



**LINKING THE BALANCED SCORECARD  
TO HUMAN RESOURCE MANAGEMENT**

**By**

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A dissertation submitted to the faculty of Business and Law in  
fulfillment of the requirement for the degree of

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## Abstract

This study examines whether the relationship between strategic human capital management practices (HCMP<sub>S</sub>) and employee capability is moderated by personnel control mechanisms, and whether the relationship between employee capability and corporate performance is affected by an intervening variable, customer loyalty, and whether efficient development and effective deployment of strategic HCMP<sub>S</sub> act as leading indicators of corporate performance. The possible moderating and intervening relationships among four constructs — strategic HCMP<sub>S</sub>, personnel control mechanisms, employee capability and customer loyalty — are considered. Propositions concerning the moderating and intervening relationships among these constructs are made, and a LISREL model of their relationships to business performance is specified.

The model is tested with data from a sample of 265 stores pertaining to five large, international companies: two high-tech manufacturing companies taking JIT inventory control and TQM into consideration; one traditional multi-plant manufacturing company making highly homogeneous products; one life insurance company fulfilling customer needs and striving for continuous improvements; and one fast food self-service company making quality a major responsibility of employees.

The research implications for academics, and the ramifications for practitioners are discussed. The results highlight the role that personnel control mechanisms play in moderating the relationship between strategic HCMP<sub>S</sub> and employee capability. This study also indicates that the development and protection of strategic HCMP<sub>S</sub> moderated by personnel control mechanisms correlate positively with employee motivation toward customers, and the deployment of strategic HCMP<sub>S</sub> moderated by personnel control mechanisms brings a significant positive effect to employee productivity.

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## List of abbreviations

Abbreviation	Meaning
HCMP <sub>s</sub>	Human capital management practices
IDEN	Identifying strategic human capital management practices
DEVE	Developing strategic human capital management practices
PROT	Protecting strategic human capital management practices
DEPL	Deploying strategic human capital management practices
CONT	The first dimension of personnel control mechanisms, human resource management control
COMM	The second dimension of personnel control mechanisms, strategy communication
TCIE	The changes in environment facing the organization
ESAOS	Employee skill and organizational structure
EM	Employee motivation
EP	Employee productivity
CC	Customer complaint

Abbreviation	Meaning
CS	Customer satisfaction
SRG	Sales revenue growth
NIBT	Net income before tax
GRROC	Gross rate of return on capital
The BSC	The balanced scorecard
JIT inventory control	Just-in-Time inventory control
TQM	Total quality management
LISREL	Linear structural relation
ABC	Activity-based costing
EFA	Exploratory factor analysis
SEM	Structural equation modeling
CFA	Confirmatory factor analysis

Abbreviation	Meaning
CR	Composite reliability
GFI	Goodness-of-fit index
AGFI	Adjusted goodness-of-fit index
RMR	Root mean square residual
RMSEA	Root mean square error of approximation
Standardized RMR	Standardized root mean square residual
NFI	Normed fit index
CFI	Comparative fit index
TCD	The coefficient of determination
M&A	Merger and acquisition

## Declaration

This thesis contains no material which has been submitted for examination in any other course or accepted for the award of any other degree or diploma in any university. The material presented in this thesis is the author's research work under the supervision of Professor R. Clift and Dr. A. Brooks.

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# Chapter 1 Introduction

## 1.1 Background to the research

Improvements in an organization should be motivated by the organization's ability to apply human capital management practices (HCMP<sub>S</sub>) strategically and effectively to create competitive advantage. One of the sources of competitive advantage of a firm stems from exploiting the capability of talented employees to produce precious ideas for improving the firm's internal processes and generating significant value to customers when HCMP<sub>S</sub> are aligned with the firm's competitive strategy. Tichy et al. (1982), and Johnson (1992), among others, have highlighted the fact that organizations will best serve customers by strategically developing HCMP<sub>S</sub><sup>1</sup>.

Kaplan and Norton (1992) base their balanced scorecard (BSC) model on activities that develop human capital, known as HCMP<sub>S</sub>, organizational learning and growth capability. Employee capability motivates internal process improvement in an organization that, in turn, drives customer loyalty<sup>2</sup>. Also, Grahn (1995) states that "the most important driver of internal process improvement of an organization is skilled and motivated employees" (p67). However, there has been no empirical investigation performing direct testing for the association between employee capability and customer loyalty in the management control literature (e.g., Widener, 2000). Moreover, earlier research on the BSC has produced partly contradictory evidence about the role of intervention variables in explaining the relationship between employee capability and financial performance of an organization (e.g., Stivers et al., 1998; Ittner and Larcker, 1998a). In the present study, how employee capability affects customer loyalty is examined. It is also proposed to concentrate on customer loyalty as a singular intervention factor of the relationships between

employee capability and financial outcomes of an organization.

Skilled and motivated employees, in practice, are expected to improve resource allocation of an organization and increase future profitability, and then enhance shareholder value. However, prior research studying the role of non-financial measures as an indicator of financial performance has mostly disregarded interactions with other potential value drivers such as employee capability (Ittner and Larcker, 1996, 1998a) or organizational citizenship (Pillai et al., 1999). Moreover, earlier studies on human resource management have produced little evidence about the role of situational moderator variables in explaining the relationship between strategic HCMP<sub>s</sub> and employee capability (e.g., Tichy et al., 1982; Snell and Dean, 1992). In the present study, the effect of employee capability on financial performance of an organization is investigated. Also, it is intended to focus on personnel control mechanisms as a moderator of the relationship between strategic HCMP<sub>s</sub> and employee capability.

Non-financial measures have recently been used as an integral part of the management control systems by many firms (Banker et al., 2000). The major motivation stems from the argument that non-financial measures are a better indicator of long-term firm value than financial performance. Also, empirical evidence indicates that firms relying heavily on HCMP<sub>s</sub> are likely to consider non-financial measures such as employee satisfaction and customer loyalty to be leading key indicators which provide them with information related to their strategic objectives (Tichy et al., 1982; Balkcom et al., 1997). Banker et al. (2000) further highlight that firms adopting traditional accounting-based measures give insufficient consideration to intangible assets and human capital. Hence, many firms seek to

create a set of tools measuring firm value by incorporating non-financial indicators into their measurement systems. However, a review of prior studies on management control systems reveals that there is a lack of empirical work on systematic and contextual links between employee capability, customer loyalty and financial performance measures (e.g., Ittner and Larker, 1998a; Banker et al., 2000; Widener, 2000).

According to the findings of Jones and Sasser (1995), customer loyalty is an important non-financial measure that is increasingly monitored by many firms recently. However, prior empirical work examining the association between customer satisfaction and future financial performance has produced mixed results<sup>3</sup> (e.g., Anderson et al., 1997; Ittner and Larker, 1998a; Banker et al., 2000). In addition, little research has been conducted on the implementation and performance consequences of constructs of the BSC, despite widespread practitioner interest in the subject (e.g., Amir and Lev, 1996). In the present study, the relationship between customer loyalty and financial performance is examined in order to evaluate the impact of employee capability on financial performance through its links with customer loyalty.

## **1.2 The research question**

As stated above, the present study is motivated by a belief that existing performance-measurement systems, primarily depending on financial accounting information, are out of date. In the present study it is contended that reliance on summary financial performance measures are holding back organizations' abilities to generate future economic value. In addition, although the role of HCMP<sub>s</sub> in capturing sustainable competitive advantage for an organization is of the essence,

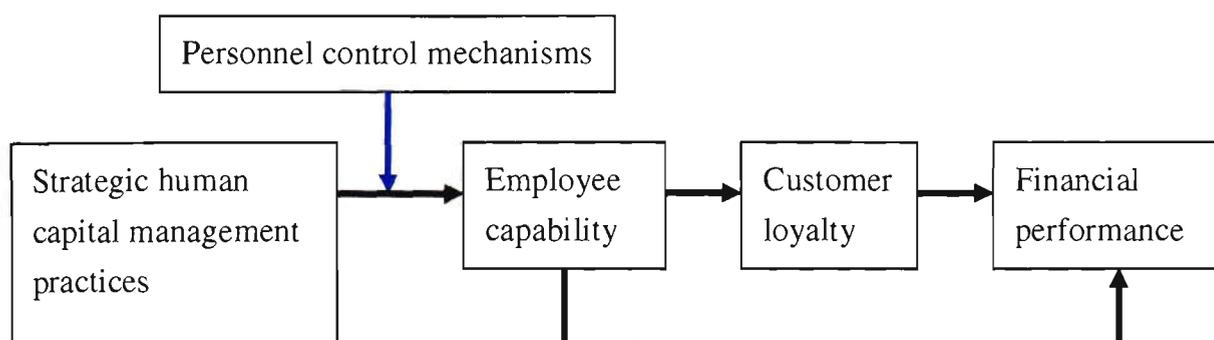
applying strategic HCMPs engenders management challenges that must be overcome to achieve an advantage. It is believed that strategic HCMPs influence employee capability through the identification and development of HCMPs, and that the protection and deployment of HCMPs help firms to capture the benefits of information asymmetries for clients through trust and satisfaction with prior services. The application of strategic HCMPs putting the emphasis on personnel control mechanisms leads to improvements in both customer loyalty and financial performance of an organization. In the present study it is expected that employee capability and customer loyalty (non-financial measures) are leading indicators of Tobin's q, sales revenue growth, net income before tax and gross rate of return on capital (financial performance).

The basic objective of the present study, therefore, is to investigate the association between employee capability and corporate performance through the direct impact of employee capability on corporate performance, and its indirect effect through the linkage between employee capability and customer loyalty. In other words, the following three research questions are further investigated.

- Is the relationship between strategic HCMPs and employee capability moderated by personnel control mechanisms?
- Is the relationship between employee capability and corporate performance affected by an intervening variable, customer loyalty?
- Do efficient development and effective deployment of HCMPs act as leading indicators of corporate performance?

In the present study, evidence on the sensitivity of these causation linkages to contextual variables is provided. The basic conceptual framework regarding research questions is illustrated as follows.

Figure 1.1 The basic conceptual framework regarding research questions



### 1.3 Definition

Based on Tichy et al. (1982), Barney (1991) and Snell and Dean (1992), human capital management is defined as extensive recruitment and selective staffing, comprehensive training procedures, stay-on of talents, the development and deployment of the relationships with customers and suppliers, and the identification and protection of insight of individual managers and workers. Additionally, strategic HCMP<sub>s</sub> in terms of human capital management are to identify, to develop, to protect, and to deploy HCMP<sub>s</sub> for recognizing and rewarding employee merit, and providing the firm with a sustainable competitive advantage and, thereby, a superior return on HCMP<sub>s</sub>. Strategic HCMP<sub>s</sub>, therefore, not only involve non-financial facets of employee capability but also include firm-specific financial aspects that competitors cannot duplicate<sup>4</sup>. Extended definitions of terms are as follows.

1. Strategic human capital management practices (Tichy et al., 1982; Barney, 1991; Grant, 1991; Snell and Dean, 1992; Amit and Schoemaker, 1993; Huselid, 1995; Coff, 1997; Abernethy and Brownell, 1997; Widener, 2000; Hitt et al., 2001). 2. Personnel control mechanisms (Jung, Dalessio, and Johnson, 1986; Snell, 1992; Hom, Caranikas-Walker, Prussia, and Griffeth, 1992; Bass and Avolio, 1993; Kaplan and Norton, 1996; Pillai et al., 1999). 3. Employee capability (Tichy et al., 1982; Katz,

Kochan, and Gobeille, 1983; Katz, Kochan, and Weber, 1985; Guzzo, Jette, and Katzell, 1985; Amit and Schoemaker, 1993; Huselid, 1995; Pillai et al., 1999). 4. Customer loyalty (Jones and Sasser, 1995; Batra and Sinha, 2000)

## **1.4 Justification for the research**

### **1.4.1 The primary theory underlying the research**

The first theoretical framework underlying the research stems from the theory of BSC. The role of accounting information within a firm has traditionally focused on the financial accounting data reported for external purposes. Many firms question whether traditional financial accounting information provides them with the best indicators for control, decision-making purposes and strategic management (Ittner and Larcker, 1998 b). There is evidence that while financial measures of performance are lagged indicators, non-financial measures (e.g., product quality and customer satisfaction) are leading indicators that evaluate and reward managerial performance in terms of timely and useful accounting information (Banker, Potter, and Srinivasan, 2000). It is believed that, in this study, a traditional accounting control system focuses on the controls of financial results while a non-traditional one emphasizes the controls of non-financial results and the moderation of personnel control mechanisms.

A principal justification for the use of non-financial measures for performance evaluation is that financial measures of performance may be imperfect and noisy signals of a manager's effort, while non-financial performance measures can put in value by encouraging long-run attentive effort. Another justification for the use of non-financial measures and controls is that they are leading indicators of financial performance (Ittner and Larcker, 1998 a). Non-financial measures and controls can complement short-run financial figures as indicators of progress toward a firm's

long-term goals. Current profit and other financial measures only partially reflect the effects of past and existing activities, whereas non-financial measures reflect the effect of current managerial actions that will not show up in financial performance until later (Malina and Selto, 2000).

The second theoretical framework underlying the research is the resource-based theory of HCMP<sub>s</sub>. Human resource theory highlights that firms capture and control unique HCMP<sub>s</sub>. This distinctive resource provides the firm with the basis for attaining sustainable competitive advantages (Amit and Schoemaker, 1993). Attributes of idiosyncratic HCMP<sub>s</sub> — asset specificity, causal ambiguity and social complexity — make resources difficult to imitate or trade (Coff, 1997). An organization that relies on firm-specific HCMP<sub>s</sub> can achieve high returns because there is no competitive market to bid up wages. Additionally, elements of HCMP<sub>s</sub> with social complexity are difficult to replicate because they are embedded in complex social systems (Barney, 1991). Finally, causal ambiguity makes HCMP<sub>s</sub> hard to reproduce since the link between the input (resource) and the output (performance) is not understood by competitors.

#### **1.4.2 Contribution to knowledge**

In spite of its limitation, results of the present study show that a number of insights can be obtained through the application of strategic HCMP<sub>s</sub> and the use of the BSC model.

First, by empirically testing whether the relationship between strategic HCMP<sub>s</sub> and employee capability is moderated by personnel control mechanisms, this study provides one of the first pieces of empirical evidence with which to evaluate the

prescriptions in the human resource strategy literature. It is expected, in the present study, that when strategic HCMP<sub>s</sub> involve more non-financial facets of employee capability<sup>4</sup>, moderating effects resulting from the control factor of personnel control mechanisms are significant, and thereby more firm-specific financial aspects that competitors cannot duplicate will be displayed such as valued relationships with specific customers, gross rate of returns on capital, sales revenue growth and net income before tax. This finding is complementary to those by Arthur (1994), Huselid (1995), and Hitt et al. (2001). In those studies, variables of socialization and the application of HCMP<sub>s</sub> were the major focal points. The present study intends to discover whether the development and protection of strategic HCMP<sub>s</sub> moderated by personnel control mechanisms correlate positively with employee's motivation toward customers, and the deployment of strategic HCMP<sub>s</sub> moderated by personnel control mechanisms brings a significant positive effect to employee productivity. These findings have one practical implication. Managers can expend efforts toward implementing strategic HCMP<sub>s</sub> and remove impediments to develop and deploy the capability of motivated and skilled employees.

Second, by applying LISREL (Linear Structural Relation) involving structural equation modelling and the measurement model about causal relationship among the chosen BSC constructs to confirmatory factor analysis and the analyses of the moderating and intervening effects (Appendix 4), the present study intends to show that firms relying more on personnel control mechanisms pay more attention to strategic HCMP<sub>s</sub> and depend more on non-traditional accounting controls. Additionally, by documenting the intervening effect of contextual variables on the linkage between employee capability and financial performance of an organization, the contribution to knowledge is expected to be the filling of the gaps caused by the

failure of the existing theory to account for the interactions of financial performance measures with value drivers of the internal-business-process improvement of an organization. In addition, the development, protection and deployment of strategic HCMPs promise to add significantly to understanding the relationship between employee capability and customer loyalty. Although these results should be seen as preliminary because of data limitations, the present study will provide future researchers with some empirical evidence supporting a promising new perspective with which to study the effects of intra-organization changes in personnel control mechanisms on the effectiveness of the development and deployment of strategic HCMPs, and thereby on the financial performance measures associated with the format of the BSC.

### **1.4.3 Contribution to practical benefits**

Although suggestions from prior empirical work are often based on observations of actual firms, they are not generally drawn from theory. Likewise, managers adopt some of the policies implemented by successful firms without the benefit of a theory explaining precisely what the policies accomplish. All dimensions of strategic HCMPs in the present study are either the design of organizational strategy for identifying, developing, protecting and deploying HCMPs or strategies for coping with both the threat of employee turnover and the problem of asymmetric information associated with the BSC model. The present research will be significant because it is expected to pick up the company's beliefs about the causal relationships among the chosen BSC constructs, and to enhance the practitioner's interest in the development and deployment of strategic HCMPs. An increasing number of firms is adopting BSC and recognizing the role of strategic HCMPs in enhancing firm effectiveness and performance. It may be practical for firms implementing the BSC to understand how

non-financial measures and controls help to reflect the effect of current managerial efforts, and how HCMP<sub>s</sub> align with the firm's competitive strategy.

The present study is also expected to contribute to practical benefits. One important implication, for current accounting practitioners, is that firms designing their management control systems must first identify and protect their strategic HCMP<sub>s</sub> and then match the design of management control systems to the development and deployment of strategic HCMP<sub>s</sub>. The contingency fit between strategic HCMP<sub>s</sub> and organizational strategy is needed, especially in dynamic environments. The present study provides empirical support for the understanding of the value of the application of strategic HCMP<sub>s</sub> in the implementation of organizational strategies. This suggests that strategic factors of HCMP<sub>s</sub> are value drivers of the dimensions of the BSC model.

## **1.5 Methodology**

There are many gaps identified in the literature regarding the dimensions of strategic HCMP<sub>s</sub> and the combination of non-financial measures and financial performance associated with the format of the BSC. Given that the research questions mentioned earlier address five inter-related areas, the present study involves two interconnected parts: the external and internal quality of LISREL model; and structural equation modeling used to test a theoretical model.

A review of the literature relating strategic HCMP<sub>s</sub> with BSC constructs is undertaken. Because the topics fall within a number of disciplines such as management accounting, strategy management, organization theory and human resource management, material is gathered from sources other than the accounting literature. The detailed study

undertaken will be reported in Chapters 2, 3 and 4. One stage of this research is an exploratory study focused on what are the theoretical and practical issues of evaluating and rewarding managerial performance in terms of BSC and strategic HCMP<sub>s</sub>. The purpose of this stage is to clarify and specify the research questions and testable hypotheses.

The survey-based method is the preferred research tool because in the present study there is little control over behavioural events, and the focus is to identify and develop a contemporary phenomenon within some real-life context. According to Yin (1984), a survey can be readily designed to answer a “what” question. Furthermore, “who” and “where” questions or their derivatives are likely to favour the survey-based research method. In the present study, one question is what have been the outcomes from applying strategic HCMP<sub>s</sub>? Identifying such outcomes is more likely to be achieved by survey-based study than others (e.g., experiment). In addition, one of the research goals of the present study is to make out the articulation of the links between non-financial measures such as employee capability and customer loyalty and financial performance of an organization. In such a case, a survey investigation might be the favoured research tool and it would be less likely to rely on doing experiments.

Data collection criteria include the following requirements. The research setting includes two different kinds of requirements. The first one relies more on the development of strategic HCMP<sub>s</sub>. The second one pays less attention to the deployment of strategic HCMP<sub>s</sub>. Firms taking strategic HCMP<sub>s</sub> into consideration differ in their reliance on the dimensions of strategic HCMP<sub>s</sub>. This variability in operation efforts highlights the significance of concentrating on the intensity of the

operation, not just on the presence of strategic HCMP<sub>S</sub><sup>5</sup>. The main reason is as follows: the change in the use of advanced manufacturing technology is often accompanied by complementary changes in strategic HCMP<sub>S</sub> (Snell and Dean, 1992). Strategic HCMP<sub>S</sub> may be even more important for modern manufacturing companies taking Just-in-Time (JIT) inventory control and Total Quality Management (TQM) into consideration (Oliver and Davies, 1990; Klein, 1991). Next, companies treating human and technical systems as integrated entities and managing them in concert are much more deliberate and comprehensive in their operation of strategic HCMP<sub>S</sub> than are others (Snell and Dean, 1992). Finally, to gain the full potential of strategic HCMP<sub>S</sub>, knowledge-based firms (e.g., law firms, hospitals, audit firms and high-tech manufacturing companies) implement all dimensions of strategic HCMP<sub>S</sub> to the greatest extent possible (Tichy et al., 1982). These firms may be even more likely to consider non-financial measures to be leading indicators which provide them with information related to corporate performance. Moreover, employee capabilities in these firms with observable financial improvements drive improved internal-business-processes and, in turn, create customer values (Kaplan and Norton, 1996b).

On the other hand, the business strategies of cost-efficiency companies paying less attention to JIT inventory control and TQM (e.g., a multi-plant cement manufacturing company producing highly homogeneous goods) are related to technological developments and investments in tangible assets, rather than the development and deployment of strategic HCMP<sub>S</sub> (Snell, 1992). The primary organizational resources of these companies are emphasized in turning out to be a low cost producer in its principal market-place.

Trade publications and annual reports indicated the companies which were likely to satisfy one or more of the criteria set out in the two previous paragraphs. They also indicated the number of branches operated by most firms. An additional criterion was at least 50 branches. In this study, direct contact with the head offices of sample firms resulted in the five companies shown below agreeing to participate in the project.

Based on the aforementioned requirements, the research sites chosen for this study include: two high-tech manufacturing companies taking JIT inventory control and TQM into consideration, Channel Well Technology Group (CWTG) and Goin Integrated Service Group (GISG); one traditional multi-plant manufacturing company making highly homogeneous products and ensuring the manufacturing processes are capable of consistently high quality but supplying a simple target for reducing average cost can suffice, Jian Kwang Machine Industrial Group (JKMIG); one life insurance company fulfilling customer needs and striving for continuous improvements, Nan Shan Life Insurance Group (NSLIG); and one fast food self-service company making quality a major responsibility of employees, Tong Hai Fish Village Group (THFVG).

With the survey-based tailored design proposed by Dillman (2000), mailed questionnaires are to be used to collect data. They are to be completed by store managers responsible for the implementation of management control and strategic HCMPs. It is also intended to conduct personal interviews with a self-selecting sub-sample to enrich the data to provide a type of cross-check on validity. Questionnaires are to be distributed to all store managers in the five companies, CWTG, GISG, JKMIG, NSLIG and THFVG, approximately 265 store managers. In addition, there to be interviews with six managers in each group to provide insights

into historical and cultural background of the research site that influence management controls and performance. Store-specific annual data on area demographics, financial performance measures and other store-level details are available for the most recent three fiscal year.

Quantitative data will be processed by using the LISREL model involving structural equation modelling and the measurement model with the SIMPLIS command language. The proposed causation relationships described in testable hypotheses are translated into a series of structural equations for each latent dependent variable. This attribute settles on structural equation modelling with the exception of techniques that accommodate multiple dependent variables – multivariate analysis of variance and canonical correlation – in that they permit only a single relationship between dependent and independent variables. The qualitative data collected from the interviews will be analysed by using the STATISTICA program.

The relationships among dimensions of non-financial and financial performance at five large, international manufacturing companies (e.g., CWTG, GISG and JKMIG) and service firms (e.g., NSLIG and THFVG) will be examined with interviews and archival data obtained from store managers whose divisions are implementing the BSC and strategic HCMPs. As stated earlier, a tailored design of survey investigation is undertaken because latent independent variables in the present study are difficult to reproduce in a laboratory setting. In addition, although the case study is a distinctive form of empirical inquiry, case studies have been viewed as a less desirable form than surveys in the present study. Why is this? The greatest concern about case studies is that they provide little basis for scientific generalization (Abernethy et al., 1999). Furthermore, the ability to estimate with considerable

precision the percentage of a population that has a particular attribute by obtaining data from only a small fraction of the total population is what distinguishes the tailored design of survey investigation from all other research methods. Neither small group experiments nor case studies have this capability (Dillman, 2000).

## 1.6 Outline of the thesis

The present study is organized as follows. The first chapter introduces the argument for inclusion of strategic HCMP<sub>s</sub> in management control systems and reviews BSC constructs. Theoretical background and the development of testable hypotheses are described in Chapter 2. Additionally, a BSC-based reward system in terms of internal or external fit is developed, and the resource-based theory of strategic HCMP<sub>s</sub> is explored. The following chapter introduces the research sites and develops the research methodology employed. The external and internal quality of LISREL model is stated in Appendix 4. Chapter 4 not only reports the analysis for the moderating and intervening effects but also discusses statistical results of the nested-model analysis. Implications of the results, concluding contributions and remarks, and avenues for future research are arranged in Chapter 5.

## Notes

1. *Every firm has access to the same physical capital, technology, and strategy. The true source of competitive advantage is found in exploiting the capabilities of superior employees who can create successful ideas for improving internal business processes and the value delivered to customers (Tichy et al., 1982). According to Johnson (1992), "the investment in employee capabilities involves the following activities: investing in employees through selective hiring and training, investing in information systems to support decision making, motivating*

*and aligning goals of employees with corporate goals, and empowering employees to use their knowledge and skills to the benefit of the organization.”*

2. *Accounting research on constructional antecedents of corporate performance (e.g., Ulrich and Lake, 1990; Baldwin et al., 2000) has identified a number of internal process improvement activities (i.e., activity-based costing and management, innovations, improvements in post-sale services) that affect customer value.*
3. *Prior studies examining the association between customer satisfaction and financial performance of an organization created mixed results. For example, Banker et al. (2000) find that there are significant linkages between customer satisfaction scores and future financial performance. However, Anderson et al. (1997) argue that productivity and future profitability can be adversely affected by higher customer satisfaction scores under certain conditions.*
4. *In this study, strategic HCMP<sub>s</sub> not only involve non-financial facets of employee capability (e.g., the design of challenging work, job enrichment interventions, realistic job previews, advancement opportunities and promotion, formal information sharing, grievance procedures, labor-management participation programs, and performance appraisal), but also include firm-specific financial aspects that competitors cannot duplicate (e.g., valued relationships with specific co-workers) (Tichy et al., 1982; Barney, 1991; Snell and Dean, 1992).*
5. *Caruana et al. (1999) hold that there are no worldwide rules that have been appropriate for all organizations' operations, and not all obtainable ways are regularly effective.*

## **Chapter 2 The development of theoretical framework and testable hypotheses**

### **2.1 Introduction**

Regarding non-accounting information used to appraise employees' performance, some valuable farsighted views come from Hopwood (1972, 1974) who distinguishes three styles of budgetary information used to measure managerial personnel's performance. The three styles are: budget-constrained style; profit-conscious style; and non-accounting style.

The former two must use budgetary information, with the difference being: budget-constrained style emphasizes managers' ability to accomplish short-term budgetary goal, while the profit-conscious style focuses on managers' ability to lift the operating performance of their departments which have close relevance with the corporation's long-term operating goal. The non-accounting style features no budgetary information to be used while appraising managerial personnel's functioning performance, with the point of differentiation from budget-constrained style as: non-accounting style not only connects with slight job-related tensions and less adroit manipulation of accounting information, but with the promotion of harmonious relationship between superiors and subordinates as well. Besides, non-accounting style also has close connection with enhancement of employees' job satisfaction.

The balanced scorecard (BSC), started in 1990s, is regarded as a tool of management control and strategy communication used to assist each departmental (or each shop) manager in measuring the operating performance. In 1990s, a booming development of activity-based costing (ABC) was used to overcome shortcomings of traditional

costing systems as follows: not being able to develop the cost drivers that make a direct contact of the operating cost of each activity with the demand quantity of each product. Most use of the BSC is made by most corporations to organize and formulate their process of management around the budget and operating plan (Kaplan and Norton, 2001b). Apparently, the interaction between the BSC and activity-based budgeting lies in that the BSC is a tool of implementing management control and strategy communication which is judging the effectiveness of operating activities of an organization.

Organizations implementing the BSC and activity-based budgeting disregard those aspects of the business strategy estimated to be without future economic values and operating activity estimated to be without strategic values usually, since these strategies and activities do not have a single redeeming feature to the organization's future operating performance. Furthermore, those organizations draw up a strategy-based and activity-based budget according to the business strategy estimated to be having economic value and operating activity estimated to have strategic value in the future. Consequently, a combination of business strategy with future economic value, operating activity with strategic value and strategy-based and activity-based budget enables those organizations implementing BSC and ABC to get new capabilities, win new customers, acquire new markets and make essential improvements in existing process and capabilities.

## **2.2 The development of a theoretical framework**

Traditional accounting research has long been criticized by academics for methods of performance measurement and tools of management control, since traditional views neglect the causation between each departmental manager's short-term operating

activity and the organization's long-term business strategy while measuring the impact of yesterday's operating strategy on today's management control.

As was indicated by Banker et al. (2000), traditional views cannot really reflect the possible impact of today's business strategy of the organization on future operating performance. Besides, the usefulness and adequacy of the traditional views have long been doubted by practitioners. Dixon et al. (1990) indicated that an organization's long-term business strategy which takes improvement of product quality, development of manufacturing flexibility and lessening of manufacturing time as the base of design will not make a mutual contact with the traditional views which squares accounts in every detail on cost improvement.

Ittner et al. (1998b) also indicate that an organization may not reflect appropriately the operating performance while facing highly uncertain exterior influences by merely relying on traditional views that emphasize results of performance measurement and management control but neglect the processes of management control and causes bringing results of performance. Therefore, traditional views will be of great benefit to the operating performance while an organization faces a stable exterior environment and a simple manufacturing process of the products.

In this study, it is argued that reasons the traditional views can hardly emphasize processes of management control and causes bringing results of performance lie in financial measurements of performance and results of these measurements being over-aggregated that thus cannot generate useful feedback information to assist the organization in mapping out the business strategy as well as each departmental (or each shop) manager in enhancing operating performance. Kaplan and Norton

(2001a,b) adopt similar views as well.

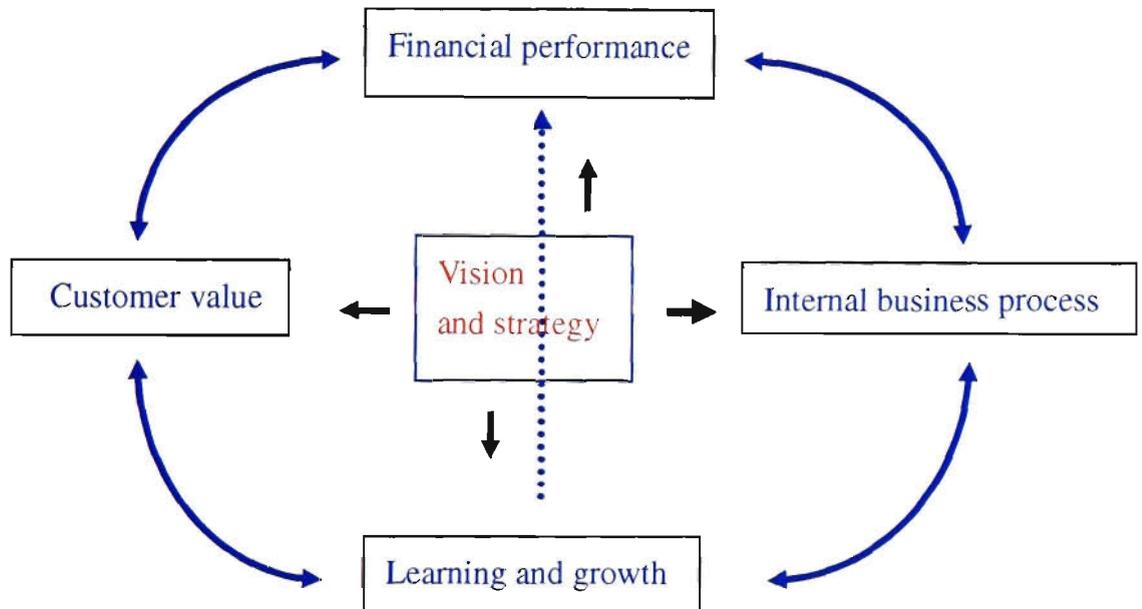
For the past two decades, both academics and practitioners have stressed repeatedly that an organization must apply non-financial indicators to measure the performance of management control while drawing up long-term business strategies as most of these indicators emphasize the processes of management control and causes of corporate performance (Bank et al., 2000). As indicated by Behn and Riley (1999) non-financial indicators to measure the performance of management control are leading indicators which can bring each departmental manager useful and timely accounting information.

Views held by Bank et al. (2000) and Behn and Riley (1999) have already enabled numerous organizations not only to use non-financial indicators to supplement shortcomings of traditional performance measurement while reporting operating performance but also to redesign management control systems so as to make the functions of management control reflect the possible impact of today's business strategy on future operating performance.

In academia, the BSC, initiated in early 1990s, has been used to link enterprise vision with its operating strategy. The key for the BSC is to make a suitable combination of corporate vision, business strategies of a company, flow process of internal business and employee capability, to take advantage of adequate communication, to decide on proper measuring indicators of financial performance, and further acquire action plans from each measuring indicator. The purpose of implementing BSC is to encourage a development towards the corporate vision and reach the operating target of an organization. Based on Kaplan and Norton (1992), the BSC model involves

three subjects: performance measurement, management control and strategy communication. The dimensions included in the BSC model can be described as follows.

Figure 2.1 The dimensions of the BSC model



Source: Kaplan and Norton (1992)

### 2.2.1 The claims for the balanced scorecard model

The BSC model is claimed to be an effective combination of management control of strategy and strategy communication (Kaplan and Norton, 1992). Atkinson et al. (1997) regard the BSC model as one of the most important advances of scientific knowledge in management accounting. In terms of the application of the BSC model, Silk (1998) calculates that approximately 60 % of the US Fortune 500 companies have put into practice or are carrying out trials with the BSC model. The BSC model offers three major improvements over traditional management control systems:

- (1)the establishment of links;
- (2)the usage of non-financial indicators; and
- (3)a congruence between the internal business process and an ABC system.

### **The first claim: setting up links**

The first claim is that BSC has designed three links among four dimensions which would benefit greatly the promotion of competitiveness of an organization. Those dimensions are as follows (Kaplan and Norton, 1992):

- (i)invest funds in items that would benefit learning and growth;
- (ii)promote the internal business process efficiently;
- (iii)create considerable customer value; and
- (iv)improve financial performance.

### Invest funds in items that would benefit learning and growth

As to the first dimension, Tichy et al. (1982) and Johnson (1992) insist that the organization enables customers to enjoy the best service quality by prudently selecting talents, training talents and keeping them as well as investing in HCMPs. BSC advocated by Kaplan and Norton (1992, 1993, 1996a, b, c and 2001a, b) demands that the organization invest in information systems, encourage employees to be diligent and work hard, authorize them to bring their working experiences and specialized skills into full play to develop a smooth process of the organization's production and marketing decisions, make employees' personal goals and the organization's business goal congruent and enable the organization to gain the highest business profit.

According to Kaplan and Norton's views concerning the investment in HCMPs, there

are three methods of evaluation for the performance: measure employees' satisfaction; evaluate the impact from employees' resignation rate on the organization's business operation; and measure employees' production capability. Apparently, promotion of employees' satisfaction is a factor which results in employees' low resignation rate, increases of production capability, enhancement of the centripetal force towards the organization, higher quality of product and enhancement of customers' satisfaction. An organization with high customer satisfaction must have employees in high morale that would definitely enhance their satisfaction.

According to the preceding inferences, this study postulates as follows. Employees' production capability will increase (e.g., enhancement of satisfaction and low resignation rate that would give rise to production capability of the employees' unit) when an organization efficiently applies HCMP<sub>s</sub> (e.g., prudently select talents, train talents and keep them).

#### Promote the internal business process efficiently

For the second dimension, BSC advocated by Kaplan and Norton (1992, 1993 and 1996a, b c and 2001a, b) maintains that the target design and performance evaluation shall be in conformity with the shareholders' maximum interest and will satisfy customers' expectation.

Following the preceding inference and postulation, employees' production capacity increases, internal business process improves and consumers' rights and interests gain the greatest protection when an organization efficiently applies strategic HCMP<sub>s</sub>. This study supposes that BSC can efficiently promote the internal business process of an organization and then strengthen the friendly relationship between the organization

and customers through innovation of the products, quality improvement and intimate after-sale service to gain an advantageous competitive position in the market. To maintain an advantageous competitive position, each organization must design a set of unique internal business processes which competitors are not able to imitate and thus increase financial performance.

According to the preceding inference, this study makes the following postulation: there exists a close causation among an increase of employees' production capacity, improvement of internal business process and maintenance of friendly relationship between the organization and customers when an organization efficiently applies HCMPs.

#### Create considerable customer value

For the third dimension, the present and prospective customers' preference on products may not necessarily be the same (Borucki and Burke, 1999). In a word, the present and prospective customers may have different intensities of preference (e.g., "like it very much" and "like it slightly"), and they may apply different methods to evaluate the product quality. The subjective value that customers recognize in products not only will affect customers' satisfaction but also indirectly affect the growth rate of sales revenue and profitability of an organization's products through the increase and decrease of customers and changes of consumers' subjective value. Kaplan and Norton (1996c) insist that lows and highs of customer satisfaction, increases and decreases of customers, fluctuation of the growth rate of sales revenue and changes in profitability are common characteristics regarding customer value for an organization.

This study supposes that an organization shall set the goal for the customer groups when creating considerable customer value: for the maximum growth rate of sales revenue and profitability from the customer group expected by the organization. Based on the above-mentioned inference, this study makes the following postulations: there exists a close relationship between customer value and the organization's growth rate of sales revenue when the organization efficiently applies BSC.

#### Improve financial performance

As to the fourth dimension, a realization of each production strategy (e.g., promote the total quality management), marketing strategy (e.g., establish circumspect marketing channel) and investment strategy (e.g., develop human resources) can serve as the goal to be pursued by each activity when implementing BSC (Kaplan and Norton, 1996c).

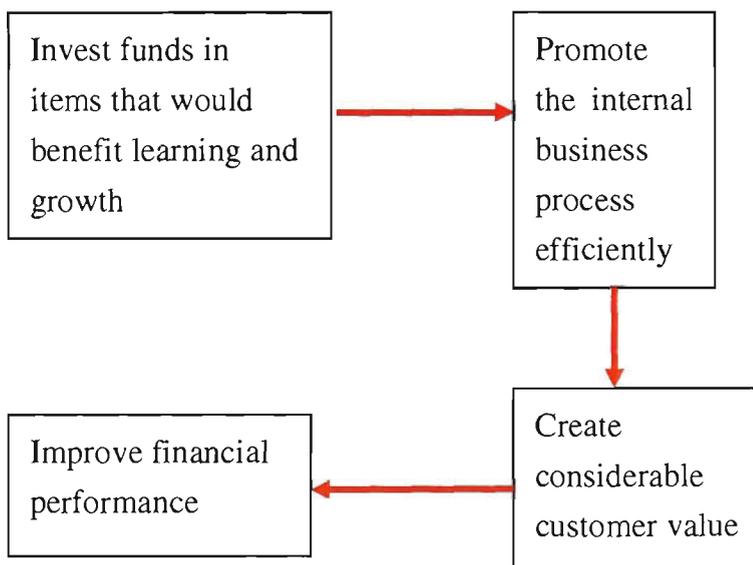
For products of the corporation, there are different missions to be accomplished for each phase of the product life cycle. Based on research by Kaplan and Norton (1996a, b, c), the life cycle for products includes three phases: start growing, keep on growing and stop growing.

In the phase "to start growing", what a corporation has to accomplish is: increase R&D for products; strengthen employees' production capability; enhance growth rate of sales revenue; and establish new marketing channels and enlarge existing ones. For the phase "to keep on growing", what should be accomplished by a corporation is: make use of discounted value of cash flow, economic value-added and shareholder value to evaluate financial performance for each investment activity. As to the phase "to stop growing", the mission to be accomplished by a corporation is: obtain direct

and reliable cash flow to make up for each cash disbursement flow already paid or yet to be paid as well as to calculate the effective growth rate of net profit.

This study holds that the corporation implementing BSC may use the following indicators to measure the financial performance of the corporation: employees' production capability, the growth rate of sales revenue, gross rate of return on capital and the growth rate of net income before tax. When making use of these financial indicators, however, it is necessary to consider at what phase of product life cycle the corporation is positioned. The links described above can be depicted as follows.

Figure 2.2 Links of the BSC model



Source: Kaplan and Norton (1992)

### **The second claim: the treatment of non-financial indicators**

The preceding links elaborate the first claim of BSC, while the second one is: in addition to the above-mentioned financial indicators used for implementing the BSC, non-financial indicators are also used frequently to evaluate a corporation's

operational performance. Examples of those indicators are: employees' centripetal force toward the corporation; degree of support by employees to the enterprise culture of the corporation; level of trust by employees in the leadership of the leading rank; and customers' loyalty to products (Ittner and Larcker, 1998a, b; Malina and Selto, 2000).

According to Kaplan and Norton (1996c), financial and non-financial indicators can fully reflect the causation between employees' production activity and the corporation's operating performance, but there appears to be a causal relationship between financial and non-financial indicators. In a word, non-financial performance measures are the leading indicators for the corporation's operating performance, while financial performance measures are lagging indicators. This study supposes that the amount of non-financial indicators and numerical value of financial indicators may sometimes change simultaneously, thus leading to a difficulty to confirm the causation. For example, a lessening of employees' centripetal force towards the corporation and a decreasing level of support by employees for the enterprise culture may make employees' short-term productivity lower.

Similarly, customers' level of satisfaction towards products of the corporation slips and customers' level of complaint increases making customers' willingness to re-purchase in the short-term lower and thus influences customers' loyalty. Consequently, the causation between financial and non-financial indicators is determined by the difference of time period for applying the two indicators. When the designated time period for applying financial and non-financial indicators is closer, it will be harder to confirm the causation between the two; similarly, causation between the two shall be hard to confirm when financial and non-financial indicators

appear simultaneously.

### **The third claim: the congruence between the internal business process and an ABC system**

The third claim of BSC is: there exists a considerable congruence between the operational measures of the internal business process and an ABC system which is used to explore the relationship among the input of operating resources, the execution of operating activity and the object of operating cost. The main function of an ABC system is to help managers to understand the real cost and practical consumption of operating resources and confirm whether specific operations produce value-added so as to assist the corporation to achieve the purpose of cost planning and control.

When a corporation applies an ABC system, cost planning and control are traced back to a developmental process, a marketing phase, the manufacturing process, the distributional phase and the transport process of each product. Moreover, after implementing BSC, those corporations shall precisely calculate the increases and decreases of customers, lows and highs of customer satisfaction and growth rate of sales revenue in order to measure the profitability brought by customers' purchases. If those corporations apply ABC system simultaneously, it is possible to have a good command of the preceding cost planning and control.

#### **2.2.2 Limitations of the prior empirical work**

The first claim discussed in BSC seems to be general commercial knowledge, but recently, numerous scholars have explored the causation between financial and non-financial performance measures empirically (e.g., Banker et al., 2000; Malina and Selto, 2000). Though the focal point of that research centre on whether or not

non-financial performance measures are leading indicators; whether financial performance measures are lagging indicators of operating performance for a corporation; and whether there exists a causation between financial and non-financial performance measures.

These authors, however, did not explore the causation between financial performance and human resources strategy of the corporation. Research by Kaplan and Norton (1996c) indicates that what BSC discusses is a causal model, basically, while the financial goals of the corporation are the centre of the four important links discussed in the first claim (i.e., invest funds to items that would benefit learning and growth, promote the internal business process efficiently, create considerable customer value and increase the financial performance). As to human resources strategy, it has a close causation with the intensification of employees' production capability, the improvement of internal business processes, the enhancement of excellent customer value, the creation of considerable financial performance and the establishment of sound management control system. The corporation creates its long-term advantages in the market through the causal relationship between human resources strategy and financial performance.

Besides, for the sake of improving the internal business processes (e.g., increase employees' productivity, strengthen the corporation's manufacturing processes, and enhance customers' loyalty to products), employee performance appraisal systems can be used to strengthen employees' centripetal force towards the corporation and enhance their intensity of support to the enterprise culture (Tichy et al., 1982). Prior empirical work did not concentrate on those issues. This study supposes that the employee performance appraisal system truthfully reflects the effectiveness of

HCMP<sub>s</sub> (e.g., the influence of prudently selecting talents, training talents and keeping them on operating performance of the corporation) and changes of employee production capability (e.g., the elevation of employee satisfaction, the decrease of employee resignation rate and the increase of employee productivity), and the relationship between the two. Particularly, when the corporation develops each new business strategy (e.g., promote JIT inventory control, establish new marketing channel and develop new human resources policies), the employee performance appraisal system must be appropriately amended to enhance employee morale and increase their performance at the time the corporation promotes the new business strategy.

Finally, financial and non-financial indicators used to measure the operating performance of HCMP<sub>s</sub> shall be carried out in a special combination so as to reflect in time the causations between human resources strategies and results after the promotion of those strategies. Every causation revealed by the dimension of BSC, learning and growth, can help the corporation to develop, communicate and promote each kind of human resources strategy. The corporation obtains reliable feedback information through BSC to achieve a good internal control and accomplish employee performance appraisal.

### **2.2.3 Barriers to the implementation of corporate strategy**

As described in the preceding paragraph, methods of performance measurement and calculation of employees' remuneration based on performance adopted by traditional views are quite dissimilar to modern ones. What is emphasized by the traditional views is lowering of cost for each unit of product, enhancement of rate of return on investment and increasing net income before tax. The modern views, however, stress

the enhancement of employees' job satisfaction, lifting of employees' working morale, improvement of internal business processes, increasing customers' loyalty and incessant lifting of the organization's competitive advantages (Grahn, 1995).

Why do modern views advocate applying non-financial indicators to supplement the accounting information required to promote the management control systems? According to Banker et al. (2000), an organization uses non-financial measurements of performance to make up for an insufficiency of short-term performance indicators to successfully draw up long-term business strategy which requires accounting information and performance measurements. Moreover, Ittner and Larcker (1998b) also indicate that an application of non-financial measures for performance evaluation is consistent with theoretical work on compensation in agency settings.

It is supposed that one reason to use non-financial indicators is that departmental managers' efforts, working experience and specialized knowledge have not been considered important by senior executives when the traditional methods of short-term performance measurement is used to evaluate each manager's performance. Also, departmental managers may consider that the operation of management control and results of performance measurement are ineffective or unfair, and these phenomena shall easily result in managers' working pressure and fatigue as well as low internal morale under circumstances lacking appropriate communication.

According to Kaplan and Norton (1996c), the crux of unsuccessful execution of BSC lies in the failure to implement efficient business strategy. The barriers to execute corporate strategy are always due to the following four items (Kaplan and Norton,

1996a, b, c): the obstacle to enterprise vision; the blockade from the employees at the basic level; managerial obstruction; and the shortage of sufficient resources.

On the other hand, the main reasons for unsuccessfully conquering the barriers can be described as follows. First, employees at the basic level will generate a state of resistance due to misapprehension and insecurity when challenging a great reformation such as the implementation of the BSC. Second, numbers of enterprises carrying out the BSC do not link budget-organizing with strategy-execution. Third, the implementation of the BSC does not have a close causation with the accurate evaluation to enterprises' operating performance. Based on the motivation of rising above the barriers mentioned above, the development of the theoretical framework in this study steps forward in terms of the following links.

First, emphasize the function of management control when implementing the BSC (The development of the theoretical framework is described in subsection 2.2.3.1).

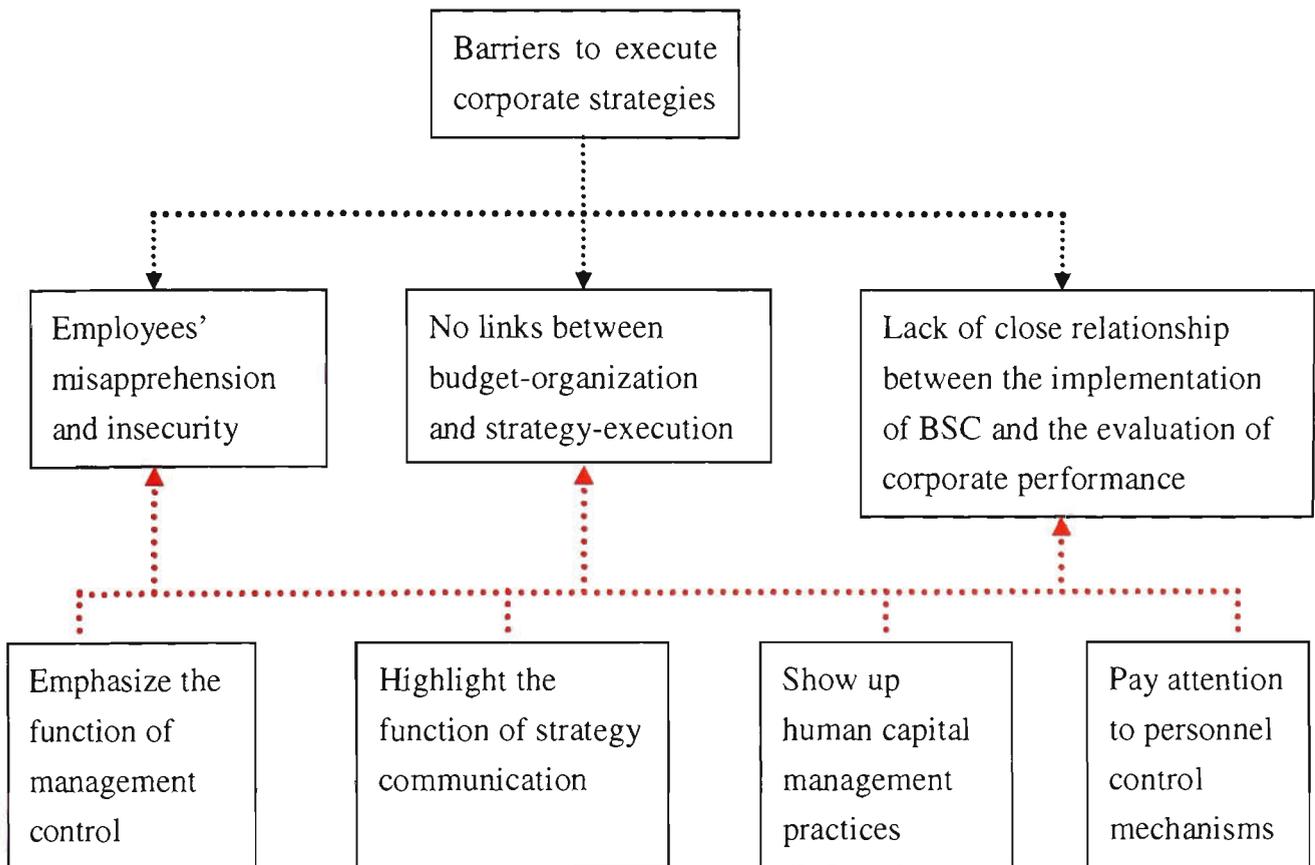
Second, highlight the function of strategy communication when executing the BSC (The development of the theoretical framework is described in subsection 2.2.3.2).

Third, show up human capital management practices (The development of the theoretical framework is described in subsection 2.2.4).

Fourth, pay attention to the moderating effect of personnel control mechanisms (The development of the theoretical framework is described in subsection 2.2.4).

The following figure depicts the whole ideas noted above.

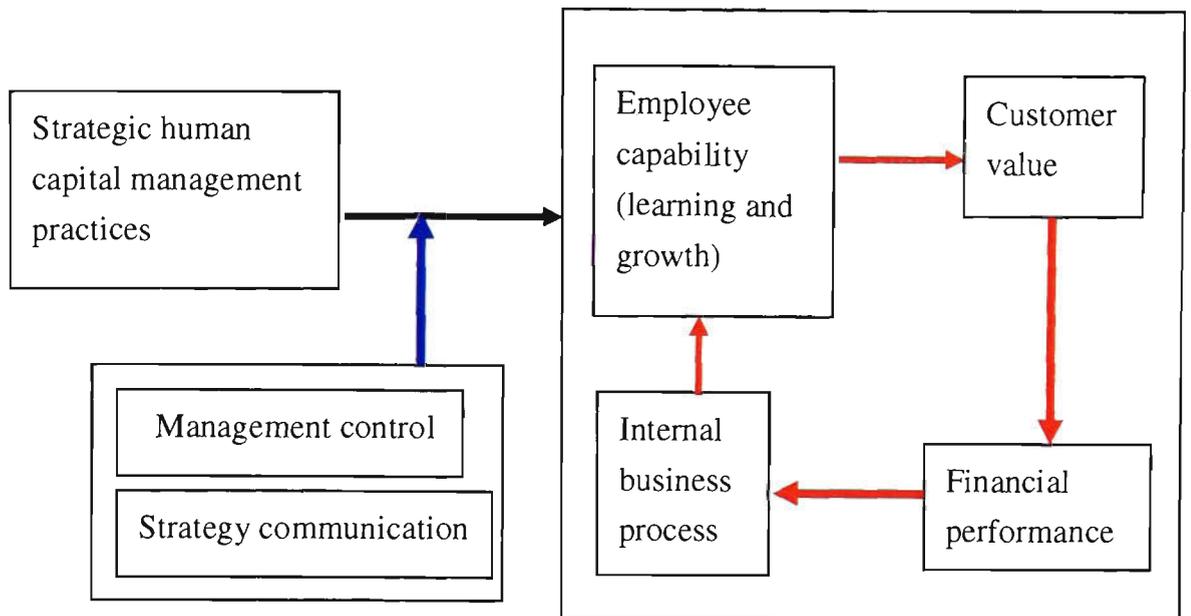
Figure 2.3 Barriers to implement corporate strategy when executing BSC



Source: Kaplan and Norton (1996 a, b, c, 2001a, b) and Tichy et al. (1982)

The whole links noted above can be depicted as the following figure. According to Snell (1992), the implementation of strategic HCMP<sub>s</sub> in Figure 2.4 indicates that strategic HCMP<sub>s</sub> are regarded as the driver of successfully executing corporate vision and improving financial performance.

Figure 2.4 The causal links for developing the theoretical framework



Sources: Kaplan and Norton (1992) and Snell (1992)

### 2.2.3.1 The function of management control

Management control of business strategy signifies one system trying to enable the production activity of employees to be consistent with the overall strategy of their employing firm (Tannenbaum, 1968; Tichy et al., 1982). According to Ouchi (1977), Cheng and McKinley (1983) and Kerr (1985), there are three ways that management control of business strategy can operate.

- (i) Leaders of the organization declare the business philosophy and their ambition.
- (ii) Internal organization forms one operating faith with a deep influence.
- (iii) Leaders of the organization evaluate employees' performance at any time and receive feedback generated from employees' activity.

BSC advocated by Kaplan and Norton (1992, 1993, 1996a, b, c, 2001a, b) aims at requesting those leaders to keep on declaring the business philosophy and their ambition, evaluating employees' performance, and laying emphasis on feedback.

Consequently, one goal of implementing BSC is to recognize BSC as one tool in management control of strategy. As noted earlier, one objective of this study is to explore the characteristic of HCMP<sub>s</sub> and the strategic factors they involves. According to Tichy et al. (1982) and Snell (1992), strategic HCMP<sub>s</sub> are the driver of corporate vision, business strategy and financial performance and management control of strategy has three patterns as follows:

- (i) control the production behaviors of employees directly;
- (ii) control the yield and quality of products; and
- (iii) control the input of production factors.

#### Control the production behaviors of employees directly

Controlling the production behaviors of employees directly originates from the following business philosophy: each activity is closely connected in sequence on a series of relevant production activities (Hitt et al., 1990). To make sure all personnel on the product line observe this stipulation, the leadership (for example, the foreman of the production line, chief of section, chief of department or manager) supervises personnel's production activity at any time and appraises their production performance. Generally speaking, the appraisal of the employee's production performance is based on the subjective evaluation by the leader. Consequently, the feedback generated from employees' production activity would be used to correct the error. In a word, the feedback is used to lessen the difference between employees' actual production outcome and the leadership's expected result.

On the other hand, controlling employees' production behaviors aims at turning leaders' ambitions into employees' practical production activities. Therefore, direct control of employees' production behavior can easily result in the following

after-effects.

First, the leadership of the organization must spend a considerable sum on supervision.

Second, a high cost resulted from controlling employees' production behavior directly will turn into an ineffective controlling activity. That is, the controlled scope of employees' production behavior will be reduced greatly. Besides, to achieve a purpose of taking control of employees' production behavior, each step for a series of production activities will be standardized to implement the supervision and performance appraisal, thus making employees more careful while engaging in production activity for fear of error.

Snell (1992: 296) supposed that "while there exists the causation of mutual correspondence between the actual outcome generated from employees' production activity and the production activity on the product line, if the leadership of the organization does not have a good or deep grasp of the causation, then each step in the employees' production activities cannot be standardized in advance". Furthermore, the leadership will never find a reasonable estimation basis to evaluate and appraise if employees' working performance or their production activities actually fulfill the philosophy and ambition of the leadership of the organization. In these circumstances, controlling employees' production behaviors directly will bring no benefit to the organization.

#### Control the yield and quality of products

A direct control of product yield and quality by foremen, chiefs of sections and

departments is the second pattern of the control system (Tichy et al., 1982; Snell, 1992). The organization must establish the expected financial goal in advance for employees to observe when product yield and quality are under direct control. Production activities are not necessarily standardized and operating philosophy and ambition of the leadership are not necessarily transformed into employees' practical production activity (Hill and Hoskisson, 1987). Under such a circumstance, each employee will be authorized to apply all useful production methods to achieve the expected goal.

In light of a view from agency theory under a lack of rigorous procedural supervision and quality control, a direct control of product yield and quality may result in less information about practical production activity acquired by leadership than by those employees on the production line (Williamson, 1975). To avoid these issues and to stimulate employees' efforts to accomplish the leadership's managerial philosophy and ambition, employees' performance and their rewards shall reveal an obvious causation with their practical production activities (Ouchi, 1977). In a word, employees are authorized to try their best to make a good command of each self-performance opportunity by eliminating each possible disadvantage on the production line, increasing product yield and enhancing product quality to obtain higher remuneration.

As a direct control of product yield and quality is an ex post behavior control, the inner organization of the corporation will have no built-in system to stop manufacturing error occurring as employees engage in production activities. Besides, what responsibility and risk employees and foremen, etc. can bear and face is far greater than under direct control (Snell and Dean, 1992). Therefore, those

employees and foremen, etc. might select the production plan with financial goals easily achieved and the working performance with an immediate effect produced, rather than the one uneasily achieved as well as the one revealed in the long-term span which are significant to the integral operation of the organization. To avoid these circumstances, the leadership must map out a reliable and effective performance accrediting system to assess the contribution level for performance of the integral operation on each production line.

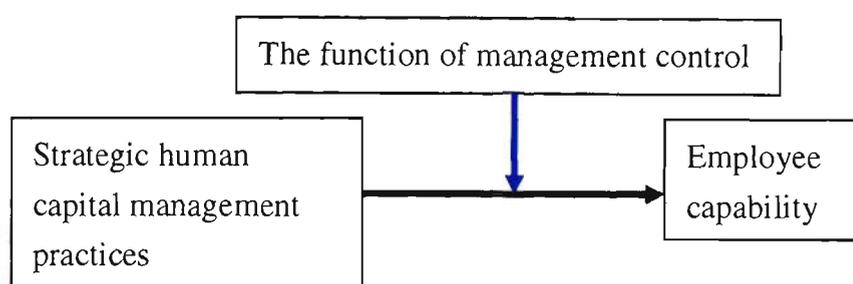
#### Control the input of production factors

The third pattern of the control system is a control of input of production factors (i.e., investment in human resources) (Snell, 1992). Research by Tichy et al. (1982) and Jaeger and Baliga (1985) indicate that seeking appropriate talents, cultivating excellent talents and keeping useful talents are one control on the input of production factors that enables a combination of employees' personal interests with those of the organization. Selection and training can take control of employees' professional knowledge and technique to decide if they are in conformity with the corporation's demands, employees' production capability is sufficient to promote product quality and engage in innovative activities, and employees' working performance meets the leadership's expectation.

Each of these three mentioned above shows advantages and defects, and a combination of them (simultaneous application) is exactly what is described in this study, i.e., the role of the BSC for management control of strategy. As Wash and Seward (1990) indicate, the basic spirit of a control system is to stimulate employees' production motivation, cultivate employees' production capability and carry out communication between leadership's managerial philosophy and employees'

production activity. Consequently, the theoretical model in this chapter advocates that an effective application of strategic HCMPs is an important premise to execute the BSC. The relationship between them moderated by the function of management control can be depicted as follows.

Figure 2.5 The relationship between strategic HCMPs and employee capability moderated by the function of management control



Source: this study

### 2.2.3.2 The function of strategy communication

Research by Kaplan and Norton (1996c) indicates that BSC links up the anticipated operating results of the organization and the energy that pushes these anticipated results to become close causation, while the leadership unifies one power with a strong centripetal force by connecting each employee's specialized knowledge with working skill through BSC to achieve a strategic goal. Consequently, BSC not only helps the organization implement beneficial business strategy but also enables its internal communication channels to remain unimpeded.

Tichy et al. (1982) think that the financial performance of an organization will worsen when its internal communication channels are impeded. Therefore, one important factor in maintaining a long-term operating advantage in the market would be to open

one good internal communication channel and link up the business strategy and employees' specialized knowledge and skill through the BSC.

According to Barker and Camarata (1998) and Goodman (1998), the distinctive features of effective communication and communication quality can be classified as follows: (i) complete communication process and brief and concise communication language; (ii) create good quality of enterprise culture by demands of self-esteem and self-realization; and (iii) legacy of working experience and giving and acceptance of specialized skill.

#### Complete communication process and brief and concise communication language

If the language used in the communication process is simple and easy to understand, employees are quite willing to communicate and the communication process will benefit greatly their production activity. Besides, effective communication should be frequent, while the effect of communication can be anticipated in advance. The results of communication will be substantial and would win trust from employees of the organization if the process were complete (Barker and Camarata, 1998). According to Goodman (1998), effective communication methods should be able to eliminate the employees' untruthful reports of working performance, thus improving the centripetal force towards the organization.

#### Create good quality of enterprise culture by demands of self-esteem and self-realization

The development of enterprise culture enables employees to be able to cooperate with each other to combat the disadvantageous impacts from the outer environment and think of the prospective orientation of development for the organization so as to build

an aspect of continuing prosperity. As described above, a depiction of the communication results shall be expressed in clear and definite and concrete methods. An excellent enterprise culture will be able to integrate different operating philosophies to eliminate the behaviours generated by employees deviating from the production activity.

In the organization, each employee thinks himself/herself a person with values who is capable of fulfilling each assigned mission and solving problems with the greatest ease while facing all kinds of challenges. Therefore, each of them would identify what they have done, hoping his/her ability would receive recognition from others. Effective communication methods can satisfy such needs for self-esteem while communication can help employees to develop their own communication capabilities to improve inter-personality and strengthen friendships with others. When needs of self-esteem are satisfied, needs of self-realization start to be activated while employees will urge themselves to bring their own aptitude, potential and natural endowments into full play and have them realized.

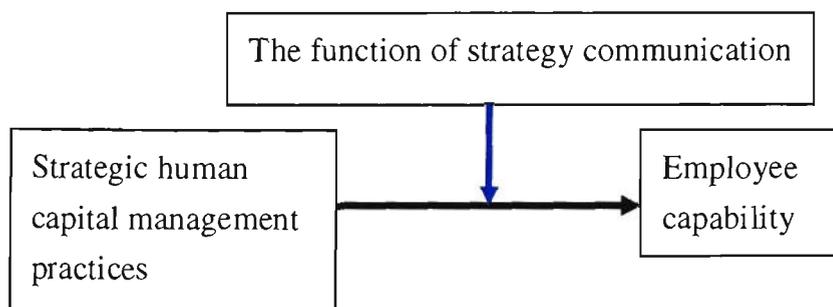
#### Legacy of working experience and giving and acceptance of specialized skill

Communication is a skill which is like other skills such as playing piano and tennis that require time and effort. First of all, learning communication skill requires a self-examination and understanding of personal status and behaviors, and accordingly, communication needs experience and practice.

With different working experiences and specialized skills as well as various practice processes to obtain them in the organization, accumulation and exchange of these working experiences and specialized skills are indispensable sources to design,

implementation of production or marketing or investment strategy. The benefits of working experience and giving and acceptance of specialized skill can be achieved through communication. The establishment of new production methods, invention of new operating philosophies and design of new marketing strategies rely on a mutual communication, exchange and brainstorming of working experiences and specialized skills between employees that lead to an incessant brew, integration and development. As expressed by de Hass and Kleingeld (1996), efficient two-way communication encourages employees to participate in the design of performance accreditation systems which keep on offering reliable and trustworthy working experiences to be in conformity to enterprise culture, providing all other employees with opportunities to share. Strategy communication of BSC discussed in this study includes three important distinctive features in communication: a complete communication process and a brief and concise communication language; needs of self-esteem and self-realization to create good quality of enterprise culture; legacy of working experience and giving and acceptance of specialized skill. The relationship between human capital management practices and employee capability moderated by strategy communication can be depicted as follows.

Figure 2.6 The relationship between strategic HCMP<sub>s</sub> and employee capability moderated by the function of strategy communication



Source: this study

#### **2.2.4 The theoretical framework of human capital management practices**

Traditional views regarding HCMP<sub>s</sub> research put the focal points on the distinction of managers and direct labour force (Arthur, 1994). The function of managers is to apply statistical skills and intellectual faculties to design products and decide the production processes simultaneously, and search for the direction of customers' preference according to the position of the products on market. The function of a direct labour force is to apply physical strength to manufacture products under managers' direct supervision and have the products transported to the market. However, modern research regarding HCMP<sub>s</sub> argues that not only managers apply statistical skills and intellectual faculties to engage in product design and production process analysis, but engineers, marketing, management and accounting personnel work on issues concerning product design and process analysis as well, while they keep on thinking how to improve the quality of the products, lower cost and shorten the manufacturing time (Huselid, 1995; Hitt et al., 2001).

This study supposes that if a corporation implementing strategic HCMP<sub>s</sub> actively can emphasize the operation of personnel control mechanisms at the same time (e.g., carefully selecting talents, prudently training talents and practically keeping them), then the main mission for employees with specialized knowledge and production skills is to keep searching for solutions to problems and to engage in innovative activities. Under such circumstances, employees are intelligent and clever people who search for problems and solve problems rather than robots merely engaging in dull and repetitive production processes.

Consequently, the scale of production keeps on growing under those problem-solvers' hard work. As indicated by Tichy et al. (1982) and Kaplan and Norton (1996c),

encouraging employees to detect problems, supporting employees to solve problems and developing their potential are important factors in the rise and fall of a corporation.

Employees' behaviour has a great impact on operating performance. According to Snell and Dean (1992) and Arthur (1994), cost control and treating others with utmost sincerity are the one and the only way to develop employees' willingness to face challenges and work hard. The purpose of cost control is aimed at lowering direct labour cost and enhancing production efficiency, while treating others with utmost sincerity aims at understanding employees' ideas and motive of behaviour and giving appropriate recognition.

This study holds that courses of action for cost control and treating others with utmost sincerity are different due to different purposes. Cost control is to ask employees to observe regulations regarding production activity, announce the appraisal method of working performance and the calculation of rewards to employees so as to let them try their best to promote working efficiency and earn the highest remuneration, as suggested by Walton (1985). On the other hand, treating others with utmost sincerity is to believe employees' behaviour valuable to the operating performance and, consequently, to give appropriate respect to their production behaviour. Pillai et al. (1999) suggested that treating others with utmost sincerity determined whether a leader could be effective or not. They postulated that when the objectives of the organization require greater diversity of effort and greater coordination, treating others with utmost sincerity becomes much more important to implement human capital management practices. In this study, treating others with utmost sincerity describes encouraging behaviours of a supervisor towards a subordinate in order to

make the subordinate go over activities before attempting them (De Vries, Roe, and Taillieu, 2002). It is contextual in the sense that it depends on the individual's assessment of the particular practices. Under such circumstances, the corporation actively encourages employees to participate in the management and operating decisions and work cooperatively to find solutions and proposals to the problems that the corporation faces. Moreover, there exists a certain relationship between employees' working performance appraisal and the corporation's operating strategy. In a word, methods of performance appraisal and the management system shall be amended appropriately when employees' performance is particularly remarkable and transcends that expected by the management, as suggested by Tichy et al. (1982).

Based on the preceding inferences, this study makes the following postulation: a corporation applying strategic HCMPs actively but failing to understand employees' ideas and motive of behavior and giving inappropriate influence cannot enhance employees' production capability by relying only on cost control and supervision of employees' production behavior.

#### **2.2.4.1 The contingency view of human capital management practices**

Huselid (1995) and Hitt et al. (2001) indicate that the impact of a corporation's business strategy on operating performance depends on the level of close combination of cost control and strategic HCMPs. Deming (1989) and Snell (1992) argue that the significance of cost control for operating performance goes beyond treating others with utmost sincerity if the supervisor has a rich specialized knowledge and working experience on production process of products and a full grasp of employees' working performance appraisal.

This study holds that cost control and treating others with utmost sincerity should be applied together to elevate the operating performance if a corporation lacks these circumstances mentioned by Snell (1992). According to Pfeffer and Cohen (1984) and Arthur (1994), how to combine cost control and treating others with utmost sincerity is one management philosophy while the two are different management practices. In the light of different corporations with different management philosophy, this study holds that combining cost control with treating others with utmost sincerity is a clever application of strategic HCMPs.

Corporations actively applying strategic HCMPs lift employees' production capability through the development of human capital. Prudent selection of new employees is equivalent to a rigorous demand of the production technology a rookie should possess, while strict before-the-job training after being employed and frequent on-the-job training are equivalent to an elevation of their production technology (Huselid, 1995). Moreover, those corporations can also enhance employees' motive to work hard on production through employee working performance appraisal and a close relationship between performance appraisal and employees' working rewards. Finally, through the regulation of organizational structure (e.g., shift and transfer of working position, design of quality circle and establishment of production team), those corporations can encourage employees' active participation in management and operational decisions, thus helping to lift the entire operating performance.

#### **2.2.4.2 Limitations of the prior empirical work**

To achieve cost control, production line managers must supervise employees' production activity continuously to appraise their performance. Those managers must also make use of the feedback generated by employees' production activity to

correct the differences between their practical production results and those expected. Consequently, the leadership of the corporation devotes resources to supervision.

If a close relationship exists between employees' production activity and practical results generated by production activity and the management is unaware of it, they cannot evaluate whether employees' production performance or production activity actually fulfills the operating philosophy of the corporation. Consequently, the leadership and employees must share the same information about the production activity, otherwise the appraisal of employees' production performance cannot be objective and employees' morale will be affected disadvantageously. That would result in a failure of the management decision and a total disintegration of cost control.

Asymmetric information between the leadership and employees can be solved through extensive collection and positive integration of the internal messages (e.g., employees' mutual appraisals on production performance and swift circulation of messages concerning the production activity between each department). Pfeffer and Cohen (1984: 550-572) also hold similar views. To achieve cost control, this study supposes that the management can take employees' self-appraisals on production performance and customers' appraisals on employees (e.g., shop assistants) as important information to assess employees' performance. Deming (1989: 27-36) also holds similar views.

The purpose of the assessment for operating performance of the corporation is to expect a consistency between goals followed by each departmental manager and those pursued by higher levels of management. As stated above, the assessment of

performance of the corporation is quite complicated. Generally speaking, there are obstacles required to be overcome while assessing the operating performance of the corporation: for departmental managers, non-financial indicators are used frequently to assess results of each departmental operating process, with their importance being not less than the financial ones. However, the difficulties faced in collecting information for non-financial indicators are far greater than for financial indicators. Kaplan and Norton (1996c) also hold similar views. On the other hand, the collection of qualitative information is intentionally or unintentionally neglected frequently by academics while assessing the corporation's operating performance and, consequently, financial indicators used to assess corporate performance lose reliability.

This study holds that economic benefits brought by intellectual assets (e.g., employees' working experience) ought to be taken into account when using the mixture of financial and non-financial indicators.

Sometimes, the contribution of these intellectual assets to the corporation's long-term operating performance is far more important than that of the tangible or physical assets. Coff (1997: 374-402) also holds similar views. If the economic benefits brought by intellectual assets can be measured by a set of objective indicators resembling that of tangible or physical assets, those corporations developing intellectual assets can make a complete report about the economic benefits brought by intellectual assets on the profit-and-loss statement<sup>1</sup> and have it shown to shareholders and employees. However, the greatest difficulty confronted by academics while handling these issues is how to identify objective indicators to reveal the economic value of these intellectual assets on the balance sheet.

The calculation of accounting profit does not take opportunity cost generated from an application of strategic HCMP<sub>S</sub> into account and that may result in inefficient allocation of internal human resources of a corporation (e.g., human resources used by some departments are far more than that by other departments, but the application of strategic HCMP<sub>S</sub> is inferior to that of other departments).

In addition, if the assessment of operating performance intentionally emphasizes the measurement of short-term performance, it may force each departmental manager to engage in a second, high-profit, strategy with its performance shown in a short-term period by giving up first, high-profit, strategy with their performance only shown in a long-term period.

This study supposes that if corporations using BSC actively can identify qualitative non-financial indicators and apply the preceding management practices by blending cost control and treating others with utmost sincerity, accounting information required to assess operating performance for each department can be completely displayed. In this way, employees of each production line or shop assistants can learn, instantly, the results generated by their efforts from individual financial or non-financial indicators. Also, higher-level managers can learn from the combined results generated by financial or non-financial indicators.

## **2.3 The development of testable hypotheses**

### **2.3.1 Strategic human capital management practices, personnel control mechanisms and employee capability**

Organizations usually apply tangible assets and intangible resources simultaneously when developing and deploying business strategies, but the operating performance of

different organizations demonstrates a great difference in the relative amounts used and the effectiveness of their use. Some intangible resources are so intricate to understand and so difficult to acquire that market competitors may not be able to imitate. Consequently, those resources (strategic HCMP<sub>s</sub>, in particular) are recognized by most as significant economic resources (Hitt et al., 2001).

### **2.3.1.1 Strategic human capital management practices**

As indicated in the preceding paragraph, an organization creates considerable competitive advantage with its source generally originating from those useful and specific human resources employed by the organization that its market competitors are not able to mimic. Nevertheless, an organization merely applying strategic HCMP<sub>s</sub> will not necessarily create competitive advantage.

An organization which is applying strategic HCMP<sub>s</sub> will not be easily followed by its market competitors, while this phenomenon may make the organization face obstacles while managing the human resources which are quite professional and specific (Teece, 1982; Hitt et al., 2001). As indicated by Chiang and Chiang (1990), the differentiation of human resources from physical assets is that: serious and insufficient information circulation may occur in an organization while applying highly specific and socially complex human resources; and the organization may sometimes face the abrupt resignation from employees with specialized knowledge and skills.

General human resources can be traded on the competitive labour market while employees can change jobs at will that makes some organizations think general production technologies are not really able to create competitive advantage (Barney,

1991). According to Amit and Schoemaker (1993), competitive advantage for an organization comes from its application of strategic HCMP<sub>s</sub>, with its power to use specific human resources held by the organization. Specific production technology and specialized knowledge, interpersonal relationships in political and business circles and enterprise culture are fitted into strategic HCMP<sub>s</sub> which can only be applied strategically in a particular organization. Although the abrupt resignation of employees may pose threats, production technology, specialized knowledge, interpersonal relationships in political and business circles and enterprise culture might lower those threats. Consequently, important and urgent issues to be solved for the organization are: how does the management of an organization efficiently apply their specific and unique human resources and have them managed appropriately to create a considerable competitive advantage.

How can the management of an organization efficiently apply its specific and unique human resources and have them developed appropriately? The most important method is to overcome managerial obstacles caused by the social complexity and uncertainty of causation behind these unique and specific human resources (Coff, 1997). Causation uncertainty of specific human resources is the source from which the organization creates competitive advantage, mainly because it makes market competitors not able to emulate.

Interpersonal relationships in political and business circle and enterprise culture may make specific human resources of an organization reveal considerable social complexity. The social complexity is tangled with the preceding causation uncertainty of human resources. Under the circumstances, the business strategy of an organization may be influenced by adverse factors such as adverse selection, moral

hazard and bound rationality while the management try to identify, develop, protect and deploy strategic HCMP<sub>s</sub> (Barney, 1991).

Some impacts from unique production technology, specialized knowledge and specific interpersonal relationships in political and business circles cannot be observed directly and that may result in good practices being replaced with bad ones in the labour market. Besides, ambiguous causation behind specific human resources may bring about this predicament while the management tries to identify strategic HCMP<sub>s</sub> (Coff, 1997). An example is the recruitment process, an interviewee falsifies or exaggerates past experiences while the information about the interviewee's knowledge and technology in the past held by the organization is quite vague. This eventually makes the organization give the interviewee an important assignment beyond his / her capacity.

On the other hand, moral hazard may occur when the management of an organization fails to understand the employees' efforts and contributions through inappropriate performance evaluation during the processes of production. For example, employees may not be certain whether their efforts will have an influence on the measurement of performance when individual contributions are entangled in some team settings (Coff, 1997). Under such circumstances, it would be like getting water from a stone to ask employees to increase their efforts and give of their best if the organization fails to present an impartial measurement of performance and a reasonable calculation formula for work remuneration.

The protection of strategic HCMP<sub>s</sub> may decrease the preceding moral hazard. For example, the management faces uncertainty of causation behind specific human

resources but uses subjective measurement of performance as well as generous rewards and severe punishment to handle promptly those activities that they can hardly understand, take control in advance and bring influence into full play.

On the other hand, when the management of an organization applies strategic HCMP<sub>s</sub>, it would be a risk for senior executives with bounded rationality to make decisions under circumstances of asymmetric information. They need one impartial measurement of performance and calculation formula for reasonable work remuneration but do not know how to collect the necessary accounting information while employees do not know how to provide that accounting information either. As indicated by Ouchi (1980), each dimension of the management control mechanisms will eventually be futile as a result of asymmetric accounting information.

This study supposes that the business strategy of an organization will suffer great loss if the organization is unable to overcome issues arising out of asymmetric accounting information but identifies, develops, protects and deploys strategic HCMP<sub>s</sub> recklessly.

### **2.3.1.2 Strategic human capital management practices and personnel control mechanisms**

The function of management control is to enable the main goal of the production activities of employees to be consistent with the goal pursued by the long-term business strategy of the organization (Snell, 1992). When the management have a full grasp of the input-output relationship, they will take effective control of the final results (output) of the production activity (Seal, 1993).

Such a view has practically indicated that the traditional management control system will be operated effectively and brings improved function when the management has a full grasp of the cause-effect relationship. For example, an organization uses a direct management control over the causation between employees' production activity and the practical results of the activity. To do this, the management must conduct rigorous supervision and measurement of employees' performance at all times to confirm employees' production activity to be exactly in conformity with the standardized operating process. Under such circumstances, the management needs the feedback arising out of employees' production activity (i.e., as soon as deviations of subordinates' actions crop up, feedback is used primarily as a remedial tool to correct them).

But Widener (2000) indicates that the management will lack reliable accounting information to establish an impartial measurement of performance and calculation formula for reasonable work remuneration when the causal relationship between employees' production activity and the practical results of the activity is vague or senior executives do not have a full grasp of the input-output relationship. Besides, the interdependence of job satisfaction among employees of the organization applying strategic HCMPs actively will make the measurement of performance lose reliability and objectivity.

Jaeger and Baliga (1985) hold that the mechanism for bringing management control into full play is important for organizations implementing strategic HCMPs, as close coordination between the management control mechanism and human resources management will make the goal of employees' production activity consistent with the business strategy of the organization. Snell (1992) further indicates that an

organization uses personnel control mechanisms to judge if employees' production technology, specialized knowledge and interpersonal relationships are in conformity with the organization's requirement as well as if employees' potential, values and endowments are required to be developed further.

Bringing the personnel control mechanisms into full play is an important premise to pursue excellent operating performance of the organization. This study supposes that personnel control mechanisms aspiring to establish an impartial and efficient measurement of performance lower the threats from employees' abrupt resignations through prudently selecting talents, training talents and keeping them. When the causation between employees' production activity and the practical results of the activity is ambiguous, the management lacks a full grasp of the input-output relationship and the appraisal and measurement of employees' work performance are partial and inefficient. Bringing the personnel control mechanisms into full play may lift employees' morale, intensify the internal unity and lower the loss as a result of employees' abrupt resignations.

For those organizations deploying strategic HCMPs actively, lowering employees' abrupt resignations is an important task. Arnold and Feldman (1982), Cotton and Tuttle (1986) and Sheridan (1992) indicate that safe working environment, solid organizational structure, impartial measurement of performance, reasonable formula of calculating work remuneration, active enterprise culture and sound labour union system may minimize labour turnover. Hom et al. (1992) further point out that employees' self-cognition and self-affirmation to work will fully reflect an enhancement of employees' job satisfaction and their demand for on-the-job training

on specific production technology that thus would lower employees' abrupt resignations.

As described in the preceding paragraph, employees' job satisfaction basically reflects self-cognition and self-description of their current job. Jung et al. (1986) point out that the enhancement of employees' job satisfaction depends on the following factors: (1) employees' pay; (2) superiors' leadership; (3) harmonious relationship between co-workers; (4) employees' opportunities of promotion; and (5) working environment. For some employees, factors other than pay are far more important than the increase of pay, sometimes, with those factors having correlations with employees' personal preference. For example, some employees may consider a safe and comfortable working environment more significant than plentiful pay; some, however, think harmonious relationships between colleagues are more important than comfortable working environment and plentiful pay.

This study supposes that for some trades (e.g., knowledge trade), intensive on-the-job training and safe and comfortable working environments are particularly important to the enhancement of employees' job satisfaction, since they enable employees to learn new knowledge and skills that would enhance their opportunities for promotion and earning higher pay. Furthermore, intensive on-the-job training makes employees able to improve skills through discussions with others, thus enhancing a harmonious relationship between co-workers as well as the coordination of team-based work. Eventually, intensive on-the-job training and safe and comfortable working environments can enhance employees' productivity, further increasing the profitability of the organization (Humphrys and O'Brien, 1986). O'Reilly et al. (1989) deem that managing group demography and social activities can increase

harmonious relationships between co-workers. In structuring employees' career paths, firms can apply promotions to enhance employees' job satisfaction. It is necessary for employees to perceive that such promotions are earned.

In a word, the operation of personnel control mechanisms not only can enhance employees' job satisfaction but also lower the loss arising out of employees' turnover. To lower the loss from employees' turnover, organizations can design one set of strategic HCMP<sub>s</sub> with a close coordination of employees' on-the-job training with working characteristics which is strict and fair in meting out rewards and punishments and provides opportunities for promotion. The production teams work in perfect harmony according to the enterprise culture and internal business processes that shall never be imitated by competitors.

Human resources are the basis for organizations to carry out long-term business strategy, while the application of strategic HCMP<sub>s</sub> will enable an organization to build competitiveness in the market and create beneficial and sustainable market opportunities. Lee and Miller (1999) point out that the efficient application of strategic HCMP<sub>s</sub> shall be a plus point to earn competitive advantages and implement business strategy. As indicated in the preceding paragraph, an organization which has specific human resources that competitors cannot imitate, a production team with production technology and specialized knowledge, a management philosophy in harmony with the enterprise culture, a communication channel of accounting information without hindrance and a system for human resources management that is strict and fair in meting out rewards and punishments and perfect in training men of ability will inevitably acquire beneficial competitive market conditions from the process of developing strategic HCMP<sub>s</sub>.

As pointed out by Wash and Seward (1990), the operation of personnel control mechanisms includes the guidance of employees' production motive and training of their productivity during the process of applying strategic HCMPs, while the former can be achieved through an impartial measurement of performance and reasonable working remuneration and the latter can be accomplished through a rigorous training plan. Consequently, impartial measurement of performance, reasonable working remuneration and rigorous training plan are significant premises to bring personnel control mechanisms into full play.

Amit and Schoemaker (1993) indicate that strategic factors contributing to the success of an organization include prudent selection of talents and complete training of men of ability, development of employees' production technology and specialized knowledge, a good use of employees' working experience and intelligent judgment, encouragement of employees' incessant innovation, and mapping out and implementation of long-term business strategy through excellent employees' real knowledge and deep insight to create useful production environment, thus making employees' goal of production activity consistent with the business strategy through the planning and coordination to create the most beneficial market opportunity eventually.

As indicated above, induction for employee motivation may be futile if there is incomplete or insufficient accounting information while neither senior executives of the organization understand how to collect accounting information related to impartial performance measurement and calculation formula for reasonable working rewards nor employees know how to provide senior executives with accounting information. As Vroom (1964) points out that an effective induction for employee motivation will

be accomplished by relying on conditions as follows.

- (a) there exists a certain causation between employees' efforts and increase of promotion opportunity and earning higher rewards;
- (b) there are certain causations between the reasonable working rewards and impartial performance appraisal; and
- (c) employees' performance appraisal and calculation of working rewards are considered to be impartial and effective by most of the employees.

Kerr (1975) further indicates that some methods of induction for employee motivation are direct with the effects of induction observable instantly, while some of them are indirect (one method of unconscious influence) with the induction effects being gradually observed over a long time.

Consequently, a mere use of direct induction methods will not necessarily bring the induction effects into full play. Moreover, individual employee's contributions are not easily described objectively in direct measurement though each employee is entitled to share the team glory and production results of the production team. However, Pritchard et al. (1988) agree that there are direct causations between effectively leading the production motivation of production team and impartially measuring the production team's overall performance and stimulating individual employee's production motivation and enhancing their productivity. For those organizations applying strategic HCMPs actively, both effectively leading the production motivation of the production team and impartially measuring the production team's overall performance create considerable competitive interest for them.

Encouraging employees to actively participate in drawing up the business strategy aims at enhancing employees' recognition of the corporate culture and further enabling the whole staff to participate in administering the organization. Wagner (1994) points out that the deeper employees' participation in the institution of organization's business strategies, the higher satisfaction they show in their work leading to lower employees' resignation rates. This phenomenon indicates that an enhancement of employees' recognition of the corporate culture generates strong interest in participating in the corporation's efforts to map out the business strategy and would help lower employee turnover.

Deming (1989: 27-36) also shares similar views. For example, senior executives of an organization collect accounting information related to storage time, moving time, waiting time and inspection time when the organization wishes to identify activities that increase product cost but not product values through the activity-based costing (ABC) system and have those activities eliminated, while employees at the basic level offer such accounting information to senior executives. Should there be asymmetrical information between the employees at the basic level and senior executives, encouraging those employees to actively participate in the strategic application of ABC would assist senior executives in eliminating non-value-added costs.

Eisenhardt (1989) further indicates, for the organization applying HCMPs actively, that its senior executives will be the best decision makers if they first establish a consensus with employees who have their own accounting information in the process of making decisions and then obtain related and useful accounting information from the management. Consequently, the operating team consisting of elites of the

organization will consider other real knowledge and deep insights other than those of the operating team to institute prompt and useful business strategies.

Ouchi (1980) argues that when there exists circumstances of asymmetrical information between employees at the basic level and senior executives, roles played by the operating team or production team in the organizational structure as well as the flexibility of role actively applied will be intensified. This study argues that an organizational structure with flexibility can alleviate threats from employees' abrupt resignations since the structure does not demand one to do whatever he/she is told to do but asks employees to establish a circumspect accounting information net, thus enabling employees to communicate and cooperate mutually with information circulation.

The corporate culture of an organization indicates that employees have the same values towards the operation, investment and financial activities of the organization, have the same faith towards business tenets and philosophy of the organization, and abide by the same moral norms (Schein, 1985). Strong corporate culture means that the same values, philosophy and belief and moral norms accepted or recognized popularly by employees. Hence, strong corporate culture can alleviate threats arising out of employees' abrupt resignations since it would be difficult for employees who have already been familiarized with the corporate culture of the original organization to transfer to another organization by accommodating themselves to a different enterprise culture. Employees will show their loyalty naturally when the corporate culture has permeated throughout the corporation.

Arthur (1994) points out that when there exists the asymmetrical information between

employees at the basic level and senior executives, a strong corporate culture can help the organization solve issues concerning asymmetrical information. Ouchi (1980) also indicates that under circumstances of asymmetrical information, a strong enterprise culture can substitute for some control systems with unobvious functions. This study argues that when an organization has a strong corporate culture, personnel control mechanisms can assist the organization in solving two issues concerning employees' abrupt resignation and asymmetrical accounting information. In a word, when firms with organic structures and a strong corporate culture adopt shared governance, we expect them to be able to create more sustainable competitive advantages from the strategic HCMP<sub>s</sub>.

#### **2.3.1.3 Difficulties of empirical analysis**

The corporation applying strategic HCMP<sub>s</sub> requires a management team consisting of members who are rich in working experiences and professional knowledge to implement business strategies and achieve the operating goals. The development of strategic HCMP<sub>s</sub> includes prudently recruiting excellent managerial staff, training professional and skillful personnel, staging periodical seminars so as to review the degree of progress and outcome for each task, establishing impartial and reasonable performance measurement systems to confirm the proper position assigned to proper employees. The deployment of strategic HCMP<sub>s</sub> includes setting up smooth and swift complaint systems for employees' positive expression of their opinions over the existing management control system as well as providing a vent for them to express their dissatisfaction, encouraging employees to actively participate in the management team, focusing on employees' promotion, and adjusting the rate of pay and practising reward-punishment system according to periodical performance evaluation report. In a word, through a positive moderation of the personnel control mechanisms, what

strategic HCMP<sub>s</sub> will bring the function into full play are: bring everyone's ability into full play; make the best use of everything; and have the goods rapidly distributed among the consumers.

After actively applying strategic HCMP<sub>s</sub>, the corporation hopes to develop, communicate and implement its business strategies through BSC as well as to help promote the efficiency in internal business process and, further, improve the existing customer relationship so as to improve the financial performance. To achieve those objectives, three issues are worthy of bringing up for further discussion.

First, in the light of long-term business strategies and operating goals, the corporation would actively develop strategic HCMP<sub>s</sub> to bring a significant improvement for the financial performance. An active development of strategic HCMP<sub>s</sub> and an improvement of financial performance may occur or exist concurrently. For example, corporations having good financial performance in the past may present a greater economic capability to bring up lucrative financial conditions to attract excellent employees than those having poor financial performance in the past, while the former will be more capable of implementing intensive employee training. In a word, firms having good financial performance in the past may be more competent to take measures to actively develop strategic HCMP<sub>s</sub> than those having poor financial performance in the past. This would result in greater financial performance.

In view of the effect of development of strategic HCMP<sub>s</sub> on the corporation's financial performance, the practical influence of strategic HCMP<sub>s</sub> practised by firms with good financial performance in the past seems to have an inclination to be overestimated while those with poor financial performance may be underestimated.

Of course, firms with poor financial performance in the past may start developing strategic HCMP<sub>s</sub> actively to improve the future financial performance. Strategic HCMP<sub>s</sub>, however, cannot show concrete results in a short-term span. Such issues may frequently occur to biotech corporations or computer software firms actively engaging in R&D, since results of R&D for those firms may show only after long-term efforts (Widener, 2000).

The second issue concerns the collection of data via a survey questionnaire. Selection or response bias may influence results because survey respondents generally self-select into samples. The most common type of selection bias occurs when the probability of responding to a survey questionnaire is related to the presence of strategic HCMP<sub>s</sub>. Survey respondents sometimes refuse to answer those questions in the light of keeping the business secrets for their corporation. According to Dillman (2000), the statistical correction of selection bias has hardly ever been attempted in prior empirical work.

Finally, in order to identify the value of executing strategic HCMP<sub>s</sub>, the organization needs to set up an internal structure that is capable of completely bringing strategic HCMP<sub>s</sub> into full play. In the process of implementing strategic HCMP<sub>s</sub>, the internal structure must have a controlling (i.e., a pursuit of stability for the internal business process) and exploring (i.e., an engagement in the innovation of the products) impact on the organization while encountering perilous changes arising out of impact from unstable environments.

In other words, the internal structure of the organization executing strategic HCMP<sub>s</sub> is liable for a fulfillment of the two missions: standardize internal business process

across an organization to ensure the reliability of employee capability (the control dimension of personnel control mechanisms) and keep the organization approachable and flexible to creative process improvements (the communication-coordination dimension of personnel control mechanisms). Standardization of internal business processes and flexibility to respond to inventive process improvements help the organization implementing strategic HCMP<sub>s</sub> secure the stability of employee capability and an incessant innovation for the internal business process.

Under these circumstances, the internal structure of the organization executing strategic HCMP<sub>s</sub> must seek a balance between the requisites for control of internal business process and flexibility required to respond and become accustomed quickly to the changing environment. Any act excessively to focus on (or neglect intentionally) the requisites for control of internal business process (or flexibility required to respond to new ideas) will eventually lessen the firm's capability to overcome the perilous adversity (Douglas and Judge, 2001).

The present study aims at examining the moderated effect of personnel control mechanisms on HCMP<sub>s</sub>, and the corresponding change in employee capability. Considering internal structure of the organization implementing HCMP<sub>s</sub>, therefore, is indispensable when evaluating the implementation of HCMP<sub>s</sub>.

#### **2.3.1.4 The first testable hypothesis**

There has been intensive research into the impact of HCMP<sub>s</sub> on organizational productivity. Cutcher-Gershenfeld (1991) found that the adoption of transformational labour relations practices (e.g., emphasizing cooperation and dispute resolution) by firms would have lower costs, less scrap, higher productivity and a greater return to

direct labour hours than those firms using traditional labour relations practices. Katz et al. (1985) demonstrated that product quality and direct labour efficiency increase as a result of highly effective industrial relations systems (e.g., systems with fewer grievances and disciplinary actions and lower absenteeism). Bartel (1994) and Holzer (1987), among others, have highlighted that an increase of productivity growth arises out of extensive recruiting efforts and the adoption of training programs. Links between incentive compensation systems and productivity are found consistently as well.

According to Bass and Avolio (1993), the following several issues are often taken by the leader of a company as a basis to confirm the significance of his/her subordinates' status in the company.

- (1)Subordinates' responsibility in the success and failure of execution of duties.
- (2)Leader's expectation from subordinates' effects prior to execution of duties.
- (3)Subordinates' level of accomplishment for execution of the duties assigned.
- (4)The highest rewards subordinates can gain by executing the duties assigned by upper hierarchy.

The present study produces inference, as follows, by integrating views by Cutcher-Gershenfeld (1991), Bass and Avolio (1993), Arthur (1994), Pillai et al. (1999) and Douglas and Judge (2001).

The relationship between the leader and his/her subordinates of a company is based on the phenomenon of mutual benefit and reciprocity as mentioned below: the reasonable and highest rewards offered to subordinates by the leader in exchange for their best working effects.

Under such a premise, there exists a positive and active mutual benefit between the leader and his/her subordinates. In a word, the higher the subordinates' working effects, the greater benefit for the company that would result in a higher rewards given to subordinates. Consequently, a subordinate's personal goal in his/her career turns out to be working hard to pursue a perfect working achievement. That is exactly what a Chinese proverb says, "Generous rewards rouse one to heroism".

In this study, the first dimension included in personnel control mechanisms aims at expressing the relationship of mutual benefit and reciprocity between the leader and subordinates for such a company. In a word, "a personnel control mechanism that gives supervision, takes material temptation as a base, and approves and gives rewards according to working achievement" (Cutcher-Gershenfeld, 1991: 244-246) comes as the underlying spirit of the control factor of personnel control mechanisms.

Pillai et al. (1999) argued that the leader of an excellent company will keep on encouraging his/her subordinates to promote the working effects to an "over-the-top" status by all incentives. The present study brings inferences as follows by integrating views of Bass and Avolio (1993), Arthur (1994) and Douglas and Judge (2001). The leader of a company incessantly creates a close attachment of "mutual trust between the leader and subordinates". Relying on a basis of mutual trust, the leader will try his/her best to persuade those subordinates to put aside personal interests and place corporate benefits in the centre. Under such a premise, a consensus of "pulling together to tide over difficulties" is established between the leader and subordinates who give their trust to the upper hierarchy's leadership and rule. Consequently, the leader will develop a smooth communication channel with his/her subordinates and conduct frequent communication but will often give simple

directions that his/her subordinates are capable of understanding tacitly to carry out the leader's intentions.

Furthermore, subordinates would frequently present their opinions and views aiming directly at the drawbacks in the company's operations together with constructive advice for reformation, thanks to the mutual trust established between them and the leader. On a basis of mutual trust, subordinates gain full authorization. Eventually, it turns out to be an opportunity for both the leader and subordinates who keep on reviewing and examining, learning and growing to intensify and improve their personal ability. A company can create its business dominions by establishing the fraternity of "blood is thicker than water", as a Chinese proverb says, between the leader and subordinates and practising an enterprise culture "standing together through thick and thin".

In this study, the second dimension included in the personnel control mechanisms mainly expresses the mutual trust and understanding as well as the group spirit of "pulling together to tide over difficulties" established between the leader and subordinates. A moderating factor which is expected to improve and intensify the relationship between strategic HCMP<sub>s</sub> and employee capability has been created by a combination of the communication-coordination factor of personnel control mechanisms with the control factor of personnel control mechanisms mentioned above.

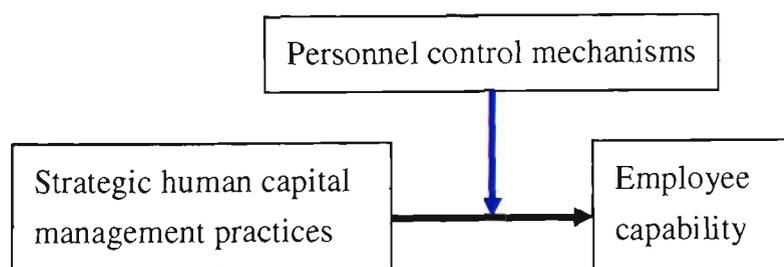
Personnel control mechanisms moderating strategic HCMP<sub>s</sub> involve managing employee satisfaction, creating firm-specific routines, adopting group incentives and performance-based compensation, employing shared governance and include organic

structure and a strong corporate culture. From current management practices, firms differ in their reliance on the application of strategic HCMP<sub>S</sub> (Snell and Dean, 1992) (e.g., knowledge-based business vs. cost-efficiency-based manufacturing company).

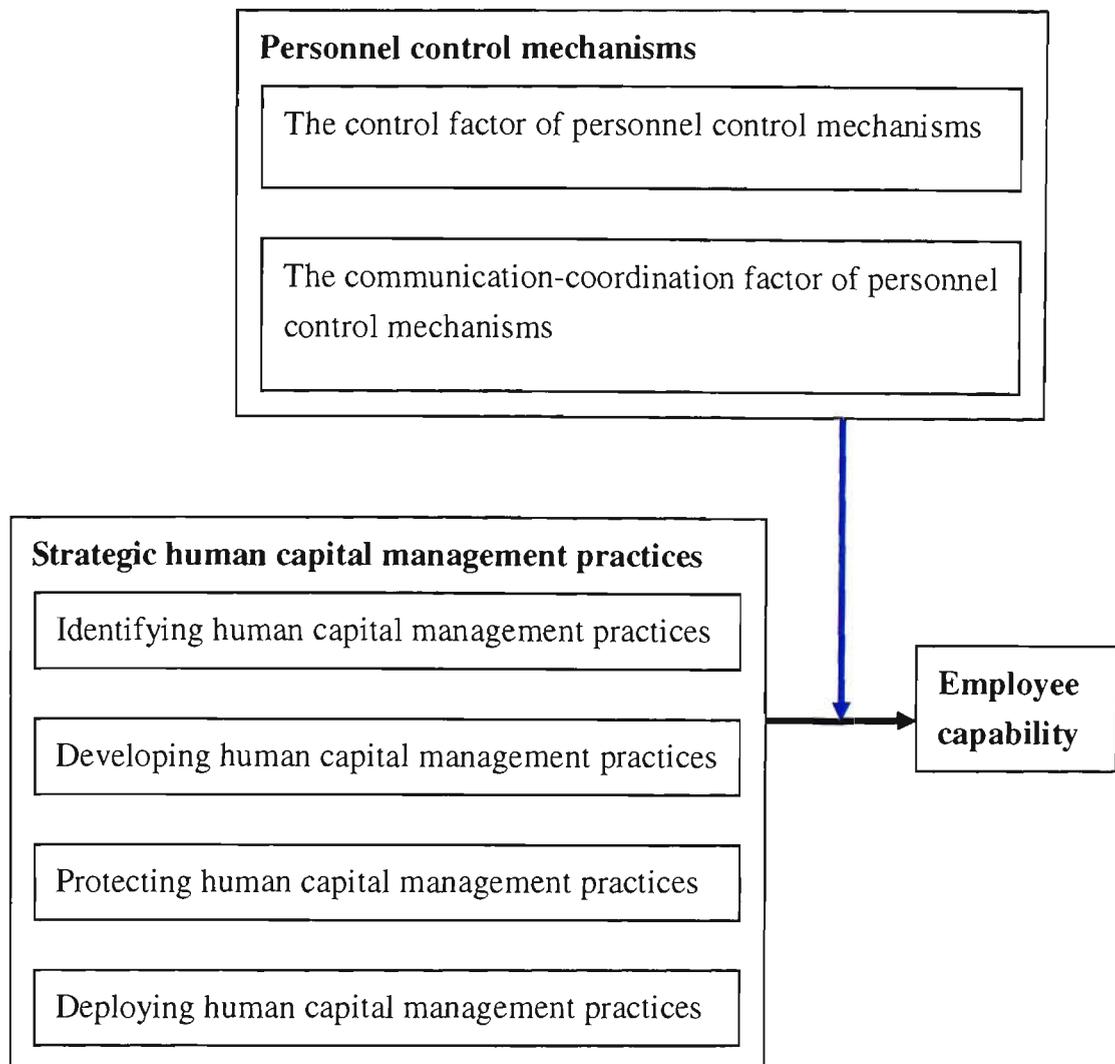
Knowledge-based firms rely more on the implementation of strategic HCMP<sub>S</sub>, and these firms are more likely to consider non-financial measures to be leading indicators which provide them with information related to the firm's performance. Hence, employee capabilities in the company with observable financial improvements drive improved internal business processes and, hence, increase customer loyalty.

In the present study, it is postulated that firms relying more on the application of strategic HCMP<sub>S</sub> depend more on both personnel control mechanisms and non-traditional accounting controls<sup>2</sup>. The moderator-variable interaction model describing the moderating relationship between strategic HCMP<sub>S</sub> and employee capability caused by personnel control mechanisms can be shown as follows, and then the moderator hypothesis is stated.

Figure 2.7 The moderated relationship between strategic HCMP<sub>S</sub> and employee capability caused by personnel control mechanisms



OR



**Hypothesis 1: Employee capabilities in firms relying on personnel control mechanisms increase as a result of paying more attention to strategic human capital management practices.**

### **2.3.2 Strategic human capital management practices, employee capability and customer loyalty**

Prior empirical work has argued that strategic HCMPs will be reflected in better firm performance (Huselid, 1995; Hitt et al., 2001). The impact of strategic HCMPs on corporate financial performance is in part due to its influence on employee productivity. An important responsibility of talented employees is to obtain and

maintain customers. Talented employees build relationships with current and potential customers and, over time, develop social capital through their client-networks. This suggests that employees with intellectual ability, articulatory knowledge, and social contacts bring the most HCMP<sub>s</sub> to their firms. These HCMP<sub>s</sub>, in turn, should produce the highest-quality services to customers and thereby contribute to firm performance.

Building excellent relationships with current and potential customers through social capital has three antecedents: perceived quality; perceived value; and the expectations of clients (Fornell and Wernerfelt, 1987; Jones and Sasser, 1995; Fornell et al., 1996).

“Perceived quality refers to the served market’s evaluation of recent consumption experience, which is expected to have a direct effect on overall customer satisfaction.” (Fornell et al., 1996: 11-15) To operationalize the perceived quality construct, the present study draws on the marketing literature to delineate two components of consumption experience: (a) “the degree to which the firm’s offering is customized to meet heterogeneous customer needs”; and (b) “the degree to which the firm’s offering is reliable, standardized and free from deficiencies” (Fornell and Wernerfelt, 1987: 341-342; Fornell et al., 1996: 12-13; Foster and Gupta, 1999: 9-11).

The second antecedent of building excellent relationships with current and potential customers is perceived value (Fornell et al., 1996). Perceived value refers to the perceived level of product quality relative to the price paid. In the present study, the purpose of incorporating the perceived value dimension is to increase the comparability of the results of exploiting strategic HCMP<sub>s</sub> across firms. It is

expected that there is a positive association between the increase in perceived value and customer loyalty.

The third antecedent of building excellent relationships with current and potential customers is the expectations of clients (Fornell et al., 1996). Customer expectations not only represent the served market's prior consumption experience with the firm's offering, but also involve a forecast of the firm's ability to deliver quality in the future (Fornell and Wernerfelt, 1987). In such a case, the customer expectations construct captures all previous quality experiences and information. Additionally, the expectations of clients forecast a firm's ability to satisfy its market in future periods (Fornell et al., 1996). This suggests that there is a positive association between the expectations of clients and customer loyalty and that diversified firms with good reputations can gain a sustainable competitive advantage as the reputations are used by current and potential customers to select firms from which to purchase new services (Jones and Sasser, 1995; Foster and Gupta, 1999).

Following Hirschman's (1970) exit-voice theory, dissatisfied customers have the option of going to a competitor or voicing their complaints in an attempt to receive satisfaction. An increase in overall customer satisfaction should decrease the incidence of customer complaints, which, in turn, should increase customer loyalty (Jones and Sasser, 1995; Fornell et al., 1996).

There are two types of customer loyalty: true long-term loyalty and false loyalty (Jones and Sasser, 1995). A variety of factors can generate false loyalty: government regulations that limit competition; high switching costs such as the cost of changing hospitals in the middle of treatment; proprietary technology that limits alternatives;

and strong loyalty-promotion programs such as frequent-flier plans (Jones and Sasser, 1995). As Reichheld and Sasser (1990) stated, providing customers with outstanding value may be a reliable way to achieve sustained customer satisfaction and loyalty. Additionally, when the relationship between the efficacy of a firm's customer service and complaint-handling systems of the firm is positive, the implication is that the firm is successful in turning complaining customers into loyal customers (Fornell and Wernerfelt, 1987; Reichheld and Sasser, 1990). In this study, the value of true customer loyalty will be used as a driver for the firm's profitability.

### **2.3.2.1 Limitations of the prior empirical work**

The first limitation of prior empirical work is its widespread conceptual spotlight on a single HCMP and the measurement problems inherent in broadening the focal point to a system of strategic HCMPs. A focus on an individual practice presents both theoretical and methodological dilemmas (Arthur, 1994). Firms applying strategic HCMPs in one area are more likely to use it in other areas as well. Hence, to the extent that any single example reflects a firm's propensity to invest in strategic HCMPs, any estimates of the firm-level impact of the particular application of strategic HCMPs will be upwardly biased. This suggests that attempts to estimate the impact of a firm's overall function of strategic HCMPs, as the aggregation of individual estimates may overstate their contribution to organizational performance.

The second limitation of prior empirical work is the lack of a link between customer satisfaction and loyalty when describing the causality between employee capability and customer satisfaction. For management practitioners, different customer satisfaction levels reflect different issues and, therefore, require different corporate strategies (Kaplan and Norton, 2001a, b). The levels of satisfaction among targeted

customers are a good indicator of the level of quality of the products or services that they are receiving.

However, the way to move up the level of customer satisfaction from neutral to satisfied clients or from satisfied to completely satisfied clients is not just a matter of doing a better job of delivering the same value or experience that the company is currently conveying. Hence, even though the results of a customer satisfaction survey are an important indicator of the health of an organization, relying solely on them can be fatal. Customer satisfaction surveys cannot supply the breadth and depth of information about customers needed to guide the company's strategy and product-innovation process. For this reason, companies must pay more attention to customer loyalty by utilizing a variety of methods to listen to existing, potential and former customers.

In short, although a growing empirical literature focuses on the impact of HCMP<sub>s</sub> on corporate performance, prior work has been limited in terms of the range of practices evaluated, the dependent variables and the industry context (e.g., Barney, 1991; Coff, 1997). For example, a discovery that systems of exploiting HCMP<sub>s</sub> influence employee productivity does not necessarily mean that these practices have an effect on corporate profits; and the finding that systems of HCMP<sub>s</sub> influence organizational profitability begs the essential issue of the processes through which they have an effect on financial performance of an organization.

### **2.3.2.2 The second testable hypothesis**

In order to serve customers, as stated earlier, investing in employee capabilities involves the following activities: comprehensive employee recruitment and selection

procedures; incentive compensation and performance measurement systems; extensive employee participation and training; information systems to support decision making; motivating and aligning goals of employees with corporate goals; and empowering employees to use their knowledge and skills to the benefit of the organization. In the present study, these activities are hypothesized to improve employee retention and productivity which, in turn, increase employee capabilities through improving the knowledge, skills and abilities of a firm's current and potential employees, increasing their motivation, reducing shirking, and enhancing retention of talented employees.

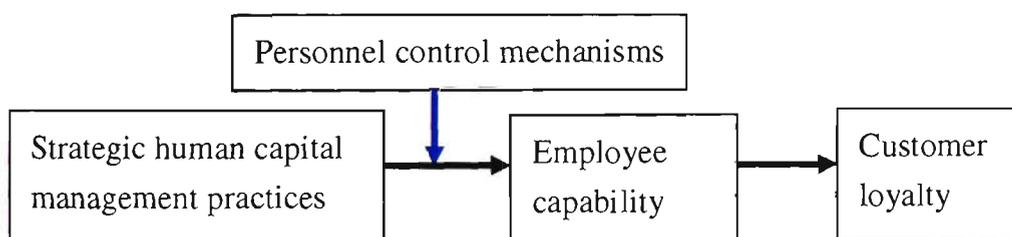
Additionally, the development of employee capability to create valuable ideas for improving the firm's internal process and generating significant value to customers shall be ensured by the retention of productive employees. Hence, skilled and motivated employees will be a precondition for improving relationships with current and potential customers and achieving corporate goals. As Sama et al. (1994) state alignment of goals might be linked to employee capability and customer service through performance evaluation<sup>3</sup>.

The HCMP<sub>s</sub> of an organization should be related to two dimensions of its performance: first, superior HCMP<sub>s</sub> increase employees' discretionary effort; and second, reducing employee turnover and increasing productivity, which, in turn, enhances corporate financial performance through highlighting customer satisfaction arising out of investments in superior HCMP<sub>s</sub>. As stated in the preceding, investing in employee training and motivating employees lead to an increase in employee job satisfaction (Heskett et al., 1994). A prior participation in required on-the-job training courses and work-based development activity is correlated with overall job satisfaction (Birdi

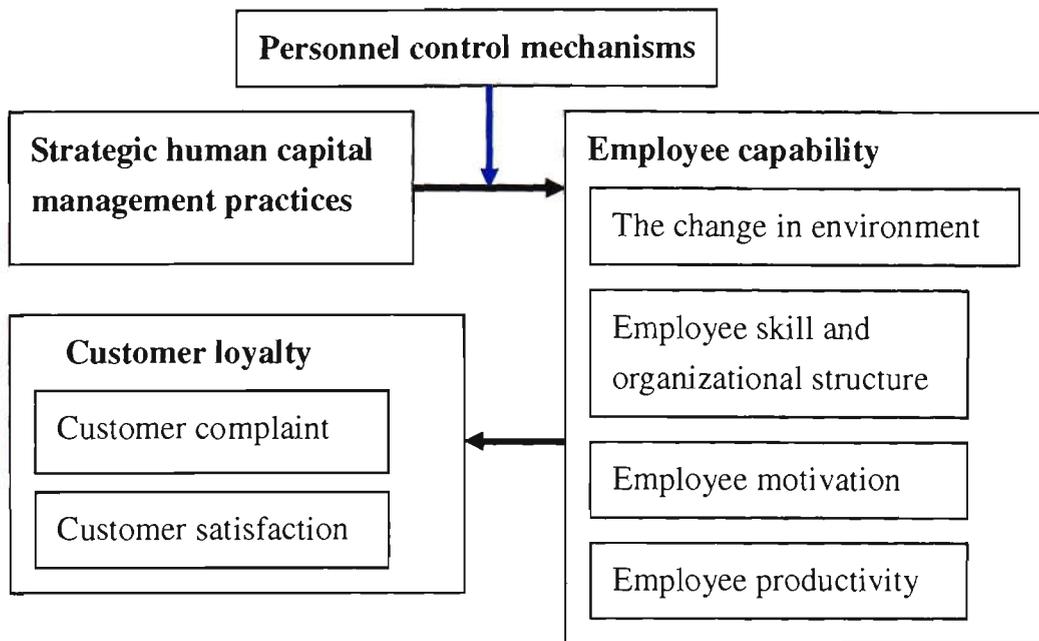
et al., 1997). A significantly positive relationship between employee productivity and job satisfaction was documented by Heskett et al. (1994) and Oliver (1998).

In general, employees in firms with opportunities for the building of excellent customer relationships would be satisfied with higher company productivity. A link between employee satisfaction and customer loyalty was supported by evidence from Banker et al. (2000). In the present study, it is hypothesized that firms relying on strategic HCMPs exhibit a positive association between employee capability and customer loyalty. The moderator–variable interaction and intervening path model describing the causality between employee capability and customer loyalty can be shown as follows, and then hypothesis 2 is stated.

Figure 2.8 The moderator–variable interaction and intervening path describing the causality between employee capability and customer loyalty



OR



**Hypothesis 2: Customer loyalty in firms with a focus on strategic human capital management practices escalates due to the increase in employee capability.**

### **2.3.3 Strategic human capital management practices, customer loyalty and financial performance**

Satisfied customers may be more likely to continue purchasing from the firm and that would further help attract new customers. According to LaBarbera and Mazursky (1983), customer satisfaction has a significant role in mediating purchase intentions and repeating purchase behaviour. Several studies have found a significant, positive, relationship between customer satisfaction and customer acquisition and retention (Anderson and Sullivan, 1993; Bolton and Lemon, 1999) while others have found a significant, positive, relationship at certain levels of customer satisfaction. A positive relationship between increases in customer satisfaction and customer acquisition and retention was found by Ittner and Larcker (1998 a), though it appears that the effects are diminished at higher levels of customer satisfaction.

Customer satisfaction has been empirically linked with customer profitability, market share and firm performance. According to Fornell (1995), the association between customer satisfaction and market share is not positive, and sometimes negative, in cross-sectional analysis. Evidence by Foster and Gupta (1999) indicated that indiscriminate customer service leads to serving some customers unprofitably. However, many other studies document a positive relationship between customer satisfaction and firm performance (e.g., Borucki and Burke, 1999). Ittner and Larcker (1996) found that there exists a positive correlation between perceived service quality and financial measures. Borucki and Burke (1999) also showed that customer service is predictive of financial performance.

For managers and investors, a firm's past and current performance as well as its future financial health can be measured by a customer satisfaction index (e.g., ACSI). According to Anderson et al. (1997), higher customer satisfaction increases loyalty, reduces price elasticity, insulates current market share from competitors, lowers transaction costs, reduces failure costs and the costs of attracting new customers and helps to build a firm's reputation in the market. As such, a leading indicator is provided by a customer satisfaction index for the firm's future financial health. Moreover, a customer satisfaction index has implications for managers to formulate competitive strategy, while it can be useful in analysing the strengths and weaknesses of the firm or its competitors. In addition, it provides a measure of the effectiveness with which a firm is defending current customers; firms with declining overall customer satisfaction are particularly vulnerable and provide expansion opportunities for more competent organizations.

For customers, on the other hand, a customer satisfaction index provides buyers with information not found in ad hoc methodologies employed in product ratings by popular magazines and commercial market research (Anderson et al., 1997). For example, very poor service or products are not the only source of high customer dissatisfaction. Often, the company has attracted the wrong customers or has an inadequate process for turning around the right customers when they have a bad experience. Having the wrong customers is the result of a flawed process for obtaining customers (Jones and Sasser, 1995). The retention of difficult-to-serve and chronically unhappy customers imposes some costs. For example, general management costs, incurred owing to making an expensive long-term marketing strategy and leveraging human capital. Furthermore, such customers impair the morale of front-line employees by overwork and disparage the company and detract from performance by continually utilizing a disproportionate amount of the company's resources.

Customer satisfaction information can be a critical barometer to show how well a company is serving its customers. According to conventional wisdom (Jones and Sasser, 1995), the link between customer satisfaction and customer loyalty in the market is a simple, linear relationship: as satisfaction goes up, so does loyalty. However, Anderson et al. (1997) found that the relationship is neither linear nor simple. In intensively competitive markets, they discovered a great difference between the loyalty of merely satisfied and completely satisfied customers. As it is not limited to markets for manufactured products, this phenomenon also occurs in services. According to Jones and Sasser (1995: 94-95), "customer loyalty is the feeling of attachment to or affection for a company's people, products or services". These feelings manifest themselves in many forms of customer behaviour.

According to Anderson et al. (1997), the measurement of customer loyalty involves the following dimensions: (a) intent to purchase; (b) primary behaviour; (c) secondary behaviour.

In the customer relationship, intent to purchase can be measured at any time while it actually is a strong indicator of future behaviour (Anderson et al., 1997). Although this measure will generally overstate the probability of repurchase, the degree of exaggeration is fairly consistent (Bolton and Lemon, 1999). This suggests that customer future intentions can be predicted accurately.

Primary behaviour is the second dimension of the measurement of customer loyalty. The following five categories can measure customers' actual repurchasing behaviour: recency; frequency; amount; retention; and longevity (Anderson et al., 1997).

The third determinant of customer loyalty is secondary behaviour. Customer referrals, endorsements, and spreading the word are important forms of customer behaviour for a company (Anderson et al., 1997). In most product and service categories, one of the most important factors in acquiring new customers is word of mouth.

#### **2.3.3.1 Limitations of the prior empirical work**

The conceptual focus on a single dimension of strategic HCMPs and the measurement problems inherent in broadening the focus to a system of such a practice are the limitations of prior empirical work (e.g., Arthur, 1994; Coff, 1997). It is more likely for firms applying strategic HCMPs in one area to exercise them in other areas as well. Primarily because of Porter's best-selling books (Porter, 1985), for example, some

western companies believe that it is not effective to pursue the two different business strategies of cost leadership and product differentiation simultaneously. However, many Japanese companies including Toyota, Nissan, Matsushita and Sony are seen as both cost leaders and product differentiators, while those companies are all cost conscious companies but, at the same time, they are pursuing differentiation strategies of products. From the perspective of Porter's framework, this is a poor strategy that potentially leads to inconsistent decisions.

From current management accounting practices, however, no company can successfully be a major player in the market without cost competitiveness (Kaplan and Norton, 1996c). In addition, today's consumers buy products not just because they are bargains as they might carefully examine functions, appearance, usability and many other factors prior to making decision to buy. Lowering costs by trimming functions is unlikely to fool consumers. In view of this reason, to the extent that any single example reflects a firm's propensity to invest in strategic HCMPs, any estimates of the firm-level impact of the particular practice will be upwardly biased (Arthur, 1994).

This probable bias presents a limitation for a line of research that attempts to estimate the firm-level impact of the function of a firm's entire strategic human capital on the firm's performance, as the sum of these individual estimates may overstate their contribution to the financial performance of an organization. This suggests that companies applying strategic HCMPs should focus on the alignment of progressive management practices with the firms' competitive strategy.

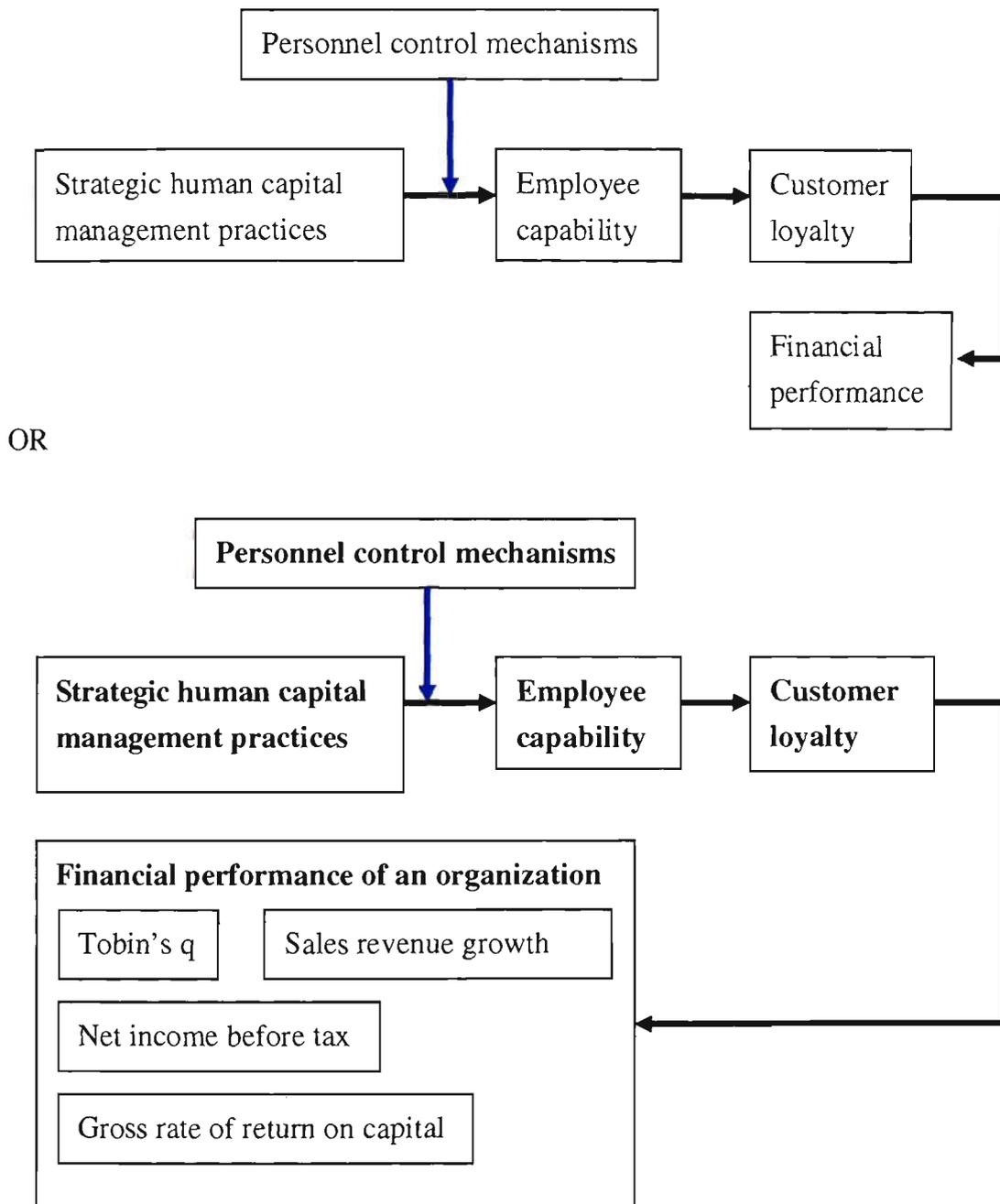
### 2.3.3.2 The third testable hypothesis

As stated earlier, employee capabilities drive internal process improvements of an organization via activity-based costing (ABC) system as a tool for employees to enhance relationships with customers and increase sales revenue growth. According to Oliver (1998), there is an association between employee satisfaction and firm performance. ABC focuses attention on activities and resources that are under the control of several employees. Several researchers have suggested that ABC implementation failures may result from failure to consider a simultaneous redesign of incentive structures that require coordinated efforts (Anderson and Young, 1999).

The connection between ABC and incentive structures may be illuminated by recent developments, such as team-based production, process-reengineering and cell manufacturing. These practices are consistent with a redistribution of decision rights and an increase in decentralized, individual decision-making throughout the organization. For example, cell members can decide among themselves the order of production, the assignment of tasks and the timing of production by relying on team-based cell manufacturing which, in turn, can significantly affect firm efficiency and profitability.

In the present study, it is hypothesized that internal process improvement of an organization is motivated by employee capabilities of firms relying more on the use of strategic HCMPs, that is related to providing higher customer value and enhancing observable financial performance. The moderator-variable interaction and intervening path model describing the causalities among employee capability, customer loyalty and financial performance of the organization implementing strategic HCMPs can be shown as follows, and then hypothesis 3 is stated.

Figure 2.9 The moderator–variable interaction and intervening path describing the causalities among employee capability, customer loyalty and financial performance



**Hypothesis 3:** As a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases.

### **2.3.4 The strategic use of human capital management practices and financial performance**

Links between individual HCMP and corporate financial performance have been explored by a number of authors. According to Terpstra and Rozell (1993), for example, there exists a significant and positive link between the extent of recruiting, selection test validation and the use of formal selection procedures and corporate profits. Russell et al. (1985) demonstrated a link between the adoption of employee training programs and financial performance of an organization. Linking performance appraisals and compensation has also been consistently connected with increased firm profitability (Borman, 1991; Gerhart and Milkovich, 1992).

Corporate performance can be enhanced by the way in which firms use strategic HCMPs in the development and implementation of their strategies. By effectively applying strategic HCMPs, firms can achieve economies of scope from diversification. In particular, knowledge-based resources in professional service firms, e.g., law firms and audit firms, are often applied directly to serve clients (Johnson, 1996). Firms are allowed to add value to incoming factors of production by relying on intangible firm-specific resources. As stated earlier, firms' outcomes may be affected by the attributes of human capital, e.g., education, experience, and skills, and, in particular, the characteristics of top managers.

Firm-specific resources, e.g., HCMPs, are often embedded in individual skills and collaborative working relationships within the firm (Szulanski, 1996). These resources, however, must be integrated and managed to create competitive advantages. For example, the human capital embodied in the partners is a professional service firm's most important resource. Partners' experiences build often tacit but valuable

firm-specific knowledge, while such tacit knowledge is always unique and difficult to imitate. Partners' knowledge of current markets and clients can be leveraged to offer new services. In such a case, the new bundle of services may allow the creative use of strategic HCMP<sub>S</sub>. This has a higher probability of creating sustainable competitive advantages than articulable knowledge without the use of strategic HCMP<sub>S</sub> (Lane and Lubatkin, 1998; Hitt et al., 2001).

The use of strategic HCMP<sub>S</sub> may also help firms capture the benefits of information asymmetries for customers (Snell, 1992). Employees with prestigious credentials contribute to a firm's positive reputation. Because of the information asymmetries experienced by clients, a positive reputation can help professional service firms build a competitive advantage. Potential customers use proxies to predict the potential quality of a firm's services that they are likely to receive, since the actual quality cannot be known until the services are rendered. Besides, clients may consume new services on the basis of trust and satisfaction with prior services provided by the firm when they have strong positive relationships with the firm's employees, e.g., partners of law firms or audit firms.

Snell and Dean (1992) further highlight the fact that an organization can provide valuable services to its clients through continuous investments in valuable tacit knowledge, e.g., intellectual capabilities and social capital. Such valuable services attract premium prices as well as more customers. In addition, Hitt et al. (2001) found that leveraging human capital has a positive effect on organizational performance, but the interaction between leverage and human capital exhibits no effect on firm performance.

In general, leveraging human capital creates efficiencies and helps build tacit knowledge in an organization, but it also imposes some costs. For example, monitoring is increased to ensure quality outcomes. Incurred by assigning tasks, coordinating activities and evaluating employees, general management costs increase with leveraging human capital. Besides, professional hubris sometimes prevents effective monitoring and leveraging human capital. Also, it may be difficult to leverage certain types of human capital, such as specific social relationships. This relationship suggests important implications for managers. Although exploiting and applying human capital and leveraging it generally create positive effects on organizational performance, managers must recognize that they have costs as well and either reduce those costs or ensure that the value gained from the use of strategic HCMPs more than offsets the costs incurred.

The purpose of using strategic HCMPs is to help minimize performance problems of an organization (Spicer and Ballew, 1983; Snell, 1992). Strategic HCMPs not only seek to find employees with knowledge, skills, abilities, values and motives that are valuable, rare and inimitable, but also minimize opportunistic behaviour. Supporting decision-making, motivating the alignment of goals of employees with corporate goals and empowering employees to use their knowledge and skills to the benefit of the organization are the result of the investment in strategic HCMPs. These activities are supposed to increase job satisfaction, which, in turn, increases employee productivity (Barney, 1991). Hence, the development of firm profitability may be ensured through the retention of productive employees.

### 2.3.4.1 Limitations of the prior empirical work

As stated earlier, non-financial performance measures such as job satisfaction, employee retention, product quality, customer complaint, customer loyalty and market share are now used by many firms to evaluate, motivate, compensate and reward managerial performance. So far, however, there have been few studies on the association between non-financial performance indicators and financial performance of an organization, and the evidence provided by prior empirical work has been mixed (e.g., Ittner and Larcker, 1998a; Behn and Riley, 1999).

Moreover, even though there have been calls for greater emphasis on non-financial measures in internal performance measurement systems associated with the format of the BSC while many firms have implemented such systems, there is no evidence on the impact of including non-financial measures in performance appraisal and incentive compensation. In addition, despite an increasing use of non-financial measures in managerial compensation, there is little evidence of the performance impact of including non-financial measures in incentive compensation plans in prior empirical work (e.g., Banker et al., 2000). Besides, none of the survey investigations in prior empirical studies report the explicit use of non-financial measures in managerial compensation (e.g., Stivers et al., 1998).

Strategic HCMP<sub>s</sub> of an organization should be related to two dimensions of its fit: first, internal fit among dimensions of strategic HCMP<sub>s</sub> could be expected to take the form of complementarity; and second, external fit between a firm's competitive strategy and its management system of human resources. Additionally, if a firm's competitive strategy and its organizational structure have been aligned, based on an external performance criterion, fit has been achieved. In spite of prior empirical

work (e.g., Coff, 1997) arguing that improved internal and external fit of strategic HCMPs will augment financial performance of an organization, the relevant research has not specified the functional form that internal or external fit can be expected to take. For example, the relationship between a firm's competitive strategy and its performance could co-vary with the type of environment in which it operates.

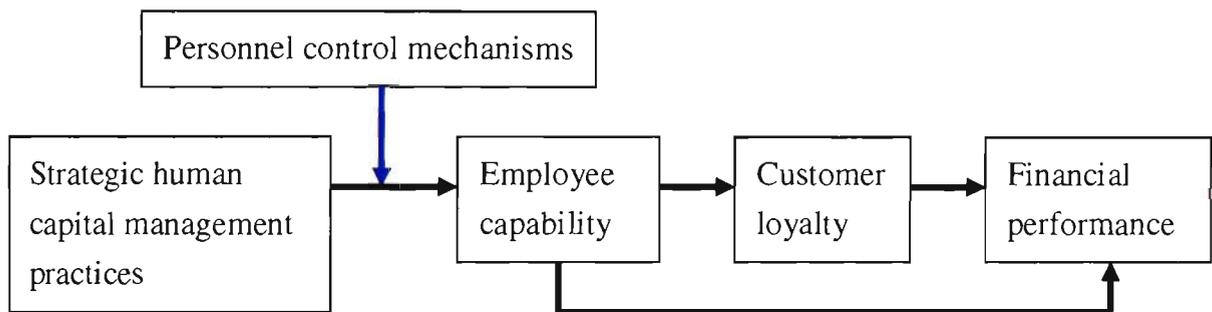
#### **2.3.4.2 The fourth testable hypothesis**

As stated earlier, employee training has been empirically linked to a number of measures of the BSC. A positive association between skill development, training and employee retention has been documented by researchers (Whitaker, 1999; Wah, 1998). Employee training has also been linked to innovation, process improvements and customer service quality (Hurley and Hult, 1998; Lynch and Black, 1998). In addition, employee training has been empirically connected to post-sale service quality (Lewis and Gabrielsen, 1998). Certainly, client acceptance of new services can be attributed to a talented employee's experience and social capital developed over time (Kaplan and Norton, 2001a, b). Hitt et al. (2001) states that strategic HCMPs can be useful in implementing service diversification, while employees' social capital and experiential knowledge can be helpful in performing geographic diversification. The relationships with clients can be advantageous to entering new geographic markets. Firms can obtain new clients in the new market through their employees' relationships with existing clients.

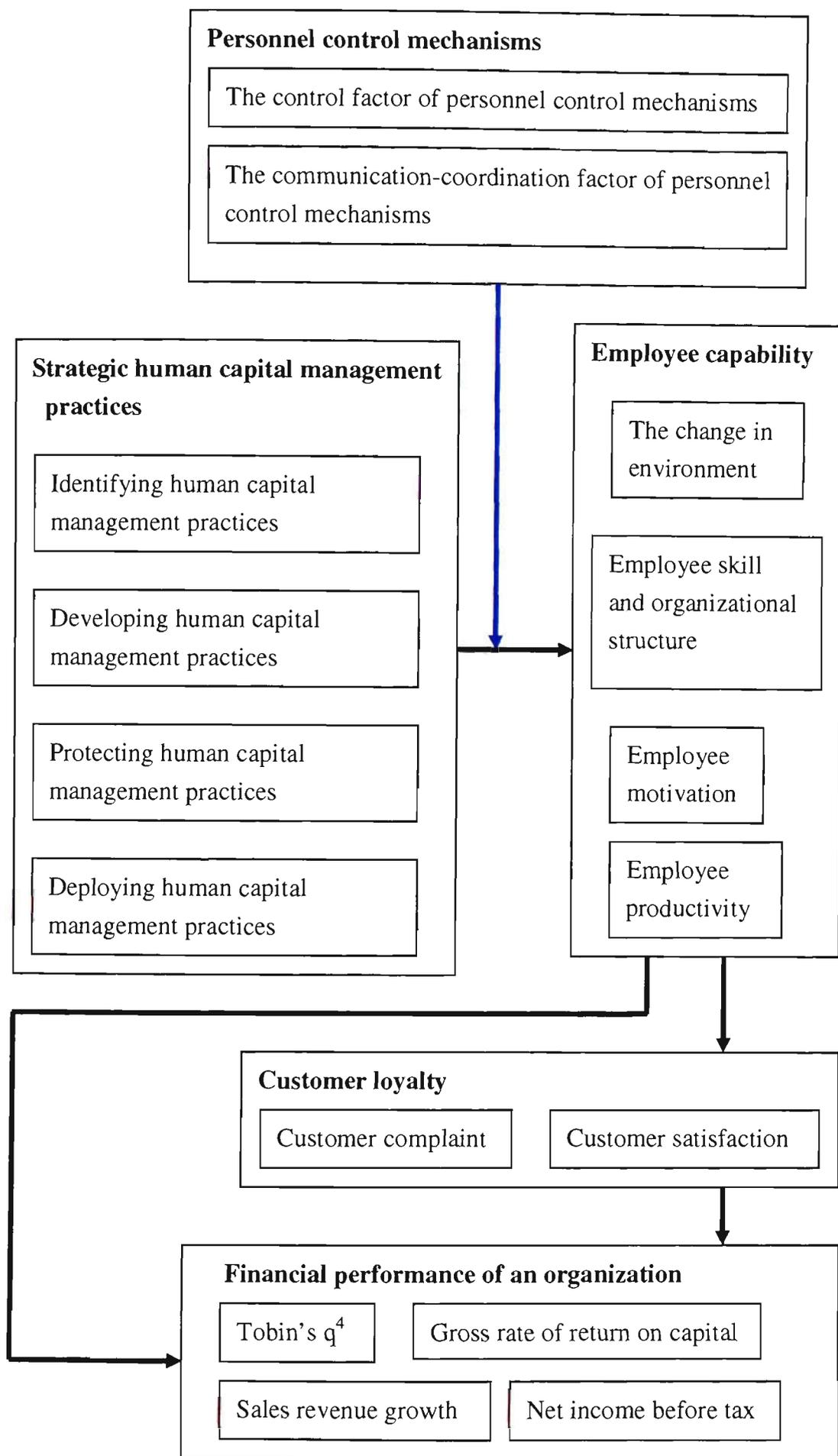
In the present study, it is hypothesized that productive employees of firms relying more on strategic HCMPs may increase the magnitude of innovative activity, the level of customer service and, hence, the degree of financial performance. The moderator-variable interaction and intervening path model describing the direct

impact of employee capability on financial performance and the indirect effect through the linkage between employee capability and customer loyalty by estimating the relationship between customer loyalty and financial performance can be shown as follows, and then hypothesis 4 is stated.

Figure 2.10 The moderator–variable interaction and intervening path describing the direct impact of employee capability on financial performance and the indirect effect through the linkage between employee capability and customer loyalty by estimating the relationship between customer loyalty and financial performance



OR



**Hypothesis 4: Financial performance in firms focusing on strategic human capital management practices increases as a result of the increase in employee capability.**

## Notes

1. *As to measures of financial performance, investments in HCMPs are regarded as period expenses on profit-and-loss statement (Johnson, 1992) according to traditional views.*
2. *Personnel control is expected to bring an effect to managerial performance of the organization in a highly uncertain setting (Abernethy and Brownell, 1997).*
3. *The associations between empowerment and employee productivity were shown by Koberg et al. (1999) by studying a sample set of hospital employees. Hartline and Ferrell (1996) provided the linkage between empowerment and customer service quality.*
4. *When the model was developed, Tobin's Q was included as a potential measurement because of its popularity in the literature. However, during the data-gathering process it was discovered that the measurement is not used by the respondents.*

## Chapter 3 Research design

### 3.1 Introduction

After having developed a set of causal relationships with interrelated dependent dimensions regarding the components of strategic human capital management practices (HCMP<sub>s</sub>) and the combination of financial and non-financial performance measurement associated with the format of the balanced scorecard (BSC), the path diagram portrayed in this chapter, including the dimensions measuring each construct, provides the basis for specification of the structural equations and the proposed correlation between exogenous constructs, and between structural equations.

The methodology used in the present study is composed of surveys, field interviews (in-depth visits) and statistical methods. Detection of variable relationships is used to produce descriptive and explanatory knowledge of an existing reality. These types of knowledge are evaluated in terms of internal and external validity, reliability and accuracy.

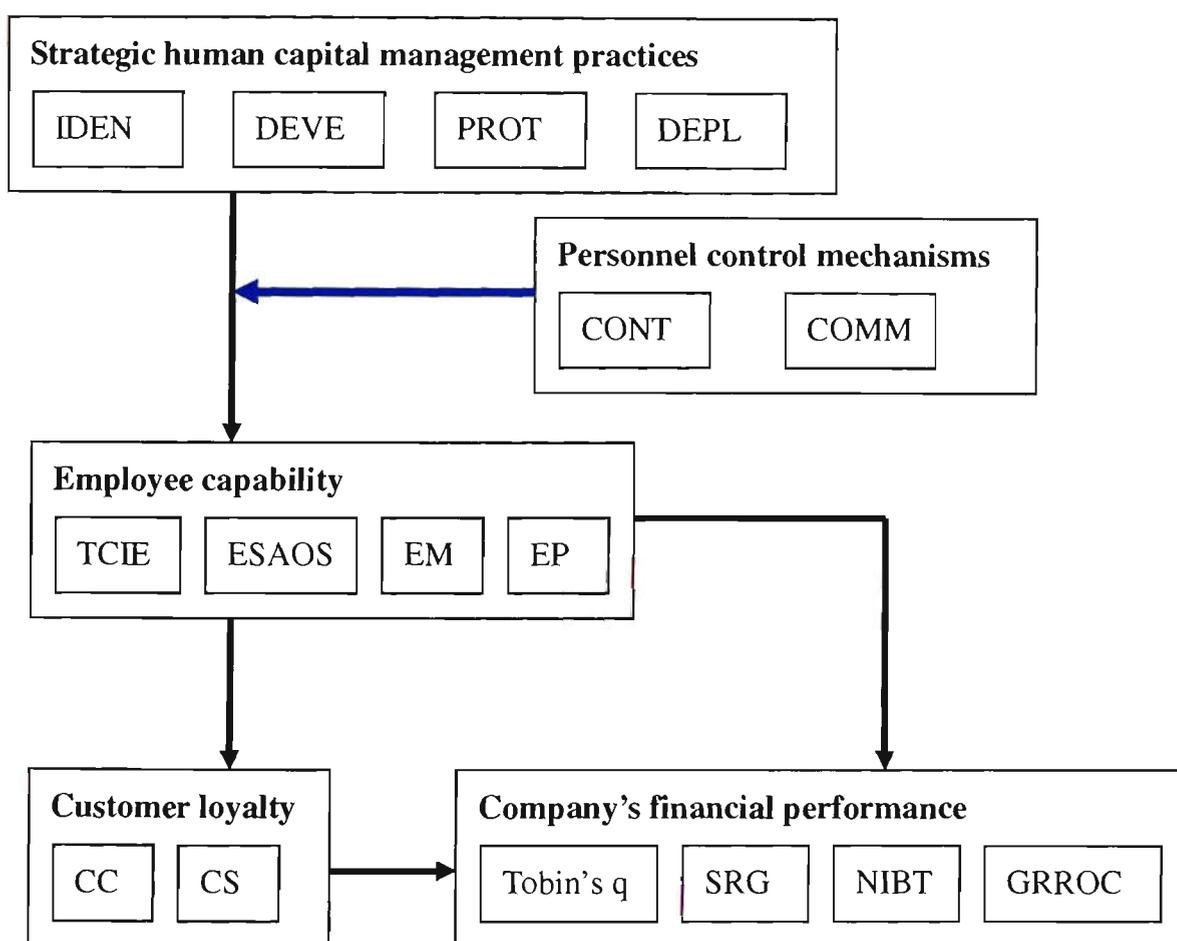
This chapter comprises eight sections with: section 1 concerning the conceptual framework and justification for survey-based research method; section 2, definition of variables and measuring methods; section 3, a description of measuring tools and the selection of subjects; section 4, an introduction of analytic methods for data used in this study; section 5, validation of the factor analysis for items structure of the questionnaire; section 6, the reliability analysis for dimensions of four multi-dimensional constructs; section 7, the discriminative validity analysis for dimensions of the questionnaire; and section 8, research limitations of the present study.

## 3.2 Framework of the research and justification for survey-based research method

### 3.2.1 The conceptual framework of the research

This research mainly explores how strategic HCMPs motivate employee capability and improve customer loyalty which could promote the company's financial performance in the manufacturing industry (e.g., electronics, computer, construction) and the service industry (e.g., insurance, foodservice, tour) in a competitive working environment. The second aim is to examine the issue of whether a personnel control mechanism has a moderating effect on the relationship between strategic HCMPs and development of employee capability. The path diagram of the conceptual framework can be illustrated as follows:

Figure 3.1 The path diagram of the conceptual framework



Note: you will find the definition of each dimension of all multi-dimensional constructs mentioned above in Appendix 5.

As noted in Chapter 2, four testable hypotheses were inferred by means of theoretical development of the conceptual framework. They are summarized briefly as follows.

Hypothesis 1: Employee capabilities in firms relying on personnel control mechanisms increase as a result of paying more attention to strategic human capital management practices.

Hypothesis 2: Customer loyalty in firms with a focus on strategic human capital management practices escalates on account of the increase in employee capability.

Hypothesis 3: As a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases.

Hypothesis 4: Financial performance in firms focusing on strategic human capital management practices increases in consequence of the increase in employee capability.

According to the above-mentioned path diagram of the conceptual framework, in the present study a series of structural equations, described in Appendix 4, is developed to constitute the structural equation model wherein dimensions are assigned to each construct. The structural equation model provides this study with a means of giving meaning to the constructs as well as specifying the correspondence of dimensions to constructs. The dimensions measured by observable indicators thus reflect the constructs described in later sections and in the following chapters.

### 3.2.2 Justification for survey-based research method

Yin (1984) suggests that question types “how” and “why” are more appropriate to the case study methodology while “who”, “what” and “to what extent” ones are appropriate to surveys. Furthermore, survey-based methods are the preferred research tool when the investigator has little control over behavioral events and when the focus is on a contemporary phenomenon within some real-life context. The nature of the research questions mentioned in this study, for example, what have been the outcomes from applying strategic HCMPs, are appropriate to the survey-based study. A survey can be readily designed for the question type “what”. Similarly, the survey-based research method is likely to find support from question types “who” and “where” or their derivatives. For example, one of the research goals of the present study is to describe the articulation of the links between non-financial measures of performance such as employee motivation and customer complaint and financial ones such as sales revenue growth, net income before tax, and gross rate of return on capital. Additionally, the present study makes investigation into issues concerning “who” has participated in applying strategic HCMPs.

The survey-based research method is the most efficient way to discover information of that type. Correspondingly, the present study aims at exploring “what” the outcomes of strategic HCMPs have been. Depending on the type of management practices, this sort of question can be answered by doing a survey or examining the accounting data. Finally, consider such questions as follows. “How many” customers did strategic HCMPs serve? “What” kinds of financial performance were received? Both of these would be more readily answered through a survey-based research design.

The application of strategic HCMPs and the integration of financial measures of performance with non-financial ones on the basis of BSC are viewed as playing an active role intertwined amongst those competing firms in the market place. The survey-based research design used in the present study does not manipulate any of the variables of interest while data relating to all variables are collected simultaneously. For example, in this study the researcher is neither able to make some customers committed to purchasing and others less committed nor is he capable of observing the effects on customer loyalty. In addition, some variables, such as employee motivation, are not capable of manipulation. In this study, the tailored design of survey-based research method focuses on the incentive design that creates respondent trust and incentives by bringing the awareness of increased compensations and reduced costs of being a respondent into existence<sup>1</sup> (Dillman, 2000). High internal reliability (i.e., Cronbach's alpha) and inter-construct correlation will be two key points.

### **3.3 Definition of variables and measuring methods**

#### **3.3.1 Strategic human capital management practice**

##### **3.3.1.1 Operational definition**

Performance differences across firms can be attributed to the variance in the firms' resources and capabilities (Grant, 1991; Coff, 1997; Hitt et al., 2001). Firm resources were defined as "stocks of available factors that are owned or controlled by the firm" (Amit and Schoemaker, 1993: 35). Barney (1991: 101) suggested that "firm resources include all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies". Firm resources can provide the basis for firms' competitive advantages by using a wide range of managerial practices.

Snell and Dean (1992) also argued that firm resources form the basis of firm strategies and are critical in the implementation of those strategies. The resource-based view of organizational strategy argued that firms take hold of and have control over unique strategic resources. These unique physical, human or organizational resources provide the firm with the basis for sustained competitive advantage (Barney, 1991). On the other hand, firm capabilities were defined as “powers available for deploying firm resources” (Amit and Schoemaker, 1993: 35). In this study, firm capabilities are based on identifying, developing, protecting, and deploying human capital management practices through complex interactions among firm resources and competitive strategies.

Managerial practices concerning human capital are frequently underutilized because the uncertainty about the economic, industry, regulatory, social and technological environments (Amit and Schoemaker, 1993; Abernethy and Brownell, 1997), competitors’ behaviour (Widener, 2000), and customers’ preferences (Tichy et al., 1982). Huselid (1995: 637) found that “human resource management practices influence employee skills and motivation through the acquisition and development of a firm’s human capital”. Therefore, complex interactions among competitors, customers, suppliers, regulators, and stakeholders determine the development and deployment of strategic human capital management practices.

Earlier studies (e.g., Barney, 1991; Amit and Schoemaker, 1993) identify six dimensions to be measured to ensure construct validity of strategic human capital management practices (i.e., value, rareness, inimitability, uncertainty, complexity, and competitiveness). In this study, four dimensions are identified (i.e., identification, development, protection, and deployment). Even though in the present study the

variable factors of each dimension have been based on the review of prior empirical works, part of them have evolved through a synthesis by this researcher. In addition, since the present study has a large number of variable factors relative to the size of the sample, and the underlying structure of several measures is not clearly established, exploratory factor analysis (EFA) is conducted to discover valid variable factors for each dimension and further reveal that the above-mentioned four dimensions which must be constructed as separate latent independent variables do load the construct, strategic human capital management practices.

#### 3.3.1.2 Measuring methods

Human resources must be a source of competitive advantage and a valuable one in order for a firm to use HCMP<sub>S</sub> strategically. Strategic HCMP<sub>S</sub> must be rare because if the resource is abundant firms will not be able to sustain their competitive advantage. Further, strategic HCMP<sub>S</sub> must be valuable to enable a firm to conceive of or implement strategies that consequently improve its efficiency and effectiveness (Barney, 1991). As noted above, the first dimension of strategic HCMP<sub>S</sub> focuses on **identifying** strategic human resources. It is measured by using a set of questions related to the firm's beliefs with respect to the importance of strategic human resources and on whether strategic human resources are a key to achieve competitive advantage (e.g., Q18, Q19, Q22, Q27, Q30 and Q35 described in Appendix 1).

To **develop** strategic human resources is the second dimension of strategic HCMP<sub>S</sub>. This dimension consists of resource specificity and the diffuseness of strategic human resources. Resource specificity is associated with strategic human resources on the grounds that competitive advantage will be short-lived if competitors can easily mimic or reproduce the resource (Grant, 1991; Amit and Schoemaker, 1993). Next,

it would be difficult for competitors to repeat the effort provided by the strategic HCMP<sub>s</sub> because there is little clarity surrounding the effort. As these strategic factors of HCMP<sub>s</sub> are associated with costs of information asymmetry and opportunism (Coff, 1997; Widener, 2000), the diffuseness of the strategic human resources determines the base over which the design and implementation costs of the management control system are spread. Under the circumstances, the second dimension of strategic HCMP<sub>s</sub> is measured by applying a set of questions related to one issue about “how common the human capital is among competitors” (e.g., Q20, Q21, Q23, Q24, Q28, Q29 and Q42 described in Appendix 1).

To **protect** strategic human resources is the third dimension of strategic HCMP<sub>s</sub>. Whether HCMP<sub>s</sub> help the firm to be more efficient and effective depends on the specificity of strategic human resource (Barney, 1991; Amit and Schoemaker, 1993). The specificity of strategic human resource is based on whether the employees’ duties are repetitious and tasks are standardized and how difficult it is to monitor and evaluate employees’ effort (Coff, 1997). Impartial measurement of performance, reasonable working remuneration, a rigorous training plan and an even chance for employee’s promotion are significant premises to bring HCMP<sub>s</sub> into full play. Questions related to whether strategic human resources help the firm to be more profitable can measure the third dimension of strategic HCMP<sub>s</sub> (e.g., Q25, Q26, Q34, Q36, Q37, Q38, Q39, Q40 and Q44 described in Appendix 1).

The spread of knowledge and skills throughout the firm, a belief that all employees contribute to the firm’s success, and all employees know how their jobs relate to the firm’s goals take shape the source for sustained competitive advantage of an organization (Barney, 1991). Strategic factors of HCMP<sub>s</sub> such as job enrichment

interventions, formal information sharing, labour-management participation, realistic job previews and grievance procedures have effects on the level of employee capability (Amit and Schoemaker, 1993; Coff, 1997), all of which, in turn, form the basis for sustained competitive advantage of an organization. As was mentioned above, to **deploy** strategic human resource comes last as the fourth dimension of strategic HCMP<sub>s</sub>. It is measured by an application of a set of questions related to the belief that all employees contribute to the firm's achievement and all employees know how their jobs relate to the firm's objective (e.g., Q31, Q32, Q33, Q41 and Q43 described in Appendix 1).

Regarding the four dimensions of strategic HCMP<sub>s</sub>, some questions in Appendix 1 are based on the review of prior empirical works and some are evolved through a self-revision by this researcher. All the sources regarding variable factors are described in Table 3.1.

Table 3.1 The source of variable factors of four dimensions of strategic HCMPs

Variable factors	Sources
Q18-a, b, d and g; Q19-b, d, e and f; Q22-a and c	Tichy et al. (1982)
Q18-c and e; Q19-c; Q30; Q31-b and c; Q33-c and e	Barney (1991)
Q18-f; Q28-c; Q43-a	Amit and Schoemaker (1993)
Q19-a; Q20; Q21; Q22-b; Q43-e	Grant (1991)
Q23; Q27; Q28-a and b; Q29; Q31-a and d	This research
Q24; Q25; Q26; Q33-a	Coff (1997)
Q33-b, d; Q34; Q35; Q37; Q38; Q 40; Q41	This research
Q43-b and c; Q44-a, b, d, e, f, h, i, j and k	This research
Q32-a, b, c, d and e; Q36; Q39; Q42; Q43-d and f	Snell and Dean (1992)
Q44-c, g and l	Barney (1991)

### 3.3.2 Personnel control mechanisms

#### 3.3.2.1 Operational definition

Snell (1992) suggested that human resource management control intending to help prevent performance problems regulates the antecedent conditions of firm performance, i.e., employees' knowledge, skills, abilities, values and motives. However, the implementation of a reliable and effective human resource management control needs to involve finding individuals with specific characteristics (e.g., values), thus minimizing opportunistic behaviour (e.g., shirking) and, in turn, reducing

transaction costs arising from opportunism. This study views the combination of human resource management control with internal corporate strategy communication as a situational moderator variable that helps explain the relationship between strategic human capital management practices and employee capabilities. This study does not refute the behavioural perspective of human resource theory. It extends Snell (1992) in two ways. First, whereas Snell (1992) examined the intervening relationship between organizational strategy and human resource management control caused by administrative information, this study examines the moderating relationships between strategic human capital management practices and employee capabilities caused by human resource management control and internal corporate strategy communication. Second, this study simultaneously examines how human resource management control and internal corporate strategy communication intensify strategic human capital management practices, whereas Snell (1992) focused on observing human resource management control and studying how human resource management practices depend on the characteristics of organizational strategy and administrative information.

In order to link the balanced scorecard to human resource management, this study assumes that non-financial facets of human resource management, such as the design of challenging work, job enrichment interventions, realistic employment reviews, formal information sharing, grievance procedures and labor-management participation programs. These each have their effect on the effectiveness of strategic human capital management practices, through the exercise of a personnel control mechanism. In this study, a personnel control mechanism is a catch-all variable, which intensifies the effects of all other contextual variables in the relationships between strategic human capital management practices and employee capabilities.

Kaplan and Norton (1996) found that the mechanism for bringing management control and strategy communication into full play is important for organizations using human capital management practices because the connection between human resource management control and internal corporate strategy communication will make employees' motivation conform to organizational strategy. Snell (1992) argued that human resource management control is used to judge if employees' technology and knowledge are in conformity with the organizational requirement as well as if employees' potential is required to be developed further. This study supposes that the mechanisms for bringing human resource management control and internal corporate strategy communication into full play intend to lower the threats from employees' abrupt resignations through prudently selecting and training talents, therefore keeping these disgruntled people from leaving. However, it is noted that when the appraisal of employees' performance is partial and inefficient, communication regarding strategy is an important complement to human resource management control (Bass and Avolio, 1993; Pillai et al., 1999). For personnel control mechanisms, bringing human resource management control and internal corporate strategy communication into full play thereby accelerating human capital management practices is an important task. Hom, Caranikas-Walker, Prussia, & Griffeth (1992) found that safe working environment, solid organizational structure, impartial measurement of financial performance, reasonable remuneration and active enterprise culture may minimize employees' abrupt resignation. This study supposes that employees' self-cognition and self-affirmation accelerate job satisfaction and employees' demand for on-the-job training. According to the findings of Jung, Dalessio, & Johnson (1986), the enhancement of job satisfaction depends on the following five factors: (1) employees' pay; (2) superiors' leadership; (3) harmonious relationship between co-workers; (4) employees' opportunities of

promotion; and finally (5) working environment. This study also purports that intensive on-the-job training is particularly important to the enhancement of job satisfaction. Since intensive on-the-job training enhances the relationship between co-workers as well as the coordination of team-based work, the link between human resource management control and internal corporate strategy communication is important to note. In other words, the operation of personnel control mechanisms not only increases employee's job satisfaction, but reduces the loss arising out of an employee's abrupt resignation as well. To increase employee's job satisfaction and lessen the cost resulting from employee's unexpected resignations, the organization pays attention to a close coordination of employee's on-the-job training with working characteristics, and focuses on an even opportunity for employee's promotion which is strict and fair as regards rewards and punishments.

A senior executive of one of the sample firms (GISG) gave the following comments on the subject of personnel control mechanisms:

“Neither senior executives will consider their employees at the basic level to be decayed woods nor those employees will deem themselves to be incompetent. In one corporation, the relationship between senior executives and employees at the basic level is equivalent to one between a pregnant woman and her unborn baby that no one mother would expect her newborn baby to be an unsightly or a retarded child. Similarly, no one senior executive hopes his/her subordinates are dummies or men of uselessness. A pregnant woman communicates with her unborn child through the umbilical cord to transmit a kindred passion between them. A senior executive and his/her employees communicate with each other through reliable language, physical response and trustworthy expression to express

their opinions and views and ameliorate their disagreement.”

According to the comments on the subject of personnel control mechanisms mentioned above, in adverse circumstances, both executives and employees would strive to seek solutions to the problems and fight for the survival of the corporation. Senior executives, or employees at the basic level, would treat themselves as important and indispensable family members at their “home”. Under circumstances of mutual respect, both executives and employees have self-esteem in their “family” and work hard and cooperate with each other to set up valuable business strategies through good communication and exchange of professional knowledge. Under a given goal to fulfill, every member of the strivers makes an effort for the future sustainable development of this “family”. Under an objective, accurate, impartial and reasonable criterion of performance measurement, every member’s efforts earn considerable and positive affirmation, while each one of them would positively recognize his/her own efforts and pay respect to others’ results. Under such circumstances, no one will harbor intentions to be idle and lazy, no one will hope to profit by other people’s toil, and further, no one would give defamatory statements suggesting that other people’s results are false. All of these are key points brought up by personnel control mechanisms.

#### 3.3.2.2 Measuring methods

The **control** factor of personnel control mechanisms is based on an exchange process in which the superior offers rewards in return for the subordinates’ effort and performance (Pillai et al., 1999). In this study, the measurement of the control factor is conducted by applying a set of questions related to contingent reward (the subordinate and the superior have unconditional fortifying relations),

management-by-exception (the superior gets involved only when things go wrong), and laissez-faire (the control factor of the personnel control mechanism is absent) (Bass and Avolio, 1993) (e.g., Q45, Q46, Q47, Q48, Q49, Q50, Q52 and Q53 described in Appendix 1).

Based on the **communication-coordination** factor of the personnel control mechanisms, the superior inspires subordinates to perform beyond expectations by triggering their higher-order needs, cultivating an atmosphere of trust, and tempting them to go beyond their self-interest for the sake of the goal the organization seeks to achieve (Pillai et al., 1999). In this study, a set of questions related to inspirational motivation (the subordinate provided with symbols and emotional appeals which are directed at goal achievement), intellectual stimulation (the subordinate encouraged to question his / her own way of doing things or to break with the past), and individualized consideration (assignments delegated to the subordinate to provide learning opportunities) are set to measure the communication-coordination factor (Bass and Avolio, 1993) (e.g., Q51, Q54, Q55, Q56 and Q57 described in Appendix 1).

Regarding the two dimensions of personnel control mechanisms, some questions in Appendix 1 are based on the review of prior empirical works and some are evolved through a self-compiled construct by this researcher. All the sources regarding variable factors are described in Table 3.2.

Table 3.2 The source of variable factors of two dimensions of personnel control mechanisms

Variable factors	Sources
Q45; Q46; Q47; Q48; Q49; Q50; Q51; Q52	This research
Q53-d; Q56	Pillai, Schriesheim and Williams (1999)
Q53-a, b, c, e, f, g, h, i, j and k; Q54	Bass and Avolio (1993)
Q55-a, b, c, d and e; Q57	Bass and Avolio (1993)

### 3.3.3 Employee capability

#### 3.3.3.1 Operational definition

According to Katz et al. (1985), highly effective employee capabilities are defined as those with fewer grievances and disciplinary actions and lower absenteeism, increased product quality and direct labor efficiency. In this study, the change in environment, employee skill and organizational structure, employee motivation, and employee productivity are expected to have effects on employee capability.

Stability for internal business processes and flexibility to inventive process improvements help the organization ensure the reliability of employee capability and keep the organization flexible to creative process (Guzzo, Jette, and Katzell, 1985). Huselid (1995: 637) suggested that “the effectiveness of skilled employees will be limited if they are not motivated to perform.” An effective induction for employee motivation can be accomplished by relying on certain causations between employees’

efforts and reasonable rewards (Amit & Schoemaker, 1993). Some methods of measurement of employee motivation are direct with the effects of induction observable instantly, while some of them are indirect with the induction effects being gradually observed over a long time. Consequently, a mere use of direct induction methods will not necessarily bring employee capability into full play. Moreover, employees' contributions are not easily described objectively in direct methods, although each employee is entitled to share in their teams' glory. Huselid (1995: 638) noted that "the contribution of a highly skilled and motivated workforce will be limited if jobs are structured programmed." However, strategic human capital management practices can influence financial performance of an organization through provision of organizational structures that encourage participation among employees (Tichy et al., 1982; Katz, Kochan, & Gobeille, 1983; Pillai et al., 1999). Cutcher-Gershenfeld (1991) suggested that firms taking on the leadership type of internal strategy communication have lower costs, less scrap, higher productivity and a greater return to direct labor hours than those using control leadership. Finally, the essential consequence of uncertainty limits the ability of organization to pre-determine and quantify desired results of employee capability (Tichy, et al., 1982; Amit & Schoemaker, 1993). This study argues that a better management structure based on manufacturing flexibility can alleviate threats from employees' abrupt resignations. The reason is that the management infrastructure does not demand one to do whatever he/she is told to do, however asks each employee to establish a their own circumspect accounting information net, thus enabling employees to communicate and cooperate mutually with information circulation.

### 3.3.3.2 Measuring methods

Findings by Katz et al. (1983) indicate that quality of work life, quality circles, and

labor-management teams would increase employee productivity. According to Guzzo, Jette and Katzell's meta-analysis (1985), training programs, goal setting, and socio-technical system design have significant and positive effects on employee capability. Gerhart and Milkovich (1992) also point out the consistent links between incentive compensation systems and employee productivity. Furthermore, Tichy et al. (1982) find that the employee capability of an organization is likely to be affected by the stability of the external environment concerning economic changes, technological changes, product changes and the change in customer preferences. In this study, the measurement of **employee capability** is conducted by applying a set of questions related to the change in environment, employee skill and organizational structure, employee motivation and employee productivity (e.g., the change in environment includes Q58, Q59, Q60, Q61 and Q62; employee skill and organizational structure include Q63, Q64, Q65, Q66, Q67, Q68, Q69, Q70, Q72 and Q73; employee motivation includes Q74, Q75, Q76, Q77 and Q78; employee productivity includes Q71, Q79, Q80, Q81, Q82, Q83, Q84, Q85, Q86 and Q87. All of them are described in Appendix 1).

Regarding the four dimensions of employee capability, some questions in Appendix 1 are based on the review of prior empirical works and some are evolved through a self-revision by this researcher. All the sources regarding variable factors are described in Table 3.3.

Table 3.3 The source of variable factors of four dimensions of employee capability

Variable factors	Sources
Q58; Q60; Q61; Q62; Q66; Q68; Q69	This research
Q59; Q63; Q64; Q65; Q70-a; Q71	Tichy, Fomburn and Devanna (1982)
Q70-c, d; Q72; Q73-a and e; Q76; Q77	This research
Q67	Guzzo, Jette, and Katzell (1985)
Q78; Q80; Q81; Q85; Q87	This research
Q70-b, e and f; Q73-b, c and d; Q74; Q75	Katz, Kochan and Gobeille (1983)
Q79; Q82; Q83; Q84; Q86	Katz, Kochan and Gobeille (1983)

### 3.3.4 Customer loyalty

#### 3.3.4.1 Operational definition

In this study, customer loyalty is defined as the ratio by having frequency of complaints divided by repurchase frequency. It is not easy to guess what customers think in their minds, but is significant to try to draw their attention and to guide them, either existing or potential ones, to visit your shop. Consumer's propensity to repurchase is subject to quality perception, i.e., a belief of a price-quality relationship, frequency of repurchase, and the degree to which the article hands over "consumption enjoyment" (Batra and Sinha, 2000). In this study, customer satisfaction indicates that a customer is quite willing to return and pass positive comments to his / her friends. In other words, (1) repurchase likelihood rating, (2) price tolerance (increase) given repurchase, and (3) price tolerance (decrease) to induce repurchase

determine customer satisfaction (Jones and Sasser, 1995). The last two measures will be constructed from two variable factors: the degree to which a store could raise its price as a percentage before the customer's willingness to buy again (given that the customer has indicated his / her likelihood to repurchase) and the degree to which a store could lower the price as a percentage before the customer's reluctance to buy again disappears (given that the customer has indicated his / her unwillingness to repurchase). On the other hand, customer complaints are determined by whether his / her complaints are formal (by writing or phoning to a store manager) or informal (made to service personnel). Three variable factors, as follows, will help operationalize the overall customer complaints: (i) an overall rating of dissatisfaction; (ii) the degree to which performance falls short of expectations; and (iii) a rating of performance relative to the customer's ideal goods or service (Batra and Sinha, 2000), while each variable factor will represent a qualitatively different benchmark customers use in making cumulative evaluation (Jones and Sasser, 1995).

A senior executive of one of the sample firms (NSLIG) gave the following comments on the subject of customer loyalty:

“One Chinese proverb says, ‘a woman's heart is just like a needle in the bottom of the sea’ which means that a man can hardly understand what reveals in a woman's mind. That can be applied to customers' mind, they are imperceptible sometimes. To meet customers' requirement, not only good quality but also lower price and even novel design are demanded. It is not an easy job to guess what customers think in their minds, but is significant to try to draw their attention and to guide them, either old or new ones, to visit your shop for purchase. Cordial smile,

humor talks, clean appearance and spacious shop are marketing skills of Sunday school truth. We shall create one opportunity for our customers who can express what they intend to say from the bottom of their hearts, then followed by an introduction to customers about the advantages of the products which are already ones worthy for purchase on the market, making them feel: it's time to put into action, or you will regret for not having purchased it. Besides, never deceive customers, while one who feel deceived equals to ten or more customers deceived that the loss for the company outweighs the gain. Any poor satisfaction from one customer must allow him or her to have the products returned. It is indispensable to make a phone call or write a thank note to those old customers who introduce new ones for purchase. Accept customer's complaints toward the company and make self-examination humbly, and further, express gratitude for their precious opinions. A care, concern and respect will definitely result in customers' frequent visit. Each shop manager must make a detailed record about customers' frequency and cause of complaints as well as frequency and amount of re-purchase regularly, and follow up the changes of sale revenue growth based on the ratio by having frequency of complaints divided by re-purchase frequency."

#### 3.3.4.2 Measuring methods

The percentage growth of business with existing customers is used to measure customer satisfaction. In addition, customer acquisition is measured by both the number of new customers and the total sales to new customers. The statement of Jones and Sasser (1995) indicates that the measures of customer satisfaction and customer acquisition are not sufficient to achieve a high degree of customer loyalty.

Hence, customer loyalty, including **customer satisfaction** and **customer complaint**, in this study, is measured by using a set of questions related to the degree of perceived quality variation, the level of perceived consumption risk, perceived value for money, and degree of customer knowledge in terms of customer complaint and customer satisfaction (e.g., Q88, Q89, Q90, Q91 and Q92 described in Appendix 1).

Regarding the two dimensions of customer loyalty, some questions in Appendix 1 are based on the review of prior empirical works and some are evolved through a self-compiled construct by this researcher. All the sources regarding variable factors are described in Table 3.4

Table 3.4 The source of variable factors of two dimensions of customer loyalty

Variable factors	Sources
Q88; Q92-a and b	Jones and Sasser (1995)
Q89; Q90; Q91	This research
Q92-c, d, e, f, g and h	Batra and Sinha (2000)

### 3.3.5 Company financial performance

#### 3.3.5.1 Operational definition

Prior empirical work on the measurement of company financial performance is extensive. Economic profits stand for the net cash flows that accrue to shareholders and reflect the capital market's perception of both potential and unlikely profitability, all of which are typified by capital market returns. Accounting profits differ from economic profits in consequence of timing issues, adjustments for depreciation,

choice of accounting method, and measurement error (Hirschey and Wichern, 1984). Moreover, accounting data are often the centre of attention for strategic HCMPs since organizational management must allocate scarce resources. Therefore, measurement of both economic profits (e.g., Tobin's  $q$ ) and accounting profits (e.g., gross rate of return on capital, sales revenue growth and net income before tax) was to be considered.

### 3.3.5.2 Measuring methods

In the present study, calculations taken from Hirschey and Wichern (1984) and Hall (1993) were intended to be used for the measurement of Tobin's  $q$  and gross rate of return on capital. First, the logarithm of Tobin's  $q$  was to be calculated by having the market value of a firm being divided by the replacement cost of its assets. Second, the calculation of gross rate of return on capital was conducted by dividing the cash flows by capital stock<sup>2</sup>. However, 259 out of the 265 store managers' responses (97.74%) retrieved, significantly point out that Tobin's  $q$  is not used to measure the store's performance and value added by management. Typical comments on the subject of financial performance when interviewing with senior executives of sample firms were as follows.

“How to attract customers' attention is an important concern for our company. Customers' response to our products or services is a valuable asset. The useful and valuable assessment of store functioning is customer-based measurement of performance. Hence, sale revenue growth from new customers and repurchasing of old customers significantly indicate the increase in market share and the opportunity of creating corporate performance. Tobin's  $q$  is

not popular in our company. This is because the market value of our company and the replacement cost of corporate assets are affected by several dynamics. Some are external issues. Taking Tobin's  $q$  as the measurement of performance does not fully and completely reflect the genuine execution of managing store business. Comparing with Tobin's  $q$ , gross rate of return on capital is a better measure of accounting profits. General speaking, economic profits such as Tobin's  $q$  is not the center of attention for implementing BSC and strategic HCMP<sub>s</sub> because store managers must concern the opportunity cost due to allocating resources of our company. Pioneering companies must pay attention to the magnification of obtainable product lines and submitting brand new products to our customers."

The views of store managers' mentioned earlier are, therefore, confirmed by typical comments of senior executives of sample firms. Hence, the use of Tobin's  $q$  is left out when measuring the performance of 265 stores.

Innovative sample firms such as CWTG, GISG and JKMIG usually lay emphasis on the enlargement of existing product lines or offering brand new products and services. According to Kaplan and Norton (1996c), the percentage of sales revenue from new products and services introduced within a specified period is a common measure for growth-stage businesses or innovative companies. Sales revenue growth and the increase in net income before tax imply enlarging product and service offerings, acquiring new customers and expanding new markets, changing the product and service mix toward higher-value-added offerings and re-pricing products and services. Sales revenue growth (SRG) and net income before tax (NIBT) for targeted regions,

markets and customers are calculated as follows.

$SRG = (\text{the increase in annual actual store sales}) \div (\text{actual store sales in the base year}).$

For example,  $SRG_{1999} = [(\text{actual store sales, net of markdowns and other discounts})_{1999} - (\text{actual store sales, net of markdowns and other discounts})_{1998}] \div (\text{actual store sales, net of markdowns and other discounts})_{1995}$ , 1995 is assumed to be the base year.

NIBT is computed as annual actual store sales less store-related expenses. For example,  $NIBT_{1999} = (\text{actual store sales, net of markdowns and other discounts})_{1999} - (\text{cost of goods sold} + \text{salaries and wages} + \text{occupancy costs} + \text{allocated overhead costs})_{1999}$ .

### 3.3.6 Control variables

To provide unbiased estimates of the impact of strategic HCMP<sub>S</sub> on financial performance of an organization, the selection of the control variables for each construct is based on a careful review of the prior empirical work. These variables include exogenous factors which are based on demographics, economic environment and long-term organizational characteristics.

First, the effect of firm size was controlled through the dependent variable. Size of an organization is the first control variable as large firms might be more likely to implement a more complex governance structure including multiple, non-financial performance measures (Tichy et al., 1982; Ittner et al., 1997). This study included two variables to control for their potential effects on strategic human capital management practices and employee capability. These were number of employees and paid-up registered capital. Firms may add new services or enter new locations

through internal development (e.g., hiring new employees, opening new offices) or by external acquisition (e.g., acquiring another firm). Acquisitions provide much faster expansion than internal development, and the two modes of market entry may have different effects on firm performance. Hitt et al. (2001; 20) found that “as firms diversify into new geographic markets, their motives and outcomes may vary. One variable that may affect the outcomes of such geographic market diversification is the process of leveraging human capital”. Furthermore, Tichy et al. (1982) argued that large firms might be more likely to implement a more complex governance structure including multiple, non-financial performance measures. Under the circumstances, human resource management practices (HCMP<sub>s</sub>) can be especially lucrative and often require high leveraging of human capital (high employee capability). Leveraging human capital creates efficiencies in a firm, but it also imposes some costs. For example, monitoring is increased to ensure quality outcomes. General management costs, incurred owing to assigning tasks, coordinating activities, and evaluating employees, also increase with leveraging human capital (Hitt et al., 2001). In the present study, number of employees and paid-up registered capital were used to account for the difference in organization size which is expected to have a positive impact on strategic HCMP<sub>s</sub>, the process of leveraging human capital, and, consequently, employee capability. These two measures were transformed using a log transformation.

Second, the effect of the store heads’ length of experience was controlled through the dependent variable. Although applying human capital and leveraging human capital generally have positive returns, store managers must ensure that the benefit gained from the use of a firm’s human capital more than offsets the costs. The job of store manager differs from that of shop-floor employees, and new skills must be developed.

Hitt et al. (2001; 20) found that “store managers must build the skills needed to develop and maintain effective relationships with clients.” Store managers serve as project and team leaders on specific cases and thus must develop managerial skills. These include skills involving leadership, decision-making, allocation of resources, relationships with subordinates, peers, superiors, and clients, resolving conflicts, and processing information. Hitt et al. (2001; 15) argued that “although new store managers are learning these skills, they may be less effective team leaders than those with more experiences.” More experienced store managers likely contribute more returns to the store than do new managers. Also, the more experience a store head has, the more familiar he or she is with the characteristics of shop-floor employees, making the flow of communication with employees smoother (Osborn and Hunt, 1975). Furthermore, the costs for new store managers may exceed the returns from their capital. Therefore, the prestige of store managers, their tacit knowledge gained through experience, and their social capital can be helpful in the implementation of their firm’s strategy (Osborn and Hunt, 1975). This study included the store heads’ length of experience to control for its potential effect on strategic HCMP<sub>s</sub> and employee capability.

Third, the effect of strategic positioning of an organization was controlled through the dependent variable. Hitt et al. (2001; 16) found that “strategic resources are the basis for and facilitate the implementation of firm strategy.” As mentioned earlier, firms building strong competencies from their HCMP<sub>s</sub> can take advantage of strategic opportunities. Furthermore, taking advantage of these strategic opportunities helps firms create value. Tichy et al. (1982) found that human capital is a vital resource for the implementation of a firm’s strategy. Nayyar (1993) argued that diversification into new services and geographic regions of diversified service firms both offer

opportunities to achieve economies of scale and scope. Furthermore, firms seeking to pursue a prospector strategy tend to use non-financial measures in CEO bonus compensation, but not traditional financial controls (Ittner et al., 1997). This study, therefore, included strategic positioning of an organization to control for its potential effect on customer loyalty and firm performance.

Fourth, the effect of environmental uncertainty was controlled through the dependent variable. The degree of environmental uncertainty comes last as the fourth control variable. An important responsibility of store managers is obtaining and maintaining clients. Store managers build relationships with current and potential clients and, overtime, develop social capital through their client networks (Nahapiet and Ghoshal, 1998). Hitt et al. (2001) suggested that one of the responsibilities of store managers is to help develop the knowledge of shop-floor employees. For example, shop-floor employees need to learn internal routines, the idiosyncrasies of important clients, and more. Firm performance is a function of many variables both from inside a firm (these include the internal cost of capital and the costs of operations, facilities and equipment, and other resources) and from outside the firm (such as competitiveness in the industry and the health of the economy). According to Govindarajan (1984), uncertainty conditions that are external to the organization can have impacts on the financial performance of an organization. This study, therefore, included environmental uncertainty to control for its potential effect on customer loyalty and firm performance. The stability of the external environment regarding the legal, political and regulatory constraints surrounding an organization, product changes without expectation and unexpected change in customer preferences were reflected by the degree of environmental uncertainty.

### 3.4 Measuring Tools

A questionnaire serves as a tool for measuring each dimension of all multi-dimensional constructs used in this research, which is based on the conceptual framework and the operational content of each dimension. Appropriate variable factors were selected through reviewing prior empirical works and a synthesis, and the revision of variable factors for each dimension took experts' and scholars' opinions into consideration. Eventually, the first draft of the questionnaire was finalized after having its relevance discussed with supervising professors. Consequently, the questionnaire is in conformity with the demand for content validity.

#### 3.4.1 Pilot test

The first draft was used in a pilot test. Questionnaires including cover letters were sent to sixty randomly selected teachers of Lu-Liow Junior High<sup>3</sup> to develop an understanding of the questions' acceptability, and ask for comments on clarity, ambiguity and the appropriateness of wording and length. Sixty copies of the pilot test questionnaires were issued, with 56 of them being retrieved from which 5 invalid copies with incomplete answers were deleted, making a total of 51 valid copies. Based on the results of the pilot test, several changes were made to the final survey. Those retrieved questionnaires were needed to conduct the reliability analysis immediately to comprehend the reliability coefficient for the intrinsic consistency of each dimension. In addition to 17 items concerning "basic data", the pre-test questionnaire contained another 75 items which were found with low reliability for two constructs, "strategic human capital management practices" and "personnel control mechanisms".

After calculating Cronbach's  $\alpha$  coefficient using STATISTICA software, one

conclusion was that ill-defined meaning of the variable factors resulted in the low  $\alpha$  coefficient. Accordingly, variable factors (questions) 18, 48, 49, 50, 51, 52, 53, 54, 55, 56 and 57 of the dimension “developing human capital management practices” were revised to be more in conformity with the content of this dimension. Similarly, variable factors (questions) 3, 4 and 6 of the dimension “the change in environment”, variable factors (questions) 7, 8, 9 and 11 of the dimension “employee skill and organizational structure”, together with variable factors (questions) 19, 20, 22 and 23 of the dimension “employee productivity” were revised, leading those dimensions to be more in conformity with the operational definition of the present study. Also, in the dimensions of self-compiled construct of “personnel control mechanisms”, variable factors (questions) 1, 2, 3, 4, 6, 7, 8, 9 and 26 of the dimension “the control factor of personnel control mechanisms” were revised to be more in conformity with the content of this dimension.

### **3.4.2 Data collection**

A revised questionnaire with a covering letter and a postage-paid, self-addressed envelope was mailed to store-level heads. A guarantee was given that the finished results of the survey would not be connected to either a particular store or manager within the sample firm. The results will be used only in an aggregated form and therefore the anonymity and confidentiality of each store manager are assured. It is also hoped that aspects of the results will be published in aggregate in various professional and academic journals. The wordings of questionnaire items originated or adapted for the present study appear in the Appendix 1.

This study analyzes cross-sectional data for 265 stores included in the five business groups mentioned above in Taiwan and China, of which about 55% are situated in

metropolitan areas while the remainder are in non-metropolitan areas. Data on the actual number of stores are not disclosed in order to protect the companies' identities. In order to provide some control over organizational size, only stores with more than 30 employees are included in this study. Only store heads are selected as they are regarded as surrogates for work units. In most companies, only a single functional head from each store is selected to ensure independence of observations. The names of the functional heads were obtained by telephone calls to ensure that the questionnaire would be answered only by the functional heads identified.

The present study uses a comprehensive survey that asks multiple questions about each dimension of five multi-dimensional constructs in order to increase construct validity. However, this situation will produce the potential risk of incurring a lower response rate (i.e., a response rate is below the average of 20 %) (Young, 1996). A sample of non-respondents was contacted by telephone to investigate reasons for non-response. In this study, time delay affected dates of receipt of responses when mailing returns from China to Taiwan (on an average the range of time delay is between 7 and 15 days). Hence, t-tests for two independent samples were not undertaken by testing early and late mailing returns because the recorded dates did not reflect the required characteristics, i.e., late receipt did not necessarily indicate late completion. Consequently, the recognition of 'non-response' as a limitation (20%) of the findings is thought to be sufficient.

The data used in this study were collected from several different sources. Key financial performance measures such as actual store sales revenue, markdowns and other discounts, cost of goods sold, salaries and wages, occupancy costs, allocated overhead costs and net income before tax were collected from corporate accounting

records and cross-checked with annual operating statements submitted by individual sample firms. Shopper surveys, demographic data and store-level details on employees, including productivity, were obtained from records maintained by the human resources and research and development departments. In addition, several in-depth visits with store managers in store operations, finance and accounting and human resources provided insights into the historical and cultural background of the research sites that influence management controls and performance. Store-specific annual data on employee productivity, employee satisfaction, employee turnover, customer satisfaction, customer complaint, area demographics, financial performance measures and other store-level details are available only for the most recent fiscal year. Several in-depth visits to senior executives of sample firms were also be conducted in order to gain a better understanding of strategic HCMPs.

Demographic data (e.g., the average length of experience of the respondents in their area of responsibility, the average number of employees in the area of responsibility, etc.) were collected to indicate whether respondents are highly experienced and hold highly responsible positions. The formal questionnaire (still covering 92 variable factors) was completed after being revised as mentioned above. Cronbach's  $\alpha$  coefficient of each dimension for the pilot test questionnaire are indicated in Table 3.5.

Table 3.5 Cronbach's  $\alpha$  coefficient of each dimension of four multi-dimensional constructs (pilot test questionnaire)

Construct	Dimension	The number of factors	Cronbach's $\alpha$
Strategic human capital management practices	IDEN	14	0.664413
	DEVE	14	0.786783
	PROT	19	0.532235
	DEPL	10	0.592452
Personnel control mechanisms	CONT	12	0.704761
	COMM	14	0.657676
Employee capability	TCIE	6	0.725872
	ESAOS	7	0.716806
	EM	6	0.602147
	EP	6	0.644035
Customer loyalty	CC	4	0.481677
	CS	4	0.698522

Note: you will find the definition of each dimension of four multi-dimensional constructs mentioned above in Appendix 5.

The formal questionnaires were issued in mid-January 2002 through liaison persons from each sampling unit while the retrieval was also completed by liaison persons designated by each unit in the end of February of the same year. 368 questionnaires were issued, and 291 were retrieved from which 26 invalid copies

with incomplete and random answers were deleted. In a word, there are 265 valid copies retrieved, making a 72% of response rate as indicated in Table 3.6.

Table 3.6 The issue and retrieval of formal questionnaire

Item	The name of respondents		Number issued	Number retrieved	Missing data	Valid copies retrieved	Response rate
1	CWTG		60	46	7	39	65%
2	JKMIG		62	45	6	39	63%
3	GISG		65	48	8	40	62%
4	NSLIG	MP	60	51	2	49	82%
		NMP	63	47	1	46	73%
5	THFVG		58	54	2	52	90%

Note: CWTG means Channel Well Technology Group.

JKMIG means Jian Kwang Machine Industrial Group.

GISG means Goin Integrated Service Group.

NSLIG means Nan Shan Life Insurance Group.

THFVG means Tong Hai Fish Village Group.

MP means metropolitan areas.

NMP means non-metropolitan areas.

Data source: the present study.

Interviewing senior executives of sample firms was aimed at comprehending the strategic consistency between senior and store managers regarding management control of corporate strategy and internal business processes within the organization. It was directed at understanding the differences in views between these two groups

of managers regarding strategy communication and the application of strategic HCMPs.

Interviews with six senior executives who come from different sample firms were carried out from mid-March 2002 to mid-April through questions designated by the interviewer. The majority of the interviewees held managerial positions. They were employed an average 15 years; 4 males and 2 females. A total of 5 interviewees had complete and concrete information and only these were used in the analysis. The first draft of transcripts was passed to interviewees by the interviewer for confirmation. Any information or quotation used in the present study was drawn from validated transcripts. The interview schedule is shown in Table 3.7 and the interview questions are shown in Appendix 3.

Table 3.7 The interview schedule

Item	The name of sample firms	The location of interviewing	The position of interviewees	The date of interviewing	The length of time
1	CWTG	Taipei	Vice general manager	21 March 2002	45minutes
2	JKMIG	Taoyung	CEO	24 March 2002	32minutes
3	GISG	Kaohsiung	Accounting manager	30 March 2002	67minutes
4	NSLIG	Taipei	Marketing manager	7 April 2002	37minutes
5	THFVG	Chunghwa	General manager	10 April 2002	30minutes
6	NSLIG	Taipei	Accounting manager	14 April 2002	41minutes

Source: the present study

The data provided by interviewing senior executives indicate that there is a great deal of intrinsic consistency within the organizational structure regarding the formulation of business strategy and the development and deployment of strategic HCMP<sub>s</sub>. However, senior executives of computer companies pay more attention to the protection of strategic HCMP<sub>s</sub>, rather than the identification, but interviewees coming from life insurance companies and traditional agriculture manufacturing companies focus on the identification of strategic HCMP<sub>s</sub>. On the

other hand, the majority of the interviewees expressed a strong agreement at conducting BSC after carefully taking strategic HCMPs into account. In addition, financial and non-financial performance measures are equally significant. In brief, the views of senior executives regarding the business strategy of their companies are somewhat different from that of store managers. The former pays attention to long-term strategy formulation, but the latter focuses on the short-run operating benefits of business strategies.

### **3.5 Data Analysis Methods**

With the path diagram of the conceptual framework completely specified, this study tests the data for meeting the assumptions underlying structural equation modeling (SEM), selects the type of input matrix (e.g., covariance or correlation matrix) to be used for model estimation, and estimates the structural and measurement models. When testing a series of causal relationships, covariance matrix is the preferred input matrix type (Nunnally, 1978), however, correlations are used for both practical and theoretical reasons. From a practical perspective, correlations are more easily interpreted and diagnosis of the results is more direct. From a theoretical perspective, the primary purpose of the present study is to examine the pattern of relationships among constructs, for this purpose the correlation matrix is an acceptable input matrix.

SEM to be used in this study includes an entire family of models known as covariance structure analysis, latent variable analysis, confirmatory factor analysis and linear structural relation analysis. When SEM incorporates latent variables into the analysis, latent variables are approximated by observable or measurable indicators. The observed indicators are gathered from respondents through

various data collection methods (e.g., surveys and interviews). This has both practical and theoretical justification by improving statistical estimation, better representing theoretical concepts and accounting for measurement error. In addition, SEM provides the measurement model, which specifies the rules of correspondence between manifest and latent variables. Relationships linking each construct with its antecedents are developed. In this study, SEM indicates the relationship between latent variables while the measurement model, the relationship between latent and observable variables. The LISREL model mentioned in Chapter 3 and Appendix 4 consists of SEM and the measurement model. All techniques of SEM are distinguished by two characteristics:

- (1) estimation of multiple and interrelated dependence relationships (e.g., relationships between strategic HCMPs and employee capability moderated by personnel control mechanisms, as well as relationships between employee capability and financial performance of an organization intervened by customer loyalty); and
- (2) the ability to represent unobserved concepts in these relationships (e.g., the design of challenging work, job enrichment interventions, realistic job previews, advancement opportunities and promotion, formal information sharing, grievance procedures, labour-management participation programs, and performance appraisal, employee job satisfaction, the store's overall climate for service friendliness, customers' degree of willingness to return, and customers' degree of willingness to pass positive comments to friends).

In brief, SEM describes a series of separate, but inter-dependent, multiple regression equations simultaneously by specifying the structure model used by the statistical program. The present study draws upon theory, experiences of prior

empirical work, and the research objectives to discover which independent variables predict each dependent variable. Some dependent variables become independent variables in subsequent relationships, giving rise to the interdependent nature of the structural model. Moreover, many of the same variables affect each of the dependent variables, but with differing effects.

As noted above, SEM used in this chapter contains a variety of causal relationships. Two types of analysis performed in this study are confirmatory factor analysis (CFA) and the estimation of a series of structural equations. In the present study, the CFA examines a multi-factor solution developed from Chapter 2. In other words, CFA discussed in this chapter is concerned with exploring the patterns of relationships among a number of variables. These patterns are represented by factors (or principal components). As variables load highly on a factor, they become descriptors of the underlying dimensions of constructs (Nunnally, 1978). The examination of the loadings of the variables on the factors helps to identify the character of the underlying dimension. This study allows for a statistical test of the goodness-of-fit for the proposed confirmatory factor solution in order to validate each dimension for the measurement of specific constructs.

Using the following data analysis procedures based on the research framework and hypotheses and taking the relevance of analytic tools into account, all valid questionnaires retrieved were coded and then the data were analyzed to verify each assumption of this research. Data analysis procedures used in the present study were as follows.

#### 1. Exploratory factor analysis

To validate variable factors for each dimension of four multi-dimensional

constructs identified by this research, exploratory factor analysis (EFA) is conducted after retrieving the questionnaires, followed by exploring the reliability of variable factors for comprehending the intrinsic consistency among factors for each dimension.

## 2. Confirmatory factor analysis

To specify models fitting the data reasonably well and further examine the stability of model parameter estimates, composite reliability (CR), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI) and root mean square residual (RMR) are employed and convergent and discriminative validity are identified.

## 3. Hierarchic regression analysis and nested-model analysis

After examining the distribution of the data used in the present study by means of frequency analysis and correlation matrix, and judging the general results of this research by applying mean, standard deviation and correlation coefficient between dimensions for each construct, the next step is to examine the degree of influence on the outcome at the time of changing the independent variables as well as the effect on the outcome with an addition of the mediators and control variables. This research also explores the causal relationship between constructs by applying hierarchic regression analysis. Finally, the present study examines the intervening effects among dimensions of five multi-dimensional constructs by conducting nested-model analysis.

### **3.6 Factor analysis**

In the present study, the structure and measurement models must be identified. Identification is a relatively simple matter in CFA, and the diagnostic procedures of the LISREL program are sufficient to detect identification problems (Pillai,

Schriesheim and Williams, 1999). The external and internal quality of data in the LISREL model are discussed in Appendix 4. The most common problem may occur if multiple variable factors are hypothesized to be dimensions for two or three constructs. The chance of occurrence is minimized by the use of theoretical foundations for specification of the measurement model.

As noted earlier, the structured components of each dimension can be validated by means of EFA which further determine the effective factors used for the assessment of the best-fitting model. Even though this research has constructed the variable factors of each dimension based on the review of prior empirical work, part of factors are evolved through a self-revision by this researcher. In addition, since the present study has a large number of factors relative to the size of the sample, and the underlying structure of several measures is not clearly established, EFA is employed for the analysis of measurement model.

EFA employed in the research begins by examining the measurement of each dimension of four multi-dimensional constructs separately, and variable factors for each dimension that perform poorly were deleted from the scale in the sample by utilizing principal component and principal axis factor extraction methods with normalized varimax rotation. As noted by Pillai et al. (1999), the optimal number of variable factors are determined by the following rules: all principal component eigenvalues are greater than one and scree plots of the principal axis factors support the number of variable factors extracted as being appropriate.

Cumulative % variance of 50 or more is considered indicative of acceptable results for EFA (Jöreskog and Sörbom, 1993). When EFA was completed, all the

remaining variable factors were used for the examination of the stability of model parameter estimates. Table 3.8 to 3.11 demonstrate the analytical results for EFA of four multi-dimensional constructs. The results manifest the variable factors of each dimension being in conformity to the factor disposition of each dimension. The variable factors for each dimension as a whole can explain what a dimension represents.

Table 3.8 The analytic results for exploratory factor analysis of strategic human capital management practices

Dimensions Variable factors	IDEN	DEVE	PROT	DEPL
New technology	0.848974			
Patents	0.834287			
Knowledge of customers	0.758285			
Experience of store head		0.761712		
Knowledge of store head		0.888596		
Understandable sequence of rules		0.899621		
Repetitive activities			0.762274	
Importance of product cost			0.692083	

Table 3.8 The analytic results for exploratory factor analysis of strategic human capital management practices (continued)

Dimensions Variable factors	IDEN	DEVE	PROT	DEPL
Competitors			0.746802	
I am not involved			0.576145	
I help to operate			0.702510	
I am responsible				0.756129
Managerial staffing process				0.840329
Extensive employee selection process				0.874418
Select the best person				0.845263
Eigenvalue	3.65942	2.91605	2.18596	1.29970
% total Variance	24.39615	19.44030	14.57306	8.66469
Cumulative % Variance	24.39615	43.83646	58.40951	67.07420

Note: You will find the definition of IDEN, DEVE, PROT and DEPL mentioned above in Appendix 5.

New technology means how important is 'new technology' for sustaining your organization's competitive advantage?

Patents means how important are 'patents' for sustaining your organization's

competitive advantage?

Knowledge of customers means how important is 'knowledge of customers' for sustaining your organization's competitive advantage?

Experience of store head means how necessary is 'experience of store head' for sustaining your organization's competitive advantage?

Knowledge of store head means how necessary is 'knowledge of store head' for sustaining your organization's competitive advantage?

Understandable sequence of rules means to what extent is there an understandable sequence of rules that can be followed by the managers performing tasks in your organization?

Repetitive activities means to what extent would you say managerial tasks in your work unit perform repetitive activities?

Importance of product cost means how important is 'product cost' for product pricing in your organization?

Competitors mean how important is the 'competitors' for product pricing in your organization?

I am not involved means strategic human capital management practices are employed in my company, but I am not involved with it.

I help to operate means I help my company operate the system of strategic human capital management practices.

I am responsible for the implementation means I am responsible for the implementation of strategic human capital management practices.

Managerial staffing process means I feel good when I place the managerial staffing process in my company.

Extensive employee selection process means it is important for my company to consider an extensive employee selection process (e.g., use of tests, interviews, etc.) for a managerial position once this position becomes open.

Select the best person means I believe that an important part of being a good CEO is to select the best person for a managerial position in my company.

Table 3.9 The analytic results for exploratory factor analysis of personnel control mechanisms

Dimensions Variable factors	CONT	COMM
Management control systems are highly tailored	0.690227	
The financial goal of each store	0.868547	
Standardized operating procedures and working practices	0.578973	
Coordination of the work		0.791254
Regular meeting within stores		0.749502
Communication among stores		0.864653
Eigenvalue	3.470910	1.070319
% total Variance	49.58443	15.29027
Cumulative % Variance	49.58443	64.87470

Note: You will find the definition of CONT and COMM mentioned above in Appendix 5.

Management control systems are highly tailored means in your company, management control systems are highly tailored to suit business strategy and store needs.

The financial goal means in your company, each store prepares its own

financial goals to be used to frame its budget.

Standardized operating procedures and working practices means in your company, the work within each store is governed by the use of standardized operating procedures and working practices.

Coordination of the work means how important is the coordination of the work of different stores?

Regular meeting within stores means how important is the regular meeting within stores to supply information to store head?

Communication among stores means how important is the regular meeting among stores to share information and coordinate activities?

Table3.10 The analytic results for exploratory factor analysis of employee capability

Variable factors \ Dimensions	TCIE	ESAOS	EM	EP
Market activities of competitors	0.821690			
External environment	0.811698			
Legal, political and regulatory constraints	0.816683			
Complexity of production process		0.809646		
Flexibility of manufacturing and service-providing facilities		0.857551		
Intensity of capital equipments		0.838664		

Table 3.10 The analytic results for exploratory factor analysis of employee capability (continued)

Dimensions Variable factors	TCIE	ESAOS	EM	EP
Control of the price			0.832594	
Control of the quality			0.698818	
Variety of products			0.816119	
Cost control			0.686533	
Operational planning				0.866769
Decentralized decision				0.834810
Eigenvalue	3.54955	2.29611	1.60612	1.05539
% total Variance	29.57958	19.13423	13.38435	8.79488
Cumulative % Variance	29.57958	48.71382	62.09817	70.89304

Note: You will find the definition of TCIE, ESAOS, EM and EP mentioned above in Appendix 5.

Market activities of competitors means how would you classify the market activities of your competitors during the past five years?

External environment means how stable or dynamic is the external economic and technological environment facing your company?

Legal, political and regulatory constraints means during the past five years, how have the legal, political and regulatory constraints surrounding your firm changed?

Complexity of production process means how complex is the production process in your company?

Flexibility of manufacturing or service-providing facilities means how flexible are the manufacturing and service-providing facilities in your company?

Intensity of capital equipments means in your company, how intensive are the capital equipments used in the production process?

Control of the price means how important is the control of the price of products to employee motivation?

Control of the quality means how important is the control of the quality of products to employee motivation?

Variety of products means how important is the variety of products or services to employee motivation?

Cost control means how important is budgeting to cost control in your company?

Operational planning means how important is operational planning to employee productivity in your company?

Decentralized decision means how important is decentralized decision to employee productivity in your company?

Table 3.11 The analytic results for exploratory factor analysis of customer loyalty

Variable factors \ Dimensions	CC	CS
Employee's perception	0.847544	
Sales clerks' friendliness	0.763167	
Customers' recommendation		0.875205
Customers' propensity to repurchase		0.853595
Eigenvalue	1.875	1.691
% total Variance	46.883	42.270
Cumulative % Variance	46.883	89.153

Note: You will find the definition of CC and CS mentioned above in Appendix 5.

Employee's perception means how important is the following factor to the reduction of customer complaint: an employee's perception of the store's overall climate for service friendliness?

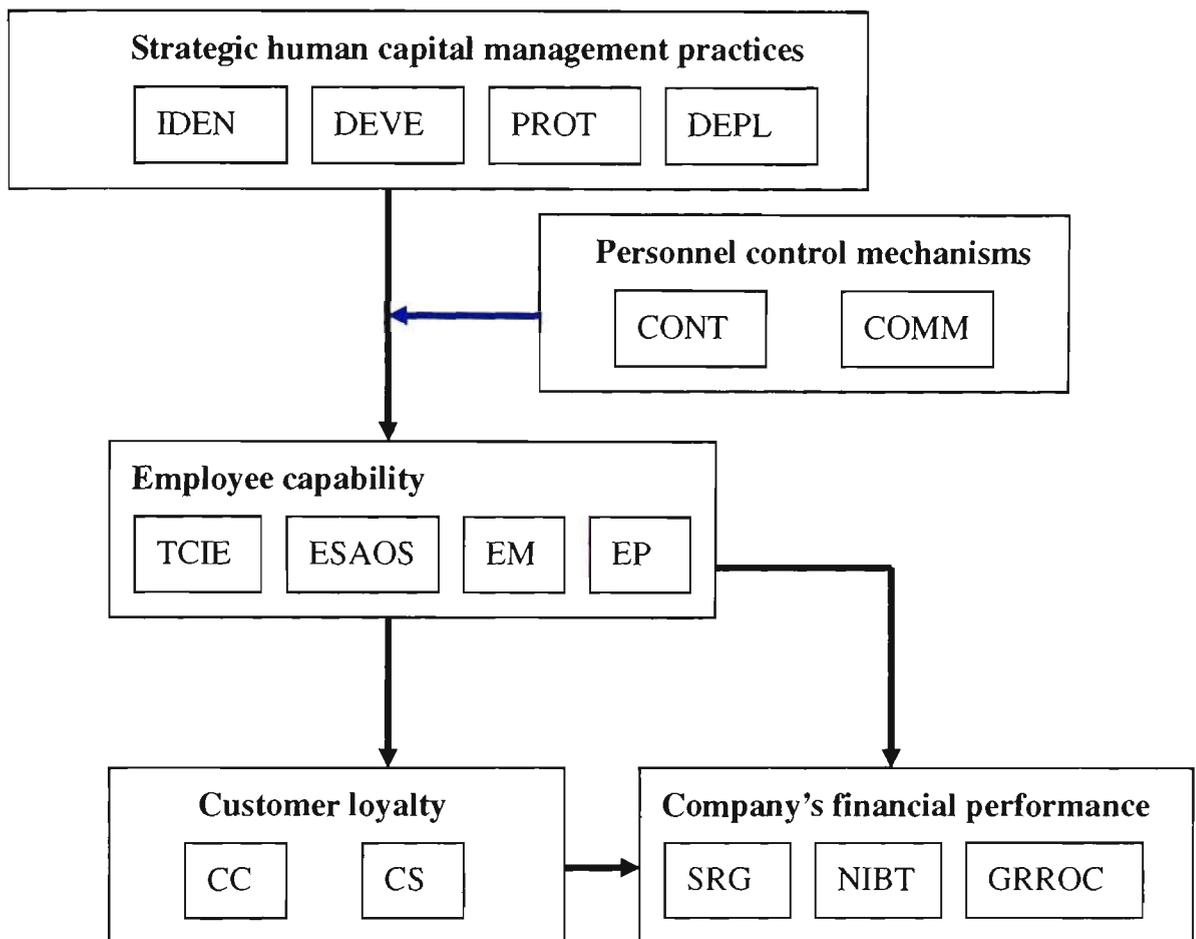
Sales clerks' friendliness means how important is the following factor to the decrease of customer complaint: store head recognizes and appreciates sales clerks' friendliness toward customers?

Customers' recommendation means how important is the following factor to the increase in customer satisfaction: your customer will recommend your store to his friend when he needs to buy a new product?

Customers' propensity to repurchase means how important is the following factor to the increase in customer satisfaction: your customer will recommend your store when he chats with his friends about your store's products?

For each construct mentioned in this study, according to Jöreskog and Sörbom (1993), cumulative % variance of 50 or more is regarded as indicative of satisfactory results for EFA. Based on the results of Table 3.8, 3.9, 3.10 and 3.11, cumulative % variance of each construct fits the requirement of Jöreskog and Sörbom (1993) (i.e., cumulative % variance of human capital management practices is 67.07%, cumulative % variance of personnel control mechanisms is 64.87%, cumulative % variance of employee capability is 70.89% and cumulative % variance of customer loyalty is 89.15%). The path diagram of the acceptable results for EFA is displayed in Figure 3.2. Each dimension of four multi-dimensional constructs involves the optimal number of factors which is satisfactory for proceeding with the following analyses shown in Chapter 3 and 4 (i.e., CFA, hierarchic regression analysis and nested-model analysis).

Figure 3.2 The path diagram of the analytic results for exploratory factor analysis



Note: You will find the definition of each dimension mentioned above in Appendix 5.

IDEN includes 3 factors, new technology, patents and knowledge of customers, shown in Table 3.8.

DEVE includes 3 factors, experience of store head, knowledge of store head and understandable sequence of rules, shown in Table 3.8.

PROT includes 5 factors, repetitive activities, importance of product cost, competitors, the store manager of sample firms is not involved in the planning of strategic human capital management practices, and the store manager of sample firms helps to operate the planning of strategic human capital management practices, shown in Table 3.8.

DEPL includes 4 factors, the store manager of sample firms is responsible for the planning of strategic human capital management practices, managerial staffing process is important, extensive employee selection process is necessary and selecting the best person is significant, shown in

Table 3.8.

CONT includes 3 factors, management control systems are highly tailored, the financial goal of each store and standardized operating procedures and working practices, shown in Table 3.9.

COMM includes 3 factors, coordination of the work, regular meeting within stores and communication among stores, shown in Table 3.9.

TCIE includes 3 factors, market activities of competitors, external environment and legal, political and regulatory constraints, shown in Table 3.10.

ESAOS includes 3 factors, complexity of production process, flexibility of manufacturing and service-providing facilities and intensity of capital equipment, shown in Table 3.10.

EM includes 4 factors, control of the price, control of the quality, variety of products and cost control, shown in Table 3.10.

EP includes 2 factors, operational planning and decentralized decisions, shown in Table 3.10.

CC includes 2 factors, employee's perception and sale clerks' friendliness, shown in Table 3.11.

CS includes 2 factors, customers' recommendation and customers' propensity to repurchase, shown in Table 3.11.

SRG means sales revenue growth.

NIBT means net income before tax.

GRROC means gross rate of return on capital.

### **3.7 Reliability analysis**

Confirmatory factor analysis (CFA) conducts statistical tests for hypothetical equivalence of certain designated factor loading or hypothetical correlation among factors. Generally, CFA is a kind of confirmatory test following exploratory factor analysis (EFA) (Jöreskog and Sörbom, 1993).

Cronbach's  $\alpha$  coefficient is currently the measure of reliability used most frequently in the study of social science, and is a kind of reliability test to measure the "total" of a set of synonymous or parallel measurements (Anderson and Gerbing, 1988). In

other words, from responses to the questionnaire, variance of each score for each question and variance for all total of questions can be calculated. If each question measures the same dimension, variance of the total will be larger than the total of each variance. As a matter of fact, variance of the sum for scores of two questions is equivalent to the sum for variance of scores of two questions added with double covariance. The ratio of sum for variance of each question to variance for the entire set of questionnaire can be used to estimate the proportion of score variance provided by these questions. This is the Cronbach's  $\alpha$  coefficient used frequently as the reliability index (Anderson and Gerbing, 1988). That is

$$\alpha = \frac{N}{N-1} \left( 1 - \frac{\sum S_i^2}{S_m^2} \right)$$

Where  $S_i^2$  indicates the variance of the  $i$ th question.

$S_m^2$  indicates variance for sum of all questions (i.e. variance for the entire set of questionnaire),

$N$  is the number of questions.

If each question measures the same dimension and all questions of each dimension are reliable then  $\alpha = 1$ , i.e.,

$$\frac{N-1}{N} = 1 - \frac{\sum S_i^2}{S_m^2}$$

Therefore, CFA used in this study aims directly at the whole factors given by the integral (overall) dimensions as well as the relationship between each dimension so as to inspect the validity. CFA is a macro-inspection with its methods of inspection having convergent validity and discriminant validity shown in Table 3-13.

Cronbach's  $\alpha$  coefficient, however, which only aims directly at variable factors given by individual (certain) dimension to conduct internal consistency reliability, is a micro-inspection. These are the reasons for deleting factors with poor consistency shown in Table 3.12.

After conducting EFA, the next analytic step is to conduct the structural equation analysis of the theoretical and rival models. The stability and consistency of the measuring tool are explored firstly by conducting reliability analysis on each dimension, succeeded by an examination using the item-to-total method to delete variable factors of each dimension with poor consistency (Jöreskog and Sörbom, 1993). As noted by Nunnally (1978), a better result of the intrinsic consistency is that  $\alpha$  reliability coefficient is over 0.7, but no consistency if it is less than 0.35. The less the number of variable factors the higher the reliability coefficient, and the higher the coefficient, the better the intrinsic consistency. The optimal number of variable factors, according to Anderson and Gerbing (1988), is between two and seven. Table 3.12 demonstrates the analytical results for the reliability analysis on each dimension.

In Table 3.12, each reliability coefficient is higher than 0.7 after deleting variable factors with poor consistency. For example, referring to the first construct (strategic HCMP<sub>S</sub>), the coefficient of the first dimension of this construct (PROT) can be increased from 0.532253 to 0.761289 by deleting 14 items with poor reliability. The coefficient of the second dimension (IDEN) can be increased from 0.664413 to 0.772248 by deleting 11 factors with poor reliability. The coefficient of the third dimension (DEPL) can be increased from 0.592452 to 0.869792 by deleting 6 items with poor reliability. However, the increase in the coefficient of the fourth dimension (DEVE) is slight after deleting 11 factors with poor reliability.

Referring to the second construct (personnel control mechanisms), the coefficient of the first dimension of this construct (CONT) increases slightly while deleting 9 items with poor reliability. However, the increase in the coefficient of the second dimension (COMM) is significant after deleting 11 factors with poor reliability (from 0.657676 to 0.788770).

Referring to the third construct (employee capabilities), both TCIE (the first dimension) and ESAOS (the second dimension) increase slightly in their coefficients after deleting items with poor reliability. However, the increases in the coefficients of the last two dimensions (EM and EP) are significant (from 0.602147 to 0.783652 and from 0.644035 to 0.7617, respectively) after deleting 2 and 4 items with poor reliability, respectively.

Referring to the fourth construct (customer loyalty), both CC (the first dimension) and CS (the second dimension) increase greatly in their coefficients (from 0.481677 to 0.824188 and from 0.698522 to 0.9139, respectively) after deleting 2 items with poor reliability individually. The results after conducting reliability analysis on each dimension and using the item-to-total method to identify reliable factors manifest no factors can be further deleted due to poor reliability.

Table 3.12 Cronbach's  $\alpha$  reliability coefficients for the formal questionnaire

Construct	Dimension	The number of factors before adjustment	Cronbach's $\alpha$ before adjustment	Cronbach's $\alpha$ after adjustment	The number of factors after adjustment
Strategic human capital management practices	IDEN	14	0.664413	0.772248	3
	DEVE	14	0.786783	0.824461	3
	PROT	19	0.532235	0.761289	5
	DEPL	10	0.592452	0.869792	4
Personnel control mechanisms	CONT	12	0.704761	0.723401	3
	COMM	14	0.657676	0.788770	3
Employee capability	TCIE	6	0.725872	0.783854	3
	ESAOS	7	0.716806	0.808081	3
	EM	6	0.602147	0.783652	4
	EP	6	0.644035	0.7617	2
Customer loyalty	CC	4	0.481677	0.824188	2
	CS	4	0.698522	0.9139	2

Note: You will find the definition of each dimension mentioned above in Appendix 5.

After conducting the analysis of the stability and consistency of the measuring tool, the next analytic step is to conduct an assessment of the goodness-of-fit for internal structure of the model by means of CFA using LISREL 8 with maximum likelihood

estimation (LISREL model is shown in Appendix 4). Statisticians have developed a series of indicators in assessing the model fit. These indicators to assess the overall model fit include: the coefficient of determination (TCD),  $\chi^2$  value, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square residual (RMR), standardized RMR, normed incremental fit index (NFI), comparative fit index (CFI) and composite reliability (CR) (Bagozzi, 1980; Anderson and Gerbing, 1988; Bollen, 1989; Jöreskog and Sörbom, 1993; Pillai et al., 1999). The numerical range and ideal numerals of these indicators have been listed in Table A4. 1.

In this study, the analysis of LISREL model adopts  $\chi^2$  test to assess the model fit, but  $\chi^2$  value varies with the change in the sample size (Bollen, 1989; Hair et al., 1995). When the sample size is small,  $\chi^2$  value is likely to be unmarked, making researchers produce a conclusion that the theoretical model and data resulted from observation fit well.

According to Pillai et al. (1999: 912), “both GFI and AGFI reflect the relative amount of the variances and co-variances in the sample matrix to the variances and co-variances predicted by the model matrix. AGFI adjusts the GFI for the degrees of freedom of the model relative to the number of variables.” It is general practice to recognize a better goodness-of-fit “when both GFI and AGFI are 0.9 or higher” (Pillai et al., 1999: 912). In addition, according to Pillai et al. (1999: 912), RMR is “an index of the size of the residuals obtained by the subtraction of the model covariance matrix from the sample covariance matrix.” The closer to 0 for RMR, the smaller the error, indicates a better goodness-of-fit. Normally, “RMR of 0.10 or less is considered indicative of acceptable fit” (Pillai et al., 1999: 912). Finally, according to Bagozzi (1980), CR is used to measure the internal quality of models and specify

how models fit the data reasonably well. It is general practice to recognize a better goodness-of-fit when CR is 0.6 or higher (Bagozzi, 1980).

Table 3.13 demonstrates the analytical results for an assessment of the goodness-of-fit for each dimension by using CFA.  $GFI_S$  of other constructs are higher than 0.90 except for a poor GFI (0.88) of the construct, strategic human capital management practices.  $AGFI_S$  of other constructs are also higher than 0.90 except for poor  $AGFI_S$  of constructs, strategic human capital management practices (0.83) and personnel control mechanisms (0.87).  $RMR_S$  of all constructs are less than 0.10 (from 0.002 to 0.069).  $CR_S$  of all dimensions of four multidimensional constructs are more than 0.6 (from 0.724 to 0.916). The results shown in Table 3.13 feature a better goodness-of-fit after conducting CFA. In other words, the theoretical model after deleting factors with poor reliability seems to have an acceptable fit.

Table 3.13 The analytic results for confirmatory factor analysis

Construct	Dimension	CR	GFI	AGFI	RMR	The number of variable factors
Strategic human capital management practices	IDEN	0.783	0.88	0.83	0.069	3
	DEVE	0.833				3
	PROT	0.764				5
	DEPL	0.872				4
Personnel control mechanisms	CONT	0.724	0.95	0.87	0.022	3
	COMM	0.794				3
Employee capability	TCIE	0.785	0.95	0.92	0.039	3
	ESAOS	0.814				3
	EM	0.789				4
	EP	0.778				2
Customer loyalty	CC	0.841	1.00	0.98	0.002	2
	CS	0.916				2

Note: You will find the definition of each dimension mentioned above in Appendix 5.

CR stands for composite reliability.

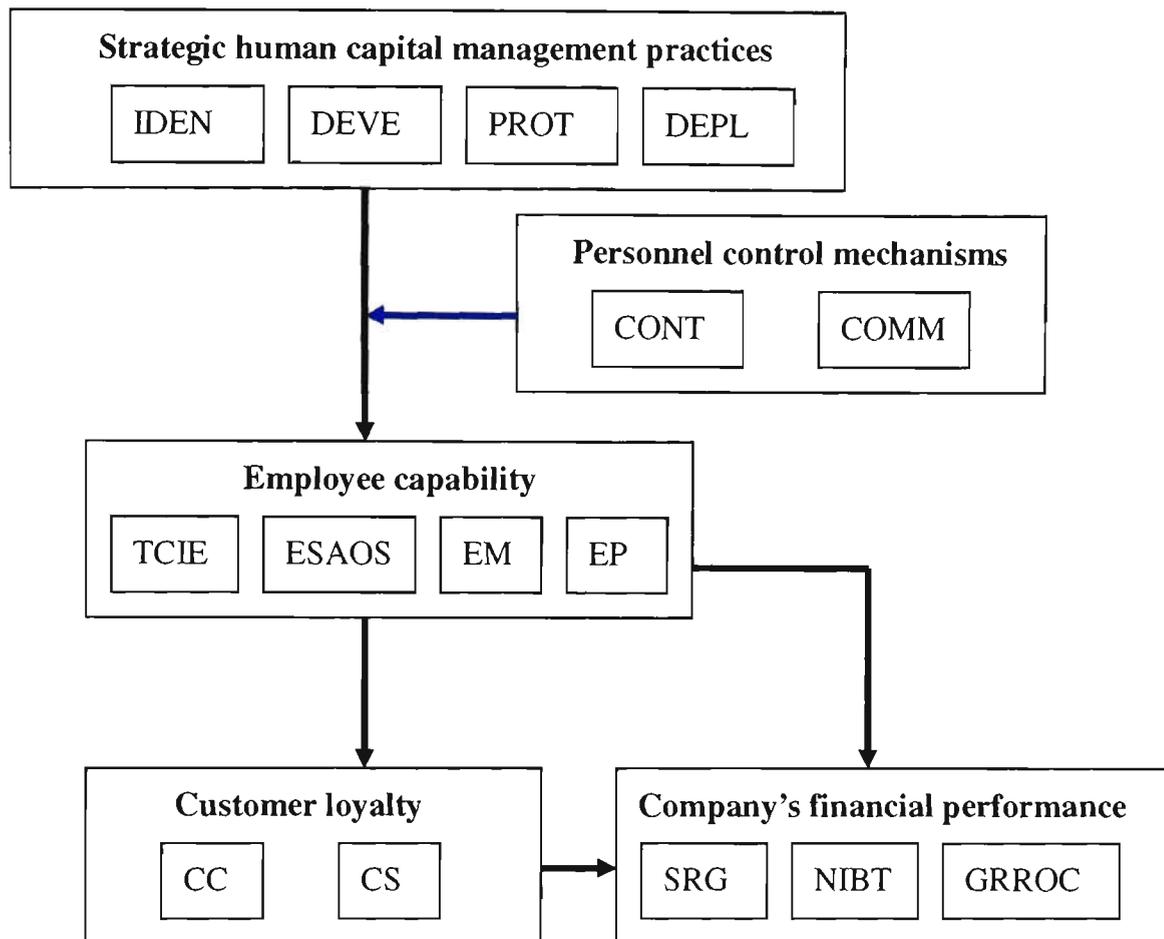
GFI stands for Goodness-of-Fit index.

AGFI stands for adjusted Goodness-of-Fit index.

RMR stands for Root Mean Square Residual.

For each construct mentioned in this study, according to Anderson and Gerbing (1988), goodness-of-fit index (GFI) and adjusted goodness-of-fit index (AGFI) of 0.9 or higher, and root mean square residual (RMR) of 0.10 or less, and composite reliability index (CR) of 0.6 or higher are regarded as indicative of satisfactory results for CFA. Based on the results of Table 3.13, almost all indices fit the requirements of Anderson and Gerbing (1988), and the optimal number of factors shown in Table 3.13 is consistent with the one shown in Table 3.12. Therefore, the results of CFA do not conflict with those of EFA. The former provides a supplementary effect on the analytic results of the latter. Along this line of reasoning, the path diagram of the acceptable results for CFA is displayed in the Figure 3.3. Each dimension of four multi-dimensional constructs involves the optimal number of variable factors which is satisfactory for proceeding the following analyses shown in Chapter 4 (i.e., hierarchic regression analysis and nested-model analysis).

Figure 3.3 The path diagram of the analytic results for confirmatory factor analysis



Note: You will find the definition of each dimension mentioned above in Appendix 5.

IDEN includes 3 factors, new technology, patents and knowledge of customers, shown in Table 3.8, Table 3.12 and Table 3.13.

DEVE includes 3 factors, experience of store head, knowledge of store head and understandable sequence of rules, shown in Table 3.8, Table 3.12 and Table 3.13.

PROT includes 5 factors, repetitive activities, importance of product cost, competitors, the store manager of sample firms is not involved in the planning of strategic human capital management practices and the store manager of sample firms helps to operate the planning of strategic human capital management practices, shown in Table 3.8, Table 3.12 and Table 3.13.

DEPL includes 4 factors, the store manager of sample firms is responsible for the planning of strategic human capital management practices,

managerial staffing process is important, extensive employee selection process is necessary and selecting the best person is significant, shown in Table 3.8, Table 3.12 and Table 3.13.

CONT includes 3 factors, management control systems are highly tailored, the financial goal of each store and standardized operating procedures and working practices, shown in Table 3.9, Table 3.12 and Table 3.13.

COMM includes 3 factors, coordination of the work, regular meeting within stores and communication among stores, shown in Table 3.9, Table 3.12 and Table 3.13.

TCIE includes 3 factors, market activities of competitors, external environment and legal, political and regulatory constraints, shown in Table 3.10, Table 3.12 and Table 3.13.

ESAOS includes 3 factors, complexity of production process, flexibility of manufacturing and service-providing facilities and intensity of capital equipment, shown in Table 3.10, Table 3.12 and Table 3.13.

EM includes 4 factors, control of the price, control of the quality, variety of products and cost control, shown in Table 3.10, Table 3.12 and Table 3.13.

EP includes 2 factors, operational planning and decentralized decisions, shown in Table 3.10, Table 3.12 and Table 3.13.

CC includes 2 factors, employee's perception and sale clerks' friendliness, shown in Table 3.11, Table 3.12 and Table 3.13.

CS includes 2 factors, customers' recommendation and customers' propensity to repurchase, shown in Table 3.11, Table 3.12 and Table 3.13.

SRG means sales revenue growth.

NIBT means net income before tax.

GRROC means gross rate of return on capital.

### **3.8 Validity analysis**

Validity means ability to get the expected measurement or function of the measuring tools. A valid measurement works to achieve the purpose of measurement to a valid degree. Construct validity means measuring the degree to which one measurement can gauge an abstraction or peculiarity (Anderson and Gerbing, 1988). The inspection of construct validity must be built on a specific rationale to guide each

basic hypothesis regarding the potential peculiarity or behavioral performance through the clarification of theory as well as to check if the measurement results are in conformity to the contents of theoretical hypotheses through the empirical approaches, and thus to test the convergent validity and discriminant validity (Anderson and Gerbing, 1988). The principle lies in the measurement of numbers of different peculiarities done by numerous different approaches (e.g., self assessment and peer assessment). The principles of judgment are as follows.

- (1) scores obtained from a measurement of the same peculiarities by the same approaches shall have the maximum correlation between them;
- (2) scores obtained from a measurement of the same peculiarities by different approaches shall have the correlation next to the maximum one between them;
- (3) scores obtained from a measurement of the different peculiarities by the same approaches shall have the lower correlation between them;
- (4) scores obtained from a measurement of the different peculiarities by different approaches shall have the lowest or meaningless correlation between them (Anderson and Gerbing, 1988).

Based on these criteria, researchers are able to test for convergence and discrimination. This study uses LISREL 8 to conduct convergent and discriminative validity for examining the validity of the measuring dimensions used in the present research (all the details are shown in Appendix 4). In the analysis of convergent validity, loading and t-value of each dimension are used to judge the function of measuring tools. From Table 3.14, t-value of load capacity for each dimension is over 2, revealing a considerable convergent validity of the measuring dimensions.

Table 3.14 The results of conducting convergent validity

Construct	Dimension	Loading	T-value
Strategic human capital management practices	IDEN	0.71 ~ 0.78	9.66 ~ 9.78
	DEVE	0.62 ~ 0.91	10.03 ~ 10.26
	PROT	0.57 ~ 0.69	7.09 ~ 7.60
	DEPL	0.68 ~ 0.88	11.23 ~ 12.32
Personnel control mechanisms	CONT	0.63 ~ 0.73	8.00 ~ 8.20
	COMM	0.64 ~ 0.82	9.69 ~ 9.83
Employee capability	TCIE	0.64 ~ 0.90	9.01 ~ 9.70
	ESAOS	0.61 ~ 0.91	9.60 ~ 9.69
	EM	0.66 ~ 0.75	9.39 ~ 9.67
	EP	0.69 ~ 0.90	7.20
Customer loyalty	CC	0.74 ~ 0.95	10.59
	CS	0.88 ~ 0.96	16.39

Note: You will find the definition of each dimension mentioned above in Appendix 5.

In the analysis of discriminative validity,  $\chi^2$  difference test (Pillai et al., 1999) and root mean square error of approximation (RMSEA) (Anderson and Gerbing, 1988) are used to examine model fit and compare alternative models. According to Pillai et al. (1999), “the  $\chi^2$  difference test examines the gain in predictive power in one

nested model over another in terms of the change in  $\chi^2$  given the change in the degree of freedom of the model.” However, the significance of a model’s  $\chi^2$  statistic is not used to assess its fit. Based upon the recommendation of Jöreskog and Sörbom (1993), between-model comparisons are conducted by means of the  $\chi^2$  difference test, along with differences in the fit indices mentioned above and others. All of them are further used for examining the nested-model analysis discussed in Chapter 4.

Table 3.15 demonstrates the results for the analysis of discriminative validity on the first construct of the present study, strategic human capital management practices. Model (1-2) frees the relationship between IDEN and DEVE, model (1-3) frees the relationship between IDEN and PROT, model (1-4) frees the relationship between IDEN and DEPL, model (2-3) frees the relationship between DEVE and PROT, model (2-4) frees the relationship between DEVE and DEPL, model (3-4) frees the relationship between PROT and DEPL. Referring to between-model comparisons, the  $\chi^2$  differences (57.71, 98.53, 53.36, 74.79, 90.43 and 75.59, respectively) calculated on the basis of the theoretical model after deleting factors with poor reliability are all significant ( $p < 0.01$ ) given the changes in the degrees of freedom, and the RMSEA differences show little change (the RMSEA of the original model is less than 0.1). Therefore, all four dimensions (IDEN, DEVE, PROT and DEPL) appreciably add to the predictive power of the construct, strategic human capital management practices.

Table 3.15 Discriminative validity of strategic human capital management practices:  
Model Goodness-of-Fit indicators for strategic human capital  
management practices

Model	$\chi^2$	df	$\chi^2_{diff}$	df <sub>diff</sub>	P-value <sup>a</sup>	RMSEA
Original model	264.07	84	---	---	---	0.090
Model (1-2)	321.78	85	57.71***	1	0.0000	0.103
Model (1-3)	362.60	85	98.53***	1	0.0000	0.111
Model (1-4)	317.43	85	53.36***	1	0.0000	0.102
Model (2-3)	338.86	85	74.79***	1	0.0000	0.107
Model (2-4)	354.50	85	90.43***	1	0.0000	0.110
Model (3-4)	339.66	85	75.59***	1	0.0000	0.107

- Note: 1. Original model is the adjusted theoretical model, deleting factors with poor internal consistency, which is related to strategic human capital management practices including four dimensions [i.e., identifying strategic human capital management practices (IDEN), developing strategic human capital management practices (DEVE), protecting strategic human capital management practices (PROT) and deploying strategic human capital management practices (DEPL)].
2. Model (1-2) means freeing the relationship between IDEN and DEVE; Model (1-3) means freeing the relationship between IDEN and PROT; Model (1-4) means freeing the relationship between IDEN and DEPL; Model (2-3) means freeing the relationship between DEVE and PROT ; Model (2-4) means freeing the relationship between DEVE and DEPL; Model (3-4) means freeing the relationship between PROT and DEPL.
3.  $\chi^2_{diff}$  (the difference in  $\chi^2$ ) is calculated on the basis of the original model;  
df<sub>diff</sub> (the difference in df) is calculated on the basis of the original model.

4. <sup>a</sup>P-value of  $\chi^2_{diff}$  given  $df_{diff}$ .
5. \*P < 0.1    \*\*P < 0.05    \*\*\*P < 0.01.
6. RMSEA: Root Mean Square Error of Approximation.

Table 3.16 demonstrates the results for the analysis of discriminative validity on the second construct of the present study, personnel control mechanisms. Model (1-2) frees the relationship between CONT and COMM. Referring to between-model comparisons, the  $\chi^2$  difference (90.97) calculated on the basis of the theoretical model after deleting factors with poor reliability is significant ( $p < 0.01$ ) given the change in the degree of freedom, and the RMSEA of model (1-2) becomes larger. Therefore, these two dimensions (CONT and COMM) appreciably add to the predictive power of the construct, personnel control mechanisms.

Table 3.16 Discriminative validity of personnel control mechanisms: Model Goodness-of-Fit indicators for personnel control mechanisms

Model	$\chi^2$	df	$\chi^2_{diff}$	$df_{diff}$	P-value <sup>a</sup>	RMSEA
Original model	41.91	8	---	---	---	0.127
Model (1-2)	132.88	9	90.97***	1	0.0000	0.228

- Note: 1. Original model is the adjusted theoretical model, deleting factors with poor internal consistency, which is related to personnel control mechanisms including two dimensions [i.e., the control factor of personnel control mechanisms (CONT) and the communication-coordination factor of personnel control mechanisms (COMM)].
2. Model (1-2) means freeing the relationship between CONT and COMM.
  3.  $\chi^2_{diff}$  (the difference in  $\chi^2$ ) is calculated on the basis of the original model;  $df_{diff}$  (the difference in df) is calculated on the basis of the original

model.

4. <sup>a</sup>P-value of  $\chi^2_{\text{diff}}$  given  $df_{\text{diff}}$ .
5. \*P < 0.1    \*\*P < 0.05    \*\*\*P < 0.01.
6. RMSEA: Root Mean Square Error of Approximation.

Table 3.17 demonstrates the results for the analysis of discriminative validity on the third construct of the present study, employee capability. Model (1-2) frees the relationship between TCIE and ESAOS, model (1-3) frees the relationship between TCIE and EM, model (1-4) frees the relationship between TCIE and EP, model (2-3) frees the relationship between ESAOS and EM, model (2-4) frees the relationship between ESAOS and EP, model (3-4) frees the relationship between EM and EP.

Referring to between-model comparisons, the  $\chi^2$  differences (46.20, 47.04, 67.54, 85.54, 85.30 and 59.17, respectively) calculated on the basis of the theoretical model after deleting factors with poor reliability are all significant ( $p < 0.01$ ) given the changes in the degrees of freedom, and the RMSEA differences show little change (the RMSEA of the original model is less than 0.1). Therefore, all four dimensions (TCIE, ESAOS, EM and EP) appreciably add to the predictive power of the construct, employee capability.

Table 3.17 Discriminative validity of employee capability: Model  
Goodness-of-Fit indicators for employee capability

Model	$\chi^2$	df	$\chi^2_{diff}$	df <sub>diff</sub>	<sup>a</sup> P-value	RMSEA
Original model	81.14	48	---	---	---	0.051
Model (1-2)	127.34	49	46.20 <sup>***</sup>	1	0.0000	0.078
Model (1-3)	128.18	49	47.04 <sup>***</sup>	1	0.0000	0.078
Model (1-4)	148.68	49	67.54 <sup>***</sup>	1	0.0000	0.088
Model (2-3)	166.68	49	85.54 <sup>***</sup>	1	0.0000	0.095
Model (2-4)	166.44	49	85.30 <sup>***</sup>	1	0.0000	0.095
Model (3-4)	140.31	49	59.17 <sup>***</sup>	1	0.0000	0.084

- Note: 1. Original model is the adjusted theoretical model, deleting factors with poor internal consistency, which is related to employee capability including four dimensions [i.e., the change in environment (TCIE), employee skill and organizational structure (ESAOS), employee motivation (EM) and employee productivity (EP)].
2. Model (1-2) means freeing the relationship between TCIE and ESAOS; Model (1-3) means freeing the relationship between TCIE and EM; Model (1-4) means freeing the relationship between TCIE and EP; Model (2-3) means freeing the relationship between ESAOS and EM; Model (2-4) means freeing the relationship between ESAOS and EP; Model (3-4) means freeing the relationship between EM and EP.
3.  $\chi^2_{diff}$  (the difference in  $\chi^2$ ) is calculated on the basis of the original model; df<sub>diff</sub> (the difference in df) is calculated on the basis of the original model.
4. <sup>a</sup>P-value of  $\chi^2_{diff}$  given df<sub>diff</sub>. 5. \*P < 0.1 \*\*P < 0.05 \*\*\*P < 0.01.
6. RMSEA: Root Mean Square Error of Approximation.

Table 3.18 demonstrates the results for the analysis of discriminative validity on the fourth construct of the present study, customer loyalty. Model (1-2) frees the relationship between CC and CS. Referring to between-model comparisons, the  $\chi^2$  difference (336.38) calculated on the basis of the theoretical model after deleting factors with poor reliability is significant ( $p < 0.01$ ) given the change in the degree of freedom, and the RMSEA of model (1-2) is much larger than that of original model. Therefore, these two dimensions (CC and CS) appreciably add to the predictive power of the construct, customer loyalty.

Table 3.18 Discriminative validity of customer loyalty: Model  
Goodness-of-Fit indicators for customer loyalty

Model	$\chi^2$	df	$\chi^2_{diff}$	df <sub>diff</sub>	<sup>a</sup> P-value	RMSEA
Original model	0.97	1	---	---	---	0.000
Model (1-2)	337.35	3	336.38 <sup>***</sup>	2	0.0000	0.650

- Note:1. Original model is the adjusted theoretical model, deleting factors with poor internal consistency, which is related to customer loyalty including two dimensions [i.e., customer complaint (CC) and customer satisfaction (CS)].
2. Model (1-2) means freeing the relationship between CC and CS .
3.  $\chi^2_{diff}$  (the difference in  $\chi^2$ ) is calculated on the basis of the original model;  $df_{diff}$  (the difference in df) is calculated on the basis of the original model.
4. <sup>a</sup>P-value of  $\chi^2_{diff}$  given  $df_{diff}$ .
5. \*P < 0.1    \*\*P < 0.05    \*\*\*P < 0.01.
6. RMSEA: Root Mean Square Error of Approximation.

### 3.9 Research limitations

In spite of seeking to meet the rigor required for the social science approach, the process of this chapter is still limited by the following issues: limited resources, response bias, the relevance of antecedent factors, Tobin's  $q$  and the objective of survey-based research method. They are described as follows.

- (a) Limited to human power, financial resources and time, survey-based research is conducted to those managers of marketing, production, financial affairs, engineering, general management, and procurement or shop managers, derived from a selection of the samples only covering 5 business groups and 265 stores.
- (b) Part of answers may have a psychological response of defence or over-estimation in the course of questionnaire, an inevitable and uncontrollable aspect of this chapter.
- (c) For a discussion of the relevance of antecedent factors for employee capability in general private enterprise organizations, the chapter takes four dimensions, i.e., the change in environment, employee skill and organizational structure, employee motivation, and employee productivity, rather than factors of organization focus (e.g., enterprise and organization scale, industry type) and personal focus (e.g., personality, resignation rate, and job demand) in order to avoid a too large framework that would not focus on the exploration of the subjects.
- (d) Tobin's  $q$ , in the present study, was intended to be used to measure the value added by management originally and the logarithm of Tobin's  $q$  was anticipated to be calculated by dividing the market value of a firm by the replacement cost of its

assets (Hirschey and Wichern, 1984; Hall, 1993). However, this measurement was omitted to conform to the content of the construct “company financial performance” by taking store managers’ and senior executives’ views into account.

- (e) While the limitations of the survey-based research method have received much attention in the literature (e.g., response bias), the contributions that the survey-based research method has made to management accounting thought have now and then been treated with disdain. It is argued that the apparent revulsion for certain research methods lies not in the intrinsic limitations that a research method possesses (and all research methods have limitations), but that puzzlement exists among management accounting researchers because of the failure to understand the objective of a particular research method. Suffice it to say that “the case-based research method aims at developing or modifying a theory and / or providing the researcher with a basis to develop new or improved research questions whereas the objective of survey-based research method is to make generalizations across the sample population” (Abernethy et al., 1999).

## Notes

1. *Tailored design, proposed by Dillman (2000), takes features of the survey situation into account, and is a system of interconnected procedures for conducting high-quality mail surveys with a greatly improved potential to obtain acceptable response rates. According to Dillman (2000), “the elements of tailored design include two parts. The first part is to make out each phase of the survey process that may be concerning either the quality or quantity of response and to profile each one in such a way that helps obtain the best possible responses. The second*

*one aims at systematizing the survey efforts so that the design intentions can be achieved in full detail”.*

2. *According to Hirschey and Wichern (1984) and Hall (1993), Tobin's  $q$  is a measure of the value added by management. However, based on the views of senior executives of sample firms in the interviews, as a result of being not as greatly affected by depreciation or other non-cash transactions, gross rate of return on capital is a better measure of accounting profits than the traditional return on assets or return on equity.*
  
3. *To pilot test the measures, 150 teachers in Lu-Liow Junior High were contacted by telephone in order to find out whether their relatives were store managers who were willing to participate in the study. A questionnaire was sent to 60 teachers whose relatives were store managers and orally agreed to participate. Thus, I asked 60 store managers in no way affiliated with the sample firms mentioned in this study to fill out the survey and to comment on the appropriateness of its wording and length and to evaluate different question orders.*

## **Chapter 4 The analysis for the moderating and intervening effects and research results**

### **4.1 Introduction**

The discovery of moderated relationships can come about intentionally or coincidentally. When they occur deliberately, the researcher has usually anticipated the possibility that a relationship may be moderated. On the other hand, the finding of moderated relationships can arise unexpectedly when the researcher conducts a test for an intervening variable<sup>1</sup>. It is intended in this study to investigate whether the moderated relationship between strategic human capital management practices (HCMP<sub>s</sub>) and employee capability caused by personnel control mechanism can occur by design. And how the moderated effect brings a consequence to the intervening relationship between employee capability and financial performance of firms implementing strategic HCMP<sub>s</sub>?

This chapter aims at applying appropriate statistical analysis to the data acquired from a survey-based formal questionnaire, as noted in Chapter 3, for further analysis so as to verify the moderating and intervening effects postulated in the hypotheses of the present study. All results of statistical analysis are given in the following seven sections for further discussion.

Section 1 features the structural analysis of sample data that focuses on an understanding of the distribution of individual attributes of common method factors by employing descriptive statistical analysis.

Section 2 centres on the correlation analysis between each dimension of four constructs that looks for a thorough grasp of the mean, standard deviation and correlation coefficient of the dimensions of each construct as well as conduct a comprehensive judgment on the results.

Section 3 concerns the analysis of causal relationships between strategic HCMP<sub>s</sub> and employee capability.

Section 4 refers to the analysis of the moderating effect for personnel control mechanisms, aiming at an exploration into the moderating effect of personnel control mechanisms on the relationship between strategic HCMP<sub>s</sub> and employee capability.

Section 5 brings out the preliminary analysis for the intervening effect involving the causal relationships between employee capability and customer loyalty, the causal relationships between customer loyalty and financial performance of the organization, the causal relationships between employee capability and financial performance of the organization, the causal relationships between the application of strategic HCMP<sub>s</sub> and customer loyalty and the causal relationships between the application of strategic HCMP<sub>s</sub> and financial performance of the organization.

Section 6 centres on the nested-model analysis for exploring the intervening effect, not only focusing on a discussion on the intervening effect of employee capability but also aiming at an exploration into the intervening effect of customer loyalty.

Section 7 highlights the assessment and correction of theoretical models.

## 4.2 Structural analysis of sample data

According to field interviews (in-depth visits) in this study, each branch (store) of the sample firms constitutes an individual profit centre with its own profit and loss statement. The manager of each branch (store) has full decision-making authority on its jurisdictional domain while they also give authority to subordinates as large as possible, thus bringing the system of decentralization into the best effect. But the head office retains domination by centralizing issues concerning investment and finance.

Branches (Stores) draw up budget reports annually and submit them to the head office for examination. While those reports must be revised for any impropriety each branch (store) acts upon those budgets being finalized. Those budgets, of course, can be altered if within the total amount of the budget while the manager of each branch (store) is able to regulate the amount within the budget. Generally, each manager can increase or decrease 10% to each budgetary item but requires approval by a senior executive one level higher if over 10%.

Each branch (store) of sample firms relies on one team of highly-institutional managerial control personnel who are in charge of observing the normality of production line for each department, particularly the financial aspects of the unit such as indirect production expenses, inventory and accounts receivable, etc. In case of any abnormality, audit personnel of the company conduct an inspection. Managerial control personnel such as store managers must fill out loss and profit figures for which they are responsible on monthly statements, and then have the statements sent to senior managers and CEOs.

At the time of implementing their duty, store managers would have the greatest support from the board of directors while both board of directors and president consider those managers to do indispensable tasks for the sake of a smooth execution of the decentralized control system.

Initiative of the company has been triggered ever since the exercise of the practices of management control mentioned above that increase output and product quality as well as profit year by year and further reveals the practices to be successful. The organized institution of each branch (or store) of sample firms not only improves subordinates' initiative and activeness but also mitigates managers' working pressure.

This study takes the store heads in computer technology manufacturing, mechanical manufacturing, life insurance, eating and drinking, tourism and wholesale of construction materials (such as sale of tile) industries as objects of research, and the analysis of the basic data for the samples examined is given in the following tables. From Table 4.1 to Table 4.4, the frequency column refers to the number of cases in each demographic category. The valid percent column is the percentage adjusted for any missing cases. In Table 4.1, sample data indicate that 160 males taking 60.4 % and 105 females taking 39.6% were surveyed with ages centring on 25 ~ 35 (79 persons, taking 29.8 %), followed by 36 ~ 45 and 46 ~ 55 (74 persons, taking 27.9% and 73 persons, taking 27.5% respectively).

Table 4.1 The frequency table for demographic data (gender and age)

Demography	Manager's characteristics	Frequency	Valid percent
Gender	Male	160	60.4%
	Female	105	39.6%
Age	Under 25	2	0.8%
	25 ~ 35	79	29.8%
	36 ~ 45	74	27.9%
	46 ~ 55	73	27.5%
	56 ~ 65	37	14.0%
	Over 65	–	–

In Table 4.2, sample data indicate a university education background in the majority, 95 persons, taking 35.8% among them, followed by college and master education, (74 persons, taking 27.9% and 54 persons, taking 20.4%, respectively). Most of the store managers finished their education programs in Taiwan (228 persons, taking 86.0%). The majority of respondents held senior positions, middle, 88 persons, taking 33.2 %, followed by middle<sup>+</sup> and high (60 persons, taking 22.6% and 55 persons, taking 20.8%, respectively).

Table 4.2 The frequency table for demographic data (education and position)

Demography	Manager's characteristics	Frequency	Valid percent
The highest level of education achieved	Senior middle school	34	12.8%
	College	74	27.9%
	University	95	35.8%
	Master	54	20.4%
	Ph.D.	8	3.0%
The country for achieving the highest level of education	Taiwan	228	86.0%
	USA	17	6.4%
	UK	12	4.5%
	Australia	4	1.5%
	Other	4	1.5%
The hierarchy the manager is	Middle	88	33.2%
	Middle <sup>+</sup>	60	22.6%
	High	55	20.8%
	Middle <sup>++</sup>	48	18.1%
	Low <sup>++</sup>	10	3.8%
	Low <sup>+</sup>	3	1.1%
	Low	1	0.4%

In Table 4.3, sample data indicate an average 15 years of work experience in current position ranging from 11 to 20 years in majority (73 persons, taking 27.5 %) with marketing background being dominant, 100 persons, taking 37.7% among them, followed by general administration (74 persons, taking 27.9 %). Most store managers did not receive foreign training (188 persons, taking 70.9 %). In this study, work experience in current position is expected to have an influence on employee productivity.

Table 4.3 The frequency table for demographic data (background, years of work experience in current position and foreign training)

Demography	Manager's characteristics	Frequency	Valid percent
Background	Marketing (Sales)	100	37.7%
	Production	22	8.3%
	Accounting	9	3.4%
	Finance	22	8.3%
	Engineering	12	4.5%
	General administration	74	27.9%
	Purchasing	3	1.1%
	Other	23	8.7%
Years of work experience in current position	Less than 3	30	11.3%
	3 ~ 5	71	26.8%
	6 ~ 10	70	26.4%
	11 ~ 20	73	27.5%
	More than 20	21	7.9%
Foreign training	Yes	77	29.1%
	No	188	70.9%

Table 4.4 also provides the data on the number of employees and five categories are employed. There are 120 stores (taking 45.3% of valid percent among those surveyed) with more than 60 employees, followed by another 69 (taking 26.0%) with less than 15 employees. In addition, sample data in Table 4.4 indicate that there are 186 stores (taking 70.2% of valid percent among those surveyed) with paid-up registered capital of more than NT\$100,000,000.00, followed by another 21 (taking 7.9%) having paid-up registered capital of NT\$ 20,010,000.00 ~ \$50,000,000.00<sup>2</sup>. With regard to regular improvement programs there are 256 stores building their relationships with customers and suppliers that take a valid percent of 96.9% and 246 are characterized by comprehensive training taking 93.2%. In respect of sales

revenue, there are 106 stores (taking 40.8% of valid percent) enjoying more than NT\$100,000,000.00 in 2001, followed by another 37 (taking 14.2%) having the sales revenue of NT\$5,010,000.00-10,000,000.00<sup>3</sup>.

Table 4.4 The frequency table for demographic data (company characteristics)

Demography	Company characteristics	Frequency	Valid percent
The number of employees	Less than 15	69	26.0%
	16 ~ 30	23	8.7%
	31 ~ 45	14	5.3%
	46 ~ 60	36	13.6%
	More than 60	120	45.3%
	(Missing data)	(3)	(1.2%)
Paid-up registered capital	Less than 1.00 million	3	1.1%
	1.01 ~ 5.00 million	13	4.9%
	5.01 ~ 10.00 million	6	2.3%
	10.01 ~ 20.00 million	13	4.9%
	20.01 ~ 50.00 million	21	7.9 %
	50.01 ~ 100.00 million	18	6.8%
	More than 100.00 million (Missing data)	186 (5)	70.2% (1.9%)
Regular improvement program	Selective staffing	228	86.4%
	Comprehensive training	246	93.2%
	Building relationships with customers and suppliers	256	96.9%
	Pay attention to the insight of individual manager and worker	223	85.4%
Sales revenue (Unit: million, NT\$)	Less than 1.00	4	1.5%
	1.01 ~ 5.00	22	8.5%
	5.01 ~ 10.00	37	14.2%
	10.01 ~ 20.00	29	11.2%
	20.01 ~ 50.00	34	13.1%
	50.01 ~ 100.00	28	10.8%
	More than 100.00	106	40.8%

### 4.3 The correlation analysis between each dimension of four constructs

According to field interviews (in-depth visits) with senior executives of THFVG, one of the sample firms in this study, one of the important experiences contributing to a success of THFVG's fast food service focuses on the tactics of 'speed is a soldier's asset', i.e., high efficiency on work. The comments on the subject of strategic HCMPs were as follows.

“ The stores of THFVG adopt the practice of “self-service” featuring putting all foods inside lower box and paper cup that is convenient for customers to take; clerks behind the counter are in charge of two or more tasks concurrently while customers will feel expedient at all times as just one queue is required to get the desired foods. To save customers' time, no public telephone or jukebox is set inside the store. Revolving rate of dining tables is thus greatly enhanced as people seldom loiter in the store and occupy seats. 'Swiftness' has turned out to be THFVG's operating master-stroke while speed is dominant here just to make swiftness stand out.”

The following statement comes from GISG's (one of the sample firms in this study) 2000 President's Letter.

“Opportunity that is precious in such an intensively competitive society would be hardly to get back in case of being missed while its existence is time-limited and shall never wait on the spot forever. Some opportunities are transient as time flies. Consequently, an immediate catch and a prompt action are indispensable that allow

neither delay nor hesitancy.”

According to the letter mentioned above, it is important that taking existing products and services to new customers and markets as well as finding new applications for existing products are desirable routes for GISG for growing sales revenue.

A review of CWTG's (one of sample firms in this study) 2000 President's Letter indicates:

“ Strategic human capital management practices are related to technological advances. The CWTG employees' intelligence, creativity and passion for excellence have made CWTG the market leader that it is today.”

In CWTG, store managers must work with clerks to transfer managerial knowledge. Learning complex forms of managerial knowledge and improving clerks' intelligence, creativity and passion for excellence require face-to-face interactions between store managers and clerks. In CWTG, store managers and clerks are usually assigned to teams that work on major projects for clients and store managers' knowledge and capabilities are leveraged and clerks gain store-specific knowledge. Leveraging human capital management practices of store managers helps create value for stores. The structural equation related to the technical question mentioned above can be described as follows. This study dealt with this problem by means of LISREL model mentioned in Chapter 4 and Appendix 4. According to Hitt et al. (2001), leverage was defined as the total number of clerks in a firm divided by the total number of store managers. This measurement indicates the average number of clerks assigned to each store manager. It represents the structure of the primary

human capital. The measure was transformed using a logarithmic transformation.

$$\text{Structural equation: } \eta_4 = \gamma_{41}\xi_1 + \gamma_{42}\xi_2 + \gamma_{43}\xi_3 + \gamma_{44}\xi_4 + \beta_{14}\eta_1 + \beta_{24}\eta_2 + \beta_{34}\eta_3 + \zeta_4$$

Where  $\eta_4$  means employee productivity.

$\xi_1$  means identifying human capital management practices.

$\gamma_{41}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and employee productivity ( $\eta_4$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{42}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and employee productivity ( $\eta_4$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{43}$  indicates the causal relation between protecting human capital management practices ( $\xi_3$ ) and employee productivity ( $\eta_4$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{44}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and employee productivity ( $\eta_4$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{14}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and employee productivity ( $\eta_4$ ).

$\eta_2$  means employee skill and organizational structure.

$\beta_{24}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and employee productivity ( $\eta_4$ ).

$\eta_3$  means employee motivation.

$\beta_{34}$  indicates the correlation between employee motivation ( $\eta_3$ ) and

employee productivity ( $\eta_4$ ).

$\zeta_4$  indicates the residual error of the structural equation mentioned above.

One purpose of this chapter is to discover how strategic HCMP<sub>S</sub> influence the financial performance of the organization, and how personnel control mechanisms moderate the relationship between strategic HCMP<sub>S</sub> and employee capability. The descriptive statistics of the dimensions used in the hypothesis tests are shown in Table 4.5. The collinearity diagnostics, including the variance inflation factors<sup>4</sup>, all indicate that multi-collinearity is not a problem. Table 4.5 contains the means, standard deviations, and maximum and minimum values of each dimension of four multi-dimensional constructs used in the present study along with their correlations.

Table 4-5 Correlation coefficients of each dimension of four multi-dimensional constructs

Dimension	1	2	3	4	5	6	7	8	9	10	11	12
IDEN	1											
DEVE	-0.242**	1										
PROT	0.035	0.086	1									
DEPL	0.075	0.223**	0.336**	1								
CONT	0.035	0.230**	0.139*	0.398**	1							
COMM	-0.085	0.392**	0.033	0.270**	0.529**	1						
TCIE	0.271**	-0.281**	0.050	0.050	0.102	-0.025	1					
ESAOS	0.433**	-0.185**	0.117	0.103	-0.031	-0.104	0.300**	1				
EM	0.161**	0.261**	0.227**	0.396**	0.305**	0.310**	0.269**	0.031	1			
EP	0.228**	0.098	0.197**	0.412**	0.454**	0.345**	0.194**	0.219**	0.410**	1		
CC	0.103	0.290**	0.183**	0.199**	0.259**	0.387**	0.006	-0.002	0.386**	0.243**	1	
CS	0.044	0.276**	0.041	0.196**	0.241**	0.321**	-0.002	-0.016	0.443**	0.240**	0.584**	1
Mean	7.9403	9.5348	10.6579	13.5998	8.3385	9.1838	7.7007	5.9179	12.2812	6.3927	7.4480	8.3765
Std. Deviation	1.5363	1.3790	1.6472	1.6464	1.0625	1.3378	2.2066	1.9332	1.6038	1.0709	1.0008	1.0715
Maxi.	13.26	11.80	15.65	15.80	10.25	11.20	1.05	10.11	13.90	7.95	8.45	9.20
Mini.	3.71	5.34	4.84	4.04	2.05	3.66	2.21	2.30	4.12	1.59	3.38	3.68

Note: \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).  
 You will find the definition of each dimension in Appendix 5.

Table 4.5 shows the mean, standard deviation, maximum, minimum and Pearson correlation coefficients of each dimension of four multi-dimensional constructs used in the present study. For computer technology manufacturing, mechanical manufacturing, life insurance, eating and drinking, tourism, and wholesale of construction materials industries, the mean for the dimension IDEN is lower than the mid-point, revealing a not-so-high level of IDEN but still with this phenomenon existing. In addition, the mean for the dimension ESAOS never scores higher than the mid-point, but is in close proximity to the mid-point, revealing a not-so-high level of ESAOS but still with this dimension present.

Next, DEPL scores the highest point, with a mean in 13.5998 as well as a standard deviation in 1.6464, in the construct of strategic human capital management practices (HCMP<sub>s</sub>). This means that the most important basis of strategic HCMP<sub>s</sub> originates from the dimension of DEPL. In addition, COMM scores the highest point, with the mean in 9.1838 and a standard deviation in 1.3378, in the construct of personnel control mechanisms, showing the communication-coordination factor of personnel control mechanisms is more important than the control factor. Moreover, EM scores the highest point, with a mean in 12.2812 as well as a standard deviation in 1.6038, in the construct of employee capability. This means that the major source of employee capability comes from the dimension of EM. Finally, in the construct of customer loyalty, CS scores higher than CC. The former has a mean in 8.3765 and a standard deviation of 1.0715. This means that the primary emergence of customer loyalty results from the dimension of CS (see Appendix 6).

In addition, correlations between each dimension of four multi-dimensional constructs are as follows.

### 1. The correlation of strategic HCMP<sub>s</sub> and employee capability

It is evident from Table 4.5 that two dimensions of strategic HCMP<sub>s</sub> present significant correlations with each dimension of employee capability in addition to the insignificant correlations of DEVE and EP, PROT and TCIE, PROT and ESAOS, DEPL and TCIE, DEPL and ESAOS, showing that identifying and developing strategic HCMP<sub>s</sub> have significant effects on employee capability.

### 2. The correlation of personnel control mechanisms and employee capability

As we learn from Table 4.5 each dimension of personnel control mechanisms presents positive and significant correlations with two dimensions of employee capability such as EM and EP, displaying that both the control factor and the communication-coordination factor of personnel control mechanisms have significant effects on employee motivation and productivity.

### 3. The correlation of strategic human capital management practices and customer loyalty

It can be learned from Table 4.5 that each dimension of strategic human capital management practices presents a marked positive correlation with each dimension of customer loyalty besides IDEN and CC, IDEN and CS, as well as PROT and CS.

### 4. The correlation of employee capability and customer loyalty

It is evident from Table 4.5 that two dimensions of employee capability have significantly positive correlation with each dimension of customer loyalty besides TCIE and ESAOS thus revealing overall that each dimension of strategic human capital management practices results in considerable increases in EM and EP besides DEVE and EP, and consequently have a significant effect on CC and CS besides TCIE and ESAOS. It is perceived that causal relationships among

dimensions of these three constructs (i.e., strategic human capital management practices, employee capability and customer loyalty) are close.

In correlation analysis, though a comprehensive judgment can be conducted on the relation between each dimension of the four constructs mentioned in this study, results of hypothetical inference in this research are still required to be further examined by other statistical methods. Accordingly, the present study employs hierarchic regression analysis and the LISREL model to help verify the causal relations between dimensions of the four multi-dimensional constructs.

#### **4.4 The causal relationship between strategic human capital management practices and employee capability**

The literature review mentioned in Chapter 2 and the correlation analysis noted in the preceding section show marked correlations between each dimension in this study. For a further understanding of the causal relationship between strategic HCMPs and employee capability, regression analysis is applied in this section. Findings from the regression analysis, as stated in Table 4.6, indicate that all four dimensions of strategic HCMPs have evident interpretative capability on each dimension of employee capability such as the change in environment, employee skill and organizational structure, employee motivation and employee productivity while  $R^2$  are 0.782, 0.590, 0.914 and 0.520, respectively, as specified in Table 4.6.

Table 4.6 The causal relationship between strategic human capital management practice and employee capability

dependent variable independent variable	TCIE		ESAOS		EM		EP	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
IDEN	.	.	.	.	.	.	.	.
DEVE	.	.	.	.	0.161	2.136*	0.477	2.681*
PROT	0.839	11.940*	0.704	7.308*	-0.189	-4.280*	.	.
DEPL	.	.	.	.	0.966	19.374*	0.289	2.454*
R <sup>2</sup>	0.782		0.590		0.914		0.520	
F	60.841***		24.467***		180.153***		18.387***	

Note: \* $p < 0.05$  \*\* $p < 0.01$  \*\*\* $p < 0.001$

Insignificant  $\beta$  coefficient is indicated by a dot.

You will find the definition of each variable mentioned above in Appendix 5.

The regression analysis, as specified in Table 4.7, shows that strategic human capital management practices have marked effects on the dimensions of employee capability.

The causal relation for each dimension of employee capability is as follows.

1. IDEN has a marked positive effect on TCIE, ESAOS, EM and EP ( $\beta$  are 0.168, 0.377, 0.143 and 0.189, respectively; p values are less than 0.01, 0.001, 0.05 and 0.01, respectively), thus revealing overall that there is a strong causal relationship between identifying human capital management practices and employee capability.
2. DEVE has a marked effect on TCIE and EM ( $\beta$  are  $-0.185$  and  $0.279$ , respectively; p values are less than 0.01 and 0.001, respectively), thus indicating that developing human capital management practices has marked effects on employee motivation and the change in environment.
3. DEPL has evident positive effects on ESAOS, EM and EP ( $\beta$  are 0.197, 0.254 and

0.302, respectively; p values are less than 0.01, 0.001 and 0.001, respectively), thus showing that deploying human capital management practices has noticeable effects on employee skill and organizational structure, employee motivation and employee productivity.

4. Dummy variable, *strate*, produces distinct positive effects on TCIE and ESAOS ( $\beta$  are 0.185 and 0.175, respectively; all p values are less than 0.01), thus revealing overall that initiating the idea of strategic human capital management practices has obvious effects on employee skill and organizational structure as well as the change in environment.
5. Dummy variable, *product*, has marked negative effects on TCIE, ESAOS, EM and EP ( $\beta$  are -0.182, -0.152, -0.129, -0.190 and -0.120, respectively; p values are less than 0.01, 0.01, 0.05, 0.01 and 0.05, respectively), thus indicating that new products marketed by the industry during the past five years have had negative impacts on each dimension of employee capability.
6. Dummy variable, *percent*, has evident positive effects on TCIE and ESAOS ( $\beta$  are 0.263, 0.160 and 0.228, respectively; p values are less than 0.001, 0.01 and 0.001, respectively), thus showing that comprehensive training procedures have perceptible effects on employee skill and organizational structure and the change in environment.
7. Dummy variable, *expense*, produces clear positive effects on ESAOS ( $\beta$  are 0.176, 0.130, 0.140 and 0.124, respectively; p values are less than 0.01, 0.05, 0.05 and 0.05, respectively), thus indicating that money spent on comprehensive

training has discernible effects on employee skill and organizational structure.

8. Dummy variable, cost, has evident negative effects on TCIE and ESAOS ( $\beta$  are -0.140 and -0.139, respectively; all p values are less than 0.05), thus making known overall that not viewing comprehensive training programs as an investment has obvious negative effects on employee skill and organizational structure as well as the change in environment.
9. Dummy variable, planning, has marked negative effects on TCIE ( $\beta$  are -0.487, -0.455, -0.611 and -0.410, respectively; p values are less than 0.001, 0.01, 0.01 and 0.01, respectively), thus showing that setting the type of annual budget for the life of the corporate plan of strategic human capital management practices has recognizable negative effects on the change in environment.
10. Dummy variable, time, has evident effects on ESAOS and EM ( $\beta$  are -0.170 and 0.219, respectively; p values are less than 0.01 and 0.001, respectively), thus showing that time spent on learning firm-specific knowledge of products and customers for a newly hired manager with experience in the industry has an obvious positive effect on employee motivation but negative impact on employee skill and organizational structure.
11. Dummy variable, imple, has marked negative effects on ESAOS and EP ( $\beta$  are -0.176, -0.163 and -0.209, respectively; p values are less than 0.01, 0.01 and 0.001, respectively), thus indicating that meagre implementation of strategic human capital management practices has obvious negative effects on employee productivity and employee skill and organizational structure.

12. Dummy variable, duties, produces a distinct negative effect on EP ( $\beta$  is -0.152; p value is less than 0.01), thus showing that repetitious managerial duties have evident unhelpful effects on employee productivity.

There is a great deal of intrinsic consistency within the organizational structure regarding the formulation of business strategy and human resource management control and internal strategy communication.

- (1) On talents' cultivation, many store managers in CWTG and JKMI (two of sample firms in this study) just stress clerks' on-the-job training and new clerks' pre-vocational training but neglect making clerks on their proper positions. Mentoring and helping clerks learn tacit knowledge require an effective balance in the process of leveraging human capital management practices. Too many clerks working on projects with too few store managers may not provide the face-to-face interactions needed to transfer tacit knowledge. On the other hand, clients want to be sure that experienced knowledgeable store managers are fully involved in their work.

Inappropriateness on management control of human capital management practices will damage clerks' potential. It is efficient for leveraging human capital to use specialized complementary assets. Relationships with specific clients can represent a specialized complementary asset (Hitt et al., 2001). In this study, leveraging human capital involves integrating the relationship with a client and the specialized human capital.

Structural equations related to the technical question mentioned above can be

described as follows. This study dealt with this problem by means of LISREL model mentioned in Chapter 4 and Appendix 4.

Structural equation 1:

$$\eta_2 = \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \gamma_{23}\xi_3 + \gamma_{24}\xi_4 + \beta_{12}\eta_1 + \beta_{32}\eta_3 + \beta_{42}\eta_4 + \zeta_2$$

Where  $\eta_2$  means employee skill and organizational structure.

$\xi_1$  means identifying human capital management practices.

$\gamma_{21}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and employee skill and organizational structure ( $\eta_2$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{22}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and employee skill and organizational structure ( $\eta_2$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{23}$  indicates the causal relation between protecting human capital management practices ( $\xi_3$ ) and employee skill and organizational structure ( $\eta_2$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{24}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and employee skill and organizational structure ( $\eta_2$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{12}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and employee skill and organizational structure ( $\eta_2$ ).

$\eta_3$  means employee motivation.

$\beta_{32}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and employee motivation ( $\eta_3$ ).

$\eta_4$  means employee productivity.

$\beta_{42}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and employee productivity ( $\eta_4$ ).

$\zeta_2$  indicates the residual error of structural equation 1 mentioned above.

Structural equation 2:

$$\eta_6 = \gamma_{61}\xi_1 + \gamma_{62}\xi_2 + \gamma_{63}\xi_3 + \gamma_{64}\xi_4 + \beta_{16}\eta_1 + \beta_{26}\eta_2 + \beta_{36}\eta_3 + \beta_{46}\eta_4 + \beta_{56}\eta_5 + \zeta_6$$

Where  $\eta_6$  means customer satisfaction.

$\xi_1$  means identifying human capital management practices.

$\gamma_{61}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{62}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{63}$  indicates the causal relation between protecting human capital

management practices ( $\xi_3$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{64}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{16}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_2$  means employee skill and organizational structure.

$\beta_{26}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_3$  means employee motivation.

$\beta_{36}$  indicates the correlation between employee motivation ( $\eta_3$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_4$  means employee productivity.

$\beta_{46}$  indicates the correlation between employee productivity ( $\eta_4$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_5$  means customer complaint.

$\beta_{56}$  indicates the correlation between customer complaint ( $\eta_5$ ) and customer satisfaction ( $\eta_6$ ).

$\zeta_6$  indicates the residual error of structural equation 2 mentioned above.

- (2) In JK MIG (one of sample firms in this study), diversification into new geographic regions provides the opportunity to learn about new clients, new service markets, and potential new resources. The movement into new services and geographic markets can create economies of

scope. Furthermore, firms can achieve economies of scope from service diversification by effectively using internal resources, particularly human capital. In JKMIG, to achieve economies of scope often requires effective coordination across service areas and an ability to configure the resources in ways that help meet clients' needs. Thus, store managers with significant experience may be needed to provide the critical managerial skills necessary to manage human resources and achieve the economies of scope.

Hitt et al. (2001: 17) suggested that "operating in multiple service and geographic markets simultaneously provides the opportunity for multipoint competition, whereby a firm is able to take actions against competitors in multiple markets." In other words, using existing human capital to move into new geographic markets may present special opportunities to gain a competitive advantage. For example, a firm may exploit existing client relationships with current store managers to move into a new geographic market. Thus, human capital can be used to facilitate the development and implementation of both service and geographic diversification.

This study measured service diversification using a Herfindahl index (Hitt et al., 2001). In other words, the service diversification Herfindahl index was calculated by working out the sum of squares of the proportion of total store managers in the five largest practice areas of each sample firm. As this value is inversely related to service diversification (high values indicate lower diversification), the value of

the variable was subtracted from 1. A similar Herfindahl index was used to measure geographic market diversification. This index was calculated for the proportion of store managers in the four largest branch locations (in separate cities). Structural equations related to the technical question mentioned above can be described as follows. This study dealt with this problem by means of LISREL model mentioned in Chapter 4 and Appendix 4.

Structure equation 1:

$$\eta_5 = \gamma_{51}\xi_1 + \gamma_{52}\xi_2 + \gamma_{53}\xi_3 + \gamma_{54}\xi_4 + \beta_{15}\eta_1 + \beta_{25}\eta_2 + \beta_{35}\eta_3 + \beta_{45}\eta_4 + \beta_{65}\eta_6 + \zeta_5$$

Where  $\eta_5$  means customer complaint.

$\xi_1$  means identifying human capital management practices.

$\gamma_{51}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and customer complaint ( $\eta_5$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{52}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and customer complaint ( $\eta_5$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{53}$  indicates the causal relation between protecting human capital management practices ( $\xi_3$ ) and customer complaint ( $\eta_5$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{54}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and customer complaint ( $\eta_5$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{15}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and customer complaint ( $\eta_5$ ).

$\eta_2$  means employee skill and organizational structure.

$\beta_{25}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and customer complaint ( $\eta_5$ ).

$\eta_3$  means employee motivation.

$\beta_{35}$  indicates the correlation between employee motivation ( $\eta_3$ ) and customer complaint ( $\eta_5$ ).

$\eta_4$  means employee productivity.

$\beta_{45}$  indicates the correlation between employee productivity ( $\eta_4$ ) and customer complaint ( $\eta_5$ ).

$\eta_6$  means customer satisfaction.

$\beta_{65}$  indicates the correlation between customer complaint ( $\eta_5$ ) and customer satisfaction ( $\eta_6$ ).

$\zeta_5$  indicates the residual error of structural equation 1 mentioned above.

Structure equation 2:

$$\eta_6 = \gamma_{61}\xi_1 + \gamma_{62}\xi_2 + \gamma_{63}\xi_3 + \gamma_{64}\xi_4 + \beta_{16}\eta_1 + \beta_{26}\eta_2 + \beta_{36}\eta_3 + \beta_{46}\eta_4 + \beta_{56}\eta_5 + \zeta_6$$

Where  $\eta_6$  means customer satisfaction.

$\xi_1$  means identifying human capital management practices.

$\gamma_{61}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{62}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{63}$  indicates the causal relation between protecting human capital management practices ( $\xi_3$ ) and customer satisfaction ( $\eta_6$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{64}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{16}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_2$  means employee skill and organizational structure.

$\beta_{26}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_3$  means employee motivation.

$\beta_{36}$  indicates the correlation between employee motivation ( $\eta_3$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_4$  means employee productivity.

$\beta_{46}$  indicates the correlation between employee productivity ( $\eta_4$ ) and customer satisfaction ( $\eta_6$ ).

$\eta_5$  means customer complaint.

$\beta_{56}$  indicates the correlation between customer complaint ( $\eta_5$ ) and customer satisfaction ( $\eta_6$ ).

$\zeta_6$  indicates the residual error of structural equation 2 mentioned above.

Structure equation 3:

$$\eta_7 = \gamma_{71}\xi_1 + \gamma_{72}\xi_2 + \gamma_{73}\xi_3 + \gamma_{74}\xi_4 + \beta_{17}\eta_1 + \beta_{27}\eta_2 + \beta_{37}\eta_3 + \beta_{47}\eta_4 + \beta_{57}\eta_5 + \beta_{67}\eta_6 + \zeta_7$$

Where  $\eta_7$  means company's financial performance.

$\xi_1$  means identifying human capital management practices.

$\gamma_{71}$  indicates the causal relation between identifying human capital management practices ( $\xi_1$ ) and company's financial performance ( $\eta_7$ ).

$\xi_2$  means developing human capital management practices.

$\gamma_{72}$  indicates the causal relation between developing human capital management practices ( $\xi_2$ ) and company's financial performance ( $\eta_7$ ).

$\xi_3$  means protecting human capital management practices.

$\gamma_{73}$  indicates the causal relation between protecting human capital management practices ( $\xi_3$ ) and company's financial performance ( $\eta_7$ ).

$\xi_4$  means deploying human capital management practices.

$\gamma_{74}$  indicates the causal relation between deploying human capital management practices ( $\xi_4$ ) and company's financial performance ( $\eta_7$ ).

$\eta_1$  means the change in environment the organization faces.

$\beta_{17}$  indicates the correlation between the change in environment the organization faces ( $\eta_1$ ) and company's financial performance ( $\eta_7$ ).

$\eta_2$  means employee skill and organizational structure.

$\beta_{27}$  indicates the correlation between employee skill and organizational structure ( $\eta_2$ ) and company's financial performance ( $\eta_7$ ).

$\eta_3$  means employee motivation.

$\beta_{37}$  indicates the correlation between employee motivation ( $\eta_3$ ) and company's financial performance ( $\eta_7$ ).

$\eta_4$  means employee productivity.

$\beta_{47}$  indicates the correlation between employee productivity ( $\eta_4$ ) and company's financial performance ( $\eta_7$ ).

$\eta_5$  means customer complaint.

$\beta_{57}$  indicates the correlation between customer complaint ( $\eta_5$ ) and company's financial performance ( $\eta_7$ ).

$\eta_6$  means customer satisfaction.

$\beta_{67}$  indicates the correlation between customer satisfaction ( $\eta_6$ ) and company's financial performance ( $\eta_7$ ).

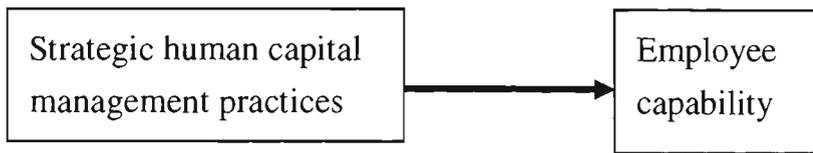
$\zeta_7$  indicates the residual error of structural equation 3 mentioned above.

As noted earlier, Hypothesis 1 indicates that employee capabilities in firms relying on personnel control mechanisms increase as a result of paying more attention to strategic human capital management practices. It includes the following two parts.

(1) the intervening relationship between strategic human capital management practices and employee capability (Figure 4.1); and

(2) the moderating effect of personnel control mechanisms on the relationship between strategic human capital management practices and employee capability.

Figure 4.1 The intervening relationship between strategic human capital management practices and employee capability



It is evident from the discussion above that part (1) of hypothesis 1 gains adequate support.

Table 4.7 Results of regression analysis of strategic human capital management practices to employee capability

independent variable \ dependent variable	TCIE		ESAOS		EM		EP	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
IDEN	0.168	2.935**	0.377	6.967***	0.143	2.597*	0.189	3.401**
DEVE	-0.185	-3.139**	.	.	0.279	4.876***	.	.
PROT	.	.	.	.	.	.	.	.
DEPL	.	.	0.197	3.149**	0.254	4.370***	0.302	5.018***
strate3	0.185	3.305**						
product2	-0.182	-3.099**					.	.
product3	-0.152	-2.675**						
percent4	0.263	4.826***						
expense5	.	.						
cost1	-0.140	-2.442*						
planning1	-0.487	-3.560***						
planning2	-0.455	-3.048**						
planning3	-0.611	-3.386**						
planning4	-0.410	-3.110**						
time11			-0.170	-3.149**				
strate4			0.175	3.428**				
product4			-0.129	-2.548*			-0.120	-2.219*
imple2			-0.176	-3.155**			-0.163	-2.826**
percent1			0.160	2.805**				
percent2			0.228	4.128***				
expense1			0.176	3.015**				
expense2			.	.				
expense3			0.130	2.446*				
expense4			0.140	2.604*				
expense6			0.124	2.356*				
cost3			-0.139	-2.542*				
time24					0.219	3.971***		

Table 4.7 Results of regression analysis of strategic human capital management practices to employee capability (continued)

independent variable \ dependent variable	TCIE		ESAOS		EM		EP	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
strate2					.	.		
product1					-0.190	-3.473**		
duties							-0.152	-2.797**
imple3							-0.209	-3.731***
F	8.079***		10.633***		15.930***		12.695***	
R <sup>2</sup>	0.319		0.413		0.307		0.312	

\*P<0.05

\*\*P<0.01

\*\*\*P<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

You will find the definition of each dimension of employee capability and strategic HCMPs mentioned above (TCIE, ESAOS, EM, EP, IDEN, DEVE, PROT and DEPL) in Appendix 5.

**strate** (dummy variable): Who initiates the idea of strategic human capital management practices?(strate2: accounting / financial managers, strate3: production managers, strate4: customer service managers)

**product** (dummy variable): How many kinds of products have been marketed during the past five years by your industry? (product1: less than one, product2: one to five, product3: six to ten, product4: eleven to fifteen)

**percent** (dummy variable): What percentage of employees has received training last year?

(percent1: less than 1%, percent2: 1% ~ 10%, percent4: 21% ~ 30%)

**expense** (dummy variable): How much money is spent on training program in your unit? (expense1: less than 1,000, expense2: 1,001~2,000, expense3: 2,001~3,000, expense4: 3,001~4,000 expense5: 4,001~5,000, expense6: 5,001~6,000, unit: NT\$)

**cost** (dummy variable): Employee training is viewed as a cost or as an investment? (cost1: viewed as a cost, cost3: neither a cost nor an investment)

**planning** (dummy variable): Annual budget fits with the deployment of strategic human capital management practices (planning 1: agree). The development of strategic human capital management practices went according to corporate business strategy (planning 2: agree). The deployment of strategic human capital management practices went according to corporate plan last year (planning 3: agree). The protection of strategic human capital management practices went according to

corporate business strategy last year (planning 4: agree).

**time** (dummy variable): How much time will it take for a newly hired store manager to learn firm-specific tasks necessary to be as effective as present store managers? (time11: less than one month) How much time is required for a newly hired manager with experience to become familiar with firm-specific knowledge of your products and customers? (time24: three to four months)

**imple** (dummy variable): How successful the implementation of strategic human capital management practices is? (imple2: poor, imple3: average)

**duties** (dummy variable): Are managerial duties in your organization repetitious?(yes:1)

#### **4.5 The analysis for the moderating effect of personnel control mechanisms**

To verify moderated relationships between strategic human capital management practices (HCMP<sub>s</sub>) and employee capability caused by personnel control mechanisms, hierarchic regression analysis including the following steps is adopted in this section to observe the moderating effect to each dimension of employee capability. Findings from the hierarchic regression analysis are shown in Table 4.8 and 4.9.

Step 1 (Model 1), taking individual attributes as the control variables;

Step 2 (Model 2), adding the predicted variables of strategic HCMP<sub>s</sub>;

Step 3 (Model 3), further adding the interactive values of personnel control mechanisms and strategic HCMP<sub>s</sub>, as well as calculating the partial F testing value (Model 3 vs. Model 2).

Table 4.8 Hierarchic regression analysis for exploring the relationship between strategic human capital management practices and employee capability moderated by the control factor of personnel control mechanisms

dependent variable independent variable	TCIE		ESAOS		EM		EP	
	$\beta$	t	$\beta$	t	$\beta$	t	$\beta$	t
Step1 (Model 1): Common method factor								
age	.	.	.	.	.	.	.	.
ed1	.	.	.	.	.	.	.	.
ed2	.	.	.	.	.	.	.	.
rank	.	.	.	.	.	.	.	.
ba	.	.	.	.	.	.	0.087	2.310*
train	.	.	.	.	.	.	.	.
employ	.	.	.	.	.	.	.	.
capital	0.208	2.142*	.	.	.	.	.	.
owner2	.	.	.	.	.	.	.	.
or 1	.	.	.	.	.	.	.	.
or 2	0.195	2.089*	.	.	.	.	.	.
formu1	0.235	3.008*	-0.372	-3.158*	0.087	2.113*	.	.
formu2	0.277	3.730*	-0.438	-3.914*	0.136	3.481*	.	.
formu3	0.215	2.086*	.	.	0.144	2.656*	.	.
impro2	.	.	.	.	.	.	.	.
impro3	.	.	0.588	2.415*	.	.	.	.
impro4	.	.	.	.	.	.	.	.
com	.	.	.	.	.	.	.	.
R <sup>2</sup>	0.363		0.396		0.314		0.324	
Step2 (Model 2): Predictors								
CONT	.	.	.	.	.	.	1.157	13.958*
IDEN	.	.	.	.	.	.	.	.
DEVE	.	.	.	.	-0.203	-2.208*	.	.
PROT	0.435	2.731*	1.211	5.043*	-0.213	-2.546*	.	.
DEPL	0.490	3.130*	.	.	0.931	11.292*	-0.283	-3.674*
R <sup>2</sup>	0.904		0.830		0.959		0.950	
$\Delta R^2$	0.541***		0.434***		0.645***		0.626***	

Step3 (Model 3):								
Interactions								
IDEN*CONT	.	.	.	.	.	.	-0.185	-2.587*
DEVE*CONT	0.755	3.336*	-0.779	-2.282*	0.520	4.366*	-0.439	-3.935*
PROT*CONT	.	.	-0.605	-2.323*	0.324	3.567*	-0.229	-2.696*
DEPL*CONT	-0.661	-2.877*	0.794	2.293*	-0.756	-6.255*	0.625	5.525*
<sup>a</sup> F	15.598***		6.474***		58.172***		66.506***	
R <sup>2</sup>	0.957		0.902		0.988		0.990	
ΔR <sup>2</sup>	0.053***		0.072***		0.029***		0.040***	

Note: \*p<0.05 \*\*p<0.01 \*\*\*p<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

<sup>a</sup>F value indicates the partial F value of testing the moderation effect (Model 3 vs. Model 2).

You will find the definition of each dimension of employee capability and strategic HCMP<sub>s</sub> (TCIE, ESAOS, EM, EP, IDEN, DEVE, PROT and DEPL) and CONT mentioned above in Appendix 5.

**age** (dummy variable) means the age of individual respondent.

**ed1** (dummy variable) means education background of individual respondent.

**ed2** (dummy variable) means the country individual respondent completes his / her education.

**rank** (dummy variable) means the position of individual respondent in his / her company.

**ba** (dummy variable) means the duties of individual respondent in his / her company.

**train** (dummy variable) means working experience and foreign training of individual respondent.

**employ** (dummy variable) means the number of employees.

**capital** (dummy variable) means paid-up registered capital.

**owner2** (dummy variable) means the owner of the company.

**or1** (dummy variable) means whether the company of individual respondent features centralized decision-making authority.

**or2** (dummy variable) means whether the company of individual respondent highlights hierarchical levels of organizational structure.

**formu1** (dummy variable) means whether the orientation of organizational structure is characterized by function.

**formu2** (dummy variable) means whether the orientation of organizational structure is typified by the line of products.

**formu3** (dummy variable) means whether the orientation of organizational structure is underlined by geographical areas.

**impro2** (dummy variable) means whether regular improvement programs draw attention to comprehensive training of employees.

**impro3** (dummy variable) means whether regular improvement programs underscore the edifice of the relationships with customers and suppliers.

**impro4** (dummy variable) means whether regular improvement programs pay attention to the suggestion of store managers.

**com** (dummy variable) means the percentage of sales revenue coming from three largest competitors in the industry.

Findings from the hierarchic regression analysis are as follows.

1. The results of the hierarchic regression analysis for the relationships between strategic HCMP<sub>s</sub> and employee capability moderated by the control factor of personnel control mechanisms are shown in Table 4.8. Of the four dimensions of strategic HCMP<sub>s</sub>, PROT and DEPL contribute significantly in explaining TCIE. PROT maintains a significant (positive) relation with ESAOS in the regression equation after the common method variance is partialled out. DEVE, PROT and DEPL contribute significantly in explaining EM. DEPL maintains a significant (negative) relation with EP in the regression equation.
2. Table 4.8 shows that the interaction of DEVE and CONT has marked effects on each dimension of employee capability ( $\beta$  are 0.755, -0.779, 0.520 and -0.439, respectively; all p values are less than 0.05). The interaction of DEPL and CONT has marked effects on each dimension of employee capability ( $\beta$  are -0.661, 0.794, -0.756 and 0.625, respectively; all p values are less than 0.05).

The preceding regression analysis results reveal that DEVE, PROT and DEPL have distinguished effects on dimensions (TCIE, ESAOS, EM and EP) of employee

capability (Table 4.6). However, DEPL brings evident effects to TCIE, EM and EP of employee capability by observing the Model 2 ( $\beta = 0.490, 0.931$  and  $-0.283$ , respectively; all p values are less than 0.05), and a buffer effect is produced ( $\beta = -0.661, 0.794, -0.756$  and  $0.625$ , respectively; all p values are less than 0.05) by adding the moderating variable of personnel control mechanisms. This reveals that the causal relationship between developing HCMP<sub>s</sub> and employee motivation is strongly moderated by the control factor of personnel control mechanisms, and that the causal relationship between deploying HCMP<sub>s</sub> and employee productivity is strongly moderated by the control factor of personnel control mechanisms.

However, the direction of the moderating effect caused by the control factor of personnel control mechanisms on the causal relationship between deploying HCMP<sub>s</sub> and employee motivation reverses the original order. The moderated relationship between deploying HCMP<sub>s</sub> and the change in environment also reverses the direction.

3. The interaction of IDEN and CONT has an evident negative effect on EP ( $\beta$  is  $-0.185$ ; p value is less than 0.05). The preceding regression analysis results reveal that IDEN has distinct positive effects on each dimension of employee capability (Table 4.7). However, DEVE brings insignificant effects to dimensions of employee capability by observing the Model 2 ( $\beta = -0.018, 0.182, 0.170$  and  $0.028$ , respectively; all p values are larger than 0.05), and a buffer effect is produced ( $\beta = -0.185$ ; p values is less than 0.05) by adding the moderating variable of personnel control mechanisms. This reveals that the causal relationship between developing HCMP<sub>s</sub> and employee productivity is moderated by the control factor of personnel control mechanisms, but the moderation effect reverses the original order.

4. The interaction of PROT and CONT has marked effects on ESAOS, EM and EP ( $\beta = -0.605, 0.324$  and  $-0.229$ , respectively; all p values are less than 0.05). The preceding regression analysis results reveal that PROT does not have significant effects on each dimension of employee capability (Table 4.7). However, PROT brings evident effects to TCIE, ESAOS and EM of employee capability by observing the Model 2 ( $\beta = 0.435, 1.211$  and  $-0.213$ , respectively; all p values are less than 0.05), and a buffer effect is produced on ESAOS, EM and EP ( $\beta = -0.605, 0.324$  and  $-0.229$ , respectively; all p values are less than 0.05) by adding the moderating variable of personnel control mechanisms. This reveals that the relationship between protecting HCMP<sub>s</sub> and employee motivation is strongly moderated by the control factor of personnel control mechanisms.

But the direction of the moderating effect caused by the control factor of personnel control mechanisms on the relationship between protecting HCMP<sub>s</sub> and employee skill and organizational structure reverses the original order. In addition, the moderating relationship between protecting HCMP<sub>s</sub> and the change in environment becomes weak and insignificant. Finally, the causal relationship between protecting HCMP<sub>s</sub> and employee productivity is strongly moderated by the control factor of personnel control mechanisms unexpectedly.

5. Findings from the hierarchic regression analysis indicate that all dimensions of strategic HCMP<sub>s</sub> have evident interpretative capability on each dimension of employee capability such as the change in environment, employee skill and organizational structure, employee motivation and employee productivity while  $R^2$  are 0.904, 0.830, 0.959 and 0.950, respectively, as shown in Table 4.8. The increments of  $R^2$  are 0.053, 0.072, 0.029 and 0.040, respectively, when taking the interactions of

IDEN and CONT, DEVE and CONT, PROT and CONT as well as DEPL and CONT into account. In each instance, the test statistic (F) for  $R^2$  is significant. The associated F-tests displayed in Table 4.8 also indicate that significant additional variance is explained with respect to each dimension of employee capability. In other words, the third step (Model 3) in the hierarchic regression analysis reveals that the interactions, overall, explain additional variances.

6. It is evident from Table 4.8 that dummy variable, ba, has a positive effect on EP ( $\beta$  is 0.087; p value is less than 0.05), thus revealing that there is a causal relationship between the duties of individual respondents in his / her company and employee productivity. Next, dummy variable, or2, has an evident positive effect on TCIE ( $\beta$  is 0.195; p value is less than 0.05), thus showing that there is a causal relationship between organizational structure highlighting hierarchical levels and the change in environment surrounding the organization.

In addition, dummy variable, formu1, has evident effects on TCIE, ESAOS and EM ( $\beta$  are 0.235, -0.372 and 0.087, respectively; all p values are less than 0.05), thus revealing that there is a causal relationship between the orientation of organizational structure drawing attention to function and the change in environment surrounding the organization, employee skill and organizational structure, and employee motivation.

Dummy variable, formu2, has effects on TCIE, ESAOS and EM as well ( $\beta$  are 0.277, -0.438 and 0.136, respectively; all p values are less than 0.05), thus showing that there is a strong causal relationship between the orientation of organizational structure underscoring the line of products and the change in environment surrounding the organization, employee skill and organizational structure, and employee motivation.

Dummy variable, formu3, has evident positive effects on TCIE and EM too ( $\beta$  are 0.215 and 0.144, respectively; all p values are less than 0.05), thus revealing that there is a causal relationship between the orientation of organizational structure giving emphasis to geographical areas and the change in environment the organization faces as well as employee motivation.

Finally, dummy variable, impro3, has an evident positive effect on ESAOS ( $\beta$  are 0.588; p values is less than 0.05), thus showing that there is a strong causal relationship between regular improvement programs underscoring the relationships with customers plus suppliers and employee skill plus organizational structure.

As regards the negative relationship between DEPL and EP shown in Table 4.8, one senior executive of CWTG made the following comments.

“The deployment of human capital management practices is one key factor if human resources can be effectively applied. Several important issues shall be taken into account: first, store managers must actually implement the management of human resources according to long-term business strategy of our company; second, a selection of proper talents must meet the current requirement of human resources in our company; third, the operating process and management control of our company must reach a result of ‘No talent is to be wasted, land should be fully utilized, the utility of things should be exhausted, and to have the goods rapidly distributed among the customers’. On talents’ cultivation, many store managers just stress employees’ on-the-job training and new employees’ pre-vocational training but neglect one significant issue, i.e., make employees on

their proper positions. Under such circumstances, many employees with brilliance and talents are assigned inappropriate positions that result in a waste of human resources and lower employees' capability. Inappropriateness on management of human resources (e.g., too much or not enough) will cause counter effect that would damage employees' potential."

With regard to the deployment of HCMP<sub>s</sub>, therefore, not only is the company's operating performance harmed but also the internal unity may be destroyed if some inappropriate employees are recruited, just as a Chinese proverb says, 'One grain of rat's excrement destroys one pot of congee'. In consequence, for one company implementing decentralized management and vesting delegation of authority level by level, store managers must be prudent in the deployment of HCMP<sub>s</sub>.

As regards the relationship between PROT and EM shown in Table 4.8, one senior executive of JKMI<sub>G</sub> made the following comments.

"For one company engaging in diversified operation such as JKMI<sub>G</sub>, a pursuit of honor for the whole teamwork is far more important than that of one individual while customers' requirements are diversified and changeable. Ten person's unity of purpose is a formidable force, and what the power accumulated will surpass their individual's solitary action as the former forms multiplied function, but not for the latter. If every store manager let things drift when considering the management of human resources to be senior executives' responsibility, the whole power of the company will be dispersed, employees' morale will be disintegrated and function of human capital management practices cannot be brought into full play that would make the market competitors take advantage of an opportunity to apportion the market



R <sup>2</sup>	0.363		0.396		0.314		0.324	
Step2 (Model 2):								
Predictors								
COMM	.	.	.	.	.	.	.	.
IDEN	.	.	.	.	.	.	.	.
DEVE	.	.	.	.	0.270	2.099*	.	.
PROT	0.352	2.005*	1.177	6.216*	-0.389	-4.075*	.	.
DEPL	0.784	4.394*	-0.722	-3.751*	1.329	13.691*	.	.
R <sup>2</sup>	0.913		0.888		0.971		0.760	
$\Delta R^2$	0.550***		0.492***		0.657***		0.436***	
Step3 (Model 3):								
Interactions								
IDEN*COMM	.	.	.	.	.	.	.	.
DEVE*COMM	.	.	-1.039	-2.033*	.	.	.	.
PROT*COMM	.	.	.	.	-0.281	-2.570*	.	.
DEPL*COMM	.	.	.	.	.	.	.	.
<sup>a</sup> F	10.232***		8.707***		36.254***		2.842**	
R <sup>2</sup>	0.936		0.925		0.981		0.802	
$\Delta R^2$	0.023***		0.037***		0.010***		0.042**	

Note: \*p<0.05 \*\*p<0.01 \*\*\*p<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

<sup>a</sup> F value indicates the partial F value of testing the moderation effect (Model 3 vs. Model 2).

You will find the definition of each dimension of employee capability and strategic HCMP<sub>s</sub> (TCIE, ESAOS, EM, EP, IDEN, DEVE, PROT and DEPL) and COMM mentioned above in Appendix 5.

**age** (dummy variable) means the age of individual respondent.

**ed1** (dummy variable) means education background of individual respondent.

**ed2** (dummy variable) means the country individual respondent completes his / her education.

**rank** (dummy variable) means the position of individual respondent in his / her company.

**ba** (dummy variable) means the duties of individual respondent in his / her company.

**train** (dummy variable) means working experience and foreign training of individual respondent.

**employ** (dummy variable) means the number of employees.

**capital** (dummy variable) means paid-up registered capital.

**owner2** (dummy variable) means the owner of the company.

**or1** (dummy variable) means whether the company of individual respondent features centralized decision-making authority.

**or2** (dummy variable) means whether the company of individual respondent highlights hierarchical levels of organizational structure.

**formu1** (dummy variable) means whether the orientation of organizational structure is characterized by function.

**formu2** (dummy variable) means whether the orientation of organizational structure is typified by the line of products.

**formu3** (dummy variable) means whether the orientation of organizational structure is underlined by geographical areas.

**impro2** (dummy variable) means whether regular improvement programs draw attention to comprehensive training of employees.

**impro3** (dummy variable) means whether regular improvement programs underscore the edifice of the relationships with customers and suppliers.

**impro4** (dummy variable) means whether regular improvement programs pay attention to the suggestion of store managers.

**com** (dummy variable) means the percentage of sales revenue coming from three largest competitors in the industry.

Findings from the hierarchic regression analysis shown in Table 4.9 are as follows.

1. Of the four dimensions of strategic HCMP<sub>s</sub>, PROT and DEPL contribute significantly in explaining TCIE and ESAOS. They also maintain a significant relation with EM in the regression equation after the common method variance is partialled out. DEVE contributes significantly in explaining EM as well.
2. Inspection of the beta's of the interaction shows that DEVE moderated by COMM has a marked negative effect on ESAOS ( $\beta = -1.039$ ; p value is less than 0.05). The interaction of PROT and COMM has an evident negative effect on EP ( $\beta = -0.281$ ; p value is less than 0.05). It is clear from the regression analysis results in the previous section that DEVE and PROT do not bring marked effects to ESAOS and EP respectively (Table 4.7). It is also apparent from Model 2 that DEVE does not

bring marked effects to ESAOS and PROT has an insignificant positive effect on EP ( $\beta$  is 0.352; p value is larger than 0.05), and a buffer effect is produced ( $\beta = -1.039$  and  $-0.281$  respectively; all p values are less than 0.05) by adding the moderating variable of personnel control mechanisms.

Thus, the causal relationship between developing human capital management practices strategically and employee skill and organizational structure is strongly moderated by the communication-coordination factor of personnel control mechanisms. In addition, the moderated relationship between protecting human capital management practices strategically and employee motivation is strongly caused by the communication-coordination factor of personnel control mechanisms, but the moderation effect reverses the original order.

3. The results of regression analysis in the preceding section show that DEVE or DEPL have marked positive effects on EM (Table 4.7), while it is clear from Model 2 that the positive effect DEVE or DEPL brings to EM ( $\beta = 0.270$  and  $1.329$  respectively; all p values are less than 0.05). However, there are no buffer effects ( $\beta = 0.111$  and  $0.190$  respectively; all p value are larger than 0.05) are created by adding the moderating variable of personnel control mechanisms. Thus, the causal relationship between DEVE (or DEPL) and EM is not strongly moderated by the communication-coordination factor of personnel control mechanisms.

4. Findings from the hierarchic regression analysis indicate that all dimensions of strategic HCMP<sub>s</sub> have evident interpretative capability on each dimension of employee capability such as the change in environment, employee skill and organizational structure, employee motivation and employee productivity while  $R^2$  are

0.913, 0.888, 0.971 and 0.760, respectively, as specified in Table 4-9. The increments of  $R^2$  are 0.023, 0.037, 0.010 and 0.042, respectively, when taking the interactions of IDEN and COMM, DEVE and COMM, PROT and COMM as well as DEPL and COMM into account, as shown in Table 4.9. In each instance, the test statistic (F) for  $R^2$  is significant. The associated F-tests displayed in Table 4.9 also indicate that significant additional variance is explained with respect to each dimension of employee capability. In other words, the third step (Model 3) in the hierarchic regression analysis reveals that the interactions, overall, explain additional variance.

As regards communication-coordination mechanisms shown in Table 4.9, one senior executive of THFVG made the following comments.

“Establishing smooth communication-coordination channels in our company lies in expecting employees’ more expression of their working experience and their opinions toward the management and management of our company that can be served as reference for each system renovation. A company will be turn into an organization without enterprise culture and interaction among employees as well as one with impediment of human resources, while employees reject to express their ideas and opinions. Communication among employees, communication between senior executives and shop (store) managers or communication between shop (store) managers aim at helping a smooth process of management control in our company. Poor communication will bring incongruity among employees that would affect performance of the whole teamwork, of its effect never be inferior to the loss due to unmarketable products. Generally speaking, horizontal communication (such as communication among

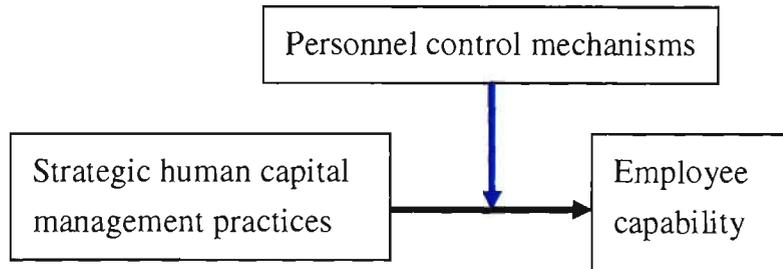
employees, communication between shop (store) managers) is easier than vertical (such as communication between senior executives and shop (store) managers, communication between shop (store) managers and employees at the basic level).

In addition, employees who will come close to customers while conducting communication-coordination shall play a guiding role since they may understand customers' preference better than those senior executives do. In consequence, a respect for profession and working experience is one important factor for a smooth communication-coordination.”

As noted earlier, Hypothesis 1 indicates that employee capabilities in firms relying on personnel control mechanisms increase as a result of paying more attention to strategic human capital management practices. It includes the following two parts:

- (1) the intervening relationship between strategic human capital management practices and employee capability; and
- (2) the moderating effect of personnel control mechanisms on the relationship between strategic human capital management practices and employee capability (Figure 4.2).

Figure 4.2 The moderating effect of personnel control mechanisms on the relationship between strategic human capital management practices and employee capability



Accordingly, it can be concluded from the discussion and the comments above that part (2) of hypothesis 1 in this research gains support.

#### **4.5.1 Additional interpretative analyses for the moderating effect of personnel control mechanisms**

To determine the exact nature of the moderated effects identified in Table 4.8 and 4.9, additional interpretative analyses using standard graphical techniques have been conducted. The charts for TCIE, ESAOS, EM and EP with moderated effect are presented below.

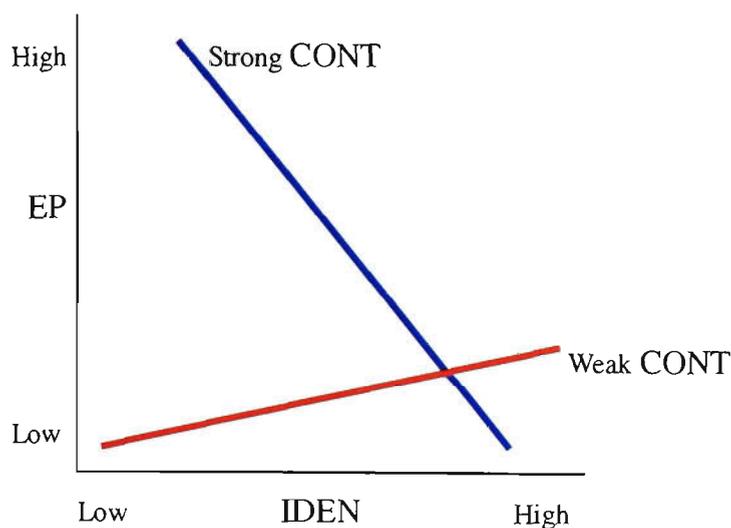


Figure 4.3 The moderated relationship between identifying human capital management practices (IDEN) and employee productivity (EP) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.3 that strong CONT is associated with a negative relationship between IDEN and EP, while weak CONT is associated with a positive or almost no relationship between the two variables.

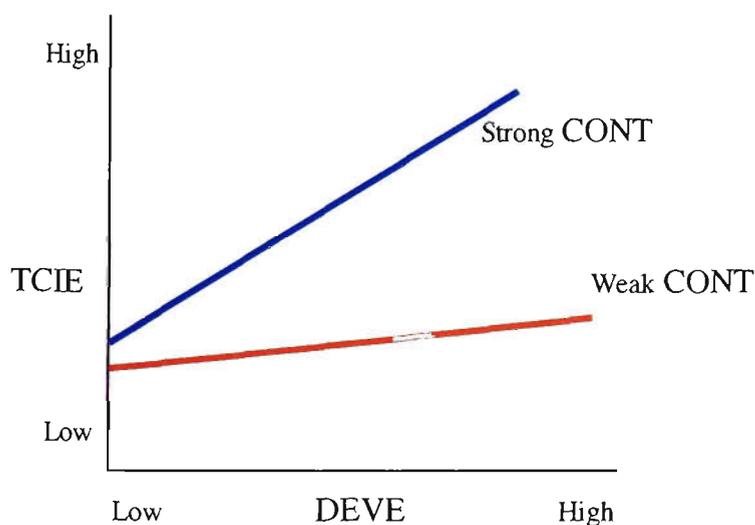


Figure 4.4 The moderated relationship between developing human capital management practices (DEVE) and the change in environment (TCIE) caused by the control factor of personnel control mechanisms (CONT)

It is not hard to find from Figure 4.4 that the causal relationship between DEVE and TCIE moderated by strong CONT is evidently superior to that of weak CONT, thus revealing that the interaction of DEVE and strong CONT has a marked positive effect on TCIE. In other words, organizations operating with relatively strong CONT exhibit a stronger relationship between DEVE and TCIE and that organizations with relatively weak CONT do not demonstrate a significant relationship between the two variables.

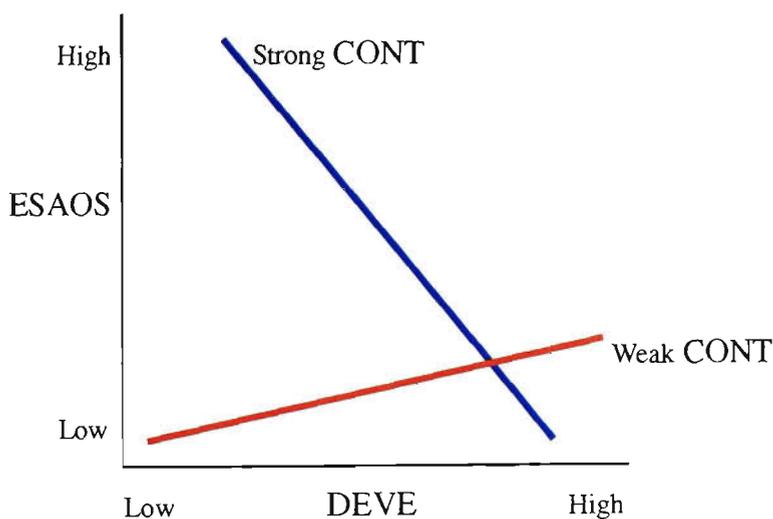


Figure 4.5 The moderated relationship between developing human capital management practices (DEVE) and employee skill and organizational structure (ESAOS) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.5 that strong CONT is associated with a negative relationship between DEVE and ESAOS, while weak CONT is associated with a positive or almost no relationship between the two variables.

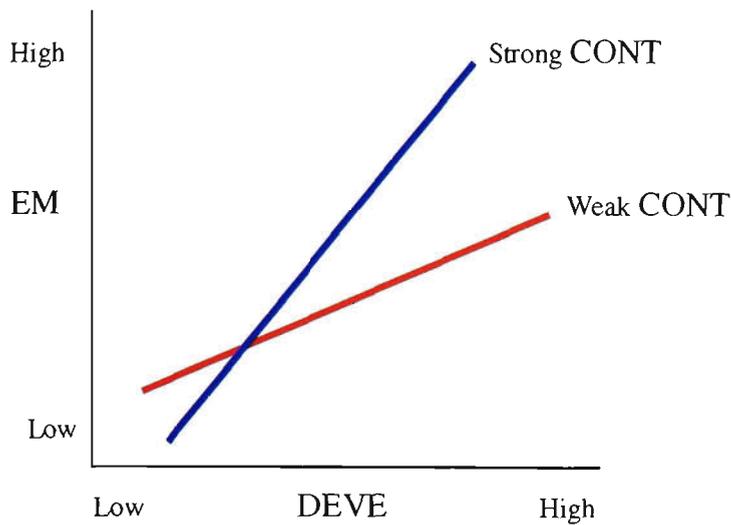


Figure 4.6 The moderated relationship between developing human capital management practices (DEVE) and employee motivation (EM) caused by the control factor of personnel control mechanisms (CONT)

It is not hard to find from Figure 4.6 that the causal relationship between DEVE and EM moderated by strong CONT is evidently superior to that of weak CONT, thus revealing that the interaction of DEVE and strong CONT has a marked positive effect on EM. In other words, strong CONT is associated with a strong positive relationship between DEVE and EM, while weak CONT is associated with a weak positive relationship between the two variables.

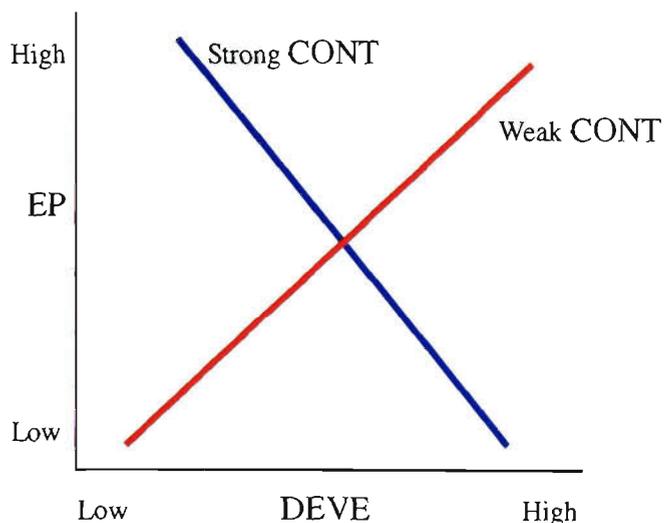


Figure 4.7 The moderated relationship between developing human capital management practices (DEVE) and employee productivity (EP) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.7 that strong CONT is associated with a negative relationship between DEVE and EP, while weak CONT is associated with a positive relationship between the two variables.

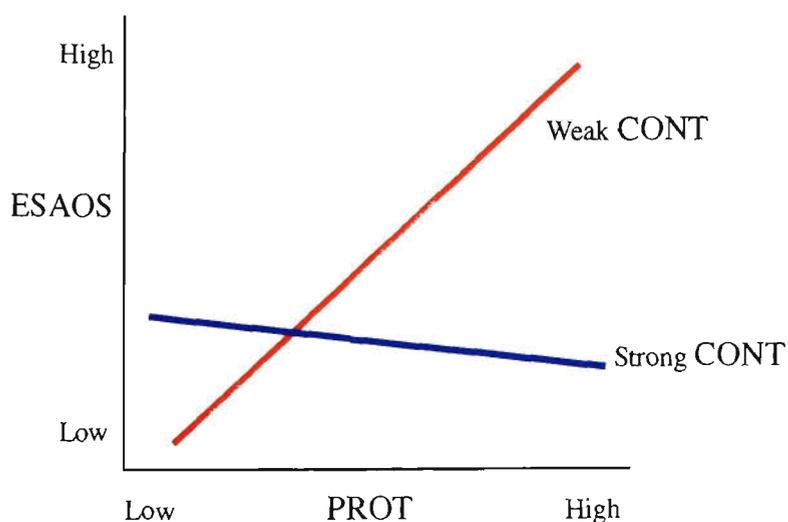


Figure 4.8 The moderated relationship between protecting human capital management practices (PROT) and employee skill and organizational structure (ESAOS) caused by the control factor of personnel control mechanisms (CONT)

It is obvious from Figure 4.8 that CONT weakens the relationship between PROT and ESAOS. Strong CONT is associated with a weak negative relationship between PROT and ESAOS, while weak CONT is associated with a strong positive relationship between the two variables.

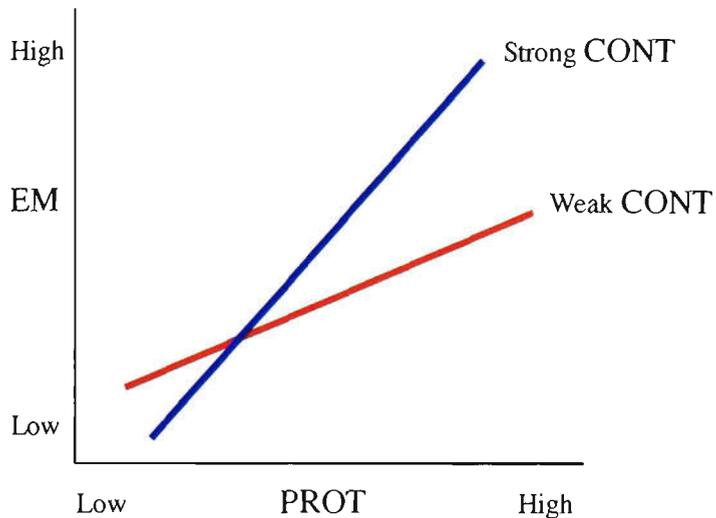


Figure 4.9 The moderated relationship between protecting human capital management practices (PROT) and employee motivation (EM) caused by the control factor of personnel control mechanisms (CONT)

It is not hard to find from Figure 4.9 that the causal relationship between PROT and EM moderated by strong CONT is evidently superior to that of weak CONT, thus revealing that the interaction of PROT and strong CONT has a marked positive effect on EM. In other words, strong CONT is associated with a strong positive relationship between PROT and EM, while weak CONT is associated with a weak positive relationship between the two variables.

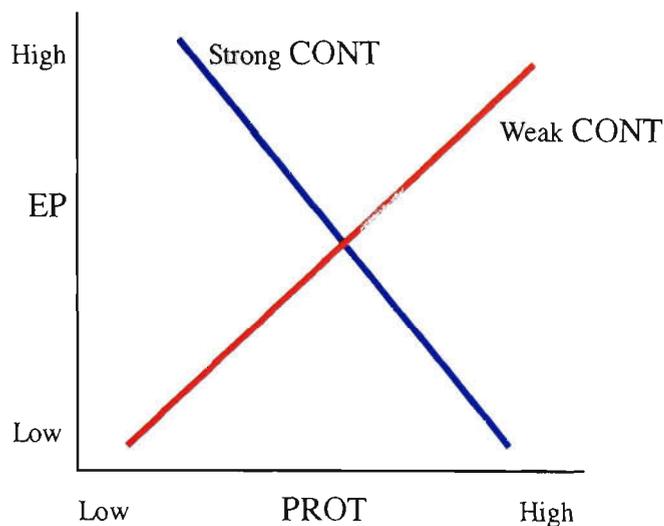


Figure 4.10 The moderated relationship between protecting human capital management practices (PROT) and employee productivity (EP) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.10 that strong CONT is associated with a negative relationship between PROT and EP, while weak CONT is associated with a positive relationship between the two variables.

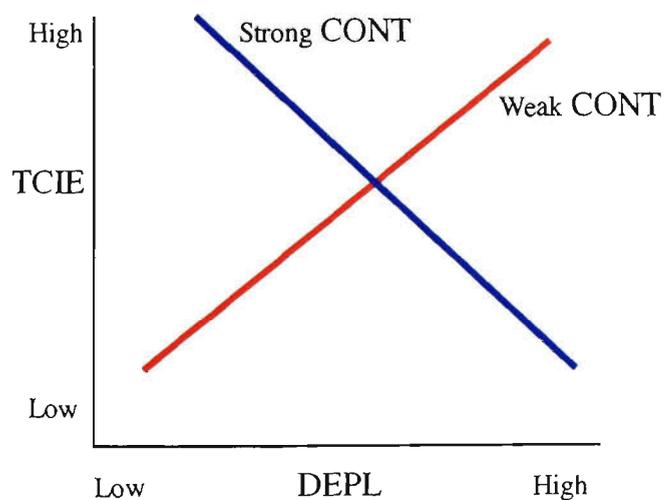


Figure 4.11 The moderated relationship between deploying human capital management practices (DEPL) and the change in environment (TCIE) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.11 that strong CONT is associated with a negative relationship between DEPL and TCIE, while weak CONT is associated with a positive relationship between the two variables.

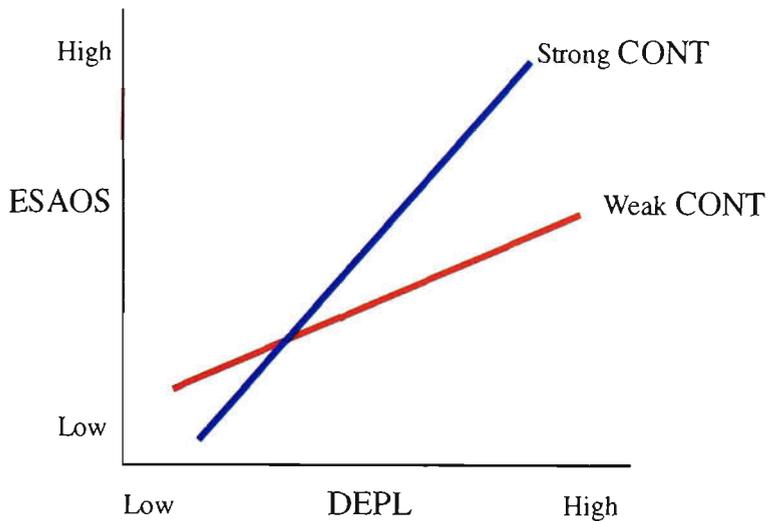


Figure 4.12 The moderated relationship between deploying human capital management practices (DEPL) and employee skill and organizational structure (ESAOS) caused by the control factor of personnel control mechanisms (CONT)

It is not hard to find from Figure 4.12 that the causal relationship between DEPL and ESAOS moderated by strong CONT is evidently superior to that of weak CONT, thus revealing that the interaction of DEPL and strong CONT has a marked positive effect on ESAOS. In other words, strong CONT is associated with a strong positive relationship between DEPL and ESAOS, while weak CONT is associated with a weak positive relationship between the two variables.

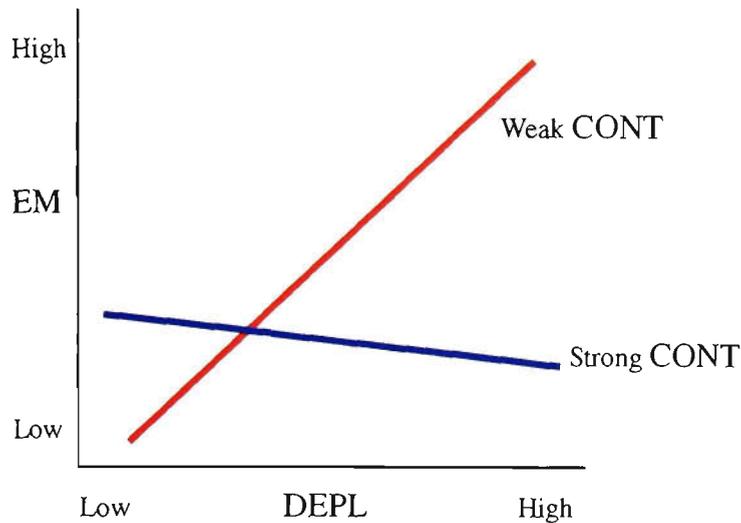


Figure 4.13 The moderated relationship between deploying human capital management practices (DEPL) and employee motivation (EM) caused by the control factor of personnel control mechanisms (CONT)

It is obvious from Figure 4.13 that CONT weakens the relationship between DEPL and EM. Strong CONT is associated with a weak negative relationship between DEPL and EM, while weak CONT is associated with a strong positive relationship between the two variables.

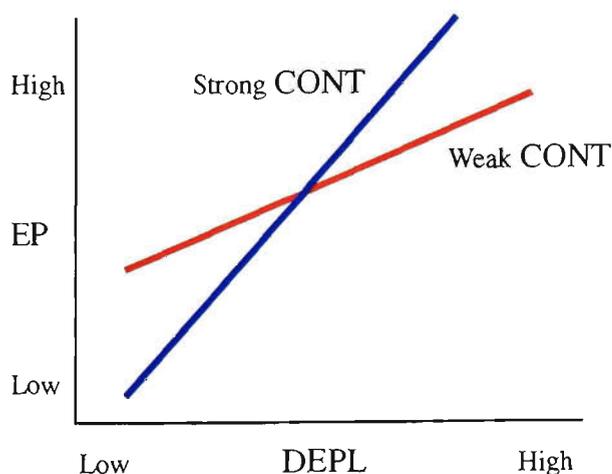


Figure 4.14 The moderated relationship between deploying human capital management practices (DEPL) and employee productivity (EP) caused by the control factor of personnel control mechanisms (CONT)

It is evident from Figure 4.14 that the causal relationship between DEPL and EP moderated by strong CONT is evidently superior to that of weak CONT, thus revealing that the interaction of DEPL and strong CONT has a marked positive effect on EP. In other words, strong CONT is associated with a strong positive relationship between DEPL and EP, while weak CONT is associated with a weak positive relationship between the two variables.

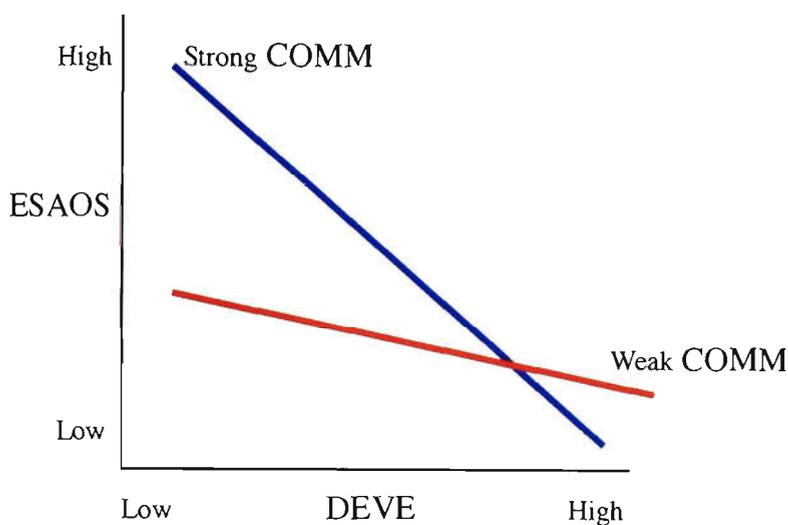


Figure 4.15 The moderated relationship between developing human capital management practices (DEVE) and employee skill and organizational structure (ESAOS) caused by the communication-coordination factor of personnel control mechanisms (COMM)

It is not hard to find from Figure 4.15 that the causal relationship between DEVE and ESAOS moderated by strong COMM is evidently superior to that of weak COMM, thus revealing that the interaction of DEVE and strong COMM has a marked negative effect on ESAOS. In other words, strong COMM is associated with a strong negative relationship between DEVE and ESAOS, while weak COMM is associated with a weak negative relationship between the two variables.

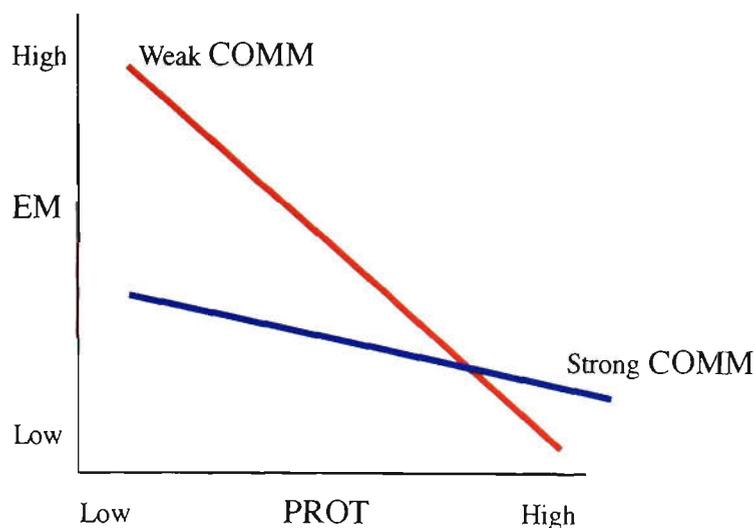


Figure 4.16 The moderated relationship between protecting human capital management practices (PROT) and employee motivation (EM) caused by the communication-coordination factor of personnel control mechanisms (COMM)

It is obvious from Figure 4.16 that COMM weakens the relationship between PROT and EM. Strong COMM is associated with a weak negative relationship between PROT and EM, while weak COMM is associated with a strong negative relationship between the two variables. In other words, the interaction of PROT and weak COMM has a marked negative effect on EM.

Additional interpretative analyses for the moderating effect of personnel control mechanisms stated above indicate that each dimension of personnel control mechanisms has differential effects on the relationship between strategic HCMP<sub>s</sub> and employee capability, but show an evident moderating effect overall. This finding offers new and practical insights into the moderating nature of personnel control mechanisms when implementing HCMP<sub>s</sub> and BSC.

## 4.6 The regression analysis for exploring the intervening effect

Is the relationship between strategic HCMP<sub>s</sub> and customer loyalty affected by an intervening variable? Taking inferences arising from the literature review as a base, one postulate in this study is that customer loyalty in firms drawing attention to strategic HCMP<sub>s</sub> increases as a result of the increase in employee capability.

### 4.6.1 The causal relationship between employee capability and customer loyalty

The regression analysis results indicate that all dimensions of employee capability have evident interpretative capability on each dimension of customer loyalty such as customer complaint and customer satisfaction while  $R^2$  are 0.238 and 0.252, respectively, as specified in Table 4.10. The causal relation for each dimension is as follows.

1. The changes in environment have a marked negative effect on customer complaint and customer satisfaction ( $\beta = -0.148, -0.164$ , respectively; p values are less than 0.05 and 0.01, respectively).
2. Employee motivation has an evident positive effect on customer complaint and customer satisfaction ( $\beta = 0.352, 0.399$ , respectively; all p values are less than 0.001).
3. Employee productivity has a marked positive effect on customer complaint ( $\beta = 0.132$ ; p value is less than 0.05).

As noted earlier, Hypothesis 2 indicates that customer loyalty in firms with a focus on strategic human capital management practices escalates on account of the increase in employee capability. Therefore, Hypothesis 2, from Table 4.10 and the discussion above, is partly supported.

Table 4.10 Results of regression analysis of employee capability to customer loyalty

independent variable \ dependent	CC		CS	
	$\beta$	t	$\beta$	t
TCIE	-0.148	-2.371*	-0.164	-2.715**
ESAOS	.	.	.	.
EM	0.352	5.511***	0.399	6.352***
EP	0.132	2.087*	.	.
service6	0.169	2.796**		
apprai 14	0.209	2.023*		
apprai 24	-0.254	-2.477*		
avehr14	-0.120	-2.057*		
griev 5	.	.		
incenti 3	.	.		
service 3			0.116	2.128*
service 6			0.145	2.484*
incenti 5			.	.
F	7.820***		12.308***	
R <sup>2</sup>	0.238		0.252	

Note: \*P<0.05 \*\*P<0.01 \*\*\*P<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

You will find the definition of each dimension of employee capability and customer loyalty mentioned above (TCIE, ESAOS, EM, EP, CC and CS) in Appendix 5.

**service** (dummy variable): How many kinds of products were produced by your company last year? (service3: 21~30, service6: 51~60)

**apprai** (dummy variable): What proportion of the workforce receives formal performance appraisals? (apprai 14: 46%~55%)

What is the proportion of the workforce using performance appraisals to determine the subordinate's compensation? (apprai 24: 46%~55%)

**avehr** (dummy variable): What is the number of training hours received by a typical employee over the last 12 months? (avehr 14: 46~55)

**griev** (dummy variable): What is the proportion of the workforce having access to a formal grievance procedure and (or) complaint resolution system?

(griev 5: 56%~65%)

**incenti** (dummy variable): What is the proportion of the workforce having access to company incentive plans, profit-sharing plans, and (or) gain-sharing plans? (incenti 3: 36%~45%, incenti5: 56%~65%)

#### **4.6.2 The causal relationship between customer loyalty and financial performance of an organization**

The postulation of a causal relationship between employee capability and customer loyalty in the previous section has some support while the inference arising from the literature review suggests that customer loyalty will cause changes in the company's financial performance. The regression analysis shows that customer loyalty has interpretative capability on financial performance of an organization while  $R^2$  is 0.141 as indicated in Table 4.11. The causal relationship for each dimension is described as follows.

1. Customer complaint has an effect on financial performance of an organization ( $\beta = 0.163$ ; p value is less than 0.05). However, customer satisfaction does not have evident effects on company's financial performance.
2. Dummy variable, complain, has a negative effect on company's financial performance ( $\beta = -0.219$ ; p value is less than 0.01).
3. Dummy variable, satisfa2, has a positive effect on financial performance of an organization ( $\beta = 0.124$ ; p value is less than 0.05).
4. Dummy variable, recom2, has a negative effect on company's financial performance ( $\beta = -0.174$ ; p value is less than 0.05).
5. Dummy variable, loyall1, has a negative effect on financial performance of an organization ( $\beta = -0.229$ ; p value is less than 0.05).

As noted earlier, Hypothesis 3 indicates that as a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases. Therefore, Hypothesis 3, from Table 4.11 and the discussion above, is partly supported.

Table 4.11 Results of regression analysis of customer loyalty to financial performance of an organization

dependent variable independent variable	PERFORM	
	$\beta$	t
CC	0.163	2.555*
CS	.	.
complain	-0.219	-3.389**
satisfa1	.	.
satisfa2	0.124	2.039*
recom1	.	.
recom2	-0.174	-2.417*
loyal1	-0.229	-2.389*
loyal2	.	.
loyal3	.	.
loyal4	.	.
F	3.779***	
R <sup>2</sup>	0.141	

Note: \*P<0.05 \*\*P<0.01 \*\*\*P<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

You will find the definition of CC or CS in Appendix 5.

PERFORM: company financial performance.

**complain** (dummy variable): An important part of your task is to ensure compliance with customer complaints.

**satisfa 1** (dummy variable): To what extent would you like your organization

to develop customer loyalty? The degree to which your store could raise the price of products as a percentage before the customer would choose not to buy from your store again (given that the customer has indicated that he or she is likely to repurchase).

**satisfa 2** (dummy variable): To what extent would you like your organization to develop customer loyalty? The degree to which your store could lower the price of products as a percentage before the customer would choose to buy from your store again (given that the customer has indicated he or she is unlikely to repurchase).

**recom** (dummy variable): Have you ever recommended your company as a place to purchase to your friend? (Yes: 1; No: 2) (recom 23: very frequent)

**loyal 1** (dummy variable): Does your store ask your customers to evaluate sales clerks' service friendliness?

**loyal 2** (dummy variable): Did your customer just purchase one kind of product from your store?

**loyal 3** (dummy variable): If your customer need to buy a new product, he wouldn't come to your store again.

**loyal 4** (dummy variable): If your customer need to buy a new product, he would visit your store again.

#### **4.6.3 The causal relationship between employee capability and financial performance of an organization**

The postulation of a causal relationship between customer loyalty and financial performance of an organization in the previous section is partly supported. However, the inference arising from the literature review suggests that employee capability will cause changes in the company's financial performance. The regression analysis shows that employee capability has evident interpretative capability on financial performance of an organization while  $R^2$  is 0.319 as indicated in Table 4.12. The causal relationship for each dimension is described as follows.

1. Employee skill and organizational structure (ESAOS) have an evident effect on financial performance of an organization ( $\beta = 0.147$ ; p value is less than 0.05).

2. Employee productivity (EP) has a positive effect on company's financial performance ( $\beta = 0.141$ ; p value is less than 0.05).
3. Dummy variable, budget, has evident negative effects on financial performance of an organization ( $\beta = -0.217, -0.168$ , respectively; all p values are less than 0.01).
4. Dummy variable, qual, has evident negative effects on company's financial performance ( $\beta = -0.161, -0.144$ , respectively; p values are less than 0.01, 0.05, respectively).
5. Dummy variable, incenti, has a positive effect on company's financial performance ( $\beta = 0.251$ ; p values is less than 0.001).

As noted earlier, Hypothesis 3 indicates that as a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases. Therefore, Hypothesis 3, from Table 4.12 and the discussion above, is partly supported.

Table 4.12 Results of regression analysis of employee capability to financial performance of an organization

independent variable \ dependent variable	PERFORM	
	$\beta$	t
TCIE	.	.
ESAOS	0.147	2.548*
EM	.	.
EP	0.141	2.318*
budget 1	-0.217	-3.130**
budget 3	-0.168	-2.662**
qual 3	-0.161	-2.767**
qual 4	-0.144	-2.557*
incenti 4	0.251	4.715***
F	13.153***	
R <sup>2</sup>	0.319	

Note: \*P<0.05 \*\*P<0.01 \*\*\*P<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

PERFORM: company financial performance;

You will find the definition of each dimension of employee capability mentioned above (TCIE, ESAOS, EM and EP) in Appendix 5.

**budget** (dummy variable): What budget setting method has your firm used?

(budget1: top-down, budget3: participative)

**qual**(dummy variable): For the five positions recruiting most frequently, how many qualified applicants do you have per position? (qual3: 36~45, qual4: 46~55)

**incenti**(dummy variable): What is the proportion of the workforce having access to company incentive plans, profit-sharing plans, and (or) gain-sharing plans?

(incenti 4: 46%~55%)

#### 4.6.4 The causal relationship between strategic human capital management practices and customer loyalty

The postulation of a causal relationship between employee capability and financial performance of an organization in the previous section has some support. However, the inference arising from the literature review is that strategic HCMP<sub>s</sub> will affect customer loyalty. The regression analysis shows that strategic HCMP<sub>s</sub> have evident interpretative capability on each dimension of customer loyalty while R<sup>2</sup> are 0.257 and 0.152, respectively, as indicated in Table 4.13. The causal relationship for each dimension is described as follows.

1. Identifying HCMP<sub>s</sub> (IDEN) has a positive effect on customer complaint (CC) ( $\beta = 0.166$ ; p value is less than 0.01).
2. Developing HCMP<sub>s</sub> (DEVE) has positive effects on customer complaint (CC) and customer satisfaction (CM) ( $\beta = 0.402, 0.244$ , respectively; all p values are less than 0.001).
3. Dummy variable, product, has a positive effect on customer complaint (CC) ( $\beta = 0.159$ ; p value is less than 0.05).
4. Dummy variable, percent, has a negative effect on customer complaint (CC) ( $\beta = -0.134$ ; p value is less than 0.05).
5. Dummy variable, time1, has a positive effect on customer complaint (CC) ( $\beta = 0.183$ ; p values is less than 0.05).

As noted earlier, Hypothesis 2 indicates that customer loyalty in firms with a focus on strategic human capital management practices escalates on account of the increase in employee capability. Therefore, Hypothesis 2, from Table 4.13 and the discussion above, is supported.

Table 4.13 Results of regression analysis of strategic human capital management practices to customer loyalty

independent variable \ dependent variable	CC		CS	
	$\beta$	t	$\beta$	t
IDEN	0.166	2.707**	.	.
DEVE	0.402	6.383***	0.244	3.630***
PROT	.	.	.	.
DEPL	.	.	.	.
strate	.	.	.	.
product	0.159	2.486*	.	.
imple	.	.	.	.
percent	-0.134	-2.073*	.	.
expense	.	.	.	.
cost	.	.	.	.
plannin	.	.	.	.
time1	0.183	2.162*	.	.
time2	.	.	.	.
duties	.	.	.	.
F	5.958***		3.087***	
R <sup>2</sup>	0.257		0.152	

Note: \*P<0.05 \*\*P<0.01 \*\*\*P<0.001

Insignificant  $\beta$  coefficient is indicated by a dot.

You will find the definition of each dimension of HCMP<sub>s</sub> and customer loyalty mentioned above (IDEN, DEVE, PROT, DEPL, CC and CS) in Appendix 5.

**strate** (dummy variable): Who initiates the idea of strategic human capital management practices? (accounting / financial managers or production managers or customer service managers)

**product** (dummy variable): How many kinds of products have been marketed during the past five years by your industry? (product1: less than one, product2: one

to five, product3: six to ten, product4: eleven to fifteen)

**imple** (dummy variable): How successful the implementation of strategic human capital management practices is? (imple2: poor, imple3: average)

**percent** (dummy variable): What percentage of employees have received training last year? (percent1: less than 1%, percent2: 1% ~ 10%, percent4: 21% ~ 30%)

**expense** (dummy variable): How much money is spent on training program in your unit? (expense1: less than 1,000, expense2: 1,001~2,000, expense3: 2,001~3,000, expense4: 3,001~4,000, expense5: 4,001~5,000, expense6: 5,001~6,000, unit: NT\$)

**cost** (dummy variable): Employee train is viewed as a cost or as an investment? (cost1: viewed as a cost, cost3: neither a cost nor an investment)

**planning** (dummy variable): Annual budget fits with the deployment of strategic human capital management practices (planning 1: agree). The development of strategic human capital management practices went according to corporate business strategy (planning 2: agree). The deployment of strategic human capital management practices went according to corporate plan last year (planning 3: agree). The protection of strategic human capital management practices went according to corporate business strategy last year (planning 4: agree).

**time** (dummy variable): How much time will it take for a newly hired store manager to learn firm-specific tasks necessary to be as effective as present store managers? (time11: less than one month) How much time is required for a newly hired manager with experience to become familiar with firm-specific knowledge of your products and customers? (time24: three to four months)

**duties** (dummy variable): Are managerial duties in your organization repetitious?(yes:1)

#### **4.6.5 The causal relationship between strategic human capital management practices and financial performance of an organization**

The postulation of a causal relationship between strategic HCMP<sub>s</sub> and customer loyalty in the previous section has some support. However, the inference arising from the literature review is that strategic HCMP<sub>s</sub> will affect the financial performance of an organization. The regression analysis shows that strategic HCMP<sub>s</sub> have evident interpretative capability on financial performance of an organization while  $R^2$  is 0.144 as indicated on Table 4.14. The causal relationship

for each dimension is described as follows.

1. Developing HCMP<sub>s</sub> (DEVE) has a negative effect on financial performance of an organization ( $\beta = -0.229$ ; p value is less than 0.01).
2. Deploying HCMP<sub>s</sub> (DEPL) has a positive effect on financial performance of an organization ( $\beta = 0.159$ ; p value is less than 0.05).
3. Dummy variable, imple, has a positive effect on financial performance of an organization ( $\beta = 0.148$ ; p value is less than 0.05).
4. Dummy variable, expense, has a negative effect on financial performance of an organization ( $\beta = -0.189$ ; p value is less than 0.01).

As noted earlier, Hypothesis 4 indicates that financial performance in firms focusing on strategic human capital management practices increases in consequence of the increase in employee capability. Therefore, Hypothesis 4, from Table 4.14 and the discussion above, is partly supported.

Table 4.14 Results of regression analysis of strategic human capital management practices to financial performance of an organization

dependent variable independent variable	PERFORM	
	$\beta$	t
IDEN	.	.
DEVE	-0.229	-3.391**
PROT	.	.
DEPL	0.159	2.164*
strate	.	.
product	.	.
imple	0.148	2.072*
percent	.	.
expense	-0.189	-2.691**
cost	.	.
plannin	.	.
time1	.	.
time2	.	.
duties	.	.
F	2.896	
R <sup>2</sup>	0.144	

Note: \* $P < 0.05$  \*\* $P < 0.01$  \*\*\* $P < 0.001$

Insignificant  $\beta$  coefficient is indicated by a dot.

PERFORM means company's financial performance.

You will find the definition of each dimension of HCMP<sub>s</sub> mentioned above (IDEN, DEVE, PROT and DEPL) in Appendix 5.

**strate** (dummy variable): Who initiates the idea of strategic human capital management practices? (accounting / financial managers or production managers or customer service managers)

**product** (dummy variable): How many kinds of products have been marketed during the past five years by your industry? (product1: less than one, product2: one to five, product3: six to ten, product4: eleven to fifteen)

**imple** (dummy variable): How successful the implementation of strategic human capital management practices is? (imple2: poor, imple3: average)

**percent** (dummy variable): What percentage of employees have received training last year? (percent1: less than 1%, percent2: 1% ~ 10%, percent4: 21% ~ 30%)

**expense** (dummy variable): How much money is spent on training program in your unit? (expense1: less than 1,000, expense2: 1,001~2,000, expense3: 2,001~3,000, expense4: 3,001~4,000, expense5: 4,001~5,000, expense6: 5,001~6,000, unit: NT\$)

**cost** (dummy variable): Employee train is viewed as a cost or as an investment? (cost1: viewed as a cost, cost3: neither a cost nor an investment)

**planning** (dummy variable): Annual budget fits with the deployment of strategic human capital management practices (planning 1: agree). The development of strategic human capital management practices went according to corporate business strategy (planning 2: agree). The deployment of strategic human capital management practices went according to corporate plan last year (planning 3: agree). The protection of strategic human capital management practices went according to corporate business strategy last year (planning 4: agree).

**time** (dummy variable): How much time will it take for a newly hired store manager to learn firm-specific tasks necessary to be as effective as present store manager? (time11: less than one month) How much time is required for a newly hired manager with experience to become familiar with firm-specific knowledge of your products and customers? (time 24: three to four months)

**duties** (dummy variable): Are managerial duties in your organization repetitious? (yes:1)

#### **4.7 The nested-model analysis for exploring the intervening effect**

The regression analysis in the previous sections shows that the interaction of developing / protecting human capital management practices (HCMP<sub>s</sub>) and the control factor of personnel control mechanisms has an evident effect on employee motivation, which, in turn, brings that effect to each dimension of customer loyalty. One dimension of customer loyalty, customer complaint, has a marked effect on a company's financial performance. Furthermore, the interaction of protecting HCMP<sub>s</sub> and the communication-coordination factor of personnel control mechanisms has a clear effect on employee motivation, which, in turn, has a marked effect on customer loyalty. In addition, the interaction of deploying HCMP<sub>s</sub> and the control factor of personnel control mechanisms has an evident effect on employee productivity, which, in turn, has a marked effect on a company's financial performance. Therefore, the nested-model analysis of the LISREL model is applied (all the details of LISREL model are explained in Appendix 4) to study the intervening effect of employee capability on strategic HCMP<sub>s</sub>, customer loyalty and financial performance of an organization.

In order to consider path parsimony, the comparative methods of nested-model analysis (Bentler and Bonett, 1980) of LISREL model (Hair et al., 1995) shown in Appendix 4 are applied here to assess the optimum goodness-of-fit model (e.g., the Null Model, the Direct Model, the Completely Mediated Model, and the Partially Mediated Model) as well as to study the direct, indirect and overall effects between each construct mentioned in this study.

There are four models proposed for the nested-model analysis. Between-model comparisons and the fit indices mentioned are kept for special purposes of conducting

the decision-tree analysis (Anderson & Gerbing, 1988), along with the examination of the adjusted (i.e., deleting factors with poor internal consistency) theoretical model and nested alternative models.

Model 1 is the Null Model which features the model with non-existence of the paths of relationship between each dimension.

Model 2, the Direct Model which indicates the existence of a paths model with marked effects for the strategic HCMP<sub>s</sub> on customer loyalty and on company's financial performance as well as for the employee capability on customer loyalty and for customer loyalty on company's financial performance.

Model 3, the Completely Mediated Model, marks the existence of a paths model with evident effect for the strategic HCMP<sub>s</sub> on employee capability, which, in turn, on customer loyalty, and consequently on company's financial performance.

Model 4, the Partially Mediated Model which means the existence of a paths model with marked effects for the strategic HCMP<sub>s</sub> on employee capability, on customer loyalty and on company's financial performance as well as for the employee capability on customer loyalty and on company's financial performance as well as for customer loyalty on company's financial performance (Model 1, 2, 3 and 4 are portrayed in Appendix 6). The results of the nested-model analysis are specified in Table 4.15.

Table 4.15 Comparative analysis of the nested-model for the intervening effects

Model	$\chi^2$	df	$\chi^2_{diff}$	df <sub>diff</sub>	GFI	AGFI	NFI	CFI	RMR	Standardized RMR
Model1(Null Model)	429.28	49	.	.	0.77	0.69	0.25	0.26	0.43	0.17
Model2(Direct Model)	223.44	27	205.84***	22	0.87	0.67	0.57	0.58	0.34	0.13
Model3(Completely Mediated Model)	109.95	23	319.33***	26	0.93	0.80	0.80	0.82	0.26	0.085
Model4 (Partially Mediated Model)	9.04	7	420.24***	42	0.99	0.94	0.98	1.00	0.041	0.020

Note : 1. Inter-model comparative base is Model 1 (Null Model).

2. \*p<0.05 \*\*P<0.01 \*\*\*P<0.001

3. GFI : Goodness of Fit Index

AGFI : Adjusted Goodness of Fit Index

NFI : Normed Fit Index

CFI : Comparative Fit Index

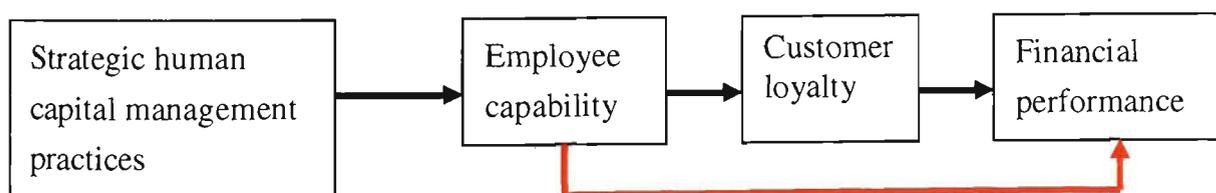
RMR : Root Mean Square Residual

The results of comparative analysis for the nested model in Table 4.15 reveal that all testing of the differences of  $\chi^2$  as model 2, 3 and 4 to model 1 are distinct. The values of goodness of fit such as GFI, AGFI, NFI, CFI, RMR and standardized RMR of model 3 and 4 are better than those of model 2 (GFI, AGFI, NFI and CFI are fairly acceptable being at, or above, the 0.80 level) (Mulaik et al., 1989). This shows that not only the direct effect existed as the strategic HCMPs on customer loyalty and company's financial performance but also employee capability on customer loyalty and customer loyalty on company's financial performance. Moreover, the testing of

the difference of  $\chi^2$  resulting from model 3 and 4 reveals a marked difference existed ( $\chi^2_{\text{diff}} = 100.91$ ,  $df_{\text{diff}} = 16$ ; p value is less than 0.001). Consequently, there exists a partial intervening effect as each dimension of strategic HCMP<sub>S</sub> on each dimension of employee capability and customer loyalty and company's financial performance as well as each dimension of employee capability on each dimension of customer loyalty and company's financial performance as well as each dimension of customer loyalty on financial performance of an organization.

As noted earlier, Hypothesis 2 indicates that customer loyalty in firms with a focus on strategic human capital management practices escalates on account of the increase in employee capability. Hypothesis 3 indicates that as a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases. Hypothesis 4 indicates that financial performance in firms focusing on strategic human capital management practices increases in consequence of the increase in employee capability. They can be shown by the following figure.

Figure 4.17 The direct intervening effect of employee capability on financial performance and indirect intervening effect of strategic human capital management practices on financial performance



Accordingly, it can be concluded from Table 4.15 and the discussion above that Hypotheses 2, 3 and 4 are supported.

#### **4.8 The assessment and correction of the theoretical model**

Analytic results in the preceding sections reveal that no marked relationship existed between all dimensions of all constructs in this study. According to Bentler and Bonett (1980), the comparative methods of nested-model analysis of LISREL model (all the details of LISREL model are explained in Appendix 4) are applied in this section to assess the optimum goodness-of-fit model as well as to study the direct, indirect and overall effects between each construct.

Each hypothetical model for the comparative methods of nested-model analysis used in this section is as follows.

From intervening effect analysis in the preceding section, it has been found that the Partially Mediated Model is superior to the Null, Direct and Completely Mediated Models in the effect of goodness-of-fit. Therefore, the Partially Mediated Model served as inter-model comparative base, namely, Model A, i.e., the existence for the paths of marked effect as the strategic HCMP<sub>s</sub> on employee capability, on customer loyalty and on company's financial performance as well as employee capability on customer loyalty and on company's financial performance as well as customer loyalty on company's financial performance (as in Figure 4.18).

Though findings from the analytic results in the previous section show that paths of the marked relationship each dimension revealed in the regression analysis has been listed into Model A and the effect of goodness of fit is ideal. However, analytic results of Pearson correlation in section 4.3 (as in Table 4.5) reveal that a causal path relationship could exist among dimensions of each construct, and, therefore, the subsequent hypothetical model has added paths, unexplored originally in the

preceding section for assessment and comparison.

Model B is formed by adding the relationship between the change in environment (TCIE) and employee skill and organizational structure (ESAOS) in Model A, and the difference in  $\chi^2$  ( $\chi^2_{diff}$ ) resulting from comparing B and A models is 0 (Table 4.16) that shows Model B is not superior to Model A.

Model C is formed by adding the relationship between the change in environment (TCIE) and employee motivation (EM) in Model B, and the difference in  $\chi^2$  ( $\chi^2_{diff}$ ) resulting from comparing C and B models is 0 (Table 4.16) that indicates Model C is not better than Model B.

Model D is formed by adding the relationship between the change in environment (TCIE) and employee productivity (EP) in Model C, and the difference in  $\chi^2$  ( $\chi^2_{diff}$ ) resulting from comparing D and C models is 0 (Table 4.16) that shows Model D is not superior to Model C.

Model E is formed by adding the relationship between employee skill and organizational structure (ESAOS) and employee productivity (EP) in Model D, and the difference in  $\chi^2$  ( $\chi^2_{diff}$ ) resulting from comparing E and D models is 0 (Table 4.16) that reveals Model E is not better than Model D.

Model F is formed by adding the relationship between employee motivation (EM) and employee productivity (EP) in Model E, and the difference in  $\chi^2$  ( $\chi^2_{diff}$ ) resulting from comparing F and E models is 0 (Table 4.16) that shows Model F is not superior to Model E.

Model G is formed by adding the relationship between customer complaint (CC) and customer satisfaction (CS) in Model F, and the difference in  $\chi^2$  ( $\chi^2_{\text{diff}}$ ) resulting from comparing G and F models is 1.29 ( $p = 0.2561$ ) (Table 4.16) that demonstrates Model G is insignificantly better than Model F.

Table 4.16 Comparative analysis of the nested-model for theoretical models

Model	$\chi^2$	df	$\chi^2_{\text{diff}}$	df <sub>diff</sub>	GFI	AGFI	NFI	CFI	RMR	Standardized RMR
A	9.04	7	.	.	0.99	0.94	0.98	1.00	0.041	0.020
B	9.04	16	0	9	0.99	0.97	0.98	1.00	0.041	0.020
C	9.04	15	0	1	0.99	0.97	0.98	1.00	0.041	0.020
D	9.04	14	0	1	0.99	0.97	0.98	1.00	0.041	0.020
E	9.04	13	0	1	0.99	0.97	0.98	1.00	0.041	0.020
F	9.04	12	0	1	0.99	0.97	0.98	1.00	0.041	0.020
G	7.75	11	1.29	1	0.99	0.97	0.99	1.00	0.040	0.018

Note : 1. Inter-model comparative base is Model A.

2. GFI : Goodness of Fit Index

AGFI : Adjusted Goodness of Fit Index

NFI : Normed Fit Index

CFI : Comparative Fit Index

RMR : Root Mean Square Residual

Table 4.16 shows the results of the nested-model comparative analysis and it is evident that the values of goodness of fit from A to G are not increasing markedly. Taking GFI and RMR as examples, the models examined are more reasonable when

GFI > 0.90 and RMR < 0.05 (Bentler and Bonett, 1980). Consequently, the goodness of fit index for GFI, AGFI, NFI, CFI, RMR and standardized RMR in Table 4.16 reveals that Model G is superior in the index for NFI, RMR and standardized RMR. From Model A to G, the comparison of the difference in  $\chi^2$  ( $\chi^2_{\text{diff}}$ ) between each model shows Model G is superior to other ones; that proves Model G to be a better one (as indicated in Figure 4.19).

Based on the principle of path parsimony, therefore, Model G is the better path model by deleting non-significant paths such as identifying HCMP<sub>s</sub> (IDEN) and the change in environment (TCIE), developing HCMP<sub>s</sub> (DEVE) and TCIE, DEVE and employee motivation (EM), DEVE and employee productivity (EP), protecting HCMP<sub>s</sub> (PROT) and EM, deploying HCMP<sub>s</sub> (DEPL) and EP, DEVE and customer complaint (CC), DEVE and customer satisfaction (CS), PROT and CS, DEVE and company's financial performance (PERFORM), DEPL and PERFORM, TCIE and CC, EM and CC, TCIE and CS, EP and CS, TCIE and PERFORM, EM and PERFORM together with the path of CS and PERFORM in Model G.

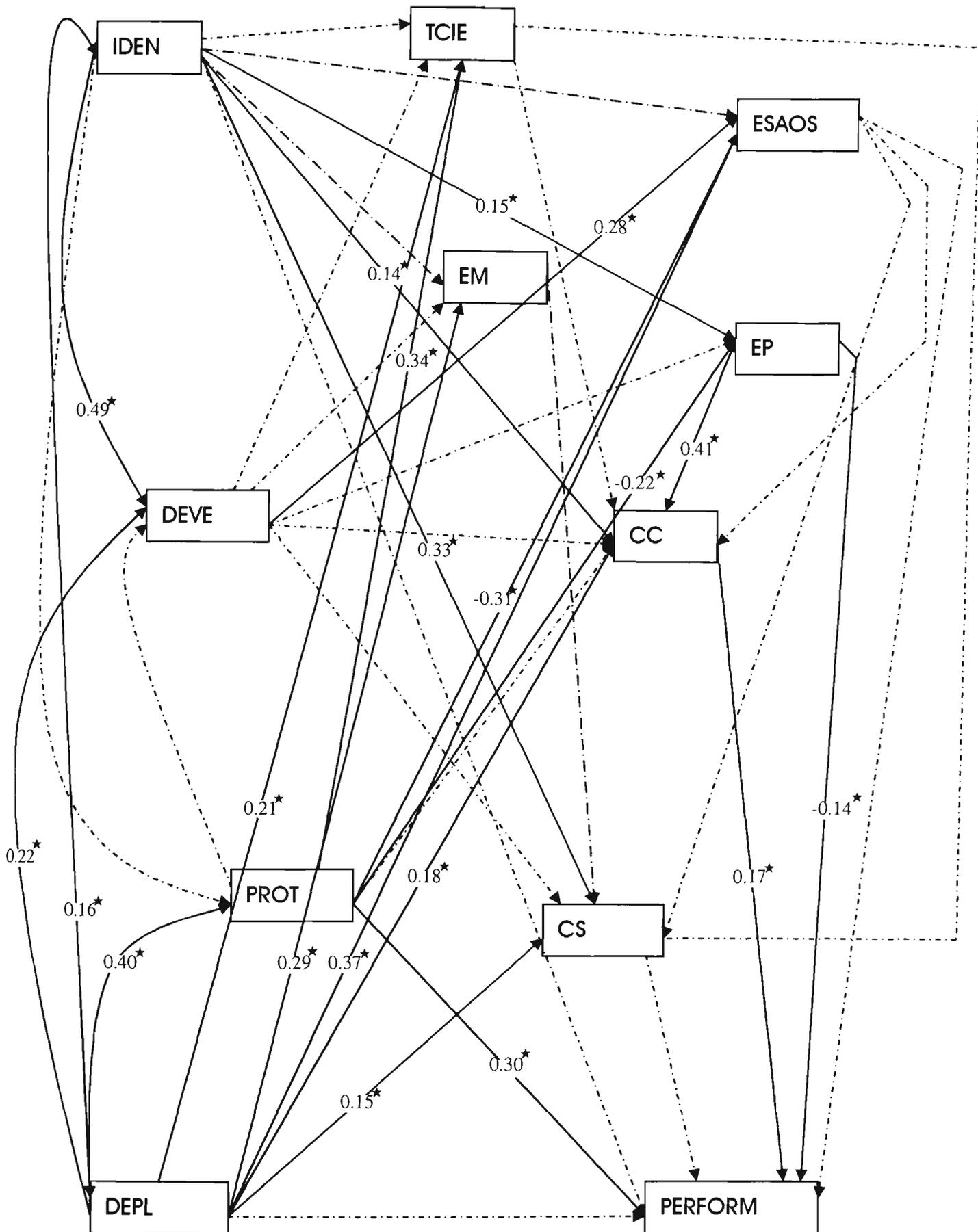
The goodness-of-fit index for GFI, AGFI, NFI, CFI, RMR and standardized RMR in Model G after the deletion of the paths mentioned above is 0.99, 0.98, 0.98, 1.00, 0.05 and 0.024, respectively. None of them violate the views of Bentler and Bonett (1980). However, there is no significant difference between before and after the deletion of non-significant paths in Model G due to the  $\chi^2$  value to be increment effect ( $\chi^2$  value before the deletion is 7.75,  $\chi^2$  value after the deletion is 11.50, the difference in  $\chi^2$  is 3.75, the difference in df is 18,  $p > 0.01$ ).

In Figure 4.18 and 4.19, each dimension of HCMP<sub>s</sub>, employee capability and

customer loyalty mentioned below (i.e., IDEN, DEVE, PROT, DEPL, TCIE, ESAOS, EM, EP, CC and CS) is defined in Appendix 5. In addition, PERFORM means company's financial performance.

As noted above, the nested-model analysis of LISREL is used for exploring the intervening effect of employee capability on the dimensions of strategic human capital management practices, customer loyalty and financial performance of an organization. In the nested-model analysis, there are four models brought up while model 1 is Null Model which highlights the model with a non-existence of the relation paths between each dimension; model 2, the Direct Model which indicates the existence of paths model with marked effects of strategic human capital management practices on customer loyalty and on company's financial performance as well as of employee capability on customer loyalty as well as of customer loyalty on company's financial performance; model 3, the Completely Mediated Model, marks the existence of paths model with the evident effects of strategic human capital management practices on employee capability which in turn on customer loyalty, and consequently on company's financial performance; and model 4, the Partially Mediated Model which means the existence of paths model with marked effects of strategic human capital management practices on employee capability, on customer loyalty and on company financial performance as well as of employee capability on customer loyalty and on company financial performance as well as of customer loyalty on company financial performance. The paths models of the direct model, the completely mediated model and the partially mediated model are portrayed in Appendix 6.

Figure 4.18 The path diagram of Model A

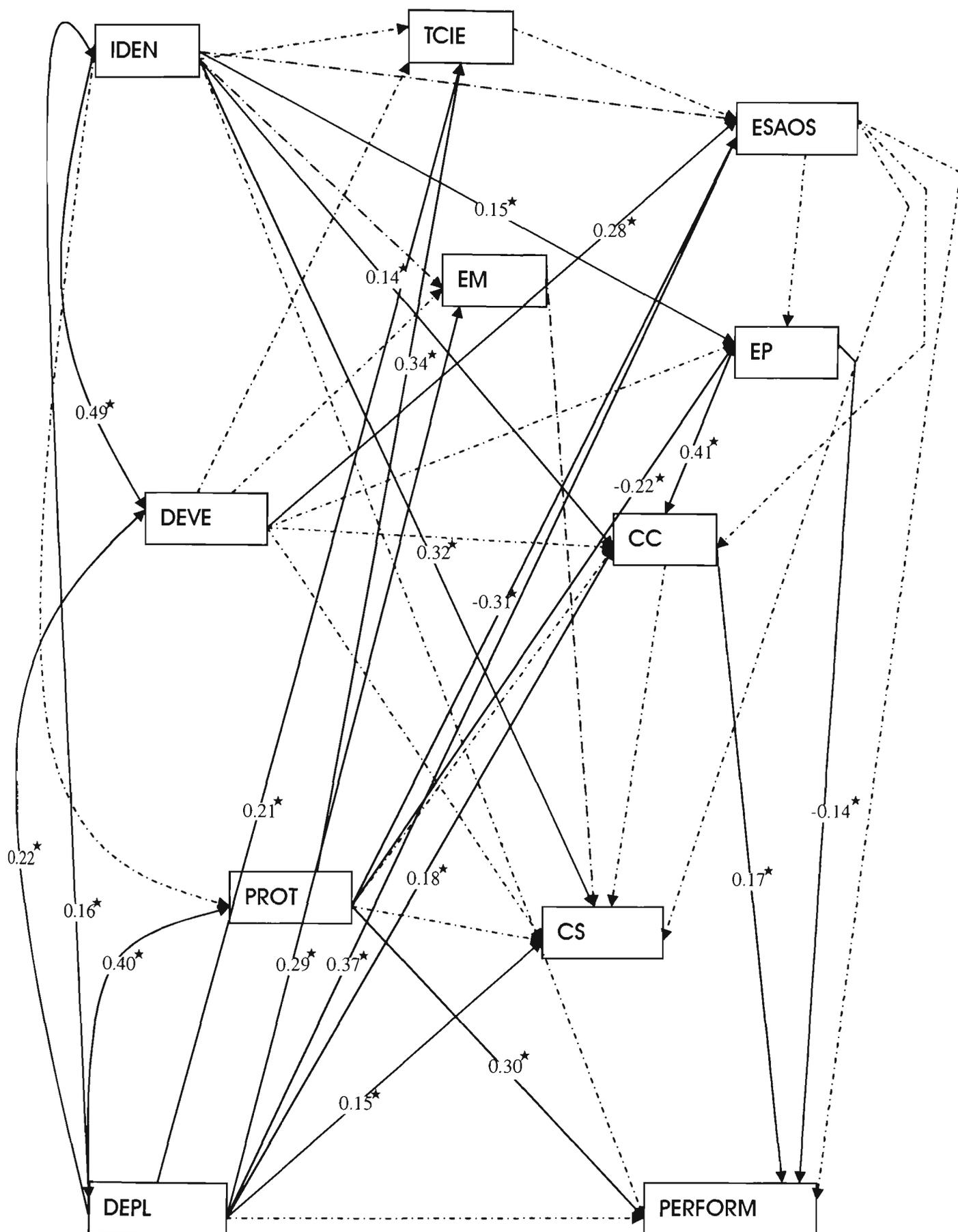


Note: 1. Asterisk ( \* ) is  $|t| > 1.96$

2. Significant causal path is portrayed by a solid line.

3. Insignificant causal path is portrayed by a dotted line.

Figure 4-19 The path diagram of Model G



Note: 1. Asterisk ( \* ) is  $| t | > 1.96$

2. Significant causal path is portrayed by a solid line.

3. Insignificant causal path is portrayed by a dotted line.

The path coefficients and t values of Model G are applied to examine the direct, indirect and overall effects of each dimension, and the results are indicated in Table 4.17.

For direct effect, the Table reveals that identifying human capital management practices has marked positive effects on developing human capital management practices, deploying human capital management practices, employee productivity, customer complaint and customer satisfaction. The Table also shows that developing human capital management practices has created distinguished effects on deploying human capital management practices and employee skill and organizational structure. It appears that protecting human capital management practices results in the increase in deploying human capital management practices, causing further increase in developing human capital management practices. Moreover, protecting human capital management practices has a marked effect on the external environment the organization faces, further causing deploying human capital management practices. In addition, protecting human capital management practices has marked effects on employee skill and organizational structure, employee productivity and company's financial performance, further causing developing and deploying human capital management practices. Finally, deploying human capital management practices has created distinguished effects on employee motivation, customer complaint and customer satisfaction and, thereby, corporate performance. However, protecting human capital management practices brings a marked negative effect to employee productivity, causing further decrease in company's financial performance.

For the exploration into the indirect effects, Table 4.17 also shows that identifying, developing and protecting human capital management practices have created indirect

effects on the change in environment the organization faces, employee skill and organizational structure and employee motivation, further affecting each dimension of customer loyalty. However, some of them influence employee productivity. On the other hand, deploying human capital management practices has an evident negative indirect effect on employee productivity but the latter does not have any effect on either dimension of customer loyalty. Moreover, deploying human capital management practices has not created indirect effects on employee motivation.

For total effects, every dimension in the strategic HCMP<sub>s</sub> has created evident effects on each dimension of employee capability except that developing human capital management practices has no effect on employee productivity. Every dimension in the strategic HCMP<sub>s</sub> also creates evident effects on financial performance of firms implementing HCMP<sub>s</sub>. In addition, each dimension of employee capability has a marked positive effect on every dimension in customer loyalty except that employee productivity has no effect on each dimension of customer loyalty. Finally, customer complaint has both direct and indirect effects on corporate performance. Customer satisfaction also has a marked positive effect on company's financial performance. It reveals that each dimension of customer loyalty has created evident effects on financial performance of the organization.

As noted earlier, Hypothesis 2 indicates that customer loyalty in firms with a focus on strategic human capital management practices escalates on account of the increase in employee capability. Hypothesis 3 points out that as a result of the increase in customer loyalty, financial performance in firms paying attention to employee capabilities increases. Hypothesis 4 specifies that financial performance in firms focusing on strategic human capital management practices increases in consequence

of the increase in employee capability. They are shown in Figure 4.20.

Figure 4.20 The direct and indirect intervening effects



Accordingly, it can be concluded from Table 4.17 and the discussion above that

Hypothesis 2, 3 and 4 are supported.

7 Results of synthetic analysis for strategic human capital management practices, employee capability, customer loyalty and company's financial performance										
Dimension	IDEN		DEVE		PROT		DEPL		TCIE	
	pc	t	pc	t	pc	t	pc	t	pc	t
DEVE	0.49	7.07	--	--	--	--	0.22	3.40	--	--
PROT	--	--	--	--	--	--	0.40	5.96	0.34	5.76
DEPL	0.16	2.53	0.22	3.40	0.40	5.96	--	--	0.21	3.53
TCIE	--	--	--	--	0.34	5.76	0.21	3.53	--	--
ESAOS	--	--	0.28	4.73	-0.31	-5.58	0.37	6.47	--	--
EM	--	--	--	--	--	--	0.29	4.95	--	--
EP	0.15	2.50	--	--	-0.22	-3.68	--	--	--	--
CC	0.14	2.48	--	--	--	--	0.18	2.83	--	--
CS	0.32	5.60	--	--	--	--	0.15	2.41	--	--
PERFORM	--	--	--	--	0.30	5.02	--	--	--	--
DEVE	--	--	--	--	--	--	--	--	0.05	12.00
PROT	--	--	--	--	--	--	--	--	0.08	21.04
DEPL	--	--	--	--	--	--	--	--	0.14	34.33
TCIE	0.03	8.93	0.05	12.00	0.08	21.04	0.14	34.33	--	--
ESAOS	0.20	49.81	0.08	22.00	0.15	38.56	-0.06	-17.17	-0.03	-9.30
EM	0.05	12.52	0.06	16.83	0.12	29.50	--	--	0.06	17.47
EP	--	--	--	--	--	--	-0.09	-21.93	-0.07	-21.20
CC	0.03	7.16	0.04	9.62	0.07	16.87	--	--	0.04	9.99
CS	0.02	6.10	0.03	8.19	0.06	14.36	--	--	0.03	8.51
PERFORM	0.003	1.00	0.04	24.44	0.04	50.64	0.15	37.11	0.14	204.84
DEVE	0.49	7.07	--	--	--	--	0.22	3.40	0.05	12.00
PROT	--	--	--	--	--	--	0.40	5.96	0.42	26.80
DEPL	0.16	2.53	0.22	3.40	0.40	5.96	--	--	0.35	37.86
TCIE	0.03	8.93	0.05	12.00	0.42	26.80	0.35	37.86	--	--
ESAOS	0.20	49.81	0.36	26.73	-0.16	32.98	0.31	-10.70	-0.03	-9.30
EM	0.05	12.52	0.06	16.83	0.12	29.50	0.29	4.95	0.06	17.47
EP	0.15	2.50	--	--	-0.22	-3.68	-0.09	-21.93	-0.07	-21.20
CC	0.17	9.64	0.04	9.62	0.07	16.87	0.18	2.83	0.04	9.99
CS	0.34	11.7	0.03	8.19	0.06	14.36	0.15	2.41	0.03	8.51
PERFORM	0.003	1.00	0.04	24.44	0.34	55.66	0.15	37.11	0.14	204.84

Results of synthetic analysis for strategic human capital management practices, employee capability, customer loyalty and company's financial performance (continued)

Dimension	ESAOS		EM		EP		CC		CS	
	pc	t	pc	t	pc	t	pc	t	pc	t
DEVE	0.28	4.73	--	--	--	--	--	--	--	--
PROT	-0.31	-5.58	--	--	-0.22	-3.68	--	--	--	--
DEPL	0.37	6.47	0.29	4.95	--	--	0.18	2.83	0.15	2.41
TCIE	--	--	--	--	--	--	--	--	--	--
ESAOS	--	--	--	--	--	--	--	--	--	--
EM	--	--	--	--	--	--	--	--	--	--
EP	--	--	--	--	--	--	--	--	--	--
CC	--	--	--	--	--	--	--	--	--	--
CS	--	--	--	--	--	--	--	--	--	--
PERFORM	--	--	--	--	-0.14	-2.12	0.17	2.54		
DEVE	0.08	22.00	0.06	16.83	--	--	0.04	9.62	0.03	8.19
PROT	0.15	38.56	0.12	29.50	--	--	0.07	16.87	0.06	14.36
DEPL	-0.06	-17.17	--	--	-0.09	-21.93	--	--	--	--
TCIE	-0.03	-9.30	0.06	17.47	-0.07	-21.20	0.04	9.99	0.03	8.51
ESAOS	--	--	0.11	32.03	0.07	20.53	0.07	18.30	0.06	15.59
EM	0.11	32.03	--	--	--	--	0.05	14.01	0.04	11.93
EP	0.07	20.53	--	--	--	--	--	--	--	--
CC	0.07	18.31	0.05	14.01	--	--	--	--	0.03	6.82
CS	0.06	15.59	0.04	11.93	--	--	0.03	6.82	--	--
PERFORM	-0.05	230.32	0.05	183.68	-0.07	-18.47	0.02	84.67	0.02	89.43
DEVE	0.36	26.73	0.06	16.83	--	--	0.04	9.62	0.03	8.19
PROT	-0.16	32.98	0.12	29.50	-0.22	-3.68	0.07	16.87	0.06	14.36
DEPL	0.31	-10.70	0.29	4.95	-0.09	-21.93	0.18	2.83	0.15	2.41
TCIE	-0.03	-9.30	0.06	17.47	-0.07	-21.20	0.04	9.99	0.03	8.51
ESAOS	--	--	0.11	32.03	0.07	20.53	0.07	18.31	0.06	15.59
EM	0.11	32.03	--	--	--	--	0.05	14.01	0.04	11.93
EP	0.07	20.53	--	--	--	--	--	--	--	--
CC	0.07	18.31	0.05	14.01	--	--	--	--	0.03	6.82
CS	0.06	15.59	0.04	11.93	--	--	0.03	6.82	--	--
PERFORM	-0.05	230.32	0.05	183.68	-0.21	-20.59	0.19	87.21	0.02	89.43

Results of synthetic analysis for strategic human capital management practices, employee capability, customer loyalty and company's financial performance (continued)

Dimension	PERFORM	
	pc	t
DEVE	--	--
PROT	0.30	5.02
DEPL	--	--
TCIE	--	--
ESAOS	--	--
EM	--	--
EP	-0.14	-2.12
CC	0.17	2.54
CS	--	--
PERFORM	--	--
DEVE	0.04	284.26
PROT	0.04	50.64
DEPL	0.15	37.11
TCIE	0.14	204.84
ESAOS	-0.05	230.32
EM	0.05	413.84
EP	-0.07	-18.47
CC	0.02	216.26
CS	0.02	201.49
PERFORM	--	--
DEVE	0.04	284.26
PROT	0.34	55.66
DEPL	0.15	37.11
TCIE	0.14	204.84
ESAOS	-0.05	230.32
EM	0.05	413.84
EP	-0.21	-20.59
CC	0.19	218.80
CS	0.02	201.49
PERFORM	--	--

nsignificant  $\beta$  coefficient is indicated by a dash.

C means path coefficient.

E means direct effect.

I means indirect effect.

T means total effect.

ou will find the definition of each dimension of HCMPs, employee capability and customer loyalty mentioned above (i.e., IDEN, DEVE, PROT, DEPL, TCIE, ESAOS, EM, EP, CC and CS) in Appendix 5.

PERFORM means company's financial performance.

## Notes

1. *An intervening variable is one that is both a product of the latent independent variable and a cause of the latent dependent variable (Bryman and Cramer, 1997).*
2. *Concerning the ownership of sample firms used in this study, there are 138 Taiwan-owned stores that take a valid percent of 52.1% while another 124 international owners taking 46.8% comes next. In organizational structure, 120 stores featuring several hierarchical levels of organizational structure significantly have a valid percent of 45.3%, followed by another 94 stores highlighting dependence on regulations or standards of job that take 35.5%. Concerning the orientation of organizational structure, there are 180 stores characterized by function having a valid percent of 68.2% and 169 are characterized by geographical areas that takes 64.5%.*
3. *In the same fiscal year (2001), there are 69 stores (taking 26.4% of valid percent) with more than 20% of sales revenue coming from new product while 61 (taking 23.4%) have 16%-20% of sales revenue coming from new product.*
4. *Specification tests for multi-collinearity include the review of the tolerance and variance inflation factor for each coefficient. Specification tests for heteroscedasticity include the review of plots of the residuals and the White test (White, 1980).*

## Chapter 5 Conclusions and Implications

### 5.1 Introduction

There are numerous types of corporate strategies aiming at creating enterprise value (e.g., promote the total quality management, establish circumspect marketing channel and develop strategic human resources). This study examines several strategic factors of human capital management practices (HCMP<sub>s</sub>) that help explain variations in structural antecedents of enterprise value. As noted in the preceding chapters, HCMP<sub>s</sub> view employees' behaviour from a standpoint of human nature, not only emphasizing their performance of results but also asking those senior executives to build interactive relationships with employees and give positive encouragement in the process of working. In attempting to create those interactive relationships, strategic factors of HCMP<sub>s</sub> make the most appropriate identification, development, protection and deployment for all HCMP<sub>s</sub> in an organization.

The balanced scorecard (BSC) which originated in the early 1990<sub>s</sub> is a management tool used by Norton and Kaplan (1992, 1996a, 1996b, 1996c, 2001a and 2001b) to link enterprise vision and operating strategy with an action plan. The BSC has promoted management team's operating philosophy and enterprise vision for future development hierarchically to all employees, making them understand the practical need for the company's future trend that further enables employees' goals and efforts to be consistent with these of the company.

For the BSC of an enterprise, what revelations can the implementation of the HCMP<sub>s</sub> bring? The HCMP<sub>s</sub> of an enterprise has long been defined as a role of administrative standby, e.g., attendance and absence, distribution of pay, annual

performance appraisal and educational training, etc., that makes it difficult for HCMP<sub>s</sub> to highlight their economic value. It was not until quite recently that Tichy et al. (1982) and Snell (1992) brought forward the roles of HCMP<sub>s</sub> such as reformation promoter, strategy partner and administrative expert that a close relationship between HCMP<sub>s</sub> and corporate strategy has been delineated. Strategic practices of HCMP<sub>s</sub> are reflexes of strategy planning while the protection and deployment of strategic HCMP<sub>s</sub> are viewed as the company's asset, both of which can help the enterprise vision to be realized.

The application of the HCMP<sub>s</sub> to BSC is to focus on the development on the strength of improving employee capability that further helps to enhance enterprise growth. The flow process of HCMP<sub>s</sub> (i.e., selection, employment, training and retention of talents), therefore, is used to reveal how strategic HCMP<sub>s</sub> play the role of "scoring". In an era rife with the knowledge economy and the Internet, strategic HCMP<sub>s</sub> have an inescapable duty to play a more positive role, i.e., increase enterprise value. The actual example for enterprise value frequently applied and measured is the role played when enterprises face merger and acquisition (M&A) and most examples of M&A in recent years feature the fact that book values of those acquired are far lower than the acquired market values, with the differentiation coming from the "intellectual capital", i.e., the part of strategic HCMP<sub>s</sub><sup>1</sup>.

Earlier research on HCMP<sub>s</sub> and BSC has produced little and partly contradictory evidence about the role of moderator variables in explaining the relationship between non-financial information and financial performance. Moreover, little prior research has thus far been done to provide empirical evidence either supporting or refuting simultaneous links among non-financial metrics and their intervening effects on

corporate performance of firms taking HCMP<sub>s</sub> and BSC into consideration. This is particularly true with respect to the use of personnel control mechanisms that has been shown to be an important moderator in justifying the relationship between strategic HCMP<sub>s</sub> and employee capability.

The present study indicates that an effective implementation of strategic HCMP<sub>s</sub> is regarded as a pre-requisite step to practise BSC successfully. Employee capability, customer loyalty and financial performance of firms implementing strategic HCMP<sub>s</sub> are imbued with the same spirit with each being related. Just think: it shall be actually a castle in the air that one enterprise with a high market share and continuous business growth still can sustain a long-term operation while its employee capability has kept on falling, quality of products has long been criticized by consumers, and the whole batch of products has always been suffering from being returned. Consequently, the present study advocates: while evaluating the performance for an enterprise practising strategic HCMP<sub>s</sub> and BSC, one issue that should be explored is how the relationship between strategic HCMP<sub>s</sub> and employee capability is moderated by personnel control mechanisms, and how the moderated effect brings an influence to the intervening relationship between employee capability and corporate performance caused by customer loyalty.

The main purpose of this study is to develop and empirically test a model linking non-financial information with financial performance by integrating several sources of literature concerning HCMP<sub>s</sub> and BSC and using a survey-based research method. Drawing on previous research, the present study argues that the moderating effect of personnel control mechanisms on the relationship between strategic HCMP<sub>s</sub> and employee capability influences corporate performance indirectly through the linkage

between employee capability and customer loyalty. This study also argues that the aforementioned effect is related to the intervening relationship between strategic HCMP<sub>s</sub> and customer loyalty, and between employee capability and corporate performance.

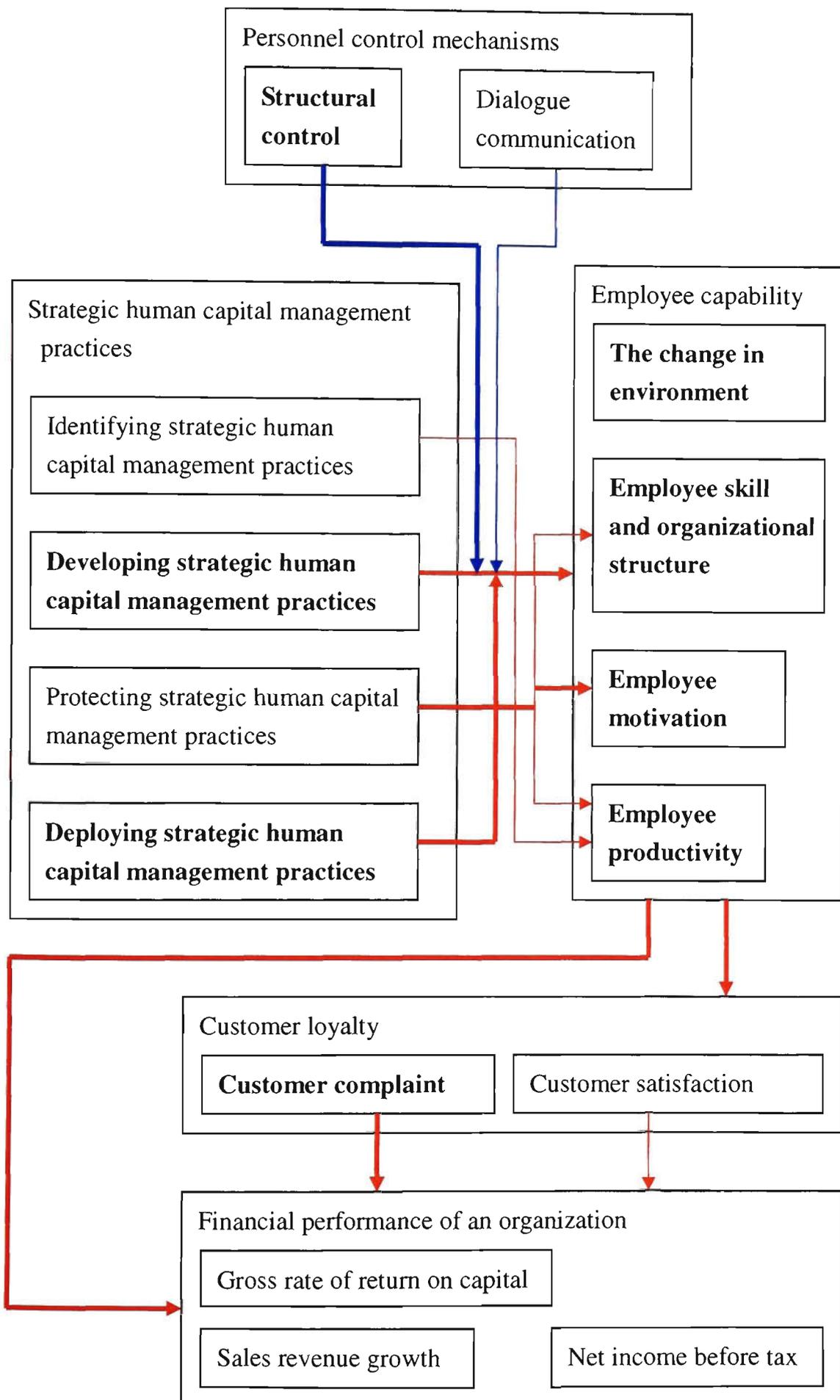
In the selection of samples, an application of strategic HCMP<sub>s</sub> has a significance to enterprises implementing Total Quality Management (TQM) (Oliver and Davies, 1990) and Just-in-Time (JIT) inventory control (Klein, 1991); hence, corporations implementing TQM and JIT currently are the main objects of this study. Using a sample of 265 Taiwan and China managers from various stores, the moderator hypothesis is tested. Two dimensions of personnel control mechanisms are paired with four strategy factors (e.g., identification, development, protection and deployment) of HCMP<sub>s</sub> and four outcome variables of employee capability, generating 32 possible moderating effects.

The interactions of each strategy factor of HCMP<sub>s</sub> and every moderator overall explain additional variance in the criteria. There is much evidence that the moderating relationships between strategy factors of HCMP<sub>s</sub> and each dimension of employee capability are mostly caused by the first moderator (i.e., structural control) of personnel control mechanisms. The moderating effects found in the second moderator (i.e., dialogue communication) of personnel control mechanisms are few and of modest strength. In 14 out of the 32 possible interactions (43.75%), significant moderated effects are found (Table 4-8 and 4-9). The evidence has shown some support of the moderator hypothesis postulated.

In the case of the relationship between the identification of strategic HCMP<sub>s</sub> and employee productivity, the development of strategic HCMP<sub>s</sub> and each dimension of employee capability (e.g., the change in environment the organization faces, employee skill and organizational structure, employee motivation and employee productivity), the protection of strategic HCMP<sub>s</sub> and three dimensions of employee capability (e.g., employee skill and organizational structure, employee motivation and employee productivity), the deployment of strategic HCMP<sub>s</sub> and each dimension of employee capability, a high reliance on the moderators of personnel control mechanisms is associated with a stronger relationship between strategic factors of HCMP<sub>s</sub> and outcome variables of employee capability, a low need for the moderators of personnel control mechanisms with a weaker relationship, offering some support for the moderator hypothesis proposed in the present study.

As noted earlier, the present study also examines the intervening association between non-financial information and financial performance in high-tech manufacturing companies using advanced manufacturing technology and JIT inventory control and service firms implementing TQM. The results of the nested-model analysis reveal that the partially mediated model is superior to the others (i.e., null model, direct model and completely mediated model). It is evident, from the partially mediated model, that the causal relationship between employee capability and corporate performance not only stemmed from the direct impact of employee capability on corporate performance but also developed from the indirect effect through the linkage between employee capability and customer loyalty. Hypotheses concerning the intervening effects have been supported. In the following figure, significant moderator and intervening variable are indicated in bold type.

Figure 5.1 Significant moderator and intervening variable in the moderating and intervening effects



Comparing Figure 2.10 with Figure 5.1 indicates that the relationship between strategic HCMP<sub>s</sub> and employee capability is moderated by the control factor of personnel control mechanisms. Figure 5.1 also points out that the relationship between employee capability and corporate performance is affected by an intervening variable, customer complaint, and the development and deployment of strategic HCMP<sub>s</sub> act as a leading indicator of corporate performance.

## **5.2 Implications for theory development**

Several important findings emerge from this research. First, using structural equation modelling to test a theoretical model, evidence was found for the moderating relationship between strategic HCMP<sub>s</sub> and employee capability caused by personnel control mechanisms. The moderating effect is related to the competitive advantage of firms implementing strategic HCMP<sub>s</sub>, and employee capability brings an effect to the intervening relationship between strategic HCMP<sub>s</sub> and customer loyalty. The evidence reveals strong empirical support for the moderating positive relationship between the development of strategic HCMP<sub>s</sub> and employee motivation, between the protection of strategic HCMP<sub>s</sub> and employee motivation, between the deployment of strategic HCMP<sub>s</sub> and employee productivity, and between the deployment of strategic HCMP<sub>s</sub> and employee skill and organizational structure.

This study, therefore, contributes to the swiftly growing human resource management literature in that it is the first study to corroborate the moderating positive relationship between the implementation of strategic HCMP<sub>s</sub> and employee capability.

Second, this research demonstrates that one important factor of HCMP success is the degree to which the whole HCMP philosophy has been put into practice. Firms providing employees access to information about their work processes are capable of implementing strategic HCMP<sub>s</sub> for competitive advantage. This finding adds force to Kaplan and Norton's (1996 a, b and c) arguments that firms implementing BSC need a learning environment in which to work effectively since employees are expected to share information about internal business processes of their organization for continuous improvement.

Third, the evidence also reveals that structural control and dialogue communication pertaining to personnel control mechanisms are mutually reinforcing. The findings in the high-tech manufacturing companies implementing TQM and JIT inventory control provide some evidence that HCMP<sub>s</sub>-adopting firms have experienced the synergistic effects of combining structural control and dialogue communication on the moderating relationship between strategic HCMP<sub>s</sub> and employee capability. However, the conclusions must be tentative about the moderating effect of personnel control mechanisms on strategic HCMP<sub>s</sub> because no significant moderating positive relationship between the identification of strategic HCMP<sub>s</sub> and employee capability was found. This result may have been caused by cultural heterogeneity (Taiwan vs. China) and the identification of strategic HCMP<sub>s</sub> may entail a slightly different set of operational indicators across cultures.

Fourth, the analysis of structural equation modeling in this study confirms a significant intervening effect of employee capability on corporate performance through the linkage between employee capability and customer loyalty. The main contribution to theory development is in extending the line of inquiry regarding the

association between employee capabilities and financial performance in firms considering the implementation of strategic HCMP<sub>s</sub>. Another contribution is the use of a formal study of the principles underlying the design of performance measurement systems by providing evidence on both direct and indirect (via employee capability and customer loyalty) impacts of employee capability on financial performance. These findings support the view that the implementation of strategic HCMP<sub>s</sub> will be positively associated with the reliance on some dimensions of personnel control mechanisms, and there is, indeed, a significant impact of non-financial accounting information on financial performance.

Fifth, results from the nested-model analysis (Table 4.15) indicate that the partially mediated model provides a comprehensive explanation of the structural relationships among each dimension of the four multi-dimensional constructs. This is indicated by the model's fit indices. In Table 4.15, the inclusion of the relationship between employee capability and corporate finance substantially improves the model's fit indices. The addition of the relationship between strategic HCMP<sub>s</sub> and customer loyalty also significantly makes better the model's fit indices.

Using a directive rule suggested by Anderson and Gerbing (1988), the partially mediated model is found to be the most preferred one (for the reasons stated earlier). In this model, the moderating relationship between strategic HCMP<sub>s</sub> and employee capability appears consistent with research by Tichy et al. (1982). The intervening relationship between employee capability and corporate performance influenced by the aforesaid moderating effect is consistent with research by Kaplan and Norton (1996a, 1996b and 1996c). They suggested that corporate performance was likely to be a consequence of a great improvement in employee capability through the linkage

between employee capability and customer loyalty, and a number of improvements in employee capability often result from effective human resource management. The present study maintains the aforesaid structures, but there are some additions of the moderating effect of personnel control mechanisms on strategic factors of HCMPs. This clearly provides evidence for the resource-based interpretation of the BSC theory.

Sixth, Pillai et al. (1999) argue that the data used in structural equation modelling are cross-sectional and based upon subordinate perceptions, the direction of causality among latent variables may be oversimplified if only one model is evaluated. Although the present study takes up data from store managers in different geographic regions of Taiwan and China, it is evident that the strategy of testing multiple structural equation models based on a reasonable review and synthesis of the literature is definitely essential for the sensible use of the aforementioned line of attack.

### **5.3 Implications for practising managers**

The present study has significant implications for practising managers.

- Four strategic practices of HCMPs appear to function as an integrated system.
- The development and deployment of strategic HCMPs represent the indispensable facets of employee capability.
- The protection of strategic HCMPs is beneficial to employee motivation.
- A balance between dimensions of personnel control mechanisms is useful for the implementation of strategic HCMPs.
- The management methods of human resources and advanced production and marketing techniques should supplement each other.

- For those enterprises taking BSC into consideration, strategy causation and the attainment of leading indicators driving lagging ones have no limitation of organization scale and features of industry.
- In the process of an introduction of the BSC, it is necessary for senior executives to eliminate the different degrees of cognition among employees caused by insufficient communication.
- A pointless replication of other enterprises' BSC will never bring the advantages of the BSC into full play.
- It is necessary to pay attention to employees' rewards and punishments through a connection of the implementing results of the BSC with the application of strategic HCMP<sub>s</sub>.

First, the findings about strategic HCMP<sub>s</sub> suggest the four strategic practices moderated by personnel control mechanisms — identification, development, protection and deployment — appear to function as an integrated system. This encourages firms implementing TQM and JIT inventory control to invest the resources to put into practice comprehensive HCMP<sub>s</sub> and to invest in specific types of knowledge to improve efficiency of internal business processes, not just certain dimensions of strategic HCMP<sub>s</sub>.

Second, the instruments used in the present study are available for practising managers to measure their own manufacturing companies or service firms for all the constructs examined. If managers want to elicit performance beyond the call of duty among their employees, they should work at improving the development and deployment of strategic HCMP<sub>s</sub> moderated by personnel control mechanisms. The two strategic factors of HCMP<sub>s</sub> represent the indispensable facets of employee

capability and determine the quality of the products or the services the manufacturing company or the service firm is able to provide to its customers, through their effects on employee motivation and employee productivity.

Third, the negative relationships between the development and protection of strategic HCMP<sub>s</sub> and employee motivation were strongly reversed by the first moderator (i.e., structural control) of personnel control mechanisms. It is evident that store managers of firms implementing strategic HCMP<sub>s</sub> will normally be advised to be supportive and develop and protect their strategic HCMP<sub>s</sub> as much as possible.

Fourth, the evidence from the present study provides tentative support for the argument that firms taking TQM and JIT inventory control into consideration must balance structural control with dialogue communication in order to develop strategic HCMP<sub>s</sub> efficiently and then to deploy strategic HCMP<sub>s</sub> effectively. It seems that an organization implementing TQM and JIT inventory control needs to have personnel control mechanisms that enable strategic HCMP<sub>s</sub> to function very well while taking new ways to generate customer value into consideration.

Fifth, changes in human resources management by the organization have close causations with production and marketing. Should the management methods of human resources and advanced production and marketing techniques not supplement each other, competitive advantages for the organization disappear gradually.

Sixth, regardless of company size and characteristics of industry (as described in Table 4.4), for those enterprises with unclear vision and strategy, the BSC is particular about a hierarchical deduction from clarifying vision, mapping out strategy and

selecting key measuring indicators to carry out action plan. The entire implementation process can enable senior executives' intensive dialogues and confirm the enterprise vision and the development of business strategy through the process of mutual communication and opinion integration. On the other hand, aiming at those enterprises which have implemented the BSC, it may probably be that established vision, business strategy and measuring indicators will be refined due to changes in internal and external conditions when implementing the BSC.

Seventh, employees will generate a state of mind of resistance due to insecurity when confronting grave change and reformation. The introduction of the BSC, in general, will definitely be a reformation of management control systems for enterprises. Hence, it is an inescapable responsibility for senior executives to make clear and definite announcements to all employees, making them understand the direction of future development for enterprise and behavioral performance considered to be important by the enterprise and further guiding their efforts to eliminate the different degrees of cognition among employees caused by insufficient communication.

On the other hand, it is indispensable for all employees to fully comprehend what their roles are in the process of an introduction of the BSC, the reasons the company to introduce the BSC and employees' goal of efforts requested by the company. Only through good communication can employees understand the company's future operating direction and then generate a sense of trust and, eventually, can the driving force of implementing the BSC be generated. Consequently, in the process of an introduction of the BSC, the company should never neglect employees' feelings but offer sufficient information appropriately, persuading them to support the company's measures and commit their efforts for the development of the company strategy.

Eighth, never simply imitate the BSC developed by other companies while only through connection of theory of the BSC with enterprises' concrete and practical conditions can the efficacy of the BSC be brought into full play. As different companies have different backgrounds, visions and missions, strategy goals of the enterprise's BSC and its measuring indicators are different, even the same strategy goals may require different indicators for measurement. In a word, each enterprise shall develop the BSC with its own characteristics. An aimless imitation of other enterprises' BSC will never bring the advantages of the BSC into full play but would affect the accurate evaluation to enterprises' operating performance.

Ninth, even though every employee in the company is different in their own duty, the introduction of the BSC will enable everyone to understand the enterprise's strategy goals that would benefit work as a team, and further help to lift personal working ability and efficiency. To bring the effect of the BSC into full play, the implementation of the BSC in major departments is necessary so as to make the attention for each department focus on each individual's working performance. Thus, it is indispensable to pay attention to employees' rewards and punishments through a connection of the implementing results of the BSC with the application of strategic HCMP<sub>s</sub> so as to achieve a better effect.

## **5.4 Limitations**

Despite the encouraging implications mentioned above, several limitations of the present study should be noted.

- The potential for specification error resulting from the oversight of relevant dimensions.
- The possibility of measurement error developing from lengthy questionnaire items.

- The generalization of the findings is limited by no-response bias.
- The generality of the evidence is restricted by the selected samples<sup>2</sup>.
- Practical complexity appears in any statistical test of a BSC.
- Dialogue communication should be carefully used.

First, the functioning of strategic HCMP<sub>S</sub> is carried out through a set of practices providing for strategic factors of HCMP<sub>S</sub>. Competitive advantage of firms implementing strategic HCMP<sub>S</sub> is based not on individual management practice, but on a series of practices that combine to support strategic factors of HCMP<sub>S</sub>. There may be the potential for specification error resulting from the oversight of relevant dimensions. The use of a theory-based model in the present study minimizes such an error; however, it cannot be entirely ruled out.

Second, the questionnaire includes 92 items making it very lengthy. This may have given rise to measurement error, particularly for the constructs of strategic HCMP<sub>S</sub> and employee capability.

Third, the most unfavourable shortcoming of using postal surveys is to bring in non-response bias where non-respondents may hold views that are meaningfully different from those of respondents, thereby limiting the generalization of the findings of this study. Moreover, survey data suffer from the common disadvantages of self-directed behaviour information, such as imprecision from poor memory.

Fourth, the sample of the present study was limited to manufacturing companies and service firms in China and Taiwan, and particularly to organizations implementing TQM and JIT inventory control. The findings of this study are therefore limited to

these populations only.

Fifth, Malina and Selto (2000) argue that practical intricacies that will occur in any statistical test of a BSC comprise desired effects that may be brought about by other, related factors, being ascribed to the BSC. Thus, there is a need, in this study, to create better instruments for the construct of customer loyalty, such as more customer-level variables, including demographics, the uncertainty the consumer feels about the product ingredients and manufacturing quality they will experience on consumption, and the factor mitigating customer's willingness to pass positive or negative comments to friends. It may also be possible to create better instruments for the construct of employee capability, such as variables concerning the relationship between store manager's inspirational skills and employee satisfaction, and store manager's support and work stress of the employee.

Sixth, Pillai et al. (1999) argue that inadequate preparation of dialogue communication is a momentous source of poor corporate performance and that the aptitude to communicate organizational knowledge and strategy in an effective manner may be a root of competitive advantage. The second moderator (i.e., dialogue communication) of personnel control mechanisms should be more carefully used, since, when moderated too much, it may bring strongly unhelpful impacts to employee skill and organizational structure and employee motivation.

## **5.5 Further research**

Various limitations mentioned above suggest avenues for future research.

First, as more and more successful organizations implementing strategic HCMPs attempt to link everything to the constructs of the BSC, it might be useful to examine

the various antecedents of eliciting performance beyond the call of duty among employees. For instance, the impact of strategic factors of HCMP<sub>s</sub> on managers' subjective evaluations of subordinates, and more objective indicators of performance needs investigation. Specifically, managerial performance appraisal depends on a detailed knowledge about outcomes associated with managerial actions or knowledge about cause-effect relationships.

Govindarajan (1984) argues that the uncertainty of task environment refers to unpredictability in the actions of the employees, customers, suppliers, competitors and regulatory groups. The essential consequence of uncertainty is to limit the ability of organization to pre-determine and quantify desired targets. Based on this line of research and the findings of the present study, it would be worthwhile to examine whether an increase in eliciting performance beyond the call of duty includes the assessment of the interrelationship between structural control (initial stages of personnel control mechanisms) and dialogue communication (later stages of personnel control mechanisms) and the differential relationships they obtain with the measurements of corporate performance.

Second, in the situation of the present tendency of dismissal in Taiwan and China, companies implementing strategic HCMP<sub>s</sub> are more and more trusting in the exceptional exertions of fewer and fewer employees. Tichy et al. (1982) argue that managers who govern companies with much experience in managing diversity may have to balance the requirement in reducing recruitment with coordinating and communicating a concern for human resource management of the organization. Thus, it might be useful to examine the various antecedents of the protection and

deployment of strategic HCMP<sub>s</sub> and assess the empirical interrelationships among strategic factors of HCMP<sub>s</sub> in the context of layoffs.

Third, corporate performance is a function of variables both from inside an organization (e.g., employee capability, plant and equipment, and other resources for increasing economies of scope) and from outside the organization (e.g., competitiveness in the market place, the fluctuation of the macro-economy and other factors having an effect on economies of scale). The sample employed in this study consists of only five large manufacturing companies and service firms. The results cannot be generalized beyond large professional service firms and international companies trusting in advanced manufacturing technology without further research. The effects of strategic factors of HCMP<sub>s</sub>, in particular, and the consequence of important economic resources, in general, needs to be examined further in other countries to test the generalizability of this study's results.

Fourth, the functioning of the development, protection and deployment of strategic HCMP<sub>s</sub> simultaneously could allow firms implementing BSC to serve their customers in helpful and exclusive ways that are difficult to mimic. These firms may, for example, be able to develop special services in particular geographic regions by deploying uniquely valuable knowledge and skills and managing them effectively. Thus, it might be useful to examine a human resource-competitive strategy contingency fit, especially research on economic resources and competitive strategies for increasing economies of scope and having an effect on economies of scale. Whether firms with relatively complex structures and much experience in implementing BSC may benefit from the new way of developing strategic factors of

HCMP<sub>S</sub>, particularly if these firms do not have strong human capital, needs to be examined further.

Fifth, this study reveals that strategic HCMP<sub>S</sub> have performance implications. It also shows that early investments in strategic HCMP<sub>S</sub> (e.g., strategic identification of HCMP<sub>S</sub>) may not create sufficient revenues to make up for the costs (i.e., the cost of monitoring for ensuring quality outcomes and the cost of general management for assigning tasks, coordinating activities and evaluating employees). Hitt et al. (2001) argue that time is required to develop managerial skills, to build social capital and to manage the firm's other human capital. It might be helpful to examine when investments in strategic HCMP<sub>S</sub> (i.e., creating valuable tacit knowledge and building intellectual employee capability) begin to reap substantial benefits, and when these investments become less costly. It seems that the design of management accounting systems should provide accounting information for all organizational levels in order to stimulate the design of monitoring and leveraging human capital. However, information required is generally non-accounting in nature and controls are not effectively captured in financial reports. For example, professional hubris sometimes turns away effective monitoring and leveraging of human capital (Hitt et al., 2001). In this study no attention was paid to the complexities of a multi-faceted management accounting system with the information functionality mentioned above. Future research might involve studies investigating the relationship between applying and leveraging of strategic HCMP<sub>S</sub>.

Sixth, it is difficult to explain, conceptually, why this study finds the moderating relationship between strategic HCMP<sub>S</sub> and employee capability caused by structural control (and not dialogue communication) to be significant. Perhaps employees

regard structural control as instrumental in acquiring rewards and appreciation from the manager, although inspirational motivation and intellectual stimulation are more likely to be the result of dialogue communication. Obviously, this unanticipated consequence in the present study draws attention to the need to test the moderated effects of personnel control mechanisms on strategic HCMPs in other settings, perhaps taking up a longitudinal design.

## Notes

1. *Generally, senior executives of those acquiring enterprises will emphasize business strategy, production line, brand name, channel and accounting assets at the very inception of acquisition. Those usually neglected come as the advantages of core competency, intellectual capital, enterprise culture and human resources, and it is necessary for those enterprises intending to conduct acquisitions to evaluate the explicit part (business strategy, production line) as well as the tacit part (core competency, intellectual capital, enterprise culture and human resources). General speaking, the relationship between acquiring and acquired enterprises should be a supplemental one, while the role of HCMPs lies in playing a role of "scoring" so as to create enterprise value and profit at the time of merger and acquisition (Hitt et al., 1990).*
2. *Some of the selected samples in this study come from Mainland China upon conducting interview with top managers, both in China and Taiwan, with the results indicating that:*
  - (i) *Disadvantageous factors for China in economic development are limited international market, restriction of domestic resources, difficulty in reform of organizational system, and issues of financial bad debts.*

(ii) *Though a country with a big market, the domestic trade in China has turned out to be regional with serious trading barriers between each province that lead to a quite difficult business promotion. For example, though not in infringement of regulations of WTO, there are high tax payments for many important products which are sold trans-regionally that would not really enable Taiwanese businessmen to share the market. Consequently, small regional businesses such as convenience stores, supermarket and chain stores are most easily successful in Mainland China.*

(iii) *Taiwanese products are neither recognized as domestic ones nor as foreign ones, while Taiwanese businessmen can hardly take a good control of channels and have been squeezed out by the local and foreign enterprises. The urgent matter right now is finding a position on the life cycle of products to develop their own brands and channels.*

(iv) *Should the domestic resources in Taiwan not be sufficient to support large-scale enterprises (e.g., electronic corporations with annual operating revenue over one hundred billion dollars) for further development, those enterprises with their head office established in Taiwan may carry out international division of work and resources allocation by recognizing Mainland China and Taiwan as the same core market.*

## **Appendix 1: Invitation letter, the item structure of the questionnaire (English version) and variable factors for each dimension of four multi-dimensional constructs after deleting items with poor inconsistency**

### o Invitation letter

Dear Participants,

I am working towards a Doctor of Philosophy degree. The research project being undertaken seeks to assess the relevance of the adoption of the balanced scorecard (BSC) and the implementation of human capital management practices (HCMPs) by Taiwanese and China companies through the theoretical models of organizational management and strategic control. To ensure the validity of results a reply to the attached questionnaire would be greatly appreciated.

You are invited to participate in this project. While your cooperation in completing the questionnaire is valued, your participation is voluntary. The results will be used only in an aggregated form and therefore your anonymity and the confidentiality of your responses are assured. The completed questionnaire will be securely stored and available only to the supervisors and myself. The only people to have access to the codes are my supervisors and myself.

The results will be contained in the thesis which will be available at the Victoria University of Technology library. It is also hoped that aspects of the results will be published in aggregate in various professional and academic journals.

Your participation would be appreciated and I look forward to receiving your completed questionnaire by the end of ( ). Should you have any queries regarding the project or questionnaire, please feel free to contact me on (04) 26326833 or e-mail: [ccying2001@yahoo.com.tw](mailto:ccying2001@yahoo.com.tw) or my senior supervisor, Professor Robert Clift on e-mail: [bob.clift@vu.edu.au](mailto:bob.clift@vu.edu.au). Your reply can be returned to my collection base in 14 Ln 127 Yung-Tung St., Lung-Chin, Taichung, Taiwan in the prepaid envelope supplied.

Thank you in anticipation of your cooperation.

Yours faithfully,

Chun-Che Chen

## The item structure of the questionnaire (English version)

In recent years, the balanced scorecard (BSC) has been implemented in organizations that recognize that managers need more than traditional financial measures to run their businesses well. The BSC links individual efforts and accomplishments to business unit objectives and serves a strategic feedback system.

Many firms have recently been emphasizing the use of non-financial measures, such as employee capability, product quality and customer loyalty, as an integral part of their management control system. In addition, many firms have begun to question the appropriateness of traditional financial measures and controls, and intend to redesign their management control system to include more non-financial measures and controls.

In today's "information-age" or "new economy", a firm's primary strategic resource is often knowledge. However, financial statements do not adequately capture human capital. Therefore, how firms that exercise strategic human capital management practices design their management control system is very important.

The following items structure of a questionnaire studies the links between strategic human capital management practices, employee capability, customer loyalty and company financial performance. Thus, this study will provide useful information about these links and will be published in professional and academic journals. Your responses will be treated as strictly CONFIDENTIAL and no information gained from this survey will be identified with any particular person or organization; therefore, do

not identify yourself or your organization on this questionnaire (unless you desire to receive a copy of our results, in which case you should provide your mailing address in the space provided on the last page of this questionnaire). Please note we have written these questions to be applicable to many types of business and industry and we know the language used may not exactly apply to your situation. Nevertheless, please answer the questions as best you can. If you are certain that your response would be misleading, please leave the specific question unanswered. We begin with demographic questions about personal and business conditions, and then, strategic human capital management practices, employee capability, customer loyalty and company financial performance.

Thank you very much.

## Section 1: Demography

1. What is your gender?

a) Male

b) Female

2. To which of the following age group do you belong?

a) Under 25

b) 25-35

c) 36-45

d) 46-55

e) 56-65

f) Over 65



7. How many years have you worked in your current position?

- a) Less than 5       b) 5-10       c) 11-15   
 d) 16-20       e) More than 20

8. Have you ever had foreign training or work experience?

- a) Yes       b) No

If 'Yes', please indicate in which country you had foreign training or work experience. \_\_\_\_\_

## Section 2: Company characteristics

9. Please indicate the number of employees in your business unit (e.g., store)

- a) Less than 15       b) 16-30       c) 31-45   
 d) 46-60       e) More than 60

10. Please indicate paid-up registered capital of your company?

- a) Less than 1.00 million NT\$   
 b) 1.01-5.00 million NT\$   
 c) 5.01-10.00 million NT\$   
 d) 10.01-20.00 million NT\$   
 e) 20.01-50.00 million NT\$   
 f) 50.01-100.00 million NT\$

g) More than 100.00 million NT\$

11. Is your company a wholly Taiwan-owned company?

or

Is your company closely held by a group of international owners?

a) Taiwan-owned company      Yes       No

b) International owners hold your company      Yes       No

12. Please describe the organizational structure of your company by circling the number linked to the descriptor.

	Not at all	Slightly	Moderately	Significantly	Extremely
a) Centralized decision-making authority	1	2	3	4	5
b) Several hierarchical levels of organizational structure (Vertical differentiation)	1	2	3	4	5
c) Dependence on regulations or standards of job	1	2	3	4	5
d) Other (Please put in details)	1	2	3	4	5

13. Please indicate how your organizational structure is organized.

	Yes	No
a) By function	<input type="checkbox"/>	<input type="checkbox"/>
b) By products or line of products	<input type="checkbox"/>	<input type="checkbox"/>
c) By geographical areas	<input type="checkbox"/>	<input type="checkbox"/>
d) By strategic business units (SBU)	<input type="checkbox"/>	<input type="checkbox"/>
e) Other (Please specify) _____		

14. Please indicate whether your company has an improvement program for competitive advantage or not

	Yes	No
a) Selective staffing	<input type="checkbox"/>	<input type="checkbox"/>
b) Comprehensive training	<input type="checkbox"/>	<input type="checkbox"/>
c) Building relationships with customers and suppliers	<input type="checkbox"/>	<input type="checkbox"/>
d) Pay attention to the insight of individual managers and workers	<input type="checkbox"/>	<input type="checkbox"/>

15. Please indicate the sales revenue (in Taiwan money, million) of your store in the last financial year

a) Less than 1.00	<input type="checkbox"/>	b) 1.01-5.00	<input type="checkbox"/>	c) 5.01-10.00	<input type="checkbox"/>
d) 10.01-20.00	<input type="checkbox"/>	e) 20.01-50.00	<input type="checkbox"/>	f) 50.01-100.00	<input type="checkbox"/>
g) More than 100.00	<input type="checkbox"/>				

16. Please indicate the percentage of sales revenue of your store which comes from new products or services (Please make an estimate)

- a) Less than 5 %       b) 6 % -10 %       c) 11 % - 15 %   
 d) 16 % - 20 %       e) More than 20 %

17. Please indicate the percentage of sales revenue of your three largest principal competitors' in your industry in the past year which come from new products and services (Please make an estimate)

- a) Less than 15 %       b) 16 % -25 %       c) 26 % - 35 %   
 d) 36 % - 45 %       e) More than 45 %

### Section 3: strategic human capital management practices

According to Barney (1991), strategic human capital management practices comprise extensive recruitment and selective staffing, comprehensive training procedures, the experience of talented employees, the relationships with customers and suppliers, and insight of individual managers and workers in a firm. In other words, strategic human capital management practices is to identify, to develop, to protect and to deploy strategic human capital for recognizing and rewarding employee merit, and

providing the firm with a sustainable competitive advantage and, thereby, a superior return on strategic human capital management practices.

18. How important is each of the following for sustaining your organization's competitive advantage?

	Not at all	Slightly	Moderately	Significantly	Extremely
a) "State of the Art" facilities	1	2	3	4	5
b) Geographical dispersion of sites	1	2	3	4	5
c) "New" technology	1	2	3	4	5
d) Patents	1	2	3	4	5
e) Strategic human capital	1	2	3	4	5
f) Knowledge of customers	1	2	3	4	5
g) Fixed assets	1	2	3	4	5
h) Other (Please specify)					

19. Please indicate the extent of your agreement or disagreement with the following statements.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) It would be easy for an experienced manager to come into your organization and work efficiently without any additional firm-specific training	1	2	3	4	5
b) Employees are key resources to achieving and sustaining competitive advantage of your company	1	2	3	4	5
c) Human capital is one kind of strategic resources	1	2	3	4	5
d) Employees are the most important elements in your strategic plan	1	2	3	4	5
e) Every employee knows what his or her job is and how it contributes to corporate goals	1	2	3	4	5
f) All employees contribute to achieving the firm's competitive advantage	1	2	3	4	5

20 How much time would it take for a newly hired store manager to learn the firm-specific tasks necessary to be as effective as the current manager?

- a) Less than one month       b) One to two months   
 c) Two to three months       d) Three to four months   
 e) Four to five months       f) More than five months

21. How much time is required for a newly hired manager with experience in the industry to become adequately familiar with firm-specific knowledge of your products and customers?

- a) Less than one month       b) One to two months   
 c) Two to three months       d) Three to four months   
 e) Four to five months       f) More than five months

22. How necessary is each of the following for sustaining your organization's success ?

	Not at all	A little	Medium	Very	Critically
a) Skills	1	2	3	4	5
b) Experience	1	2	3	4	5
c) Knowledge	1	2	3	4	5

23. To what extent is there an understandable sequence of rules that can be followed by the managers performing tasks in your organization?

Very hard	A little hard	A little easy	Very easy	Critical easy
1	2	3	4	5

24. Is the knowledge base held by your managers primarily specific to your organization?

Not at all	A little	Medium	Very	Critically
1	2	3	4	5

25. Are managerial duties in your organization repetitious?

a) Yes                       b) No

26. To what extent would you say managerial tasks in your work unit perform repetitive activities?

Not at all	A little	Medium	Very	Critically
1	2	3	4	5

27. If your firm has ever operated strategic human capital management practices, who initiated the idea of strategic use of human capital?

a) Top management

b) Accounting / Financial managers

c) Production managers

d) Customer service managers

e) Administrative managers

f) Other (Please specify) \_\_\_\_\_

28. Please indicate the level of importance of each of the following factors in product pricing by circling the number linked to the descriptor

	Not important	A little important	Medium important	Very important	Critically important
a)Product cost	1	2	3	4	5
b)Customers	1	2	3	4	5
c)Competitors	1	2	3	4	5
d)Other (Please specify) _____					

29. How many new products and / or services have been marketed during the past five years by your industry?

- a) Less than one     b) One to five     c) Six to ten   
 d) Eleven to fifteen     e) Sixteen to twenty     f) More than twenty

30. Please rate the success of implementation of strategic human capital management practices for your company?

- a) Very poor     b) Poor     c) Average   
 d) Good     e) Very good

31. Using the following five-point scale, select the descriptor which best describes the impacts of strategic human capital management practices on the balanced scorecard by circling the number linked to the descriptor.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) I am so busy with producing routine reports that I have little time for direct involvement in decision-making	1	2	3	4	5
b) For the use of strategic human capital management practices, my role is to present relevant information to decision-makers.	1	2	3	4	5

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
c)For strategic decisions (The impact is over two or more years), it is not my role to recommend appropriate courses of actions.	5	4	3	2	1
d)For operating decisions (The impact is within one year), it is not my role to challenge the plans and actions of operating executives.	5	4	3	2	1

32. Please indicate the level of importance of each of the following statements that most closely describes your experience of strategic human capital management practices.

	Not important	A little important	Medium important	Very important	Critically important
a)Strategic human capital management practices are not operated in my company.	1	2	3	4	5
b) Strategic human capital management practices are operated in my company, but I am not involved with it.	1	2	3	4	5

	Not important	A little important	Medium important	Very important	Critically important
c) Strategic human capital management practices are operated in my company, and I help to operate the system.	1	2	3	4	5
d) I initiated the introduction of strategic human capital management practices.	1	2	3	4	5
e) I am responsible for the implementation of strategic human capital management practices.	1	2	3	4	5

33. Please describe the extent to which you agree or disagree with each statement of providing the operating techniques of strategic human capital management practices by circling the number linked to the descriptor.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) I feel good when I place the managerial staffing process in my company	1	2	3	4	5

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
b) I feel good when I know my company spent much money in selecting persons for managerial positions	1	2	3	4	5
c) I want my company to consider an extensive employee selection process for managerial positions	1	2	3	4	5
d) I believe that an important part of being a good CEO is to select the best person for a managerial position	1	2	3	4	5
e) I believe that the knowledge base held by my superior is primarily specific to my company	1	2	3	4	5

34. How extensive is the training process for members of your work unit?

Not extensive	A little extensive	Medium extensive	Very extensive	Critically extensive
1	2	3	4	5

35. How much priority is placed on training employees in your unit?

Very little	A little	No opinion	Moderate amount	A great deal
1	2	3	4	5

36. How formal or structured is the training process?

Very unstructured	A little unstructured	No opinion	Somewhat structured	Very structured
1	2	3	4	5

37. What percentage of persons has received training last year?

- a) Less than 1 %     b) 1 %~10%     c) 11%~20%
- d) 21%~30%     e) 31%~40%     f) 41%~50%
- g) More than 51 %

38. On average, how many hours of formal training does a typical member of your work unit receive per year?

- a) Less than 1     b) 1 ~10     c) 11~20
- d) 21~30     e) 31~40     f) 41~50
- g) More than 51

39. How many different kinds of training programs are available for members of your work unit to attend?

- a) Less than 3       b) 3 ~5       c) 6 ~10   
 d) 11~15       e) 16 ~ 20       f) 21~ 25   
 g) More than 25

40. How much money is spent on training individuals in your work unit (measured in Taiwan dollars, thousand)?

- a) Less than 1,000       b) 1,001~ 2,000       c) 2,001~ 3,000   
 d) 3,001~4,000       e) 4,001~ 5,000       f) 5,001~ 6,000   
 g) More than 6,000

41. Do you feel training is viewed as a cost or as an investment?

- a) Viewed as a cost       b) Viewed as an investment   
 c) Neither a cost nor an investment       d) No opinion

42. The plan of strategic human capital management practices can take many forms, depending on the particular needs of an organization. In your company, preparation of corporate plans and annual budgets are according to the following pattern (Please select one):

- a) The corporate plan of strategic human capital management practices provides the framework for the annual budget. The plan is prepared first and annual budgets for the life of the plan fit with the plan.
- b) Annual budget is set on the basis of current year's needs of strategic human capital management practices. The corporate plan of strategic human capital management practices is adjusted to fit with current annual budget.
- c) The corporate plan of strategic human capital management practices is modified on the basis of last year's plan and fits with current needs, and annual budget is set to fit with the modified corporate plan.
- d) The annual budget and the corporate plan of strategic human capital management practices are decided simultaneously.
- e) The corporate plan of strategic human capital management practices is not a working document and is not referred to annual budget during the process of the preparation of the budget.

43. Using the following five-point scale, select the descriptor which best describes your perceptions of financial and non-financial performance measures.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) Non-financial performance measures (e.g., customer satisfaction, customer complaint and employee motivation) are more important than financial measures (e.g., sales revenue growth) in determining compensation for store managers	1	2	3	4	5
b) Non-financial performance measures are the usual basis for awarding performance or bonus remuneration to store managers	1	2	3	4	5
c) Team performance measures are more important relative to the importance of individual performance measures in determining compensation for store managers	1	2	3	4	5

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
d)Employee related measures (e.g., employee turnover, job satisfaction) are important in determining store managers' compensation	1	2	3	4	5
e)It would be easy for an experienced store manager to come into your company and work efficiently without any additional firm-specific training	1	2	3	4	5
f)In your company, human capital is a strategic resource and employees are key to achieving and sustaining firm's competitive advantage	1	2	3	4	5

44. To what extent are each of the following measures used to evaluate managers' performance? Please circle the appropriate number.

	Never	Rarely	Sometimes	Regularly	Very frequently
a)Sales revenue growth	1	2	3	4	5

	Never	Rarely	Sometimes	Regularly	Very frequently
b)New services or programs developed by the store manager	1	2	3	4	5
c)Personnel development (e.g., the increase in the number of training courses)	1	2	3	4	5
d)Public imagine (e.g., public meetings attended, letters of complaint or thanks, etc.)	1	2	3	4	5
e)Cost control	1	2	3	4	5
f)The effectiveness of cost reduction	1	2	3	4	5
g)Employee satisfaction	1	2	3	4	5
h)Growth in net income before tax	1	2	3	4	5
i)Gross rate of return on capital	1	2	3	4	5

	Never	Rarely	Sometimes	Regularly	Very frequently
j)Tobin's q	1	2	3	4	5
k)Subjective evaluation by the superior	1	2	3	4	5
l) Comparison with the financial performance of other stores in comparable areas	1	2	3	4	5

#### Section 4: Personnel control mechanisms

45.How important is it to select the best person for a managerial position in your organization? Please indicate your response by circling the number linked to the descriptor.

Not at all	A little	Medium	Very	Critically
1	2	3	4	5

46. In general, how many weeks does it take to select someone for a managerial position in your business unit once the job becomes open?

- a) Less than one       b) One       c) Two
- d) Three       e) Four       f) Five
- g) More than five

47. How many people are involved in the selection of staff in your organization?

- a) Less than two       b) Two       c) Three   
 d) Four       e) Five       f) Six   
 g) More than six people

48. How much money is generally spent in selecting people for a managerial position?

- a) Very little       b) A little       c) No opinion   
 d) Moderate       e) A great deal

49. How many applicants are screened for each person hired for a managerial position?

- a) Less than 10 people       b) 11-20 people       c) 21-30 people   
 d) 31-40 people       e) 41-50 people       f) 51-60 people   
 g) More than 60 people

50. How important is the staffing process for your business unit?

- a) Very little       b) A little       c) No opinion   
 d) Moderate       e) A great deal

51. How important is the non-financial dimension of strategic human capital management practices (e.g., job enrichment interventions, formal information sharing, labour-management participation, realistic job previews, grievance procedures) in your organization?

Not at all	A little	Medium	Very	Critically
1	2	3	4	5

52. How important is the financial dimension of strategic human capital management practices (e.g., incentive compensation, advancement opportunity, performance appraisal, valued relationship with specific co-workers) in your organization?

Not at all	A little	Medium	Very	Critically
1	2	3	4	5

53. Please indicate the extent of your agreement or disagreement with each of the following statement for your company by circling the appropriate number

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) Control reports received by senior managers are highly summarized	1	2	3	4	5

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
b) Management control systems are highly tailored to suit differing business unit and store needs	1	2	3	4	5
c) In the last three years there has been a great change in the management control system	1	2	3	4	5
d) The financial goal is set by senior manager in annual budget report	1	2	3	4	5
e) All store and department managers have whole participation in budget setting	1	2	3	4	5
f) Budget setting is coordinated by the financial department	1	2	3	4	5
g) Each store decides its financial goal and frame the budget report	1	2	3	4	5

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
h) The work of each store is governed by standardized procedures or working practices	1	2	3	4	5
i) Store managers abide by spending ceilings which cannot be exceeded under any circumstances	1	2	3	4	5
j) Prior approval is required when the expenditure of a store or department is in excess of budget report	1	2	3	4	5
k) Store or department managers are frequently reminded of the requirements of the budget report containing spending ceilings	1	2	3	4	5

54. Non-financial dimension of strategic human capital management practices (e.g., job enrichment interventions, formal information sharing, labor-management participation, realistic job previews, grievance procedures, etc.) is more important than financial dimension of strategic human capital management practices (e.g.,

incentive compensation, advancement opportunity, performance appraisal, valued relationship with specific co-workers, etc.) in your organization?

Not at all	A little	No opinion	More	Much more
1	2	3	4	5

55. How important is each of the following activities for managing your store or department? Please circle the appropriate number

	Not at all	A little	Medium	Very	Critically
a) Informal communications among the subordinates (e.g., inter-personal contacts) for providing information to the superior	1	2	3	4	5
b) Formal communications (e.g., memos, policy statements, manuals, etc.) for providing information to the superior	1	2	3	4	5
c) Coordination of working practices among stores or departments	1	2	3	4	5

	Not at all	A little	Medium	Very	Critically
d) Regular meetings within stores for supplying information to managers	1	2	3	4	5
e) Regular meetings among stores or departments for supplying information and coordinating activities	1	2	3	4	5

56. Please choose the statement which best describes the management philosophy of your store. It is likely that there will be elements of each description which fit with your store, but please choose the one which is most appropriate for your store, and enter your choice below.

TYPE A It is most concerned about efficiency (minimizing cost) in management. Stability is preferred, with few innovations unless innovations result in cost reduction. In other words, type A is primarily concerned with cost efficiency in the provision of existing products and seeks out cost efficient practices.

TYPE B It actively seeks out new opportunities and challenges and looks for new ways of working practices. Continual innovation and experimentation are preferred. In other words, type B tries to find the chance of innovations and ask

for being involved in pilot programs to test new products. Cost efficiency is not the vital concern, although it remains important.

TYPE C It consciously and systematically looks for learning how competitors perform their functions. There is a desire to know what new processes and products are being developed, but new ideas are not tried out until they are proven. In addition, once innovation activities have been established by competitors, they are quickly taken on. Cost efficiency for existing products is of prime concern.

TYPE D It appreciates stability but introduces the modification when external environments require. Knowledge of new ideas and practices is not actively sought out but may be acquired through informal communication with other stores. Changes occur largely in response to external events.

YOUR STORE:

 A

 B

 C

 D

(Please tick one)

Do you have any comments on the management philosophy of your store?

57. Every store places its own emphasis on different management items, depending on the specific circumstances of the store. For each of the following statements, please indicate the extent of your agreement with the statement as describing the situation in your store by circling the appropriate number.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
a) Ensuring that products are produced at least costs is extremely important to this store	1	2	3	4	5
b) Heavy emphasis is placed on searching for new products and programs	1	2	3	4	5
c) Maintaining current actual levels of products and programs is a priority for this store	1	2	3	4	5
d) Maintaining current actual levels is emphasised in budget setting	1	2	3	4	5
e) Research and development are systematically carried out	1	2	3	4	5
f) Trying to find new ideas for programs and products is undertaken annually	1	2	3	4	5

## Section 5: Employee capability

Use the following five-point scale and select the descriptor which best describes the change of your environment by circling the number linked to the descriptor.

58. How would you classify the market activities of your competitors during the past five years?

Very stable	A little stable	No opinion	Somewhat dynamic	Very dynamic
1	2	3	4	5

59. How stable or dynamic is the external economic and technological environment facing your company?

Very stable	A little stable	No opinion	Somewhat dynamic	Very dynamic
1	2	3	4	5

60. During the past five years, the preferences of your customers have become easier or harder to predict?

Very easy to predict	A little easy to predict	No opinion	A bit hard to predict	Very hard to predict
1	2	3	4	5

61. How often do new scientific discoveries emerge in your industry?

Seldom	Occasionally	No opinion	Quite often	Extremely often
1	2	3	4	5

62. During the past five years, how have the legal, political, and regulatory constraints surrounding your firm changed?

Very stable	A little stable	No opinion	Somewhat dynamic	Very dynamic
1	2	3	4	5

63. How intense is each of the following activities in your industry: (i) Bidding for raw materials, (ii) Price competition for products, (iii) Competition for employees?

Not at all	A little intense	No opinion	A bit intense	Very intense
1	2	3	4	5

Select the descriptor which best describes each attribute of your environment by using the following five-point scale and circling the number linked to the descriptor.

	None	Slight	Moderate	Significant	Extreme
64. Variation in technical complexity for producing the products in your company	1	2	3	4	5
65. Complexity of the production process in your company	1	2	3	4	5
66. Diversity in products of your company	1	2	3	4	5
67. Flexibility of manufacturing facility in your company	1	2	3	4	5
68. Intensity of capital equipments in your company	1	2	3	4	5
69. Variation in competitors in your industry	1	2	3	4	5

70. How important do you perceive each of the following product / service characteristics offered by your store to be?

	Not at all	A little	Medium	Very	Critically
a) Price	1	2	3	4	5
b) Quality	1	2	3	4	5
c) Cost	1	2	3	4	5
d) Variety of products / services	1	2	3	4	5
e) Reliability	1	2	3	4	5
f) Delivery performance	1	2	3	4	5
g) Other (Please specify)	1	2	3	4	5

71. How many kinds of products (or services) were produced (or provided) by your company last year?

- a) Less than 10       b) 11 - 20       c) 21 - 30
- d) 31 - 40       e) 41 - 50       f) 51 - 60
- h) More than 60

72. Which budget setting method has your firm used?

- a) Top-down       b) Bottom-up       c) Participative
- d) Other (Please specify) \_\_\_\_\_

73. Please indicate the level of importance of the budget to each of the following functions by circling the number linked to the descriptor.

	Not at all	A little	Medium	Very	Critically
a) Cost control	1	2	3	4	5
b) Performance evaluation	1	2	3	4	5
c) Reward	1	2	3	4	5
d) Operational planning	1	2	3	4	5
e) Decentralized decisions	1	2	3	4	5
f) Other (Please specify)	1	2	3	4	5
_____					

74. What proportion of the workforce receives formal performance appraisals?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

75. What is the proportion of the workforce whose performance appraisals are used to determine their compensation?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

76. Which of the following promotion decision rules do your company use most often?

- |   |                      |
|---|----------------------|
| a) Merit or performance rating alone                  | <input type="text"/> |
| b) Seniority only if merit is equal                   | <input type="text"/> |
| c) Seniority when meeting a minimum merit requirement | <input type="text"/> |
| d) Seniority alone                                    | <input type="text"/> |

(Item is reverse-coded)

77. For the five positions that your firm hires most frequently, how many qualified applicants apply for each position (on average)?

- |             |                      |            |                      |
|-------------|----------------------|------------|----------------------|
| a) Under 25 | <input type="text"/> | b) 25-35   | <input type="text"/> |
| c) 36- 45   | <input type="text"/> | d) 46 -55  | <input type="text"/> |
| e) 56-65    | <input type="text"/> | f) Over 65 | <input type="text"/> |

78. For the five positions that your firm hires most frequently, what is the intensity of their recruiting efforts (e.g., selection ratio, on average)?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

79. What is the proportion of the workforce who is included in a formal information-sharing program (e.g., a newsletter)?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

80. What is the proportion of the workforce whose job has been subjected to a formal task analysis?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

81. What proportion of non-entry level jobs have been filled with in recent two years?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

82. What proportion of the workforce is conducted an attitude survey on a regular basis?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

83. What is the proportion of the workforce who participates in Quality of Work Life (QWL) programs, Quality Circles (QC), and / or labor-management participation teams?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

84. What is the proportion of the workforce who has access to company incentive plans, profit-sharing plans, and / or gain-sharing plans?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

85. What is the average number of hours of training received by a typical employee over the last 12 months?

- |             |                      |            |                      |
|-------------|----------------------|------------|----------------------|
| a) Under 25 | <input type="text"/> | b) 25-35   | <input type="text"/> |
| c) 36- 45   | <input type="text"/> | d) 46 -55  | <input type="text"/> |
| e) 56-65    | <input type="text"/> | f) Over 65 | <input type="text"/> |

86. What is the proportion of the workforce who has access to a formal grievance procedure and / or complaint resolution system?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

87. What proportion of the workforce is administered an employment test prior to hiring?

- |              |                      |             |                      |
|--------------|----------------------|-------------|----------------------|
| a) Under 25% | <input type="text"/> | b) 25%-35%  | <input type="text"/> |
| c) 36%- 45%  | <input type="text"/> | d) 46% -55% | <input type="text"/> |
| e) 56%-65%   | <input type="text"/> | f) Over 65% | <input type="text"/> |

## Section 6: Customer loyalty

Please select the descriptor which best describes each attribute of your customer value by using the following five-point scale and circling the number linked to the descriptor.

	Strongly disagree	Somewhat disagree	A little disagree	Very agree	Critically agree
88. An important part of my task is to ensure compliance with customer complaints	1	2	3	4	5

89. To what extent would you like your customers to develop customer satisfaction?

The degree to which your store could raise the price of products as a percentage before the customer's willingness to buy again next time (given that the customer has indicated his / her likelihood to repurchase).

- a) Less than 5 %       b) 6 % - 10 %       c) 11 % - 15 %   
 d) 16 % - 20 %       e) More than 20 %

90. To what extent would you like your customers to develop customer satisfaction?

The degree to which your store could lower the price of products as a percentage before the customer's reluctance to buy again next time (given that the customer has indicated his / her unwillingness to repurchase).

- a) Less than 5 %       b) 6 % - 10 %       c) 11 % - 15 %   
 d) 16 % - 20 %       e) More than 20 %

91. Have you ever recommended your store as a place to purchase to your friends?

- a) Yes       b) No

If your answer is 'Yes', please indicate the frequency of your recommendation by circling the appropriate item.

- a) About once a month       b) Two to three times a month   
 c) Very frequent       d) No opinion

92. Please indicate the level of importance of each of the following factors in consumer loyalty by circling the number linked to the descriptor

	Not at all	A little	Medium	Very	Critically
a) An employee's perception of the store's overall climate for service friendliness	1	2	3	4	5
b) Store head recognizes and appreciates sales clerks' friendliness toward customers	1	2	3	4	5
c) Your store asks your customers to evaluate sales clerks' service friendliness	1	2	3	4	5
d) Did your customer just purchase one kind of product from your store?	1	2	3	4	5
e) If your customer needs to buy a new product, he / she will not come to your store	1	2	3	4	5

	Not at all	A little	Medium	Very	Critically
f) If your customer needs to buy a new product, he / she will visit your store	1	2	3	4	5
g) Your customer will recommend your store to his / her friends when they need to buy new products	1	2	3	4	5
h) Your customer will recommend your store when he / she chats with his / her friends about your store's products	1	2	3	4	5
i) Other	1	2	3	4	5
(Please specify)	_____				

## **Variable factors for each dimension of four multi-dimensional constructs after deleting items with poor inconsistency**

### **Part 1**

**1. The first dimension (identifying strategic human capital management practices) of the first construct (strategic human capital management practices) is constructed as follows.**

Q<sub>1</sub>: How important is 'new technology' for sustaining your organization's competitive advantage: (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: How important is 'patents and other like assets' for sustaining your organization's competitive advantage: (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>3</sub>: How important is 'knowledge of customers' for sustaining your organization's competitive advantage: (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**2. The second dimension (developing strategic human capital management practices) of the first construct (strategic human capital management practices) is constructed as follows.**

Q<sub>1</sub>: How necessary is 'experience of store head' for sustaining your organization's competitive advantage? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: How necessary is 'knowledge of store head' for sustaining your organization's competitive advantage? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>3</sub>: To what extent is there an understandable sequence of rules that can be followed by the managers performing tasks in your organization? (1 = very hard, 2 = a little hard, 3 = a little easy, 4 = very easy, 5 = critical easy).

**3. The third dimension (protecting strategic human capital management practices) of the first construct (strategic human capital management practices) is constructed as follows.**

Q<sub>1</sub>: To what extent would you say managerial tasks in your work unit perform repetitive activities? (1 = not at all, 2 = a little, 3 = somewhat, 4 = very, 5 = critically).

Q<sub>2</sub>: How important is 'product cost' in the product pricing of your company? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>3</sub>: How important is 'competitors' in the product pricing of your company? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>4</sub>: How important is the following situation describing your experience of strategic human capital management practices? Strategic human capital management practices are employed in your company, but you have never involved with it. (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>5</sub>: How important is the following situation describing your experience of strategic human capital management practices? Strategic human capital management practices are employed in your company, and you help to operate this system. (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**4. The fourth dimension (deploying strategic human capital management practices) of the first construct (strategic human capital management practices) is constructed as follows.**

- Q<sub>1</sub>: In your company, you are responsible for the implementation of strategic human capital management practices? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).
- Q<sub>2</sub>: You feel good when you place the managerial staffing process in your company? (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).
- Q<sub>3</sub>: You want your company to consider an extensive employee selection process (e.g., the use of tests, interviews, etc.) for a managerial position once the position becomes open? (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).
- Q<sub>4</sub>: You believe that an important part of being a good CEO is to select the best person for a managerial position in your company? (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

## **Part 2**

### **1. The first dimension (the control factor of personnel control mechanisms) of the second construct (personnel control mechanisms) is constructed as follows.**

- Q<sub>1</sub>: In your company, management control systems are highly tailored to suit differing business unit and store needs? (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).
- Q<sub>2</sub>: In your company, each store or department sets its own financial goals to frame the current budget? (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).
- Q<sub>3</sub>: In your company, the work within each store or department is governed by the use of standardized operating procedures or working practices? (1 = strongly

disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

**2. The second dimension (the communication-coordination factor of personnel control mechanisms) of the second construct (personnel control mechanisms) is constructed as follows.**

Q<sub>1</sub>: How important is the coordination of the work among different stores or departments? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: How important is the regular meeting within stores or departments to supply information to store head or department manager? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>3</sub>: How important is the regular meeting between stores or departments to supply information and coordinate activities? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**Part 3**

**1. The first dimension (the change in environment) of the third construct (employee capability) is constructed as follows.**

Q<sub>1</sub>: How would you classify the market activities of your competitors during the past five years? (1 = very stable, 2 = a little stable, 3 = neither stable nor dynamic, 4 = somewhat dynamic, 5 = very dynamic).

Q<sub>2</sub>: How stable or dynamic is the external economic and technological environment facing your company? (1 = very stable, 2 = a little stable, 3 = neither stable nor dynamic, 4 = somewhat dynamic, 5 = very dynamic).

Q<sub>3</sub>: During the past five years, how have the legal, political, and regulatory constraints surrounding your firm changed? (1 = very stable, 2 = a little stable, 3 = neither stable nor dynamic, 4 = somewhat dynamic, 5 = very dynamic).

**2. The second dimension (employee skill and organizational structure) of the third construct (employee capability) is constructed as follows.**

Q<sub>1</sub>: How complex is the service providing or production process in your company? (1 = none, 2 = slight, 3 = moderate, 4 = significant, 5 = extreme).

Q<sub>2</sub>: How flexible is the service providing or manufacturing facility in your company? (1 = none, 2 = slight, 3 = moderate, 4 = significant, 5 = extreme).

Q<sub>3</sub>: In your company, how intensive is the capital equipment of the production process? (1 = none, 2 = slight, 3 = moderate, 4 = significant, 5 = extreme).

**3. The third dimension (employee motivation) of the third construct (employee capability) is constructed as follows.**

Q<sub>1</sub>: In your company, how important is the control of the price of products to employee motivation? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: In your company, how important is the control of the quality of products to employee motivation? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>3</sub>: In your company, how important is the variety of products to employee motivation? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>4</sub>: In your company, how important is budgeting to cost control? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**4. The fourth dimension (employee productivity) of the third construct (employee capability) is constructed as follows.**

Q<sub>1</sub>: In your company, how important is budgeting to operational planning? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: In your company, how important is budgeting to decentralized decisions? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**Part 4**

**1. The first dimension (customer complaint) of the fourth construct (customer loyalty) is constructed as follows.**

Q<sub>1</sub>: How important is the following factor to the reduction of customer complaint: an employee's perception of the store's overall climate for service friendliness? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: How important is the following factor to the reduction of customer complaint: store head recognizes and appreciates sales clerks' friendliness toward customers? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

**2. The second dimension (customer satisfaction) of the fourth construct (customer loyalty) is constructed as follows.**

Q<sub>1</sub>: How important is the following factor to the increase in customer satisfaction: your customer will recommend your store to his friend when he needs to buy a new product? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

Q<sub>2</sub>: How important is the following factor to the increase in customer satisfaction: your customer will recommend your store to his friend when he chats with his friends about your store's products? (1 = not at all, 2 = a little, 3 = medium, 4 = very, 5 = critically).

## Appendix 2: The item structure of the questionnaire (Chinese version)

### 第一段：個人背景資料

1. 請問您是：(請在題號前\_\_作答，以下各題同)

- (a) 男性
- (b) 女性

2. 請問您的年齡是：

- (a) 25 歲以下
- (b) 25~35 歲
- (c) 36~45 歲
- (d) 46~55 歲
- (e) 56~65 歲
- (f) 65 歲以上

3. 請問您的最高學歷是：

- (a) 高中（高職）
- (b) 專科
- (c) 大學
- (d) 碩士
- (e) 博士

4. 請問您在那裏完成您的最高學歷？

- (a) 台灣
- (b) 美國
- (c) 英國
- (d) 澳洲
- (e) 其他（請說明地區）\_\_\_\_\_

5. 在您的公司，請問您的職級是

低階 → 中階 → 高階  
 1 2 3 4 5 6 7

6. 在您的公司，請問您的職務是(請圈選一項)

- (a)行銷 (b)生產 (c)會計 (d)財務
- (e)工程 (f)一般管理 (g)採購
- (h)其他(請說明)\_\_\_\_\_

7. 您在目前的職位上已工作幾年？

- (a) 3 年以下

- (b) 3~5 年
- (c) 6~10 年
- (d) 11~20 年
- (e) 20 年以上

8. 您是否曾在國外接受訓練或工作過？

- (a) 是
- (b) 否

如果您的回答是“是”，請說明您在那個國家或地區曾經受過訓練或工作過\_\_\_\_\_

## 第二段：公司基本資料

9. 請問您的商店共有多少員工？

- (a) 15 人以下
- (b) 16~30 人
- (c) 31~45 人
- (d) 46~60 人
- (e) 60 人以上

10. 請問您公司的登記資本額是多少？

- (a) 新台幣 100 萬元以下
- (b) 新台幣 101~500 萬元
- (c) 新台幣 501~1000 萬元
- (d) 新台幣 1001~2000 萬元
- (e) 新台幣 2001~5000 萬元
- (f) 新台幣 5001 萬~1 億元
- (g) 新台幣 1 億元以上

11. 請問您的公司是台資公司嗎？

- (a) 是
- (b) 否

請問您的公司是外資公司嗎？

- (a) 是
- (b) 否

2.請就下列四項問題分別圈選出您的公司的組織結構：(請圈選一種選項，例如：答案是 1，就圈 ①，以下各題同)

	完全不是	稍微是	有部分是	大部分是	完全是
(a)中央極權式的決策方式	1	2	3	4	5
(b)分層負責式的決策方式	1	2	3	4	5
(c)依循工作準則或員工手冊的決策方式	1	2	3	4	5
(d)其他(請說明)	1	2	3	4	5

13.請問您公司的組織結構的組成方式

	是	否
(a)按單位的功能來組成	<input type="checkbox"/>	<input type="checkbox"/>
(b)按產品或產品線來組成	<input type="checkbox"/>	<input type="checkbox"/>
(c)按營業區域來組成	<input type="checkbox"/>	<input type="checkbox"/>
(d)按商業策略的共同性來組成	<input type="checkbox"/>	<input type="checkbox"/>
(e)其他(請說明)	<input type="checkbox"/>	<input type="checkbox"/>

14.為保持良好的獲利狀況，請問您的商店是否已有下列各項的改善計劃？

	是	否
(a)甄選新進員工	<input type="checkbox"/>	<input type="checkbox"/>
(b)廣泛的在職訓練	<input type="checkbox"/>	<input type="checkbox"/>
(c)與客戶及供應商建立良好的關係	<input type="checkbox"/>	<input type="checkbox"/>
(d)搜集經理人和員工對公司長遠的發展的建議	<input type="checkbox"/>	<input type="checkbox"/>

15.請問您的商店在去年的銷貨收入是

- (a)新台幣 100 萬元以下
- (b)新台幣 101~500 萬元
- (c)新台幣 501~1000 萬元
- (d)新台幣 1001~2000 萬元
- (e)新台幣 2001~5000 萬元
- (f)新台幣 5001 萬~1 億元
- (g)新台幣 1 億元以上

16.請問您商店的總銷貨收入中，有多少的百分比是來自新產品的銷售？

- (a)低於 5%
- (b)6%~10%
- (c)11%~15%
- (d)16%~20%

(e)20%以上

17.在您公司所屬的產業中，三家最大的市場競爭者他們去年的銷貨收入中，大約有多少的百分比是來自新產品的銷售？

- (a)低於 15%
- (b)16%~25%
- (c)26%~35%
- (d)36%~45%
- (e)45%以上

第三段：下列各項問題和您公司目前人力資源的使用狀況有關

18.爲了保持您公司的獲利狀況，下列各項敘述對您公司的重要性如何？

	完全不重要	稍微重要	有些重要	很重要	極爲重要
(a)管理的技巧	1	2	3	4	5
(b)多角化的經營	1	2	3	4	5
(c)新技術的發展	1	2	3	4	5
(d)專利的發明	1	2	3	4	5
(e)開發人力資源	1	2	3	4	5
(f)與顧客建立友好關係	1	2	3	4	5
(g)添購硬體設備	1	2	3	4	5
(h)其他(請說明)	1	2	3	4	5

19.請就下列各項敘述，圈選出您同意或不同意的程度？

	完全不同意	很不同意	稍微不同意	同意	完全同意
(a)一位有經驗的經理人，在您的公司，不須要再受額外的訓練，即可把工作處理得很好	1	2	3	4	5
(b)員工是您的公司維持獲利狀況的重要資產	1	2	3	4	5
(c)人力資源是您公司執行經營策略的一項重要資源	1	2	3	4	5
(d)在規劃經營策略時，公司員工被視爲最重要的因素	1	2	3	4	5
(e)在您的公司，每位員工都很清楚他的職務內容，及該項內容對公司目標完成的貢獻	1	2	3	4	5

- (f)您的公司相信，所有員工對達成公司的預期獲利狀況均有貢獻。 1 2 3 4 5
- 20.對新任的經理人而言，他需要多少時間才能在職務的執行上，像前任經理人一樣的勝任愉快？
- (a)1 個月以內  
(b)1~2 個月  
(c)2~3 個月  
(d)3~4 個月  
(e)4~5 個月  
(f) 5 個月以上
- 21.對一位有經驗的新聘經理人而言，他需要多少時間才能對公司的產品及顧客有充分的瞭解？
- (a)1 個月以內  
(b)1~2 個月  
(c)2~3 個月  
(d)3~4 個月  
(e)4~5 個月  
(f) 5 個月以上
- 22.在您公司所屬的產業中，
- (a) 生產技術是公司成功的必要因素
- |       |      |      |     |      |
|-------|------|------|-----|------|
| 完全不必要 | 稍微必要 | 有些必要 | 很必要 | 極為必要 |
| 1     | 2    | 3    | 4   | 5    |
- (b) 經驗是公司成功的必要因素
- |       |      |      |     |      |
|-------|------|------|-----|------|
| 完全不必要 | 稍微必要 | 有些必要 | 很必要 | 極為必要 |
| 1     | 2    | 3    | 4   | 5    |
- (c) 經理人的專業知識是公司成功的必要因素
- |       |      |      |     |      |
|-------|------|------|-----|------|
| 完全不必要 | 稍微必要 | 有些必要 | 很必要 | 極為必要 |
| 1     | 2    | 3    | 4   | 5    |
- 23.在您的公司，當經理人執行任務時，可供遵循的規則或程序，其難易程度為何？
- (a)很難遵循  
(b)有點難遵循  
(c)稍微容易遵循  
(d)容易遵循  
(d) 很容易遵循  
(e)
- 24.在您的公司，經理人所擁有的專業能力和知識，對市場競爭者而言，其特殊的程度如何？
- (a)一點都不特殊

- (b)不特殊
- (c)有點特殊
- (d)很特殊
- (e)非常特殊

25.在您的公司，經理人是否經常做重複性的例行工作，而少有創意。

- (a)是
- (b)否

26.在您的公司，經理人的職務內容其重複程度如何？

- (a)一點都不重複
- (b)有些不重複
- (c)只有少部分不重複
- (d)有部分重複
- (e)完全重複

27.如果您的公司，已經執行人力資源的策略運用，請問下列那一個人最先提出此種構想？

- (a)總經理。
- (b)會計部經理或財務部經理。
- (c)生產部經理。
- (d)顧客服務部經理。
- (e)管理部經理。
- (f) 其他(請說明)\_\_\_\_\_

28.在您的公司，有關產品定價的各項決定因素，其重要程度為何？(請圈選一項)

	完全不重要	稍微重要	有些重要	很重要	極為重要
(a)產品成本	1	2	3	4	5
(b)顧客	1	2	3	4	5
(c)競爭的廠商	1	2	3	4	5
(d)其他	1	2	3	4	5
(請說明)_____					

29.在過去的五年內，您的產業已經開發出多少種新的產品？

- (a)完全沒有
- (b)1~5 種
- (c)6~10 種
- (d)11~15 種
- (e)16~20 種
- (g) 20 種以上

30.請就下列各選項，圈出最適宜表達您公司執行策略性人力資源的進展績效。

- (a)績效很差
- (b)績效不好
- (c)績效普通
- (d)績效良好
- (e)績效極佳

#### 第四段：甄選人才

31.當您的單位店面經理人的職務有空缺時，適時地對外甄選人才重要嗎？(請圈選一項)

- 完全不重要   稍微重要   有些重要   重要   非常重要
- 1                      2                      3                      4                      5

32.當您的單位店面經理人的職務有空缺時，大約要花多少時間才能完成甄選人才的工作？

- (a)一個星期以內
- (b)一個星期
- (c)二個星期
- (d)三個星期
- (e)四個星期
- (f)五個星期
- (h)五個星期以上

33.當您的單位店面經理人的職務有空缺時，大約有多少人來參與該項職位的甄選工作？

- (a)10 人以下
- (b)11~20 人
- (c)21~30 人
- (d)31~40 人
- (e)41~50 人
- (f)51~60 人
- (g)60 人以上

34.當您的單位店面經理人的職務有空缺時，大約要花多少錢才能完成甄選人才的工作？

- (a)新台幣 1000 元以下(很少)
- (b)新台幣 1000~3000 元(一點點)
- (c)新台幣 3000~5000 元(適量)
- (d)新台幣 5000 以上(很多)
- (e)不清楚要花多少錢

35.當您的單位店面經理人的職務有空缺時，大約有多少人來應徵該項職位？

- (a)10 人以上      (e)41~50 人  
 (b)11~20 人      (f)51~60 人  
 (c)21~30 人      (g)60 人以上  
 (d)31~40 人

36.在您的工作單位，隨時甄選及進用新的員工，重要嗎？

- 完全不重要   稍微重要   有些重要   重要   非常重要  
 1                    2                    3                    4                    5

### 第五段：人事控制

37.在您的公司，激勵員工努力工作的非金錢誘因(例如：職務調動、休假…等)重要嗎？

- 非常不重要   稍微重要   有些重要   重要   非常重要  
 1                    2                    3                    4                    5

38.在您的公司，激勵員工努力工作的金錢誘因(例如:加薪，各項獎金的給予、升遷…等)重要嗎？

- 非常不重要   稍微重要   有些重要   重要   非常重要  
 1                    2                    3                    4                    5

39.請就下列各項敘述，圈選出您同意或不同意的程度。

- |                                       | <u>非常不同意</u> | <u>很不同意</u> | <u>難以表達意見</u> | <u>同意</u> | <u>非常同意</u> |
|---------------------------------------|--------------|-------------|---------------|-----------|-------------|
| (a)高階經理所得到的管理控制訊息是來自於各店面經理所彙整的評估報告    | 1            | 2           | 3             | 4         | 5           |
| (b)管理控制制度已做過適當的修正，它適合於各不同的營業單位及各店面的需要 | 1            | 2           | 3             | 4         | 5           |
| (c)在最近3年內，管理控制制度已有大幅度的修改              | 1            | 2           | 3             | 4         | 5           |
| (d)在編列年度預算時，財務目標是由高階經理來制定             | 1            | 2           | 3             | 4         | 5           |
| (e)在編列年度預算時，所有的店面經理均有全程參與的權利          | 1            | 2           | 3             | 4         | 5           |
| (f)年度預算在編列時，財務部門扮演居中協調的角色             | 1            | 2           | 3             | 4         | 5           |
| (g)每一店面設定其年度財務目標用以編列其年度預算             | 1            | 2           | 3             | 4         | 5           |
| (h)每一店面的營業活動是由標準化的                    | 1            | 2           | 3             | 4         | 5           |

## 營業程序及工作實務來指導

(i)每位店面經理所做的支出決策不得超出預算支出上限的規定	1	2	3	4	5
(j)如果店面經理要做超出預算支出上限的決策，必須事先取得上級單位的核准	1	2	3	4	5
(k)店面經理經常被要求嚴格遵守預算支出的上限規定	1	2	3	4	5

40.在您的公司，激勵員工努力工作的非金錢誘因(例如：職務調動、休假…等)遠比金錢誘因(例如：各項獎金的給予、升遷…等)重要嗎？

- (a)非金錢誘因比金錢誘因重要很多。  
 (b)非金錢誘因的重要性和金錢誘因差不多。  
 (c)金錢誘因比非金錢誘因重要很多。  
 (d)完全不需考慮金錢或非金錢的誘因。  
 (e)金錢或非金錢誘因的採用，要視公司的財務狀況而定。

41.請就下列各項敘述，圈選出重要性的強度

	非常不重要	很不重要	有些重要	很重要	極為重要
(a)採取非正式溝通的方式(例如：員工與經理人的當面溝通)以提供店面經理管理控制的訊息	1	2	3	4	5
(b)採取正式溝通的方式(如：備忘錄、公司政策宣告書、員工手冊)以提供店面經理管理控制的訊息	1	2	3	4	5
(c)由各店面經理溝通協調	1	2	3	4	5
(d)店面經理定期集會討論以提供管理控制的訊息給高階經理	1	2	3	4	5
(e)各店面經理定期集會討論，以溝通管理實務上的差異	1	2	3	4	5

42.請就下列各項敘述(即 A、B、C、D)中，圈選出您的店面所採取的管理模式:

- A：最主要的管理模式是控制成本(即講求效率實務)。追求穩定是公司的主要目標。除非創新能導致成本降低，公司很少從事創新的活動。
- B：最主要的管理模式是尋找新的市場機會及新的挑戰，不斷開發新的產品及新的嘗試是公司的主要目標。此種方式是追求公司穩定的最佳模式。因此，各店面經理勇於從事創新的活動，並促銷各種新產品。但控制成本(及追求最低成本的營運方式)並非公司最重要的管理策略。
- C：最主要的管理模式是精確而有系統地掌握市場競爭者的營業活動。試圖瞭解這些競爭者所開發的新產品及生產過程。一旦競爭者已經開發出某種新的產品或採用新的生產過程，公司將試圖跟進。此外，控制成本亦為公司最重要的管理策略之一。
- D：最主的管理模式是追求穩定，但大環境有需要時，亦得從事創新的活動。新理念的追求及新實務的培養並沒有被嚴格要求，但透過店面經理人非正式的溝通程序並針對外在環境

的需要，管理策略的變動亦經常發生。

請問您的店面是採取上述那一種管理哲學模式： A  B  C  D

(請複選)

有關您店面的管理哲學，您是否有其他的看法。請說明\_\_\_\_\_

3.請就下列各項敘述，圈選出您同意或不同意的程度。

	非常不同意	稍微不同意	稍微同意	同意	非常同意
(a)在您的公司裡，確保產品能以最低成本的方式生產，是最重要的管理模式經理管理控制的訊息	1	2	3	4	5
(b)在您的公司裡，開發新產品是最主要的管理哲學	1	2	3	4	5
(c)在您的店面裡，促銷目前既有的產品，是最重要的管理策略	1	2	3	4	5
(d)您的公司在編列預算時，維持目前的方式及型態是最主要的管理控制方式	1	2	3	4	5
(e)有系統地研究市場競爭對手的管理策略是您公司最重要的管理哲學	1	2	3	4	5
(f)在您的公司裡，每年至少一次，對各店面的經營理念加以檢討，並尋求新的突破	1	2	3	4	5

#### 第六段：顧客滿意度，顧客抱怨及員工滿意度

44.請問您同意下列的敘述嗎？「在公司裏，我的職務之一是處理與顧客抱怨有關的各項事誼。」

完全不同意   稍微不同意   有些同意   同意   非常同意  
 1                      2                      3                      4                      5

45.爲了提高顧客的滿意度，您能爲顧客服務的最高程度是什麼？例如：

顧客事前表明會再度購買本商店的商品，商品售價提高的最高百分比是多少，才不會阻止顧客再度光臨的意願。

5%以下   6%~10%   11%~15%   16%~20%   20%以上

(a)                      (b)                      (c)                      (d)                      (e)

46.爲了提高顧客的滿意度，您能爲顧客服務的最高程度是什麼？例如：

假設顧客事前表明不會再度購買本商店的商品，商品售價調低的最大百分比是多少，才會激發顧客再度光臨的意願。

5%以下   6%~10%   11%~15%   16%~20%   20%以上

(a)                      (b)                      (c)                      (d)                      (e)

47.請圈選您對下列問題的看法：

「當您的公司某項職務有懸缺時，您是否會大力推薦給您的朋友？」

(a)是                       (b)否

如果您的回答是“是”，請說明您推薦的平均次數。

(a)大約一個月一次

(b)大約一個月二次至三次

(c)非常頻繁(例如:平均每個月四次以上)

(d)沒有意見

48.店面職員所營造的友善氣氛對該店的獲利狀況有所影響，請問您認為其重要程度如何？

完全不重要   稍微重要   有些重要   很重要   極為重要

	<u>完全不重要</u>	<u>稍微重要</u>	<u>有些重要</u>	<u>很重要</u>	<u>極為重要</u>
(a)店員對店面友善氣氛的營造均極為認同	1	2	3	4	5
(b)店面經理非常重視店員對顧客表現出友善的態度	1	2	3	4	5
(c)店面經理時常要求顧客評鑒店員態度是否友善	1	2	3	4	5
(d)顧客光顧您的店面時，經常只選購一種商品	1	2	3	4	5
(e)如果顧客需要購買一種新產品，他並不會光臨您的商店	1	2	3	4	5
(f)如果顧客需要購買一種新產品，他會再度光臨您的商店	1	2	3	4	5
(g)您的顧客會推薦您的商店給他的朋友(當他的朋友需要購買一項新產品時)	1	2	3	4	5
(h)當您的顧客與他的朋友聊到您公司的產品時，他會極力推薦您的店面給他的朋友	1	2	3	4	5
(i)其他 (請註明)_____	1	2	3	4	5

第七段：對經濟變動、技術變動、產品變動和顧客偏好變動的認知

49.在過去的五年內，您公司的市場競爭者處於下列何種狀況？

非常穩定   穩定   稍微穩定   稍有變動   劇烈變動

1                      2                      3                      4                      5

50.您的公司所面對的外在經濟環境及生產技術的變動，其程度為何？

非常穩定   穩定   稍微穩定   稍有變動   劇烈變動

1                      2                      3                      4                      5

51.在過去的五年內，您公司顧客的偏好趨勢，可預測性的難易程度如何？

非常容易預測   容易預測   有點困難預測   困難預測   很困難預測

1                      2                      3                      4                      5

52.在您公司所屬的產業中，新產品的發明或生產技術的改良，出現的頻率如何？

從未出現   很少出現   有時出現   時常出現   出現頻率極高

1                      2                      3                      4                      5

53.在過去的五年內，您公司所面對的公司法的修改，及政府管制措施的變動，其程度為何？

非常穩定   穩定   稍微穩定   稍有變動   劇烈變動

1                      2                      3                      4                      5

54.在您的公司所屬的產業中，下列各項活動其競爭程度如何？

沒有競爭   稍有競爭   偶有競爭   相當競爭(區域性)   競爭很激烈

(a)原物料的採購                      1                      2                      3                      4                      5

(b)產品的價格                      1                      2                      3                      4                      5

(c)員工的聘用                      1                      2                      3                      4                      5

請就下列各項敘述(55 題-60 題)，圈選出最適合描述您公司所面對的外在環境

	<u>完全無變化</u>	<u>稍有變化</u>	<u>有些變化</u>	<u>變化大</u>	<u>有劇烈變化</u>
55.公司產品在技術層面的變化幅度	1	2	3	4	5
56.生產過程的複雜性	1	2	3	4	5
57.產品多元化	1	2	3	4	5
58.製造設備的彈性	1	2	3	4	5
59.資本設備之密集度	1	2	3	4	5
60.店面競爭的密集度	1	2	3	4	5

61.在您的公司裏，有關產品特徵及產品定價的各種決定因素，請就重要性的高低，圈選出適當的數字。

	完全不重要	稍微重要	有些重要	重要	非常重要
(a)價格	1	2	3	4	5
(b)品質	1	2	3	4	5
(c)產品成本	1	2	3	4	5
(d)需求的強弱程度及市場競爭程度	1	2	3	4	5
(e)產品的可靠性	1	2	3	4	5
(f)產品運送的績效	1	2	3	4	5
(g)其他(請說明)_____					

62.在過去的一年內，請問您的公司生產多少種產品或提供多少種服務？

- (a)10種以下
- (b)11~20種
- (c)21~30種
- (d)31~40種
- (e)41~50種
- (f)51~60種
- (g)60種以上

63.請問您的公司編列預算的方式是：

- (a)由上往下(Top-down)
- (b)由下往上(Bottom-up)
- (c)參與式的(Participative)
- (d)其他(請說明)\_\_\_\_\_

64.在您的公司裏，預算編列對下列所陳述的各項功能，其重要程度如何？

	完全不重要	稍微重要	有些重要	重要	極為重要
(a)成本控制	1	2	3	4	5
(b)績效的考核	1	2	3	4	5
(c)員工年終獎金額度的決定	1	2	3	4	5
(d)作業規劃	1	2	3	4	5
(e)分層負責，逐級授權	1	2	3	4	5
(f)其他(請說明)_____	1	2	3	4	5

第八段：運用策略性人力資源的經驗，實施策略性人力資源的技巧，及策略性人力資源對平衡計分卡的影響

65.請就下列各項敘述，圈選出您同意或不同意的程度。

	<u>非常不同意</u>	<u>稍微不同意</u>	<u>稍微同意</u>	<u>非常同意</u>	<u>無法表達意見</u>
(a)在您的公司裏，您因為忙於編製定期的財務報表，所以沒有時間參與公司營運方針的決策事誼。	1	2	3	4	5
(b)就人力資源的策略運用而言，您的職責是提供相關的訊息給公司的決策部門。	1	2	3	4	5
(c)就人力資源的長期運用而言(二年或二年以上)，提供適當的行動準則不是您的職責。	1	2	3	4	5
(d)在您的公司裏，就短期(指一年)營業政策的制定而言，政策內容的修改，及政策執行過程的變更，並不是您的職責。	1	2	3	4	5

66.下列五項敘述均被用來表達您的公司實施策略性人力資源的經驗，請就表達程度的高低，圈選出適當的數字。

	<u>完全不能表達</u>	<u>只能些微表達</u>	<u>能部分表達</u>	<u>大體上可表達</u>	<u>可充分表達</u>
(a)尚未使用策略性人力資源	1	2	3	4	5
(b)您的公司正在運用策略性人力資源，但您並未參與此項制度的設計與實施過程	1	2	3	4	5
(c)您的公司正在運用策略性人力資源，而且您有參與此項制度的設計與實施過程	1	2	3	4	5
(d)策略性人力資源的運用是您引進公司的	1	2	3	4	5
(e)運用策略性人力資源的成敗得失，	1	2	3	4	5

## 我必須要負全責

7.請就下列各項敘述，圈選出你同意或不同意的程度

(a).當您的公司實施策略性人力資源時，特別強調管理人才的聘用是有必要的。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
1                      2                      3                      4                      5

(b).當您的公司實施策略性人力資源時，編列大筆的預算用於管理人才的選拔是有必要的。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
1                      2                      3                      4                      5

(c).當您的公司運用策略性人力資源時，嚴謹的管理人才選拔過程(例如：筆試、面試)是必要的。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
1                      2                      3                      4                      5

(d).當您的公司運用策略性人力資源時，聘用優秀的管理人才是培養管理部經理的先決條件。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
1                      2                      3                      4                      5

(e).當您的公司運用策略性人力資源時，店面經理所擁有的專業知識，對公司的獲利狀況有明顯的貢獻。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
1                      2                      3                      4                      5

68.在您的工作單位裏，員工的培訓計劃，其範圍如何？(例如：職前訓練、在職訓練、各種進階研習課程)

無任何培訓計劃   只有職前訓練   只有在職訓練   含職前及在職訓練   範圍廣泛  
1                      2                      3                      4                      5

69.在您的工作單位裏，員工培訓對公司獲利狀況的影響程度如何？

毫無影響   稍有影響   只有短期的影響   影響層面廣   影響深遠  
1                      2                      3                      4                      5

70.您的工作單位裏，員工培訓計劃的內容，其周延性如何？(例如：規劃的完整性。)

事前毫無規劃   局部規劃   只有短期規劃   重點式規劃   規劃完整周延  
1                      2                      3                      4                      5

71. 在您的工作單位裏，過去一年內，接受培訓的員工佔全體員工的百分比是多少？

- (a) 0%
- (b) 1%~10%
- (c) 11%~20%
- (d) 21%~30%
- (e) 31%~40%
- (f) 41%~50%
- (g) 51%以上

72. 在您的工作單位裏，已經接受培訓的員工，每年每人接受培訓的時數是多少？

- (a) 0 小時
- (b) 1~10 小時
- (c) 11~20 小時
- (d) 21~30 小時
- (e) 31~40 小時
- (f) 41~50 小時
- (g) 51 小時以上

73. 在您的工作單位裏，有多少種的培訓計劃可以讓員工參加？(例如：公司自辦的職前訓練、在職訓練，學術機構的研習課程……)

- (a) 少於 3 種
- (b) 3~5 種
- (c) 6~10 種
- (d) 11~15 種
- (e) 16~20 種
- (f) 21~25 種
- (g) 25 種以上

74. 在過去的一年內，您公司爲了培訓員工，所花費的金錢大致上是多少？(單位:新台幣，千元)

- (a) 1,000 以內
- (b) 1,001~2,000
- (c) 2,001~3,000
- (d) 3,001~4,000
- (e) 4,001~5,000
- (f) 5,001~6,000
- (g) 6,000 以上

75. 在您的工作單位裏，員工培訓所花費的金錢，被視為一種營運成本或長期投資？

- (a) 被視為營運成本  
 (b) 被視為長期投資  
 (c) 其他(請說明)\_\_\_\_\_

76. 請就下列各項敘述，圈選出一項最能表達您公司策略性人力資源的規劃與管理

- (a) 人力資源的規畫與管理提供一個完整的編列年度預算的架構，換言之，年度預算的編列與人力資源的規劃與管理，二者息息相關
- (b) 公司年度預算的編製完全依照當年度策略性人力資源的規劃來擬訂。此外，公司策略性人力資源的規劃亦隨時調整以配合年度預算的編列
- (c) 公司本年度策略性人力資源的規劃，按照去年度公司的計劃做適當的調整，以配合本年度的需要。而本年度預算的編列亦配合修正版的策略人力資源的規劃來擬訂
- (d) 公司每年度的人力資源規劃與每年年度預算的編列均同時進行
- (e) 公司每年度的人力資源規劃，完全與年度預算的編製無關。人力資源規劃並非公司重要的營運策略

77. 請就下列各項敘述，圈選出您同意或不同意的程度

(a). 在您的工作單位裏，店面經理的薪資及年終獎金的決定，非財務績效衡量(例如：顧客滿意度的高低、顧客抱怨度的大小及員工忠誠度的大小)遠比財務績效衡量(例如：銷貨收入成長率、稅前淨利成長率、毛資本報酬率、托賓史 Q(Tobin's Q)來得重要。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
 1                      2                      3                      4                      5

(b). 在決定店面經理的績效獎金及年終獎金額度的高低時，非財務績效衡量是重要的計算基礎。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
 1                      2                      3                      4                      5

(c). 在決定店面經理的績效獎金及年終獎金額度的高低時，團隊績效的衡量比個人績效的衡量還要重要。

非常不同意   稍微不同意   稍微同意   非常同意   無意見  
 1                      2                      3                      4                      5

(d). 在決定店面經理的績效獎金及年終獎金額度的高低時，員工工作滿意度及員工離職率是重要的衡量因素。

非常不同意   稍微不同意   稍微同意   非常同意   無意見

1                      2                      3                      4                      5

(e).在您的工作單位裏，一位有經驗的店面經理人，並不需要接受公司所安排的在職訓練，就能勝任愉快。

非非常不同意   稍微不同意   稍微同意   非常同意   無意見

1                      2                      3                      4                      5

(f).在您的公司裏，人力資源是執行公司策略的一種重要資源，而員工是公司追求及維持獲利狀況的重要資產。

非常不同意   稍微不同意   稍微同意   非常同意   無意見

1                      2                      3                      4                      5

78.請就下列各項敘述，圈選出最適合用來評鑑店面經理績效的方式，並指出其被使用的頻繁程度

完全不用      很少使用      有時候用      經常用      完全採用

(a)銷貨收入成長率	1	2	3	4	5
(b)由店面經理所開發的新產品的數目	1	2	3	4	5
(c)人力資源的發展(例如:店員在職訓練所設計之訓練課程的數目)	1	2	3	4	5
(d)公共形象(例如:參與公共會議的次數，收到顧客感謝函及抱怨信的數目)	1	2	3	4	5
(e)成本控制(例如:完成店面年度預算的目標)	1	2	3	4	5
(f)店面經理降低成本的效率	1	2	3	4	5
(g)店面職員工作滿意及和諧的氣氛	1	2	3	4	5
(h)稅前淨利成長率	1	2	3	4	5
(i)毛資本報酬率	1	2	3	4	5
(j)托賓史 Q(店面經理配合股東利益的程度)	1	2	3	4	5
(k)高階經理對店面管理的主觀評價	1	2	3	4	5
(l)店面績效與同區	1	2	3	4	5

市場競爭對手之  
績效的比較

第八段：激勵員工勤奮工作的方式

79. 在您的公司所屬的各工作單位中，已實施正式的員工績效評鑑，其比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
80. 在您的公司裏，以員工的績效評鑑來決定員工報酬的高低，這種作法在您的公司所屬的各工作單位中，其比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
81. 在您的公司裏，員工績效評鑑的準則，最常被使用的，是下列那一種情況？
- (a)完全以員工績效評等為基礎，不管員工年資的大小。
  - (b)當員工績效評等相同時，以員工年資為基礎。
  - (c)當員工績效評等達到公司所要求的標準時，以員工年資為計算的基礎。
  - (d)完全以員工的年資為基礎，不管員工的績效評等。
  - (e)除以員工年資為考慮的基礎外，尚有其他因素被列為計算的基礎。
82. 在您的公司裏，最常聘用新員工的五個工作單位，平均而言，大約有多少人來應徵每一工作職位？
- (a)15 人以下
  - (b)16~30 人
  - (c)31~45 人
  - (d)46~60 人
  - (e)60 人以上
83. 在您的公司裏，當工作職位有出缺時，平均而言，每一職位的錄取百分比有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上

### 第九段：員工培訓及員工參與

- \_84. 在您的公司裏，員工可從公司的時事通訊中，獲悉公司的經營決策及管理方式的變動等各項重要訊息，這些員工所佔的比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
- \_85. 在您的公司裏，工作職位的安排及變動必須在事前經過詳細的分析及討論，這樣的工作職位所佔的比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
- \_86.在您的公司裏，人事已經凍結的工作職位，在最近三年內，其比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
- \_87.在您的公司裏，人力資源的配置及管理，必須定期被監督的比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上
- \_88.在您的公司裏，員工參與「工作生活之品質規劃 ( quality of work life) 」，「品質圈之設計 (quality circles) 」，及「勞動經營管理團隊 ( labor-management participation teams) 」等各項活動的比例有多大？
- (a)低於 5%
  - (b)6%~10%
  - (c)11%~15%
  - (d)16%~20%
  - (e)20%以上

89. 在您的公司裏，員工參與「公司利潤分配 (profit-sharing plans)」，「公司薪俸之調整 (company incentive plans)」，及「員工分紅 (gain-sharing plans)」等各項計劃的比例有多大？
- (a) 低於 5%
  - (b) 6%~10%
  - (c) 11%~15%
  - (d) 16%~20%
  - (e) 20%以上
90. 在您的公司裏，過去 12 個月內，員工已接受的在職訓練，每位員工平均時數是多少？
- (a) 15 小時以下
  - (b) 16~30 小時
  - (c) 31~45 小時
  - (d) 46~60 小時
  - (e) 60 小時以上
91. 在您的公司裏，過去 12 個月內，員工透過正式的申訴管道 (formal grievance procedure) 或糾紛調節會議 (complaint resolution system)，以表達意見的比例有多大？
- (a) 低於 5%
  - (b) 6%~10%
  - (c) 11%~15%
  - (d) 16%~20%
  - (e) 20%以上
92. 在您的公司裏，過去 12 個月內，新進員工已接受的職前訓練，每位員工平均時數是多少？
- (a) 15 小時以下
  - (b) 16~30 小時
  - (c) 31~45 小時
  - (d) 46~60 小時
  - (e) 60 小時以上

## Appendix 3 Interview questions

1. Does your company have owned many shops (stores) in Taiwan and Mainland China? From senior executives' standpoint, which kind of means of evaluation do you use often when evaluating shop (store) managers' operating performance? Do you use Tobin's q often? Why? (Some economists say that Tobin's q is one efficient means of performance evaluation.) Do you use sale revenue growth often? Why? Do you use gross rate of return on capital often? Why? Of these three means of performance evaluation, which one do you think can help you measure the shop (store) managers' efforts? Why?
2. Do each manager for those many shops (stores) differ in experience and specialties? Why? Should there be different means of communication between employees at the basic level, between shop (store) managers and employees at the basic level, between senior executives and shop (store) managers and between senior executives and employees at the basic level? Why? Which one communication do you think can be the most effective one to promote the management of human resources, encourage employees' morale and increase employees' capability? Why?
3. From senior executives' standpoint, do you think the management of human resources or the implementation of management control system can achieve a result of 'No talent is to be wasted, land should be fully utilized, the utility of things should be exhausted and to have the goods rapidly distributed among the customers'? Why?
4. From senior executives' standpoint, how do you think shop (store) managers should encourage employees at the basic level to make them work hard? Why? How senior executives should encourage shop (store) managers to enable them to do efforts in operating shops (stores)? Why?

5. From senior executives' role, how do you build a good communication channel with your subordinates when you discover they possess more production technology or specialized knowledge than you are? Would your subordinates fail to communicate with you just because of your status as a senior executive? Why? Do you ever consider your status as a senior executive that would prevent you from communicating with your subordinates? Why? Do you think 'communication' and 'control' to be supplemental each other or alternative mutually? Why?
6. Do you practice a system of 'be strict and fair in meting out rewards and punishments' immediately or conduct an overall-examination to find out all possible causes that affect operating performance and carry out benign communication between each shop (store) when you discover a great difference of operating performance for each shop (store) (suppose those shops or stores sharing the same conditions) under your ruling and management? Why? How do you conduct the communication mentioned above?
7. Have your company implemented (or is implementing) just-in-time, total quality management and activity-based costing? Do they affect human resources management? Why? Is your company's gradual increase of operating performance arising out of an implementation of the preceding three management control systems? Why?
8. Do you think a premise of implementing the balanced scorecard to be a good human resources management and a sound human resources management system? Why? Or do you think there exists no inevitable causation between 'good or bad human resources management' and 'implementation of the balanced scorecard'? Why?

## **Appendix 4 The external and internal quality of data in the LISREL model**

It is basically a confirmatory method to test the causation of theoretical models by the analytical process of LISREL (Linear Structure Relation) (i.e. developing the theoretical models, establishing the path diagram of causation and listing the parameters to be estimated, assessing the identification of models, processing the estimation of parameters, assessing the model fit). This kind of confirmatory method is usually a study that theories guide the relationship of causation, more than the one guided by data. This study presents the exploratory analysis first in Chapter 3, then followed by the confirmatory analysis. The main reason lies in: the sequence of the causation on time will not necessarily be the sufficient condition for the causation between each dimension though causation is theoretically supported between each construct, and consequently, the cause and effect model of LISREL shall be identified through the exploratory analysis first.

According to Hair et al. (1995), the structural equation modeling not only can deal with the relationship between one set of independent variables and one set of dependent variables but also the relationship among a series of dependent variables as well. Besides, the structural equation modeling can provide researchers with paths of research turning from the exploratory analysis to the confirmatory one thanks to its being able to handle the relationship among numerous sets of variables simultaneously. LISREL which is one computer software used to analyze the structural equation modeling features an advantage of offering rich output, but also generates a drawback, i.e. up to eight matrices used to give a difficulty for those rookies in writing programmes. This study works to put factors extracted from the

factor analysis into LISREL model to engage in the fit analysis of sample data and theoretical model. The entire Appendix consists of four paragraphs with the first one studying on the structural equation modeling, the second one on measurement model, the third one on the external quality of LISREL model, and the fourth one on the internal quality of LISREL model.

Based on views by Jöreskog and Sörbom (1993), there are four variables in LISREL model, among two of them latent variables, and the other two, observable variables. In latent variables, ones assumed as cause are called the latent independent variables, and ones as effect, the latent dependent variables. For observable variables, the observable indicator classified as the latent independent variables is X variable, the observable indicator classified as the latent dependent variables, Y variable. Of all these four variables, there's no directly causal relationship between the latent independent and Y variables, the latent dependent and X variables, and X and Y variables. Consequently, those four variables form five relationships listed as follows.

- 1.The relationship between the latent independent and latent independent variables;
- 2.The relationship between the latent independent and latent dependent variables;
- 3.The relationship between the latent dependent and latent dependent variables;
- 4.The relationship between the latent independent and X variables (similar to regression coefficient or factor loading); and
- 5.The relationship between the latent dependent and Y variables (similar to regression coefficient or factor loading).

For the five above-mentioned relationships, the structural equation modeling can

indicate the relationship between the latent variables while the measurement model, the relationship between the latent and observable variables. Therefore, LISREL model consists of the structural equation modeling and measurement model.

In addition five relationships mentioned in the preceding paragraph, LISREL model comprises three error terms.

- 1.The measurement error terms of X variables;
- 2.The measurement error terms of Y variables;
- 3.Residual unexplained by the latent dependent variables.

In LISREL model, there are more than one term for the latent independent, latent dependent, X and Y variables, and consequently, the above-mentioned five relationships and three error terms are matrices. These are the eight main parametric matrices of LISREL model. Figure A4.1 shown in the end of this appendix indicates one causation path of LISREL model according to theories after deleting variable factors with poor consistence. The round in this diagram indicates the latent variables, square, the observable variables, sign of arrow, the causation (effect as indicated by arrow, cause as indicated by the source of arrow), and double arrows, relevance but no causation.

### **A. Structural equation modeling**

In Figure A4.1 shown in the end of this appendix, it is inferred according to theories that causation model of LISREL has four latent independent variables and seven latent dependent variables. Factor analyses mentioned in Chapter 3 manifest the variable factors of each dimension being in conformity with the factor disposition of

each dimension of four constructs discussed in the present study.

The step to list parameters to be estimated is to transform the path diagram of the causation model of LISREL into the structural equation modeling and measurement model, and then list the parameters desired to be estimated in detail. Take Figure A4.1 shown in the end of this appendix as a basis, seven latent dependent variables can be indicated in equation and the structural equation modeling discussed in this study are as follows.

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$$\text{latent dependent variables} = \text{latent independent variables} + \text{latent dependent variables} + \text{error terms}$$

$$\eta_m \quad \xi_1 \quad \xi_2 \quad \xi_3 \quad \xi_4 \quad \eta_1 \quad \eta_2 \quad \eta_3 \quad \eta_4 \quad \zeta_m$$

$$\eta_5 \quad \eta_6 \quad \eta_7$$

$$\eta_1 = \gamma_{11}\xi_1 + \gamma_{12}\xi_2 + \gamma_{13}\xi_3 + \gamma_{14}\xi_4 + \beta_{21}\eta_2 + \beta_{31}\eta_3 + \beta_{41}\eta_4 + \zeta_1$$

$$\eta_2 = \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \gamma_{23}\xi_3 + \gamma_{24}\xi_4 + \beta_{12}\eta_1 + \beta_{32}\eta_3 + \beta_{42}\eta_4 + \zeta_2$$

$$\eta_3 = \gamma_{31}\xi_1 + \gamma_{32}\xi_2 + \gamma_{33}\xi_3 + \gamma_{34}\xi_4 + \beta_{13}\eta_1 + \beta_{23}\eta_2 + \beta_{43}\eta_4 + \zeta_3$$

$$\eta_4 = \gamma_{41}\xi_1 + \gamma_{42}\xi_2 + \gamma_{43}\xi_3 + \gamma_{44}\xi_4 + \beta_{14}\eta_1 + \beta_{24}\eta_2 + \beta_{34}\eta_3 + \zeta_4$$

$$\eta_5 = \gamma_{51}\xi_1 + \gamma_{52}\xi_2 + \gamma_{53}\xi_3 + \gamma_{54}\xi_4 + \beta_{15}\eta_1 + \beta_{25}\eta_2 + \beta_{35}\eta_3 + \beta_{45}\eta_4 + \beta_{65}\eta_6 + \zeta_5$$

$$\eta_6 = \gamma_{61}\xi_1 + \gamma_{62}\xi_2 + \gamma_{63}\xi_3 + \gamma_{64}\xi_4 + \beta_{16}\eta_1 + \beta_{26}\eta_2 + \beta_{36}\eta_3 + \beta_{46}\eta_4 + \beta_{56}\eta_5 + \zeta_6$$

$$\eta_7 = \gamma_{71}\xi_1 + \gamma_{72}\xi_2 + \gamma_{73}\xi_3 + \gamma_{74}\xi_4 + \beta_{17}\eta_1 + \beta_{27}\eta_2 + \beta_{37}\eta_3 + \beta_{47}\eta_4 + \beta_{57}\eta_5 + \beta_{67}\eta_6 + \zeta_7$$

Combine the above-mentioned seven equations and have it indicated in matrix that

will turn as:

$$\begin{pmatrix} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \\ \eta_7 \end{pmatrix} = \begin{pmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} & \gamma_{24} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} & \gamma_{34} \\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} \\ \gamma_{51} & \gamma_{52} & \gamma_{53} & \gamma_{54} \\ \gamma_{61} & \gamma_{62} & \gamma_{63} & \gamma_{64} \\ \gamma_{71} & \gamma_{72} & \gamma_{73} & \gamma_{74} \end{pmatrix} \times \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} +$$

$$\begin{pmatrix}
 0 & \beta_{12} & \beta_{13} & \beta_{14} & \beta_{15} & \beta_{16} & \beta_{17} \\
 \beta_{21} & 0 & \beta_{23} & \beta_{24} & \beta_{25} & \beta_{26} & \beta_{27} \\
 \beta_{31} & \beta_{32} & 0 & \beta_{34} & \beta_{35} & \beta_{36} & \beta_{37} \\
 \beta_{41} & \beta_{42} & \beta_{43} & 0 & \beta_{45} & \beta_{46} & \beta_{47} \\
 \beta_{51} & \beta_{52} & \beta_{53} & \beta_{54} & 0 & \beta_{56} & \beta_{57} \\
 \beta_{61} & \beta_{62} & \beta_{63} & \beta_{64} & \beta_{65} & 0 & \beta_{67} \\
 \beta_{71} & \beta_{72} & \beta_{73} & \beta_{74} & \beta_{75} & \beta_{76} & 0
 \end{pmatrix}
 \times
 \begin{pmatrix}
 \eta_1 \\
 \eta_2 \\
 \eta_3 \\
 \eta_4 \\
 \eta_5 \\
 \eta_6 \\
 \eta_7
 \end{pmatrix}
 +
 \begin{pmatrix}
 \zeta_1 \\
 \zeta_2 \\
 \zeta_3 \\
 \zeta_4 \\
 \zeta_5 \\
 \zeta_6 \\
 \zeta_7
 \end{pmatrix}$$

where  $\eta_1$  means the change in environment the organization faces.

$\zeta_1$  means identifying human capital management practices.

$\gamma_{11}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and the change in environment the organization faces (the first latent dependent variable).

$\gamma_{21}$  indicates the causal relation between identifying human capital

management practices (the first latent independent variable) and employee skill and organizational structure (the second latent dependent variable).

$\gamma_{31}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and employee motivation (the third latent dependent variable).

$\gamma_{41}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and employee productivity (the fourth latent dependent variable).

$\gamma_{51}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and customer complaint (the fifth latent dependent variable).

$\gamma_{61}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and customer satisfaction (the sixth latent dependent variable).

$\gamma_{71}$  indicates the causal relation between identifying human capital management practices (the first latent independent variable) and company's financial performance (the seventh latent dependent variable).

$\xi_2$  means developing human capital management practices.

$\gamma_{12}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and the change in environment the organization faces (the first latent dependent variable).

$\gamma_{22}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and employee skill and organizational structure (the second latent dependent variable).

$\gamma_{32}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and employee motivation (the third latent dependent variable).

$\gamma_{42}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and employee productivity (the fourth latent dependent variable).

$\gamma_{52}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and customer complaint (the fifth latent dependent variable).

$\gamma_{62}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and customer satisfaction (the sixth latent dependent variable).

$\gamma_{72}$  indicates the causal relation between developing human capital management practices (the second latent independent variable) and company's

financial performance (the seventh latent dependent variable).

$\xi_3$  means protecting human capital management practices.

$\gamma_{13}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and the change in environment the organization faces (the first latent dependent variable).

$\gamma_{23}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and employee skill and organizational structure (the second latent dependent variable).

$\gamma_{33}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and employee motivation (the third latent dependent variable).

$\gamma_{43}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and employee productivity (the fourth latent dependent variable).

$\gamma_{53}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and customer complaint (the fifth latent dependent variable).

$\gamma_{63}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and customer satisfaction (the sixth latent dependent variable).

$\gamma_{73}$  indicates the causal relation between protecting human capital management practices (the third latent independent variable) and company's financial performance (the seventh latent dependent variable).

$\xi_4$  means deploying human capital management practices.

$\gamma_{14}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and the change in environment the organization faces (the first latent dependent variable).

$\gamma_{24}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and employee skill and organizational structure (the second latent dependent variable).

$\gamma_{34}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and employee motivation (the third latent dependent variable).

$\gamma_{44}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and employee productivity (the fourth latent dependent variable).

$\gamma_{54}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and customer complaint (the

fifth latent dependent variable).

$\gamma_{64}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and customer satisfaction (the sixth latent dependent variable).

$\gamma_{74}$  indicates the causal relation between deploying human capital management practices (the fourth latent independent variable) and company's financial performance (the seventh latent dependent variable).

$\eta_2$  means employee skill and organizational structure.

$\beta_{21}$ (or  $\beta_{12}$ ) indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and employee skill and organizational structure (the second latent dependent variable).

$\beta_{32}$ (or  $\beta_{23}$ ) indicates the correlation between employee skill and organizational structure (the second latent dependent variable) and employee motivation (the third latent dependent variable).

$\eta_3$  means employee motivation.

$\beta_{31}$ (or  $\beta_{13}$ ) indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and employee motivation (the third latent dependent variable).

$\eta_4$  means employee productivity.

$\beta_{41}$  (or  $\beta_{14}$ ) indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and employee productivity (the fourth latent dependent variable).

$\beta_{42}$ (or  $\beta_{24}$ ) indicates the correlation between employee skill and organizational structure (the second latent dependent variable) and employee productivity (the fourth latent dependent variable).

$\beta_{43}$ (or  $\beta_{34}$ ) indicates the correlation between employee motivation (the third latent dependent variable) and employee productivity (the fourth latent dependent variable).

$\eta_5$  means customer complaint.

$\beta_{15}$  indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and customer complaint (the fifth latent dependent variable).

$\beta_{25}$  indicates the correlation between employee skill and organizational structure (the second latent dependent variable) and customer complaint (the fifth latent dependent variable).

$\beta_{35}$  indicates the correlation between employee motivation (the third latent dependent variable) and customer complaint (the fifth latent dependent variable).

$\beta_{45}$  indicates the correlation between employee productivity (the fourth latent dependent variable) and customer complaint (the fifth latent dependent variable).

$\eta_6$  means customer satisfaction.

$\beta_{16}$  indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and customer satisfaction (the sixth latent dependent variable).

$\beta_{26}$  indicates the correlation between employee skill and organizational structure (the second latent dependent variable) and customer satisfaction (the sixth latent dependent variable).

$\beta_{36}$  indicates the correlation between employee motivation (the third latent dependent variable) and customer satisfaction (the sixth latent dependent variable).

$\beta_{46}$  indicates the correlation between employee productivity (the fourth latent dependent variable) and customer satisfaction (the sixth latent dependent variable).

$\beta_{65}$  (or  $\beta_{56}$ ) indicates the correlation between customer complaint (the fifth latent dependent variable) and customer satisfaction (the sixth latent dependent variable).

$\eta_7$  means company's financial performance.

$\beta_{17}$  indicates the correlation between the change in environment the organization faces (the first latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\beta_{27}$  indicates the correlation between employee skill and organizational structure (the second latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\beta_{37}$  indicates the correlation between employee motivation (the third latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\beta_{47}$  indicates the correlation between employee productivity (the fourth latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\beta_{57}$  indicates the correlation between customer complaint (the fifth latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\beta_{67}$  indicates the correlation between customer satisfaction (the sixth latent dependent variable) and company's financial performance (the seventh latent dependent variable).

$\zeta_1, \zeta_2, \zeta_3, \zeta_4, \zeta_5, \zeta_6$  and  $\zeta_7$  indicate the residual error of each structural equation.

Therefore, the structural equation modeling discussed in the present study is as follows.

$$\eta = \Gamma \xi + B \eta + \zeta$$

where  $\eta$  means latent dependent variables.

$\Gamma$  is a coefficient matrix describing the direct impact of the latent independent variable on the latent dependent variable.

$\xi$  means latent independent variables.

$B$  is a coefficient matrix describing the direct impact of one latent dependent variable on another latent dependent variable.

$\zeta$  means the residual error of structural equation modeling.

## B. The measurement model

According to Figure A4.1 shown in the end of this Appendix, the observable variables  $X$  can be indicated in equation as follows.

$$\begin{aligned} X_1 &= \lambda^x_{11} \xi_1 + \delta_1 ; & X_2 &= \lambda^x_{21} \xi_1 + \delta_2 ; & X_3 &= \lambda^x_{31} \xi_1 + \delta_3 ; \\ X_4 &= \lambda^x_{42} \xi_2 + \delta_4 ; & X_5 &= \lambda^x_{52} \xi_2 + \delta_4 ; & X_6 &= \lambda^x_{62} \xi_2 + \delta_6 ; \\ X_7 &= \lambda^x_{73} \xi_3 + \delta_7 ; & X_8 &= \lambda^x_{83} \xi_3 + \delta_8 ; & X_9 &= \lambda^x_{93} \xi_3 + \delta_9 ; \\ X_{10} &= \lambda^x_{103} \xi_3 + \delta_{10} ; & X_{11} &= \lambda^x_{113} \xi_3 + \delta_{11} ; & X_{12} &= \lambda^x_{124} \xi_4 + \delta_{12} ; \\ X_{13} &= \lambda^x_{134} \xi_4 + \delta_{13} ; & X_{14} &= \lambda^x_{144} \xi_4 + \delta_{14} ; & X_{15} &= \lambda^x_{154} \xi_4 + \delta_{15}. \end{aligned}$$

where  $X_1$  means the first observable indicator of the first latent independent variable, identifying human capital management practices.

$X_2$  means the second observable indicator of the first latent independent variable, identifying human capital management practices.

$X_3$  means the third observable indicator of the first latent independent variable, identifying human capital management practices.

$X_4$  means the first observable indicator of the second latent independent

- variable, developing human capital management practices.
- $X_5$  means the second observable indicator of the second latent independent variable, developing human capital management practices.
- $X_6$  means the third observable indicator of the second latent independent variable, developing human capital management practices.
- $X_7$  means the first observable indicator of the third latent independent variable, protecting human capital management practices.
- $X_8$  means the second observable indicator of the third latent independent variable, protecting human capital management practices.
- $X_9$  means the third observable indicator of the third latent independent variable, protecting human capital management practices.
- $X_{10}$  means the fourth observable indicator of the third latent independent variable, protecting human capital management practices.
- $X_{11}$  means the fifth observable indicator of the third latent independent variable, protecting human capital management practices.
- $X_{12}$  means the first observable indicator of the fourth latent independent variable, deploying human capital management practices.
- $X_{13}$  means the second observable indicator of the fourth latent independent variable, deploying human capital management practices.
- $X_{14}$  means the third observable indicator of the fourth latent independent variable, deploying human capital management practices.
- $X_{15}$  means the fourth observable indicator of the fourth latent independent variable, deploying human capital management practices.
- $\xi_1$  means the first latent independent variable, identifying human capital management practices.
- $\xi_2$  means the second latent independent variable, developing human capital management practices.
- $\xi_3$  means the third latent independent variable, protecting human capital management practices.
- $\xi_4$  means the fourth latent independent variable, deploying human capital management practices.
- $\lambda_{11}^X$  is a coefficient describing the relation between the first latent independent variable ( $\xi_1$ ) and its first observable indicator,  $X_1$ .
- $\lambda_{21}^X$  is a coefficient describing the relation between the first latent independent variable ( $\xi_1$ ) and its second observable indicator,  $X_2$ .
- $\lambda_{31}^X$  is a coefficient describing the relation between the first latent independent variable ( $\xi_1$ ) and its third observable indicator,  $X_3$ .
- $\lambda_{42}^X$  is a coefficient describing the relation between the second latent

independent variable ( $\xi_2$ ) and its first observable indicator,  $X_4$ .

$\lambda_{52}^X$  is a coefficient describing the relation between the second latent independent variable ( $\xi_2$ ) and its second observable indicator,  $X_5$ .

$\lambda_{62}^X$  is a coefficient describing the relation between the second latent independent variable ( $\xi_2$ ) and its third observable indicator,  $X_6$ .

$\lambda_{73}^X$  is a coefficient describing the relation between the third latent independent variable ( $\xi_3$ ) and its first observable indicator,  $X_7$ .

$\lambda_{83}^X$  is a coefficient describing the relation between the third latent independent variable ( $\xi_3$ ) and its second observable indicator,  $X_8$ .

$\lambda_{93}^X$  is a coefficient describing the relation between the third latent independent variable ( $\xi_3$ ) and its third observable indicator,  $X_9$ .

$\lambda_{103}^X$  is a coefficient describing the relation between the third latent independent variable ( $\xi_3$ ) and its fourth observable indicator,  $X_{10}$ .

$\lambda_{113}^X$  is a coefficient describing the relation between the third latent independent variable ( $\xi_3$ ) and its fifth observable indicator,  $X_{11}$ .

$\lambda_{124}^X$  is a coefficient describing the relation between the fourth latent independent variable ( $\xi_4$ ) and its first observable indicator,  $X_{12}$ .

$\lambda_{134}^X$  is a coefficient describing the relation between the fourth latent independent variable ( $\xi_4$ ) and its second observable indicator,  $X_{13}$ .

$\lambda_{144}^X$  is a coefficient describing the relation between the fourth latent independent variable ( $\xi_4$ ) and its third observable indicator,  $X_{14}$ .

$\lambda_{154}^X$  is a coefficient describing the relation between the fourth latent independent variable ( $\xi_4$ ) and its fourth observable indicator,  $X_{15}$ .

$\delta_1$  means the measurement error of the observable indicator,  $X_1$ .

$\delta_2$  means the measurement error of the observable indicator,  $X_2$ .

$\delta_3$  means the measurement error of the observable indicator,  $X_3$ .

$\delta_4$  means the measurement error of the observable indicator,  $X_4$ .

$\delta_5$  means the measurement error of the observable indicator,  $X_5$ .

$\delta_6$  means the measurement error of the observable indicator,  $X_6$ .

$\delta_7$  means the measurement error of the observable indicator,  $X_7$ .

$\delta_8$  means the measurement error of the observable indicator,  $X_8$ .

$\delta_9$  means the measurement error of the observable indicator,  $X_9$ .

$\delta_{10}$  means the measurement error of the observable indicator,  $X_{10}$ .

$\delta_{11}$  means the measurement error of the observable indicator,  $X_{11}$ .

$\delta_{12}$  means the measurement error of the observable indicator,  $X_{12}$ .

$\delta_{13}$  means the measurement error of the observable indicator,  $X_{13}$ .

$\delta_{14}$  means the measurement error of the observable indicator,  $X_{14}$ .

$\delta_{15}$  means the measurement error of the observable indicator,  $X_{15}$ .

If indicated in matrix, the above-mentioned equation for 15 X is:

$$\begin{pmatrix} X_1 \\ X_2 \\ X_3 \\ X_4 \\ X_5 \\ X_6 \\ X_7 \\ X_8 \\ X_9 \\ X_{10} \\ X_{11} \\ X_{12} \\ X_{13} \\ X_{14} \\ X_{15} \end{pmatrix} = \begin{pmatrix} \lambda_{11}^X & 0 & 0 & 0 \\ \lambda_{21}^X & 0 & 0 & 0 \\ \lambda_{31}^X & 0 & 0 & 0 \\ 0 & \lambda_{42}^X & 0 & 0 \\ 0 & \lambda_{52}^X & 0 & 0 \\ 0 & \lambda_{62}^X & 0 & 0 \\ 0 & 0 & \lambda_{73}^X & 0 \\ 0 & 0 & \lambda_{83}^X & 0 \\ 0 & 0 & \lambda_{93}^X & 0 \\ 0 & 0 & \lambda_{103}^X & 0 \\ 0 & 0 & \lambda_{113}^X & 0 \\ 0 & 0 & 0 & \lambda_{124}^X \\ 0 & 0 & 0 & \lambda_{134}^X \\ 0 & 0 & 0 & \lambda_{144}^X \\ 0 & 0 & 0 & \lambda_{154}^X \end{pmatrix} \times \begin{pmatrix} \xi_1 \\ \xi_2 \\ \xi_3 \\ \xi_4 \end{pmatrix} + \begin{pmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \\ \delta_6 \\ \delta_7 \\ \delta_8 \\ \delta_9 \\ \delta_{10} \\ \delta_{11} \\ \delta_{12} \\ \delta_{13} \\ \delta_{14} \\ \delta_{15} \end{pmatrix}$$

In the same principle, the equation and matrix of the observable variables Y can be indicated as:

$$\begin{aligned}
Y_1 &= \lambda_{11}^Y \eta_1 + \varepsilon_1; & Y_2 &= \lambda_{21}^Y \eta_1 + \varepsilon_2; & Y_3 &= \lambda_{31}^Y \eta_1 + \varepsilon_3; \\
Y_4 &= \lambda_{42}^Y \eta_2 + \varepsilon_4; & Y_5 &= \lambda_{52}^Y \eta_2 + \varepsilon_5; & Y_6 &= \lambda_{62}^Y \eta_2 + \varepsilon_6; \\
Y_7 &= \lambda_{73}^Y \eta_3 + \varepsilon_7; & Y_8 &= \lambda_{83}^Y \eta_3 + \varepsilon_8; & Y_9 &= \lambda_{93}^Y \eta_3 + \varepsilon_9; \\
Y_{10} &= \lambda_{103}^Y \eta_3 + \varepsilon_{10}; & Y_{11} &= \lambda_{114}^Y \eta_4 + \varepsilon_{11}; & Y_{12} &= \lambda_{124}^Y \eta_4 + \varepsilon_{12}; \\
Y_{13} &= \lambda_{135}^Y \eta_5 + \varepsilon_{13}; & Y_{14} &= \lambda_{145}^Y \eta_5 + \varepsilon_{14}; & Y_{15} &= \lambda_{156}^Y \eta_6 + \varepsilon_{15}; \\
Y_{16} &= \lambda_{166}^Y \eta_6 + \varepsilon_{16}; & Y_{17} &= \lambda_{177}^Y \eta_7 + \varepsilon_{17}.
\end{aligned}$$

where  $Y_1$  means the first observable indicator of the first latent dependent variable, the change in environment.

$Y_2$  means the second observable indicator of the first latent dependent variable, the change in environment.

$Y_3$  means the third observable indicator of the first latent dependent variable, the change in environment.

$Y_4$  means the first observable indicator of the second latent dependent variable, employee skill and organizational structure.

$Y_5$  means the second observable indicator of the second latent dependent variable, employee skill and organizational structure.

$Y_6$  means the third observable indicator of the second latent dependent variable, employee skill and organizational structure.

$Y_7$  means the first observable indicator of the third latent dependent variable, employee motivation.

$Y_8$  means the second observable indicator of the third latent dependent variable, employee motivation.

$Y_9$  means the third observable indicator of the third latent dependent variable, employee motivation.

$Y_{10}$  means the fourth observable indicator of the third latent dependent variable, employee motivation.

$Y_{11}$  means the first observable indicator of the fourth latent dependent variable, employee productivity.

$Y_{12}$  means the second observable indicator of the fourth latent dependent

- variable, employee productivity.
- $Y_{13}$  means the first observable indicator of the fifth latent dependent variable, customer complaint.
- $Y_{14}$  means the second observable indicator of the fifth latent dependent variable, customer complaint.
- $Y_{15}$  means the first observable indicator of the sixth latent dependent variable, customer satisfaction.
- $Y_{16}$  means the second observable indicator of the sixth latent dependent variable, customer satisfaction.
- $Y_{17}$  means the observable indicator of the seventh latent dependent variable, company's financial performance.
- $\eta_1$  means the first latent dependent variable, the change in environment.
- $\eta_2$  means the second latent dependent variable, employee skill and organizational structure
- $\eta_3$  means the third latent dependent variable, employee motivation.
- $\eta_4$  means the fourth latent dependent variable, employee productivity.
- $\eta_5$  means the fifth latent dependent variable, customer complaint.
- $\eta_6$  means the sixth latent dependent variable, customer satisfaction.
- $\eta_7$  means the seventh latent dependent variable, company's financial performance.
- $\lambda_{11}^Y$  is a coefficient describing the relation between the first latent dependent variable ( $\eta_1$ ) and its first observable indicator,  $Y_1$ .
- $\lambda_{21}^Y$  is a coefficient describing the relation between the first latent dependent variable ( $\eta_1$ ) and its second observable indicator,  $Y_2$ .
- $\lambda_{31}^Y$  is a coefficient describing the relation between the first latent dependent variable ( $\eta_1$ ) and its third observable indicator,  $Y_3$ .
- $\lambda_{42}^Y$  is a coefficient describing the relation between the second latent dependent variable ( $\eta_2$ ) and its first observable indicator,  $Y_4$ .
- $\lambda_{52}^Y$  is a coefficient describing the relation between the second latent dependent variable ( $\eta_2$ ) and its second observable indicator,  $Y_5$ .
- $\lambda_{62}^Y$  is a coefficient describing the relation between the second latent dependent variable ( $\eta_2$ ) and its third observable indicator,  $Y_6$ .
- $\lambda_{73}^Y$  is a coefficient describing the relation between the third latent dependent variable ( $\eta_3$ ) and its first observable indicator,  $Y_7$ .
- $\lambda_{83}^Y$  is a coefficient describing the relation between the third latent dependent variable ( $\eta_3$ ) and its second observable indicator,  $Y_8$ .
- $\lambda_{93}^Y$  is a coefficient describing the relation between the third latent dependent variable ( $\eta_3$ ) and its third observable indicator,  $Y_9$ .

$\lambda_{103}^Y$  is a coefficient describing the relation between the third latent dependent variable ( $\eta_3$ ) and its fourth observable indicator,  $Y_{10}$ .

$\lambda_{114}^Y$  is a coefficient describing the relation between the fourth latent dependent variable ( $\eta_4$ ) and its first observable indicator,  $Y_{11}$ .

$\lambda_{124}^Y$  is a coefficient describing the relation between the fourth latent dependent variable ( $\eta_4$ ) and its second observable indicator,  $Y_{12}$ .

$\lambda_{135}^Y$  is a coefficient describing the relation between the fifth latent dependent variable ( $\eta_5$ ) and its first observable indicator,  $Y_{13}$ .

$\lambda_{145}^Y$  is a coefficient describing the relation between the fifth latent dependent variable ( $\eta_5$ ) and its second observable indicator,  $Y_{14}$ .

$\lambda_{156}^Y$  is a coefficient describing the relation between the sixth latent dependent variable ( $\eta_6$ ) and its first observable indicator,  $Y_{15}$ .

$\lambda_{166}^Y$  is a coefficient describing the relation between the sixth latent dependent variable ( $\eta_6$ ) and its second observable indicator,  $Y_{16}$ .

$\lambda_{177}^Y$  is a coefficient describing the relation between the seventh latent dependent variable ( $\eta_7$ ) and its observable indicator,  $Y_{17}$ .

$\varepsilon_1$  means the measurement error of the observable indicator,  $Y_1$ .

$\varepsilon_2$  means the measurement error of the observable indicator,  $Y_2$ .

$\varepsilon_3$  means the measurement error of the observable indicator,  $Y_3$ .

$\varepsilon_4$  means the measurement error of the observable indicator,  $Y_4$ .

$\varepsilon_5$  means the measurement error of the observable indicator,  $Y_5$ .

$\varepsilon_6$  means the measurement error of the observable indicator,  $Y_6$ .

$\varepsilon_7$  means the measurement error of the observable indicator,  $Y_7$ .

$\varepsilon_8$  means the measurement error of the observable indicator,  $Y_8$ .

$\varepsilon_9$  means the measurement error of the observable indicator,  $Y_9$ .

$\varepsilon_{10}$  means the measurement error of the observable indicator,  $Y_{10}$ .

$\varepsilon_{11}$  means the measurement error of the observable indicator,  $Y_{11}$ .

$\varepsilon_{12}$  means the measurement error of the observable indicator,  $Y_{12}$ .

$\varepsilon_{13}$  means the measurement error of the observable indicator,  $Y_{13}$ .

$\varepsilon_{14}$  means the measurement error of the observable indicator,  $Y_{14}$ .

$\varepsilon_{15}$  means the measurement error of the observable indicator,  $Y_{15}$ .

$\varepsilon_{16}$  means the measurement error of the observable indicator,  $Y_{16}$ .

$\varepsilon_{17}$  means the measurement error of the observable indicator,  $Y_{17}$ .



$$\begin{matrix} \times & \left( \begin{array}{c} \eta_1 \\ \eta_2 \\ \eta_3 \\ \eta_4 \\ \eta_5 \\ \eta_6 \\ \eta_7 \end{array} \right) & + & \left( \begin{array}{c} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \\ \varepsilon_4 \\ \varepsilon_5 \\ \varepsilon_6 \\ \varepsilon_7 \\ \varepsilon_8 \\ \varepsilon_9 \\ \varepsilon_{10} \\ \varepsilon_{11} \\ \varepsilon_{12} \\ \varepsilon_{13} \\ \varepsilon_{14} \\ \varepsilon_{15} \\ \varepsilon_{16} \\ \varepsilon_{17} \end{array} \right) \end{matrix}$$

The measurement model, therefore, of the observable variables X and Y is as follows.

$$X = \Lambda_X \xi + \delta; \quad Y = \Lambda_Y \eta + \varepsilon$$

where  $\Lambda_X$  describes the relation between the latent independent variable ( $\xi$ ) and the observable variable, X.

$\Lambda_Y$  describes the relation between the latent dependent variable ( $\eta$ ) and the observable variable, Y.

$\delta$  means the measurement error of the observable variable, X.

$\varepsilon$  means the measurement error of the observable variable, Y.

While processing the analysis of LISREL model, apply the parameters to be estimated to the above-mentioned structural equation modeling and measurement model, followed by an estimation of eight main parametric matrices ( $\Lambda_X$ ,  $\Lambda_Y$ ,  $\Gamma$ , B,  $\Theta_\varepsilon$ ,  $\Theta_\delta$ ,  $\Phi$  and  $\Psi$ ), which shall be processed in iteration by computer, required by the LISREL model in the variance-covariance formula mentioned below.

$$\Sigma = \begin{pmatrix} \Lambda_Y A (\Gamma \Phi \Gamma' + \Psi) A' \Lambda_Y' + \Theta_\varepsilon & \Lambda_Y A \Gamma \Phi \Lambda_X' \\ \Lambda_X \Phi \Gamma' A' \Lambda_Y' & \Lambda_X \Phi \Lambda_X' + \Theta_\delta \end{pmatrix}$$

where  $\Lambda_Y$  is a coefficient matrix describing the relation between the latent dependent variable ( $\eta$ ) and the observable variable, Y.

A means  $(I - B)^{-1}$ ; B is a coefficient matrix describing the direct impact of one latent dependent variable on the other latent dependent variable.

$\Gamma$  is a coefficient matrix describing the direct impact of the latent independent variable ( $\xi$ ) on the latent dependent variable ( $\eta$ ).

$\Phi$  is a variance-covariance matrix describing the relations between two different latent independent variables.

$\Psi$  is a variance-covariance matrix describing the residual error ( $\zeta$ ) of structural equation modeling.

$\Theta_\varepsilon$  is a variance-covariance matrix describing the measurement error of the observable variable, Y.

$\Lambda_X$  is a coefficient matrix describing the relation between the latent independent variable ( $\xi$ ) and the observable variable, X.

$\Theta_{\delta}$  is a variance-covariance matrix describing the measurement error of the observable variable, X.

Eight parametric matrices, according to the structural equation modeling and measurement model mentioned above, can be described as follows.

$$\Lambda_X = \begin{pmatrix} 1 & 0 & 0 & 0 \\ \lambda_{21}^x & 0 & 0 & 0 \\ \lambda_{31}^x & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & \lambda_{52}^x & 0 & 0 \\ 0 & \lambda_{62}^x & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & \lambda_{83}^x & 0 \\ 0 & 0 & \lambda_{93}^x & 0 \\ 0 & 0 & \lambda_{103}^x & 0 \\ 0 & 0 & \lambda_{113}^x & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & \lambda_{134}^x \\ 0 & 0 & 0 & \lambda_{144}^x \\ 0 & 0 & 0 & \lambda_{154}^x \end{pmatrix} \quad q \times n = 15 \times 4$$

where  $\Lambda_X$  is a coefficient matrix describing the relation between the latent independent variable ( $\xi$ ) and the observable variable, X.

q means the number of the observable variable.

n means the number of the latent independent variable ( $\xi$ ).

$$\Gamma = \begin{pmatrix} \gamma_{11} & \gamma_{12} & \gamma_{13} & \gamma_{14} \\ \gamma_{21} & \gamma_{22} & \gamma_{23} & \gamma_{24} \\ \gamma_{31} & \gamma_{32} & \gamma_{33} & \gamma_{34} \\ \gamma_{41} & \gamma_{42} & \gamma_{43} & \gamma_{44} \\ \gamma_{51} & \gamma_{52} & \gamma_{53} & \gamma_{54} \\ \gamma_{61} & \gamma_{62} & \gamma_{63} & \gamma_{64} \\ \gamma_{71} & \gamma_{72} & \gamma_{73} & \gamma_{74} \end{pmatrix} \quad m \times n = 7 \times 4$$

where  $\Gamma$  is a coefficient matrix describing the direct impact of the latent independent variable ( $\xi$ ) on the latent dependent variable ( $\eta$ ).

m means the number of the latent dependent variable ( $\eta$ ).

n means the number of the latent independent variable ( $\xi$ ).

$$\Phi = \begin{pmatrix} 0 & \Phi_{12} & \Phi_{13} & \Phi_{14} \\ \Phi_{21} & 0 & \Phi_{23} & \Phi_{24} \\ \Phi_{31} & \Phi_{32} & 0 & \Phi_{34} \\ \Phi_{41} & \Phi_{42} & \Phi_{43} & 0 \end{pmatrix} \quad n \times n = 4 \times 4$$

where  $\Phi$  is a variance-covariance matrix describing the relations between two

different latent independent variables.

n means the number of the latent independent variable ( $\xi$ ).

$$\Theta_{\delta} = \begin{pmatrix} \delta_{11} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \delta_{22} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \delta_{33} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \delta_{44} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \delta_{55} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \delta_{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \delta_{77} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{99} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1010} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1111} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1212} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1313} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1414} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \delta_{1515} \end{pmatrix}$$

$$q \times q = 15 \times 15$$

where  $\Theta_{\delta}$  is a variance-covariance matrix describing the measurement error of the observable variable, X.

q means the number of the observable variable.

$$\Lambda_Y = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ \lambda_{21}^Y & 0 & 0 & 0 & 0 & 0 & 0 \\ \lambda_{31}^Y & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & \lambda_{52}^Y & 0 & 0 & 0 & 0 & 0 \\ 0 & \lambda_{62}^Y & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & \lambda_{83}^Y & 0 & 0 & 0 & 0 \\ 0 & 0 & \lambda_{93}^Y & 0 & 0 & 0 & 0 \\ 0 & 0 & \lambda_{103}^Y & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & \lambda_{124}^Y & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & \lambda_{145}^Y & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & \lambda_{166}^Y & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$p \times m = 17 \times 7$$

where  $\Lambda_Y$  is a coefficient matrix describing the relation between the latent dependent variable ( $\eta$ ) and the observable variable,  $Y$ .

$p$  means the number of the observable variable.

$m$  means the number of the latent dependent variable ( $\eta$ ).

$$B = \begin{pmatrix} 0 & \beta_{12} & \beta_{13} & \beta_{14} & \beta_{15} & \beta_{16} & \beta_{17} \\ \beta_{21} & 0 & \beta_{23} & \beta_{24} & \beta_{25} & \beta_{26} & \beta_{27} \\ \beta_{31} & \beta_{32} & 0 & \beta_{34} & \beta_{35} & \beta_{36} & \beta_{37} \\ \beta_{41} & \beta_{42} & \beta_{43} & 0 & \beta_{45} & \beta_{46} & \beta_{47} \\ \beta_{51} & \beta_{52} & \beta_{53} & \beta_{54} & 0 & \beta_{56} & \beta_{57} \\ \beta_{61} & \beta_{62} & \beta_{63} & \beta_{64} & \beta_{65} & 0 & \beta_{67} \\ \beta_{71} & \beta_{72} & \beta_{73} & \beta_{74} & \beta_{75} & \beta_{76} & 0 \end{pmatrix}$$

$m \times m = 7 \times 7$

where  $B$  is a coefficient matrix describing the direct impact of one latent dependent variable on the other latent dependent variable ( $\eta$ ).

$m$  means the number of the latent dependent variable.

$$\Psi = \begin{pmatrix} \Psi_{11} & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & \Psi_{22} & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \Psi_{33} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & \Psi_{44} & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & \Psi_{55} & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \Psi_{66} & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \Psi_{77} \end{pmatrix}$$

$m \times m = 7 \times 7$

where  $\Psi$  is a variance-covariance matrix describing the residual error ( $\zeta$ ) of structural equation modeling.

$m$  means the number of the latent dependent variable.

$$\Theta_{\varepsilon} = \begin{pmatrix}
 \varepsilon_{11} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & \varepsilon_{22} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & \varepsilon_{33} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & \varepsilon_{44} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & \varepsilon_{55} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & \varepsilon_{66} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{77} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{88} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{99} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1010} & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1111} & 0 & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1212} & 0 & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1313} & 0 & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1414} & 0 & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1515} & 0 & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1616} & 0 \\
 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & \varepsilon_{1717}
 \end{pmatrix}$$

$$p \times p = 17 \times 17$$

where  $\Theta_\varepsilon$  is a variance-covariance matrix describing the measurement error of the observable variable, Y.  
 $p$  means the number of the observable variable.

In matrices of  $\Lambda_x$  and  $\Lambda_y$  mentioned above, there is one parameter to be fixed as 1 in each straight line with its purpose aiming at taking the reference indicator as the unit of the latent variables. Generally, each latent variable must have one parameter to be fixed as the reference indicator (Jöreskog and Sörbom, 1993).

The computer programmes automatically apply the eight parametric matrices mentioned above to the following formula of  $\Sigma$  matrix for each iteration, and then calculate the value of the fitting function.

$$F = \log \|\Sigma\| + \text{tr}(S\Sigma^{-1}) - \log \|S\| - (p + q)$$

where  $\text{tr}$  means the sum of diagonal elements.

$S$  means the variance-covariance matrix of the observable variables, X and Y.

$p$  means the number of the observable variable, Y.

$q$  means the number of the observable variable, X.

$\|\Sigma\|$  means the determinant of  $\Sigma$ .

$\Sigma$  means the variance-covariance matrix for processing the estimation of eight main parametric matrices ( $\Lambda_X$ ,  $\Lambda_Y$ ,  $\Gamma$ ,  $B$ ,  $\Theta_\varepsilon$ ,  $\Theta_\delta$ ,  $\Phi$  and  $\Psi$ ) in the LISREL model mentioned above.

In the above-mentioned formulas,  $S$  is a matrix of the observable variables X and Y resulted from an actual inspection of the data. Following an increase of frequency of iteration, the fitting function values for formulas mentioned above are increasingly smaller, generally. When the difference of the two fitting function values is smaller than the convergent standard, the estimation draws a conclusion while the fitting function acquired is the smallest one of the fitting function value, then followed by

the  $\chi^2$  test according to the smallest fitting function value.

$$\chi^2 = (N - 1) \times F$$

$$df = 1 / 2 (p + q) (p + q + 1) - t$$

where N means the number of observable variables.

df means degree of freedom.

p means the number of the observable variable, Y.

q means the number of the observable variable, X.

t means the number of parameters expected to be estimated in the above-mentioned eight parametric matrices.

Null hypothesis is thus accepted if the test result finds insignificant  $\chi^2$  value, thus indicating the theoretical model of LISREL (the figure shown in the end of this Appendix) and data gained from an observation to be well fit (Jöreskog and Sörbom, 1993).

### **C. The external quality of data in the LISREL model**

Upon listing parameters to be calculated, this study further decides the type of data matrix used for analysis. First, distinguish the input matrix from analytic matrix while the former indicates the data matrixes read by the computer programmes and the latter, the above-mentioned eight parametric matrixes reproduced by the computer when conducting LISREL analysis, i.e. the variance-covariance matrix of X and Y variables resulted from data observation. The present study takes variance-covariance matrix as the analytic matrix, and the correlation matrix is the one used most frequent beside the variance-covariance matrix. If taking the correlation matrix as the analytic matrix, however, incorrect  $\chi^2$  value or standard error can be produced, particularly when there are restricted parameters to be

estimated in models (Jöreskog and Sörbom, 1993). In the process of obtaining the correlation matrix or variance-covariance matrix to be working as the analytic matrix, this study adopts listwise method to deal with the deficient data for an avoidance of “not-positive-definite” issues generated by LISREL model.

The identification of LISREL model means that if there is the unique solution for parameters in LISREL model. If there comes a non-solution or non-unique solution, computer will not be able to reproduce the above-mentioned eight parametric matrices that would automatically bring an end to the estimation (Bollen, 1989). There are numerous discussions by scholars on regulations about if LISREL model being able to make identification, and Bollen (1989) has suggested four methods concerning if inspection models being able to identify.

1. Apply the LISREL programmes to deal with the issues concerning the identification of LISREL model. In the process of estimating parameters, LISREL programmes will automatically check models to see if they can identify. The computer will automatically conclude the estimation and show the warnings whenever the models can not make identification.
2. To adopt methods suggested by Jöreskog and Sörbom (1993), first key in the variance-covariance matrix of X and Y variables in normal process, then the computer programmes will bring an output of the above-mentioned eight parametric matrices and the estimation value of each parameter. Secondly, take eight parametric matrices gained in the preceding step as the input of the variance-covariance matrix of X and Y variables, and LISREL programmes will bring out another parametric matrix and the estimation value of each parameter. If the model is able to make identification, the two estimation values of each

parameter will be consistent. Should it be inconsistent, it indicates that the identification of the model is problematic.

3. Run several times for the same programmes, and set estimation values in different starting point each time. The model is capable of identifying if the estimation values of each parameter are in close proximity; or on the other hand, it means the identification of the model to be problematic.
4. Divide samples into several sub-samples randomly to see if these estimation values of each parameter are close. There shall be no problem of identification if the estimation values calculated of each parameter are in close proximity; or on the other hand, it means the identification of the model to be problematic.

In addition to the four methods mentioned above, Hair et al. (1995) suggest that LISREL models presented by researchers may violate regulations of identification if four conditions listed below appear in the results of each parameter estimation: (1) part of parameter estimations have greater standard error; (2) computer programmes can not transform the data matrices; (3) unreasonable and impossible estimation values appear, such as negative error variance; and (4) the correlation among the parameters is too high (exceeding  $\pm 0.9$ ).

In spite of solutions brought forwarded by numerous scholars to solve the problems of identification, the present study suggests that researchers had better to re-list parameters desired to be estimated in detail, i.e. re-list the path of cause and effect in detail according to theoretic fundamental, whenever encountering the unidentified problems.

While processing the estimation of parameter, the present study must write computer

programmes according to the developed theoretical model, path diagram of causation, and identified assessment model. Upon the accomplishment of writing the computer programmes, enter the LISREL system under Window system.

The purpose of assessing the model fit lies in an assessment from each respect that if theoretical models can explain those data gained from a practical observation, or the scale of difference between theoretical models and data gained from the practical observation (Bagozzi, 1980). The analysis of LISREL model adopts  $\chi^2$  test to assess the model fit, but  $\chi^2$  value varies with the change in the sample size (Bollen, 1989; Hair et al., 1995). When the sample size is small,  $\chi^2$  value is likely to be unmarked, making researchers hastily produce a conclusion that the theoretical model and data resulted from observation fit well. Besides,  $\chi^2$  value easily becomes a significant level whenever the sample size is big, thus enabling researchers to reach a conclusion rashly that the theoretical model and data resulted from observation are misfit. The present study suggests that the assessment of the model fit from different aspects is necessary, and showing a reasonable judgment by using various indicators is important.

Regarding the assessment of model fit, Hair et al. (1995) think to have it assessed from the preliminary fit criteria, overall model fit and fit of internal structure of model. The present study recognizes it a good reference framework while the overall model fit is the external quality of model in assessing the fit level of the entire model and observable data; the fit of internal structure of model is the internal quality of model in assessing the significance of estimating parameter of model and the reliability of each indicator and latent variables. Literatures in the past frequently assessed the model fit from the standard of the overall model fit, rather than involving in the

quality assessment in the model (Bollen, 1989). In addition to take the external quality of model into consideration, however, the internal quality of model does not tolerate to be overlooked.

According to Bagozzi (1980), there are several important basic criteria of model fit listed as below:

1. There shall be no negative error variance.
2. The error variance must reach a marked level.
3. The absolute value of correlation among the parameters shall not to be in proximity to 1.
4. The factor loading shall not be too low (lower than 0.5) or too high (higher than 0.95).
5. The standard error shall not be too big.

While violating several of the above-mentioned criteria, it indicates that there may have error listed in detail, problems of identification or erroneous input. Researchers had better to re-inspect that if the model parameters listed in detail make sense, and examine if the computer programmes to be in consistence with parameters listed in detail (Bagozzi, 1980). If the estimation results of the model can meet the five criteria, it can further examine the overall model fit and the fit of internal structure of model.

The overall fit criteria in assessing the model in the past took the significance of  $\chi^2$  value as criteria.  $\chi^2$  value, however, fluctuates according to the sample number, and almost all models can be turned down whenever the sample number is too big (Hair et al., 1995). Therefore, statisticians have developed a series of indicators in assessing

the model fit in addition to take  $\chi^2$  test. These indicators to assess the overall model fit include: the coefficient of determination (TCD),  $\chi^2$  value, goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), root mean square residual (RMR), standardized RMR, normed incremental fit index (NFI) and comparative fit index (CFI) (Bollen, 1989).

Scholars still have inconsistent views that if each index will fluctuate according to the sample number (Anderson and Gerbing, 1988). According to Anderson and Gerbing (1988) and Bollen (1989), eight indices used frequently used to assess the overall model fit are selected from the present study, and the numerical range and ideal numerals are listed in Table A4. 1.

Table A4. 1 The numerical range and ideal numerical value of the nine indices of the overall model fit

Indicator	Numerical Range	Ideal Numerical Value
1. $\chi^2$ Value	Above 0	Not remarked
2. GFI	Between 0~1, but negative value may appear	At least above 0.9
3. AGFI	Between 0~1, but negative value may appear	At least above 0.9
4. RMR	If the analytic matrix is related matrix, it shall be between 0~1; if the analytic matrix is variance-covariance matrix, it shall be above 0.	If the analytic matrix is related matrix, it shall be lower than 0.05, and the value lower than 0.025 shall be the best; if the analytic matrix is variance-covariance matrix, SRMR value should be less than 0.05.
5. Standardized RMR	-ditto-	-ditto-
6. Ratio of $\chi^2$ value	Above 0	Less than 3
7. NFI	Between 0~1	At least above 0.9

8. CFI	Above 0, but most between 0~1	At least above 0.9
9. TCD	Above 0, but most between 0~1	At least above 0.9

$$GFI = 1 - \left\{ \frac{[\text{tr} (E^{-1}S - I)^2]}{[\text{tr} (E^{-1}S)^2]} \right\}$$

$$= (p + q) / [(p + q) + 2 \times F]$$

$$AGFI = 1 - \left[ \frac{(p + q) \times (p + q + 1)}{2 \text{ df}} \right] \times (1 - GFI)$$

where GFI means goodness-of-fit index.

AGFI means adjusted goodness-of-fit index..

p means the number of the observable variable, Y

q means the number of the observable variable, X.

F means the minimum value of fitting function.

S means the variance-covariance matrix of observable variables, X and Y.

E means the fitted or reproduced matrix.

tr means the sum of diagonal elements.

df means degree of freedom.

GFI and AGFI indices indicate the variance-covariance amount that can be explained by the theoretical model while AGFI is just adjusted according to the degree of freedom number. The maximum value for both two indices is 1, but the negative value may appear.

$$RMR = \sqrt{\frac{2 \sum \sum (S_{ij} - \sigma_{ij})^2}{(p + q) \times (p + q + 1)}}$$

where RMR means root mean square residual.

$S_{ij}$  means variance / covariance of observable variables.

$\sigma_{ij}$  means variance / covariance of reproduced matrix.

RMR is the square root of average of fit residual variance/covariance, reflecting the magnitude of residual. Therefore, the smaller the value, the better the model fit. If the analytic matrix is a correlation matrix, RMR must be lower than 0.05, or a value lower than 0.025 shall be the best. If taking the variance-covariance matrix as the analytic matrix, the meaning of RMR value shall be difficult for judgment (Bollen, 1989) while the value for the standardized RMR (SRMR) shall be smaller than 0.05 (Hair, et al., 1995).

$$\text{TCD of X (or Y)} = 1 - ( \| \Theta \| / \| \Sigma \| )$$

where TCD means the coefficient of determination.

$\Theta$  is a variance-covariance matrix describing the measurement error of the observable variable, X or Y.

$\| \Theta \|$  means the determinant of  $\Theta$ .

$\Sigma$  is a variance-covariance matrix describing the fitting function.

$\| \Sigma \|$  means the determinant of  $\Sigma$ .

$$\text{TCD of structural equation modeling} = 1 - ( \| \Psi \| / \| \text{Cov}(\eta) \| )$$

where TCD means the coefficient of determination.

$\Psi$  is a variance-covariance matrix describing the residual error ( $\zeta$ ) of structural equation modeling.

$\| \Psi \|$  means the determinant of  $\Psi$ .

$\text{Cov}(\eta)$  is a variance-covariance matrix of latent dependent variables.

$\| \text{Cov}(\eta) \|$  means the determinant of  $\text{Cov}(\eta)$ .

The TCD of X or Y variables (indicated in TCD (X) or TCD (Y)) represents a level that how well the latent independent variables  $\xi$  which takes X variables as well as the latent dependent variables  $\eta$  which takes Y variables as an ideal observable

indicators. The TCD of structural equation (indicated in TCD (E)) represents a level that how well the latent dependent variables  $\eta$  in models be explained. Numerical values of these three indices are between 0~1 while the greater value represents the better level of model fit. On point necessarily to be noticed while explaining TCD (E) is that not all TCD (E) values come from the antecedents (ordinary  $\xi$ ) of latent dependent variables whenever there is correlation among the residual  $\xi$  of latent dependent variables (Bagozzi, 1980). As the maximum value for all these three indexes are 1, take value above 0.9 as the model fit criteria.

The ratio of  $\chi^2 = \frac{\chi^2}{df}$ , where df means degree of freedom.

Ratio of  $\chi^2$  is one index used frequently, and what it represents is how big the difference to be with the expectation value thanks to the expectation value of  $\chi^2$  exactly to be its degree of freedom (Bollen, 1989). How much the ratio will be still indicates a lack of consensus for the overall model fit while some advocate 3 or 2 (Bollen, 1989). The present study takes a value less than 3 as the ideal value of model fit which may be far more loose.

$$NFI = (\chi_b^2 - \chi_m^2) / \chi_b^2$$
 where  $\chi_b^2$  means  $\chi^2$  of the base model.  
 $\chi_m^2$  means  $\chi^2$  of the theoretical model.

$$CFI = (\chi_b^2 - \chi_m^2) / (\chi_b^2 - df_m)$$
 where  $\chi_b^2$  means  $\chi^2$  of the base model.  
 $\chi_m^2$  means  $\chi^2$  of the theoretical model.  
 $df_m$  means the degree of freedom of the theoretical model.

NFI and CFI indices originate from a comparison of  $\chi^2$  value or degree of freedom of the theoretical model with  $\chi^2$  value or degree of freedom of base model. As model fit of the base model will be the worst one, consequently, these two indices reflect the incremental fit of the theoretical model. Values of NFI and CFI are between 0~1, and Bollen (1989) thinks that it indicates an excellent model fit if the index is at least above 0.9.

## D. The internal quality of data in the LISREL model

Model fit of internal structure of LISREL is the internal quality of the model. Six criteria suggested by Bagozzi (1980) are as follows:

1. The individual factor reliability is above 0.5.

The individual factor reliability is  $R^2$  of X or Y variables, and the calculation method is:

$$R^2(X_i) = 1 - (\Theta_{ii} / \sigma_{ii})$$

where  $R^2(X_i)$  means individual item reliability of the observable variable,  $X_i$ .

$\Theta_{ii}$  is the variance of the estimated error of the observable variable,  $X_i$ .

$\sigma_{ii}$  is the variance of the observable variable,  $X_i$ .

2. The composite reliability (CR) of latent variables is above 0.6.

The calculation of CR for latent variables takes individual latent variable as calculation unit, with its value be equivalent to Cronbach's  $\alpha$  coefficient of observable indicator belonging to the latent variable. The calculation method is:

$$\rho_{\xi_i} = (\sum \lambda_{ij})^2 / [(\sum \lambda_{ij})^2 + \sum \Theta]$$

where  $\rho_{\xi_i}$  is the composite reliability of a certain latent dependent variable or latent

independent variable.

$\lambda_{ij}$  means standardized loading of a certain latent dependent variable or latent independent variable.

$\Theta$  means the measurement error of the observable variable, X or Y.

3. The average variance extracted of the latent variable is above 0.5.

The average variance extracted of the latent variable also takes the individual latent variable as calculation unit, while the indication of value is made through the observable indicator, and how much percent of the latent variable can be measured (Bollen, 1989). The calculation method is as follows:

$$\rho_{vc}(\xi_i) = \frac{\sum \lambda_{ij}^2}{(\sum \lambda_{ij}^2 + \sum \Theta)}$$

where  $\rho_{vc}(\xi_i)$  is the average variance extracted of a certain latent dependent variable or latent independent variable.

$\lambda_{ij}$  means standardized loading of a certain latent dependent variable or latent independent variable.

$\Theta$  means the measurement error of the observable variable, X or Y.

4. All estimated parameters reach marked level.

5. The absolute value of standardized residuals must be smaller than 1.96.

6. The modification indices is smaller than 3.84.

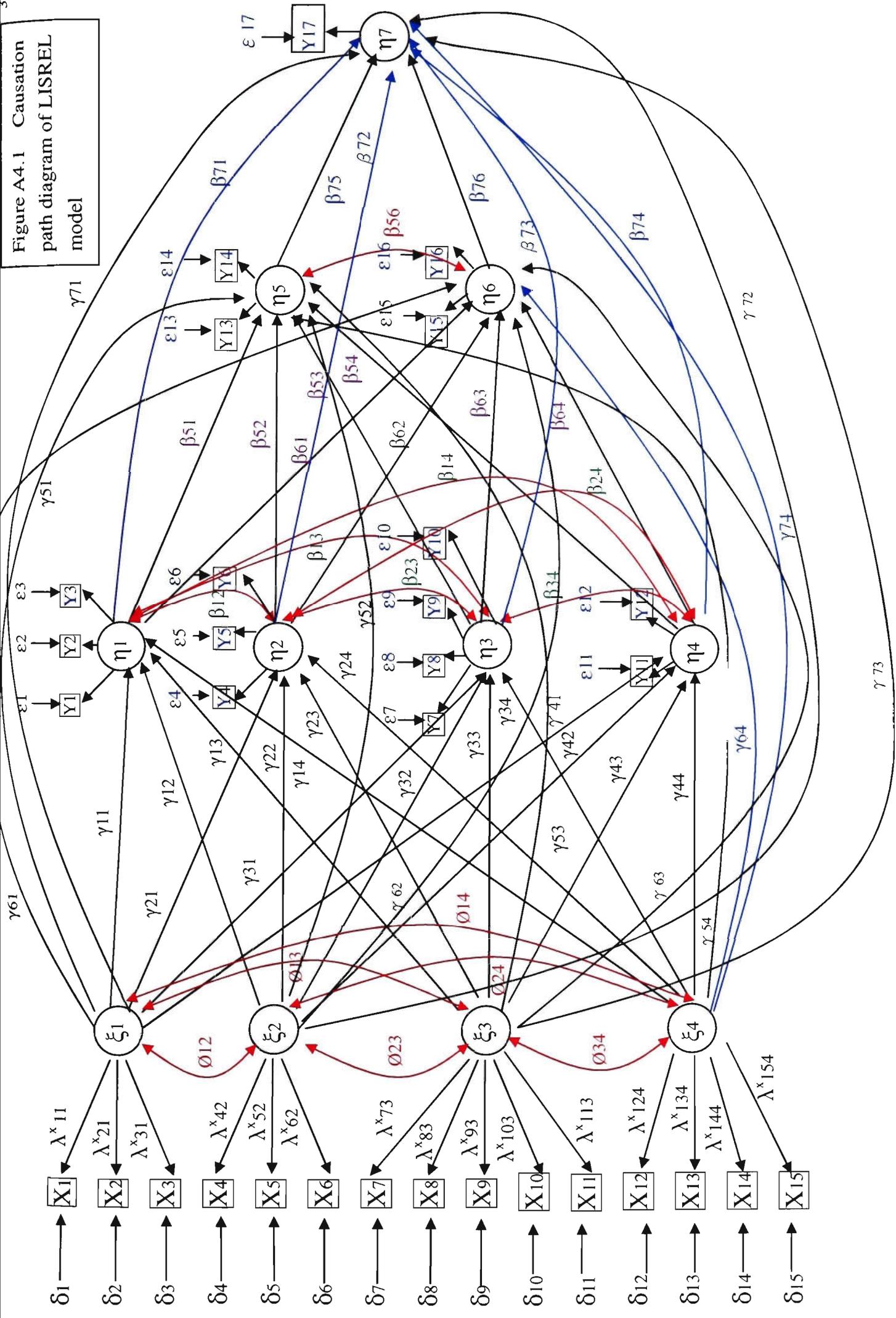
It can learn from the output in the computer form that if all estimated parameters reach significant level. It indicates that the internal quality of model is excellent if all estimated parameters reach significant level; or on the contrary, it indicates poor internal quality.

The standardized residual is a result of fit residual divided by the asymptotic standard

error while 1.96 is the critical value of  $z$  at the time  $\alpha$  equals to 0.05. According to Jöreskog and Sörbom (1993), it supposes that just have the absolute value of standardized residuals to be less than 2.58 (i.e. the critical value of  $z$  at the time  $\alpha$  equals to 0.01).

The modification indices is a result aiming at the restricted parameters, with its numerical value indicating that how much the  $\chi^2$  of the model shall be reduced if turning one restricted parameter into free parameter (i.e. estimating the parameter). The degrees of freedom of the model shall be reduced one due to turning one restricted parameter into free parameter while the critical value of  $\chi^2_{0.95(1)}$  is 3.84. Therefore, it not only indicates that the model fit will be improved significantly after turning the restricted parameter into the free parameter when the modification index is more than 3.84, but also signifies there shall be error listed in detail for the model (Bagozzi, 1980; Jöreskog and Sörbom, 1993).

Figure A4.1 Causation path diagram of LISREL model



## **Appendix 5 The definition of each dimension of all multidimensional constructs**

IDEN means identifying strategic human capital management practices.

DEVE means developing strategic human capital management practices.

PROT means protecting strategic human capital management practices.

DEPL means deploying strategic human capital management practices.

CONT represents the control factor of personnel control mechanisms.

COMM represents the communication-coordination factor of personnel control mechanisms.

TCIE means the changes in environment facing the organization.

ESAOS means employee skill and organizational structure.

EM means employee motivation.

EP means employee productivity.

CC means customer complaint.

CS means customer satisfaction.

SRG means sales revenue growth.

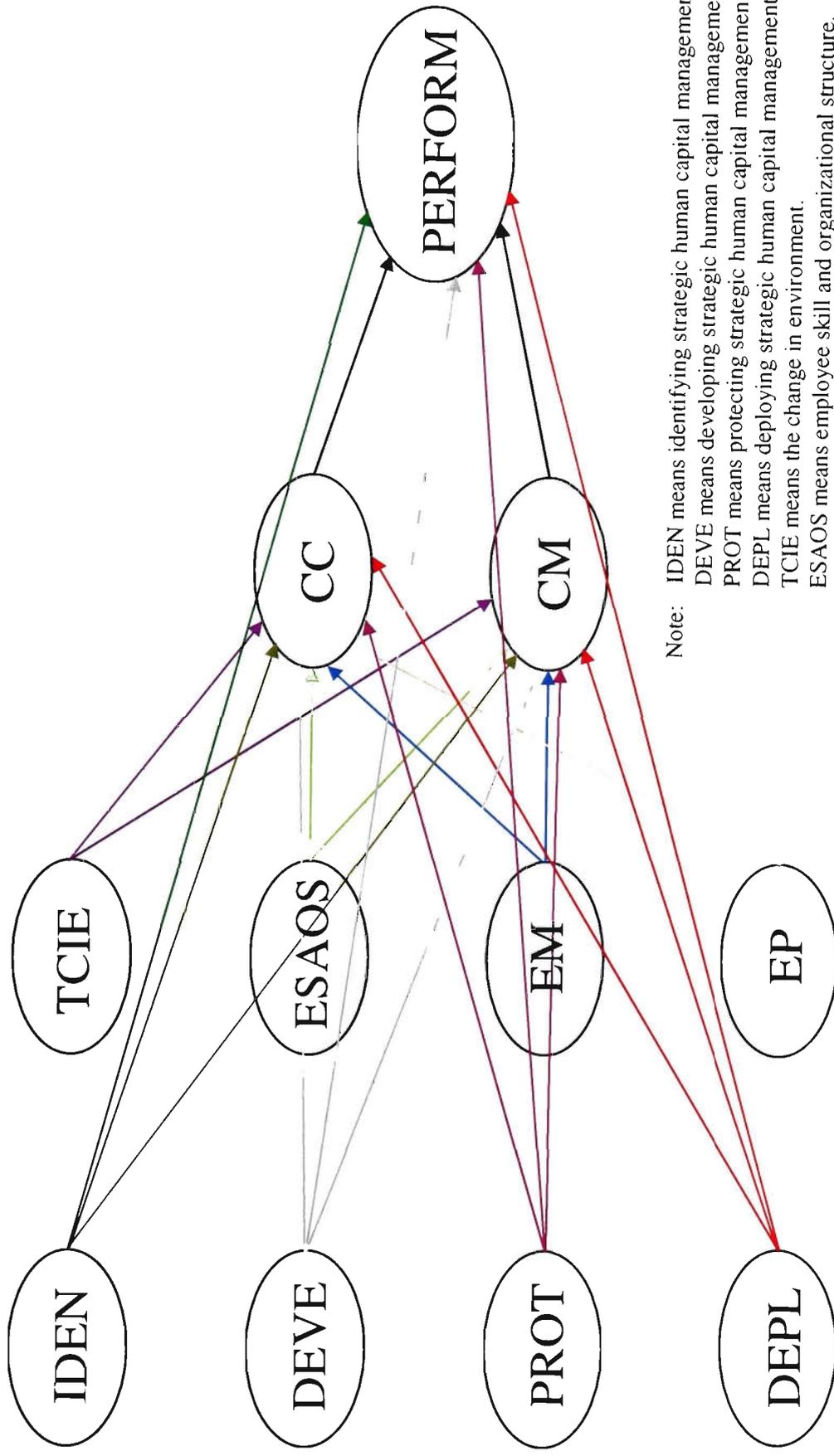
NIBT means net income before tax.

GRROC means gross rate of return on capital.

## **Appendix 6: Null model, the direct model, the completely mediated model and the partially mediated model**

The nested-model analysis of LISREL is employed in the present study to explore the intervening effect of employee capability on the dimensions of strategic human capital management practices, customer loyalty and financial performance of an organization. In the nested-model analysis, there are four models brought up while model 1 is Null Model which highlights the model with a non-existence of the relation paths between each dimension; model 2, the Direct Model which indicates the existence of paths model with marked effects of strategic human capital management practices on customer loyalty and on company's financial performance as well as of employee capability on customer loyalty as well as customer loyalty on company's financial performance; model 3, the Completely Mediated Model, marks the existence of paths model with the evident effects of strategic human capital management practices on employee capability which in turn on customer loyalty, and consequently on company's financial performance; and model 4, the Partially Mediated Model which means the existence of paths model with marked effects of strategic human capital management practices on employee capability, on customer loyalty and on company financial performance as well as of employee capability on customer loyalty and on company financial performance as well as of customer loyalty on company financial performance. The paths models of the direct model, the completely mediated model and the partially mediated model are portrayed as follows.

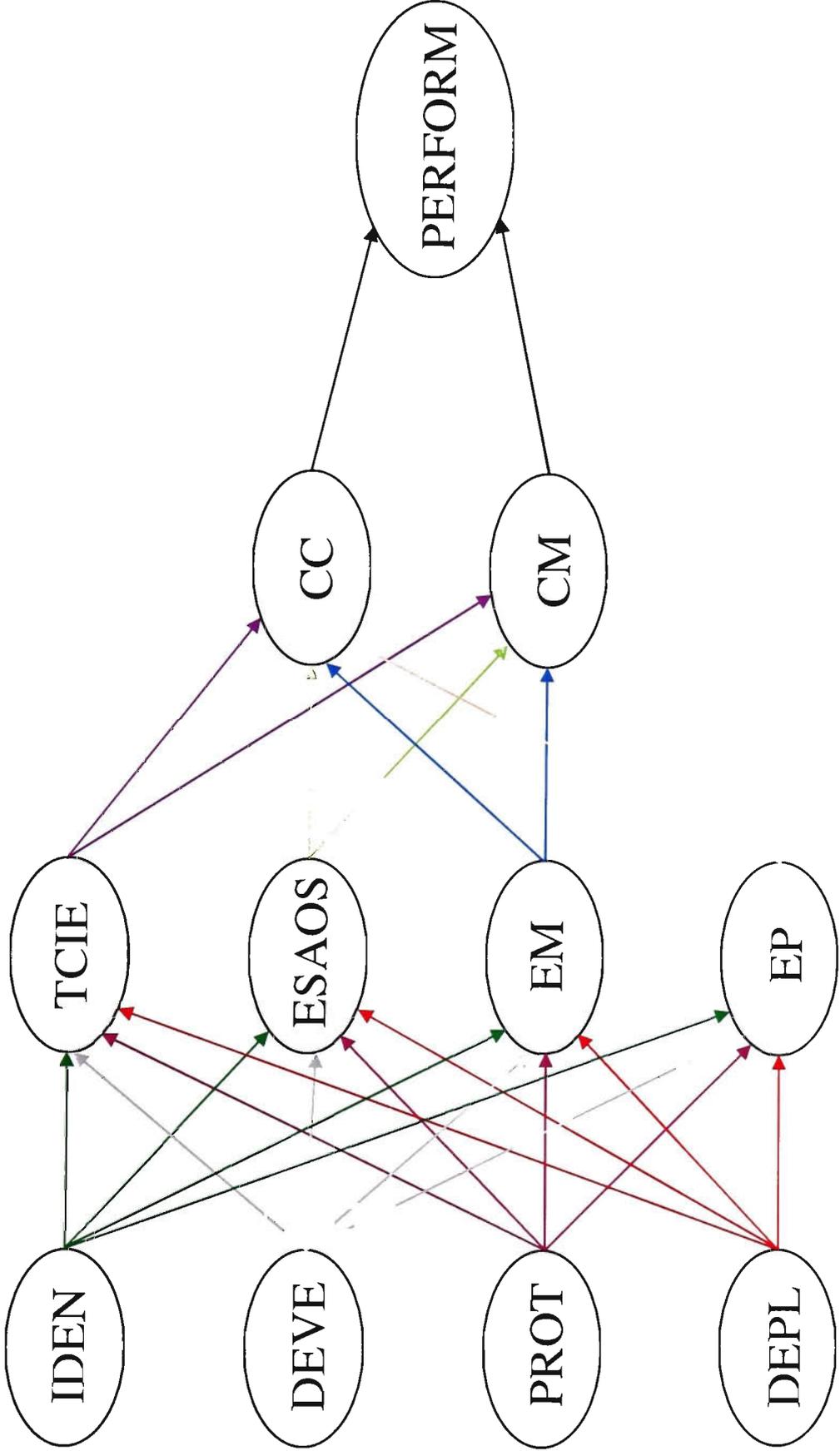
(1) Direct Model



Note:

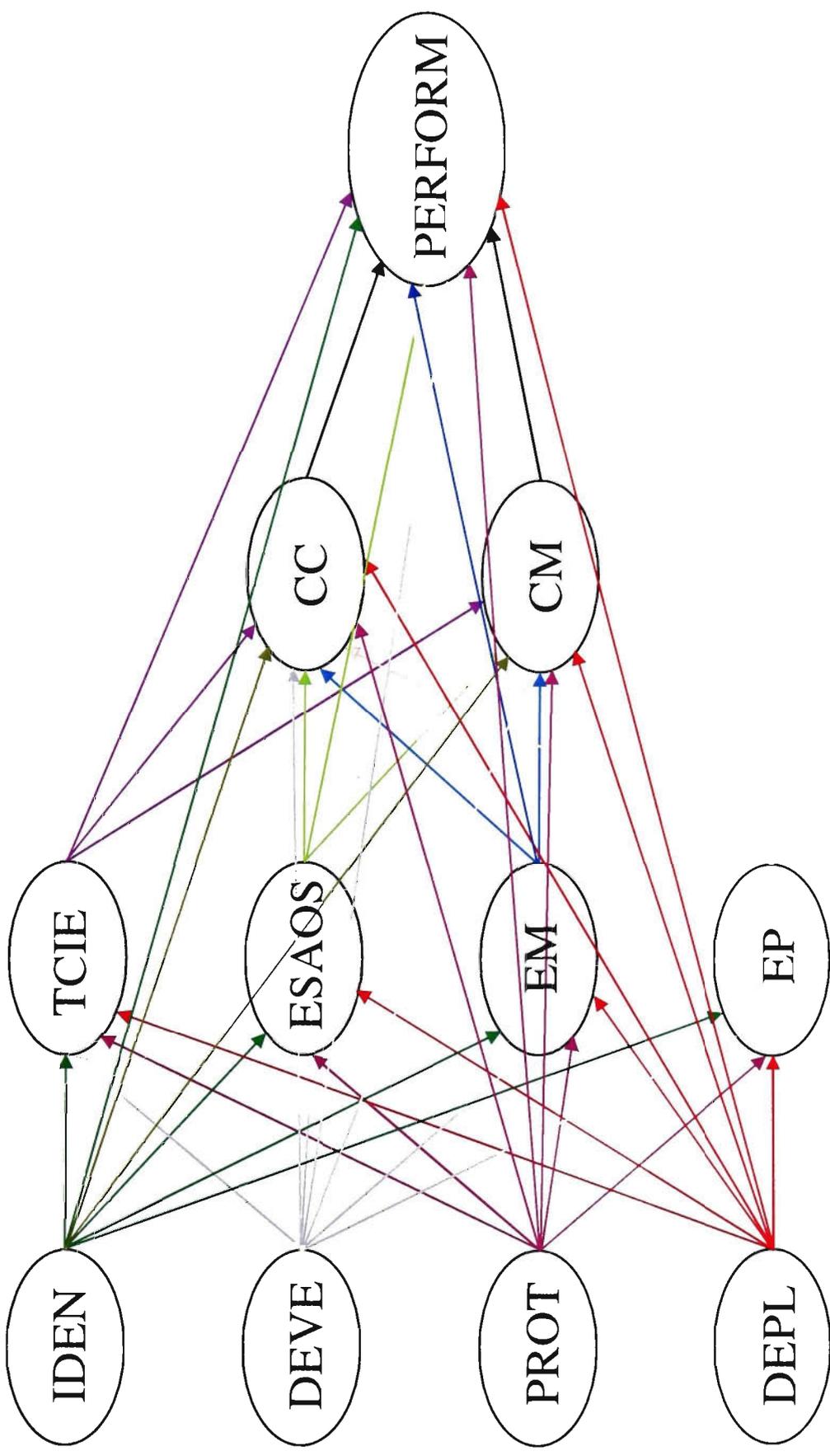
- IDEN means identifying strategic human capital management practices.
- DEVE means developing strategic human capital management practices.
- PROT means protecting strategic human capital management practices.
- DEPL means deploying strategic human capital management practices.
- TCIE means the change in environment.
- ESAOS means employee skill and organizational structure.
- EM means employee motivation.
- EP means employee productivity.
- CC means customer complaint.
- CS means customer satisfaction.
- PERFORM means financial performance of an organization.

(2) Completely Mediated Model



Note: You will find the definition of each dimension on the note of (1), Direct Model.

(3) Partially Mediated Model



Note: You will find the definition of each dimension on the note of (1), Direct Model.

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