

Exploring the Indirect Performance  
Impact of High Performance Work  
Systems in Professional Service Firms:  
A Practices-Resources-Uses-  
Performance Approach

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## DECLARATION

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of a degree of Doctor of Philosophy is entirely my own work, that I have exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

Signed: \_\_\_\_\_ Na Fu ID No. 57117713

Date: \_\_\_\_\_

## **DEDICATION**

Dedicated to:

My grandma, my husband Zhengwei and my little daughter Anna.

To the memory of my beloved grandpa.

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## List of Abbreviations

ACCA = Association of Chartered Certified Accountants

CAI = Chartered Accountants Ireland

CFA = Confirmatory Factor Analysis

CPA = Institute of Certified Public Accountants in Ireland

CIMA = Chartered Institute of Management Accountants

CIPD = Chartered Institute of Personnel and Development

DCU = Dublin City University

EFA = Exploratory Factor Analysis

FAME = Forecasting Analysis and Modeling Environment, a financial information database of UK and Irish companies.

HPWS = High Performance Work Systems

HR = Human Resource

HRM = Human Resource Management

IAP = Irish Accounting Practices

ICC = Intraclass correlations

IIPA = Institute of Incorporated Public Accountants

ITI = The Irish Taxation Institute

LISREL = Linear Structural Relationships (statistics software)

PSFs = Professional Service Firms

RBV = The Resource-based View of the Firm

KBT = The Knowledge-based Theory

SHRM = Strategic Human Resource Management

SPSS = Statistical Package for the Social Sciences (statistics software)

## **ABSTRACT**

This study uses a practices-resources-uses-performance approach to examine the indirect impact of High Performance Work Systems (HPWS) on firm performance in Irish Professional Service Firms (PSFs).

The study proposes that HPWS does not influence firm performance directly but indirectly. HPWS affects a firm's performance through two stages. Firstly, the HPWS helps to build the firm's resources which include human capital, social capital and organisational capital. Secondly, these resources, in turn, create value for the firm when they are effectively utilised. The hypotheses in this study propose that resources mediate the relationship between HPWS and firm performance and the uses of resources mediate the relationship between resources and firm performance.

To test this systematic approach, data was collected from 120 Irish accounting firms who participated in the survey. This data was collected in 2010. Hierarchical multiple regression was used to analyse the data and test the proposed mediational models.

The results provide support for the stated hypotheses. The findings suggest that the firm's resources such as human capital, social capital and organisational capital mediate the relationship between HPWS and firm performance and that the uses of the firm's resources mediate the relationship between the firm's resources and the firm's performance. Therefore, this study provides a comprehensive picture of how HPWS works in professional service firms by providing the conceptual and empirical support for the practices-resources-uses-performance value creation chain. These findings could help firms find mechanisms to improve their performance.

The study of the indirect impact of HPWS on firm performance contributes to the understanding of how and why HPWS affect firm performance by identifying valuable resources and the way to effectively use them in PSFs. It also provides theoretical support for the resource-based view of the firm (Barney, 1991), knowledge-based theory (Grant, 1996a, 1996b) and dynamic capabilities theory (Teece, Pisano & Shuen, 1997). It also contributes to the theory of knowledge exploitation and exploration (Lavie, Stettner, & Tushman, 2010; March, 1991).

# CHAPTER ONE

## INTRODUCTION

### 1.1 Overview of This Dissertation

The research reported in this dissertation examines how high performance work systems (HPWS) affect firm performance in professional service firms (PSFs). The research applies a novel practices-resources-uses-performance approach to explore the so called “black box” (Becker & Gerhart, 1996: 793) between human resource management practices and the firm’s performance.

The research model developed is based on a broad range of literature which includes strategic human resource management (SHRM) (Becker & Huselid, 2006; Boxall, 1992; Boxall & Purcell, 2000; Collins & Clarks, 2003; Delery & Doty, 1996; Delery & Shaw, 2001; Wright & McMahan, 1992), the resource-based view of the firm (RBV) (Barney, 1991), the knowledge-based theory (Grant, 1996a, 1996b) and the dynamic capabilities theory (Teece, Pisano & Shuen, 1997). The unique aspect of the research model is that it provides a comprehensive picture which links high performance work systems to firm performance, by combining the key concepts and ideas in relation to resources<sup>1</sup> and the uses<sup>2</sup> of resources.

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<sup>1</sup> Resources in this study are defined as the knowledge embedded in individuals, i.e. human capital, relationships, i.e. social capital and organisation’s routines, systems, database, i.e. organisational capital. This applies to rest of thesis.

<sup>2</sup> Uses in this study are defined as the ways to use resources. Uses include communication, coordination, monitoring and team utilisation. This applies to the rest of thesis.



The data was collected from 190 managing partners, HR directors/managers and other senior staff representing 120 Irish accounting firms. The findings provide strong support for identifying how HPWS affects firm performance in PSFs. In addition, some findings were found in relation to the management effectiveness of accounting firms.

This study employs and provides empirical support for the resource-based view of the firm (Barney, 1991), the knowledge-based theory (Grant, 1996a, 1996b) and the dynamic capabilities theory (Teece et al., 1997). It contributes to the understanding of how and why HPWS affects the firm's performance by identifying its valuable resources and the effective uses of them in PSFs. The findings provide the support for the mediational effect of resources in the relationship between HPWS and firm performance and the mediational effect of uses in the relationship between resources and firm performance.

## **1.2 Significance of the Study**

In comparison to other studies of the relationship between SHRM and firm performance (Arthur, 1994; Becker & Gerhart, 1996; Datta, Guthrie, & Wright, 2005; Delery & Doty, 1996; Guthrie, 2001; Guthrie, Flood, Liu, & MacCurtain, 2009; Huselid, 1995; MacDuffie, 1995; Richard & Johnson, 2001; Terpstra & Rozell, 1993; Youndt, Snell, Dean Jr, & Lepak, 1996), this study addresses two important issues. One is the indirect performance impact of human resource practices compared to the impact of direct relationships. The other is the research context – professional service firms (PSFs). The significance of the two issues is described in detail in the following two sections.

## **1.2.1 Significance of Understanding How SHRM Influences Performance**

Researchers in the field of strategic human resource management (SHRM) have found that the application of a system or a bundle of human resource (HR) practices is positively associated with organisational performance. For example, a bundle or system of HR practices has been found to positively influence firms' outcomes especially in manufacturing firms. These outcomes include financial performance (Guthrie, 2001; Huselid, 1995), employee turnover (Richard & Johnson, 2001), productivity (Guthrie, 2001), efficiency, flexibility (Evans & Davis, 2005), and organisational commitment (Youndt et al., 1996). To clarify, this study labels the bundle or system of HR practices as high performance work systems (HPWS) (Guthrie, 2001; Guthrie et al., 2009; Huselid, 1995).

From the evidence found in the above studies, the relationship between HPWS and firm performance may be indirect and many scholars call for deeper and more theoretical approaches to understand how and why high performance work systems (HPWS) affect firm performance (Bowen & Ostroff, 2004; Combs, Liu, Hall, & Ketchen, 2006; Delery & Shaw, 2001), especially in service organisations (Combs et al., 2006).

For example, Combs et al. (2006) suggested that employees' knowledge, skills and abilities (KSAs) acted as mediators between high performance work practices and organisational performance. Guest (1997) showed that SHRM influenced firm performance by improving employees' skills and abilities. The findings of these two

studies suggest the mediational effect of the human capital in the relationship between HR practices and firm performance.

Collins and Clark (2003) provided support for the mediating role of social structure. They examined the mediating effect of social networks of top management teams (TMT) on the relationship between HRM and firm performance. They found that the mediating effects of TMT networks accounted for nearly all of the effect of network-building practices on sales growth and less than half of the effect of incentive pay practices based on organisational performance. Collins and Clark's (2003) study provides support for the mediational effect of social capital in the relationship between HR practices and firm performance.

In addition, Wright, Dunford, and Snell (2001) argued that HPWS might play a role in creating organisational cultures and shared organisational knowledge which enabled the firm to form and maintain its core competencies. They indicated that HR practices could help shape organisational processes, systems, and ultimately competencies. Wright et al. (2001) indeed suggest the possibility of the mediational effect of organisational capital in the relationship between HR practices and firm performance.

Consequently, in terms of the intervening variables between HPWS and firm performance, this study considers the resources of human capital, social capital and organisational capital systematically. In addition, this study takes into account how to use these resources which is labelled as uses. The uses include communication, coordination, monitoring and team utilisation. By doing so, this study provides a comprehensive understanding on how HRM affects firm performance.

## **1.2.2 Significance of Research Context: PSFs**

Many researchers conducted their research in general manufacturing firms such as auto manufacturing plants and steel companies (Datta et al., 2005; Ichniowski & Shaw, 1999; Ichniowski, Shaw, & Prennushi, 1997; MacDuffie, 1995), some general service firms like banks (Delery & Doty, 1996; Richard & Johnson, 2001), call centres (Batt, 2002) or with the mixture of the former two contexts (Guthrie et al., 2009; Huselid, 1995). However, there has been a lack of research into one important context – the professional service firms. In contrast to firms previously studied, which have stable business conditions, professional firms face a more dynamic environment (Collins & Smith, 2006).

Professional Service Firms (PSFs) consist of a highly educated and professionalised workforce and provide clients with customised knowledge (Empson, 2007; Greenwood, Li, Prakash, & Deephouse, 2005; Maister, 1993). Examples of professional services include accounting, engineering consulting, management consulting and legal services.

PSFs are a significant context for conducting research because of their unique characteristics, but also because of their important position in the current global knowledge economy which is reflected in the increased growth and significance of PSFs. According to Delong and Nanda (2003: ix), they are “becoming ever more pronounced in economies the world over”. In the past 25 years, the professional services sector has grown by more than 10% per annum and currently generates more than US\$ 1,000 billion in revenues globally (Empson, 2007). From the years 1978-1986, employment in these firms grew by 53.8% in comparison to 13.1% in

the rest of the US economy (Aharoni, 1993). For example, as one of the world's largest professional services firms and the largest of the Big Four auditing firms, PricewaterhouseCoopers earned aggregated worldwide revenues of US\$26.2 billion for the fiscal year 2009, and employed over 163,000 people in 151 countries (PricewaterhouseCoopers, 2010).

PSFs are very different from traditional manufacturing firms (Løwendahl, 2000). They are knowledge-intensive (Morris, 2001; von Nordenflycht, 2007, 2010). Their inputs are mainly the expert knowledge of the professional workforce (Starbuck, 1992), while their outputs are expert knowledge in the form of customised solutions for their clients (Empson, 2007; Greenwood et al., 2005; Hitt, Shimizu, Uhlenbruck, & Bierman, 2006; Løwendahl, 2000; Morris & Empson, 1998; von Nordenflycht, 2007, 2010). PSFs gain competitive advantage mainly by relying on their intangible assets such as, expert knowledge known as human capital, internal and external relationships also known as social capital, their efficient routines, databases and systems, also known as organisational capital. However, the current research on PSFs is not comprehensive. Although various researchers addressed the issues like governance structure of PSFs (Cooper, Hinings, Greenwood, & Brown, 1996; Greenwood, Hinings, & Brown, 1990; Pinnington & Morris, 2003), and the tournament promotion system (Morris & Pinnington, 1998), only von Nordenflycht (2010) systematically answered the question of what the PSF is and described the characteristics of PSFs. However, issues such as “how to manage PSFs effectively” and establishing “what the determinants of PSFs’ performance are” are in great need of comprehensive investigation and definition.

For these reasons, this study chooses the professional service context to examine the indirect impact of HPWS on firm performance.

### **1.3 Research Aims**

This study aims to explore how HPWS affects firm performance in the professional services context by identifying and testing the intervening variables between HPWS and firm performance.

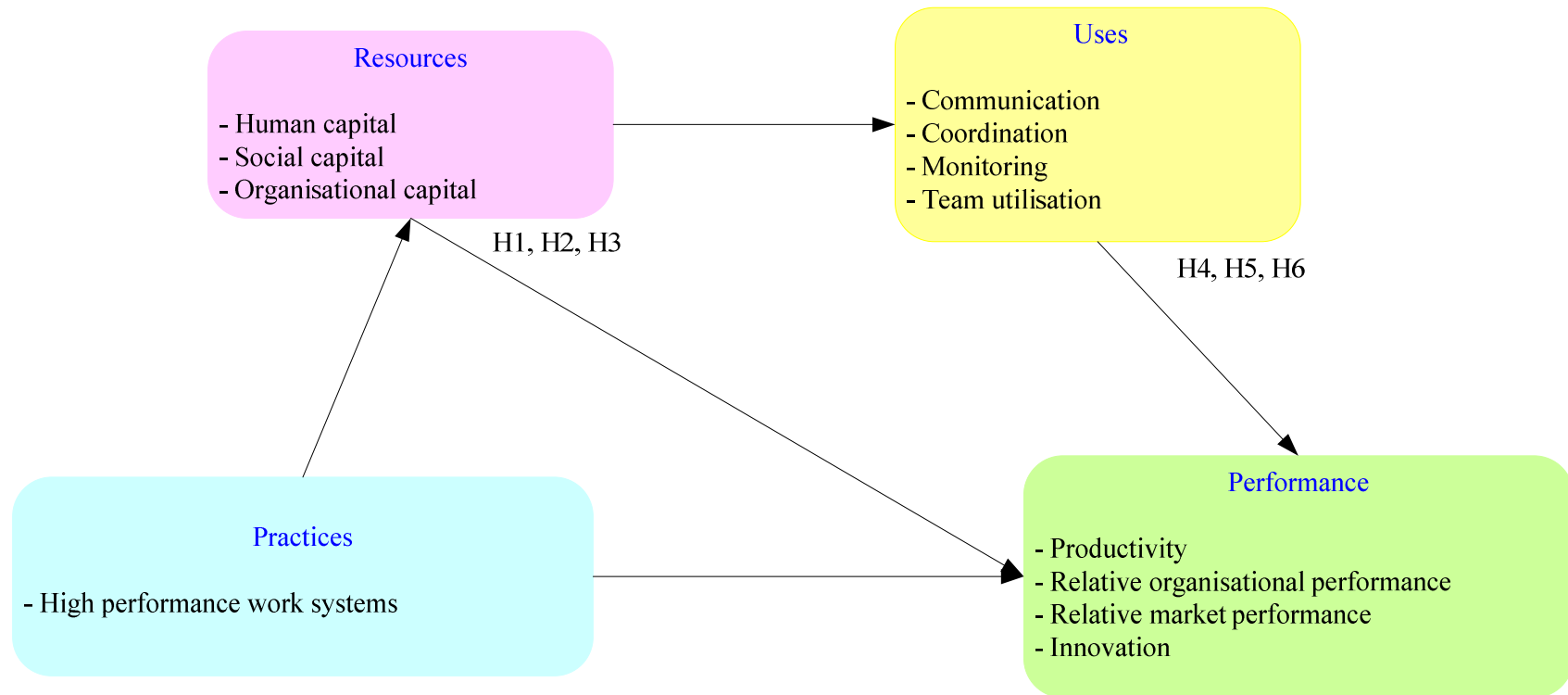
Using the strategic human resource management theory (Becker & Huselid, 2006; Boxall, 1992; Boxall & Purcell, 2000; Delery & Shaw, 2001; Wright & McMahan, 1992) and the resource-based theory (Barney, 1991; Penrose, 1959; Wernerfelt, 1984), this study will explore the processes/mechanisms through which HPWS influences firm performance. Specifically, the study will look at the mediational effects of organisational resources in the relationship between HPWS and firm performance. These resources are identified as human capital, social capital and organisational capital.

In addition, based on the dynamic capabilities theory which emphasises the exploitation and exploration of resources (Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece & Pisano, 1994; Teece et al., 1997), this study will explore the uses through which organisational resources influence firm performance. The uses are measured by communication, coordination, monitoring and team utilisation.

### **1.4 Research Model**

Figure 1.1 provides a conceptual model with hypotheses on the link between the utilisation of HPWS and firm performance.

**Figure 1.1 Conceptual Research Model**



Source: The Author

In this model, it is argued that HPWS results in the creation of human capital (Becker, 1964; O’Sullivan & Sheffrin, 1998), social capital (Burt, 1992; Nahapiet & Ghoshal, 1998), and organisational capital resources (Youndt, Subramaniam, & Snell, 2004; Subramaniam & Youndt, 2005). It is only when these resources are effectively managed and utilised that firms can generate superior profit above competitors’ returns in a perfectly competitive environment (Schultz, 1961), achieve sustainable competitive advantage, and create value (Barney & Arian, 2001; Sirmon, Hitt, & Ireland, 2007).

## 1.5 Research Hypotheses

Table 1.1 provides a summary of the research hypotheses that are tested in this study. These hypotheses are formed based on the literature review presented in Chapter 3.

**Table 1.1 A Summary of The Research Hypotheses**

Hypotheses	
H1	PSF’s human capital mediates the relationship between HPWS and firm performance.
H2	PSF’s social capital mediates the relationship between HPWS and firm performance.
H3	PSF’s organisational capital mediates the relationship between HPWS and firm performance.
H4	PSF’s uses mediate the relationship between its human capital and firm performance.
H5	PSF’s uses mediate the relationship between its social capital and firm performance.
H6	PSF’s uses mediate the relationship between its organisational capital and firm performance.



## **1.6 Thesis Structure and Outline**

Chapter One introduces the overview of this dissertation which includes the objectives and general process of this study. It outlines the significance of this research, especially with regards to the SHRM theoretical perspective and the PSF context. It also presents the research questions, research models, a summary of hypotheses, and outlines the thesis structure.

Chapter Two provides a general introduction to PSFs. It presents the definition and characteristics of PSFs and proposes that their most important resources are human capital, social capital and organisational capital.

Chapter Three reviews and discusses the main theoretical perspectives examined in this study. These are strategic human resource management theory, the resource-based view of the firm, knowledge based theory and dynamic capabilities theory. In particular, the chapter presents three approaches in the SHRM literature that have dominated studies on the link between HRM and organisational outcomes; the universalistic approach, the institutional approach, and the contingency theory approach. In addition, the applications of each theory in the management of PSFs are provided and the various hypotheses are also proposed.

Chapter Four firstly explores the philosophical basis of the research methodology used in this study. It describes the appropriateness of a positivist approach which provides the support for survey-based research. It then presents a detailed outline of the research process via an illustrated chart and then describes in detail the sample

set up from different database resources, how the survey is designed and how it is conducted by employing Dillman's (2007) Tailored Design Method. Finally, all the variable measurements in the survey and their validity and reliability are presented.

Chapter Five presents the results of the data analysis. This chapter includes a presentation of sample representativeness, support for data aggregation, common bias check, descriptive statistics and regression analysis of the study.

Chapter Six reviews the findings based on the results in Chapter Five and describes the contributions of this study to literature on the subject. It also presents the implications for researchers and for practitioners and a description of its limitations. Finally, the future directions of the research are discussed.

Chapter Seven provides a short and general conclusion. It reiterates the research aim, research model, findings and implications.

# **CHAPTER TWO**

## **RESEARCH CONTEXT: PROFESSIONAL SERVICE FIRMS**

### **2.1 Introduction**

This chapter provides a description and definition of PSFs. This is supported by examples, characteristics and an outline of the most important resources in PSFs.

### **2.2 Definition of PSFs**

PSFs are an increasingly important component of the global economy, and have attracted considerable attention from management researchers as they have grown in scale and significance across the whole world (Aharoni, 1993; Delong & Nanda, 2003; Empson, 2007). However, “a significant obstacle to progress in our understanding of PSFs is the lack of a definition of the central term” (von Nordenflycht, 2010: 155). Before examining the concept of professional service firms (PSFs), it is important to investigate the relevant concepts such as profession and professional.

As Abbott (1988) explained, “professions are exclusive occupational groups applying somewhat abstract knowledge to particular cases” (p.8). Greenwood (1957) described the attributes of a profession as a systematic body of knowledge; professional authority and credibility; regulation and control of members; a professional code of ethics and a culture of values, norms, and symbols. Khurana,

Nohria and Penrice (2005) provided the criteria for calling an occupation a bona fide profession as follows: a common body of knowledge resting on a well-developed, widely accepted theoretical base; a system for certifying that individuals possess such knowledge before being licensed or otherwise allowed to practice; a commitment to use specialised knowledge for the public good, and a renunciation of the goal of profit maximisation, in return for professional autonomy and monopoly power; a code of ethics, with provisions for monitoring individual compliance with the code and a system of sanctions for enforcing it. Based on the above definitions, the profession is an occupation that requires expert knowledge, authority, credibility and autonomy.

Sharma (1997) described professionals as people who “apply in their work a body of knowledge and techniques acquired through training and experience, have a service orientation and distinctive ethics, and have a great deal of autonomy and prestige in the modern economy” (p.763). Empson (2006) provided a strict definition of professional as “someone who has won the right to membership of a professional association by completing an accredited programme of training and examinations” (p.6). Her definition represents a very narrow group of organisations - accounting, law, architecture and engineering practices. Experts or professionals within a given field unite to form a PSF.

The above descriptions of professionals suggest that professionals embed expert knowledge, have autonomy and are qualified from a professional association when they pass their professional exams. In the case of accountancy, for example, professional accountants normally have professional expert knowledge in

accounting, high autonomy in their work, and qualifications from some accounting association. Accounting associations in Ireland include Chartered Accountants Ireland (CAI: [www.charteredaccountants.ie](http://www.charteredaccountants.ie)), the Association of Chartered Certified Accountants Ireland (ACCA: <http://ireland.accaglobal.com>), the Institute of Certified Public Accountants in Ireland (CPA: [www.cpaireland.ie](http://www.cpaireland.ie)), the Chartered Institute of Management Accountants Ireland (CIMA: [www.cimaglobal.com/Our-locations/Ireland](http://www.cimaglobal.com/Our-locations/Ireland)), and the Institute of Incorporated Public Accountants (IIPA: [www.iipa.ie](http://www.iipa.ie)).

In most of the research on PSFs, “the term [PSF] is either undefined or is defined only indirectly, by providing a brief list of examples: ‘PSFs, such as law firms, accounting firms, etc.’” (von Nordenflycht, 2010: 155). According to Hinings et al. (1991), “a professional service firm has a primary resource and work force of a group of trained professionals who have agreed to work under the same organisational umbrella” (p.376). Greenwood et al. (2005) defined professional service firms as “those whose primary assets are a highly educated (professional) workforce and whose outputs are intangible services encoded with complex knowledge” (p.661). In von Nordenflycht’s (2010) study, the question of “what is a professional service firm?” was addressed. However, von Nordenflycht did not provide a single definition of PSFs but a theoretical framework on a taxonomy and theory of knowledge-intensive firms. The PSFs that are discussed in this study are the classic PSFs referred to in von Nordenflycht’s (2010) study, e.g. law, accounting and architecture.

Morris (2001) stated that the professional service firm was a classic example of knowledge-based or knowledge-intensive organisations. Professional service firms

are knowledge-intensive but are different from knowledge intensive firms as their knowledge output is customised. In other words, both the services provided by PSFs and the processes involved are customised or tailored to individual customers' needs (Maister, 1993; Nachum, 1999). In this way, pharmaceutical and software companies are categorised as knowledge intensive firms but are not professional service firms, as they sell the same products/services to all customers and do not tailor them for individual clients as PSFs do. The above definitions of PSFs suggest that PSFs require a highly educated professional workforce and provide a customised output.

In summary, the definitions of professions, professionals, professional service firms and the difference between PSFs and knowledge intensive firms demonstrate the uniqueness of PSFs as their reliance on a professional workforce, in other words that the human resource is one of the most important assets within PSFs.

### **2.3 The Characteristics of PSFs**

Based on the definitions provided in section 2.2 above, PSFs clearly differ from the traditional manufacturing firms in their knowledge intensity (Løwendahl, 2000).

PSFs are knowledge-intensive (Morris, 2001; von Nordenflycht, 2007, 2010). Their inputs are mainly the knowledge embedded in the professional workforce (Starbuck, 1992) and their outputs are expert knowledge in the form of customised solutions for their clients (Empson, 2007; Greenwood et al., 2005; Hitt et al., 2006; Løwendahl, 2000; Morris & Empson, 1998; von Nordenflycht, 2007, 2010).

In addition to being knowledge intensive, there are other differences between PSFs and traditional firms. These include the type of work they perform, their professionalised workforce, their organisational structure and processes, their financial structure, their management governance, and other unique management practices, such as “up-or-out tournament promotion system”. All of these have been examined from many different perspectives. For example, in terms of the *type of work* performed by PSFs, Maister (1993) distinguished PSFs from other firms as follows:

- **Procedural** – work for which the solution/approach is well known. This can be delegated to less experienced staff and to some extent the range of answers can even be prescribed. The key to selling this work is its efficiency. This area has greatest leveraging potential and so has been the focus of most business growth (particularly in larger firms) over the last two/three decades.
- **Brain** – work that requires a lot of creativity. This calls for professional expertise and little of it can be specified in advance. While this favours sole-traders and boutique practices, larger firms can also address it.
- **Grey hair** – equally unique and difficult to proceduralise but where the delivery of the solution is based on the experience and breadth of the professional.

Stumpf, Doh and Clark (2002) described the work in PSFs as “project or program-oriented, serving the needs of the external client organisation (or customer) rather than internal management.” (p.261). Therefore, it may require several professionals to work together, and frequently involves client contact, often through co-location at a client’s place of business (Stumpf et al., 2002). Due to the type of work performed

by PSFs, two dependencies that affect the appropriateness of organisational and strategic decisions were identified by Greenwood et al. (2005). The first of these is an asymmetry of information between the firm and its clients which makes the latter dependent on the former; and the second is the high mobility of the firm's human assets which makes it dependent on its professional workforce. These dependencies differentiate PSFs from goods-producing organisations in their distinctive organisational practices.

In terms of the professionalised *workforce*, Stumpf et al. (2002) observed that professionals in PSFs generally received advanced education for their profession since PSF's work requires professional knowledge and technical expertise, coupled with good diagnostic, analytic, and problem-solving skills.

Williams and Nersessian (2007) listed three key characteristics of PSFs which emerge from the professionalised workforce. The first one was the barriers to entry.

“Many segments of the professional services industry have specialised requirements in education, training, and accreditation that must be satisfied before an individual can work in that specialty. Examples include law, accounting, medicine, architecture and engineering, each of which requires many years of formal higher education” (p.2).

The second one was the high degree of self-regulation:

“This typically includes control over initial qualification and accreditation, as well as the creation and enforcement of a code of ethics or practice standards against which a professional's ongoing work is measured” (p.2).

The last one was the professionals' ability to use specialised knowledge or training in a customised way to solve problems that their clients cannot solve for themselves.

Empson (1999) listed three key aspects of PSFs that are generally agreed to be distinctive:

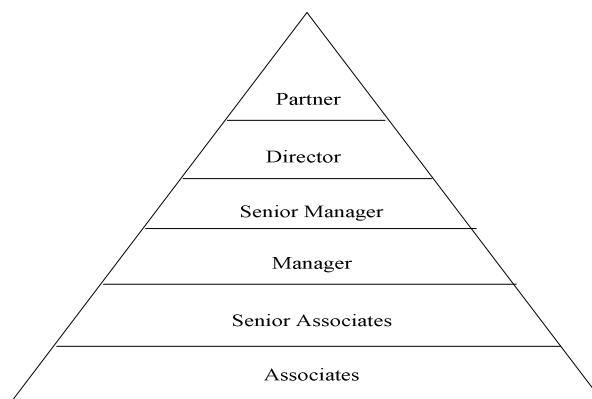


- **Resource base** - PSFs have relatively limited physical resources; their value derives primarily from their professional workers, specifically the technical knowledge, expertise, and experience which they possess. The management of knowledge and knowledge workers is therefore fundamentally important to PSFs.
- **Organisational form** – through the partnership form of governance, professionals in PSFs experience a higher degree of autonomy than they would typically enjoy in conventional bureaucratic structures; those PSFs which have adopted the corporate structure may still attempt to imitate elements of the partnership form.
- **Professional identity** - firm members identify themselves as professionals and are united by a shared understanding of the concept of professionalism. This professional identity is often associated with the rhetoric of independence and exemplary ethics but may be redefined within PSFs to focus on exceptional commitment to clients and quality of service.

In terms of the *organisational structure*, PSFs have relatively few levels of hierarchy (Greenwood et al., 1990; Stumpf et al., 2002). This can be seen from the PwC career path (Figure 2.1), the partial structure of a typical large accounting firm (Figure 2.2), and the career paths in Burges Salmon (Figure 2.3). Figure 2.3, which describes the career path from a trainee to full partner in Burges Salmon law firm, indicates there are only five levels in the organisation; solicitor, qualified solicitor, associate, junior partner and full partner. The low hierarchy organisational structure in PSFs is related to the limited categories of workers. By tradition, there are three main categories of employee in PSFs, and they are the so called “finders, minders

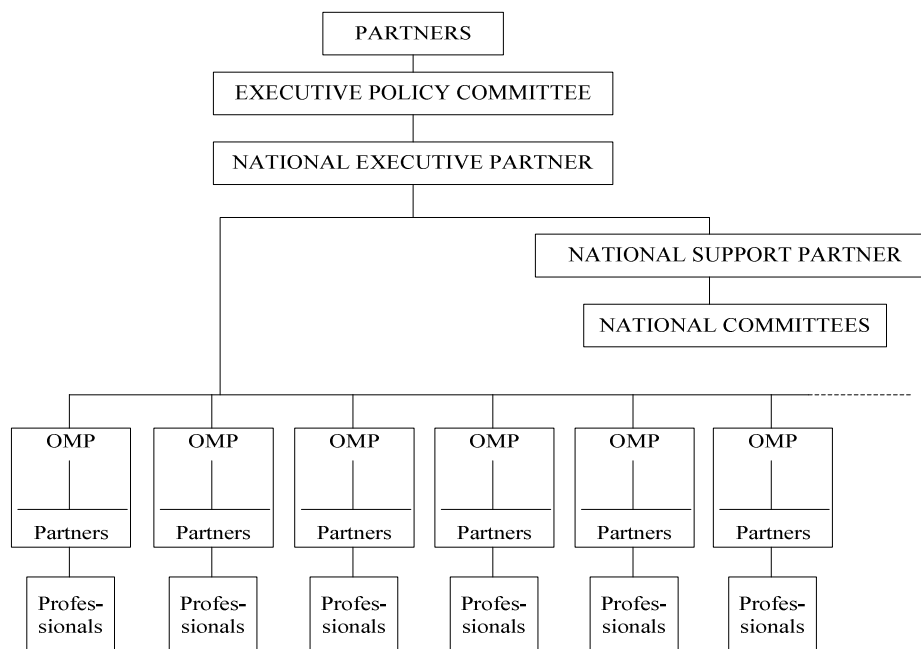
and grinders” (Master, 2004). The finders are responsible for bringing in the business, scoping and designing the projects, and engaging in the high-level client relations necessary during work. Minders are usually those who manage the projects and the team of people working on them to ensure that the firm runs as a cohesive whole. Grinders (the lowest level) perform the analytical tasks.

**Figure 2.1 Career Path in PricewaterhouseCoopers**



Source: PricewaterhouseCoopers (2010)

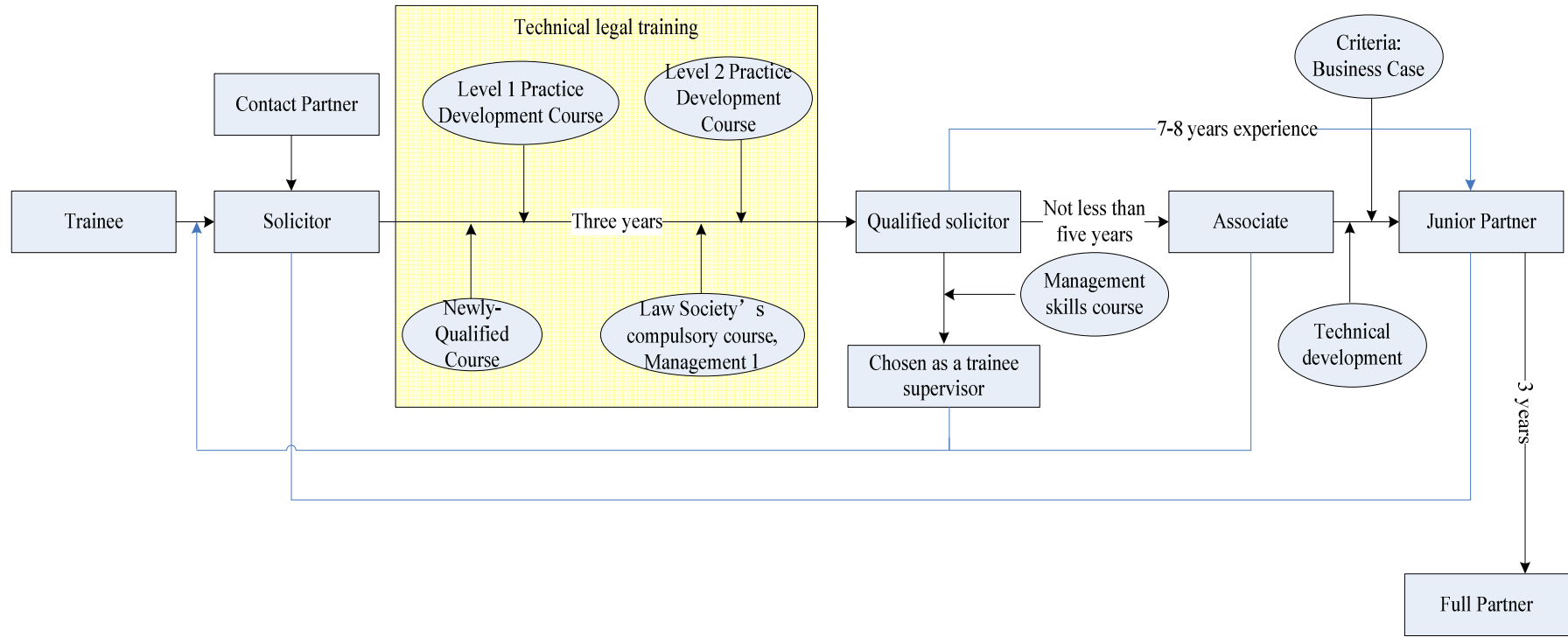
**Figure 2.2 Partial Structure of a Typical Large Accounting Firm<sup>a</sup>**



<sup>a</sup>: This pattern is repeated in each principal country in which a large accounting firm operates. “OMP” represents a local office managing partner.

Source: Greenwood et al. (1990: 732)

**Figure 2.3 From Trainee to Full Partner in Burges Salmon Law Firm**



Source: Burges Salmon LLP (2007)

The organisational structure of PSFs is changing. Hinings et al. (1991) commented that “an important characteristic of such firms is that these professionals agree to share ownership as a group of partners” (p.376). They also developed the P<sup>2</sup> model – professionalism and partnership – to describe the strategic management of the professional firm (Greenwood et al., 1990). However, Cooper et al. (1996) suggested that this model no longer adequately captured the dynamic changes in professional service firms. Based on their analysis of change in two Canadian law firms, they suggested that the dominant archetype of the professional organisation was shifting from P<sup>2</sup> to the Managed Professional Business (MPB) model. Similarly, Pinnington and Morris (2003) found that the PSF was changing from traditional partnership into a more ‘business-like’ entity, i.e. the managed professional business. In terms of *organisational processes*, professional development is structured as an apprenticeship and learn-by-doing process (Stumpf et al., 2002). Most junior professionals have senior professionals as mentors or supervisors.

With regard to *financial structure*, many PSFs bill by the hour (or partial hour), day, or an estimated number of days to complete the project (Stumpf et al., 2002).

In terms of *governance*, new officers are elected by existing officer corps, leadership roles are often rotated and officers are frequently expected to continue the producer role while taking on the leadership role (Stumpf et al., 2002).

In terms of *management practice*, the up-or-out tournament promotion system has been identified as unique to PSFs (Morris & Pinnington, 1998). This practice demands that a candidate who does not get promoted has to resign. However, Morris and Pinnington (1998) showed that the up-or-out promotion system had become less used in PSFs.

Løwendahl (2000) comprehensively defined the characteristics of PSFs as having more than 50% professional employees; a high priority for professional goals, including altruistic problem solving for the client; a high degree of respect for professional norms, including the limitation of expertise; an emphasis on the creation as well as the application of knowledge; professionals in charge of key decisions and activities. A professional is usually also a service provider.

Based on the above review, the characteristics of PSFs are summarised as follows:

- PSFs are knowledge intensive;
- PSFs are dependent on their professionalised workforce;
- PSFs have fewer hierarchical levels than other organisations;
- PSFs are mostly partnerships although their organisational structure is changing to more a business-like model;
- PSFs' financial structure is pay-by-hour/day.

Therefore, the human resource in which the required knowledge is embedded is critically important for PSFs.

## **2.4 The Most Important Resources in PSFs**

The professionalised workforce is a PSF's most important resource. From the knowledge perspective, the workforce has acquired professional knowledge from both education and job training and this is used during their work to help build organisational knowledge. They also have more tacit knowledge embedded in their relationships within and beyond the organisation (Hitt et al., 2006; Pennings, Lee & Van Witteloostuijn, 1998).

Literature on the subject suggests that these resources are conceptualised as human capital i.e. knowledge embedded in individuals (Becker, 1964; O'Sullivan & Sheffrin, 1998), social capital i.e. knowledge embedded in relationships (Coleman, 1988; Bourdieu; 1985; Burt, 1992; Putnam, 1993; Nahapiet & Ghoshal, 1998; Lin, 2001), and organisational capital i.e. the knowledge embedded in organisational processes, routines, databases, and systems (Youndt et al., 2004; Subramaniam & Youndt, 2005). Their application in PSFs is introduced as follows:

**Human capital.** Professionals in PSFs receive explicit knowledge from formal education and tacit knowledge from their daily work and on-the-job training (Hitt, Bierman, Shimizu, & Kochhar, 2001). They embody this expertise knowledge and translate it into customised solutions for clients.

**Social capital.** Professionals build and maintain internal relationships which facilitate knowledge exchange and sharing within teams since most of work in PSFs is programme or project based. They also develop and maintain external clients' relationships which attract new business continuously and result in direct profits for the firm.

**Organisational capital.** Professionals play an important role in forming efficient organisational routines and building organisational databases and systems which facilitate knowledge exchange and sharing within firms.

To summarise, the human resource constitutes the critical asset of PSFs. Because of its importance to the organisation this study will investigate if high performance work systems (HPWS) create the human capital, social capital, and organisational capital resources and if these resources in turn influence the firm's performance.

This study will also investigate if the uses of these resources have intervening effects on the resources-firm performance link.

Professional service firms are an appropriate context to examine strategic human resource management because human resources constitute one of the most critical assets and therefore provide a strong test of the practices-uses-resources-performance model – which is what this study aims to investigate

## **2.5 Summary**

This chapter presents the concepts and characteristics of PSFs and analyses the valuable resources of PSFs. The knowledge intensity and highly professionalised workforce indicate that human resources are the most important asset of PSFs. In the next chapter, the review of relevant theories and their applications in PSFs are presented.

# **CHAPTER THREE**

## **LITERATURE REVIEW AND HYPOTHESES**

### **3.1 Introduction**

The main objective of this chapter is to identify relevant theories that explain why firms utilise high performance work systems (HPWS) extensively and how these affect firm performance. The chapter, therefore, reviews and discusses the main theoretical perspectives that are examined in this study. They include strategic human resource management (SHRM), the resource-based view of the firm (RBV), knowledge based theory (KBT) and dynamic capabilities theory. In particular, this chapter presents three approaches from SHRM literature that have dominated studies on the link between HRM and organisational outcomes. In addition, the linkages between the theories and their applications in the management of professional service firms (PSFs) are reviewed. The hypotheses are also proposed.

### **3.2 Strategic Human Resource Management**

The aim of this section is to provide the definition of SHRM and to present the three approaches to research on the link between SHRM and firm performance. They are the universalistic approach, the contingency theory approach, and the configurational approach. HPWS, a system of HR practices, is introduced in this study. The main reason for this is that the research in SHRM focuses on a bundle or a system of human resource (HR) practices rather than individual practices. Then



the role of HPWS in PSFs is reviewed. Next, two research themes on the direct and indirect impact of HPWS on firm performance are considered. Finally, a short conclusion is provided.

### **3.2.1 Definition of SHRM**

Strategic human resource management (SHRM) links human resource management with organisational strategy (Becker & Huselid, 2006; Boxall, 1992; Boxall & Purcell, 2000; Collins & Clarks, 2003; Delery & Doty, 1996; Delery & Shaw, 2001; Wright & McMahan, 1992).

SHRM is different from traditional human resource management (HRM). As Delery and Shaw (2001) argued, there are at least two major features which distinguish SHRM research from the more traditional HRM practice research. The first is that SHRM studies focus on the strategic role of HR practices in enhancing organisational effectiveness. The second is that SHRM focus on the analysis at unit or firm level rather than at individual level. Similarly, Becker and Huselid (2006) provide two differences between SHRM and traditional HRM. The first is that SHRM is systematic and emphasised the role of HR systems rather than individual HR practices in traditional HRM. The second is that SHRM focuses on organisational performance which is also the objective of the organisation, rather than individual outcomes.

There are a range of similar definitions of SHRM. For example, Wright and McMahan (1992) define SHRM as “the pattern of planned human resource deployments and activities intended to enable an organisation to achieve its goals” (p.298). Bratton and Gold (2003) define strategic human resource management as

“the process of linking the human resource function with the strategic objectives of the organisation in order to improve performance” (p. 37) and “a managerial process requiring human resource policies and practices to be linked with the strategic objectives of the organisation” (p. 38).

Other definitions of SHRM are offered as follows:

- A human resource system that “is tailored to the demands of the business strategy” (Miles & Snow, 1984: 37).
- “The pattern of planned human resource activities intended to enable an organisation to achieve its goals” (Wright & McMahan, 1992: 298).
- HR activities that are “systematically designed and intentionally linked to an analysis of the business and its context” (Schuler, Jackson, & Storey, 2001: 127).

There are a lot of different labels of SHRM, such as high performance work practices (Cappelli & Neumark, 2001; Huselid, 1995), commitment-based HR practices (Collins & Smith, 2006), High HRM systems (Guest & Hoque, 1994), human capital-enhancing human resource systems (Youndt et al., 1996), high commitment management (Wood & de Menezes, 1998), high involvement HRM (Bae & Lawler, 2000; Wood & de Menezes, 2008), high involvement management practices (Batt 2002; Bryson, Forth, & Kirby, 2005), system of high involvement work practices (Guthrie, 2001), and high performance work systems (Combs et al., 2006; Datta et al., 2005; Evans & Davis, 2005; Guthrie et al., 2009; Way, 2002).

From a systematic perspective, a lot of studies have been conducted to examine the linkages between human resources management practices and firm performance (Arthur, 1992, 1994; Becker & Gerhart, 1996; Datta et al., 2005; Delery & Doty,

1996; Guthrie et al., 2009; Huselid, 1995; MacDuffie, 1995; Richard & Johnson, 2001; Terpstra & Rozell, 1993; Youndt et al., 1996).

### **3.2.2 Three Approaches to SHRM**

Many authors have attempted to provide more analytical frameworks for SHRM. Delery and Doty's (1996) analysis is one of the most prominent studies which distinguish between the following three theoretical frameworks:

- Universalistic: some HR practices are believed to be universally effective, i.e., "best practice(s)".
- Contingency theory: the effectiveness of HR practices is supposed to be dependent on an organisation's strategy, i.e., "best fit" or "vertical fit".
- Configurational: the effectiveness of HR practices is supposed to not only enhance vertical fit but also "horizontal fit".

The three different theoretical frameworks of SHRM have received a lot of attention and many empirical studies have been conducted to test their validity.

#### **3.2.2.1 The Universalistic Approach**

The universalistic approach to SHRM argues that some HR practices are always better than others and suggests that all organisations should adopt these best practices. As Delery and Doty (1996) wrote, "universalistic arguments are the simplest form of theoretical statement in the SHRM literature because they imply that the relationship between a given independent variable and a dependent variable is universal across the population of organisations" (p.805). The universalistic approach has attracted a range of interested researchers. Examples of this research

include Pfeffer (1994), Osterman (1994), Delery and Doty (1996), Guthrie (2001), Guthrie et al. (2009), and Huselid (1995).

In Pfeffer's (1994) book, he enumerated sixteen distinctive management practices which helped organisations to achieve high productivity and profits and gain competitive advantage. These sixteen best management practices were later reduced to seven, such as employee security, selective hiring, self-managed teams or teamworking, high pay contingent on company performance, extensive training, reduction of status differences, and sharing information (Pfeffer, 1998). Osterman (1994) identified a number of innovative work practices which help organisations to achieve high productivity. They include teams, job rotation, quality circles, and total quality management.

Empirically, Huselid (1995) examined the link between the use of bundles of high performance work practices and organisation-level outcomes. He found considerable support for the hypothesis that investments in such high performance work practices were associated with lower employee turnover and greater productivity and corporate financial performance. Delery and Doty (1996) discovered that three individual HR practices - profit sharing, results-oriented appraisals, and employment security - had relatively strong universalistic relationships with important financial performance measures. This provided strong support for the universalistic perspective. Guthrie (2001) found a positive association between the use of high-involvement work practices and employee retention and firm productivity while studying the relationship between High-Involvement Work Practices, Turnover, and Productivity in a New Zealand context. Guthrie et al. (2009) examined the effectiveness of high performance work systems

for organisational performance using a multi-industry sample of firms operating in the Republic of Ireland. Their results suggested that greater use of HPWS was associated with positive human resource and organisational outcomes.

The above research provides strong evidence for the universalistic framework of SHRM which argues the direct relationship between SHRM and organisational performance that proposes the “best practices” (Combs et al., 2006).

### **3.2.2.2 The Contingency Theory Approach**

According to the contingency theory approach of SHRM, HR practices are effective in improving organisational performance only when they are consistent with other aspects of the organisation, e.g. organisational strategy and organisational contexts (Delery & Doty, 1996). In other words, the contingency theory approach of SHRM argues that the impact of HRM on firm performance is moderated by organisational strategy. The example studies include Youndt et al. (1996) and Datta et al. (2005).

The study by Youndt et al. (1996) tested and found the support for the moderating role of manufacturing strategy in the relationship between HR practices and firm performance. Datta et al. (2005) examined how industry characteristics affect the relative importance interacting with HPWS. They analysed and found the evidence for the moderating effects of industry capital intensity, industry growth, industry differentiation and industry dynamism in the relationship between HPWS and firm performance.

Therefore, the two above studies provide support for the contingency theory approach of SHRM which proposes the “best fit” approach between HRM and

organisational strategy rather than the “best practices” as advocated in the universalistic approach. This “best fit” is sometimes labelled as “vertical fit”.

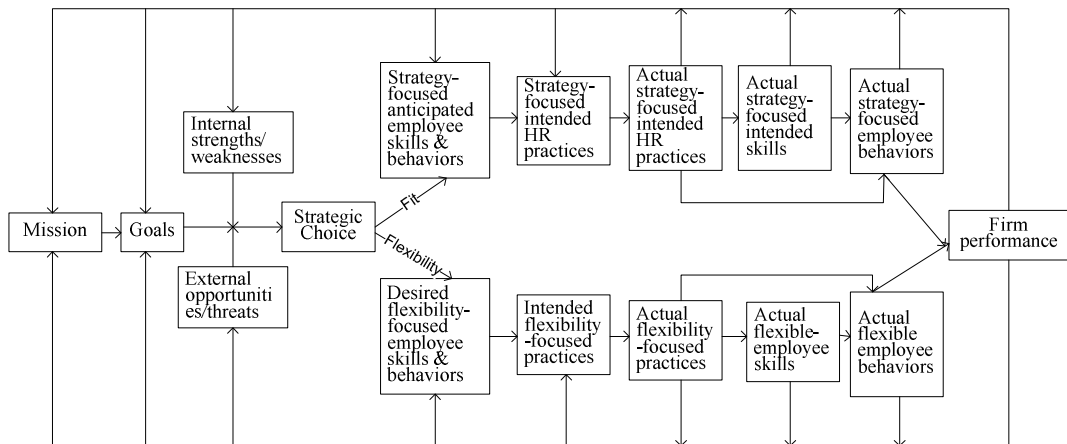
### **3.2.2.3 The Configurational Approach**

The configurational approach of SHRM argues that the effectiveness of HR practices not only depends on the fit between HRM and the aspects of organisations, i.e. vertical fit, but also depends on the internal consistency of HR policies or practices, i.e. horizontal fit (Delery & Doty, 1996).

Wright and Snell (1998) presented a model for exploring fit and flexibility in strategic human resource management (see Figure 3.1). They considered fit and flexibility as two goals of organisational strategies. They then investigated whether SHRM could contribute to a firm’s competitive advantage. Their comprehensive analysis illustrated that a multifaceted HRM system could simultaneously pursue both the fit and flexibility. Multifaceted HRM emphasised the idea of “best bundles”. To achieve the goal of “fit”, as Wright and Snell (1998) suggested, “firms that seek to increase levels of customer service can develop selection tests, such as role plays or interviews that assess an individual’s skill in providing customer service” (p.767). To achieve the goal of “flexibility”, organisations could adopt practices to improve employees’ “developmental experiences, such as job rotation and temporary assignments, focus on broadening both the skills and behavioural repertoires of individuals” (p.767).

Another distinctive paper on the bundles of HR practices was conducted by Kang and Snell (2009). They linked HR practices with organisational learning. They argued that different HR configurations, i.e. different bundles of HR practices,

**Figure 3.1 A Fit/Flexibility Model of SHRM**



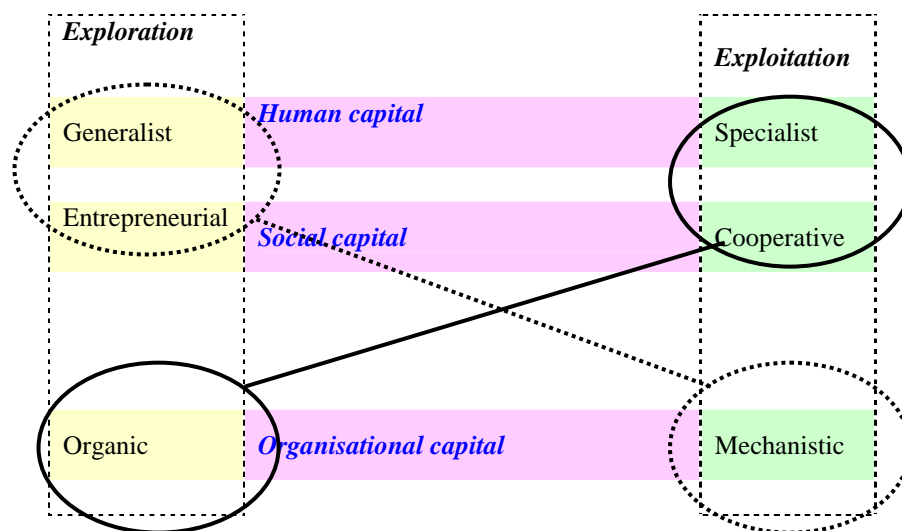
Source: Wright and Snell (1998: 760)

created different types of human capital as generalist and specialist, social capital as entrepreneurial and cooperative, and organisational capital as organic and mechanistic as shown in Tables 3.1 to 3.3. Table 3.1 shows that skill-based HR development system helps to build generalist human capital while job or function-based HR development systems helps to build specialist human capital. Table 3.2 shows that market or network-based employ relations system helps build entrepreneurial social capital while internal labour market (ILM)-based employ relations system helps build cooperative social capital. From Table 3.3, it can be seen that error embracing performance control system helps build organic organisational capital while error avoiding performance control system helps build mechanistic organisational capital.

Kang and Snell (2009) identified that the different combination of these forms of capitals facilitate different modes of organisational learning, i.e. exploring new knowledge domains or exploiting current ones, and they might facilitate ambidextrous learning which includes both exploration and exploitation. Figure 3.2 shows that generalist human capital, supplemented by entrepreneurial social capital

and complemented by organic organisational capital facilitates exploration in organisational learning. Specialist human capital supplemented by cooperative social capital, and complemented by mechanistic organisational capital facilitates exploitation in organisational learning. The dashed lines and complete circles and lines present two new architectures of intellectual capital found by Kang and Snell (2009). These are described in Figure 3.3 as refined interpolation and disciplined extrapolation. Both of these architectures of intellectual capital encourage ambidextrous learning.

**Figure 3.2 Intellectual Capital Architectures and Ambidextrous Learning**



Source: Kang and Snell (2009: 74)

Kang and Snell's (2009) framework provides strong support for a configurational approach of SHRM. It emphasises the consistency among detailed HR practices to achieve different goals, e.g. different types of human capital, social capital and organisational capital represent different intellectual capital architectures, or horizontal fit. The different intellectual capital architectures are actually the organisational strategic choices, i.e. the vertical fit. This study also recalls Wright



**Table 3.1 HR Practices for Human Capital**

<b>Human capital</b>	<b>Generalist:</b> diverse knowledge of multiple domains	<b>Specialist:</b> deep knowledge in a specific domain
<b>Development system</b>	<b>Skill-based</b>	<b>Job or function-based</b>
	Based on potential (aptitude) (e.g. cognitive ability and aptitude tests)	Based on the fit between persons and jobs
Staffing	Place priority on employee potential and openness to learn new skills	Consider the fit between individuals' current competence and job requirements as a primary criterion.
Job design	Broad and multidimensional; formal; broad or loosely-defined, and serendipitous job designs	Narrow and tight job definitions, idiosyncratic job designs
Job rotation	Broad and multidimensional	Focused career development; hierarchical job movement with few job rotations
Training	Extensive training to focus on future skill requirements beyond current job requirements	Intensive training to focus on the improvement of current job-related skills
Incentive systems	Skill- or knowledge-based incentive systems	Focus on individuals' performance and effort in current jobs for compensation.

Source: Kang and Snell (2009).

**Table 3.2 HR Practices for Social Capital**

<b>Social capital</b>	<b>Entrepreneurial:</b> a more loosely connected social system	<b>Cooperative:</b> a tightly coupled social system
Structural	weak and non-redundant relational networks	strong and dense network connections
Affective	resilient dyadic trust that is developed through direct personal experiences	generalized or institutional trust based on membership in the social unit
Cognitive	common component knowledge that reflects shared technical, professional, or operational knowledge	shared understanding of how knowledge can be combined

<b>Employee relations system</b>	<b>Market or network-based</b>	<b>Internal labour market (ILM)-based</b>
Staffing	Extensive external staffing that utilizes various external sources of human resources	Internal staffing/promotion
Compensation	Performance-based compensation (e.g. individual incentives, pay for reputation, hierarchical pay structure)	Seniority-based compensation (including fixed bonus and egalitarian pay structure)
Training	General development experiences (e.g. crosstraining, training for interpersonal skill improvement, social events)	
Socialization		Socialization (e.g. mentoring, P-O fit criteria for recruiting and promotion, extensive orientation, team structures, multi-source feedback, etc)

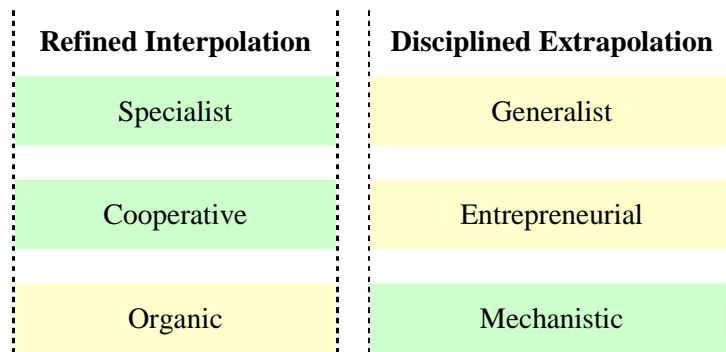
Source: Kang and Snell (2009).

**Table 3.3 HR Practices for Organisational Capital**

<b>Organisational capital</b>	<b>Organic:</b> more loosely connected to precedent, rules, and traditional expectations about work	<b>Mechanistic:</b> standardized processes and structures, detailed routines, and rule following cultures
<b>Performance / control system</b>	<b>Error embracing</b>	<b>Error avoiding</b>
Appraisal	Develop mental performance appraisal	Specific behavioural appraisal systems (e.g. behavioural observation scales)
Participation	Employees' participation in problem-solving and decision-making; Extensive transference of tasks and responsibilities to employees; Encouraging and implementing employee suggestions; Reduction of status barriers between managers and employees	Performance programme imposed top-down
Evaluation	Providing chances to use personal initiatives	Behaviour (versus result)-based evaluation and rewards

Source: Kang and Snell (2009).

**Figure 3.3 Two Intellectual Capital Architectures**



Source: Kang and Snell (2009)

and Snell (1998)'s conclusions that SHRM can achieve both vertical fit and horizontal fit.

Viewed together, the above research provides support for the configurational approach to SHRM, which emphasises consistency among HR practices as well as consistency between HRM and the aspects of organisational outcomes.

### **3.2.3 SHRM and HPWS**

Many researchers in the field of SHRM adopt a systems perspective which focuses on a bundle or a system of human resource (HR) practices rather than individual practices to examine the performance impact of HRM on relevant organisational outcomes (Authur, 1994; Huselid, 1995; Guthrie, 2001; Guthrie et al., 2009; Gittell, Seidner, & Wimbush, 2010; Takeuchi, Lepak, Wang, & Takeuchi, 2007).

As reviewed previously, HPWS is also often used as a label for SHRM. Although there is no universal agreement on the definition of HPWS due to its wide and varied usage (Boxall & Macky 2009; Boxall & Purcell 2003), HPWS can be described as “a system of HR practices designed to enhance employees’ skills, commitment, and productivity in such a way that employees become a source of sustainable competitive advantage” (Lawler, 1992, 1996; Levine, 1995; Pfeffer,

1998; cited in Data et al., 2005: 136). HPWS involves selective staffing, extensive training and development, mentoring, performance management, and incentives (Gittell et al., 2010; Takeuchi et al., 2007).

HPWS is a system of HR practices that are effective for improving a firm's performance. However, different organisational contexts might apply different practices, so it is necessary to look at the "firms facing similar environments rather than on firms with diverse environments, because within- rather than cross-industry studies will better allow researchers to identify the firm capabilities necessary for success" (Collins & Smith 2006: 554). Therefore, the professional service firms have been chosen as the context within which this research is conducted. The applications of HPWS in PSFs are provided in the next section.

### **3.2.4 HPWS in PSFs**

As outlined in Chapter Two, the inputs and outputs of PSFs are knowledge. The human resource is the most valuable asset of PSFs as the professional staff members embed, deliver and apply knowledge. Therefore, human resource management plays an important role in value creation in PSFs.

PSFs usually adopt apprenticeships (Morris & Pinnington, 1998). Most professional staff members have senior supervisors who supervise and monitor their progress. Every year, many trainees are recruited and become professionally accredited while they are trained on-the-job. They acquire formal knowledge through training and experience through the performance of day-to-day tasks. After qualification, most of them will choose to leave though some will remain. These are usually self-motivated to obtain a qualification but monitoring or coaching is also necessary.

Efficient monitoring practices for trainees could help PSFs reduce costs and improve firm performance. Therefore, the HR practices in PSFs include staffing, training, performance management, compensation, information sharing and participation.

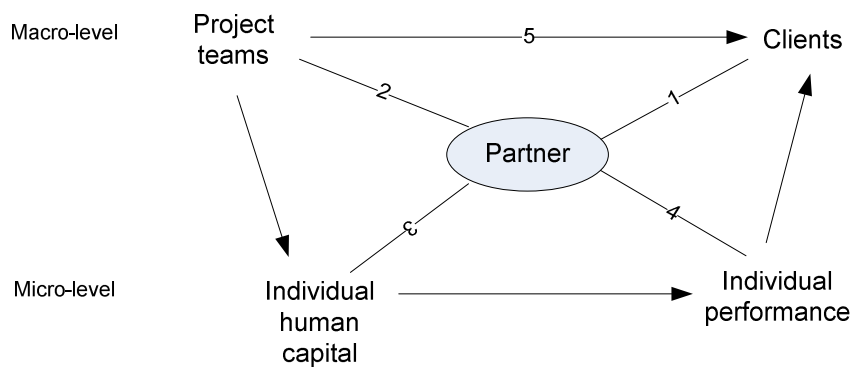
In PSFs, most employees are revenue producers (Stumpf et al., 2002). However, partners are found to play a very important role in seeking business and retaining existing clients (Hitt et al., 2001). During the process of delivering services to clients, partners serve as managers, as well as key production workers who actively participate in a lot of businesses. Each partner is responsible for organising a group of professionals, who share a particular form of expertise, into a recognizable practice area. Partners are also responsible for a firm's overall management.

“Partners’ desire for autonomy in the conduct of their professional tasks and their control of client relationships produce a dispersed distribution of power within professional firms” (Empson, 2007: 64).

Partners are the most aware of opportunities in their client markets (Hinings et al., 1991). Usually, each partner looks after some fixed clients. When the partner establishes the client's needs, he or she will choose one or several directors at the senior level who will choose some qualified professionals at the junior level to form a service or project team. Usually after delivering services to clients, the partner will go to his or her clients to check if they are happy with the service. This process can be understood from a macro-level (firm level) and a micro-level (individual level) as shown in Figure 3.4.

In Figure 3.4, line 1 illustrates a partner discovers clients' needs. Line 2 shows the partner forming a project team and line 5 shows delivery of service to clients.

**Figure 3.4 How PSFs Deliver Service to Their Clients by Partners**



Internally, the partner coaches and monitors individuals (line 3) to improve individual performance (line 4) and subsequently improve team competencies.

Based on the above analysis of the work process in PSFs, partners are those who have very good knowledge of their organisation to ensure the success in delivering service. In addition, the use of HR practices, such as staffing, training, performance management, compensation, information sharing and participation, facilitates this process through improving partners and employees' communication, coordination, monitoring and team utilisation (Gittell et al., 2010; Kraut & Streeter 1995). Therefore, this study explores how HR practices operates in PSFs through collecting data from partners.

### **3.2.5 HPWS and Firm Performance**

In the studies on the relationship between HRM and firm performance, two main research themes concerned with direct and indirect effects have emerged. Some scholars argue that HR practices have a direct effect on various measures of organisational performance (Guest, 1997; Huselid, 1995). For example, high performance work systems (HPWS) have been found to positively relate to firms'

outcomes in generalized firms especially in manufacturing firms, such as financial performance (Guthrie, 2001; Huselid, 1995), employee turnover (Richard & Johnson, 2001), firm productivity (Guthrie, 2001), efficiency, flexibility (Evans & Davis, 2005), and organisational commitment (Youndt et al., 1996). This research theme mainly employs the universalistic approach of SHRM.

On the other hand, other researchers contend that that is an indirect relationship between HR practices and organisational performance, i.e. the mechanisms by which HPWS affect firm performance. As Becker and Gerhart's (1996: 793) commented:

“future work must elaborate on the black box between a firm's HRM system and the firm's bottom line. Unless and until researchers are able to elaborate models, including key intervening variables- it will be difficult to rule out alternative causal models that explain observed associations between HR systems and firm performance”.

The representative studies on the indirect relationship between HRM and firm performance include Batt (2002), Collins and Clark (2003), Datta et al. (2005), Gittell et al. (2010), Tackechui et al. (2007), Wright et al. (2001), and Youndt et al. (1996). This research theme mainly employs the contingency theory and configurational approaches of SHRM.

Table 3.4 summarises findings of studies relating to the direct and indirect relationships between SHRM and organisational performance including the tested model, sample/method and findings.

**Table 3.4 A Summary of Empirical Studies of HRM on Organisational Performance**

Direct Relationships	Indirect Relationships	Study(s)	Model test	Sample/Method	Findings
✓		Athur (1994)	To explore the effect of human resource systems on manufacturing performance and turnover	USA: 30 of 54 mini-mills in the steel industry, survey to HR managers Response rate: 56%	High commitment HRM systems were associated to higher reported productivity and show lower reported labour turnover.
✓	✓	Batt (2002)	To examine the relationship between human resource practices, employee quit rates, and organisational performance in the service sector	USA: survey to general managers in call centers. Response rate: 54%	High involvement HR practices positively related to sales growth and negatively related to employee quit rates. Effect of high involvement HR practices on sales growth was moderated by market context.
✓	✓	Collins & Clark (2003)	To examine the mediating effect of social networks of top management teams on the relationship between HRM and firm performance	USA: two questionnaires to CEO in 73 high-technology firms to measure and TMT (excluding CEO) to measure social networks and the secondary source records to measure financial performance. Response rate: participation rate of 35%; internal response rate of 54%	HR practices were positively associated to firm's financial performance. This relationship was mediated by top management team's networks.
✓	✓	Combs et al. (2006)	Meta-analysis of the effect of HPWS on organisational performance	92 studies of HRM and organisational performance that examined a total of 19,319 organisations from 1985 to 2005	HPWPs considerably and positively affect organisational performance. This relationship is moderated by firm context.
	✓	Datta et al. (2005)	To examine how industry characteristics affect the relative importance and value of HPWS for organisational performance.	USA: Survey to HR executives in 971 manufacturing firms having a minimum of 100 employees and \$50 million in sales. Response rate: 25%	The positive relationship between human resources systems and productivity was influenced by industry capital intensity, growth, and differentiation.



**Table 3.4 A Summary of Empirical Studies of HRM on Organisational Performance (continued)**

Direct Relationships	Indirect Relationships	Study(s)	Model test	Sample/Method	Findings
✓		Delery & Doty (1996)	To test which mode of SHRM, universalistic, contingency and configurational, is theoretical foundation of SHRM.	USA: two questionnaires to senior HR manager and president in 1050 banks. Response rate: 21% from HR manager and 53% from president, 11% in total	HR practice performance appraisal, profit sharing and employment security were found directly and positively associated to organisational performance.
✓		Huselid (1995)	To evaluate the links between HPWPs and firm performance	USA: questionnaire to senior HR professionals in 3,452 firms representing all major industries. Response rate: 28%	HR practices were positively associated to firm financial performance and productivity and negatively associated to employee turnover.
✓	✓	Gittell et al. (2010)	To explore the mediating role of relational co-ordination between HPWS and organisational outcomes	USA: nine orthopedics units located in a different hospital. Multiple data collection resources. Administrator interviews were used to measure high-performance work practices at the unit level. Relational coordination was measured by the care provider survey at the level of individual level with response rate at 51%. Patient surveys and hospitalization records were used to measure outcomes at the level of individual patients with response rate at 64%.	Relational coordination mediated the relationship between HPWS and organisation outcomes.
✓		Guthrie et al. (2009)	To examine the effectiveness of HPWS in Irish context	Ireland: two questionnaires to managing director and senior HR manager in 1338 top firms. Response rate: 12.3%	Greater use of HPWS was associated with lower rates of employee absenteeism and voluntary turnover and with higher labor productivity and lower labor costs.

**Table 3.4 A Summary of Empirical Studies of HRM on Organisational Performance (continued)**

Direct Relationships	Indirect Relationships	Study(s)	Model test	Sample/Method	Findings
✓		Richard & Johnson (2001)	The link between SHRM effectiveness and organisational level outcomes	USA: questionnaire to HR manager in 406 Banks in California and Kentucky and the secondary data information sources  Response rate: 23%	Firms with higher levels of SHRM effectiveness experience performance gains.
✓	✓	Tackechui et al. (2007)	To examine the mediating roles of collective human capital, and social exchange in the link between HPWS and organisational performance	Japan: two surveys to employees and managers in 76 Japanese establishments.  Participation rate: 47%	Collective human capital and the degree of social exchange mediated the relationship between HPWS and relative establishment performance.
✓		Wood & de Menezes (2008)	To distinguish between high involvement management as a set of complementary best practices, as a set of synergistic practices, and as an underlying orientation or philosophy to affect organisational performance	UK: adopt the result of WERS98 and a structured interview with the senior manager responsible in 2191 workplaces with 10 or more employees across the whole British economy.	HR practices were critical for productivity. Different HR practices had different effect on different organisational performance. For example, job security was found as the only practice associated with reduced labour turnover.
✓	✓	Youndt, Dean & Lepak (1996)	To examine two alternative views-universal and contingency-of HR and performance relationship in manufacturing context	Two round questionnaires: 1st to general manager to ask HR and performance, and 2nd to all managers to ask the strategy.  Response rate: 31%	HR systems as a set were significantly related to customer alignment and employee productivity

### **3.2.6 Summary**

This section has presented the definition and three approaches to SHRM, and the application of HPWS in PSFs. In particular, it reviewed the research on the direct and indirect effect of SHRM on organisational performance. Both research themes are supported by empirical evidence.

However, there is a lot of evidence to suggest that the HPWS-firm performance relationship is not necessarily a direct one and many scholars call for deeper and more theoretical approaches to understand how and why high performance work systems (HPWS) affect firm performance (Bowen & Ostroff, 2004; Combs et al., 2006; Delery & Shaw, 2001), especially in service organisations (Combs et al., 2006). The next section will review the resource based view of the firm and the knowledge-based theory to for supporting the indirect impact of HPWS on firm performance.

### **3.3 The Resource-Based View of the Firm**

This section reviews the resource-based view of the firm (RBV) and its application in SHRM. In particular, three resources in PSFs are identified, i.e. human capital, social capital and organisational capital. Combining SHRM and the RBV, the mediating roles of the three capital resources are found. This is followed by a proposal of the hypotheses. Finally, a brief conclusion is provided.

#### **3.3.1 Definition**

The resource-based view of firm argues that a firm's competitive advantage lies primarily in the valuable, rare, imperfectly imitable, and non-substitutable resources

that a firm already has (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). These include tangible and intangible resources. The key resources of firms must meet the VRIN criteria, i.e., be valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1991). Only the firms that have superior resources and protect them from diffusion throughout the whole industry can maintain sustainable competitive advantage and sustain high performance levels.

### **3.3.2 RBV and KBT**

The knowledge based theory (KBT) is built upon the resource-based view of the firm (Alavi & Leidner 2001; Grant, 1996a, 1996b). Although the resource-based view of the firm recognises the important role of knowledge as a source of competitive advantage, it “does not go far enough”. Specifically, the RBV treats knowledge as a generic resource, rather than recognising that it possesses special characteristics. It therefore does not distinguish between different types of knowledge-based capabilities (Alavi & Leidner 2001; Grant, 1996a, 1996b).

The knowledge-based theory of a firm considers intangible resources, such as knowledge, as the most strategically significant resource of the firm (Grant, 1996a, 1996b; Nonaka & Takeuchi 1995; Spender, 1996). This knowledge is embedded and carried through multiple entities including individuals, relationships and organisational processes, routines, database, and systems.

Knowledge is different from data and information as it involves ‘beliefs and commitment’, and therefore it is a ‘function of a particular stance, perspective, or intention’ (Nonaka & Takeuchi, 1995: 58).

There are two types of knowledge: explicit knowledge and tacit knowledge (Berry, 1997; Nonaka, 1994; Nonaka & Takeuchi, 1995; Polanyi, 1958, 1966). Tacit knowledge is inherently difficult to transfer because it cannot be fully transferred through written or verbal communication but must be learned through experience (Nonaka & Takeuchi, 1995; Polanyi, 1966).

The knowledge-based theory argues that knowledge-based resources can build long-term sustainable competitive advantage. As Alavi and Leidner (2001) stated “[b]ecause knowledge-based resources are usually difficult to imitate and socially complex, heterogeneous knowledge bases and capabilities among firms are the major determinants of sustained competitive advantage and superior corporate performance” (p.108).

### **3.3.3 RBV, KBT and SHRM**

RBV has been widely used and has become a presumed paradigm in SHRM research (Paauwe, 2004). It shifts the emphasis of SHRM from external factors, i.e. environments, industry position, to the internal resources of the firm (Hoskisson, Hitt, Wan, & Yiu, 1999). Therefore, it has been used as a theory base in many empirical studies to examine how HRM practices can impact firm performance (Boxall & Purcell, 2000; Guthrie et al., 2009; Wood & de Menezes, 2008; Wright et al., 2001). “A knowledge-based perspective of the firm has emerged in the strategic management literature” (Cole, 1998; Nonaka & Takeuchi, 1995; Spender, 1996a, 1996b; cited in Alavi & Leidner, 2001: 108).

There is a growing research interest in applying knowledge management in SHRM research. One of the most distinctive theoretical studies was conducted by Wright et

al. (2001). They explain that SHRM forms organisational core competencies through knowledge management, intellectual capital and dynamic capabilities. Their work has been reviewed in the previous section.

### **3.3.4 RBV and KBT in PSFs**

Professional service firms consist of a highly educated and professionalised workforce who provides clients with customised knowledge (Empson, 2007; Greenwood et al. 2005; Maister, 1993). Based on the RBV and KBT, three resources within PSFs were identified to embed the required knowledge in Chapter 2. They are human capital, social capital, and organisational capital. Human resource constitutes the critical asset of PSFs. Therefore, this study investigates how to build the resources through human resource management practices systems. This study also aims to discover how to use these resources at the firm level to help PSFs to achieve higher performance.

### **3.3.5 RBV, KBT and SHRM in PSFs**

The SHRM literature argues that the use of HPWS will have a positive impact of firm performance (Arthur, 1992, 1994; Collins and Clark 2003; Huselid 1995; Youndt et al. 1996). This impact may often be indirect (Batt, 2002; Collins & Clark, 2003; Datta et al., 2005; Gittell et al., 2010; Tackechui et al., 2007; Wright et al., 2001; Youndt et al., 1996). The resource-based view of the firm (RBV) argues that a firm's competitive advantages lie primarily on the valuable, rare, imperfectly imitable, and non-substitutable resources that a firm already has (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). The intangible resources are more likely to

produce a competitive advantage because they are often rare and socially complex, thereby making them difficult to imitate (Barney 2001; Black & Boal 1994; Itami, 1987; Peteraf 1993). In an extension of the RBV, the knowledge-based theory of a firm considers intangible resources such as knowledge, as the most strategically significant resource of the firm (Grant, 1996a, 1996b). This knowledge is embedded and carried through multiple entities including individuals, relationships and organisational processes, routines, database, and systems.

Based on the resource-based view of the firm, knowledge-based theory and strategic human resource management, the literature suggests three pathways through which HPWS influence firm performance. They are the human capital, social capital and organisational capital pathways (Kang & Snell, 2007). This literature is now reviewed.

#### **3.3.5.1 The Mediating Role of Human Capital**

Human capital refers to the stock of skills and knowledge embodied in individuals (Becker, 1964; O'Sullivan & Sheffrin, 1998), which can be built through education and training (Becker, 1964).

There are some scholars who have found that a HPWS affects firm performance by improving employees' human capital. For example, Guest (1997) indicated that SHRM improved firm performance by improving the quality of employees, i.e. their skills and abilities. Snell and Dean (1992) argued that human resource management practices affected a firm's financial performance by creating higher human capital skills, experience and knowledge. Wright et al. (2001) asserted that HPWS facilitated building of a firm's competitive advantage by creating a high quality

human capital pool which is not easily imitated by its competitor in a given time. Becker and Gerhart (1996) explained that human resource activities contributed to firm's competitive advantages by developing employees' skills. They argued that a highly skilled workforce would help firms to achieve higher financial performance.

In PSFs, human capital is defined as the knowledge embedded in professionals that can be used to produce high quality professional services for clients (Hitt et al., 2001; Hitt et al., 2006; Pennings, Lee & Van Witteloostuijn, 1998).

Human capital is a very important asset of PSFs (Hitt et al., 2001; Morris & Snell, 2008). Higher human capital means more expertise knowledge embedded in highly professionalised workforces in PSFs. It can help PSFs build a good reputation by signalling that the professional service firm has the potential to provide more efficient solutions for its clients. The clients may prefer to choose the PSF with higher human capital since they believe that smarter people will provide better solutions when other conditions are the same. PSFs achieve high human capital by recruiting graduates from top institutions who have potentially better learning capability (Hitt et al., 2001). In addition, extensive training programmes can help to build human capital as most people want to learn more and are interested in opportunities that develop personal skills. So higher human capital also helps PSFs to attract more talent and brighter graduates from top institutions.

To build high human capital, PSFs need to identify, attract and retain superior professionals. This can be achieved through HR practices such as selection, recruitment, training and skill-based pay.

Thus this study proposes that HPWS improves firm performance by improving PSFs' human capital.



*H1: PSF's human capital mediates the relationship between HPWS and firm performance.*

### **3.3.5.2 The Mediating Role of Social Capital**

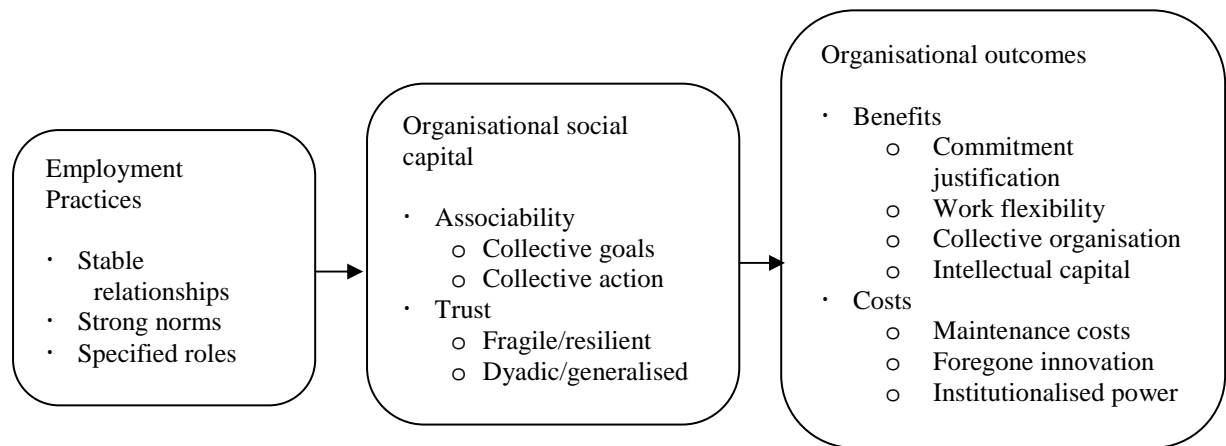
Social capital is a resource which is embedded in the relationships among individuals (Coleman, 1988; Bourdieu; 1985; Burt, 1992; Putnam, 1993; Nahapiet & Ghoshal, 1998; Lin, 2001).

There is some research which has found that many human resource management practices have a significant role to play in creating social capital. For example, Wright et al. (2001) argued that HPWS affected firm performance in many different ways and give an example that "... these [human resource management] systems may promote and maintain socially complex relationships characterized by trust, knowledge sharing, and teamwork" (p.710). Bowen and Ostroff (2004) identified that human resources management influenced organisational performance by fostering a collective organisational climate. The concept of organisational climate in Bowen and Ostroff (2004) came from psychology and was defined as "is a shared perception of what the organization is like in terms of practices, policies, procedures, routines, and rewards" (p.205). It responded to Nahapiet and Ghoshal's (1998) description of the cognitive facet of social capital as "shared representations, interpretations, and systems of meaning among parties" (p.244). Therefore, Bowen and Ostroff's (2004) research provides support for the mediating role of social capital between HR practices and firm performance.

Leana and van Buren (1999) stated that employment practices fostered organisational internal social capital and then organisational internal social capital

created value for firms. In other words, organisational social capital mediated the human resource management practices and organisational performance relationship (see Figure 3.5).

**Figure 3.5 A Model of Organisational Capital**



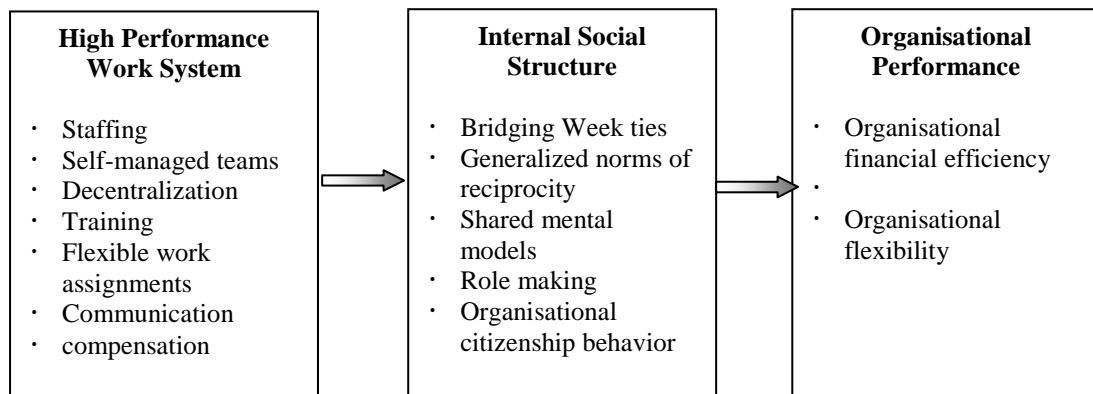
Source: Leana and van Buren III (1999: 547)

They also indicated that employment practices could also reduce organisational internal social capital. However the issue of what employment practices reduce internal social capital remains unanswered.

Evans and Davis (2005) studied the mediating role of the internal social structure between high performance work systems and organisational performance and built a framework to show that the human resource practices that enhance organisational internal social structure will create organisational internal social capital and then improve organisational financial efficiency and organisational flexibility (see Figure 3.6).

Empirically, Collins and Clark (2003) tested and found support for the mediating role of social capital between HR practices and firm performance in high technology firms. In addition, Gittell et al. (2010) provided one of the best empirical tests to

**Figure 3.6 Expanded Framework of HPWS and Organisational Performance**



Source: Evans and Davis (2005: 761)

date of the argument that high-performance work systems affected organisational outcomes through their impact on strengthening relational coordination among employees. They argued that high-performance work systems, including selection for cross-functional teamwork, cross-functional conflict resolution, cross-functional performance measurement, cross-functional rewards, cross-functional meetings, and cross-functional boundary spanners, were designed to foster the employee-employee relationships through which effective coordination was achieved. The relational coordination was defined as “a mutually reinforcing process of interaction between communication and relationships carried out for the purpose of task integration” (Gittell 2002a, p. 301). Gittell et al. (2010) tested their hypotheses among a sample from nine hospitals where the administrators were interviewed on the high-performance work systems, the care providers completed the survey on relational coordination, the patients answered the questions on the quality of care, and the hospital records were reviewed to measure the efficiency of care. Their results provided the support for the argument that the impact of high-performance work

systems on organisational outcomes was mediated by the relational coordination among employees.

Although the above research provides support that social capital mediates the relationship between HR practices and organisational outcomes, there are still some gaps. First of all, their contexts include high technology firms and hospitals which are knowledge-intensive but not professional service firms which are knowledge-intensive but differ from the above firms. Secondly, Collins and Clark (2003) only focused on the top management team members without considering the relationships between employees and managers. Gittell et al. (2010) only analysed the employee-employee relationships, i.e., internal social capital at an individual level without considering the external social capital, i.e. the relationships between employees and their clients. Both the studies overlook the mediating role of general social capital especially the external social capital through which HR practices influence firm performance. Therefore, this study investigates both the internal and external social capital at firm level to illustrate the three pathways through which HPWS work.

In this study, PSFs' social capital is defined as the knowledge embedded in the relationships among professionals and between professionals and clients. Some HR practices contribute to building social capital through training, compensation, and communication and information sharing practices. For example, to build internal social capital, PSFs could provide training programs for improving professionals' teamwork and communication skills, compensation policies such as group-based pay and bonus sharing plans, and open vertical and horizontal communication channels for professionals sharing and exchanging knowledge within the firm through employee suggestion forums. To build external social capital, PSFs could

provide professionals with external training opportunities, and reimburse them for developing networks with potential and existing clients.

In PSFs, social capital plays an important role in two ways. On one hand, the relationships between PSFs and clients, i.e., external social capital, help PSFs to attract and retain clients. The service delivered by PSFs suffers from an “opaque quality” (von Nordenflycht, 2010) mainly because the PSFs inputs and outputs are intangible and the clients can not evaluate the quality of service before they receive it. When choosing a service provider, the clients usually choose the service provider who has a relationship with them all other things being equal (Alvesson, 2001; Pennings et al., 1998). Pennings et al. (1998) defined a firm’s social capital as the ties between professionals and their potential clients and found that a firm’s human and social capital has great influence on firm dissolution in PSFs. Their study shows that at a firm-level, human and social capital can be an important source of competitive advantage. On the other hand, the capital embedded in the internal relationships among professionals within the firm, i.e., internal social capital, can help PSFs deploy teams, coordinate tasks and communicate within the firm efficiently.

Based on the above analysis, this study proposes that the PSFs’ social capital mediates the relationship between HPWS and firm performance.

***H2: PSF’s social capital mediates the relationship between HPWS and firm performance.***

### **3.3.5.3 The Mediating Role of Organisational Capital**

Organisational capital is defined as the institutionalised knowledge residing within organisational processes, routines, systems and structures (Youndt et al., 2004; Subramaniam & Youndt, 2005) and is the result of integrating and combining individual knowledge into organisational knowledge (Grant, 1996a, 1996b) which is preserved over time (Daft & Weick, 1984). Organisational capital is a source of organisational competitive advantage (Kang & Snell, 2007; Teece, 2000; Teece et al., 1997).

Some scholars propose that HR practices affect firm performance through building organisational capital. For example, Ferris, Arthur, Berkson, Kaplan, Harrell-Cook, and Frink (1998) point out that HR practices affected organisational effectiveness by shaping organisational work climate. According to Kopelman, Brief and Guzzo's (1990) definition, work climate can be understood as the extent to which managements know the organisational processes, databases and systems that employees can use to accomplish their work. In addition, Wright et al. (2001) suggested that HPWS might play a role in creating organisational cultures and shared organisational knowledge which enables a firm to form and maintain its core competencies. Their work indicated that HR practices might affect firm performance by forming organisational processes and systems.

In PSFs, organisational processes are highly institutionalised due to their knowledge-based work (Freidson, 1986; Greenwood et al., 1990; Robertson, Scarbrough, & Swan, 2003). The organisational routines in PSFs are informal work practices which are formed by professionals during their team work (Morris, 2001). Some large PSFs build their own databases and systems which store individual

experience and knowledge (Suddaby & Greenwood, 2005), which are often called knowledge centres (Moore & Birkinshaw, 1998). The professionals in the firm can access them and draw on previous experience. The databases and systems provide support for professionals to reuse and exploit existing knowledge. Most PSFs have flat organisational structures (Greenwood et al., 1990; Stumpf et al., 2002) which facilitate knowledge flow between seniors and juniors.

Organisational capital constitutes an important resource for PSFs by facilitating knowledge creation, sharing, combination and exchange (Morris & Snell, 2008). Besides facilitating knowledge integration, organisational capital also shapes professionals' image and identity (Empson, 2001) which play an important role in attracting new clients.

Some HR practices contribute to the building of organisational capital in PSFs through staffing, training, and performance control (Kang & Snell, 2009; Youndt et al., 2004). In detail, when recruiting new people, the fit between candidates' attitudes and organisational culture needs to be considered. During the training process, it is not only the professional knowledge but also the organisational databases and systems and the shared values among the firm that need to be introduced to employees. In designing the performance control system, organisations could embrace the errors made by employees to encourage them to explore new knowledge. This will form organic organisational capital which involves "the simple and enacted routines, structures, and cultures ... [that] provides opportunities and autonomy for individuals and groups to experiment with both the way they work and the way they organize that work" (Kang & Snell, 2009: 70-71). The organisations also can choose to avoid errors to encourage employees only

exploit existing knowledge. This will form mechanistic organisational capital which involves “the standardized processes and structures, detailed routines, and rule ... [that] tends to reinforce efficient coordination by establishing ingrained patterns of behaviour and interdependence” (Kang & Snell, 2009: 70).

These above arguments lead to the following hypotheses.

*H3: PSF's organisational capital mediates the relationship between HPWS and firm performance.*

### **3.3.6 Summary**

This section reviewed the resource-based view of the firm and its application in strategic human resource management research. Based on the literature and the practices in PSFs, three valuable, rare, imperfectly imitable, and non-substitutable resources in PSFs were identified as human capital, social capital and organisational capital. Then the research on the mediating roles of the three capital resources in the relationship between high performance work systems and firm performance was reviewed which leads to the proposed hypotheses on the link of practices-resources-performance. The following section will review the dynamic capabilities theory (Teece et al., 1997) and its application in PSFs to provide the arguments on the link of resources-uses-performance.

### **3.4 The Dynamic Capabilities Theory**

The dynamic capabilities theory (Eisenhardt & Martin 2000; Helfat et al. 2007; Teece & Pisano, 1994; Teece et al., 1997) argues that firms not only compete on



their existing resources but also compete on their capabilities to exploit and explore the resources.

This section presents the concept of dynamic capabilities and its application in professional service firms. Based on the dynamic capabilities theory (Eisenhardt & Martin 2000; Helfat et al. 2007; Teece & Pisano, 1994; Teece et al., 1997), this study proposes the intervening variables as the “uses of resources” between resources and firm performance. The uses of resources describe how resources are developed, how they are integrated within the firm, and how they are released. The effective use of resources, for example, will help a professional service firm to balance their investments in exploring new ideas, products and services and later exploiting existing knowledge to gain competitive advantage.

### **3.4.1 Definition of Dynamic Capabilities**

The concept of dynamic capabilities was introduced by Teece and Pisano (1994) and Teece et al. (1997). They asserted that in a dynamic environment a firm’s competitive advantage would rest on the firm’s internal processes and routines that enable the firm to renew and develop their resources to enable the firm to deliver innovative products and services to their clients.

Teece et al. (1997: 516) defined dynamic capabilities as follows:

“the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments.”

Other definitions of dynamic capabilities by Eisenhardt and Martin (2000) and Helfat et al. (2007) are given as follows:

“The firm’s processes that use resources-specifically the processes to integrate, reconfigure, gain and release resources-to match and even create market change.” (Eisenhardt and Martin, 2000: 1107).

“the capacity of an organisation to purposefully create, extend, or modify its resource base” (Helfat et al., 2007: 4).

The concept of dynamic capabilities offers insights into the drivers of competitiveness in firms that have similar resource bases. These drivers include: integrating, combining and developing the resource bases according to the firm’s strategic options.

### **3.4.2 Dynamic Capabilities and RBV**

The resource-based view of the firm argues that a firm’s competitive advantage lies primarily in the valuable, rare, imperfectly imitable, and non-substitutable resources that a firm already has (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). However, the resources alone cannot guarantee the development of competitive advantage or the creation of value (Barney & Arikan, 2001; Priem & Butler, 2001; Sirmon et al., 2007). For example, Porter (1991) commented that “resources are not valuable in and of themselves, but they are valuable because they allow firms to perform activities ... business processes are the source of competitive advantage” (p.108). The “resources can only be a source of competitive advantage if they are used to ‘do something;’ i.e., if those resources are exploited through business processes (Ray, Barney, & Muhanna, 2004: 26).

The dynamic capabilities theory considers how resources are developed, how they are integrated within the firm, and how they are released. This process is omitted in the resource-based view of the firm. Therefore, the dynamic capabilities theory

attempts to bridge these gaps between resources and firm performance by adopting a process approach.

While the resource-based view of the firm emphasises the importance of resources, including the creation and selection of resources, the dynamic capabilities theory emphasises the development and renewal of resources. Therefore, the dynamic capabilities approach can be theoretically considered as outlining the process which links the resources to firm performance. Empirically, Ray et al. (2004) provided support for the dynamic capabilities approach linking resources and performance. They conducted their research to explore the relationships between resources and firm performance in a call centre. The resources were social climate, managerial IT knowledge, technology resources, and investment in customer service. The unit performance was measured by customer service quality, self-assessment, weighted retention ratio and complaints ratio. Their results show that social climate and managerial IT knowledge are positively related to customer service performance. This research examined the relationship between resources and performance at a unit level. They claimed that the “uses” of resources enabled resources to become a source of competitive advantage using the dynamic capabilities framework. However, they did not answer the question of *how* to use these resources empirically. The next section will identify the effective uses of the resources in PSFs, i.e. the dynamic capacities of PSFs.

### **3.4.3 Dynamic Capabilities and KBT**

The knowledge-based theory emphasises the important strategic role of knowledge. Effectively managing knowledge can help organisations to achieve sustainable

competitive advantage. Knowledge management has been considered as an improved means by which to understand the dynamic capabilities approach. For example, Nielsen (2006) demonstrated that dynamic capabilities were composed of concrete and well-known knowledge management activities. He identified eight knowledge management activities: knowledge creation, acquisition, capture, assembly, sharing, integration, leverage, and exploitation. He then assembles these activities into the three dynamic capabilities of knowledge development, knowledge (re)combination, and knowledge use. The dynamic capabilities and the associated knowledge management activities create flows to and from the firm's stock of knowledge and they support the creation and use of organisational capabilities.

#### **3.4.4 Dynamic Capabilities in PSFs**

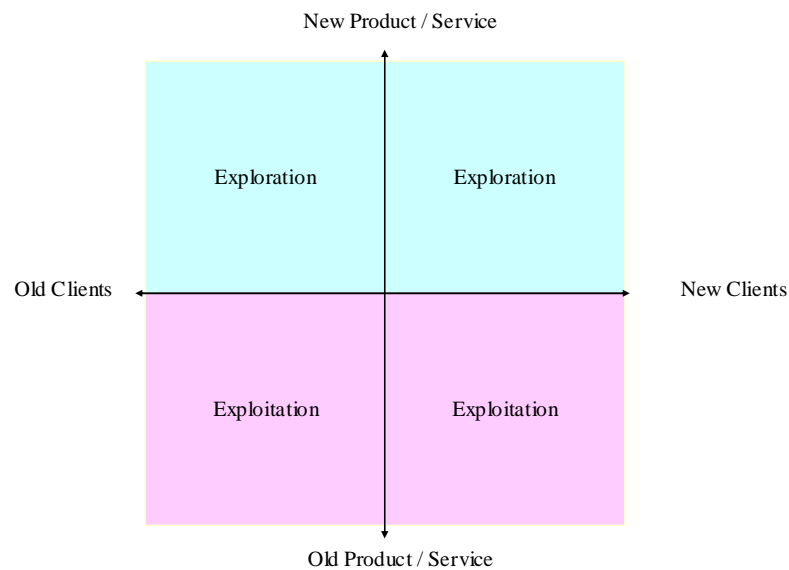
Some studies have investigated the relationship between resources and dynamic capabilities. For example, Eisenhardt and Martin (2000) suggested that social capital facilitates the four processes of dynamic capabilities which are acquiring, integrating, recombining and releasing internal and external resources. Coff and Blyler's (2003) investigated the relationship between social capital, dynamic capabilities and rent appropriations. They claimed that social capital played a central role in building dynamic capabilities through facilitating the acquiring, integrating, recombining and releasing of internal and external resources. They also mentioned that organisational structure, shared culture, language and routines (organisational capital) are elements required to build firms' dynamic capabilities. In the second half of their paper, they argued that the person who had higher social capital would generate higher rents when the firm has a dynamic capability.

While social capital facilitates building dynamic capabilities, human capital does so as well. Human capital builds reputations for firms and then attracts new clients. It also integrates, recombines and releases resources through being leveraged in PSFs. During the process of teamwork in delivering service, partners and associates exchange, recombine their knowledge and provide an integrated and efficient solution to clients. During this process, partners usually release their tacit knowledge to juniors.

Uses of these resources are similar to uses of the knowledge which is embedded in individuals, relationships and the organisational processes, routines, databases, and systems. They are human capital, social capital and organisational capital as mentioned in previous sections. There are two approaches using this knowledge or resources (Kang & Snell, 2009; Lavie et al., 2010; March 1991). One focuses on how to reuse or replicate existing knowledge, i.e., exploitation. The other one focuses on how to generate new knowledge, i.e., exploration. The effective use of resources may help a PSF balance the effective exploitation of existing resources with the exploration of knowledge to create new capabilities. The following matrix shows how PSFs create value by exploiting and exploring existing resources.

The matrix in Figure 3.8 shows that the exploration of resources in PSFs is designed to deliver new products or services to new clients and to deliver new products or services to old clients. It also shows that the exploitation of resources in PSFs is to deliver existing services or products to the existing clients or new clients as there is no new knowledge/capability required. The exploration process needs to utilise human capital to invent new products or services and the social capital to attract new clients and new business and the organic organisational capital (Kang & Snell,

**Figure 3.7 Exploitation and Exploration in PSFs**



2009) that facilitate this delivery. The exploitation process needs to reuse or refine the existing products or services and existing clients, which requires the use mechanistic organisational capital (Kang & Snell, 2009) to facilitate this delivery.

### **3.4.5 The Mediating Role of “Uses”**

To illustrate exploration and exploitation in more detail, this study proposes the concept of uses which indicate the management mechanisms of PSFs. The uses include communication, coordination, monitoring and team utilisation.

The addition of uses into the mediational model of resources and firm performance is an innovation of this study. In an extensive review of the literature, only Soo, Devinney, Midgley and Deering (2002) proposed a framework of “sources-uses-outcomes” in examining firms’ knowledge systems and their impact on firms’ innovation and financial performance. They surveyed the knowledge management processes of 317 firms across a wide range of consumer, industrial, service and manufacturing sectors. They measured the sources as formal and informal

networking, as well as internal and external acquisition. They measured uses as the quality of problems solving/decision making which was correctly viewed as an evaluation rather than a real “use” of resources. Therefore, their study is limited in the single resource (social capital) and the measurements of uses. In addition, they tested their model in different context which overlooked the influence of industry characteristics. Therefore, this study explores the intervening role of uses as communication, coordination, monitoring and team utilisation in the relationships between three recourses and firm performance in professional service firms.

There is some research which investigates how human capital, social capital and organisational capital work together to improve organisational learning (Kang & Snell 2009) and innovation (Subramaniam & Youndt, 2005) directly. These studies have found support for the significant and positive association between the resources of human capital, social capital, organisational and firm performance.

With regard to the mediators between resources and firm performance, some scholars have paid a lot of attention to how knowledge management capacity mediates the relationship between resources and firm performance. For example, Smith, Collins and Clark (2005) investigated the mediation of knowledge creation ability in employees’ stock of knowledge including experience, education and functional heterogeneity (similar to human capital in this study), ego networks including number of contacts, range of contacts and strength of ties (similar to social capital in this study), and organisational climate for risk taking and teamwork (similar to organisational capital in this study) and innovation. They found empirical support for these mediational models in the context of high technology firms. Yli-Renko, Autio and Sapienza (2001) provided empirical evidence for the mediating

role of knowledge acquisition in their investigation of the relationship between social capital and knowledge exploitation/firm performance which was measured as new product development in young technology-based firms. Another example is Collins and Smith's (2006) study which examined the causal chain from HR practice, social climate, knowledge exchange and combination to firm performance. They found that commitment-based HR practices were indirectly related to firm performance through their effects on organisational social climate and knowledge exchange and combination in the context of high technology firms.

From a practical perspective, four management mechanisms within PSFs are identified in this study. They are communication, coordination, monitoring and team utilisation (Gittell et al., 2010; Greenwood et al., 2005; Greenwood et al., 2007; Morris, Gardner, & Anand, 2007; Stumpf et al., 2002).

With a high degree of human capital, social capital, and organisational capital, a professional service firm can "redeploy its employees easily and quickly" (Jin, Hopkins, & Wittmer, 2010: 943) since employees will be capable of adapting to new jobs quickly and work well with new and existing co-workers and clients. Efficient organisational capital can also allow and facilitate redeployment through the uses mechanisms, i.e. communication, coordination, monitoring and team utilisation.

The uses of resources means exploiting and exploring the knowledge embedded in employees and their relationships, as well as in organisational systems and databases. It is through the uses of resources that professional service firms are able create value from the resources. As described earlier, PSFs' work is project or programme-oriented. To meet client's needs, a partner needs to choose several



professionals to form a team to solve client's problems. The team forms the basic unit of work in the professional service firm, and team management is vital for the successful completion of project.

First, PSFs need to deploy the team and coordinate tasks efficiently. The dynamic global economic environment accelerates PSFs' working speed (Morris et al., 2007; Teece, 2003). Usually the customers' assignments are much more compressed in terms of time (Morris et al., 2007). The PSFs have to compress their work into a much shorter time frame. As in Morris et al. (2007)'s study, a partner from a consulting firm said "... [we need to] compress six months work into a three week assignment" (p.20).

In professional service firms, since professionals need to work together, the communication among them is very important to accomplish the work. They need to exchange their opinions, and to create solutions through teamwork to meet the clients' needs. This includes communication in a timely and accurate manner.

Since professionals need to work together, the communication among them is very important to accomplish the work. They need to exchange their opinions, create solutions through teamwork to meet the clients' needs. According to Transactive Memory Theory which proposes that individual members can serve as external memory aids to each other (Wegner, 1987), in PSFs, coordination and communication can benefit firm performance through combining and recombining individual knowledge into group knowledge or organizational knowledge.

Efficient team management will contribute to the efficient utilisation of a firm's human capital and social capital during the creation of new knowledge.

As discussed in the previous sections, most professional staff have senior supervisors who supervise and others monitor their progress. Monitoring (Teece, 2003) is a way to leverage and exploit knowledge between them.

Based on the above review and analysis, this study proposes that the uses of resource mediate the positive relationship between resource and firm performance as follows:

*H4. PSF's uses mediate the relationship between its human capital and firm performance.*

*H5. PSF's uses mediate the relationship between its social capital and firm performance.*

*H6. PSF's uses mediate the relationship between its organisational capital and firm performance.*

### **3.4.6 Summary**

This section presented the theory of dynamic capabilities to better understand the value chain which links HR *practices*, resources and uses to firm performance. Four uses of resources were identified in PSFs. These were: communication, coordination, monitoring and team utilisation. The hypotheses were proposed for the mediational effects of the uses of the resources in understanding the relationship between PSFs' resources and firm performance.

### **3.6 Summary**

This chapter presented the theoretical base for the research model proposed in this study. These theories, including strategic human resource management, the

resource-based view of the firm, dynamic capabilities and knowledge-based theory, are not completely separate. They can be applied together to explain *how* and *why* HPWS affects firm performance. This chapter reviewed literature and the practices in PSFs and then proposed the hypotheses which answered the above question theoretically. Based on the literature, three potential mediators between HPWS and firm performance were identified as resources which include human capital, social capital, organisational capital. In addition, four mediators between resources and firm performance were identified as uses which include communication, coordination, monitoring and team utilisation. This chapter also provided the origins for the approach of the practices-resources-uses-performance applied in this study. The hypotheses were also presented in this chapter.

## **CHAPTER FOUR**

### **RESEARCH METHODOLOGY**

#### **4.1 Introduction**

This chapter first explores the philosophical basis of the research methodology that is used in this study. It describes the appropriateness of a positivist approach which provides the support for survey-based research. It then provides a description of the whole research process. It also presents the details on sampling and survey design. Next, it presents the procedure to conduct the survey by employing Dillman's (2007) Tailored Design Method. Finally, all the variable measurements in the survey as well as their validity and reliability are presented.

#### **4.2 Research Philosophy and Its Application to This Research**

“All research is based on assumptions about how the world is perceived and how we can best come to understand it” (Uddin & Hamiduzzaman, 2009: 658). It is therefore very important to understand the philosophy of research for two main reasons (Hughes & Sharrock, 1997). First, the exploration of philosophy encourages “in-depth thinking, and generates further questions in relation to the topic under consideration” (Crossan, 2003: 47). Second, the understanding of philosophy is significant for researchers to refine, specify and evaluate research methods (Easterby-Smith, Thorpe & Lowe, 2002).

A main philosophy in social research is positivism. The term positivism was first coined by French philosopher August Comte (1798-1857) in nineteenth century. Based on Comte's assumptions, "society could be analyzed empirically just like other subjects of scientific enquiry and social laws and theories could be on the basis of psychology and biology" (Walliman, 2005: 203). In other words, real knowledge could be derived from human observation of objective reality (Comte, 1853). The facts of reality can be verified through observation and examination which is labelled as empiricism. Therefore, the positivist approach usually adopts a clear quantitative approach to investigate the real world and it has a number of advantages. First, the quantitative approach allows the comparison between groups, locations and times which can be measured for difference. Second, the positivist approach attempts to identify causal mechanisms in the real world which helps to predict other phenomena. It means that researching a small group can give a reliable indication of the views of a larger population. The third advantage of the positivist approach is that researchers retain control of the research process, e.g., standardisation of survey instruments and controlling for variables. Other advantages of the positivist approach include easily comparable data, economical collection of large amounts of data, and clear theoretical focus (Saunders, Lewis, & Thornhill, 2007). It can be argued that this focus on measurement can lead to major flaws. It is argued by critics that the positivist approach does not "provide the means to examine human beings and their behaviours in an in-depth way" (Crossan, 2003: 51). As an amendment to positivism, post-positivism emerged which recognises the critiques against positivism (Popper, 1959) and assumes that "reality is multiple, subjective and mentally constructed by individuals" (Crossan, 2003: 54). Therefore,

the post-positivism approach does not reject positivism but refines it to meet these critiques. The post-positivist approach usually adopts a qualitative research perspective to describe and explore in-depth phenomena.

Although there is criticism against positivism, it has a lot of advantages listed above and is widely used in social science. In most of the research in social research, especially studies that are concerned with investigating the HRM-firm performance link, surveys are frequently used, e.g. Arthur (1994), Becker and Gerhart (1996), Datta et al. (2005), Delery and Doty (1996); Gittell et al. (2010), Guthrie (2001), Guthrie et al. (2009), Huselid (1995), MacDuffie (1995), Richard and Johnson (2001), Takeuchi et al. (2007) and Youndt et al. (1996). Aligned with the mainstream quantitative approach in HRM-firm performance research, this study mainly uses a positivist approach. Following three exploratory interviews, pilot tests of the questionnaire were conducted with accounting faculty and practitioners to refine the instrument. The survey-based method was employed to collect data which was then analysed allowing propositions to be tested. The findings based on the survey data are discussed. By doing so, it allows for comparisons between the findings in the present study and the previous findings. Moreover, this approach allows the investigator to test the role of intervening variables in the HRM-firm performance link and to statistically control for variables such as firm size.

### **4.3 Research Process**

Accountancy is a traditional professionalised and regulated sector. Therefore, Irish accounting firms were chosen in this study. To better understand the Irish accounting context, the researcher conducted three semi-structured interviews with

the managing partners and HR senior director in a large accounting firm. The topics in the interview covered human resource management, innovation, etc. (refer to Appendix C). Following these interviews, a survey was conducted. During the survey design, the researcher piloted it with many experts in different areas to improve the face validity and content validity of the survey. Then Dillman's (2007) Tailored Design Method was employed to conduct the survey. Letters or emails were sent to the respondents who omitted some questions for missing information. Figure 4.1 presents a flow chart of the data collection process in detail.

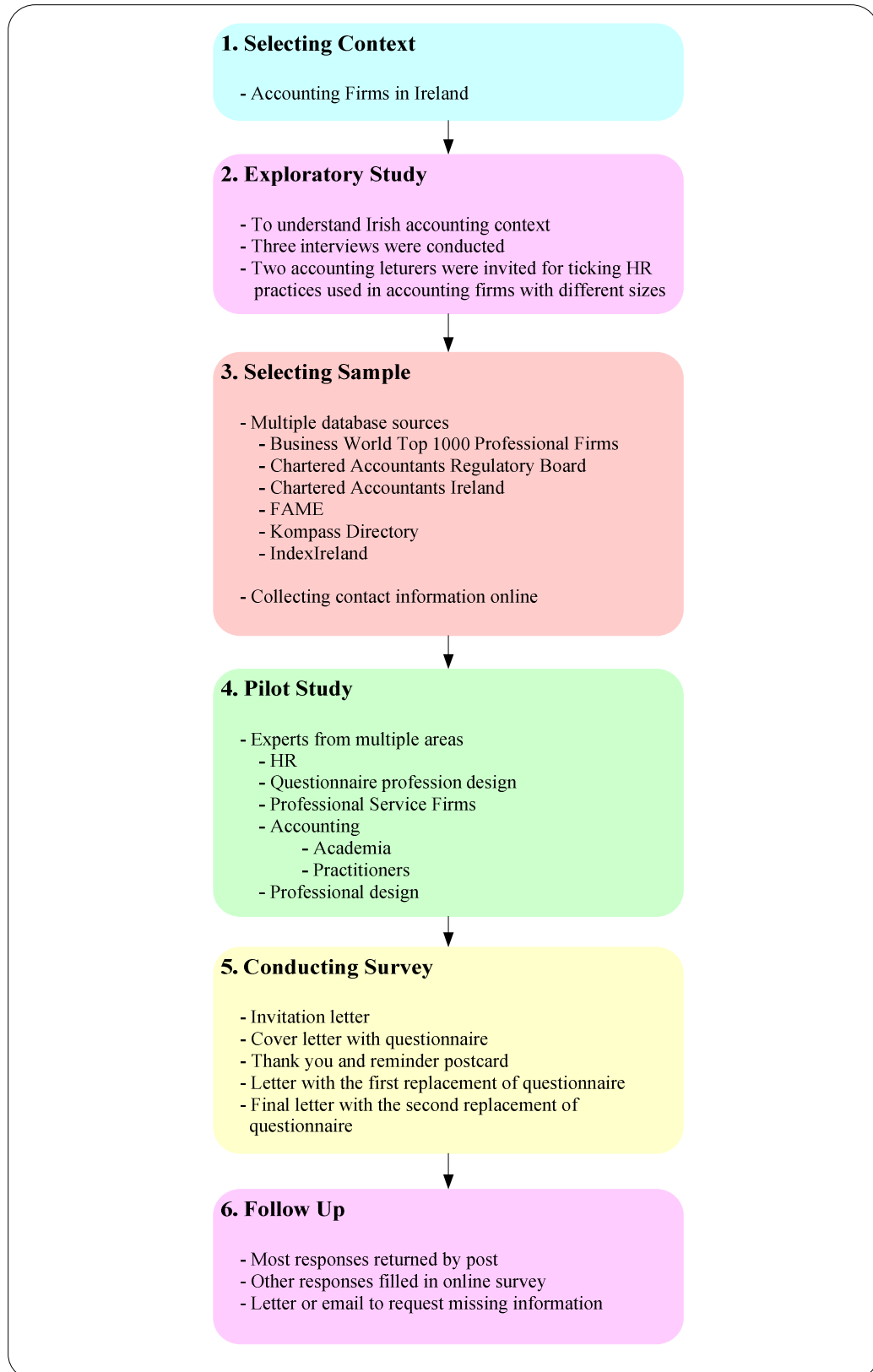
#### **4.4 Sampling**

Most of the Irish accounting firms are small and medium sized. To avoid the firms are too small in size to have a HPWS, the accounting firms with 3 or more partners or 5 or more employees were chosen as the sample. These criteria were based on the pilot study. Since there was no single database which could provide comprehensive information on accounting firms, the information from several databases was combined to select the final sample.

There are mainly six databases which include information regarding Irish accounting firms. They are: Business World Top 1000 Professional Firms, Chartered Accountants Regulatory Board, Chartered Accountants Ireland, Forecasting Analysis and Modeling Environment (FAME), Kompass Directory, and IndexIreland.

**Business World Top 1000 Professional Firms:** This is a database which contains the top 1000 professional firms in Ireland (e.g. accounting, auctioneers, architects, consulting, estate agents, marine surveyors, opticians,

**Figure 4.1 The Data Collection Process**





recruitment agencies, solicitors, etc). The number of employees is the ranking criterion. It contains 242 accounting firms, 240 firms with 5 or more employees. This database provides the managing partners' contact information. However, none is provided for HR directors. There is also no financial information.

**Chartered Accountants Regulatory Board:** This is a body established by the Institute of Chartered Accountants in Ireland to regulate its members, in accordance with the provisions of the Institute's Bye-laws, independently, openly and in the public interest. It has firm information for 1130 accounting firms located in all Ireland including 212 Irish accounting firms with 3 or more partners. It provides all of the partners' names and firms' contact information including mailing address and telephone numbers. It does not provide financial information or the number of employees.

**Chartered Accountants Ireland:** This is the largest and longest established accountancy body in Ireland and has over 18,000 members and 6,500 students ([www.charteredaccountants.ie](http://www.charteredaccountants.ie)). It provides the information on HR manager/director in the top 100 Irish accounting firms, such as post address, telephone number, and email.

**FAME:** This database provides information on company accounts, ratios, activities, ownership and management for the largest 2.6 million UK and Irish companies with summary information for a further 1 million smaller businesses. It includes 1328 Irish accounting firms and provides

information on some firms' financial performance and on the number of employees.

**IndexIreland:** This contains the information for 89 Irish accounting firms. It provides the websites of the firms and also a short introduction to some firms.

**Kompass Directory:** This includes contact details and some basic company information for 1.8 million companies in 75 countries worldwide, including Ireland. It also includes 1322 Irish accounting firms' information including 251 firms with more than 10 employees. However, it does not provide financial information and provides only the number of employees for a few of the firms.







In addition, the local magazines such as Accountancy Ireland and Finance Dublin were used to confirm the information from other databases.

Table 4.1 shows the basic information distribution of the above databases.

Based on the above analysis of the databases, the final sample was set up as follows.

- **Step 1:** Select the accounting firms with 5 or more employees from the Businessworld Top 1000 Profession Firms (n = 240).
- **Step 2:** Select the accounting firms with 3 or more partners from the Chartered Accountants Regulatory Board (n = 162).
- **Step 3:** Select the accounting firms in IndexIreland (n = 89).

**Table 4.1 Different Databases for Collecting Respondents' Contact Information**

Databases	No. of firms		Mailing address	Tel/Fax	Website	Contact person		Financial information	Number. employees
	Total	Specify				Partners /principals	HR Director		
 Top 1000 Professional Firms	243	240 with $\geq$ 5 employees	✓	✓	Some	✓	✗	✗	✓
 Chartered Accountants Regulatory Board	1130	162 with $\geq$ 3 principals	✓	✓	Some	✓	✗	✗	✗
	100	100	✓	✓	✓	✗	✓	✗	✗
	1328	n/a	✓	✓	Some	✓	Some	Some	Some
	89	n/a	✗	✗	✓	✗	✗	✗	✗
 Connects business to business	1322	251 with $\geq$ 11 employees	✓	✓	Some	✓	Some	✗	Some

Source: The Author

- **Step 4:** Select the accounting firms from Chartered Accountants Ireland (n = 100).
- **Step 5:** Combine the information from the four databases.
- **Step 6:** Check internet and collect more information from firm websites if available. Also check FAME, Kompass, Accountancy Ireland and Finance Dublin to confirm the information (n = 274).

To avoid single-rater bias (Gerhart, Wright, McMahan & Snell 2000), two respondents from each unit were chosen to post the surveys to. Among the 274 firms, all the firms had address information. 202 firms had two contacts including 161 firms with emails. 70 firms just had only one contact including 19 firms with emails (see Table 4.2). Because accounting firms are different from other traditional firms, there is no HR director position in the small or medium firms. For example, in a firm with 3 partners and 18 employees, the managing partner answered “I have HR responsibilities also” when being requested for HR manager/director’s contact information. For these small and medium sized firms, two copies of the questionnaires were sent to the two partners within one unit/firm.

**Table 4.2 Final Sample Contact Information**

No of firms	%	Managing Partner			HR Director			Other contacts	Web email
		Name	Title	Email	Name	Title	Email		
161	59	✓	✓	✓	✓	✓	✓	(40)	
41	15	✓	✓	✗	✓	✓	✗		14
19	7	✓	✓	✓	✗	✗	✗		
53	19	✓	✓	✗	✗	✗	✗		

## **4.5 Questionnaire**

The main source of the data used in this dissertation was the Survey of Accounting Firms 2010 (Human Resource Management, Knowledge Management and Firm Performance). This questionnaire contained Likert scale statements, proportion questions, and some objective continuous data such as revenue. It was clearly structured and professionally designed. More importantly, it had been pilot studied by experts from different areas which helped to minimise the problems of misinterpretation or misreading the questions. The design of the survey instrument and the survey itself will be described in more detail in the following sections.

### **4.5.1 Preliminary Research**

For creating a suitable and valid questionnaire to measure the HPWS in accounting firms with different sizes, the investigator firstly formed a list all of the HR practices shown in the representative literature in HPWS and firm performance link (Collins and Smith, 2005; Data et al., 2005; Guthrie, 2001; Huselid, 1995; Takeuchi et al., 2007). Then two experienced accounting lecturers based at DCU were invited to tick the practices which were used by Irish accounting firms with small, medium and large firm sizes. Both lecturers worked in accounting firms before joining the university and are perfectly active researchers in accounting firms in Ireland. One worked in a large accounting firm and the other worked in a medium size accounting firm.

The reason for this preliminary work is that most of research on HRM is based in general manufacturing firms and some HR practices may not be suitable for accounting firms, especially for the accounting firms of a small or medium size. The

results are shown in Appendix D. The results show that most of firms are using HR practices such as employment tests, especially skill tests, internal promotions, task training, monitoring systems, continuous training, formal individual performance appraisals, multiple formal performance feedbacks, performance appraisals for setting goals and determining compensation, and self-directed teams.

At the same time, three semi-structured interviews were conducted with the managing partner, communication partner and senior HR manager in a large accounting firms to understand and explore the context. This accounting firm has more than 100 partners and over 2,100 employees. Each interview lasted about one hour. The topics addressed include human resource management, the vital resources in accounting firms, and innovation (see Appendix C).

In terms of the valuable resources, all interviewees identified the importance of 1) the workforce and 2) the relationships between professional staff and clients and those relationships among the professional staff. They also regarded communication, coordination, monitoring and team utilisation as very important within PSFs.

The above exploratory study is critically important, not only for a better understanding of the Irish accounting context, but also for creating a valid and suitable questionnaire for Irish accounting firms.

#### **4.5.2 Structure of Questionnaire**

The Survey of Accounting Firms 2010 (Appendix G) covered nine key areas that covered all the interests of the broader research project. These included

- Section 1: Background
- Section 2: Human Resource Practices

- Section 3: Human Capital and Social Capital in Your Organisation
- Section 4: Organisational Routines
- Section 5: Market and Clients
- Section 6: Knowledge Management Capacity
- Section 7: Monitoring and Team Utilisation
- Section 8: Administrative Coordination
- Section 9: Generating New Ideas and Communication

### **4.5.3 Pilot Study of Questionnaire**

To improve the validity of the survey (Robson, 2002), the questionnaire was pilot tested by many experts from different areas. For example, the academic experts in the field of HR reviewed the questionnaire in relation to the HR practices included. The statistical advice was obtained from the experts in survey design area. In addition, the academics and practitioners in accounting helped to re-word the survey items to reflect the unit level and using the language in accounting profession such as articles systems in accounting firms.

### **4.6 Survey Procedures**

After setting up the sample and finishing the pilot study, Dillman's (2007) Tailored Design Method was employed to conduct the survey. This method consists of five steps which include invitation letter, cover letter with questionnaire, thank you and reminder postcard, letter with the first replacement of questionnaire, and final letter with the second replacement of questionnaire. The procedure is described in more detail in the following:

- Invitation letter
  - First, an invitation letter (Appendix E) was posted and emailed to all the respondents to inform them about the survey.
- Cover letter with questionnaire
  - Two weeks later, a cover letter (Appendix F) and a copy of questionnaire (Appendix G) were mailed out. A pre-paid and self-addressed envelope was also enclosed.
- Thank you and reminder postcard
  - Four weeks later, a postcard (Appendix H) was sent out to thank the respondents who had filled in and returned the questionnaire or had filled in the online survey. The postcard was also sent to remind the respondents who had not filled in the questionnaire.
- Letter with the first replacement of questionnaire
  - Six weeks later, a letter with the first replacement of questionnaire was sent out to the respondents who had not completed it.
- Final letter with the second replacement of questionnaire
  - Eight weeks later, the final letter with the second replacement of the questionnaire was sent out to the respondents who had not completed it.

In all mailings, the respondents were promised complete confidentiality regarding the data provided by them. They were also promised a customised report (Appendix I) which would help to position their practice and a summary industry report (Appendix J).



The managing partners and the HR managers returned their surveys independently. During the process, if some respondent missed some questions, a letter or email was sent to him or her to request the missing information (Appendix K). Considering some respondents may prefer to complete the survey electronically, an online version of the survey was provided at [www.surveymonkey.com/s/accountants](http://www.surveymonkey.com/s/accountants).

## **4.7 Measurement of Variables**

This section describes how the variables were measured in this study. They include HPWS, resources as human capital, social capital, organisational capital, uses of resources as communication, coordination, monitoring and team utilisation, firm performance as productivity, relative organisational performance, relative market performance and innovation, and control variables as firm size and firm age.

To help ensure the survey's validity, most of the items except monitoring and team utilisation were adopted from measures that had been used in previous studies. Multiple-item scales were employed.

### **4.7.1 HPWS**

Considering the characteristics of PSFs, sixteen items were adopted from Huselid (1995) and Datta et al. (2005). These items covered HR practices including: staffing, performance management and remuneration, information sharing and participation, and training and development. An example item is, "Please estimate what proportion (0% to 100%) of your professional staff are administered an employment test (e.g. skills tests) prior to hiring with respect to all of the professional staff in your organisation over the previous 12 months".

Since HPWS is mostly used as an index (Batt, 2002; Guthrie, 2001; Guthrie et al., 2009), the Cronbach's alpha was calculated for this sixteen-item HPWS scale and it was .73 which was above the cut-off point of .70 (Nunnally, 1978). This shows the internal consistency of the HPWS measures.

#### **4.7.2 Resources**

The resources as human capital, social capital and organisational capital were mainly adopted from Youndt et al. (2004) and Subraman and Youndt (2005). All of the measures use a seven-point Likert scale varying from 1 = strongly disagree to 7 = strongly agree. The respondents were asked to indicate their level of agreement with each of the statements.

***Human Capital.*** Five items from Youndt et al. (2004) and Subraman and Youndt (2005)'s were adopted. They included: "Our professional staff are highly skilled", "Our professional staff are widely considered to be the best in the accounting industry", "Our professional staff are creative and bright", "Our professional staff are experts in their particular jobs and functions", and "Our professional staff develop new ideas and knowledge". One item which emerges from the exploratory interviews was added: "Our professional staff are up to date on relevant new taxation, auditing, accounting and legal developments".

***Social Capital.*** Five items from Youndt et al. (2004) and Subraman and Youndt (2005) were adopted. They included: "Our professional staff are skilled at collaborating with each other to diagnose and solve problems", "Our professional staff share information and learn from one another", "Our professional staff interact and exchange ideas with people from different functional areas of the organisation.",

“Our professional staff partner with clients to develop solutions”, and “Our professional staff apply knowledge from one area of the organisation to problems and opportunities that arise in another”. One item was added for measuring the external social capital. It is that “Our professional staff develop and maintain good relationships with clients”.

**Organisational Capital.** Three items in Youndt et al. (2004) and Subraman and Youndt (2005) were adopted<sup>3</sup>. They included: “The databases are used as a way to store knowledge”, “The culture (stories, rituals and symbols) contains valuable ideas and ways of doing business”, and “Much of the organisation’s knowledge is contained in manuals, databases, structures and processes”, Another four items were added to get a more comprehensive measure of organisational capital including organisational processes, routines and structure. They included: “The processes are efficient to solve clients’ problems”, “The routines encourage employees to know each other”, “The routines encourage employees to know about the whole organisation”, and “A low level of vertical hierarchies and cross-function barriers are maintained in the organisation structure”.

Because of the additional items for the resource variables, an exploratory factor analysis was conducted first to examine their factor structure. To test the convergent and discriminant validity of the multiple-item scales of human, social and organisational capital, a confirmatory factor analysis was performed.

A principal axis factor analysis using oblique rotation was performed. The results are shown in Appendix L. The nineteen items loaded on to three factors with factor

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<sup>3</sup> One item in Youndt et al. (2004) and Subraman and Youndt (2005)’s was not adopted as “Our organisation uses patents and licenses as a way to store knowledge”. This is because the accounting context does not use patents.

loadings of .54 or above<sup>4</sup>. The factor of human capital explained 42.41% of the variance, with an eigenvalue of 8.06. The factor of social capital explained 7.18% of the variance, with an eigenvalue of 1.36. The factor of organisational capital explained 13.41% of the variance, with an eigenvalue of 2.54.

The human capital, social capital and organisational capital also had high internal consistency with Cronbach's alphas of .86, .88, and .89 respectively which were comparable to the ones obtained by Youndt et al. (2004) (0.81, 0.88, and 0.62 respectively).

Using Amos 7.0, the confirmatory factor analysis (CFA) was performed to the multiple-item scales of human, social and organisational capital. The three-factor model showed a good model fit since it had chi-square less than five times their degrees of freedom ( $\chi^2/df = 306.05/132 = 2.32$ ), the Comparative Fit Index (CFI, Bentler, 1990) was .90 ( $p = .00$ ) which is acceptable according to Bentler and Bonnett (1980) and RMSEA was .08 which is smaller than the cut-off point .10 (Browne & Cudeck, 1993). All of the three factors had very high reliability with Cronbach's alpha above .86 which was above the suggested value of .70. Thus, it is concluded that the measures for resources were valid and internally consistent.

### **4.7.3 Uses**

The measures of uses included communication, coordination, monitoring and team utilisation.

**Communication.** Three items were adopted from Gittell et al. (2010) and reworded to reflect the unit/firm level analysis by changing the focus of the items to the unit

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<sup>4</sup> One item of "Professional staff develop new ideas and knowledge" had cross-loadings on human capital (.44) and social capital (.48) and thus dropped.

level. For example, the respondents were asked “how often do employees on average engage in the behaviors listed below, e.g., communicating with management in a timely way about the status of the project?” Respondents answered on a seven-point Likert scale ranging from 1 = never to 7 = always.

**Coordination.** Seven items were adopted from Kraut and Streeter (1995). The respondents were asked “to what extent does your organisational engage in the following items, e.g. formal policies and procedures for coordinating the team’s work?” Respondents answered on a seven-point Likert scale ranging from 1 = small extent to 7 = great extent.

**Monitoring.** Three items were created based on Teece (2003). The respondents were asked to what extent they agree with the items. These three items are, “There are mechanisms in place to encourage employees to reflect on the outcomes of their efforts”; “There are mechanisms in place to monitor employee contributions to new ideas and developments”; and “There are mechanisms in place to assist employees adjust their approach if they find their efforts are taking them down the wrong path”. Respondents answered on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree.

**Team utilisation.** Four items were created based on Teece (2003). The respondents were asked to what extent they agree with the items. These four items were: “Newly formed teams quickly establish a good understanding of each others’ talents and skills”; “Teams are formed on the basis of an understanding of people’s skills and abilities”; “Teams can be formed quickly as required”; and “Teams are continuously reconfigured to address the set of opportunities facing the organisation”.

Respondents answered on a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree.

Since these measures of uses included adopted items and newly created ones, a principal axis factor analysis using oblique rotation was performed to check the factor structure. The results in Appendix M revealed the expected four-factor structure, which accounted for 76.28% of variance with the preliminary factor loadings of .55 or above. The factor of communication explained 6.71% of the variance, with an eigenvalue of 1.07. The factor of coordination explained 48.54% of the variance, with an eigenvalue of 7.77. The factor of monitoring explained 8.66% of the variance, with an eigenvalue of 1.39. The factor of team utilisation explained 12.38% of the variance, with an eigenvalue of 1.98. The communication, coordination, monitoring and team utilisation also had high internal consistency with Cronbach's alphas of .92, .90, .89 and .88 respectively.

#### **4.7.4 Firm Performance**

Firm performance was assessed using both objective and subjective measures. The objective one was productivity and the subjective ones were the self-reported relative organisational performance, relative market performance and innovation.

Although a lot of published studies on the HR-performance link employed self-reported performance measures (e.g., Chuang & Liao 2010; Delaney & Huselid 1996; Liao, Toya, Lepak, & Hong, 2009; Sun, Aryee, & Law, 2007; Takeuchi et al., 2007; Youndt et al., 1996), there have been concerns regarding their use. This is because that self-reported/subjective firm performance measures may raise

measurement errors and common method bias (this issue will be addressed in detail in Chapter 5).

There are mainly three reasons for using the self-reported comparative firm performance measures. First, it is very difficult or impossible to obtain the objective financial performance on individual units (Gupta, 1987; Gupta & Govindarajan 1984, 1986). Second, the comparative method encourages more respondents to participate than the method of directly asking respondents to provide exact figures (Tomaskovis-Devey, Leiter, & Thompson 1994). Finally, the subjective measures of company performance (relative to competitors) are positively associated with the objective measures. Empirically, Wall et al. (2004) found that subjective and objective measures of company performance were positively associated at .52.

In this study, the correlations between perceived organisational and market performance and their revenue were both significant,  $t=.197$ ,  $p=.034$  and  $t=.248$ ,  $p=.007$  respectively, which indicates that the subjective performance measures were appropriate.

The above analysis reveals the appropriateness of the objective and subjective firm performance measures. The measures and their validity and reliability of productivity, relative organisational performance, relative market performance and innovation are presented in the following:

***Productivity.*** The productivity was calculated as revenue/number of professional staff. The revenue data was aggregated from the respondents' data and the public data since there was strong agreement between the data from these sources. The respondents were asked to estimate the fee income for their firm/unit for the most recent year (€ million). Information on firm size was collected from public

databases such as Chartered Accountants Regulatory Board, Businessworld Top 1000 Professional Firms, Kompas and Fame.

***Relative organisational performance and relative market performance.*** Eleven items were adopted from Delaney and Huselid (1996). Respondents were asked to rate their organisation's performance relative to their competitors using a seven-point Likert-type scale, varying from 1 = much worse to 7 = much better. Since all of the items were adopted and found to be valid, the reliabilities for relative organisational performance and relative market performance were calculated and were both .84. These were comparable to the ones obtained by Delaney and Huselid (1996) (alpha = .86 for relative organisational performance and .85 for the relative market performance).

***Innovation.*** Nine items were adopted from Janseen (2001, 2005). The respondents were asked "How often do employees on average engage in the behaviors listed below, e.g. creating new ideas for difficult issues". The respondents answered from 1 = never to 7 = always. Janseen (2001) found two factors in this measure of innovation. However, in the pilot study, the experts from HR and accountancy understood them as measuring the same thing. Therefore, a principal axis factor analysis using oblique rotation of the items was conducted to check the factor structure. All of the nine items had factor loadings of .72 or above on a single factor, and this factor explained 75.99% of variance, with an eigenvalue of 6.84. These factor loadings are shown in Appendix N. The nine-item scale had a reliability of .96.



#### **4.7.5 Control Variables**

Firm size and firm age were considered as control variables.

*Firm size.* Firm size was included because it might be associated with the use of HPWS as well as revenue, productivity (Datta et al. 2005), and innovation. The HR practices and the resources of the large firms are different from the small and medium firms. For example, the large accounting firms will have a system of HR practices while small firms may only have some informal HR practices. Therefore, firm size was considered as control variable. The objective number of professional staff was mostly derived from public databases such as IndexIreland, Chartered Accountants Regulatory Board, Compass, Top 20 Irish Accountancy Firms and a few are from the company websites.

*Firm age.* Similar to Guthrie et al. (2009), firm age was included to control for “any advantages associated with increased time for the evolution or adoption of HPWS or differences in our outcome measures” (Guthrie et al. 2009: 118). The logarithm of the firm age was used to normalise the firm age. The firm age was calculated as “2010 – the established year” and respondents were asked to indicate the established year.

#### **4.8 Summary**

This chapter first explored the importance of understanding research philosophy for conducting research and reviewed the advantage and flaws for positivism which claimed for the quantitative approach in social science. Similar to the previous research, this study adopted mainly survey-based method to collection data to test the proposed model in this study. This chapter then described the processes in detail

for selecting sample firms. The pilot study and how to conduct the survey were reviewed. The methods used to measure the variables selected in the model were also described. In addition, the validity and reliability of these measures were provided. In the next chapter, the data will be analysed and the results will be provided.

# **CHAPTER FIVE**

## **DATA ANALYSIS**

### **5.1 Introduction**

This chapter provides a detailed overview of the research findings. The structure of this chapter is as follows: Firstly, it provides an analysis of non-response bias to examine the sample representativeness in this study. Secondly, the results of the analysis of interrater agreement (IRA) and interrater reliability (IRR) are presented to provide support for aggregating the matched pair responses in each firm. Then, the common method bias is addressed and tested to demonstrate that it is not a serious problem in this study. Next, the descriptive statistics are presented in order to show the association between variables. Finally, the results are presented of the hierarchical multiple regression analysis together with the Sobel tests.

### **5.2 Sample Representativeness**

Surveys were mailed to 548 respondents in 274 firms as described in Chapter 4. This included 10 firms that did not exist and 3 firms that did not qualify for this study because of small firm size or because they are not accounting firms. This reduced the sample to 522 respondents in 261 firms in the final population. After survey mails, reminder postcards, replacement surveys (see Chapter 4), 195 surveys in total were returned in the form of hard copy (156) and online (39). Four surveys were not completed and were therefore excluded. The response rate was 36.40%

(190/522) representing 120 firms (45.98%). There are 71 matched pair responses representing 71 firms (27.20%).

Therefore, the final sample for this study consisted of 120 accounting firms located in Ireland, covering a range of geographical regions.

To examine the sample representativeness (Wilcox, Bellenger, & Rigdon, 1994), many researchers have checked the non-response bias by comparing demographic and contextual variables from the respondents with the known values from the population to see if they differ in terms of the available data (Armstrong & Overton, 1977; Guthrie et al., 2009).

This study conducted the comparison analysis on the characteristics between the early responses and late responses, web responses and hard copy responses, as well as matched pair responses and non-paired responses. The early responses are those who returned the survey after the first mailing. The late responses are those who returned the survey after later mailings. The web responses are those who filled in the survey online. The hard copy responses are those returned the hard copy survey. The matched pair responses are those where there are two respondents in one unit/firm. The non-paired responses are those where there is only one respondent in one unit/firm.

There are two reasons for conducting comparison analysis. One is the relatively high response rate (36.40% for individual level and 45.98% for firm level). The other is the difficulty in obtaining public data on the firms' background and contextual information. To explore representativeness, a one-way ANOVA procedure was used. The results in Table 5.1 showed no significant difference between the early responses and the late responses, between the web response and the hard copy

response, as well as between the matched pair responses and non-paired responses in terms of firm information and individual information.

As a result, there were no concerns on the sample representativeness and non-response bias in this study. Therefore, the full sample was utilised for the purpose of later analysis and the profile of participating firms was deemed to be representative of the accounting firm profession in Ireland.

**Table 5.1 ANOVA Results from Comparison Analysis**

Items	Early response v late response		Web response v hard copy response		Matched pair response v non pair response	
	F	Sig	F	Sig	F	Sig
Revenue	.380	.539	.043	.835	.483	.488
Firm size	.103	.749	.505	.478	1.672	.198
Firm age	1.054	.306	1.396	.239	.359	.550
Respondents' age	.162	.688	1.044	.308	.802	.372
Respondents' education	1.928	.167	.045	.831	.003	.954
Respondents' work tenure in present organisation	.582	.447	.193	.661	.339	.561
Respondents' work tenure in accounting	.108	.743	.033	.855	.083	.773
Respondents' full time work experience	.018	.893	.114	.736	.112	.739

### 5.3 Profile of the Respondents

Among the respondents, 50% of respondents were managing partners, 10% of respondents were HR manager/directors, 34% of respondents were partners, and 6% of respondents were other experienced professional staff who had a good knowledge

of their organisations (including titles such as Director, Financial Director, Managers, Office Manager, Auditor and Associate.).

In terms of gender, 80% of respondents were males and 20% were females. In terms of age, 2% of respondents were 30 or less, 21% of respondents were between 31 and 40, 37% of respondents were between 41 and 50, 29% of respondents were between 51 and 60, and 11% of respondents were above 60. For education level, 48% of respondents had a Bachelor's Degree, 11% of respondents had a Master's Degree and 37% of respondents do not have any degrees.

In terms of the professional qualification, 60% of respondents qualified from the Chartered Accountants Ireland (CAI), 13% of respondents qualified from the Association of Chartered Certified Accountants (ACCA), 11% of respondents qualified from the Institute of Certified Public Accountants in Ireland (CPA), 1% of respondents qualified from the Chartered Institute of Management Accountants (CIMA), 1% of respondents qualified from the Institute of Incorporated Public Accountants (IIPA), 10% of respondents qualified from the Irish Taxation Institute (ITI) and 4% of respondents were members of the Chartered Institute of Personnel and Development (CIPD).

## **5.4 Individual Items Descriptive Analysis**

This section presents a summary of the 190 respondents' perception of various items as assessed in the measure of HPWS and the measures of resources including human capital, social capital and organisational capital. Uses such as communication, coordination, monitoring and team utilisation, relative organisational performance, relative market performance and innovation are also reported.

## 5.4.1 HPWS

Table 5.2 illustrates the breakdown of respondents' replies on the proportionate use of various HPWS practices. The respondents were asked for the proportion (0%-100%) of the professional staff who were involved in each HR practice over the last 12 months.

**Table 5.2 The Applications of HPWS in Irish Accounting Firms<sup>a</sup>**

Measurements	Mean Score %	S.D.
HPWS Index (average)	44.92	16.92
What proportion of your professional staff...		
Are administered an employment test (e.g. skills tests) prior to hiring?	18.10	36.15
Hold jobs which have been subjected to a formal job analysis to identify position requirements (such as required knowledge, skills or abilities)?	48.91	45.06
Hold non-entry level jobs which have been filled as a result of internal promotions (as opposed to hired from outside of the organisation)?	25.99	32.29
Receive formal individual performance appraisals?	82.52	34.15
Receive formal performance appraisals from more than one source (i.e., from several individuals such as supervisors, peers etc.)?	37.94	45.85
Have access to company incentive plans, profit-sharing plans, and/or gain-sharing plans?	15.43	30.82
Receive their performance appraisals which are used to determine their compensation?	45.69	46.67
Receive their performance appraisals which are used to set goals and plan skill development?	63.05	43.39
Receive above market wage levels to attract and retain them?	25.96	32.61
Are included in a formal information sharing programme (e.g., a newsletter)?	44.37	47.31
Are asked to complete attitude surveys on a regular basis?	9.06	28.15
Participate in Quality of Work Life (QWL) programs, Quality Circles (QC), and/or labour-management participation teams?	7.94	24.23
Have access to a formal grievance procedure and/or complaint resolution system?	82.96	37.37
Receive continuous training, e.g. continuous professional development?	89.30	21.26
Receive structured mentoring, e.g. via articles?	59.72	40.23
Are organised in self-directed work teams in performing a major part of their work roles?	61.93	42.32

<sup>a</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 187.

Table 5.2 shows that the average level for Irish accounting firms to use HPWS was about 45%. In other words, a score above 44.92 implied a more extensive utilisation of HPWS and any lower score implied a less extensive utilisation of HPWS in comparison to the average utilisation of HPWS. This result is consistent with the result (46.96%) in Guthrie et al.'s study (2009) in which data on HPWS was collected from 165 firms among the Top 1000 companies in Ireland. In this study, the highest score showed the extent to which a specific firm policy or HR practice was in use in the sample of Irish accounting firms. In this regard, 89% of the sample had access to continuous training. Similarly, about 83% of the sample utilised formal individual performance appraisals.

#### **5.4.2 Resources**

Table 5.3 illustrates the breakdown of respondents' replies on each item for organisational resources, including human capital, social capital and organisational capital.

The resources were measured on a seven-point Likert-type scale ranging from 1 = strongly disagree, to 7 = strongly agree.

On average, the scores for human capital, social capital and organisational capital of Irish accounting firms were 5.49, 5.71 and 5.50 respectively. A higher score for each item indicated stronger agreement of the respondents on it. In all, higher scores of resources variables indicated higher human capital, social or organisational capital while a lower score indicated lower human, social or organisational capital.



**Table 5.3 Resources in Irish Accounting Firms**

Resources Measurement	Mean Score  7-Point	S.D.
Human Capital (Average) <sup>a</sup>		
In your organisation, the professional staff...	5.49	.75
are highly skilled.	6.01	.80
are widely considered to be the best in the accounting industry.	5.01	1.11
are creative and bright.	5.46	.84
are experts in their particular jobs and functions.	5.55	.96
are up to date on relevant new taxation, auditing, accounting and legal developments.	5.85	.91
develop new ideas and knowledge.	5.04	1.05
Social Capital (Average) <sup>b</sup>		
In your organisation, the professional staff...	5.71	.79
are skilled at collaborating with each other to diagnose and solve problems.	5.68	.89
develop and maintain good relationships with clients.	6.16	.81
share information and learn from one another.	5.91	.86
interact and exchange ideas with people from different functional areas of the organisation.	5.56	1.04
partner with clients to develop solutions.	5.53	1.15
apply knowledge from one area of the organisation to problems and opportunities that arise in another.	5.39	1.11
Organisational Capital (Average) <sup>c</sup>		
In your organisation ...	5.50	.79
The databases are used as a way to store knowledge.	5.76	.95
The processes are appropriate to solve clients' problems.	5.58	.90
The culture (stories, rituals and symbols) contains valuable ideas and ways of doing business.	5.35	1.05
The routines enable employees to know each other.	5.61	.98
The routines enable employees to know about the whole organisation.	5.59	.99
Much of the organisation's knowledge is contained in manuals, databases, structures and processes.	5.15	1.35
A low level of vertical hierarchies and cross-function barriers are maintained in the organisation structure.	5.46	1.27

<sup>a</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 188.

<sup>b</sup> The valid sample was n = 190 (listwise).

<sup>c</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 185.

**Table 5.4 Uses in Irish Accounting Firms**

Uses Measurement	Mean Score 7-Point	S.D.
Communication (Average) <sup>a</sup>		
In your organisation, how often do employees on average engage in the behaviours listed below?	5.01	1.18
Communicating with management in a timely way about the status of the project.	4.98	1.26
Communicating with management accurately about the status of the project.	5.10	1.22
Sharing organisational goals about the quality of services.	4.94	1.34
Coordination (Average) <sup>b</sup>		
To what extent does your organisation engage in the following items?	4.98	1.10
Formal policies and procedures for coordinating the team's work.	5.00	1.40
Project milestones and delivery schedules.	5.16	1.26
Project documents and memos.	5.15	1.24
Regularly scheduled team meetings.	5.29	1.25
Requirements/design review meetings.	4.97	1.35
Design inspections.	4.26	1.53
Monitoring (Average) <sup>a</sup>		
In your organisation...	4.65	1.18
There are mechanisms in place to monitor employee contributions to new ideas and developments.	4.29	1.36
There are mechanisms in place to encourage employees to reflect on the outcomes of their efforts.	4.69	1.35
There are mechanisms in place to assist employees adjust their approach if they find their efforts are taking them down the wrong path.	4.97	1.23
Team Utilisation (Average) <sup>a</sup>		
In your organisation ...	5.33	1.09
Teams can be formed quickly as required.	5.61	1.10
Newly formed teams quickly establish a good understanding of each others' talents and skills.	5.34	1.20
Teams are continuously reconfigured to address the set of opportunities facing the organisation.	5.04	1.43
Teams are formed on the basis of an understanding of people' s skills and abilities	5.33	1.28

<sup>a</sup> The valid sample was n = 190 (listwise).

<sup>b</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 188.

### **5.4.3 Uses**

Table 5.4 illustrates the breakdown of respondents' replies on the uses as communication, coordination, monitoring and team utilisation.

All of the measurements were using a seven-point Likert-type scale. For communication, 1 = never, and 7 = always. For coordination, 1 = small extent, and 7 = great extent. For monitoring and team utilisation, 1 = strongly disagree, to 7 = strongly agree.

On average, Irish accounting firms' communication, coordination, monitoring and team utilisation effectiveness were perceived as quite high (5.01, 4.98, 4.65, and 5.33 respectively). Similar to the explanations on the results of resources, a higher score indicated more effective use mechanisms while a lower score indicated less effective uses.

### **5.4.4 Firm Performance**

Table 5.5 illustrates the breakdown of respondents' replies on productivity, relative organisational performance, relative marketing performance and innovation. All of the subjective measurements used a seven-point Likert-type scale. For relative organisational performance and relative market performance, scales ranged from 1 = much worse to 7 = much better. For innovation, scales ranged from 1 = never to 7 = always.

For the subjective firm performance measure, on average, the productivity of Irish accounting firms was €0.08 million per professional staff. A higher score indicates that the firm is more productive and a lower score indicates that the firm is less productive.

For the subjective firm performance measurements, the average scores were 5.72 for relative organisational performance, 4.78 for relative market performance, and 4.40 for innovation. A higher score indicated better performance, while a lower score indicated worse performance.

**Table 5.5 Organisational Performance in Irish Accounting Firms<sup>a</sup>**

Firm Performance Measurements	Mean Score	S.D.
Productivity (€ million per professional staff) <sup>†</sup>	.08	.03
Relative Organisational Performance <sup>b</sup>		
Please rate your organisation's performance relative to your competitors:	5.72	.63
Quality of services	6.06	.78
Development of new services	5.19	1.07
Ability to attract essential employees	5.25	1.02
Ability to retain essential employees	5.75	.93
Satisfaction of clients	5.96	.70
Relations between partners/directors and other employees	5.90	.82
Relations among employees in general	5.93	.85
Perceived Marketing Performance <sup>b</sup>		
Please rate your organisation's performance relative to your competitors:	4.78	.95
Marketing	4.62	1.24
Growth in revenue	4.83	1.10
Profitability	4.94	1.18
Market share	4.72	1.10
Innovation <sup>b</sup>		
In your organisation, how often do employees on average engage in the behaviours listed below?	4.50	1.13
Creating new ideas for difficult issues	4.53	1.18
Searching for new work methods, techniques or instruments	4.65	1.21
Generating original solutions for problems	4.76	1.27
Mobilising support for innovative ideas	4.51	1.32
Acquiring approval for innovative ideas	4.61	1.35
Transforming innovative ideas into useful applications	4.45	1.27
Evaluating the utility of innovative ideas	4.31	1.30
Introducing innovative ideas into the work environment in a systematic way	4.31	1.37
Making team members enthusiastic for innovative ideas	4.40	1.40

<sup>a</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 137

<sup>b</sup> The valid sample was n = 190 (listwise).

## 5.5 Aggregation Issues

In the final sample, there were 71 matched pair responses representing 71 firms. The investigator chose to average across their responses so that the final score for each firm represents the average unit-level response/perception. To aggregate matched pairs data, the interrater agreement<sup>5</sup> and interrater reliability<sup>6</sup> were examined.

Interrater agreement was assessed using  $R_{wg}$  (James, demaree, & Wolf, 1984, 1993) for each variable (see Table 5.6). The rule of thumb value for  $R_{wg}$  is .60 (James, 1982) and the more commonly acceptable value of .70. In this study, the mean  $R_{wg}$  for the 16-item HPWS scale was 1.17 which was higher than the .97 obtained by Lepak and Snell (2002) and the .96 obtained by Takeuchi et al. (2007). For human capital, the mean of  $R_{wg}$  was .90, which was comparable to the .92 obtained by Takeuchi et al. (2007); for social capital, the mean  $R_{wg}$  was .89; for organisational capital, the mean of  $R_{wg}$  was .82; for communication, the mean of  $R_{wg}$  was .89; for coordination, the mean of  $R_{wg}$  was .86; for monitoring, the mean of  $R_{wg}$  was .79; for team utilisation, the mean of  $R_{wg}$  was .84; for the relative organisational performance, the mean of  $R_{wg}$  was .96, which is higher than the .94 obtained by Takeuchi et al. (2007); for the relative market performance, the mean of  $R_{wg}$  was .97; and for innovation, the mean of  $R_{wg}$  was .99. The average of the  $R_{wg}$ s for all of the variables were well above the thumb value for  $R_{wg}$  is .60 (James, 1982) and the

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<sup>5</sup> The interrater agreement refers to the degree to which ratings from individuals are interchangeable; namely, it reflects the extent to which raters provide essentially the same rating, i.e. the consensus (Kozlowski & Hattrup, 1992; LeBreton & Senter, 2008; Tinsley & Weiss, 1975).

<sup>6</sup> The interrater reliability refers to the degree to which ratings of different judges are proportional when expressed as deviations from their means, i.e. the consistency (Bliese, 2000; Kozlowski & Hattrup, 1992; LeBreton, Burgess, Kaiser, Atchley, & James, 2003).

more commonly acceptable value of .70, which indicates that the two respondents from each firm were in strong agreement.

Both interrater agreement and interrater reliability were assessed using the intraclass correlations. ICC(1)s and ICC(2)s were calculated using McGraw and Wong's (1996) formula with a one-way random-effects analysis of variance (see Table 5.6). ICCs simultaneously measures interrater agreement and interrater reliability. High values may only be obtained when there is both absolute consensus and relative consistency in judges' ratings (LeBreton & Senter, 2008). Gittell et al. (2010) state "the ICC(1) provides an estimate of the reliability of a single respondent's assessment of the unit mean" and "ICC(2) provides an overall estimate of the reliability of unit means" (p. 498). In this study, the ICC(1) values for all of the variables ranged from .23 to .99 which were higher than the median value as .12 reported by James (1982). This indicates that the two respondents in each unit/firm had high agreement and also the answers from any one of the respondents in a particular firm was reliable. The ICC(2) values for all of the variables ranged from .63 to 1.00 which were higher than the .60 cut-off point recommended by Glick (1985). This indicates the firms can be reliably differentiated in terms of all of the variables in this study.

Based on the above results, the matched pair response data were aggregated into firm level data.

## **5.6 Common Method Bias**

The collection of all measures from the same source may raise concerns about common method bias. To avoid common method bias, this study obtained some data

from public database sources. For example, the control variable firm size which was also used for calculating the dependent variable, productivity, was obtained from the Chartered Accountants Regulatory Board, Businessworld Top 1000 Professional Firms, Kompas and FAME. In addition, for the firm's revenue, public data were obtained from the Top 20 Accounting Firms (Accounting Survey, 2009) for the 12 firms (10.17%). While it is somewhat limited due to the sample size, it does provide a reliability cross-check. Computed ICCs for this sub-sample strongly supported the reliability of these data,  $ICC(1) = .965$ ,  $ICC(2) = .979$  for aggregation purpose. The  $ICC(1)$  results suggest that a single source is a reliable indicator of scores provided from the other sources. In other words, the revenue data from respondents and the public sources are highly correlated. In addition, the  $ICC(2)$  results indicate the high reliability of unit means on revenue information therefore supporting aggregation. Based on these results, all revenue data was utilised in this study to calculate average productivity scores for each firm.

In addition to using public source data, the Harman one-factor test was conducted to examine the common method bias for the rest of the measures. Significant common method bias would result if one general factor accounts for the majority of covariance in the variables (Podsakoff & Organ, 1986). A principal axis factoring analysis with oblique rotation method was performed for the rest of the items except for HPWS since the HPWS' scales (proportion from 0% to 100%) were measured differently from other measures (which used a seven-point Likert Scale). The results showed eleven factors with eigenvalues greater than one which accounted for 72.65% of the total variance, with the first factor accounting for 36.12% of the variance. Since a single factor did not emerge and one general factor did not account

for most of the variance, common method bias is unlikely to be a serious problem in the rest of the data (Podsakoff & Organ, 1986).

The use of public data and the examination of the multiple-factor structure of measures show that common method bias is not a serious problem in this study. Therefore, all of the matched pair response data was aggregated to the firm level to create the measures of HPWS, human capital, social capital, organisational capital and monitoring, communication, coordination, monitoring and team utilisation.

## **5.7 Descriptive Statistics**

This section presents findings based on the correlation analysis using the aggregated data. Table 5.6 provides operationalisations and descriptive statistics for study variables, including the means, standard deviations, *R*wgs, ICC(1)s, ICC(2)s, inter-item reliabilities. Table 5.7 provides correlation coefficients among the variables in the study. It indicates a number of statistically significant and noteworthy relationships. For example, HPWS was found somewhat more likely to yield higher human capital ( $r = .312, p < .01$ ), social capital ( $r = .247, p < .01$ ) and organisational capital ( $r = .250, p < .01$ ). It also was found to be significantly correlated with relative organisational performance ( $r = .283, p < .01$ ), relative market performance ( $r = .311, p < .001$ ) and innovation ( $r = .319, p < .001$ ). Table 5.7 shows that all correlations between human capital, social capital, organisational capital communication, coordination, monitoring, communication, team utilisation, relative organisational performance, relative market performance and innovation were significant at different levels.



**Table 5.6 Descriptive Statistics**

	<b>Variables</b>	<b>Operationalization</b>	<b>N</b>	<b>Mean</b>	<b>S.D.</b>	<b>Rwg</b>	<b>ICC(1)</b>	<b>ICC(2)</b>	<b>Alpha</b>
1.	Firm age	$l_n$ (years since founding)	120	1.29	.35		.89	.94	.94
2.	Firm size	$l_n$ (number of professional staff)	115	1.38	.51				
3.	HPWS	Average score for 16 HPWS items	120	44.88	15.70	1.17	.64*	.78	.80
4.	Human Capital	Average score for 7 human Capital items	120	5.48	.64	.92	.46	.63	.90
5.	Social Capital	Average score for 6 social Capital items	120	5.73	.67	.89	.38	.88	.90
6.	Organisational Capital	Average score for 7 organisational Capital items	120	5.51	.69	.82	.28	.85	.86
7.	Communication	Average score for 3 communication items	120	5.05	.99	.89	.41	.71	.81
8.	Coordination	Average score for 6 coordination items	120	5.00	.96	.86	.38	.88	.90
9.	Monitoring	Average score for 3 monitoring items	120	4.68	1.05	.79	.45	.83	.85
10.	Team Utilisation	Average score for 3 team utilisation items	120	5.35	.91	.84	.41	.85	.86
11.	Productivity	$l_n$ ( revenue per professional staff member)	111	-1.10	.16	n.a.	.99	1.00	1.00
12.	Relative organisational performance	Average score for 7 organisational performance items	120	5.72	.56	.96	.23	.82	.84
13.	Relative market performance	Average score for 4 market performance items	120	4.77	.84	.97	.41	.85	.86
14.	Innovation	Average score for 9 innovation items	120	4.52	1.03	.99	.55	.96	.96

\* When calculating ICC(1), ICC(2) and reliability for HPWS, HPWS was treated as one index.

**Table 5.7 Correlation Matrix of the Study Variables**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Firm age													
2. Firm size	.162 <sup>†</sup>												
3. HPWS	.023	.466 <sup>***</sup>											
4. Human Capital	.081	.377 <sup>***</sup>	.312 <sup>**</sup>										
5. Social Capital	-.022	.066	.247 <sup>**</sup>	.641 <sup>***</sup>									
6. Organisational Capital	-.023	.166	.250 <sup>**</sup>	.308 <sup>***</sup>	.496 <sup>***</sup>								
7. Communication	-.012	.146	.256 <sup>**</sup>	.377 <sup>***</sup>	.404 <sup>***</sup>	.433 <sup>***</sup>							
8. Coordination	-.097	.300 <sup>**</sup>	.601 <sup>***</sup>	.394 <sup>***</sup>	.365 <sup>***</sup>	.422 <sup>***</sup>	.432 <sup>***</sup>						
9. Monitoring	-.041	.226 <sup>*</sup>	.455 <sup>***</sup>	.353 <sup>***</sup>	.421 <sup>***</sup>	.599 <sup>***</sup>	.498 <sup>***</sup>	.524 <sup>***</sup>					
10. Team Utilisation	-.096	.206 <sup>*</sup>	.426 <sup>***</sup>	.460 <sup>***</sup>	.468 <sup>***</sup>	.486 <sup>***</sup>	.583 <sup>***</sup>	.558 <sup>***</sup>	.644 <sup>***</sup>				
11. Productivity	-.047	.211 <sup>*</sup>	.089	.102	-.001	-.048	.083	-.020	.058	.043			
12. Relative organisational performance	.076	.220 <sup>*</sup>	.283 <sup>**</sup>	.477 <sup>***</sup>	.343 <sup>***</sup>	.358 <sup>***</sup>	.209 <sup>*</sup>	.364 <sup>***</sup>	.346 <sup>***</sup>	.300 <sup>**</sup>	.056		
13. Relative market performance	.015	.341 <sup>***</sup>	.311 <sup>***</sup>	.295 <sup>**</sup>	.162 <sup>†</sup>	.260 <sup>**</sup>	.264 <sup>**</sup>	.408 <sup>***</sup>	.365 <sup>***</sup>	.389 <sup>***</sup>	.168 <sup>†</sup>	.559 <sup>***</sup>	
14. Innovation	.016	.225 <sup>*</sup>	.319 <sup>***</sup>	.493 <sup>***</sup>	.524 <sup>***</sup>	.447 <sup>***</sup>	.807 <sup>***</sup>	.578 <sup>***</sup>	.517 <sup>***</sup>	.613 <sup>***</sup>	.119	.228 <sup>*</sup>	.317 <sup>***</sup>

\*\*\* p< 0.001, \*\* p< 0.01, \* p< 0.05, <sup>†</sup> p< 0.10 (two-tailed tests). Listwise deletion method was employed to deal with missing data which reduced sample size from 120 to 111.

## 5.8 Multiple Regression Analysis

Usually, the most desirable analytical method for testing the hypotheses proposed in this study would be structural equation modelling. However, given the small sample size ( $n = 120$ ), structural equation modelling could not be used, especially with the large number of items (16) that were used to measure HPWS. The hierarchical multiple regression analysis techniques (Hofmann, Griffin, & Gavin, 2000) were employed instead to test two separate mediational models.

The first mediational model was to test the mediational effects of resources on the HPWS - firm performance link, labelled as Model 1. Model 1 tested the practices-resources-performance approach. It consisted of one independent variable (HPWS); four dependent variables to measure firm performance (productivity, relative organisational performance, relative market performance and innovation); and three mediators to measure resources (human, social and organisational capital). Model 1 refers to Hypotheses 1 to 3 which proposed the mediational effect of human, social, and organisational capital on the relationship between HPWS and firm performance.

The second mediational model was to test the mediational effects of uses on resources-firm performance link, labelled as Model 2. Model 2 tested the resources-uses-performance approach. It consisted of three independent variables to measure resources (human capital, social capital, and organisational capital); four dependent variables to measure firm performance (productivity, relative organisational

performance, relative market performance and innovation); and four mediators to measure uses (communication, coordination, monitoring and team utilisation).

Model 1 refers to Hypotheses 4 to 6 which proposed the mediational effect of uses on the relationship between resources and firm performance.

**Table 5.8 Proposed Mediation Tests**

	Model 1	Model 2
Step 1 Test for significant relationship: X->Y	HPWS->Firm Performance	HC-> Firm Performance SC-> Firm Performance OC-> Firm Performance
		HC-> Communication HC-> Coordination HC-> Monitoring HC-> Team Utilisation
Step 2 Test for significant relationship: X->M	HPWS-> HC HPWS-> SC HPWS-> OC	SC-> Communication SC-> Coordination SC-> Monitoring SC-> Team Utilisation  OC-> Communication OC-> Coordination OC-> Monitoring OC-> Team Utilisation
Step 3 Test for significant relationship: M->Y	HC-> Firm Performance SC-> Firm Performance OC-> Firm Performance	Communication-> Firm Performance Coordination-> Firm Performance Monitoring-> Firm Performance Team Utilisation-> Firm Performance
Step 4 Test for relationship: XM->Y	The effect of X on Y should be “0” to indicate a full mediation or weaker to indicate a partial mediation.	

Note: X indicates independent variable; Y indicates dependent variable; M indicates proposed mediators; HC indicates human capital, SC indicates social capital and OC indicates organisational capital. Firm performance represents four measures. These are productivity, relative organisational performance, relative market performance and innovation. Using one phrase to indicate firm performance is designed to avoid confusion and complexity.

The tests for the two mediational models followed the four conditions discussed in Baron and Kenny (1986). The four conditions used to assess mediation in Baron and Kenny (1986) are as follows:

- 1) the independent variable should be directly related to the dependent variable (X->Y);
- 2) the independent variable should be related to the mediator (X->M);
- 3) the mediator should be related to the dependent variable (M->Y);
- 4) the direct relationship between the independent variable and dependent variable should become non significant (full mediation) or weaker (partial mediation) when accounting for the effect of the mediator (XM->Y).

In addition, the Sobel test for testing the significance of mediation (Preacher & Hayes, 2004; Sobel, 1982) was conducted for each model. Table 5.8 shows the relationships to be tested for Model 1 and Model 2 corresponding to Baron and Kenny (1986)'s four conditions.

### **5.8.1 Results of Model 1: Practices-Resources-Performance**

Model 1 examined the mediational effects of resources in the relationship between HPWS and firm performance. The independent variable was HPWS. The mediators were human capital, social capital and organisational capital. The dependent variables included productivity, relative organisational performance, relative market performance and innovation which were used to measure firm performance.

Based on Baron and Kenny's (1986) procedure, controlling for firm age and firm size, firm performance was first regressed on HPWS. The mediation variables, i.e., human capital, social capital and organisational capital, were then regressed on

HPWS separately. Finally, firm performance was regressed on HPWS with each mediator separately. The Sobel tests were conducted for each mediational model.

Tables 5.9 and 5.10 show the regression results for Model 1, which proposed the mediational effects of resources (human capital, social capital and organisational capital) on the relationship between HPWS and firm performance. The dependent variables for measuring firm performance include productivity, relative organisational performance, relative market performance and innovation. Therefore there were four models labelled as Model 1.1 to 1.4 in Table 5.10 representing different dependent variables for firm performance measures. Model 1.1 to 1.4 all include four separate simple mediational models which could be tested using regression analysis. For example, Model 1.1 includes four simple mediation models as 1) human capital as mediator between HPWS and productivity; 2) social capital as mediator between HPWS and productivity; 3) organisational capital as mediator between HPWS and productivity; and 4) human capital, social capital and organisational capital together as mediators between HPWS and productivity. Therefore, there are 12 simple mediational models.

To streamline the presentation of the results and to avoid repetition in the reporting of the results, one detailed example of the findings for the mediational model which proposed the mediational effect of human capital and firm performance was presented and then the results for the additional mediational models were reported in a short section. Table 5.11 presents a summary of results for each step and Sobel Test for Model 1.

**Table 5.9 Impact of HPWS on Resources**

Variable	Human capital		Social Capital		Organisational capital	
	Step1	Step2	Step1	Step2	Step1	Step2
<i>Control</i>						
Firm age	.000	.010	-.029	-.013	-.051	-.038
Firm size	.376***	.291**	.068	-.065	.170 <sup>†</sup>	.067
<i>Practices</i>						
HPWS		.176 <sup>†</sup>		.276*		.214*
R <sup>2</sup>	.142	.165	.005	.064	.029	.064
Adjusted R <sup>2</sup>	.123	.142	-.013	.038	.012	.039
ΔR <sup>2</sup>		.024		.059		.035
F/ ΔF	9.279***	3.166 <sup>†</sup>	.276	6.956*	1.668	4.175*
[df1, df2]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]
N	115	115	115	115	115	115

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.10 Impact of HPWS and Resources on Firm Performance**

Variable	Model 1.1 (productivity)						Model 1.2 (relative organisational performance)					
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4
<i>Control</i>												
Firm age	-.083	-.084	-.084	-.085	-.088	-.088	.070	.082	.075	.086	.094	.084
Firm size	.225*	.233*	.226*	.233*	.240*	.227*	.184*	.084	-.051	.104	.063	-.089
<i>Practices</i>												
HPWS		-.018	-.023	-.014	.002	-.005		.207*	.125	.121	.139	.100
<i>Resources</i>												
Human Capital			.025			.047			.464***			.515***
Social Capital				-.015		.002				.310***		-.154
Organisational Capital					-.090	-.103					.317***	.259**
R <sup>2</sup>	.051	.052	.052	.052	.052	.061	.043	.076	.255	.166	.170	.312
Adjusted R <sup>2</sup>	.034	.025	.016	.016	.024	.007	.026	.051	.228	.135	.140	.273
ΔR <sup>2</sup>		.000	.001	.000	.008	.009		.033	.180	.090	.094	.236
ΔF	2.930*	.028	.056	.023	.860	.348	2.493 <sup>†</sup>	3.961*	26.522***	11.857***	12.468***	12.344***
[df1, df2]	[2, 108]	[1, 107]	[1, 106]	[1, 106]	[1, 106]	[3, 104]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[3, 108]
N	111	111	111	111	111	111	115	115	115	115	115	115
Z <sub>Sobel</sub>									2.923**	2.051*	2.114*	



**Table 5.10 Impact of HPWS and Resources on Firm Performance (Continued)**

Variable	Model 1.3 (relative market performance)						Model 1.4 (innovation)					
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4
<i>Control</i>												
Firm age	-.010	-.004	-.007	-.002	.004	.000	-.009	.005	-.001	.011	.020	.011
Firm size	.288**	.236*	.176	.244*	.222*	.137	.209**	.093	-.063	.124	.066	-.030
<i>Practices</i>												
HPWS		.109	.072	.075	.066	.058		.241*	.156*	.106	.155	.085
<i>Resources</i>												
Human Capital			.207*			.266 <sup>†</sup>			.485***			.398***
Social Capital				.123		-.150				.489***		.108
Organisational Capital					.201*	.204 <sup>†</sup>					.400***	.248**
R <sup>2</sup>	.082	.091	.127	.106	.129	.160	.043	.088	.284	.312	.238	.413
Adjusted R <sup>2</sup>	.066	.067	.095	.073	.098	.113	.026	.063	.258	.287	.210	.380
ΔR <sup>2</sup>	.082	.009	.036	.014	.038	.068		.045	.196	.224	.150	.325
ΔF	5.027**	1.113	4.487*	1.735	4.766**	2.932**	2.530 <sup>†</sup>	5.443*	30.075***	35.767***	21.660***	19.901***
[df1, df2]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[3, 108]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[3, 108]
N	115	115	115	115	115	115	115	115	115	115	115	115
Z <sub>Sobel</sub>			2.128*	1.060	1.695 <sup>†</sup>				2.937**	2.381*	2.306*	

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to sizes ranging from 111 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.11 A Summary of Results for Each Step and Sobel Test for Model 1**

Hypothesis	X	M	Y	1 <sup>st</sup> condition (X->Y)	2 <sup>nd</sup> condition (X->M)	3 <sup>rd</sup> condition (M->Y)	4 <sup>th</sup> condition (XM->Y)	Sobel Test (Z)
1. Human capital mediates the relationship between HPWS and firm performance.	HPWS	Human Capital	Productivity	×	√	×	--	--
			Rorga	√	√	√	√	2.923**
			Rmark	×	√	√	√ <sup>a</sup>	2.218*
			Innovation	√	√	√	√ <sup>a</sup>	2.937**
2. Social capital mediates the relationship between HPWS and firm performance.	HPWS	Social Capital	Productivity	×	√	×	--	--
			Rorga	√	√	√	√	2.051*
			Rmark	×	√	×	--	--
			Innovation	√	√	√	√	3.106**
3. Organisational capital mediates the relationship between HPWS and firm performance.	HPWS	Organisational capital	Productivity	×	√	×	--	--
			Rorga	√	√	√	√	2.114*
			Rmark	×	√	√	√ <sup>a</sup>	1.695 <sup>†</sup>
			Innovation	√	√	√	√	3.106**

Note: <sup>a</sup> indicates that the direct path between X and Y remained significant. Rorga = relative organisational performance; Rmark = relative market performance. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

### **5.8.1.1 Human Capital as a Mediator**

Hypothesis 1 proposed the mediational effect of human capital on the relationship between HPWS and firm performance. Following the procedure by Baron and Kenny (1986), the multiple hierarchical regression was used. Controlling for firm size and firm age, firm performance was firstly regressed on HPWS. Then human capital was regressed on HPWS. Lastly, firm performance was regressed on both HPWS and human capital.

Since firm performance was measured via four performance indicators, four simple mediational models were tested as: 1) the mediational effect of human capital between HPWS and productivity; 2) the mediational effect of human capital between HPWS and relative organisational performance; 3) the mediational effect of human capital between HPWS and relative market performance; and 4) the mediational effect of human capital between HPWS and innovation.

#### ***Productivity as the Dependent Variable.***

The first condition requires the significant relationship between the predictor and the dependent variable (X->Y), i.e. HPWS and productivity. The beta coefficients for HPWS on productivity was not significant ( $\beta = -.018, p > .10$ ) (see Step 2 in Model 1.1, Table 5.10). The first condition was not satisfied. However, the first condition is not required unless the expectation is for complete mediation (Kenny, Kashy, & Bolger, 1998).

The second condition requires the significant relationship between predictor and mediator (X->M), i.e. HPWS and human capital. The beta coefficients for HPWS on

human capital was significant and positive ( $\beta = .176, p < .10$ ) (see Step 2 in Table 5.9 for human capital), satisfying the second condition.

The third condition requires the significant relationship between mediator and dependent variable (M->Y), i.e. human capital and productivity. The beta coefficients for human capital on productivity was not significant ( $\beta = .025, p > .10$ ) (see Step 3-1 in Model 1.1, Table 5.10). The third condition which is required was not satisfied.

Therefore, the meditational effect of human capital on HPWS and productivity is not supported.

***Relative Organisational Performance as the Dependent Variable.***

The first condition (X->Y): The beta coefficients for HPWS on relative organisational performance was significant and positive ( $\beta = .207, p < .05$ ) (see Step 2 in Model 1.2, Table 5.10). The first condition was satisfied.

The second condition (Y->M): The beta coefficients for HPWS on human capital was significant and positive ( $\beta = .176, p < .10$ ) (see Step 2 in Table 5.9 for human capital), satisfying the second condition.

The third condition (M->Y): The beta coefficients for human capital on relative organisational performance was significant and positive ( $\beta = .464, p < .001$ ) (see Step 3-1 in Model 1.2, Table 5.10), satisfying the third condition.

The fourth condition requires the direct relationship between the independent variable and dependent variable should become non significant (full mediation) or weaker (partial mediation) when accounting for the effect of mediator (XM->Y). The beta coefficients for HPWS on relative organisational performance became

smaller and non significant when human capital was included (from  $\beta = .207$ ,  $p < .05$ , to  $\beta = .120$ ,  $p > .10$ ) (see Step 2 and Step 3-1 in Model 1.2, Table 5.10), satisfying the fourth condition.

Finally, the Sobel test was conducted using Preacher and Hayes' (2004) procedure for simple mediation for the mediator- human capital. The results provided support for human capital acting as the mediator between HPWS and relative organisational performance ( $Z_{\text{Sobel}} = 2.923$ ,  $p < .01$ ).

Therefore, human capital mediates the relationship between HPWS and relative organisational performance.

#### ***Relative Market Performance as the Dependent Variable.***

The first condition (X->Y): The beta coefficients for HPWS on relative market performance was positive but not significant ( $\beta = .109$ ,  $p > .05$ ) (see Step 2 in Model 1.3, Table 5.10). The first condition was not satisfied. However, the first condition is not required unless the expectation is for complete mediation (Kenny, Kashy, & Bolger, 1998).

The second condition (Y->M): The beta coefficients for HPWS on human capital was significant and positive ( $\beta = .176$ ,  $p < .10$ ) (see Step 2 in Table 5.9 for human capital), satisfying the second condition.

The third condition (M->Y): The beta coefficients for human capital on relative market performance was significant and positive ( $\beta = .207$ ,  $p < .05$ ) (see Step 3-1 in Model 1.3, Table 5.10), satisfying the third condition.

The fourth condition (XM->Y): The beta coefficients for HPWS on relative market performance became smaller when human capital was included (from  $\beta = .109$ ,

$p > .10$ , to  $\beta = .072$ ,  $p > .10$ ) (see Step 2 and Step 3-1 in Model 1.3, Table 5.10), satisfying the fourth condition.

Finally, the Sobel test was conducted and support was found for human capital acting as the mediator between HPWS and relative market performance ( $Z_{\text{Sobel}} = 2.128$ ,  $p < .05$ ).

Therefore, human capital mediates the relationship between HPWS and firm performance which was measured by relative market performance.

### ***Innovation as the Dependent Variable.***

The first condition (X->Y): The beta coefficients for HPWS on innovation was significant and positive ( $\beta = .241$ ,  $p < .05$ ) (see Step 2 in Model 1.4, Table 5.10). The first condition was satisfied.

The second condition (Y->M): The beta coefficients for HPWS on human capital was significant and positive ( $\beta = .176$ ,  $p < .10$ ) (see Step 2 in Table 5.9 for human capital), satisfying the second condition.

The third condition (M->Y): The beta coefficients for human capital on innovation was significant and positive ( $\beta = .485$ ,  $p < .001$ ) (see Step 3-1 in Model 1.4, Table 5.10), satisfying the third condition.

The fourth (XM->Y): The beta coefficients for HPWS on innovation became smaller and non significant when human capital was included (from ( $\beta = .241$ ,  $p < .05$ , to  $\beta = .156$ ,  $p < .10$ ) (see Step 2 and Step 3-1 in Model 1.4, Table 5.10), satisfying the fourth condition.

The results of Sobel test provided support for human capital acting as the mediator between HPWS and innovation ( $Z_{\text{Sobel}} = 2.937$ ,  $p < .01$ ).

Therefore, human capital mediates the relationship between HPWS and innovation.

### **5.8.1.2 Social Capital as a Mediator**

To streamline the presentation of the results and to avoid repetition in the reporting of the results, this section and afterwards provides a short summary report on the mediation tests.

Hierarchical regression was used to test hypothesis 2 which proposed the mediational effect of social capital in the relationship between HPWS and firm performance.

The results shown in Tables 5.9 (for social capital), 5.10 and 5.11 suggested that social capital mediated the relationship between HPWS and two dependent variables by satisfying four conditions in Baron and Kenny (1986). According to Sobel test of significance of this mediation, social capital mediated the relationship between HPWS and relative organisational performance ( $Z_{\text{Sobel}} = 2.051, p < .05$ ) and innovation ( $Z_{\text{Sobel}} = 2.381, p < .05$ ). For models assessing productivity and relative market performance as firm performance indicators, one or more of the relevant paths were non significant and thus failed to meet the criteria for mediation.

### **5.8.1.3 Organisational Capital as a Mediator**

Hypothesis 3 stated that organisational capital would mediate the relationship between HPWS and firm performance.

The results shown in Tables 5.9, 5.10 and 5.11 suggested that organisational capital fully mediated the relationship between HPWS and two firm performance measures, i.e., relative organisational performance and innovation by satisfying four conditions in Baron and Kenny (1986). The results also suggested that organisational capital partially mediated the relationship between HPWS and relative market performance

although this relationship was non significant ( $\beta = .109, p > .10$ ) (see Step 2 in Model 1.3, Table 5.10) (Kenny, Kashy, & Bolger, 1998). The results of the Sobel test provided support for the mediational effect of organisational capital in the relationship between HPWS and relative organisational performance ( $Z_{\text{Sobel}} = 2.114, p < .05$ ), relative market performance ( $Z_{\text{Sobel}} = 1.695, p < .10$ ) and innovation ( $Z_{\text{Sobel}} = 2.306, p < .05$ ). For the model assessing productivity, the relevant paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.1.4 Resources “Together” as Mediators**

Due to the high correlations between human capital, social capital and organisational capital shown in Table 5.7, multiple hierarchical regression analyses were also carried out in which all three resources were entered into the equation simultaneously in Step 3 in order to test the combined effect of these interrelated Human capital was found to significantly relate to relative organisational performance ( $\beta = .515, p < .001$ ), relative market performance ( $\beta = .266, p < .10$ ), and innovation ( $\beta = .398, p < .01$ ). Organisational capital was found to significantly relate to relative organisational performance ( $\beta = .259, p < .01$ ), relative market performance ( $\beta = .204, p < .10$ ), and innovation ( $\beta = .248, p < .01$ ).

#### **5.8.1.5 Summary**

The purpose of this section was to test hypotheses 1 to 3 which proposed the mediational effects of human capital, social capital and organisational capital on the HPWS - firm performance link.

Based on the above analysis, hypothesis 1 is supported by the finding on the mediational effects of human capital on the relationship between HPWS and firm



performance indicators, i.e. relative organisational performance, relative market performance and innovation. Hypothesis 2 is supported by the finding on the meditation effects of social capital between HPWS and firm performance indicators, i.e. relative organisational performance and innovation. Hypothesis 3 is supported by the finding on the meditation effects of organisational capital between HPWS and firm performance indicators, i.e. relative organisational performance, relative market performance and innovation.

### **5.8.2 Results of Model 2: Resources-Uses-Performance**

Model 2 set out to examine the mediational effects of uses in the relationship between resources and firm performance. In this model, there were three independent variables, i.e. human capital, social capital and organisational capital; four dependent variables to measure firm performance, i.e. productivity, relative organisational performance, relative market performance and innovation; and four mediators to measure uses, i.e. communication, coordination, monitoring and team utilisation.

Due to the complexity of Model 2, this section presents the results in the order of the independent variables examined. First, the results on the mediating effect of uses in human capital and firm performance are reported. Then the results on the mediating effect of uses in social capital and firm performance are reported. Finally, the results for the model on the mediating role of uses in the relationship between organisational capital and firm performance are reported.

### **5.8.2.1 Mediation of Uses in Human Capital and Firm Performance**

Hypothesis 4 proposed that uses mediate the relationship between human capital and firm performance. The independent variable was human capital. The mediators examined were uses, i.e. communication, coordination, monitoring and team utilisation. The dependent variables to measure firm performance were productivity, relative organisational performance, relative market performance and innovation. Based on Baron and Kenny's (1986) procedure, controlling for firm age and firm size, firm performance was first regressed on human capital. Each mediator was then regressed on human capital separately. Finally, firm performance was regressed on human capital with each mediator separately. The Sobel tests were conducted for each mediational model.

Tables 5.12 to 5.13 show the regression results for the mediational model which proposed that the relationship between human capital and firm performance was mediated by uses. The dependent variables for measuring firm performance were productivity, relative organisational performance, relative market performance, and innovation. Therefore, there were four models labelled as Model 2.1 to 2.4 in Table 5.12 representing different dependent variables for firm performance measures. Model 2.1 to Model 2.4 all included five separate simple mediational models which could be tested using regression analysis. For example, Model 2.1 addressed five simple mediation models as 1) communication as mediator between human capital and productivity; 2) coordination as mediator between human capital and productivity; 3) monitoring as mediator between human capital and productivity; 4) team utilisation as mediator between human capital and productivity; and 5) communication, coordination, monitoring and team utilisation together as mediators

between human capital and productivity. The test of the 16 simple mediational models was carried out using hierarchical regression analyses and following the four-step procedure by Baron and Kenny (1986) as described in the previous section. To streamline the presentation of the results this section presents the findings of the mediational analyses in a short format.

Table 5.14 presents a summary of results for each step and Sobel Test for the mediational model in which uses act as mediators between human capital and firm performance. This table illustrates why the models failed to be a mediational ones via showing which conditions were not satisfied.

**Table 5.12 Impact of Human Capital on Uses**

Variable	Communication		Coordination		Monitoring		Team Utilisation	
	Step1	Step2	Step1	Step2	Step1	Step2	Step1	Step2
<i>Control</i>								
Firm age	-.028	-.030	-.158 <sup>†</sup>	-.156 <sup>†</sup>	-.073	-.074	-.139	-.142 <sup>†</sup>
Firm size	.134	-.018	.314***	.186*	.226*	.101	.219*	.046
<i>Resource</i>								
Human Capital		.404***		.341***		.331***		.459***
R <sup>2</sup>	.018	.158	.109	.208	.051	.145	.058	.239
Adjusted R <sup>2</sup>	.000	.135	.093	.87	.034	.122	.041	.219
ΔR <sup>2</sup>		.140		.100		.094	.058	.181
ΔF	1.006	18.496***	6.819**	13.990***	3.030 <sup>†</sup>	12.206***	3.463*	26.429***
[df1, df2]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]
N	115	115	115	115	115	115	115	115

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.13 Impact of Human Capital and Uses on Firm Performance**

Variable	Model 2.1 (productivity)							Model 2.2 (relative organisational performance)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.083	-.083	-.082	-.102	-.083	-.087	-.105	.070	.067	.068	.097	.083	.079	.094
Firm size	.225*	.217*	.217*	.241*	.217*	.218*	.245*	.184 <sup>†</sup>	.002	.003	-.033	-.019	-.002	-.046
<i>Resource</i>														
Human Capital		.021	.001	.067	.021	.034	.042		.484***	.472***	.419***	.415***	.447***	.427***
<i>Uses</i>														
Communication			.049				.098			.029				-.077
Coordination				-.130			-.170				.189*			.152
Monitoring					-.002		.042					.209*		.222 <sup>†</sup>
Team Utilisation						-.028	-.028						.080	-.082
R <sup>2</sup>	.051	.052	.054	.065	.052	.052	.074	.043	.243	.244	.272	.281	.248	.299
Adjusted R <sup>2</sup>	.034	.025	.018	.030	.017	.017	.011	.026	.223	.217	.245	.255	.221	.253
ΔR <sup>2</sup>		.000	.002	.013	.001	.001	.022		.210	.000	.028	.037	.005	.056
ΔF	2.930 <sup>†</sup>	.041	.230	1.507	.063	.063	.609	2.493 <sup>†</sup>	29.458***	.104	4.275*	5.712*	.712	2.213 <sup>†</sup>
[df1, df2]	[2, 108]	[1, 107]	[1, 106]	[1, 106]	[1, 106]	[1, 106]	[4, 103]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	111	111	111	111	111	111	111	115	115	115	115	115	115	115
Z <sub>Sobel</sub>										.403	1.884 <sup>†</sup>	2.079*	1.013	

**Table 5.13 Impact of Human Capital and Uses on Firm Performance (Continued)**

Variable	Model 2.3 (relative market performance)							Model 2.4 (innovation)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.010	-.011	-.005	.037	.010	.035	.049	-.009	-.012	.010	.060	.017	.055	.050
Firm size	.288**	.206*	.210*	.149	.177 <sup>†</sup>	.191**	.154	.209*	.018	.031	-.068	-.022	-.004	-.015
<i>Resource</i>														
Human Capital		.218**	.137	.114	.122	.069	.035		.509***	.219***	.353***	.380***	.293***	.156*
<i>Uses</i>														
Communication			.201*				.018			.718***				.617***
Coordination				.305**			.174				.457***			.213*
Monitoring					.290**		.125					.391***		.016
Team Utilisation						.324**	.163						.470***	.084
R <sup>2</sup>	.082	.123	.157	.197	.195	.203	.239	.043	.266	.700	.431	.396	.434	.742
Adjusted R <sup>2</sup>	.066	.099	.126	.168	.166	.174	.189	.026	.246	.689	.411	.374	.413	.725
ΔR <sup>2</sup>	.082	.041	.034	.074	.072	.080	.116		.222	.453	.166	.130	.168	.476
ΔF	5.027**	5.163*	4.422*	10.092**	9.823**	11.021**	4.080**	2.530 <sup>†</sup>	33.609***	159.434***	32.031***	23.733***	32.606***	49.253***
[df1, df2]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	115	115	115	115	115	115	115	115	115	115	115	115	115	115
Z <sub>Sobel</sub>			1.839 <sup>†</sup>	2.825**	2.599**	2.928**				4.176***	3.578***	3.199**	4.035***	

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to sizes ranging from 111 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.14 A Summary of Results for Each Step and Sobel Test for Mediation Model of Uses as Mediators between Human Capital and Firm Performance**

Hypothesis	X	M	Y	1 <sup>st</sup> condition (X->Y)	2 <sup>nd</sup> condition (X->M)	3 <sup>rd</sup> condition (M->Y)	4 <sup>th</sup> condition (XM->Y)	Sobel Test (Z)
4. Uses mediate the relationship between human capital and firm performance.	Human Capital	Communication	Productivity	×	√	×	--	--
			Rorga	√	√	×	--	--
			Rmark	√	√	√	√	1.839 <sup>†</sup>
			Innovation	√	√	√	√ <sup>a</sup>	4.176***
		Coordination	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	1.884 <sup>†</sup>
			Rmark	√	√	√	√	2.825**
			Innovation	√	√	√	√ <sup>a</sup>	3.578***
		Monitoring	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	2.079*
			Rmark	√	√	√	√	2.599**
			Innovation	√	√	√	√ <sup>a</sup>	3.199**
		Team Utilisation	Productivity	×	√	×	--	--
			Rorga	√	√	×	--	--
			Rmark	√	√	√	√	2.928**
			Innovation	√	√	√	√ <sup>a</sup>	4.035***

Note: <sup>a</sup> indicates that the direct path between X and Y remained significant. Rorga = relative organisational performance; Rmark = relative market performance. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

#### **5.8.2.1.1 Communication as a Mediator**

The results shown in Tables 5.12 (for communication), 5.13 and 5.14 suggested that communication fully mediated the relationship between human capital and relative market performance by satisfying Baron and Kenny (1986)'s four conditions. The results also suggested that communication mediated the relationship between human capital and innovation, although the direct path between human capital and innovation remained significant. The strength of the direct path is not surprising given the findings by Subramaniam and Yount (2005) on the direct relationship between human capital and innovation. According to the Sobel test of significance, communication mediated the relationship between human capital and relative market performance ( $Z_{\text{Sobel}} = 1.839, p < .10$ ) and innovation ( $Z_{\text{Sobel}} = 4.176, p < .001$ ). For models assessing the other two firm performance measures as productivity and relative organisational performance, one or more of the relevant paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.2.1.2 Coordination as a Mediator**

The results shown in Tables 5.12 (for coordination), 5.13 and 5.14 suggested that coordination fully mediated the relationship between human capital and relative market performance by satisfying the four conditions set out by Baron and Kenny (1986). The results also suggested that coordination mediated the relationship between human capital and two firm performance measures – relative organisational performance and innovation, although the direct paths between human capital and the two firm performance measures remained significant. According to the Sobel test, coordination mediated the relationship between human capital and relative organisational performance ( $Z_{\text{Sobel}} = 1.884, p < .10$ ), relative market performance

( $Z_{\text{Sobel}} = 2.825, p < .10$ ) and innovation ( $Z_{\text{Sobel}} = 3.578, p < .001$ ). For model assessing productivity, the first and third paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.2.1.3 Monitoring as a Mediator**

The results shown in Tables 5.12 (for monitoring), 5.13 and 5.14 suggested that monitoring fully mediated the relationship between human capital and relative market performance by satisfying the four conditions identified by Baron and Kenny (1986). The results also suggested that monitoring mediated the relationship between human capital and the two firm performance variables - relative organisational performance and innovation, although the direct path between human capital and these two firm performance measures remained significant. The literature provides support for the strong direct relationship between human capital and firm performance (Hitt et al., 2001; Subramaniam & Yount, 2005). According to the Sobel test, monitoring mediated the relationship between human capital and relative organisational performance ( $Z_{\text{Sobel}} = 2.079, p < .05$ ), relative market performance ( $Z_{\text{Sobel}} = 2.599, p < .01$ ) and innovation ( $Z_{\text{Sobel}} = 3.199, p < .01$ ). For model assessing productivity, the first and third paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.2.1.4 Team Utilisation as a Mediator**

The results shown in Tables 5.12 (for team utilisation), 5.13 and 5.14 suggested that team utilisation fully mediated the relationship between human capital and relative market performance by satisfying the four conditions required in Baron and Kenny (1986). The results also suggested that team utilisation mediated the relationship between human capital and innovation, although the direct path between human



capital and innovation remained significant. This result is acceptable considering the literature which provides support for the strong direct relationship between human capital and innovation (Subramaniam & Yount, 2005). According to the Sobel test of significance, team utilisation mediated the relationship between human capital and relative market performance ( $Z_{\text{Sobel}} = 2.928, p < .01$ ), and innovation ( $Z_{\text{Sobel}} = 4.035, p < .001$ ). The models assessing the other two firm performance measures - productivity and relative organisational performance were not supported due to the non significance of one or more relevant paths which thus failed to meet the criteria for mediation.

#### **5.8.2.1.5 Uses “Together” as Mediators**

Due to the fact that communication, coordination, monitoring and team utilisation are related to each other as found in the correlation statistics in Table 5.7, the human capital and uses including communication, coordination, monitoring and team utilisation were entered together in the third step. The results were shown in the Step 3-5 shown in Table 5.12. Communication was significantly related to innovation ( $\beta = .617, p < .01$ ). Monitoring was significantly related to innovation ( $\beta = .213, p < .01$ ). Monitoring was significantly related to relative organisational performance ( $\beta = .222, p < .10$ ).

#### **5.8.2.1.6 Summary**

This section provided the results of testing hypothesis 4 which proposed the mediation effects of uses on the relationship between human capital and firm performance.

The results of the analyses support Hypotheses 4 by showing the mediating effect of 1) communication on the relationship between human capital and relative market

performance and innovation; 2) coordination on the relationship between human capital and relative organisational performance, relative market performance and innovation; 3) monitoring on the relationship between human capital and relative organisational performance, relative market performance and innovation; and 4) team utilisation on the relationship between human capital and relative organisational performance, relative market performance and innovation.

#### **5.8.2.2 Mediation of Uses in Social Capital and Firm Performance**

Hypothesis 5 proposed that uses would mediate the relationship between social capital and firm performance. The independent variable was social capital. The mediators were uses which were measured by communication, coordination, monitoring and team utilisation. The dependent variables to measure firm performance were productivity, relative organisational performance, relative market performance and innovation.

Based on Baron and Kenny's (1986) procedure, controlling for firm age and firm size, firm performance was first regressed on social capital. Each mediator was then regressed on social capital separately. Finally, firm performance was regressed on social capital with each mediator separately. The Sobel tests were conducted for each meditational model.

Tables 5.15 to 5.16 show the regression results for the meditational model which proposed that the relationship between social capital and firm performance was mediated by uses. Model 2.5 to 2.8 in Table 5.16 represented different dependent variables to measure firm performance, i.e. productivity, relative organisational performance, relative market performance and innovation. Model 2.5 to Model 2.8 all included five separate simple meditational models which could be tested using

regression analysis directly. For example, Model 2.4 included five simple mediation models as 1) communication as a mediator between social capital and productivity; 2) coordination as a mediator between social capital and productivity; 3) monitoring as a mediator between social capital and productivity; 4) team utilisation as a mediator between social capital and productivity; and 5) communication, coordination, monitoring and team utilisation together as mediators between social capital and productivity. The test of these simple mediational models was carried out using hierarchical regression analyses and following the four-step procedure by Baron and Kenny (1986) as described in the previous section. To streamline the presentation of the results this section presents the findings of the mediational analyses in a short format. Table 5.16 presents a summary of results for each step and Sobel Test for the mediational model in which uses act mediators between social capital and firm performance.

**Table 5.15 Impact of Social Capital on Uses**

Variable	Communication		Coordination		Monitoring		Team Utilisation	
	Step1	Step2	Step1	Step2	Step1	Step2	Step1	Step2
<i>Control</i>								
Firm age	-.028	-.017	-.156 <sup>†</sup>	-.147 <sup>†</sup>	-.073	-.061	-.139	-.127
Firm size	.134	.107	.314***	.291***	.226*	.198*	.219*	.190*
<i>Resource</i>								
Social Capital		.395***		.338***		.409***		.433***
R <sup>2</sup>	.018	.173	.109	.222	.051	.218	.058	.245
Adjusted R <sup>2</sup>	.000	.150	.093	.201	.034	.197	.041	.224
ΔR <sup>2</sup>		.155	.	.114		.167		.187
ΔF	1.006	20.818***	6.819**	16.233***	3.030 <sup>†</sup>	23.642***	3.463*	27.433***
[df1, df2]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]
N	115	115	115	115	115	115	115	115

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.16 Impact of Social Capital and Uses on Firm Performance**

Variable	Model 2.5 (productivity)							Model 2.6 (relative organisational performance)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.083	-.084	-.082	-.100	-.083	-.085	-.102	.070	.079	.081	.113	.093	.097	.114
Firm size	.225*	.226*	.218*	.261*	.223*	.227*	.255*	.184*	.161 <sup>†</sup>	.153 <sup>†</sup>	.094	.116	.134	.081
<i>Resource</i>														
Social Capital		-.018	-.045	.022	-.024	-.016	-.017		.336***	.307**	.258**	.242*	.275**	.224*
<i>Uses</i>														
Communication			.068				.106			.073				-.045
Coordination				-.116			-.163				.229*			.176
Monitoring					.015		.043					.229*		.184
Team Utilisation						-.005	-.010						.141	-.012
R <sup>2</sup>	.051	.052	.056	.062	.052	.052	.073	.043	.155	.159	.196	.196	.170	.215
Adjusted R <sup>2</sup>	.034	.025	.020	.027	.016	.016	.010	.026	.132	.129	.166	.167	.140	.164
ΔR <sup>2</sup>		.000	.004	.010	.000	.000	.021		.112	.004	.041	.041	.015	.060
ΔF	2.930 <sup>†</sup>	.036	.422	11.180	.019	.002	.585	2.493 <sup>†</sup>	14.742***	.577	5.588*	5.624*	2.002	2.055 <sup>†</sup>
[df1, df2]	[2, 108]	[1, 107]	[1, 106]	[1, 106]	[1, 106]	[1, 106]	[4, 103]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	111	111	111	111	111	111	111	115	115	115	115	115	115	115
Z <sub>Sobel</sub>										.977	2.279*	2.378*	1.754	

**Table 5.16 Impact of Social Capital and Uses on Firm Performance (Continued)**

Variable	Model 2.7 (relative market performance)							Model 2.8 (innovation)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.010	-.006	-.002	.043	.014	.040	.054	-.009	.005	.017	.069	.026	.062	.054
Firm size	.288**	.279**	.254**	.182*	.215*	.210*	.158*	.209	.174**	.099*	.047	.106	.089	.038
<i>Resource</i>														
Social Capital		.139	.048	.026	.006	-.018	-.076		.512***	.234***	.364***	.370***	.318***	.177***
<i>Uses</i>														
Communication			.230*				.036			.701***				.613***
Coordination				.333***			.186 <sup>†</sup>				.436***			.211***
Monitoring					.324**		.138					.345***		-.014
Team Utilisation						.361***	.188						.447***	.063
R <sup>2</sup>	.082	.102	.145	.188	.184	.200	.243	.043	.301	.711	.451	.397	.455	.748
Adjusted R <sup>2</sup>	.066	.077	.114	.158	.154	.171	.193	.026	.285	.701	.431	.375	.435	.732
ΔR <sup>2</sup>		.019	.044	.086	.082	.098	.141		.260	.407	.148	.093	.151	.445
ΔF	5.027**	2.366	5.619*	11.646***	11.053**	13.532***	4.984**	2.530*	41.500**	155.132***	29.621**	17.007**	30.115**	47.306**
[df1, df2]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	115	115	115	115	115	115	115	115	115	115	115	115	115	115
Z <sub>Sobel</sub>			2.242*	2.898**	3.057**	3.304***				4.217***	3.319***	3.426***	3.949***	

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to sizes ranging from 111 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.17 A Summary of Results for Each Step and Sobel Test for Mediation Model of Uses as Mediators between Social Capital and Firm Performance**

Hypothesis	X	M	Y	1 <sup>st</sup> condition (X->Y)	2 <sup>nd</sup> condition (X->M)	3 <sup>rd</sup> condition (M->Y)	4 <sup>th</sup> condition (XM->Y)	Sobel Test (Z)
5. Uses mediate the relationship between social capital and firm performance.	Social Capital	Communication	Productivity	×	√	×	--	--
			Rorga	√	√	×	--	--
			Rmark	×	√	√	√ <sup>b</sup>	2.242*
			Innovation	√	√	√	√ <sup>a</sup>	4.217***
		Coordination	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	2.279*
			Rmark	×	√	√	√ <sup>b</sup>	2.898**
			Innovation	√	√	√	√ <sup>a</sup>	3.319***
		Monitoring	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	2.378*
			Rmark	×	√	√	√ <sup>b</sup>	3.057**
			Innovation	√	√	√	√ <sup>a</sup>	3.426***
Team Utilisation	Productivity	×	√	×	--	--		
	Rorga	√	√	×	--	1.754		
	Rmark	×	√	√	√ <sup>b</sup>	3.304***		
	Innovation	√	√	√	√ <sup>a</sup>	3.949***		

Note: <sup>a</sup> indicates that the direct path between X and Y remained significant. <sup>b</sup> indicates that the direct path between X and Y was not significant. Rorga = relative organisational performance; Rmark = relative market performance. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . All tests were two-tailed.

#### **5.8.2.2.1 Communication as a Mediator**

The results shown in Tables 5.15 (for communication), 5.16 and 5.17 suggested that communication mediated the relationship between social capital and innovation, although the direct path between social capital and innovation remained significant. The results also suggested that communication mediated the relationship between social capital and relative market performance though the direct relationship was not significant. According to the Sobel test, communication mediated the relationship between social capital and relative market performance ( $Z_{\text{Sobel}} = 2.242, p < .05$ ) and innovation ( $Z_{\text{Sobel}} = 4.217, p < .001$ ). For models assessing the firm performance indicators of productivity and relative organisational performance, one or more of the relevant paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.2.2.2 Coordination as a Mediator**

The results shown in Tables 5.15 (for coordination), 5.16 and 5.17 suggested that coordination mediated the relationship between social capital and relative organisational performance and innovation with the remaining significant direct paths. The results also suggested that coordination mediated the relationship between social capital and relative market performance with non significant direct path between social capital and relative market performance. According to the Sobel test, coordination mediated the relationship between social capital and relative organisational performance ( $Z_{\text{Sobel}} = 2.279, p < .05$ ), relative market performance ( $Z_{\text{Sobel}} = 2.898, p < .01$ ) and innovation ( $Z_{\text{Sobel}} = 3.319, p < .001$ ). For models assessing productivity, the first and third conditions were not satisfied and thus failed to meet the criteria for mediation.

#### **5.8.2.2.3 Monitoring as a Mediator**

The results shown in Tables 5.15 (for monitoring), 5.16 and 5.17 suggested that monitoring mediated the relationship between social capital and relative organisational performance and innovation with the remaining significant direct paths between social capital and these two firm performance measures. The results also suggested that monitoring mediated the relationship between social capital and relative market performance with a non significant direct path between social capital and relative market performance. According to the Sobel test of significance of this mediation, monitoring mediated the relationship between social capital and relative organisational performance ( $Z_{\text{Sobel}} = 2.378, p < .05$ ), relative market performance ( $Z_{\text{Sobel}} = 3.057, p < .01$ ) and innovation ( $Z_{\text{Sobel}} = 3.426, p < .001$ ). The model assessing productivity failed to meet the criteria for mediation because the first and the third condition were not satisfied.

#### **5.8.2.2.4 Team Utilisation as a Mediator**

The results shown in Tables 5.15 (for team utilisation), 5.16 and 5.17 suggested that team utilisation mediated the relationship between social capital and innovation with the remaining significant path from social capital to innovation. The results also suggested that team utilisation mediated the relationship between social capital and relative market performance, although the direct path between social capital and relative market performance was not significant. According to the Sobel test of significance, team utilisation mediated the relationship between social capital and relative market performance ( $Z_{\text{Sobel}} = 3.304, p < .001$ ), and innovation ( $Z_{\text{Sobel}} = 3.949, p < .001$ ). The model assessing firm performance indicators of productivity and



relative organisational performance were not supported due to the non significance of one or more relevant paths which thus failed to meet the criteria for mediation.

#### **5.8.2.2.5 Uses “Together” as Mediators**

Due to the fact that communication, coordination, monitoring and team utilisation are related to each other as indicated by their inter-correlations (see Table 5.7), the social capital and uses including communication, coordination, monitoring and team utilisation were entered together in the third step. The results were shown in Step 3-5 shown in Table 5.14. Communication was significantly related to innovation ( $\beta = .613, p < .001$ ). Coordination was significantly related to relative market performance ( $\beta = .186, p < .10$ ) and innovation ( $\beta = .211, p < .001$ ).

#### **5.8.2.2.6 Summary**

This section presents the results for hypothesis 5 which proposed the mediation effects of uses on the relationship between social capital and firm performance.

Viewed together, hypothesis 5 is supported by finding the mediational effects of 1) communication on the relationship between social capital and relative market performance and innovation; 2) coordination on the relationship between social capital and relative organisational performance, relative market performance and innovation; 3) monitoring on the relationship between social capital and relative organisational performance, relative market performance and innovation; and 4) team utilisation on the relationship between social capital and relative organisational performance, relative market performance and innovation.

#### **5.8.2.3 Mediation of Uses in Organisational Capital and Firm Performance**

Hypothesis 6 proposed that uses would mediate the relationship between organisational capital and firm performance. The independent variable was

organisational capital. The mediators were uses which were measured via communication, coordination, monitoring and team utilisation. The dependent variables to measure firm performance were productivity, relative organisational performance, relative market performance and innovation.

Based on Baron and Kenny's (1986) procedure, controlling for firm age and firm size, firm performance was first regressed on organisational capital. Each mediator was then regressed on organisational capital. Finally, firm performance was regressed on organisational capital with each mediator separately. The Sobel tests were conducted for each mediational model.

Tables 5.18 to 5.19 show the regression results for the mediational model which proposed that the relationship between organisational capital and firm performance was mediated by uses. Model 2.9 to 2.12 in Table 5.16 represented four different dependent variables to measure firm performance i.e. productivity, relative organisational performance, relative market performance and innovation. Model 2.9 to Model 2.12 all included five separate simple mediational models which could be tested using regression analysis directly. For example, Model 2.9 included five simple mediation models as 1) communication as mediator between organisational capital and productivity; 2) coordination as mediator between organisational capital and productivity; 3) monitoring as mediator between organisational capital and productivity; 4) team utilisation as mediator between organisational capital and productivity; and 5) communication, coordination, monitoring and team utilisation together as mediators between organisational capital and productivity. The test of the 16 simple mediational models was carried out using hierarchical regression analyses and following the four-step procedure by Baron and Kenny (1986) as

described in the previous section. To streamline the presentation of the results this section presents the findings of the mediational analyses in a short format.

Table 5.20 presents a summary of results for each step and the Sobel Test for the mediational model in which uses act as mediators between social capital and firm performance.

**Table 5.18 Impact of Organisational Capital on Uses**

Variable	Communication		Coordination		Monitoring		Team Utilisation	
	Step1	Step2	Step1	Step2	Step1	Step2	Step1	Step2
<i>Control</i>								
Firm age	-.028	-.007	-.156 <sup>†</sup>	-.137	-.073	-.043	-.139	-.117
Firm size	.134	.063	.314***	.250**	.226*	.127	.219*	.143 <sup>†</sup>
<i>Resource</i>								
Organisational Capital		.420***		.377***		.582***		.446***
R <sup>2</sup>	.018	.189	.109	.246	.051	.380	.058	.252
Adjusted R <sup>2</sup>	.000	.167	.093	.226	.034	.364	.041	.231
ΔR <sup>2</sup>		.171		.138		.329		.193
ΔF	1.006	23.428***	6.819**	20.290***	3.030 <sup>†</sup>	58.935***	3.463*	28.683***
[df1, df2]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]	[2, 112]	[1, 111]
N	115	115	115	115	115	115	115	115

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , <sup>†</sup>  $p < .10$ . All tests were two-tailed.

**Table 5.19 Impact of Organisational Capital and Uses on Firm Performance**

Variable	Model 2.9 (productivity)							Model 2.10 (relative organisational performance)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.083	-.088	-.086	-.099	-.084	-.084	-.101	.070	.087	.087	.117	.096	.103	.120
Firm size	.225*	.241*	.232*	.262*	.229*	.235*	.257*	.184 <sup>†</sup>	.126	.122	.071	.101	.106	.063
<i>Resource</i>														
Organisational Capital		-.090	-.135	-.059	-.141	-.108	-.141		.341***	.313**	.257**	.225*	.279**	.200 <sup>†</sup>
<i>Uses</i>														
Communication			.106				.122			.066				-.035
Coordination				-.084			-.152				.221*			.182
Monitoring					.088		.102					.199 <sup>†</sup>		.132
Team Utilisation						.038	-.004						.139	.021
R <sup>2</sup>	.051	.059	.068	.065	.064	.060	.085	.043	.155	.159	.192	.180	.170	.202
Adjusted R <sup>2</sup>	.034	.033	.033	.029	.029	.025	.023	.026	.133	.128	.163	.150	.140	.150
ΔR <sup>2</sup>		.008	.009	.005	.005	.001	.025		.113	.004	.037	.025	.041	.047
ΔF	2.930 <sup>†</sup>	.897	1.026	.598	.541	.123	.714	2.493 <sup>†</sup>	14.813***	.461	5.016*	3.299 <sup>†</sup>	1.911	1.576
[df1, df2]	[2, 108]	[1, 107]	[1, 106]	[1, 106]	[1, 106]	[1, 106]	[4, 103]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	111	111	111	111	111	111	111	115	115	115	115	115	115	115
Z <sub>Sobel</sub>											2.247*	2.052*		

**Table 5.19 Impact of Organisational Capital and Uses on Firm Performance (Continued)**

Variable	Model 2.11 (relative market performance)							Model 2.12 (innovation)						
	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5	Step1	Step2	Step3-1	Step3-2	Step3-3	Step3-4	Step3-5
<i>Control</i>														
Firm age	-.010	.001	.002	.042	.014	.038	.052	-.009	.012	.018	.077	.029	.070	.060
Firm size	.288**	.252**	.240**	.177†	.213*	.206**	.164†	.209*	.136	.090	.019	.088	.065	.025
<i>Resource</i>														
Organisational Capital		.212*	.130	.098	.033	.069	-.023		.427***	.112†	.249**	.204*	.204*	.027
<i>Uses</i>														
Communication			.195*				.027			.749***				.638***
Coordination				.302**			.180				.471***			.228***
Monitoring					.307**		.135					.383***		.004
Team Utilisation						.321**	.174						.499***	.097
R <sup>2</sup>	.082	.126	.157	.195	.184	.203	.239	.043	.220	.675	.387	.311	.406	.726
Adjusted R <sup>2</sup>	.066	.102	.126	.166	.155	.174	.189	.026	.199	.663	.365	.286	.385	.708
ΔR <sup>2</sup>		.044	.031	.069	.058	.077	.113		.177	.455	.167	.091	.186	.506
ΔF	5.027**	5.540*	4.023*	9.407**	7.854**	10.676**	3.960**	2.530†	25.169***	154.086**	30.013**	14.480**	34.460**	49.369**
[df1, df2]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]	[2, 112]	[1, 111]	[1, 110]	[1, 110]	[1, 110]	[1, 110]	[4, 107]
N	115	115	115	115	115	115	115	115	115	115	115	115	115	115
Z <sub>Sobel</sub>			1.960*	2.976**	3.038**	3.092**				4.718***	3.727***	3.826***	4.152***	

Note: Standardized coefficients were reported. Listwise deletion method was employed to deal with missing data in hierarchical multiple regression analysis which reduced sample size from 120 to sizes ranging from 111 to 115. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . All tests were two-tailed.

**Table 5.20 A Summary of Results of Each Step and Sobel Test for Mediation Model of Uses as Mediators between Organisational Capital and Firm Performance**

Hypothesis	X	M	Y	1 <sup>st</sup> condition (X->Y)	2 <sup>nd</sup> condition (X->M)	3 <sup>rd</sup> condition (M->Y)	4 <sup>th</sup> condition (XM->Y)	Sobel Test (Z)
6. Uses mediate the relationship between organisational capital and firm performance.	Organisational Capital	Communication	Productivity	×	√	×	--	--
			Rorga	√	√	×	--	--
			Rmark	√	√	√	√	1.960*
			Innovation	√	√	√	√ <sup>a</sup>	4.718***
		Coordination	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	2.247*
			Rmark	√	√	√	√	2.976**
			Innovation	√	√	√	√ <sup>a</sup>	3.727***
		Monitoring	Productivity	×	√	×	--	--
			Rorga	√	√	√	√ <sup>a</sup>	2.052*
			Rmark	√	√	√	√	3.038**
			Innovation	√	√	√	√ <sup>a</sup>	3.826***
		Team Utilisation	Productivity	×	√	×	--	--
			Rorga	√	√	×	--	--
			Rmark	√	√	√	√	3.092**
			Innovation	√	√	√	√ <sup>a</sup>	4.152***

Note: <sup>a</sup> indicates that the direct path between X and Y remained significant. Rorga = relative organisational performance; Rmark = relative market performance. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$ , †  $p < .10$ . All tests were two-tailed.

#### **5.8.2.3.1 Communication as a Mediator**

The results shown in Tables 5.18 (for communication), 5.19 and 5.20 suggested that communication fully mediated the relationship between organisational capital and relative market performance. The results also suggested that communication mediated the relationship between organisational capital and innovation, although the direct path between organisational capital and innovation remained significant. According to the Sobel test of significance of this mediation, communication mediated the relationship between organisational capital and relative market performance ( $Z_{\text{Sobel}} = 1.960, p=.05$ ) and innovation ( $Z_{\text{Sobel}} = 4.718, p<.001$ ). For models assessing the other two firm performance measures as productivity and relative organisational performance, one or more of the relevant paths were non significant and thus failed to meet the criteria for mediation.

#### **5.8.2.3.2 Coordination as a Mediator**

The results shown in Tables 5.18 (for coordination), 5.19 and 5.20 suggested that coordination fully mediated the relationship between organisational capital and relative market performance. The results also suggested that coordination mediated the relationship between organisational capital and the two firm performance measures - relative organisational performance and innovation, although the direct paths remained significant. According to the Sobel test, coordination mediated the relationship between organisational capital and relative organisational performance ( $Z_{\text{Sobel}} = 2.247, p<.05$ ), relative market performance ( $Z_{\text{Sobel}} = 2.976, p<.01$ ) and innovation ( $Z_{\text{Sobel}} = 3.727, p<.001$ ). For models assessing productivity, the first and the third conditions were not satisfied and thus failed to meet the criteria for mediation.

#### **5.8.2.3.3 Monitoring as a Mediator**

The results shown in Tables 5.18 (for monitoring), 5.19 and 5.20 suggested that monitoring fully mediated the relationship between organisational capital and relative market performance. The results also suggested that monitoring mediated the relationship between organisational capital and two firm performance measures as relative organisational performance and innovation, although the direct paths remained significant. According to the Sobel test, monitoring mediated the relationship between organisational capital and relative organisational performance ( $Z_{\text{Sobel}} = 2.052, p < .05$ ), relative market performance ( $Z_{\text{Sobel}} = 3.038, p < .01$ ) and innovation ( $Z_{\text{Sobel}} = 3.826, p < .001$ ). For models assessing productivity, the first and the third conditions were not satisfied and thus failed to meet the criteria for mediation.

#### **5.8.2.3.4 Team Utilisation as a Mediator**

The results shown in Tables 5.18 (for team utilisation), 5.19 and 5.20 suggested that team utilisation fully mediated the relationship between organisational capital and relative market performance. The results also suggested that monitoring mediated the relationship between organisational capital and innovation, although the direct path between organisational capital and innovation remained significant. According to Sobel test of significance of this mediation, team utilisation mediated the relationship between organisational capital and relative market performance ( $Z_{\text{Sobel}} = 3.092, p < .01$ ), and innovation ( $Z_{\text{Sobel}} = 4.152, p < .001$ ). The model assessing the other two firm performance measures - productivity and relative organisational performance - were not supported due to the non significance of one or more relevant paths which thus failed to meet the criteria for mediation.



#### **5.8.2.3.5 Uses “Together” as Mediators**

Due to the fact that communication, coordination, monitoring and team utilisation are related to each other as found in correlation statistics in Table 5.7, the organisational capital and uses including communication, coordination, monitoring and team utilisation were entered together in the third step. The results were shown in the Step3-5 shown in Table 5.16. Communication was significantly related to innovation ( $\beta = .638, p < .001$ ). Coordination was significantly related to innovation ( $\beta = .228, p < .001$ ).

#### **5.8.2.3.6 Summary**

This section provides the results of mediation test for hypothesis 6 which proposed the mediation effects of uses on the relationship between organisational capital and firm performance.

Viewed together, hypothesis 6 is supported by finding the mediational effects of 1) communication on the relationship between organisational capital and relative market performance and innovation; 2) coordination on the relationship between organisational capital and relative organisational performance, relative market performance and innovation; 3) monitoring on the relationship between organisational capital and relative organisational performance, relative market performance and innovation; and 4) team utilisation on the relationship between organisational capital and relative organisational performance, relative market performance and innovation.

## 5.9 Summary

The main objective of this chapter was to present how the hypotheses were tested by processing and analysing the raw data step by step. First, the results from ANOVA show that the sample for this study was representative. The  $R_{wgS}$ , ICC(1)s and ICC(2)s calculated from the pairs data provided evidence for data aggregation. In addition, the public firm size information and firm revenue information was adopted and the results of Harman one-factor test helped to rule out the common method bias. After aggregation, the correlations presented an overview of relationships between variables. Due to the complexity of the model and the sample size (120), the proposed research model in this study was tested in two separate mediational models. The first model tested the mediational effects of resources on the relationship between HPWS and firm performance. The second model tested the mediational effects of uses on the relationship between resources and firm performance. The hierarchical multiple regression analysis was employed and the results provided sufficient support for the hypotheses proposed in Chapter 3. The findings will be discussed in the next chapter

# CHAPTER SIX

## DISCUSSION

### 6.1 Introduction

The main objective of this study was to examine how HPWS affects firm performance by identifying and testing the influence of a series of intervening variables between HPWS and firm performance. Based on an analysis of existing literature and considering the unique characteristics of PSFs (e.g. knowledge intensity, professionalised workforce), three pathways through which HPWS influences firm performance were identified as resources. These are human capital, social capital and organisational capital. In addition, this study also identified the uses of the resources as intervening variables between resources and firm performance. Based on this work, the thesis presents a novel and systematic practices-resources-uses-performance approach to explain the indirect performance effect of HPWS on firm performance.

The complete model proposed in this study was tested in two separate mediational models. This was due to its complexity and the limited sample size. The first model tested the practices-resources-performance link, i.e. the mediational effect of resources in the relationship between HPWS and firm performance. The second model tested the resources-uses-performance link, i.e. the mediational effects of uses between resources and firm performance.

Table 6.1 provides a summary of the hypotheses and the empirical results found in this study.

**Table 6.1 Summary of Hypotheses and Empirical Results**

Hypotheses	Support				
	Productivity	Rorga	Rmark	Innovation	
1 Human capital mediates the relationship between HPWS and firm performance.	×	√	√	√	
2 Social capital mediates the relationship between HPWS and firm performance.	×	√	√	√	
3 Organisational capital mediates the relationship between HPWS and firm performance.	×	√	√	√	
4 Uses mediate the relationship between human capital and firm performance.	Communication	×	×	√	√
	Coordination	×	√	√	√
	Monitoring	×	√	√	√
	Team Utilisation	×	×	√	√
5 Uses mediate the relationship between social capital and firm performance.	Communication	×	×	√	√
	Coordination	×	√	√	√
	Monitoring	×	√	√	√
	Team Utilisation	×	×	√	√
6 Uses mediate the relationship between organisational capital and firm performance.	Communication	×	×	√	√
	Coordination	×	√	√	√
	Monitoring	×	√	√	√
	Team Utilisation	×	×	√	√

Note: Rorga = relative organisational performance; Rmark = relative market performance.

For Model 1, mediational effects of human capital, social capital and organisational capital were found in the relationship between HPWS and three firm performance measures (relative organisational performance, relative market performance and innovation). For Model 2, mediational effects of four “uses” were found in the relationships between resources (human capital, social capital and organisational capital) and two firm performance measures (relative market performance and innovation). The mediational effects of two “uses” (coordination and monitoring) were found in the relationship between resources (human capital, social capital and organisational capital) and relative organisational performance.

## **6.2 Research Findings**

The findings in this study which demonstrate that the firms with more extensive HR practices saw increases in firm performance are consistent with findings from previous studies on the positive relationship between HPWS and firm performance (Arthur, 1994; Becker & Gerhart, 1996; Datta et al., 2005; Delery & Doty, 1996; Guthrie et al., 2009; Huselid, 1995; MacDuffie, 1995; Richard & Johnson, 2001; Terpstra & Rozell, 1993; Youndt et al., 1996). However, this study’s failure to find the expected significant relationship between HPWS and productivity is not consistent with findings from previous studies. There are two possible reasons for this. The first is the global economic recession which resulted in rapidly falling revenues for many accounting firms (Finance Dublin, 2009). As revenue decreases, HPWS practices are less likely to be dropped immediately due to time and monetary constraints. Therefore, the relationship between HPWS and productivity in this study may be different from that found in periods of greater economic stability. The

other possible reason is the research context. Professional service firms differ from traditional manufacturing firms in that their employees are not paid piecework wage but are paid through chargeable hours, resulting in revenue stream uncertainty. Revenue per employee, which is usually used in other contexts, might not be an appropriate measure for PSFs. Given these contexts, the non significant relationship between HPWS and productivity in this study is not wholly surprising.

The findings of Model 1 which propose the mediational effects of resources between HPWS and firm performance provide support for the claim that firms with more extensive HPWS have higher human capital, social capital and organisational capital, which in turn leads to higher firm performance. The findings regarding the mediational effect of human capital and social capital in the relationship between HPWS and firm performance corresponds to the study by Takeuchi et al. (2007) who found the mediational effects of human capital and social capital in the relationship between HPWS and relative organisational performance in 76 Japanese business establishments. The findings regarding the mediational effect of social capital in the HPWS and firm performance corresponds to the study by Gittell et al. (2010) who found that HPWS influenced organisational performance through its impact on relational capital.

With regard to the second model, the findings also found evidence for the mediational effect of uses between resources and firm performance. In other words, the firms with higher human capital, social capital and organisational capital seem to experience higher firm performance through improving their uses of their resources.

The uses in this study reflect the knowledge management capacities from a practical perspective since communication, coordination, monitoring and team utilisation are the mechanisms through which knowledge is acquired, shared, transferred, leveraged and created. Therefore, the findings correspond to the existing studies on the mediational effects of knowledge management capacities in the relationship between resources and firm performance. For example, Smith, Collins and Clark (2005) found that knowledge creation ability mediated the effects of an employee's stock of knowledge (similar to human capital in this study), ego networks (similar to social capital in this study), and organisational climate (similar to organisational capital in this study) on innovation in high technology firms. Additionally, Yli-Renko, Autio and Sapienza (2001) explored the mediational effects of knowledge acquisition in the relationship between social capital and new product development in young technology-based firms. Another example from Collins and Smith (2006) investigated the causal chain from HR practice, social climate, knowledge exchange and combination to firm performance. They found that commitment-based HR practices were indirectly related to firm performance through their effects on organisational social climate and knowledge exchange and combination in the context of high technology firms. All in all, the findings generally supported previous research. In addition, in contrast to previous research, the findings provided support for the extended model of another mediator -organisational capital -between HPWS and firm performance. It also supported the idea that uses act as a mediator between resources and firm performance.

## 6.3 Research Contributions

The present research makes four key contributions to the existing literature on the relationship between HPWS and firm performance. These will now be described in detail.

Firstly, this study found a systematic pathway through which HPWS effects firm performance by identifying the three mediators of human capital, social capital and organisational capital. Previous research into mediators between HPWS were confined to either investigating only one or two possible mediators out of three. For example, Collins and Smith (2006) examined the mediating effect of social networks in top management teams (TMT) and on the relationship between HRM and firm performance in high technology firms. Gittell et al. (2010) examined the mediating role of relational coordination, which includes the shared goals and mutual respect in the relationship between HPWS and organisational performance in hospitals. Takeuchi et al. (2007) examined the mediating roles of human capital and social capital between HPWS and organisational performance in 76 Japanese business establishments. As a contribution to the existing research, this study not only examined human capital and social capital but also examined organisational capital as an additional mediator in the relationship between HPWS and firm performance and found empirical to support for all mediators. This is especially important in the professional services firm context which is under-explored from the vantage point of high performance work systems.

A second contribution of this study is the articulation of a novel way through which human capital, social capital and organisational capital affect firm performance. In



doing so it additionally highlights the mediational role of uses in the relationship between resources and firm performance. Of the existing research on human capital, social capital and organisational capital, many researchers only examined their direct effect on organisational performance and some focused solely on one or two forms of capital. For example, Youndt et al. (2004) examined the effect of human capital, social capital and organisational capital on firms' performance indicators such as financial returns and Tobin's Q. Subramaniam and Youndt (2005) examined the effect of human capital, social capital and organisational capital on two types of innovation capabilities in high technology firms. Pennings et al. (1998) examined the effect of human capital and social capital on firm dissolution in PSFs. Hitt et al. (2001) examined the non-linear effect of human capital on firm performance. Later, Hitt et al. (2006) examined the effect of human capital and social capital on internationalisation of PSFs in law firms. The findings of this study provide support for significant direct effects of human capital, social capital and organisational capital on firm performance. This is consistent with previous research conducted in different organisational contexts. Moreover, the findings provide support for the indirect effects of resources on firm performance through the uses. In so doing the present study provides empirical support for the argument that resources must be utilised to create value for firms (Sirmon et al. 2007).

A third contribution of this study is that a more complete picture of firm performance is provided by measuring both objective and subjective firm performance. In the existing research in HPWS and firm performance, some researchers adopted objective measures such as productivity (Guthrie, 2001; Guthrie et al., 2009; Huselid, 1995; Wood & de Menezes, 2008), turnover (Guthrie, 2001;

Guthrie et al., 2009; Huselid, 1995; Wood & de Menezes, 2008), absenteeism (Guthrie et al., 2009; Wood & de Menezes, 2008), financial performance such as ROA and ROE (Delery & Doty, 1996) and organisational efficiency (Gittell et al., 2010). Other researchers adopted subjective self-reported performance measures, such as perceived firm performance (Chung & Liao, 2010; Delaney & Huselid, 1996; Takeuchi et al., 2007; Youndt et al., 1996), innovation (Subramaniam & Yount, 2005), client satisfaction (Gittell et al., 2010) and service quality (Liao et al., 2009). In this study, both objective measures on firm performance such as productivity, and multiple subjective measures of firm performance such as relative organisational performance, relative market performance and innovation, were employed. The comprehensive measures of firm performance provide a more complete picture of the firms' achieved goals. In addition, the findings of mediation tests provide insights into the different predictors for different firm performance dimensions.

The fourth contribution of this study is the specific context being tested – professional service firms. Most of previous literature on the relationship between HRM practices and firm performance has examined this in contexts such as manufacturing firms e.g. auto manufacturing plants, steel companies (Datta et al., 2005; Ichniowski & Shaw, 1999; Ichniowski et al., 1997; MacDuffie, 1995; Gant, Ichniowski, & Shaw, 2002), some general service firms like banks (Delery & Doty, 1996; Richard & Johnson, 2001) and call centres (Batt, 2002), a mixture of manufacturing firms, general service firms (Huselid, 1995; Guthrie et al., 2009) or high technology firms (Subramaniam & Youndt, 2005). The important context of professional service firms was omitted. Authors such as Collins and Smith (2006)

called for the exploration of HRM practices in firms which are “facing more dynamic environments”, rather than stable business conditions typically faced by the above sample firms (p.545). The research reported here responds to this call., Some topics have been addressed in existing research in PSFs. These include organisational structure (Greenwood et al., 1990; Cooper et al., 1996; Pinnington & Morris, 2003), tournament promotion systems (Morris & Pinnington, 1998) and knowledge management (Alvesson, 2001; Donaldson, 2001; Empson, 2001; Løwendahl, Revang & Fosstenløyken, 2001; Morris, 2001; Suddaby & Greenwood, 2001; Willman, Fenton-O’Creevy, Nicholson & Soane, 2001). However, systematic research on HRM in professional service firms is scarce. This study filled this gap by examining how HPWS operates in professional service firms.

## **6.4 Implications for Research and Practice**

The findings of this study have important implications for both researchers and managers.

Theoretically, the findings provide support for the general arguments of the resource-based view of firm (Barney, 1991), the knowledge-based theory of firm (Grant, 1996a, 1996b), dynamic capabilities (Teece et al., 1997) perspectives, knowledge exploitation and knowledge exploration (Lavie et al., 2010; March, 1991). More specifically there are four potential implications for researchers in HRM.

First, the findings provide insights into how HPWS work. Many HRM researchers have discussed the indirect effect of HPWS on firm performance. The arguments and empirical results of this study indicate that HPWS positively influences firm

performance through improving the firm's resources (human capital, social capital and organisational capital) and the efficient uses of these resources. Therefore, this study provides researchers with comprehensive insights into the value creation chain to better understand how HPWS works.

Second, this study provides insights into how organisational resources such as human capital, social capital and organisational capital are used to improve firm performance. Many researchers in knowledge management have argued that human capital, social capital and organisational capital facilitate knowledge acquisition, sharing, transfer, leverage, combination and creation. This study identifies four mechanisms through which knowledge is acquired, shared, transferred, leveraged, combined and created. This provides researchers with insights on an alternative way to test the effect of organisational knowledge resources on firm performance.

Third, this study identifies the mechanisms between HPWS and performance and provides insights into the universalistic and contingency perspectives in strategic HRM research. In a meta-analysis of 92 articles on SHRM, Combs et al. (2006) found that HPWS considerably and positively affects organisational performance. They also found that organisational strategy and context could potentially moderate the HRM and firm performance relationship and that employees' knowledge, skills and abilities (KSAs) and social structure mediate the relationship between high performance work practices and organisational performance. This study found that HPWS were significantly and positively related to firm performance. This provides support for the universalistic perspective in SHRM research and is consistent with other studies such as Combs et al. (2006). This study also found that human capital, social capital and organisational capital mediate the relationship between HPWS

and firm performance. This supports the contingency perspective in SHRM research which is consistent with other studies such as Combs et al. (2006).

From a practical perspective, several important lessons for practitioners can be drawn from the discussion and analysis of the link from HR practices, through resources built from HR practices and the uses of these resources to firm performance.

Fourth, this study found empirical evidence for the importance of a firm's investments in HR practices. It demonstrates that firms with extensive utilisation of HR practices seem to experience increases in firm performance. This study also provides managers in PSFs with the mechanisms through which HPWS works by improving firm performance. The HR practices help the firm to create human capital, social capital and organisational capital, which in turn allows the firm to improve their communication, coordination, monitoring and team utilisation abilities. Resources and the uses of these resources are critically important for PSF management since they enable internal employee deployment and build the external clients relationships which are required for improved service quality and efficiency. In addition to the above, this study provides some decision making support for managers in PSFs, by identifying resources and resource use effectiveness. For example, when managers in PSFs know that their external social capital is high, in other words, they have very good relationship with their clients, they may utilise their existing knowledge to their clients. This study also highlights how managers improve the pool of human capital, social capital and organisational capital and how to explore and exploit these to create new products and service and to attract new clients and new business.

## **6.5 Limitations and Future Research Directions**

Despite its contributions and strong implications, this study is limited in several ways.

First, it examined three mediators between HPWS and firm performance, these are human capital, social capital and organisational capital. There may also be other intervening variables between HPWS and firm performance which remain unidentified. For example, the relationship between employees and organisations was not addressed in this study. Therefore, the next steps in the development of strategic human resource management theory should include the development of HPWS models that include more causal mechanisms. Some researchers have begun to take steps in this direction. For example Liao et al. (2009) examined the mediational effects of employees' psychological empowerment and employees' perceived organisational support on the relationship between HPWS and employees' performance.

The second limitation concerns the small sample size, single industry data and collection of data at a single time point. This study is limited by its small sample size (120) albeit with a high response rate (45.80%). The small sample size did not allow the investigator to conduct structural equation modelling which was the desired method to test the complete model. As a result a complete picture of the relationships could not be deduced. This study may also be limited by the single industry data which was collected from accounting firms only. Other professional service firms, e.g. law firms, architecture firms, were omitted from the investigation. In order to test the more universal validity of the findings it is important for future

research to investigate multiple-sector PSFs, such as law firms, architecture firms, etc. which will increase the sample size and sample diversity. In addition, this study collected data at a single point of time. It is also important to gather longitudinal data on the HPWS in PSFs to track the sample firms and to detect causal relationships in more detail.

This study is also limited in the examination of HPWS as an index. This makes it difficult to isolate the effects of single HR practices on specific firm resources and performance. For example, it was argued that HPWS had an influence on firm performance through the improvement of human capital. However, the question remains unanswered as to which HR practices improve human capital which in turn will influence a key dimension of firm performance. Therefore, another direction for future research is to examine the consistency between HPWS usage and firm goals.

Despite these limitations, these results contribute to a better understanding of the process of explaining how HPWS affects firm performance, especially in the professional service context. The findings of this study provide empirical evidence underlying the mechanisms through which HPWS and important firm performance is linked.

## **CHAPTER SEVEN**

### **CONCLUSION**

The main objective of this study was to examine the indirect performance effect of HPWS in professional service firms. By doing so, this study adds to those studies which attempt to open up the so called “black box” in strategic HRM research (Wright & Garner, 2003) in the particular context of professional service firms.

Based on the resource-based view of the firm, knowledge-based theory and dynamic capability theory, the present study conceptualised and tested a new model of practices-resources-uses-performance that provides insights into linkages between HPWS and firm performance in PSFs. Three pathways through which HPWS influences firm performance were found in the existing studies on the indirect relationship between HPWS and firm performance. These pathways were human capital, social capital and organisational capital. These are the most important resources in PSFs as they have the potential to be valuable, rare, imperfectly imitable, and non-substitutable resources (Barney, 1991). However, these resources must be effectively managed and utilised to achieve superior profit (Schultz, 1961) and competitive advantage (Sirmon et al., 2007). The mediation of uses of resources between firms’ resources and performance was then proposed. Therefore, the present study theoretically and empirically establishes a new framework for HPWS research in terms of a “practices-resources-uses-performance” approach.



To test the proposed model, data was collected from managing partners and HR managers in 120 accounting firms based in Ireland. The findings provide support for the mediational effects of resources in the relationship between HPWS and firm performance. They also provide support for the mediational effects of uses in the relationship between resources and firm performance. In this regard, this study provides evidence from professional service firms that HPWS influences firm performance by building firms' human capital, social capital and organisational capital. These resources in turn improve firm performance by improving firms' communication, coordination, monitoring and team utilisation.

Despite its limitations in terms of sample size and single industry focus, the present study contributes to SHRM theory and its application in PSFs. It does this by identifying systematic mechanisms through which HPWS affect firm performance and by identifying three mediators: human capital, social capital and organisational capital. In addition, the identification of uses as a mediator between resources and firm performance represents a novel way through which resources influence firm performance. The new model proposed here and the empirical findings provide a rounded and more complete perspective of how HPWS affects firm performance. This in turn provides new insights for researchers in the SHRM field. This study also enriches the understanding of context in SHRM research by extending the focus of research to professional service firms.

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# APPENDIX A: APPLICATION FORM: DUBLIN CITY UNIVERSITY RESEARCH ETHICS COMMITTEE

## Research Ethics Committee: Notification Form for Low-Risk Projects and Undergraduate Dissertations

DCU Research Ethics Committee has introduced a procedure for notification to the committee of

1. low-risk social research projects, in which personal information that is deemed not sensitive is being collected by interview, questionnaire, or other means
2. dissertations on undergraduate programmes in all disciplines.

The committee requires researchers to concisely answer the following questions within this form (before the project starts):

### **Project Title:**

Exploring the Indirect Performance Impact of High Performance Work Systems in Professional Service Firms: A Practices-Resources-Uses Approach

### **Applicant Name and E-mail:**

Na Fu [Na.Fu3@mail.dcu.ie](mailto:Na.Fu3@mail.dcu.ie)

### **If a student applicant, please provide the following:**

Level of Study (Undergrad/Taught MSc/Research MSc/Phd): PhD

Supervisor Name and E-mail:

Patrick Flood & Janine Bosak; [Patrick.flood@dcu.ie](mailto:Patrick.flood@dcu.ie), [Janine.Bosak@dcu.ie](mailto:Janine.Bosak@dcu.ie)

### **Questions:**

1. Provide a lay description of the proposed research (approx. 300wds):

This study examines how high performance work systems (HPWS) affect firm performance in professional service firms (PSFs). The research applies a practices-resources-uses systematic approach to explore the "black box".

It is argued that HPWS do not affect firm performance directly but indirectly. HPWS affect firm performance through two steps. First, the HPWS creates firm's human capital, social capital and organisational capital resources. These resources in turn create value for firms when they are effectively utilized. This is the practices-resources-uses approach.

The research model is developed based on a diverse range of literature which includes strategic human resource management (SHRM), resource-based view of the firm (RBV), knowledge-based theory as well as dynamic capabilities. The uniqueness of the research model is that it provides a comprehensive chain from HPWS to firm performance, i.e. innovation, productivity and financial performance, through combining the key concepts and ideas in relation to intellectual capital resources which includes human capital, social capital and organisational capital, uses of resources which includes monitoring, team utilization, administrative coordination, generating new ideas and communication, and knowledge management capacities.

The study of the indirect impact of HPWS on firm performance will contribute to the understanding of how and why HPWS affect firm performance by identifying valuable resources and the way to effectively use them in PSFs. It also will provide theoretical support for the arguments of the resource-based view of firm (Barney, 1991), the knowledge-based theory of firm (Grant, 1996a, 1996b) and the dynamic capabilities (Teece, Pisano & Shuen, 1997) perspectives.

This research project gets the support from Chartered Accountants Ireland. To conduct this research project, Patrick Flood, Janine Boask and I collaborated with Professor Tim Morris at University of Oxford and Dr Philip O'Regan at University of Limerick.

2. Detail your proposed methodology (1 page max.):

This research project will be survey-based. The data will be collected from two responses in one unit/firm in the sample of 272 accounting firms in Ireland. The contact information for the respondents in 272 accounting firms were collected from Business World Top 1000 Professional Firms, Chartered Accountants Regulatory Board, Chartered Accountants Ireland, FAME, Kompass Directory and IndexIreland.

Dillman (2002)'s Tailored Design Method (TDM) is applied to conduct the survey.

The data collected from hard copy and online survey will be inputted to statistical software packages and analysed accordingly, using correlation and regression analysis.

3. Detail the means by which potential participants will be recruited:

Dillman (2002)'s Tailored Design Method (TDM) is applied to conduct the survey.

1. An invitation letter will be posted to responses first to invite them to participate in this research project.
2. A letter and a hard copy of questionnaire will be posted to responses.
3. A reminder/thank you postcard will be posted.
4. A follow up letter and the first replacement of questionnaire will be posted to the responses who have not filled in the questionnaires.
5. A letter and the second replacement of questionnaire will be posted to the non-responses. (This may be not necessary if by then a lot of responses return survey.)
6. A final letter will be posted.

Together with the letter and questionnaire, a pre-paid and self-addressed envelop will be enclosed for returning surveys. Alternatively to hard copy of questionnaire, an online version will be provided.

All of the surveys will be posted to potential participants. The link for an online version will be written in the letters which will be posted to potential participants.

4. How will the anonymity of the participants be respected?

The questionnaires will contain generic questions which will in no way identify the participants. If the questionnaires are filled out in hard copy they will returned in non identifiable envelopes. If the questionnaires are filled out electronically the responses will file in automatically with non identifiable responses. There will be a reference number for each response which will only be used for checking response rate.

In addition, it will be assured to participants that this is a strictly confidential survey. No individual response or firm will be identified in our research. Only aggregate results will be reported.

5. What risks are researchers or participants being exposed to, if any?

There are no risks foreseen for filling the questionnaire which may take around 15 minutes.

6. Have approval/s have been sought or secured from other sources? Yes/No No  
If Yes, give details:

7. Please confirm that the following forms are attached to this document:

Informed Consent Form	Yes/No	No
Plain Language Statement	Yes/No	No

If not, explain why:

**NB – The application should consist of one file only, which incorporates all supplementary documentation. The completed application must be proofread and spellchecked before submission to the REC. All sections of the form should be completed. Applications which do not adhere to these requirements will not be accepted for review and will be returned directly to the applicant.**

The administrator to the Research Ethics Committee will assess, on receiving such notification, whether the information provided is adequate and whether any further action is necessary. Please complete this form and e-mail to [fiona.brennan@dcu.ie](mailto:fiona.brennan@dcu.ie)

Please note: Project supervisors of dissertations on undergraduate programmes have the primary responsibility to ensure that students do not take on research that could expose them and the participants to significant risk, such as might arise, for example, in interviewing members of vulnerable groups such as young children.

In general, please refer to the Common Questions on Research Ethics Submissions for further guidance on what research procedures or circumstances might make ethical approval necessary ([http://www.dcu.ie/internal/research/questions\\_ethics\\_submissions.pdf](http://www.dcu.ie/internal/research/questions_ethics_submissions.pdf))

# APPENDIX B: DCU RESEARCH ETHICS COMMITTEE APPROVAL LETTER

Dublin City University  
Ollscoil Chathair Bhaile Átha Cliath



Prof. Patrick Flood  
DCUBS

15<sup>th</sup> October 2010

**REC Reference:** DCUREC/2010/087

**Proposal Title:** Exploring the Indirect Performance Impact of High Performance Work Systems in Professional Service Firms: A Practices-Resources-Uses Approach

**Applicants:** Prof. Patrick Flood, Dr. Janine Bosak, Ms. Na Fu

Dear Patrick,

Further to review, the DCU Research Ethics Committee approves this research proposal. Should substantial modifications to the research protocol be required at a later stage, a further submission should be made to the REC.

Yours sincerely,

A handwritten signature in blue ink that reads 'pp Fiona Brennan'.

Dr. Donal O'Mathuna  
Chair  
DCU Research Ethics Committee



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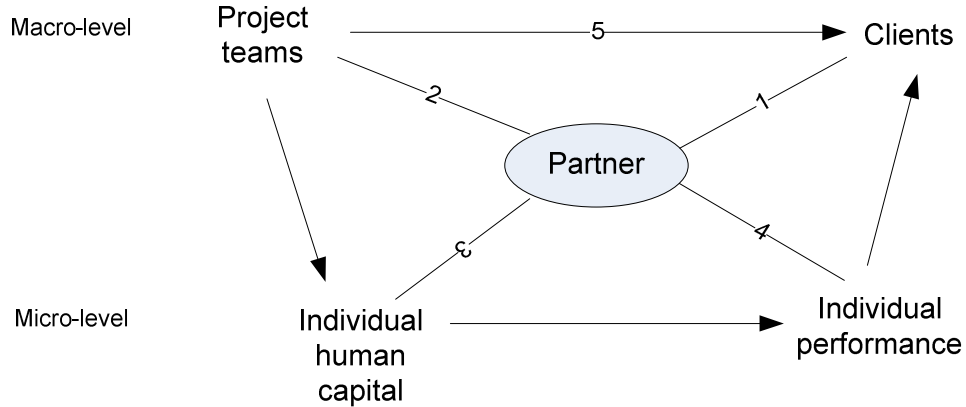
E [research@dcu.ie](mailto:research@dcu.ie)

[www.dcu.ie](http://www.dcu.ie)

## APPENDIX C: INTERVIEW TOPICS

### Interview 1 with Managing Partner

**Figure C.1 How PSFs Deliver Service to Their Clients by Partners**



Source: The Author

Based on Figure C.1, the following questions were asked to interviewee.

- 1a. What do you do to retain your existing clients during the recession?
- 1b. What do you do when a client wants to leave you or has left you?
- 1c. How do you build relationships with potential clients?
- 1d. How do you do things differently from your competitors?
- 1e. How do you ensure the quality and profit of your service to your clients?
  
- 2a. How do you select people to form a client service team?
- 2b. Generally, how many directors, managers and juniors are there in one client service team?
- 2c. How do you measure your team performance?
- 2d. How do you keep your project team efficient and effective?
  
- 3a. What can be done to improve your employees' skills when you are cutting costs?
- 3b. What can be done to strengthen the relationships between team members within departments and between different departments?
- 3c. What do you do with the organisational structure and routines to improve project efficiency?
- 3d. What is key employee?
- 3d. How do you retain your key employees?

- 4a. The people who are motivated well will contribute more to the company. How do you make sure the employees in different levels are highly motivated?
  - 4b. How can juniors become partners?
  - 4c. Do you hire directors or managers outside PWC, e.g. some people with fruitful experience in other industries? If so, are you employing the same promotion method/criteria to them?
  - 4d. Since you have annual performance appraisal, do you use a performance-based compensation strategy?
5. What is new practice portfolio?
6. How do you deliver it to your clients?
- 

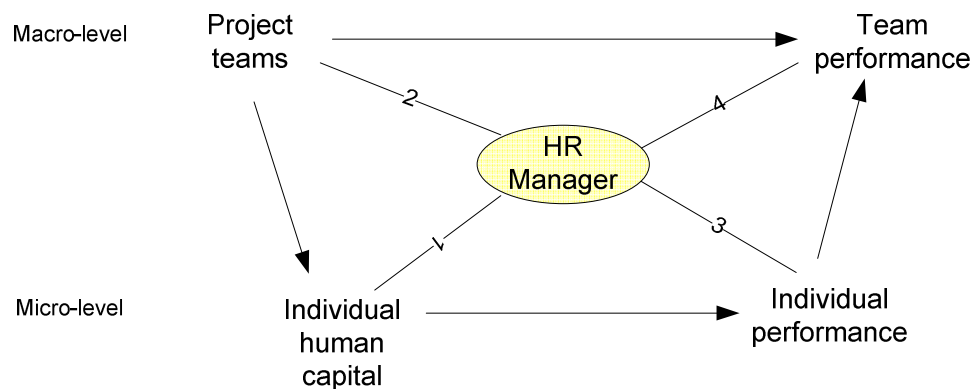
#### Interview 2 with Communication Partner

- 1. What is the impact of the recession on HR and company performance in PWC?
  - 2a. Because of the recession, lots of firms are cutting costs. What are you going to or have you been doing?
  - 2b. Are there any changes in the organisational structure, for example, job redesigning, clients retention, promotion models and performance management? If so, what are they?
  - 3a. Do you think the recession is the best time for upgrading talent? If yes, what are you going to do for upgrading your talent? Will you make contingency plans for recruiting and/or retaining top talent?
  - 3b. Are there any changes in the relationships between employees, between employee and clients and between different networks?
  - 3c. Generally, most of the work is conducted by teams. During the recession, are there events for team building, such as improving trust, leadership or motivation?
- 4a. What has happened to your business results in the last 3 years?
- 4b. Could you forecast the business results for the next 3 years?
- 4c. What are your estimated changes in the market share?
- 4d. How can you retain or improve your revenue during this recession? Are you going to provide your clients with new practice portfolio?
- 4e. Is innovation important for PSFs and why?

- 4f. How should today's economy change our view of innovation?
- 4g. What do you think innovation means for PSFs? New practice portfolio, new solutions, or else?
5. How do you look after your clients? And the changes at the moment?
6. What have the employees in different levels to do to get promoted?
7. How can juniors become a partner?
8. What challenges and opportunities are there for PSFs?
9. Is a recession really the time for PSFs to make major changes?
10. Are larger or smaller companies better positioned to make such changes?

Interview 3 with Senior HR Manager

**Figure C.2 How to Improve Team Performance through HRM**



Source: The Author

HR practice here includes recruitment (path 1), training (path 1 and 2), compensation (path 3 and 4), and performance measurement (path 3 and 4).

- 1a. Externally, where do the candidates come from and what are the percentages, e.g., graduates or experienced employees, and the percentage?
- 1b. Can you tell me about your promotion systems?
  - promotion criteria, e.g., formal assessment V automatically based on tenure
- 1c. What will the people do if they are not promoted? (“up or out” tournament promotion model)



- 2a. What kind of training activities are there for employees in different levels?
- 2b. How often does training take place?
- 2c. Are there training activities to improve trust and teamwork to keep the project team efficient and effective?
- 2d. Is there management skills training for those who get promoted, e.g., for senior manager?
  
- 3a. What is the compensation package for associates, seniors, managers, directors, and partners?
- 3b. How is the profit shared? Is it based on tenure, performance or equal sharing?
- 3c. Is there any performance based pay, “eat what you kill” or team based pay in PWC?
  
- 4a. How is the performance of employees measured?
- 4b. What are the performance criteria for associates, seniors, managers, directors, and partners?
- 4c. What type of information would you like to know about the performance of the PSF as a HR manager in a PSF?
  
5. What changes are there for HRM in PWC because of the recession?

## APPENDIX D: A SUMMARY OF HR PRACTICES IN ACCOUNTING FIRMS WITH DIFFERENT FIRM SIZE

HR Practices	Firm Size		
	Small firm	Medium firm	Large firm
<b>Selection</b>			
employment test (e.g., skills tests, aptitude tests, mental/cognitive ability tests)		✓ skills tests	
internal promotions		✓	
promotions based upon merit or performance (versus seniority)		✓	
promotions based upon seniority only if merit is equal		✓ based upon seniority	
promotions based upon seniority among employees who meet a minimum merit requirements;		✗	
intensive recruiting efforts	✗ recruitment when required		✓ a lot of advertising
comprehensive selection (using structured, standardized interviews, e.g., behavioural or situational interviews, tests etc.)		✓	
selection based on overall fit to the company		✓	
selection based on aptitude		✓	
selection based on collaboration and teamwork skills		✗	
selection based on individual competency no matter fit with the organisation		✗	
applicant pool, for one job many candidates		✓	
offer an orientation program		✓	✓
<b>Training and Development</b>			
cross training (for a variety of skills)	✗ More technical skills, firm-specific training		
cross-utilisation (routinely perform more than one job, i.e. job rotation)		✗	
task or firm-specific training		✓	
training in generic skills		✓	
training focused on future skill requirements	✗ just for what they need		
multiple career path opportunities		✗	
team-building and teamwork skills training	✗ team skills are trained on the job		
mentoring system		✓	
continuous training		✓	
comprehensive training		✓	

HR Practices	Firm Size		
	Small firm	Medium firm	Large firm
on-the-job training		✓	
Training length (hours)	✓ total training hours for trainees every year		
<b>Compensation and Benefits</b>			
group / team performance based pay	✓ only for management not trainees		
knowledge-based / skill-based / individual performance based pay	✓ individual performance based pay		
employee stock ownership		✗	
organisational performance-based pay		✗ only for partners	
high salaries / wages	✓ high salary + low benefits package or low salary + high benefits package		
extensive benefits package			
sponsor company social events		✓	
<b>Performance Control</b>			
formal individual performance appraisals		✓	
multiple formal performance feedbacks		✓	
performance appraisals for setting goals		✓	
performance appraisals for planning skill development		✓	
performance appraisals linked to individual performance related pay		✓	
objective and quantifiable performance appraisals	✓ e.g., cost, clients satisfaction and time		
<b>Information Sharing and Participation</b>			
participation programs		✗	
operating performance information sharing		✗	
financial performance information sharing		✗	
strategic information sharing		✗	
formal grievance/complaint resolution procedure		✗	
self-directed work teams		✓	
attitude surveys	✗		✓
decision making	✗ trainees don't make decision		
participation in quality of work life programs		✗	

# APPENDIX E: INVITATION LETTER

UNIVERSITY RESEARCH



## SURVEY OF ACCOUNTING FIRMS 2010

HUMAN RESOURCE MANAGEMENT, KNOWLEDGE MANAGEMENT AND PERFORMANCE

Date Ref: ...

Name  
Address

Dear XXX

I write to request your advance support for a major study of professional service firms in Ireland, conducted by three major universities. These are, Dublin City University, University of Oxford and University of Limerick. The research study is supported by the Chartered Accountants of Ireland. The purpose of this study is to examine the influence of human resource management (HRM) and knowledge management (KM) upon the performance of accounting firms.

In a few days time you will receive a mail request to fill in a brief questionnaire which will take 10 to 15 minutes to complete. It has already been tested with Managing Partners and HR Directors of accounting firms.

The goals of our project are to:

- Understand the determinants of accounting firms' success
- Establish the key HRM and KM practices of accounting firms
- Determine how these factors influence innovation and performance

The benefits of participation in our study include a free customised professional report for your organisation which will explain how:

- HR investment impacts on the performance of your practice
- Best HR practices attract, maintain and motivate professional accounting staff
- Acquiring, combining and utilising organizational knowledge boosts profitability
- How you can improve the management of your practice to achieve higher performance

The results will benefit accounting practice, academic knowledge and doctoral students' careers. If you require further information please feel free to contact me at 01-7006943 (direct line) or e-mail [Patrick.Flood@dcu.ie](mailto:Patrick.Flood@dcu.ie). A good response rate is critical. Therefore, your time and effort are greatly appreciated.

Best wishes,

Professor Patrick C Flood on behalf of the project team



Prof. Patrick Flood  
HRM Group Head  
Dublin City University



Dr. Janine Bosak  
Lecturer in Psychology  
Dublin City University



Prof. Tim Morris  
Professor of Management  
University of Oxford



Ms Na Fu  
Doctoral student  
Dublin City University



Dr. Philip O'Regan  
Senior Lecturer  
University of Limerick



SUPPORTED BY



# APPENDIX F: COVER LETTER

Cover letter to the firms who have contact information for two persons:

UNIVERSITY RESEARCH

DCU   Chartered Accountants Ireland

**SURVEY OF ACCOUNTING FIRMS 2010**  
HUMAN RESOURCE MANAGEMENT, KNOWLEDGE MANAGEMENT AND PERFORMANCE

Date Ref. ....

Name  
Address

Dear XXX

A few days ago, you received an invitation from me to participate in a major study of professional service firms in Ireland, conducted by Dublin City University, University of Oxford and University of Limerick. This study is supported by Chartered Accountants Ireland. The purpose of this study is to examine the influence of human resource management (HRM) and knowledge management (KM) upon the performance of accounting firms. This is an area which has not been fully researched in the Irish context and is of practical relevance to the management of accounting firms. We would really appreciate your participation in our study. The results will benefit accounting practice, academic knowledge and doctoral students' careers.

As a thank you for your participation, you will receive a free customised professional report for your organisation. This will allow you to benchmark your firm's management effectiveness and will also explain how:


- HR investment impacts on the performance of your practice
- Best HR practices attract, maintain and motivate professional accounting staff
- Acquiring, combining and utilising organizational knowledge boosts profitability
- You can improve the management of your practice to achieve higher performance

The questionnaire is now attached. One pre-paid envelope is provided to return the questionnaires to DCU Business School. Please return to us by YYY.






We assure you that this is a strictly confidential survey. No individual response or firm will be identified in our research. Only aggregate results will be reported. If you prefer to complete the survey electronically, the online survey is available at [www.surveymonkey.com/s/accountants](http://www.surveymonkey.com/s/accountants). Please write your reference number as requested in the online survey. You can find this number on the top of this letter or on the envelope enclosed.

If you require further information please feel free to contact me at 01-7006943 (direct line) or e-mail [Patrick.Flood@dcu.ie](mailto:Patrick.Flood@dcu.ie). Thank you again for your assistance with our research.


Best wishes,

  
Professor Patrick C Flood on behalf of the project team

.....




 Prof. Patrick Flood HRM Group Head Dublin City University	 Dr. Janine Bosak Lecturer in Psychology Dublin City University	 Prof. Tim Morris Professor of Management University of Oxford	 Ms Na Fu Doctoral student Dublin City University	 Dr. Philip O'Regan Senior Lecturer University of Limerick
--	---	--	---	--

SUPPORTED BY

 Chartered Accountants Ireland

Cover letter to the firms who have contact information for two persons:

UNIVERSITY RESEARCH

DCU    Chartered Accountants Ireland

**SURVEY OF ACCOUNTING FIRMS 2010**  
HUMAN RESOURCE MANAGEMENT, KNOWLEDGE MANAGEMENT AND PERFORMANCE

Date Ref: ...

Name  
Address

Dear XXX

A few days ago, you received an invitation from me to participate in a major study of professional service firms in Ireland, conducted by Dublin City University, University of Oxford and University of Limerick. This study is supported by Chartered Accountants Ireland. The purpose of this study is to examine the influence of human resource management (HRM) and knowledge management (KM) upon the performance of accounting firms. This is an area which has not been fully researched in the Irish context and is of practical relevance to the management of accounting firms. We would really appreciate your participation in our study. The results will benefit accounting practice, academic knowledge and doctoral students' careers.

As a thank you for your participation, you will receive a free customised professional report for your organisation. This will allow you to benchmark your firm's management effectiveness and will also explain how:


- HR investment impacts on the performance of your practice
- Best HR practices attract, maintain and motivate professional accounting staff
- Acquiring, combining and utilising organizational knowledge boosts profitability
- You can improve the management of your practice to achieve higher performance


We enclose *nvo* copies of the questionnaire because we need *nvo* respondents for each firm/unit to ensure the reliability and validity of the research results. We would ask you to pass the second questionnaire for completion to another partner or managerial colleague who knows your organisation well. Two pre-paid envelopes are provided to return the questionnaires to DCU Business School. Please return to us by **YYY**.


We assure you that this is a strictly confidential survey. No individual response or firm will be identified in our research. Only aggregate results will be reported. If you prefer to complete the survey electronically, the online survey is available at [www.surveymonkey.com/s/accountants](http://www.surveymonkey.com/s/accountants). Please write your reference number as requested in the online survey. You can find this number on the top of this letter or on the envelope enclosed.


If you require further information please feel free to contact me at 01-7006943 (direct line) or e-mail [Patrick.Flood@dcu.ie](mailto:Patrick.Flood@dcu.ie). Thank you again for your assistance with our research.


Best wishes,


  
Professor Patrick C Flood  
on behalf of the project team


  
Prof. Patrick Flood  
HRM Group Head  
Dublin City University

  
Dr. Janine Bosak  
Lecturer in Psychology  
Dublin City University

  
Prof. Tim Morris  
Professor of Management  
University of Oxford

  
Ms Na Fu  
Doctoral student  
Dublin City University

  
Dr. Philip O'Regan  
Senior Lecturer  
University of Limerick

SUPPORTED BY  
 Chartered Accountants Ireland

## **APPENDIX G: SURVEY OF ACCOUNTING FIRMS 2010**



Dublin City University  
Ollscoil Chathair Bhaile Átha Cliath



Saïd Business School  
UNIVERSITY OF OXFORD



UNIVERSITY of LIMERICK  
OLLSCOIL LUIMNIGH



Chartered  
Accountants  
Ireland

# SURVEY OF ACCOUNTING FIRMS

HUMAN RESOURCE PRACTICES  
KNOWLEDGE MANAGEMENT  
AND PERFORMANCE

## GENERAL INSTRUCTIONS

### **What is the purpose of the project?**

The purpose of this study is to examine the influence of human resource management (HRM) and knowledge management (KM) on the performance of accounting firms.

### **Why should I participate?**

You will receive a free customised professional report for your organisation which will allow you to benchmark your firm's management effectiveness. The study will also benefit the Chartered Accountants Ireland, your profession and several doctoral students.

### **What are the questions about?**

The questions relate to human resource management, knowledge management, human capital, management control mechanisms, clients and markets. There are no trick questions and we think that you will find this questionnaire both stimulating and interesting.

### **How long will it take?**

The survey will take about 10 to 15 minutes to complete. A prepaid self addressed envelope is provided to return the survey to DCU.

### **Which part of the organisation should I think of as I complete the survey?**

Please answer in respect of the local firm/unit of which you are part, unless you have received this in your capacity as National Managing Partner or National HR Director. In that case you should complete it for the national organisation as a complete entity.

### **Who will read the results?**

We assure you that this is a strictly confidential survey. Under no circumstances will your individual responses be made available to anyone in your organisation or other organisations. Only the directors of this research can read your answers.

### **Is there an online version?**

If you prefer to complete the survey electronically, the online survey is also available online at [www.surveymonkey.com/s/accountants](http://www.surveymonkey.com/s/accountants).

### **Who should I contact?**

If you have any questions, please contact Professor Patrick Flood at 01 700 6943 or email him at [Patrick.Flood@dcu.ie](mailto:Patrick.Flood@dcu.ie).

We would like to thank you in advance for your time and effort.



## PROJECT DIRECTORS AND RESEARCH TEAM

**Prof. Patrick Flood** is Professor of Organisational Behaviour, Head of the HRM Group and a Deputy Director of the Leadership, Innovation and Knowledge (LInK) research centre at Dublin City University. A former Fulbright scholar, he has held faculty and visiting appointments at the Australian Graduate School of Management, London School of Economics, London Business School, University of Limerick and the University of Maryland. Patrick's research interests include CEO leadership and top team effectiveness; HRM and organisational performance; management practices and professional service firms performance.



**Prof. Tim Morris** is Professor of Management Studies, University of Oxford, Programme Co-Director and Academic Director of the Centre for the Management of Professional Service Organisations at Saïd Business School, University of Oxford. Dr Morris specialises in the leadership challenges facing those heading up organisations of professionals and has taught and written extensively on strategic change, the management of innovation and strategies for managing human capital. He has presented the models he has developed from his consulting and research to senior executives on many occasions in the UK and abroad.



**Dr. Janine Bosak** is a lecturer in Organisational Psychology at Dublin City University Business School. She holds a diploma in Psychology from the University of Mannheim (Germany) and a doctorate from the University of Bern (Switzerland). Janine is a member of LInK Research Centre. Her research interests are at the interface of organisational and social psychology.



**Dr. Philip O'Regan** is a Senior Lecturer in Financial Accounting at the University of Limerick. He is an accountant and worked for a number of accounting firms including PwC before joining UL. Philip's research interests include intellectual capital, corporate governance and regulation, accounting history and financial reporting.



**Ms Na Fu** is a registered doctoral student at Dublin City University Business School. She is a member of LInK Research Centre. Na's research topic is on the indirect relationship between HPWS and organisation performance in Irish professional service organisations using a practice-resource-use approach. Na received her BA in Engineering from Northeastern University at Shenyang, China and is the 2010 recipient of the best graduate paper award of the Academy of Management awarded by the Management Consulting Division.



Ref:

**1. YOUR BACKGROUND**

1. What is your title or position?

- Managing Partner       HR Manager/Director       Other (please specify) \_\_\_\_\_

2. In what functional area do you work?

- Accounting                       Auditing  
 Taxation                           Business Advisory  
 Other (please specify) \_\_\_\_\_

3. Are you?

- Male                                   Female

4. Please indicate your nationality?

- Irish                                   Other (please specify) \_\_\_\_\_

5. What age are you? \_\_\_\_\_ years

**Regarding your education and work experience:**

6. What is the highest degree you have obtained?

- Bachelor's Degree  
 Masters  
 PhD  
 None  
 Other (please specify) \_\_\_\_\_

7. From which professional body did you obtain your professional qualification and in which year did you qualify?

- |   |                            |
|---|----------------------------|
| <input type="checkbox"/> Chartered Accountants Ireland (ACA/FCA)                    | Qualified in year... _____ |
| <input type="checkbox"/> Association of Chartered Certified Accountants (ACCA)      | _____                      |
| <input type="checkbox"/> Institute of Certified Public Accountants in Ireland (CPA) | _____                      |
| <input type="checkbox"/> Chartered Institute of Management Accountants (CIMA)       | _____                      |
| <input type="checkbox"/> Other (please specify) _____                               | _____                      |

8. How many years have you worked **in your present organisation**? \_\_\_\_\_ years9. How many years have you worked **in the accounting profession**? \_\_\_\_\_ years10. How many years of **full time** work experience do you have? \_\_\_\_\_ years**Regarding Your Organisation:**

Please answer in respect of the local firm/unit of which you are part, unless you have received this in your capacity as National Managing Partner or National HR Director, in which case you should complete it for the national organisation.

11. Please indicate the year in which your organisation was established in its current form: \_\_\_\_\_

12. Please indicate if your organisation's ownership structure is a partnership:  Yes  No13. Please indicate if your organisation is part of an international network of accounting firms:  Yes  No14. Please indicate if your organisation is part of a national network of accounting firms:  Yes  No

15. How is the firm organised: by (please tick ✓ as many as are relevant)

- Department
- Client group
- Specialist group
- Local office
- Other (please specify) \_\_\_\_\_

16. Please rank in order of importance the following criteria for promoting a professional to partner in your organisation: (Please rank the categories below from 1 through to 6. 1=Most important)

- \_\_\_\_\_ Getting new business
- \_\_\_\_\_ Technical skill
- \_\_\_\_\_ Fee earning ability
- \_\_\_\_\_ Management ability
- \_\_\_\_\_ Getting on with peers
- \_\_\_\_\_ Getting on with clients

17. Please rank in order of importance the following criteria used to assess partner’s performance: (Please rank the following categories from 1 through to 4. 1=Most important)

- \_\_\_\_\_ Fees earned
- \_\_\_\_\_ Technical skill
- \_\_\_\_\_ Management ability
- \_\_\_\_\_ Getting new business

18. Please indicate how many offices you have in all-Ireland (including Northern Ireland): \_\_\_\_\_

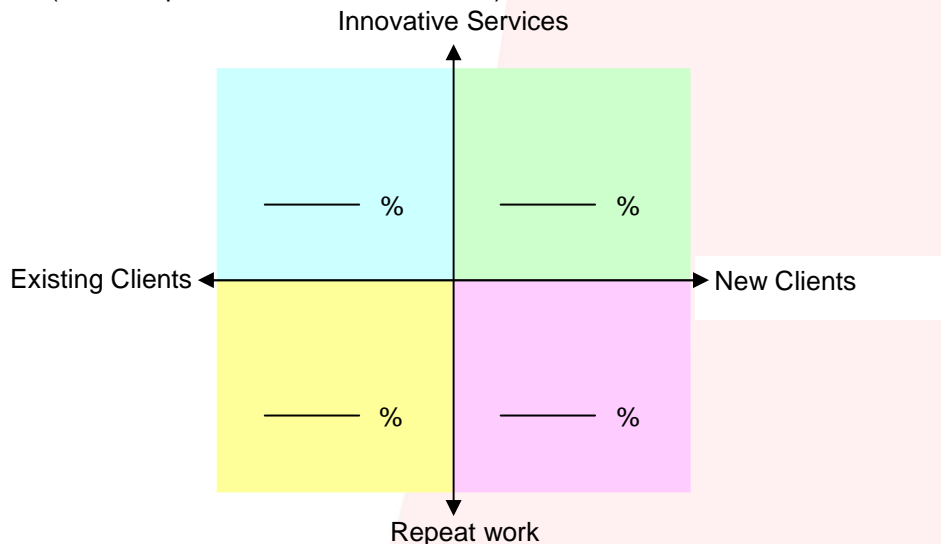
19. Please indicate the number of people below in your organisation in all-Ireland (including Northern Ireland):

- the number of partners: \_\_\_\_\_
- the number of other associates (non-partner chargeable): \_\_\_\_\_
- and the number of support staff: \_\_\_\_\_

20. Please estimate the fee income for your practice in all-Ireland (including Northern Ireland) for your most recent year: € \_\_\_\_\_ million (Please note that this information will not be disclosed to any third party. It will only be used for statistical purposes).

21. Please indicate the proportion of your fee income that comes from innovative services (as opposed to repeat work): \_\_\_\_\_%

22. Please indicate the proportion of fee income for your most recent year that came from each of the following activities: (the four quadrants should total 100%).



## 2. HUMAN RESOURCE PRACTICES

Please answer the following questions **with respect to all the professional staff** in your organisation **over the previous 12 months**. Please estimate, on average...

### Staffing: What proportion of your professional staff...

1. Are administered an employment test (e.g. skills tests) prior to hiring? ..... %
2. Hold jobs which have been subjected to a formal job analysis to identify position requirements (such as required knowledge, skills or abilities)? ..... %
3. Hold non-entry level jobs which have been filled as a result of internal promotions (as opposed to hired from outside of the organisation)? ..... %

### Performance management & Remuneration: What proportion of your professional staff ...

4. Receive formal individual performance appraisals? ..... %
5. Receive formal performance appraisals from more than one source (i.e., from several individuals such as supervisors, peers etc.)? ..... %
6. Have access to company incentive plans, profit-sharing plans, and/or gain-sharing plans? ..... %
7. Receive their performance appraisals which are used to determine their compensation? .... %
8. Receive their performance appraisals which are used to set goals and plan skill development? ..... %
9. Receive above market wage levels to attract and retain them? ..... %

### Information sharing & participation: What proportion of your professional staff ...

10. Are included in a formal information sharing program (e.g., a newsletter)? ..... %
11. Are asked to complete attitude surveys on a regular basis? ..... %
12. Participate in Quality of Work Life (QWL) programs, Quality Circles (QC), and/or labour-management participation teams? ..... %
13. Have access to a formal grievance procedure and/or complaint resolution system? ..... %

### Training & development: What proportion of your professional staff ...

14. Receive continuous training, e.g. continuous professional development? ..... %
15. Receive structured mentoring, e.g. via articles? ..... %
16. Are organised in self-directed work teams in performing a major part of their work roles? ..... %

### Other issues...

17. What is the average number of hours of training received by a typical professional staff member *per year*? ..... #
18. Which one of the following promotion bases do you use most often? (Please tick only one option)
  - merit or performance rating alone
  - seniority only if merit is equal
  - seniority among employees who meet a minimum merit requirement
  - seniority
19. For the five graduate trainee positions that your firm hires most frequently, how many qualified applicants do you have per position (on average)? ..... #

**Over the previous three years**, please estimate (on average)

20. your annual **voluntary** employee turnover rate (percent who voluntarily departed your organisation) ..... %
21. your annual **involuntary** employee turnover rate (percent who involuntarily departed your organisation – i.e., were discharged) ..... %
22. the number of days per year employees were absent ..... #

**3. HUMAN CAPITAL IN YOUR ORGANISATION**

In your organisation, the professional staff...

	Strongly Disagree		Unsure			Strongly Agree	
	←						→
1. are highly skilled. ....	1	2	3	4	5	6	7
2. are widely considered to be the best in the accounting industry .....	1	2	3	4	5	6	7
3. are creative and bright. ....	1	2	3	4	5	6	7
4. are experts in their particular jobs and functions. ....	1	2	3	4	5	6	7
5. are up to date on relevant new taxation, auditing, accounting and legal developments .....	1	2	3	4	5	6	7
6. are skilled at collaborating with each other to diagnose and solve problems. ....	1	2	3	4	5	6	7
7. develop new ideas and knowledge. ....	1	2	3	4	5	6	7
8. develop and maintain good relationships with clients.....	1	2	3	4	5	6	7
9. share information and learn from one another. ....	1	2	3	4	5	6	7
10. interact and exchange ideas with people from different functional areas of the organisation. ....	1	2	3	4	5	6	7
11. partner with clients to develop solutions .....	1	2	3	4	5	6	7
12. partner with other firms in the network to develop solutions .....	1	2	3	4	5	6	7
13. apply knowledge from one area of the organisation to problems and opportunities that arise in another .....	1	2	3	4	5	6	7

**4. ORGANISATIONAL ROUTINES**

In your organisation...

	Strongly Disagree		Unsure			Strongly Agree	
	←						→
1. The databases are used as a way to store knowledge .....	1	2	3	4	5	6	7
2. The processes are appropriate to solve clients' problems. ....	1	2	3	4	5	6	7
3. The culture (stories, rituals and symbols) contains valuable ideas and ways of doing business.....	1	2	3	4	5	6	7
4. The routines enable employees to know each other .....	1	2	3	4	5	6	7
5. The routines enable employees to know about the whole organisation....	1	2	3	4	5	6	7
6. Much of the organisation's knowledge is contained in manuals, databases, structures and processes .....	1	2	3	4	5	6	7
7. A low level of vertical hierarchies and cross-function barriers are maintained in the organisation structure.....	1	2	3	4	5	6	7

**5. MARKETS AND CLIENTS**

Please use the following scale to rate your organisation's performance relative to your competitors:

	Much Worse		Comparable			Much Better	
	←						→
1. Quality of services.....	1	2	3	4	5	6	7
2. Development of new services.....	1	2	3	4	5	6	7
3. Ability to attract essential employees.....	1	2	3	4	5	6	7
4. Ability to retain essential employees.....	1	2	3	4	5	6	7
5. Satisfaction of clients .....	1	2	3	4	5	6	7
6. Relations between partners/directors and other employees .....	1	2	3	4	5	6	7
7. Relations among employees in general.....	1	2	3	4	5	6	7
8. Marketing .....	1	2	3	4	5	6	7
9. Growth in revenue.....	1	2	3	4	5	6	7
10. Profitability .....	1	2	3	4	5	6	7
11. Market share .....	1	2	3	4	5	6	7

**6. KNOWLEDGE MANAGEMENT CAPACITY**

In your organisation...

1. Knowledge is obtained from clients to solve their problems.....
2. Knowledge is obtained from partners to solve clients' problems .....
3. Knowledge is obtained from employees to solve clients' problems .....
4. Knowledge is shared between senior level staff and junior level staff .....
5. Knowledge is shared between colleagues.....
6. Knowledge is shared between units .....
7. Knowledge is effectively translated into application .....
8. The existing knowledge is integrated successfully with new knowledge acquired from clients .....
9. Organisational knowledge is accumulated by employees through writing general guides on a project and storing them as archives.....
10. Most of the employees have access to these archives .....
11. Most partners leverage their knowledge efficiently to generate novel solutions for clients .....
12. Most teams can efficiently use knowledge to develop new ideas .....
13. An expertise directory is maintained by job division and speciality of all employees .....

Strongly Disagree		Unsure			Strongly Agree	
←					→	
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7

**7. MONITORING AND TEAM UTILIZATION**

In your organisation...

1. There are mechanisms in place to monitor employee contributions to new ideas and developments .....
2. There are mechanisms in place to encourage employees to reflect on the outcomes of their efforts .....
3. There are mechanisms in place to assist employees adjust their approach if they find their efforts are taking them down the wrong path.....
4. Teams can be formed quickly as required.....
5. Newly formed teams quickly establish a good understanding of each others' talents and skills.....
6. Teams are continuously reconfigured to address the set of opportunities facing the organisation .....
7. Teams are formed on the basis of an understanding of people's skills and abilities .....

Strongly Disagree		Unsure			Strongly Agree	
←					→	
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7

**8. ADMINISTRATIVE COORDINATION**

To what extent does your organisation engage in the following items?

1. Formal policies and procedures for coordinating the team's work .....
2. Project milestones and delivery schedules.....
3. Project documents and memos .....
4. Regularly scheduled team meetings.....
5. Requirements/design review meetings.....
6. Design inspections.....

Small Extent				Great Extent		
←				→		
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7
1	2	3	4	5	6	7

**9. GENERATING NEW IDEAS AND COMMUNICATION**

In your organisation, how often do employees on average engage in the behaviours listed below?

	Never		Occasionally			Always	
	←----- -----→						
1. Creating new ideas for difficult issues .....	1	2	3	4	5	6	7
2. Searching for new work methods, techniques or instruments .....	1	2	3	4	5	6	7
3. Generating original solutions for problems .....	1	2	3	4	5	6	7
4. Mobilising support for innovative ideas .....	1	2	3	4	5	6	7
5. Acquiring approval for innovative ideas .....	1	2	3	4	5	6	7
6. Transforming innovative ideas into useful applications .....	1	2	3	4	5	6	7
7. Evaluating the utility of innovative ideas .....	1	2	3	4	5	6	7
8. Introducing innovative ideas into the work environment in a systematic way .....	1	2	3	4	5	6	7
9. Making team members enthusiastic for innovative ideas .....	1	2	3	4	5	6	7
10. Communicating with management in <u>a timely way</u> about the status of the project .....	1	2	3	4	5	6	7
11. Communicating with management <u>accurately</u> about the status of the project .....	1	2	3	4	5	6	7
12. Sharing organisational goals about the quality of services .....	1	2	3	4	5	6	7

*That was the final set of questions for the survey. If you wish to share any additional comments please use the following space. We appreciate your time and effort in answering these questions.*

**ADDITIONAL COMMENTS FOR THE RESEARCHERS:**

We certainly welcome any comments that you may have about how your organisation motivates employees to accumulate and share information and knowledge with each other in order to increase your organization's ability to solve clients' problems. Thank you once again for helping us to increase our understanding of how organisations like yours increase the knowledge base in an organisation and exploit it efficiently.

.....

.....

.....

.....

.....

.....

Would you like to take part in a follow-up study, please?     Yes     No

If 'yes', please provide name and address or attach a business card:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Email: \_\_\_\_\_

**Thank you again for your help!**





## **APPENDIX I: CUSTOMISED REPORT (SAMPLE)**

**EVIDENCE FROM IRISH ACCOUNTING PRACTICES**  
**HUMAN RESOURCES, KNOWLEDGE MANAGEMENT AND PERFORMANCE**



Report to XXXX

December 2010



University of Oxford



Dublin City University



University of Limerick

## Executive Summary

1. The purpose of this study was to examine the influence of human resource management (HRM) and knowledge management (KM) upon the performance of professional service firms.
2. This report provides the results of research undertaken within accounting firms in Ireland between May 2010 and August 2010. It includes information on high performance work systems, intellectual capital, knowledge management capacities, management mechanisms and organisational performance.
3. This report provides comparisons between your practice and all 190 members of the Irish Accounting profession who participated in this survey on each of above areas.
4. The results show that your practice uses more high performance work systems, has higher intellectual capital, higher knowledge management capacities, higher management mechanisms effectiveness, higher relative organisational performance, higher relative market performance, higher productivity and lower absenteeism.
5. The main recommendation is to continue using human resource management practices to build intellectual capital, to improve knowledge management capacities and management mechanisms effectiveness to encourage your employees to be more innovative and productive.

## Basic Concepts

**High performance work systems (HPWS):** “a system of HR practices designed to enhance employees’ skills, commitment, and productivity in such a way that employees become a source of sustainable competitive advantage” (Lawler, 1992, 1996; Levine, 1995; Pfeffer, 1998; cited in Data, Guthrie and Wright 2005).

**Intellectual capital:** “sum of all knowledge with which an organisation is able to leverage in the process of conducting business to gain competitive advantage” (Subramaniam and Youndt, 2005: 451).

**Human capital:** the stock of skills and knowledge embedded in individuals (Becker, 1964; O’Sullivan & Sheffrin, 1998), which can be built through education and training (Becker, 1964).

**Social capital:** the stock of knowledge embedded in the relationships among individuals (Coleman, 1988; Bourdieu; 1985; Burt, 1992; Putnam, 1993; Nahapiet & Ghoshal, 1998; Lin, 2001).

**Organisational capital:** the institutionalized knowledge residing within organisational processes, routines, systems and structures (Youndt et al., 2004; Subramaniam & Youndt, 2005).

**Knowledge management capacity:** organisation’s capacity to manage knowledge. In this study, knowledge acquisition, knowledge sharing and knowledge application which help organisations to improve their knowledge management capacity are explored.

**Management mechanisms:** the management practices or activities that explore, develop and utilize the resources of organisations. Communication, coordination, monitoring and team utilisation are measured.

**Relative organisational and market performance:** the self-reported comparative measures of organisational performance.

**Productivity:** revenue per professional staff (€ million).

**Absenteeism:** the number of absent days per employee per year due of illness.

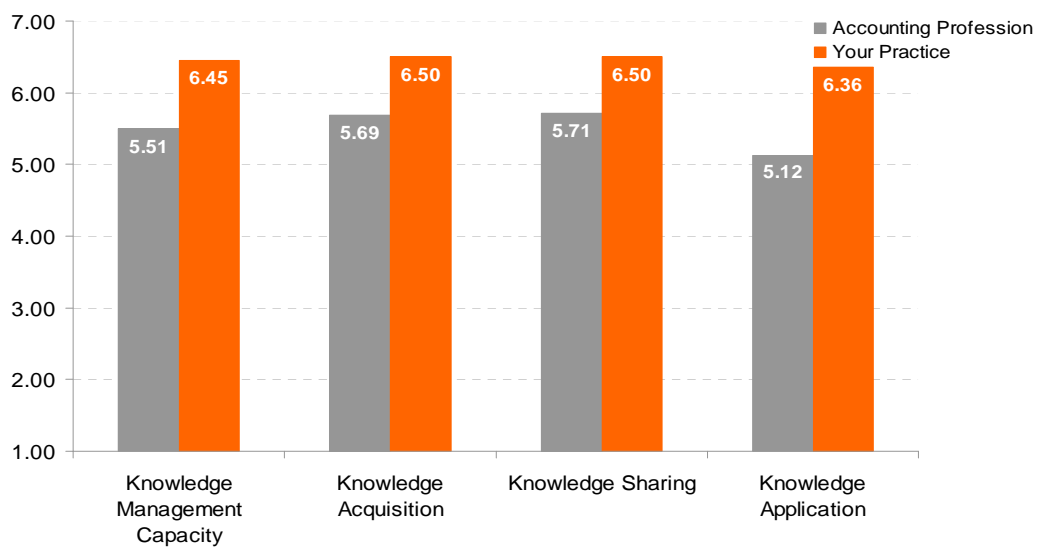
**Figure 1 Comparison on Uses of High Performance Work Systems (0% - 100%)**



**Figure 2 Comparison on Intellectual Capital (7 point scale)<sup>1</sup>**



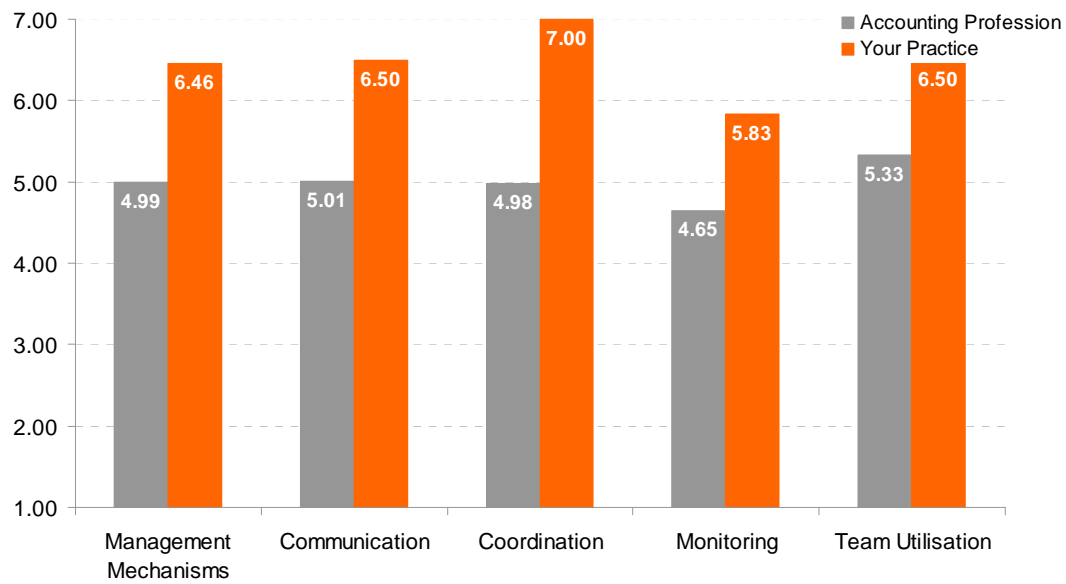
**Figure 3 Comparison on Knowledge Management Capacity (7 point scale)<sup>2</sup>**



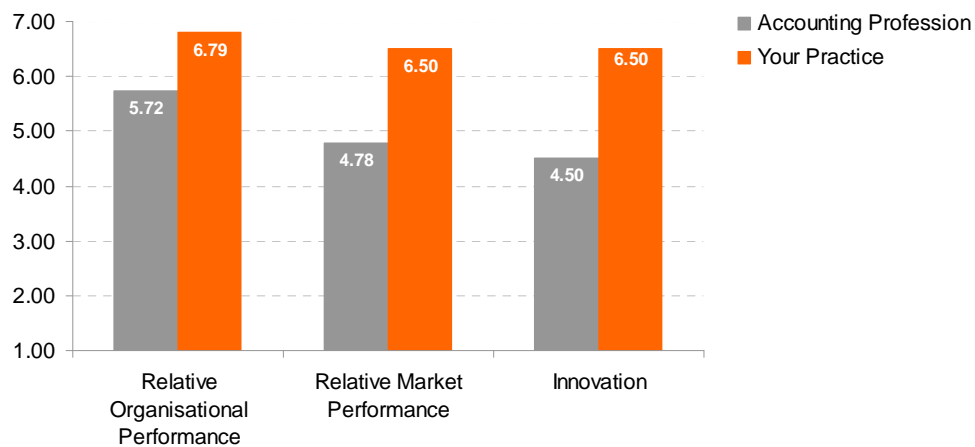
<sup>1</sup> Details are in page 6 in main report.

<sup>2</sup> Details are in page 9 in main report.

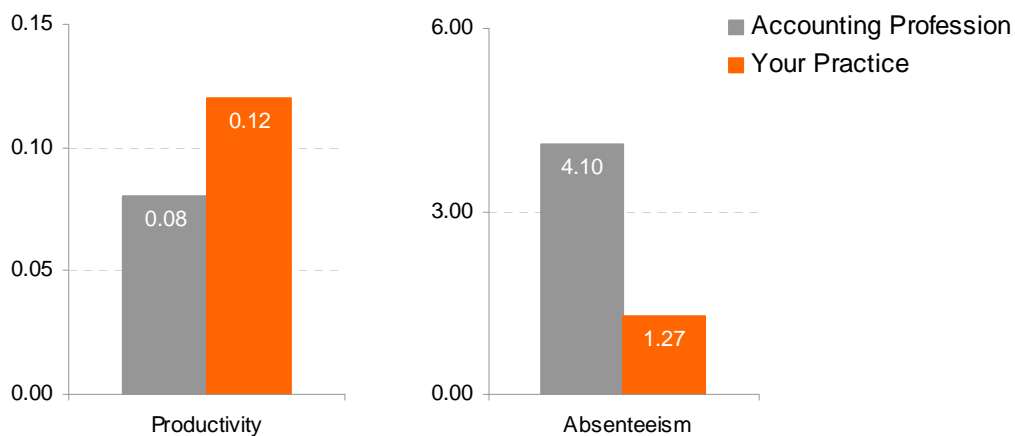
**Figure 4 Comparison on Effectiveness of Management Mechanisms (7 point scale)**<sup>3</sup>



**Figure 5 Comparison on Subjective Performance Measures (7 point scale)**<sup>4</sup>



**Figure 6 Comparison on Objective Performance Measures**<sup>4</sup>



<sup>3</sup> Details are in page 10 in main report.

<sup>4</sup> Details are in page 11 in main report.

## **APPENDIX J: INDUSTRY REPORT**

**EVIDENCE FROM IRISH ACCOUNTING PRACTICES**  
**HUMAN RESOURCES, KNOWLEDGE MANAGEMENT AND PERFORMANCE**



An Industry Report

December 2010



University of Oxford



Dublin City University



University of Limerick

## Foreword

Human resource management is of critical importance for accounting firms and has an important role in value creation and exploitation. This report addresses several important areas in organisational management:

- It outlines the uses of human resource management practices.
- Within firms it provides an evaluation of human capital, i.e. knowledge embedded in individuals, social capital, i.e. knowledge embedded in relationships, and organisational capital, i.e. knowledge embedded in organisational routines, systems and databases.
- It illustrates the knowledge management practices which encourage the flow of knowledge between senior employees, junior employees and clients.
- It identifies the management mechanisms which are effective in daily management, such as communication, coordination, monitoring and team utilisation.
- It also presents different performance measures such as perceived organisational and market performance; innovation, productivity and absenteeism.
- The report's findings provide a useful insight into the management of professional service firms, taking into account comprehensive human resource and knowledge management practices and policies.

Thank you very much for your participation in this major study. I hope your practice will benefit from the insight provided by this study. Both a long report for the industry and a short customised report for your practice are provided.

Diarmuid Breathnach

Student Service Manager of Chartered Accountants Ireland



## ACKNOWLEDGEMENTS

This extensive survey of human resource management (HRM) and knowledge management (KM) in professional service firms (PSFs) would not have been possible without the cooperation of a large number of people and institutions.

First and foremost, we acknowledge the managing partners, human resource managers and other partners, senior staff in almost 120 accounting firms in Ireland and thank them all for their time and insights on human resource management and knowledge management in their respective practices.

We are very grateful to the Chartered Accountants Ireland (CAI) for their assistance. We particularly acknowledge the input of Diarmuid Breathnach in promoting the access to accounting firms in Ireland.

To improve the validity and reliability, we piloted the survey with accounting and organisational experts in different areas. We express our appreciation to their efforts and help. They are Dr Edel Conway, Dr Aurora Trif, Dr Jan Bosak, Prof. Tim Morris, Dr Philip O'Regan, Dr Barbara Flood, Prof. Marann Byrne, Ms Orla Feeney, Dr Ruth Mattimoe, Dr Mary Canning, two partners and three managers in Big 4 firms.

We also thank David Meehan based at DCU library who provided support for the firm database to select the sample in this study.

The professional design of the survey comes from Dr Hyowon Lee at DCU. We give him our thanks.

Many thanks are also given to Professor Denise Rousseau who provided great insights for the research model at the initial stage and Professor Jim Guthrie who helped a lot in data analysis.

Last, but certainly not least, we wish to thank our international and national partners. They are Professor Tim Morris at Saïd Business School, University of Oxford, and Dr Philip O'Regan at Kemmy Business School, University of Limerick.

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## **Abbreviations**

ACCA = Association of Chartered Certified Accountants

CAI = Chartered Accountants Ireland

CFA = Confirmatory Factor Analysis

CPA = Institute of Certified Public Accountants in Ireland

CIMA = Chartered Institute of Management Accountants

CIPD = Chartered Institute of Personnel and Development

DCU = Dublin City University

HPWS = High Performance Work Systems

HR = Human Resource

HRM = Human Resource Management

IIPA = Institute of Incorporated Public Accountants

IS = Information Sharing

ITI = The Irish Taxation Institute

PA = Performance Appraisals

UL = University of Limerick

## 1. OVERVIEW

This report details the results of research undertaken within accounting firms in Ireland between May 2010 and August 2010. The research, which was conducted by three universities, is a major study of professional service firms in Ireland. The universities participating in the study are; Dublin City University, the University of Oxford and the University of Limerick. The research study was supported by the Chartered Accountants Ireland.

In the first part of this report, the background to the research study is provided. This includes the research aim and process. Following this, the theoretical base is presented to help better understand the concepts of high performance work systems (HPWS), intellectual capital, human capital, social capital, organisational capital, knowledge management capacity and management mechanisms. Then the results of the survey are provided. The results of the regression of HPWS and intellectual capital on firm performance are also provided. A number of findings and recommendations from the study are presented. This is followed by a short conclusion.

## 2. BACKGROUND OF THIS STUDY

### 2.1 Research Aim

The purpose of this study was to examine the influence of human resource management (HRM) and knowledge management (KM) upon the performance of professional service firms.

Professional service firms (PSFs) consist of a highly educated and professionalized workforce who provide clients with customised knowledge (Empson, 2007; Greenwood, Li, Prakash, & Deephouse, 2005; Maister, 1993). Examples of professional services include accounting, engineering consulting, management consulting and legal services. PSFs are very different from traditional manufacturing firms (Løwendahl, 2000).

Professional service firms are knowledge-intensive (Morris, 2001; von Nordenflycht, 2007, 2010). Their inputs are mainly the knowledge acquired, possessed and utilised by their professional workforce (Starbuck, 1992). Their outputs are the expert knowledge in the form of customized solutions for their clients (Empson, 2007; Greenwood et al., 2005; Hitt, Shimizu, Uhlenbruck, & Bierman, 2006; Løwendahl, 2000; Morris & Empson, 1998; von Nordenflycht, 2007, 2010).

Human resources constitute one of the most critical assets of PSFs. Because of this, we investigated how to build the resources of human capital, social capital and organisational capital through human resource management practices systems. We also wanted to investigate how to utilise these resources at the firm level to help PSFs to achieve higher performance.

This is an area which had not been fully researched in the Irish context and is of practical relevance to the management of accounting firms.

The goals of our project were to:

- Understand the determinants of accounting firms' success
- Establish the key HRM and KM practices of accounting firms
- Determine how these factors influence innovation and performance

### 2.2 Research Process

#### 2.2.1 Sampling

Accountancy is a traditional professionalised and regulated sector. Most Irish accounting firms are small to medium size. Selection of appropriate firms, which included some formal and informal HR practices and knowledge management activities, was based on defined criteria. One of these was that the accounting firm should have 3 or more partners. The other criterion was that the employee number was not less than 5. Since no single database could provide comprehensive information on accounting firms, this information was researched using Business World Top 1000 Professional Firms, Chartered Accountants Regulatory Board, Chartered Accountants Ireland, FAME, Kompass Directory and IndexIreland. The information obtained from these sources was combined to create the sample frame for this study. 274 accounting firms were chosen as a sample of this study. To

avoid single-rater bias, two respondents (primarily the Managing Partner and the Partner responsible for Human Resource) were chosen for each firm.

### 2.2.2 Survey Procedures

In order for a questionnaire to be effective, the measures used in each of the questions should be valid (Robson, 2002).

To improve the validity of the survey, the questionnaire was pilot studied by many experts from academia and practitioners in the areas of HRM, survey design, professional service firms' research and accounting practice.

The questions in the survey relate to human resource management, knowledge management, human capital, management control mechanisms, clients and markets.

To conduct the survey, Dillman (2002)'s Tailored Design Method (TDM) was applied. First, an invitation letter was posted and emailed to all the respondents to inform them that the survey was being conducted and to introduce our research objectives. Second, a letter and a copy of the questionnaire were mailed out. A pre-paid envelope was also enclosed. Third, a postcard was issued to thank the respondents who completed and returned the questionnaire or who completed the online survey. The postcard also served to remind the respondents who had not yet completed the questionnaire. Fourth, a letter with a copy of the questionnaire was issued to those respondents who had not yet completed the original. Last, a final letter with a second copy of the questionnaire was issued to the respondents who had not completed either the original or the first copy.

## 3. THEORETICAL BASIS

In this section, the concept of HPWS, intellectual capital, knowledge management capacity and management mechanisms are reviewed and defined. This provides a theoretical base for better understanding of these relevant management theories.

### 3.1 HPWS

High Performance Work Systems (HPWS) can be described as "a system of HR practices designed to enhance employees' skills, commitment, and productivity in such a way that employees become a source of sustainable competitive advantage" (Lawler, 1992, 1996; Levine, 1995; Pfeffer, 1998; cited in Data, Guthrie and Wright 2005).

HPWS involve selective recruitment, extensive training and development, mentoring, performance management, and incentives (Gittell, Seidner and Wimbush 2009; Takeuchi, Lepak, Wang and Takeuchi 2009).

### 3.2 Intellectual Capital

Intellectual capital is the "sum of all knowledge with which an organisation is able to leverage in the process of conducting business to gain competitive advantage" (Subramaniam and Youndt, 2005: 451). There are three dimensions of intellectual capital; human capital, social capital and organisational capital.

#### 3.2.1 Human Capital

Human capital refers to the stock of skills and knowledge embodied in individuals (Becker, 1964; O'Sullivan & Sheffrin, 1998), which can be built through education and training (Becker, 1964). In PSFs, human capital is defined as the knowledge embedded in professionals that can be used to produce high quality professional services for clients (Hitt et al., 2001; Hitt et al., 2006; Pennings, Lee & Van Witteloostuijn, 1998).

Human capital is a very important asset of PSFs (Hitt et al., 2001; Morris & Snell, 2008). Higher human capital means more expert knowledge embedded in a highly professionalized PSF workforce. It could help PSFs build a good reputation by signalling that the professional service firm has the potential to provide more efficient solutions for its clients. The clients may also prefer to choose the PSF with higher human capital if they believe that smarter people would provide better solutions if other conditions are the same.

### 3.2.2 Social Capital

Social capital is a resource which is embedded in the relationships among individuals (Coleman, 1988; Bourdieu, 1985; Burt, 1992; Putnam, 1993; Nahapiet & Ghoshal, 1998; Lin, 2001). We define the PSFs' social capital as the knowledge embedded in the relationships among professionals and between professionals and clients.

In PSFs, social capital plays an important role in two ways. Firstly, the relationships between PSFs and clients, i.e., external social capital, help PSFs to attract and retain clients. The service delivered by PSFs suffers from an "opaque quality" (von Nordenflycht, 2010) mainly because the PSFs inputs and outputs are intangible knowledge and the clients cannot evaluate the quality of service that they will get or they will have gotten. When choosing a service provider, the clients usually choose the ones who have relationships with them when other things are equal (Alvesson, 2001; Pennings et al., 1998). Pennings et al. (1998) defined the firms' social capital as the ties between professionals and their potential clients and found that a firm's human and social capital has a great influence on firm dissolution in PSFs. Their study shows that firm-level human and social capital could be important sources of competitive advantage.

Secondly, the capital embedded in the internal relationships among professionals within the firm, i.e., internal social capital, could help PSFs deploy teams, coordinate tasks and communicate within the firm efficiently.

### 3.2.3 Organisational Capital

Organisational capital is defined as the institutionalized knowledge residing within organisational processes, routines, systems and structures (Youndt et al., 2004; Subramaniam & Youndt 2005). It is the result of integrating and combining individual knowledge into organisational knowledge (Grant, 1996a, 1996b) which is preserved over time (Daft & Weick, 1984). Organisational capital is a source of organisational competitive advantage (Teece, 2000).

In PSFs, organisational processes are highly institutionalized due to the nature of knowledge-based work (Freidson, 1986; Greenwood, Hinings, & Brown, 1990; Robertson, Scarbrough, & Swan, 2003). The organisational routines in PSFs are informal work practices that are formed by professionals during team work (Morris, 2001). Some large PSFs build their own databases and systems that store individual experience and expertise knowledge (Suddaby & Greenwood, 2001). The professionals in the firm can access them and gain the benefit of previous experience. They are also known as knowledge centres (Moore & Birkinshaw, 1998). These databases and systems provide support for professionals to reuse and to exploit existing knowledge. Most PSFs have flat organisational structures (Greenwood et al., 1990; Stumpf, Doh & Clark, 2002) that facilitate knowledge flow between seniors and juniors.

Organisational capital constitutes an important resource of PSFs by facilitating knowledge creation, sharing, combination and exchange (Morris & Snell, 2008). Besides facilitating knowledge integration, organisational capital also shapes a professionals' image and identity (Empson, 2001) and these play an important role in attracting new clients.

### 3.3 Knowledge Management Capacity: Finders, Minders and Grinders

The knowledge-based theory (KBT) of the firm considers knowledge as an intangible resource and as the most strategically significant resource of the firm (Grant, 1996a, 1996b; Nonaka and Takeuchi 1995; Spender 1996). Knowledge represents a highly valuable organisational resource. Organisations should pay careful attention to how they manage knowledge (Empson 2001) and effectively managing it could help them to achieve sustainable competitive advantage.

Nielsen (2006) identifies eight knowledge management activities; knowledge creation, acquisition, capture, assembly, sharing, integration, leverage, and exploitation. He assembled these activities into the three dynamic capabilities of knowledge development, knowledge (re)combination, and knowledge use.

Knowledge represents a highly valuable organisational resource, especially in PSFs where partners, who are also referred to as "finders" (Maister, 2004) need knowledge to find potential clients and to maintain good relationships with their existing clients. They also require knowledge to choose appropriate members to form an efficient project team to deliver a good quality service to their clients. The managers or directors, also referred to as "minders" (Maister, 2004), perform



administrative tasks and coordinate tasks and teams to ensure that the firm runs as a cohesive group. The other professionals and trainees, also referred as “grinders” (Maister, 2004), serve the clients’ needs and integrate their knowledge to tailor solutions for their clients.

From the view of knowledge stock and knowledge flow, knowledge acquisition, knowledge sharing and knowledge application are of critical important in helping organisations to gain knowledge management capacity. These aspects of knowledge are explored in this study.

### 3.4 Management Mechanisms

The RBV argues that a firm’s competitive advantages lie primarily in the valuable, rare, imperfectly imitable, and non-substitutable resources that a firm already has (Barney, 1991; Penrose, 1959; Wernerfelt, 1984). However, the resources by themselves cannot guarantee the development of competitive advantages or the creation of value (Barney & Arian, 2001; Priem & Butler, 2001; Sirmon, Hitt and Ireland, 2007). For example, Porter (1991: 108) argued that ‘resources are not valuable in and of themselves, but they are valuable because they allow firms to perform activities ... business processes are the source of competitive advantage’. The “resources can only be a source of competitive advantage if they are used to ‘do something;’ i.e., if those resources are exploited through business processes (Ray, Barney and Muhanna, 2004: 26).

Here, the management mechanisms are considered as the management practices or activities that explore, develop and utilize the resources of organisations. Communication, coordination, monitoring and team utilisation are measured. These are sufficient for successful and efficient completion of PSFs’ daily work.

In PSFs, most of the work is project or program-oriented. To meet client’s needs, a partner needs to choose several professionals to form a team to solve a client’s problems. The team forms the basic unit of work in the professional service firm and team management is vital for the successful completion of a project.

First, PSFs need to deploy the team and coordinate tasks efficiently. The dynamic global economic environment accelerates PSFs’ work speed. Usually the customers’ assignments are much more compressed in term of time (Morris, Gardner, & Anand, 2007). The PSFs have to compress their work into much shorter time. Morris et al. (2007)’s, report a partner from a consulting firm as saying “... [we need to ] compress six months work into a three week assignment”. Another issue in managing teams is conflict management. All of the professionals in PSFs are knowledge workers. They have high autonomy and prefer self-management. There may be a conflict between them when they do not have consistency with some work design. PSFs have to transform these conflicts into cooperation by means of team management. Otherwise, it may “lead to mass defections and the destruction of enterprise value, even more assuredly than in an industrial company setting” (Teece, 2003: 900). Since professionals need to work together, the communication among them is very important to accomplish the work. They need to exchange their opinions and create solutions through teamwork to meet the clients’ needs. Efficient team management will contribute to improving the efficiency of the firm’s human capital and social capital as they create new knowledge. For this reason, communication, coordination, monitoring and team utilisation are explored in this study.

## 4. DESCRIPTIVE RESULTS

This section presents the results of the survey, including the characteristics of the sample, the profile of respondents and the comparison between your practice and whole accounting profession in terms of HPWS, human capital, social capital, organisational capital, knowledge management capacities, management effectiveness on monitoring, team utilisation, coordination, generating new ideas and communication, and firm performance.

### 4.1 Characteristics of the Sample

Surveys were mailed to 548 respondents in 274 firms. This included 10 firms that did not exist and 3 firms that did not qualify for this study because of small firm size or because they are not accounting firms. This reduced the final sample population to 522 respondents in 261 firms. Survey mails, reminder postcards, replacement surveys (see Chapter 4) representing 195 surveys in total, were returned in the form of hard copy (156) and online (39). Four surveys were not completed

Figure 7 Distribution of Respondents on Title

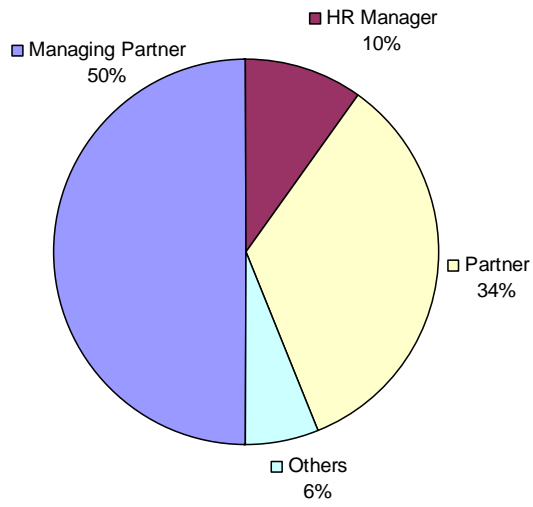


Figure 8 Distribution of Respondents on Gender

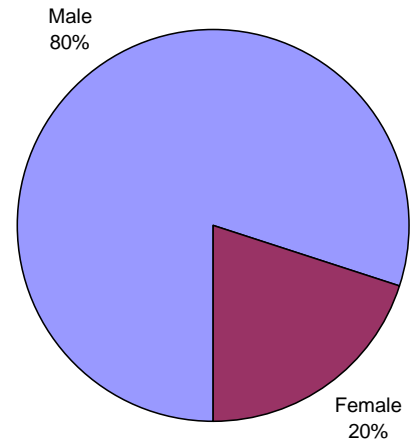


Figure 9 Distribution of Respondents on Age Education

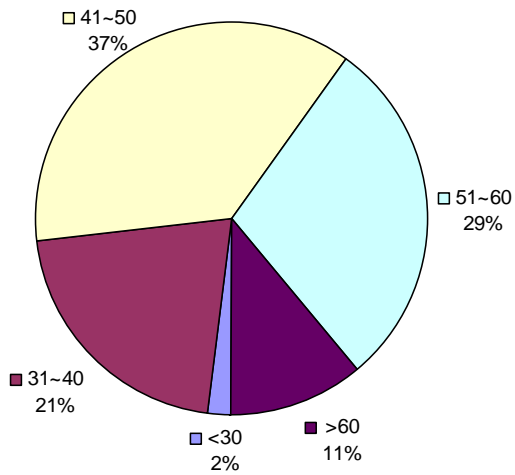


Figure 10 Distribution of Respondents on Education

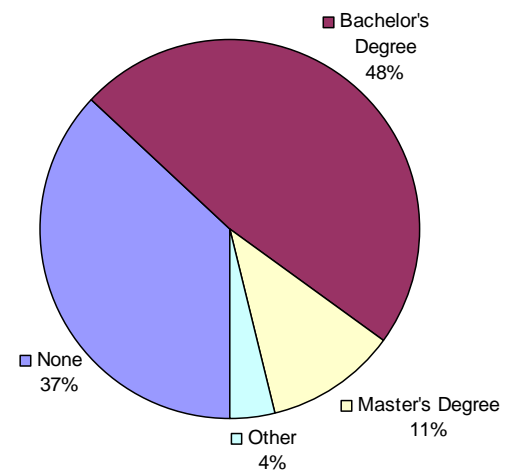
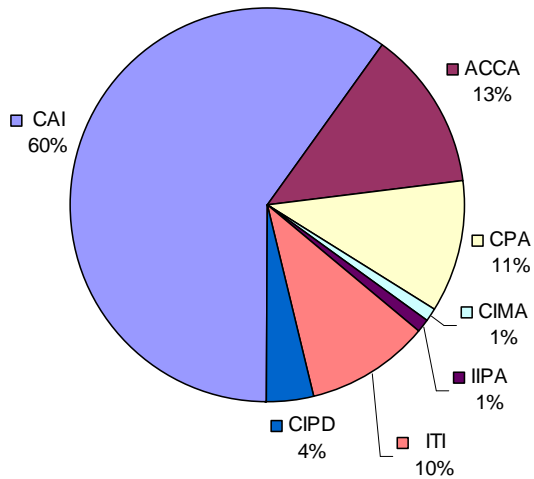


Figure 11 Distribution of Respondents on Professional Qualification



and were therefore excluded. The response rate was 36.40% (190/522) representing 120 firms (45.98%). There are 71 matched pair responses explain representing 71 firms (27.20%).

Therefore, the final sample for this study consisted of 120 accounting firms located in Ireland, covering a range of geographical regions.

Among the respondents, 50% were managing partners, 10% were HR manager/directors, 34% were partners and 6% were other experienced professional staff who had a good knowledge of their organisations (including holders of positions such as Director, Financial Director, Managers, Office Manager, Auditor and Associate.).

In terms of gender, 80% of respondents were male and 20% were female. In terms of age, 2% of respondents were 30 or less, 21% were between 31 and 40, 37% were between 41 and 50, 29% were between 51 and 60, and 11% were above 60. With regard to education level, 48% of respondents had a Bachelor's Degree, 11% had a Master's Degree and 37% did not have any degree.

In terms of the professional qualification, 60% of respondents qualified from the Chartered Accountants Ireland (CAI), 13% qualified from the Association of Chartered Certified Accountants (ACCA), 11% qualified from the Institute of Certified Public Accountants in Ireland (CPA), 1% qualified from the Chartered Institute of Management Accountants (CIMA), 1% of from the Institute of Incorporated Public Accountants (IIPA), 10% qualified from the Irish Taxation Institute (ITI) and 4% were members of the Chartered Institute of Personnel and Development (CIPD).

#### 4.2 Results of Uses of HPWS

In consideration of the characteristics of PSFs, sixteen items were adopted from Huselid (1995) and Datta et al. (2005). These items covered HR practices in recruitment, performance management & remuneration, information sharing & participation, training & development. A sample question is, "Please estimate what proportion (0% to 100%) of your professional staff are administered an employment test (e.g. skills tests) prior hiring with respect to all of the professional staff in your organisation over the previous 12 months".

Since HPWS is mostly used as an index (Batt, 2002; Guthrie, 2001; Guthrie et al., 2009), the Cronbach's alpha was calculated for this sixteen-item HPWS scale and this was found to be .73. This was above the cut-off point of .70 and demonstrates the internal consistency of our HPWS measure.

Table 2 illustrates the breakdown of respondent's replies on the proportionate use of various HPWS practices. On average, the application of HPWS in Irish accounting firms was about 45%. In other words, a score above 45 implied a more extensive utilisation of HPWS and any lower score implied a less extensive utilisation of HPWS in comparison to the average utilisation of HPWS. In this study, the highest score showed the extent to which a specific firm policy or HR practice was in use in the sample of Irish accounting firms. In this regard, 89% of the sample had access to continuous training. Similarly, about 83% of the sample utilised formal individual performance appraisals. Figure 6 presents the results of uses of HPWS in Irish accounting context.

#### 4.3 Results of Intellectual Capital

The measurements derived by Subramaniam and Youndt (2005) to measure intellectual capital were adopted. The respondents were asked to indicate their level of agreement with each of the statements (from 1 = strongly disagree, and 7 = strongly agree).

Table 3 illustrates the breakdown of respondent's replies on each item for measuring intellectual capital. On average, the scores for human capital, social capital and organisational capital for Irish accounting firms were 5.49, 5.71 and 5.50 respectively. A higher score for each item indicates stronger agreement of the respondents. In all, higher scores of resources variables indicate higher human capital, social or organisational capital while a lower score indicates lower human, social or organisational capital. Figure 7 presents the results of intellectual capital for each dimension in the Irish accounting context.

Table 1 The Uses of HPWS in Irish Accounting Firms

HPWS Index (average)	Mean Score %
	44.92
What proportion of your professional staff...	
Are administered an employment test (e.g. skills tests) prior to hiring?	18.10
Hold jobs which have been subjected to a formal job analysis to identify position requirements (such as required knowledge, skills or abilities)?	48.91
Hold non-entry level jobs which have been filled as a result of internal promotions (as opposed to hired from outside of the organisation)?	25.99
Receive formal individual performance appraisals?	82.52
Receive formal performance appraisals from more than one source (i.e., from several individuals such as supervisors, peers etc.)?	37.94
Have access to company incentive plans, profit-sharing plans, and/or gain-sharing plans?	15.43
Receive their performance appraisals which are used to determine their compensation?	45.69
Receive their performance appraisals which are used to set goals and plan skill development?	63.05
Receive above market wage levels to attract and retain them?	25.96
Are included in a formal information sharing program (e.g., a newsletter)?	44.37
Are asked to complete attitude surveys on a regular basis?	9.06
Participate in Quality of Work Life (QWL) programs, Quality Circles (QC), and/or labour-management participation teams?	7.94
Have access to a formal grievance procedure and/or complaint resolution system?	82.96
Receive continuous training, e.g. continuous professional development?	89.30
Receive structured mentoring, e.g. via articles?	59.72
Are organised in self-directed work teams in performing a major part of their work roles?	61.93

<sup>a</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 187.

Figure 12 Comparison on Uses of HPWS (index results)

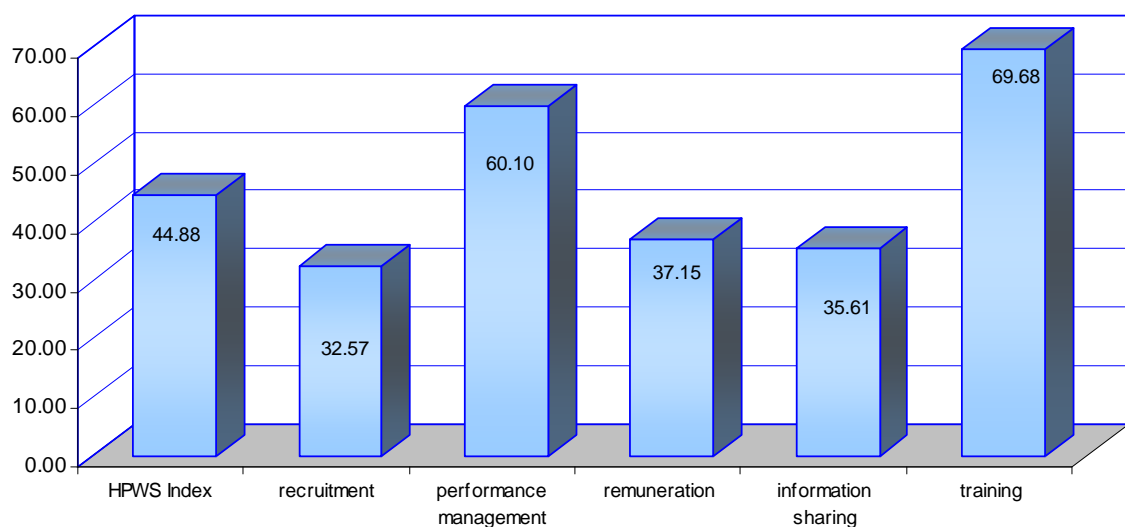
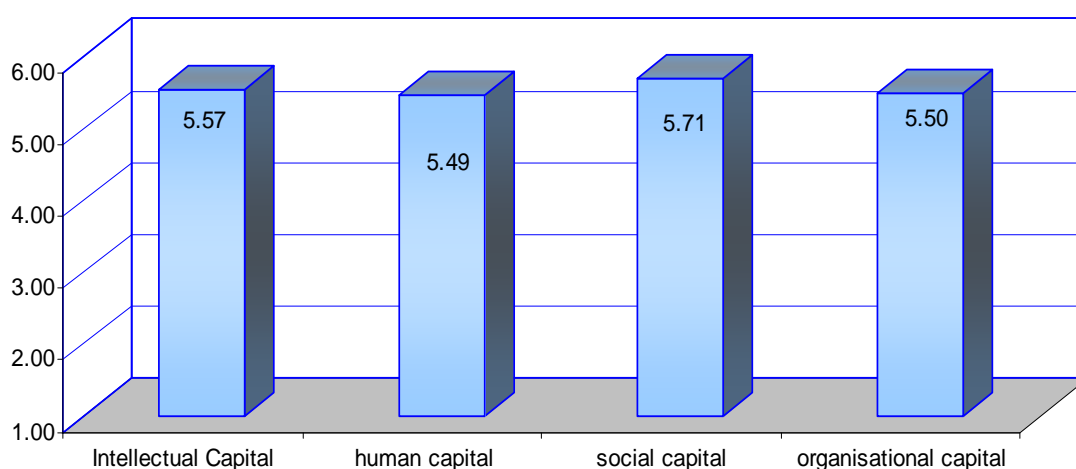


Table 2 Intellectual Capital in Irish Accounting Firms

Resources Measurement	Mean Score 7-Point
Human Capital (Average) <sup>a</sup> : In your organisation, the professional staff...	5.49
are highly skilled.	6.01
are widely considered to be the best in the accounting industry.	5.01
are creative and bright.	5.46
are experts in their particular jobs and functions.	5.55
are up to date on relevant new taxation, auditing, accounting and legal developments.	5.85
develop new ideas and knowledge.	5.04
Social Capital (Average) <sup>b</sup> : In your organisation, the professional staff...	5.71
are skilled at collaborating with each other to diagnose and solve problems.	5.68
develop and maintain good relationships with clients.	6.16
share information and learn from one another.	5.91
interact and exchange ideas with people from different functional areas of the organisation.	5.56
partner with clients to develop solutions.	5.53
apply knowledge from one area of the organisation to problems and opportunities that arise in another.	5.39
Organisational Capital (Average) <sup>c</sup> : In your organisation ...	5.50
The databases are used as a way to store knowledge.	5.76
The processes are appropriate to solve clients' problems.	5.58
The culture (stories, rituals and symbols) contains valuable ideas and ways of doing business.	5.35
The routines enable employees to know each other.	5.61
The routines enable employees to know about the whole organisation.	5.59
Much of the organisation's knowledge is contained in manuals, databases, structures and processes.	5.15
A low level of vertical hierarchies and cross-function barriers are maintained in the organisation structure.	5.46

<sup>a</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 188. <sup>b</sup> The valid sample was n = 190 (listwise).  
<sup>c</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 185.

Figure 13 Intellectual Capital (7-point scale)



#### 4.4 Results of Knowledge Management Capacity

The measures for knowledge management capacity are mainly adopted from Chen and Huang (2009). Five additional items are also used to measure knowledge management capacity because of the context of PSFs. All of the 13 items are measured on a seven-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). All of the three aspects had very high reliability with Cronbach's alpha above .83. This is above the suggested value of .70. Thus, we concluded the measures for knowledge management were valid and internally consistent.

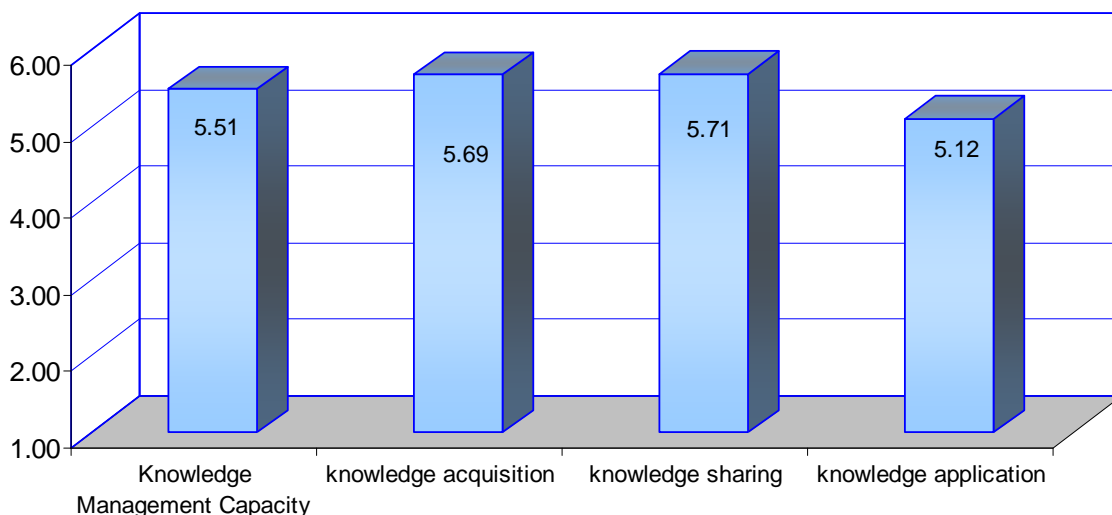
Table 4 illustrates the breakdown of respondent's replies on knowledge management capacity. On average, Irish accounting firms' knowledge management capacity is 5.56 on a seven point scale.. A higher score indicates more knowledge management capacity while a lower score indicates less knowledge management capacity. This applies to the three aspects of knowledge management capacity, i.e. knowledge acquisition, knowledge sharing and knowledge application. Figure 8 presents the results of knowledge management capacity for each knowledge management capacity in the Irish accounting context.

Table 3 Knowledge Management Capacity in Irish Accounting Firms

Knowledge Management Capacity Measurement	Mean Score 7-Point
Knowledge Acquisition (Average) <sup>a</sup> : In your organisation, ...	5.69
Knowledge is obtained from clients to solve their problems	5.68
Knowledge is obtained from partners to solve clients' problems	6.04
Knowledge is obtained from employees to solve clients' problems	5.36
Knowledge Sharing (Average) <sup>a</sup> : In your organisation, ...	5.71
Knowledge is shared between senior level staff and junior level staff	5.77
Knowledge is shared between colleagues	5.89
Knowledge is shared between units	5.47
Knowledge Application (Average) <sup>b</sup> : In your organisation, ...	5.12
Knowledge is effectively translated into application	5.52
The existing knowledge is integrated successfully with new knowledge acquired from clients	5.58
Organisational knowledge is accumulated by employees through writing general guides on a project and storing them as archives	4.67
Most of the employees have access to these archives	5.12
Most partners leverage their knowledge efficiently to generate novel solutions for clients	5.67
Most teams can efficiently use knowledge to develop new ideas	5.35
An expertise directory is maintained by job division and specialty of all employees	3.97

<sup>a</sup> The valid sample was n = 190 (listwise). <sup>b</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 189.

Figure 14 Knowledge Management Capacity (7-point scale)



#### 4.5 Results of Management Mechanisms Effectiveness

The measures of management mechanisms are newly created scales based on measures of Kraut and Streeter (1995) on administrative coordination, Janseen (2000) on generating new ideas, Gittel, Seidner, and Wimbush (2009) on communication. All of the measures use a seven-point Likert scale, 1 = strongly disagree and 7 = strongly agree for monitoring and team utilisation, 1 = to small extent and 7 = to great extent for coordination, 1 = never and 7 = always for generating new ideas and communication.

Exploratory factor analysis (principal axis analysis with oblique rotation) was conducted and five factors were found. The factor loadings are above .55 for monitoring, above .65 for team utilisation, above .50 for coordination, above .65 for generating new ideas, above .49 for communication. The reliability for each of the five factors was very high (all Cronbach's alphas above .83).

Table 5 illustrates the breakdown of respondents' replies on the management mechanisms. On average, Irish accounting firms' management mechanisms effectiveness is 4.93. A higher score indicates more effective management mechanisms while a lower score indicates less effective management mechanisms. This applies to the five aspects of management mechanisms, i.e. monitoring, team utilisation, coordination, generating new ideas and communication. Figure 9 presents the results of management mechanisms effectiveness for each aspect in the Irish accounting context.

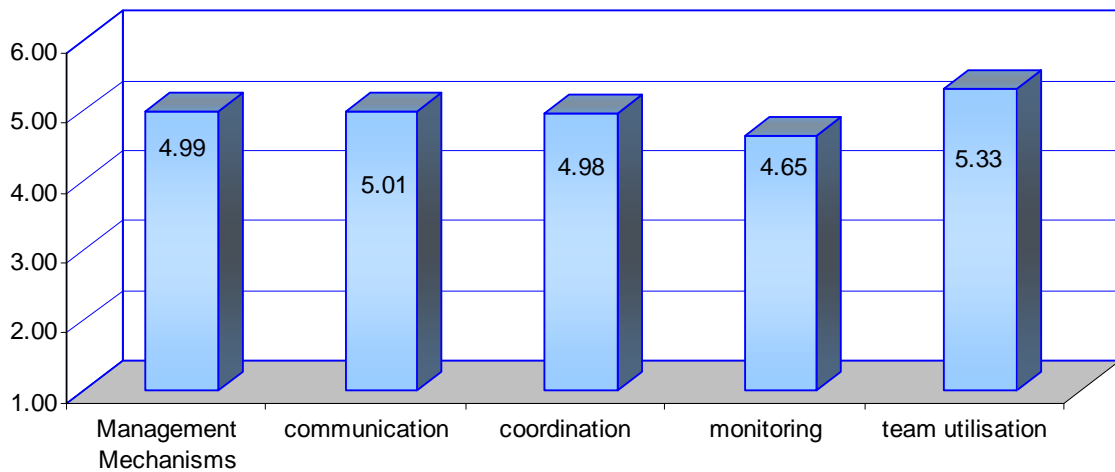
Table 4 Management Mechanisms in Irish Accounting Firms

Uses Measurement	Mean Score 7-Point
Communication (Average) <sup>a</sup>	
In your organisation, how often do employees on average engage in the behaviours listed below?	5.01
Communicating with management in a timely way about the status of the project.	4.98
Communicating with management accurately about the status of the project.	5.10
Sharing organisational goals about the quality of services.	4.94
Coordination (Average) <sup>b</sup>	
To what extent does your organisation engage in the following items?	4.98
Formal policies and procedures for coordinating the team's work.	5.00
Project milestones and delivery schedules.	5.16
Project documents and memos.	5.15
Regularly scheduled team meetings.	5.29
Requirements/design review meetings.	4.97
Design inspections.	4.26
Monitoring (Average) <sup>a</sup>	
In your organisation...	4.65
There are mechanisms in place to monitor employee contributions to new ideas and developments.	4.29
There are mechanisms in place to encourage employees to reflect on the outcomes of their efforts.	4.69
There are mechanisms in place to assist employees adjust their approach if they find their efforts are taking them down the wrong path.	4.97
Team Utilisation (Average) <sup>a</sup>	
In your organisation ...	5.33
Teams can be formed quickly as required.	5.61
Newly formed teams quickly establish a good understanding of each others' talents and skills.	5.34
Teams are continuously reconfigured to address the set of opportunities facing the organisation.	5.04
Teams are formed on the basis of an understanding of people' s skills and abilities	5.33

<sup>a</sup> The valid sample was n = 190 (listwise).

<sup>b</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 188.

Figure 15 Management Mechanisms Effectiveness (7-point scale)



#### 4.6 Results of Organisational Performance

Firm performance was assessed using both subjective and objective measures. The subjective ones were the self-reported relative organisational performance, relative market performance and innovation. The objective measures were productivity and absenteeism.

*Relative organisational performance and relative market performance.* Eleven items were adopted from Delaney and Huselid (1996). Respondents were asked to rate their organisation's performance relative to their competitors using a seven-point Likert-type scale, varying from 1 = much worse to 7 = much better. Since all of the items adopted have been proved to be valid, the reliabilities for relative organisational performance and relative market performance were calculated and were both .84. These were comparable to the ones obtained by Delaney and Huselid (1996) (alpha = .86 for relative organisational performance and .85 for the relative market performance).

*Innovation.* Nine items were adopted from Janseen (2001, 2005). The respondents were asked "How often do employees on average engage in the behaviors listed below, e.g. creating new ideas for difficult issues". The respondents answered from 1 = never to 7 = always. Janseen (2001) found two factors in innovation. However, in the pilot study, the experts from HR and accountancy understood them as measuring the same thing. Therefore, a principal axis factor analysis using oblique rotation of the items was conducted to check the factor structure. All of the nine items had factor loadings of .72 or above on a single factor, and this factor explained 75.99% of variance, with an eigenvalue of 6.84. These factor loadings are shown in Appendix L. The nine-item scale had a reliability of .96.

*Productivity.* Productivity was calculated as revenue/number of professional staff. The revenue data was aggregated from the respondents' data and the public data since there was strong agreement between the data in these resources. The respondents were asked to estimate the income from fees for their firm/unit for the most recent year (€ million). The firm size information was collected from public databases such as Chartered Accountants Regulatory Board, Businessworld Top 1000 Professional Firms, Kompas and Fame.

*Absenteeism.* Absenteeism was calculated as the number of absent days per employee per year due to illness.

Table 6 illustrates the breakdown of respondent's replies on relative organisational performance and relative marketing performance. For subjective firm performance measurements, the average scores were 5.72 for the relative organisational performance, 4.78 for the relative market performance and 4.40 for innovation. A higher score indicated better performance than the average performance while a lower score indicated worse performance. For the subjective firm performance measure, on average, the productivity of Irish accounting firms was €0.08 million per professional staff. The higher score indicates that the firm is more productive than the average firm and a lower score indicates that the firm is less productive. The average absenteeism was 4.10



days. The larger number indicates that the longer absent time of employees. Figures 10 to 11 presents the results of these performance measures in Irish accounting context.

**Table 5 Organisational Performance in Irish Accounting Firms**

Firm Performance Measurements	Mean Score
Relative Organisational Performance	5.72
Please rate your organisation's performance relative to your competitors:	
Quality of services	6.06
Development of new services	5.19
Ability to attract essential employees	5.25
Ability to retain essential employees	5.75
Satisfaction of clients	5.96
Relations between partners/directors and other employees	5.90
Relations among employees in general	5.93
Perceived Marketing Performance <sup>a</sup>	4.78
Please rate your organisation's performance relative to your competitors:	
Marketing	4.62
Growth in revenue	4.83
Profitability	4.94
Market share	4.72
Innovation <sup>a</sup>	4.50
In your organisation, how often do employees on average engage in the behaviours listed below?	
Creating new ideas for difficult issues	4.53
Searching for new work methods, techniques or instruments	4.65
Generating original solutions for problems	4.76
Mobilising support for innovative ideas	4.51
Acquiring approval for innovative ideas	4.61
Transforming innovative ideas into useful applications	4.45
Evaluating the utility of innovative ideas	4.31
Introducing innovative ideas into the work environment in a systematic way	4.31
Making team members enthusiastic for innovative ideas	4.40
Productivity (€ million per professional staff) <sup>b</sup>	.08
Absenteeism (the number of absent days per employee per year because of illness) <sup>c</sup>	4.10

<sup>a</sup> The valid sample was n = 190 (listwise)

<sup>b</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 137

<sup>c</sup> Missing data and listwise deletion reduced the sample from n = 190 to n = 188

**Figure 16 Subjective Performance Measures (7-point scale)**

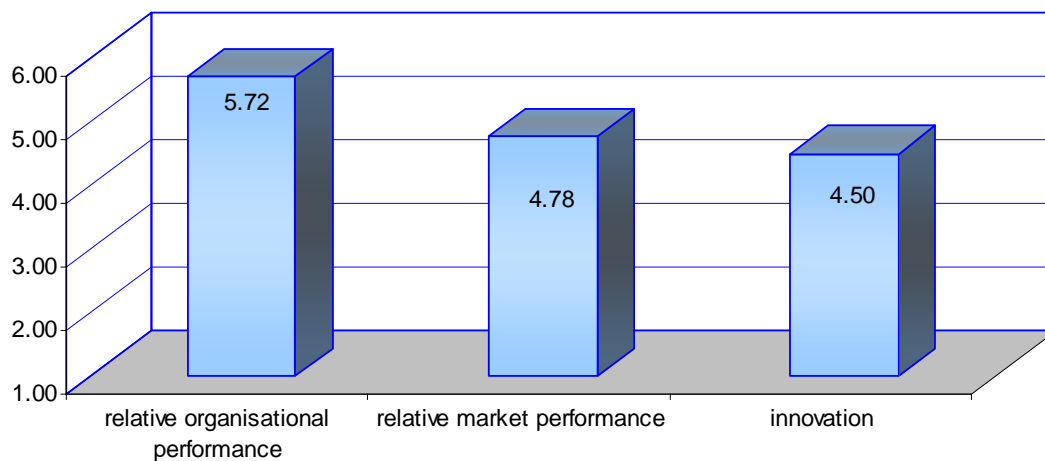
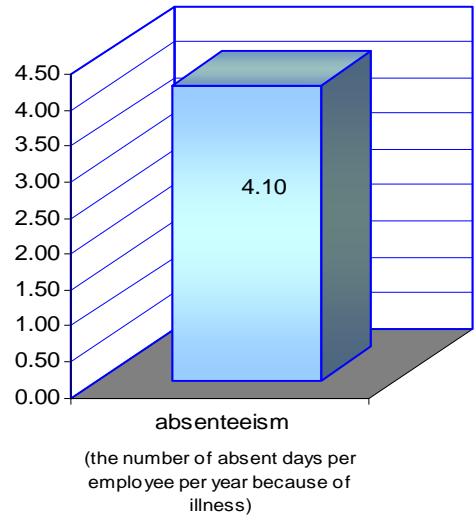
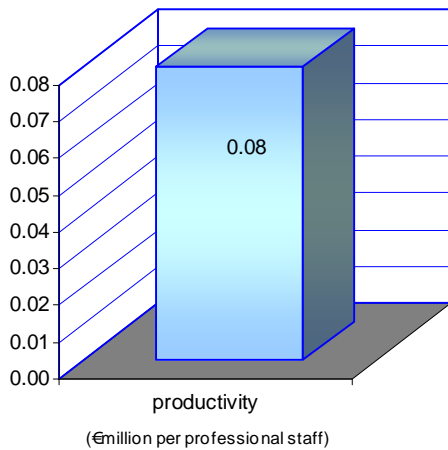


Figure 17 Objective Performance Measures



## 5. REGRESSION RESULTS OF THE SURVEY

Controlling for firm size and firm age, the impact of HPWS, intellectual capital on firm performance was tested.

Figures 12 to 14 illustrate that the use of HPWS was positively related to productivity, relative organisational and market performance and innovation, and negatively related to absenteeism.

Figure 18 HPWS on Relative Organisational and Market Performance and Innovation

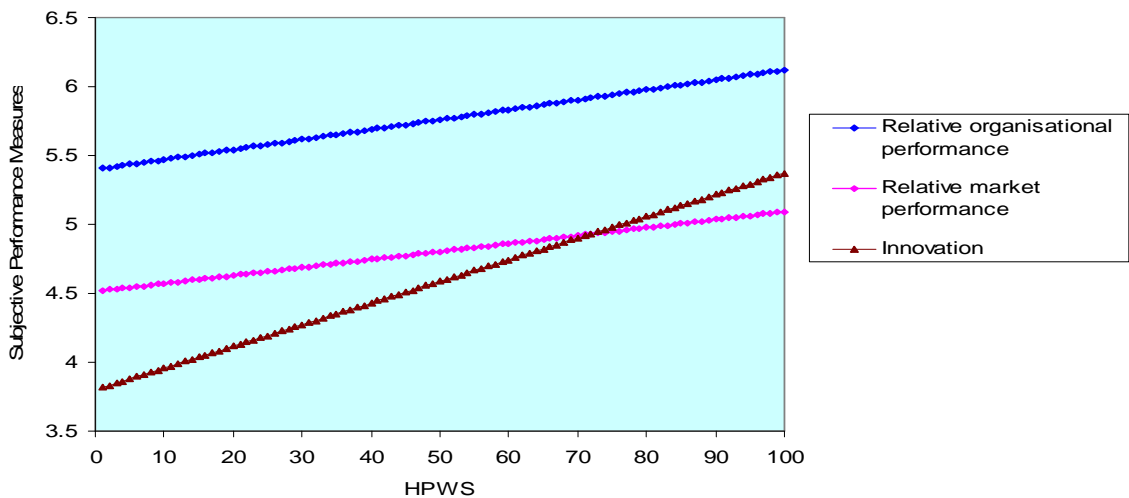


Figure 19 HPWS on Productivity

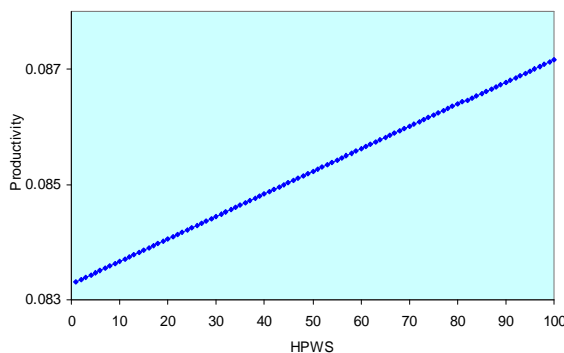
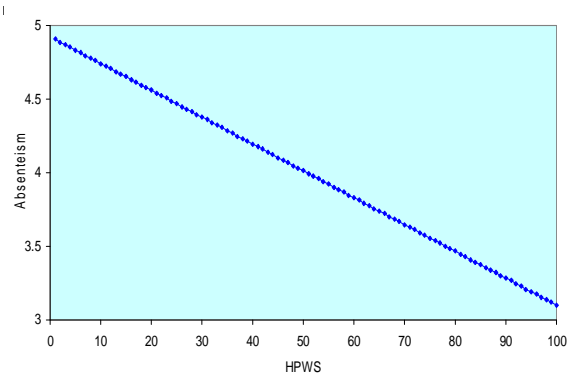


Figure 20 HPWS on Absenteeism



Figures 15 to 17 illustrate that the human capital was positively related to productivity, relative organisational and market performance and innovation, and negatively related to absenteeism.

Figure 21 Human Capital on Relative Organisational and Market Performance and Innovation

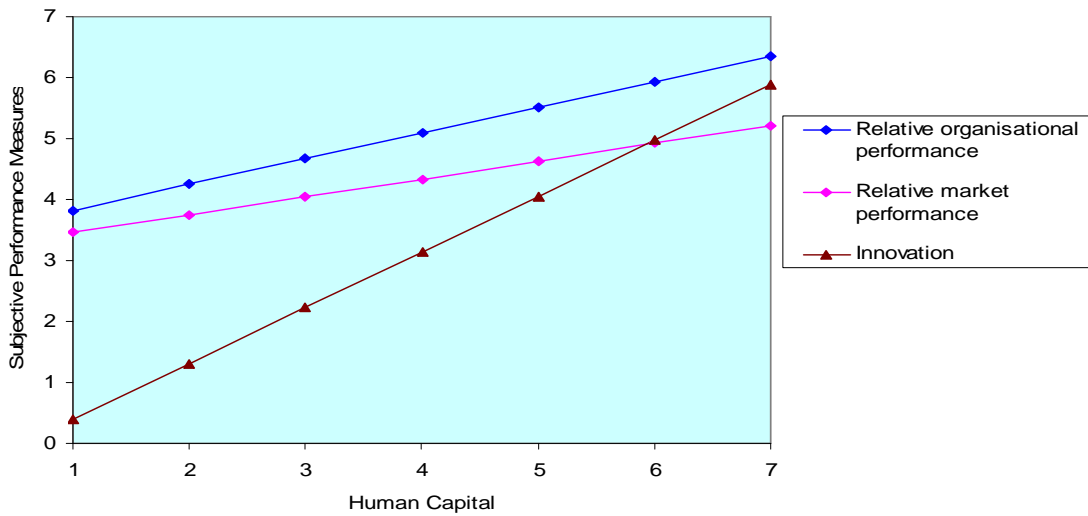


Figure 22 Human Capital on Productivity

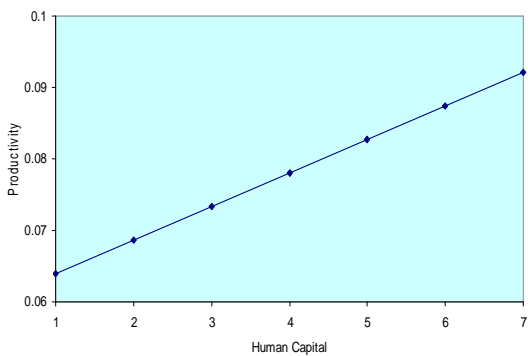
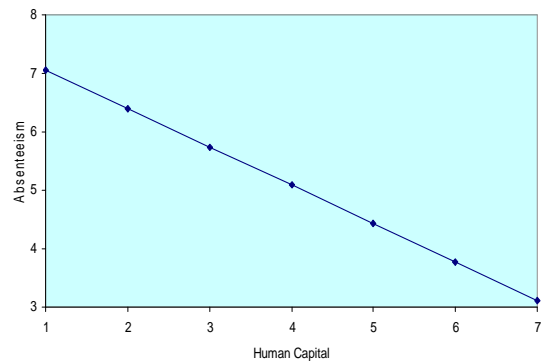


Figure 23 Human Capital on Absenteeism



Figures 18 to 20 illustrate that the social capital was positively related to productivity, relative organisational and market performance and innovation, and negatively related to absenteeism.

Figure 24 Social Capital on Relative Organisational and Market Performance and Innovation

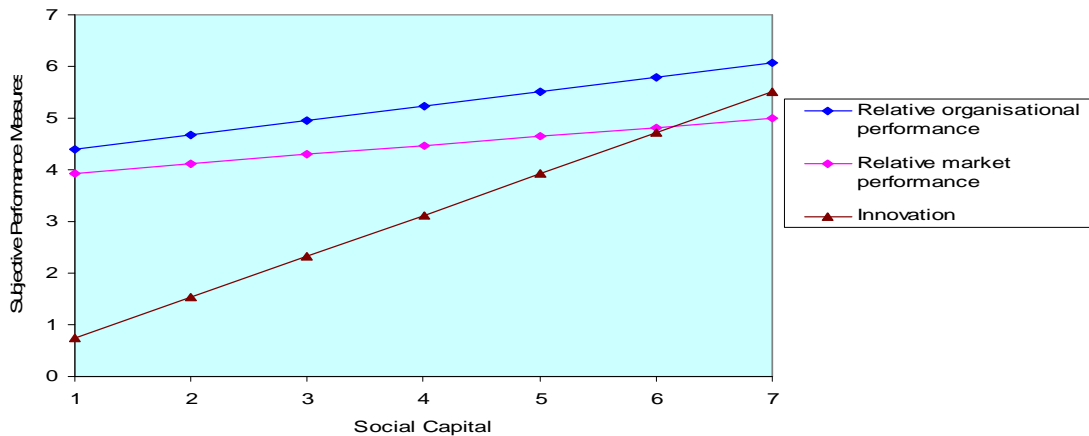


Figure 25 Social Capital on Productivity

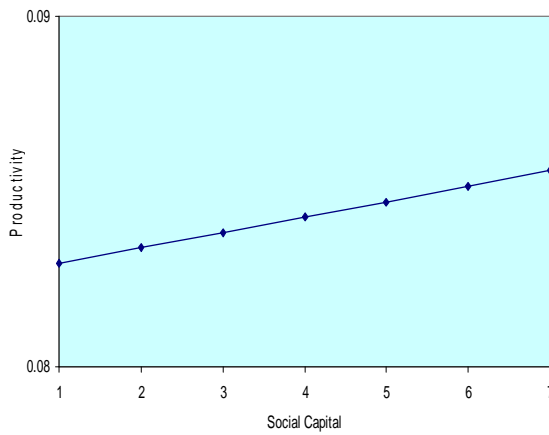
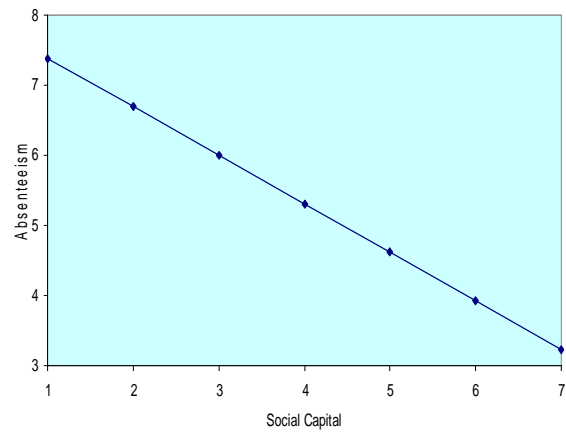


Figure 26 Social Capital on Absenteeism



Figures 21 to 23 illustrate that the organisational capital was positively related to productivity, relative organisational and market performance and innovation, and negatively related to absenteeism.

Figure 27 Organisational Capital on Productivity

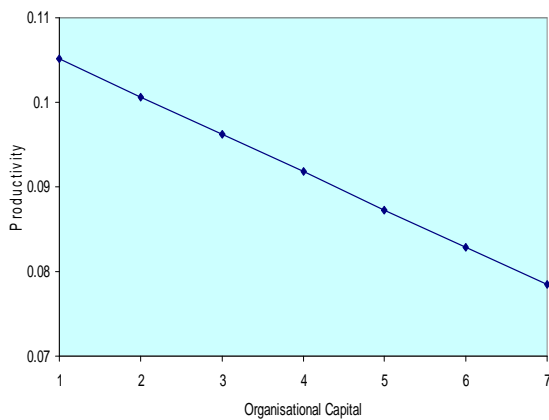


Figure 28 Organisational Capital on Absenteeism

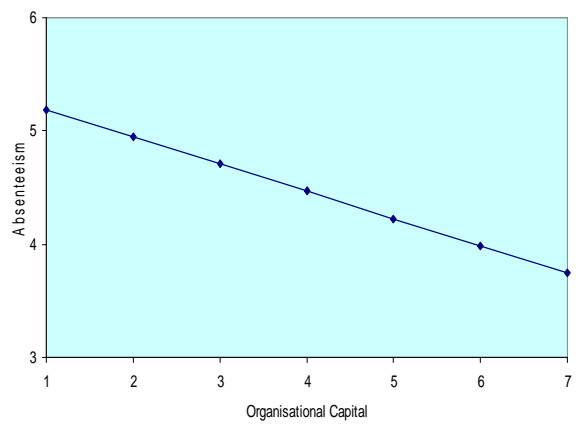
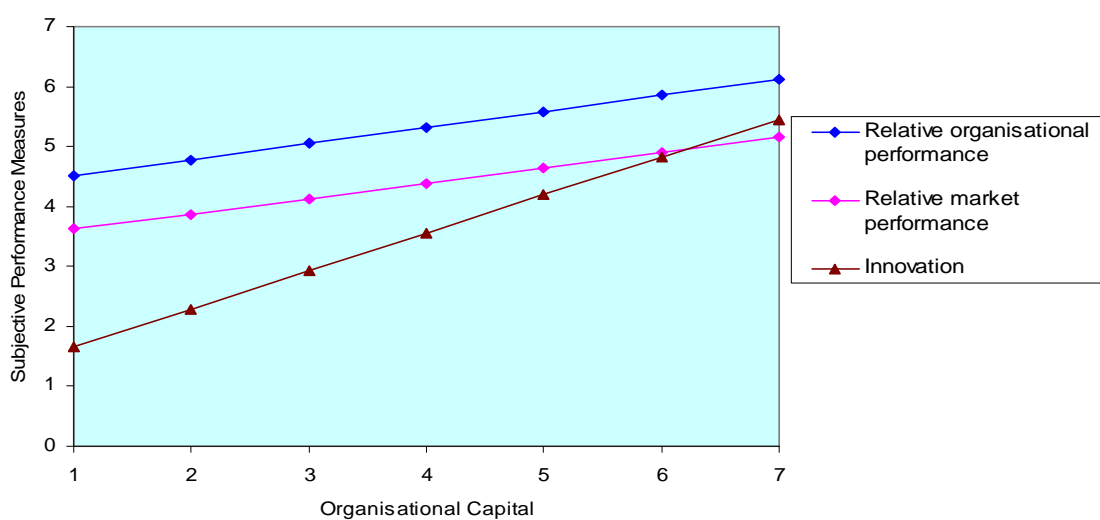


Figure 29 Organisational Capital on Relative Organisational and Market Performance and Innovation



In addition, the impact of HPWS on intellectual capital, knowledge management capacities and management mechanisms were tested. Figures 24 to 26 show that HPWS was positively related to the three aspects of intellectual capital (human capital, social capital organisational capital), knowledge management capacities (knowledge acquisition, sharing and application), and four management mechanisms (communication, coordination, monitoring and team utilisation).

Figure 30 HPWS on Intellectual Capital

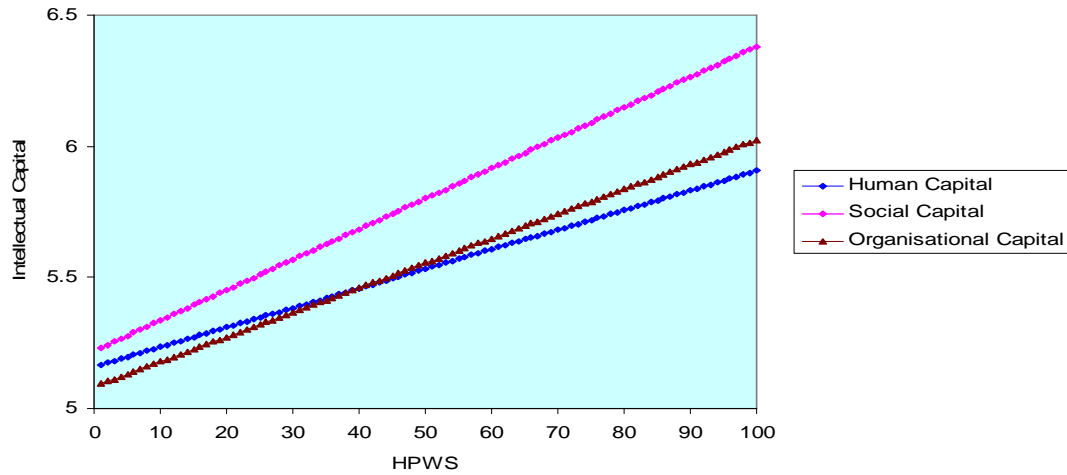


Figure 31 HPWS on Knowledge Management Capacity

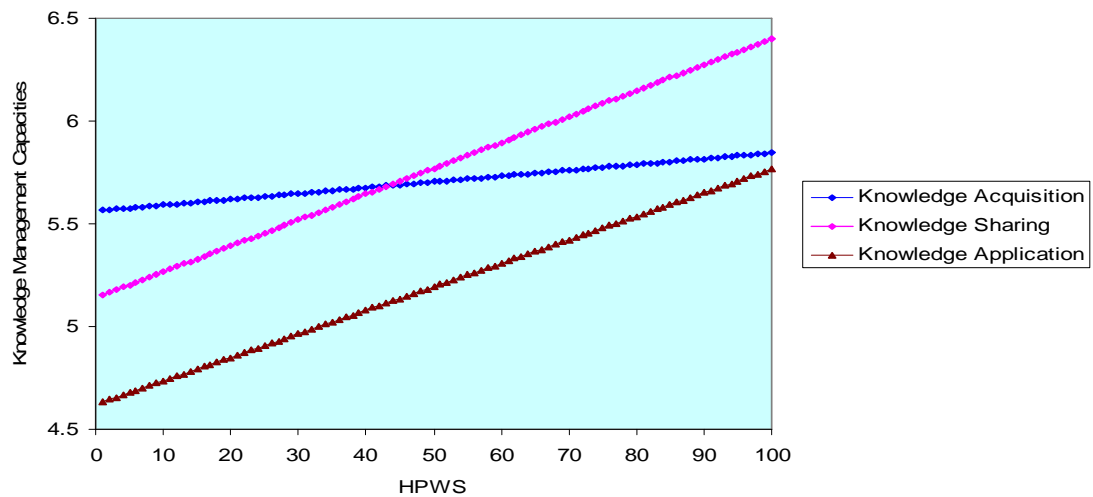
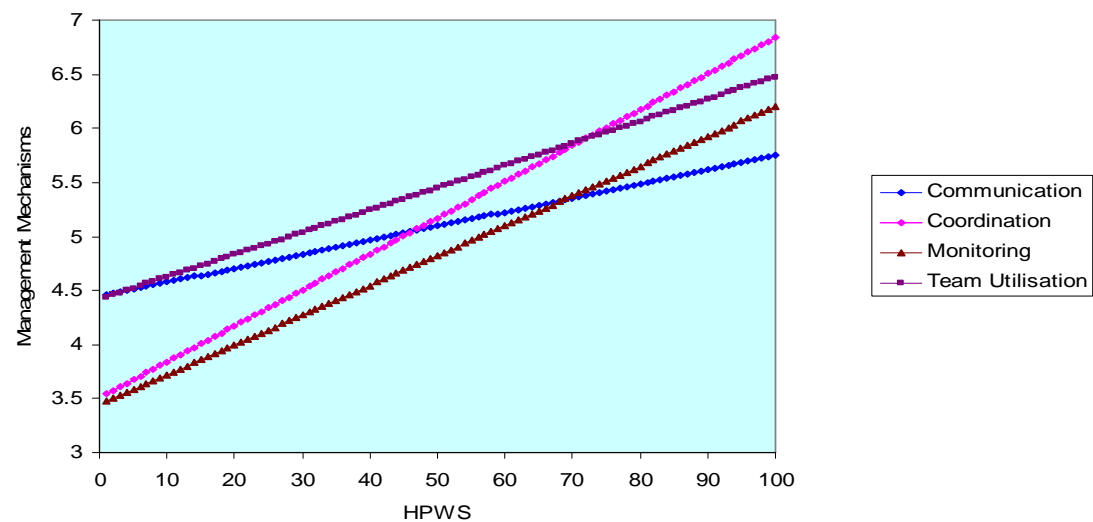


Figure 32 HPWS on Management Mechanisms Effectiveness



## 6. FINDINGS

Based on the above analysis, the findings can be summarized as follows:

- HPWS usage was found to be about average (45%).  
  
This result is consistent with the result (46.96%) in Guthrie et al.'s study (2009) in which data on HPWS was collected from 165 firms among the Top 1000 companies in Ireland.
- Intellectual capital, knowledge management capacities, and management mechanisms effectiveness in Irish accounting firms are high (above average value of 4).
- The firms with more uses of HPWS saw increases in productivity, relative organisational and market performance and innovation, and decreases in absenteeism.
- The firms which make more use of HPWS saw higher intellectual capital, i.e. human capital, social capital and organisational capital.
- The firms with more uses of HPWS saw higher knowledge management capacities, i.e. knowledge acquisition, knowledge sharing and knowledge application.
- The firms with more uses of HPWS saw more efficient management mechanisms, i.e. communication, coordination, monitoring and team utilisation.
- The firms with higher human capital saw increase in productivity, relative organisational and market performance and innovation, and decreases in absenteeism.
- The firms with higher social capital saw increase in productivity, relative organisational and market performance and innovation, and decreases in absenteeism.
- The firms with higher organisational capital saw increases in relative organisational and market performance and innovation, and decreases in productivity and absenteeism.

## 7. CONCLUSION

The main objective of this research was to investigate the uses of HPWS, intellectual capital, knowledge management capacities and to examine their impact on firm performance in Irish accounting context.

This study explores the theory bases for the above concepts and their application in professional service firms. Data was collected from 190 managing partners, HR directors/managers in 120 Irish accounting firms. This report presents both descriptive results and hierarchical multiple regression analysis results of the survey. The findings provide sufficient support for the uses of HPWS which have positive impact on organisational performance and help firms build intellectual capital and knowledge management capacities.

There are some limitations in this report. For example, it did not list each item for each category in HPWS. Recruitment includes employment test, formal job analysis and internal promotion. If you require any further information relating to the study or its findings, you could contact Ms Na Fu who will be very happy to provide additional information. Her contact information is as follows:

Ms Na Fu  
Dublin City University Business School  
Glasnevin  
Dublin 9

Email: [Na.Fu3@mail.dcu.ie](mailto:Na.Fu3@mail.dcu.ie)  
Tel: 01-700-5742  
Mobile: 0870510338

References are available as request.

**link**

A Dublin City University Designated Research Centre

# APPENDIX K: LETTER FOR MISSING DATA (SAMPLE)

UNIVERSITY RESEARCH



## SURVEY OF ACCOUNTING FIRMS 2010

HUMAN RESOURCE MANAGEMENT, KNOWLEDGE MANAGEMENT AND PERFORMANCE

Date

Ref: ...

Dear XXX

I am writing in relation to the work we are doing on accounting firms.

First, thank you very much for your great support. **We very much appreciate this.**

The data collection is drawing to a close and we are preparing the customized report for your practice.

Could you please help us to confirm the following three questions?

If there is no exact data in your practice, could you please provide us with your best estimate? Many thanks.

1.21 Please indicate the proportion of your fee income that comes from innovative services (as opposed to repeat work): \_\_\_\_ %

5.2 Please rate your organisation's performance as follows relative to your competitors using the scale of 1 to 7 (1 = much worse, 7 = much better)

Development of new services

1 2 3 4 5 6 7  
much worse much better

Please return your answers to us using the pre-paid envelope enclosed or email me at [Na.fu3@mail.dcu.ie](mailto:Na.fu3@mail.dcu.ie) with subject of "Ref: ....".

Thanks again for your help as always.

Best wishes,

Na

Research Fellow

on behalf of Patrick

.....  
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Head, HRM-Organizational Psychology Group  
Dublin City University Business School  
Dublin 9, Ireland  
Office: +353-1-7006943

LiNk Research Centre: <http://www.link.dcu.ie>  
<http://www.amazon.ca/Persuasive-Leader-Lessons-Arts/dp/0470688289>



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Prof. Tim Morris  
Professor of Management  
University of Oxford



Ms Na Fu  
Doctoral student  
Dublin City University



Dr. Philip O'Regan  
Senior Lecturer  
University of Limerick

SUPPORTED BY





## APPENDIX L: EXPLORATORY FACTOR ANALYSIS RESULTS FOR RESOURCES (N=189)<sup>a, b</sup>

	<i>Rotated Factor Loadings</i>		
	1	2	3
<b>Human Capital</b>			
Professional staffs are widely considered to be the best in the accounting industry.	<b>.82</b>	.05	-.18
Professional staffs are experts in their particular jobs and functions.	<b>.75</b>	.00	.10
Professional staffs are up to date on relevant new taxation, auditing, accounting and legal developments.	<b>.72</b>	.10	.02
Professional staffs are creative and bright.	<b>.70</b>	-.06	.05
Professional staffs are highly skilled.	<b>.69</b>	-.10	.09
Professional staffs develop new ideas and knowledge.	<b>.44</b>	-.09	.48
<b>Social Capital</b>			
Professional staffs share information and learn from one another.	-.08	-.02	<b>.87</b>
Professional staffs interact and exchange ideas with people from different functional areas of the organisation.	-.11	-.04	<b>.84</b>
Professional staffs partner with clients to develop solutions.	.09	-.01	<b>.69</b>
Professional staffs develop and maintain good relationships with clients	.20	-.04	<b>.63</b>
Professional staffs apply knowledge from one area of the organisation to problems and opportunities that arise in another.	.10	.22	<b>.58</b>
Professional staffs are skilled at collaborating with each other to diagnose and solve problems.	.26	.03	<b>.56</b>
<b>Organisational Capital</b>			
The culture (stories, rituals and symbols) contains valuable ideas and ways of doing business.	.23	<b>.75</b>	-.18
Much of the organisation's knowledge is contained in manuals, databases, structures and processes.	-.06	<b>.75</b>	-.16
The processes are efficient to solve clients' problems.	.14	<b>.74</b>	-.08
The routines encourage employees to know each other.	-.07	<b>.72</b>	.19
The routines encourage employees to know about the whole organisation.	-.13	<b>.67</b>	.25
The databases are used as a way to store knowledge.	.02	<b>.63</b>	-.07
A low level of vertical hierarchies and cross-function barriers are maintained in the organisation structure.	-.19	<b>.54</b>	.22
Eigenvalues	8.06	2.54	1.36
% of variance	42.41	13.41	7.18
$\alpha$	.86	.89	.88

<sup>a</sup> Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

<sup>b</sup> Rotation converged in 6 iterations.

## APPENDIX M: EXPLORATORY FACTOR ANALYSIS RESULTS FOR USES (N=189)<sup>a, b</sup>

	<i>Rotated Factor Loadings</i>			
	1	2	3	4
<b>Communication</b>				
Communicating with management in a timely way about the status of the project.	.01	-.04	<b>1.02</b>	-.04
Communicating with management accurately about the status of the project.	-.03	.01	<b>.95</b>	-.02
Sharing organisational goals about the quality of services.	.06	.07	<b>.65</b>	.10
<b>Coordination</b>				
Project milestones and delivery schedules.	<b>.87</b>	.00	.05	-.12
Project documents and memos.	<b>.87</b>	.01	-.03	-.07
Requirements/design review meetings.	<b>.79</b>	-.10	.08	.07
Regularly scheduled team meetings.	<b>.73</b>	.10	-.07	.08
Design inspections.	<b>.71</b>	.02	.04	-.01
Formal policies and procedures for coordinating the team's work.	<b>.59</b>	.04	-.08	.18
<b>Monitoring</b>				
There are mechanisms in place to encourage employees to reflect on the outcomes of their efforts.	-.02	.02	-.02	<b>.92</b>
There are mechanisms in place to monitor employee contributions to new ideas and developments.	.05	-.12	.00	<b>.91</b>
There are mechanisms in place to assist employees adjust their approach if they find their efforts are taking them down the wrong path.	-.04	.30	.10	<b>.55</b>
<b>Team utilisation</b>				
Newly formed teams quickly establish a good understanding of each others' talents and skills.	-.09	<b>.91</b>	.05	.01
Teams are formed on the basis of an understanding of people's skills and abilities.	.00	<b>.86</b>	-.01	.02
Teams can be formed quickly as required.	.09	<b>.85</b>	-.05	-.11
Teams are continuously reconfigured to address the set of opportunities facing the organisation.	.10	<b>.62</b>	.04	.03
Eigenvalues	7.77	1.98	1.39	1.07
% of variance	48.54	12.38	8.66	6.71
$\alpha$	.90	.89	.88	.92

a Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

b Rotation converged in 10 iterations.

## APPENDIX N: EXPLORATORY FACTOR ANALYSIS RESULTS FOR INNOVATION (N=189)<sup>a, b</sup>

Innovation	Factor Loadings
Transforming innovative ideas into useful applications.	<b>.89</b>
Evaluating the utility of innovative ideas.	<b>.89</b>
Mobilising support for innovative ideas.	<b>.88</b>
Making team members enthusiastic for innovative ideas.	<b>.88</b>
Introducing innovative ideas into the work environment in a systematic way.	<b>.88</b>
Generating original solutions for problems	<b>.86</b>
Acquiring approval for innovative ideas.	<b>.84</b>
Searching for new work methods, techniques or instruments.	<b>.83</b>
Creating new ideas for difficult issues.	<b>.72</b>
Eigenvalues	6.84
% of variance	75.99
$\alpha$	.96

a Extraction Method: Principal Axis Factoring. Rotation Method: Promax with Kaiser Normalization.

b Rotation converged in 10 iterations.

## APPENDIX O: A SUMMARY OF STUDIES FOR MEASURING PSFS' PERFORMANCE

Study	Purpose	Sample	Performance measurement	Data source
Burke (1996)	To examine performance evaluation and counselling experiences within a single large professional services firm.	2,150 professionals in a single large professional services firm	performance evaluation and coaching experiences (mainly five-point Likert scale: 1 = not at all; 5 = to a great extent)	Survey
Greenwood et al. (2007)	To explore and compare the effects of ownership upon professional service firms	top 50 consulting firms worldwide	Productivity = total revenues per professional	<i>Consultants News and Management Consulting International</i>
Greenwood et al. (2005)	To find the determinants of PSFs' performance by analysing organisational reputation and diversification	160 accounting firms in US	Firm Performance = revenues per professional (R/P)	<i>Public Accounting Report</i>
Hitt et al. (2001)	To examine the direct and moderating effects of human capital on PSFs' performance	93 from 100 largest law firms in the United States	the ratio of net income to total firm revenue	<i>American Lawyer</i>
Hitt et al. (2006)	To examine the impact of human capital and relational capital on the internationalization of PSFs	72 from the 100 largest U.S. law firms	Firm performance = the ratio of worldwide net income to total firm revenue. Internationalization = the number of foreign offices and the number of lawyers in each office	<i>American Lawyer</i>
Malos (1996)	To investigate linkage among indicators of options-based career mobility strategies in PSFs and mentoring, developmental work experience, intentions to stay, starting salaries, and firm financial performance	117 of the nation's highest grossing law firms and other large firms in major urban centers.	Financial performance measures (revenues per lawyer, profits per partner, and the relative profitability index)	Am Law 100

Study	Purpose	Sample	Performance measurement	Data source
von Nordenflycht. (2007)	To examine if public ownership create negative consequences for professional service firms by reducing employee incentives in advertising industry	122 from the largest 200 agencies from the 1962 Advertising Age report.	Performance growth = an agency's percent annual change in revenue creativity = the number of Clio and ADCNY awards an agency won in a given year firm size = the logarithm of global revenue	Advertising Age report
Nucham (1999)	To address the difficulties associated with the measurement of productivity of professional service firms and to propose a more adequate measure of productivity in these industries.	60 largest management consulting firms active in Sweden	Output of the service producer (operational measure) : Turnover  Output of the client: Improved competitive position	Data Envelopment Analysis (DEA)
Pennings et al. (1998)	To examine the effect of human and social capital upon firm dissolution in PSFs	Entire population of Dutch accounting firms for the period 1880-1990	organisational dissolutions = the changes in accountants' organisational affiliations	Directories of accountant associations that appeared at one- to five-year intervals
Pinnington and Morris (2003)	To examine the proposition that the traditional archetype of the professional partnership is said to have changed into a more 'business-like' entity, the managed professional business.	756 partnership firms of solicitors in England and Wales	Comparative firm performance using a five-point Likert varying from 1=much better to 5 = much worse	Survey