Service productivity measurement
an application to Higher Education Business and Management schools

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Service Productivity Measurement: An Application to Higher Education Business and Management Schools

By:

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STUDENT DECLARATION

"I, Andrews Agya Yalley, declare that this PhD thesis entitled 'Service Productivity Measurement: An Application to Higher Education Business and Management Schools' contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work".

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ABSTRACT

The service sector over the last few decades has become a symbol of prosperity and growth in many economies around the world in terms of its contribution to GDP growth, employment and standard of living. Despite this, the perception among most economists that productivity of services lags behind manufacturing still persists. Several scholars have attributed this to the conceptual, empirical and practical problems of measuring productivity in services. In an attempt to address these problems, the systematic review of extant literature and existing scales and semi-structured interviews led to the development of a theoretically grounded model and multi-item scales for measuring service productivity and its related constructs. The data was collected from higher education academics using a questionnaire instrument and was analysed using exploratory factor analysis, confirmatory factor analysis and structural equation modelling to empirically assess and validate the proposed service productivity model and to test the research hypotheses.

The findings reveal that resource commitment positively and significantly influences employee readiness and customer readiness. In addition, resource commitment, employee readiness and customer readiness positively and significantly impact on service productivity. Finally, service productivity positively and significantly influences stakeholder satisfaction. Each of the relationships in the conceptual model was supported and resource commitment has the greatest impact on both employee and customer readiness. Overall, the results suggest that the antecedent determinants of service productivity are resource commitment, employee readiness and customer readiness and the consequential determinant of service productivity is stakeholder satisfaction.

Theoretically, this thesis advances our understanding of productivity measurement in services and contributes to its multidisciplinary theory building by establishing the determinants of service productivity and proposing and validating a conceptual model for measuring service productivity. Methodologically, this thesis contributes to the existing scales in marketing by developing new scales for measuring the researcher`s proposed constructs. Managerially, the proposed model and conceptual framework highlight the factors that service managers can employ in measuring, managing and improving productivity in their organisations.

PUBLICATIONS ASSOCIATED WITH THIS THESIS

Conference Papers

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ABBREVIATIONS AND ACRONYMS USED IN THIS THESIS

Abbreviation/Acronyms	Meaning
AIC	Akaike's Information Criterion
AMOS	Analysis of Moment Structures
APG	Aggregate Productivity Growth
AVE	Average Variance Extracted
CCB	Customer Citizenship Behaviour
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMIN	Relative Chi-Square
CR	Customer Readiness
CVR	Content Validity Ratio
DCB	Dysfunctional Customer Behaviour
df	Degree of Freedom
ECVI	Expected Cross-Validation Index
EFA	Exploratory Factor Analysis
ER	Employee Readiness
GDP	Gross Domestic Product
GFI	Goodness- of- Fit Index
HE	Higher Education
HEI	Higher Education Institution
ICT	Information and Communication Technology
KMO	Kaiser-Meyer-Olkin
MFP	Multi-Factor Productivity
MI	Modification Indices
NFI	Normed Fit Index
OECD	Organisation for Economic Co-operation and Development
PCA	Principal Component Analysis
PFP	Partial-Factor Productivity
RBV	Resource-Based View
RC	Resource Commitment
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modelling
SMC	Squared Multiple Correlation
SP	Service Productivity
SS	Stakeholder Satisfaction
TCA	Thematic Content Analysis
TFP	Total-Factor Productivity
TLI	Tucker Lewis Index
WTO	World Trade Organization

GLOSSARY OF TERMS

Term	Definition /Meaning
Service	The process of producing intangible outputs/outcomes.
Services	Intangible outputs/outcomes produced by service industries.
Goods	Tangible outputs produced by manufacturing industries.
Product	Refers to both goods and services.
Manufacturing Sector	This is the goods producing sector of the economy, which involves the transformation of raw materials to tangible products. Examples of manufacturing industries include: engineering industries; electronics industries; energy industries; chemical industries; metalworking industries; textile industries; food and beverage industries.
Service Sector	This is the tertiary sector of the economy, which involves the production of intangible products/services. Examples of service industries are professional services; health and social services; educational services; government services; financial services; travel and leisure services.
Manufacturing Production Process	The transformation of inputs to outputs and excludes customer inputs and participation in the production process.
Service Production Process	Relates to the transformation of inputs to outcomes and entail customer inputs and participation in the production process. In addition, outcome is determined by the customer and other stakeholders and is dependent on the consequence of the service on customers and other stakeholders.
HE Sector	Comprising institutions providing education at university level.
Performance	Consists of several concepts for measuring how well an organisation is managed and the value the organisation delivers to its stakeholders including productivity, profitability and customer satisfaction.
Productivity	Measures the relationship between outputs and inputs.
Service Productivity	Measures the relationship between the outcome of the service transformation process and the inputs to the service transformation process.
Subjective Measurement	Used to assess an experience, attitude, and perception of an organisation`s performance (Wang and Gianakis 1999).
Objective Measurement	Is the direct measure of an object, recorded by an investigator or through a technological means and data measured directly from the product during the process (McClelland 1995).
Co-production	The joint production of services by the organisation (employees/technology) and customers
Partial Employees	Customers involved in the production of services

CHAPTER ONE: INTRODUCTION CHAPTER

1.1 INTRODUCTION

The service sector has become a symbol of prosperity and growth in many economies around the world particularly in the developed economies and in recent times in developing economies. Notwithstanding the importance of productivity growth in services, particularly, in terms of its contribution to GDP growth, employment and standard of living to world economies, organisations, employees and individuals; productivity measurement in services has been the Achilles heel of most researchers and practitioners alike in attempting to understand how this can be measured holistically, particularly in capturing the important determinants of productivity in services. In addition, productivity research within Higher Education has been sparse and slow to take off, despite the importance of Higher Education to the economy and society and the persistent admonition for HE to evidence their value for money by students, government, funding agencies and other stakeholders involved and affected by HE. This thesis, therefore, develops a model for measuring productivity in services which is tested in the higher education (hereafter, HE) sector, specifically amongst Business and Management Schools across different countries.

This chapter firstly presents the background to the thesis. This leads to a discussion on the rationale for undertaking this thesis, intrinsically the aim and objectives of this thesis. This is followed by a discussion on the context of the study and the contribution of this thesis. Finally, the structure of the overall presentation of the thesis is discussed.

1.2 BACKGROUND TO RESEARCH

This section discusses the importance and productivity growth of the service economy, the factors contributing to the productivity growth of the service economy and, the debates relating to productivity growth of the service economy.

1.2.1 The Importance and Growth of the Service Economy

The intangible nature of service output has made it problematic to define services. In an attempt to adopt a concrete definition of services, Hill (1977: 318) defined it as:

> "a change in the condition of a person, or a good belonging to some economic unit, which is brought about as a result of the activities of some other economic unit, with the prior agreement of the former person or economic unit."

Grönroos (2000: 48) also defined it as:

> “Consisting of a series of activities where a number of different types of resources are used in direct interaction with a customer, so that a solution is found to a customer’s problem.”

Both Hill`s (1977) and Grönroos` (2000) definitions taken together recognise services as entailing the use of different resources to perform a series of activities or processes resulting in outcomes that have impact on people and goods belonging to an economic unit.

The service sector covers industries involved in production processes that transformed the condition of objects or people. These industries include the financial services,

transportation services, telecommunication and computer services, real estate services, construction services, health services, education services, wholesale and retail distribution, hotel and catering services, insurance services, professional services, business support services, government services, recreational services, and domestic services (WTO 2010). The service sector currently represents more than two-thirds of the world`s Gross Domestic Product (hereafter, GDP) (WTO 2010).

In addition, the service sector contributes significantly to national and organisational productivity growth in terms of employment, standard of living, poverty reduction and GDP as well as providing support and anchor for other sectors of the economy (OECD 2001; Garner 2004; D'Agostino et al. 2006; Chesbrough and Spohrer 2006). Furthermore, the rapid expansion of the service sector has become a symbol of prosperity and growth in many economies around the world, particularly in the developed economies and in recent times in developing economies. Quah (1997) attributed the economic growth in world economies to the growth in the services sector. According to WTO (2010), the service sector contributes about 73%, 54%, and 47% to GDP in developed, emerging and developing economies respectively.

In developed economies, the service sector contributes about 70% to 80% to GDP and employment respectively and this growth is expected to increase further (Wölfl 2003; Jones and Yoon 2008; Maroto-Sanchez 2010). For instance, the International Labour Organisation (2006) estimates that about 75.3%, 72.6%, 69.2% and 68.1% of all employments in USA, UK, Germany and Japan respectively were in the service sector and this trend is expected to continue.

In developing and emerging economies, similar trends are emerging but with a twist. In South Africa for instance, Tregenna (2007) observed greater growth in services in terms of GDP (64.7%) and employment (65.1%) while the manufacturing sector lagged behind with GDP (19.44%) and employment (14.1%). Liberia on the other hand was dominated by the agricultural economy as highlighted in Figure 1.1. In India and China, both manufacturing and services contributed proportionately to economic growth, GDP and employment (Rodrik and Subramanian 2004; Dasgupta and Singh 2006; Alessandrini et al. 2007; Chinesestock 2010). Finally, the resilience of the service economy around the world during the current global financial crisis testifies to the importance of services to national economies. See

Figures 1.1 and 1.2 for service contribution to GDP and employment respectively across different countries.

(WTO 2010)

Figure 1.2: Share of Services Employment in Total Employment for 1997 and 2007 (Percentage)

(WTO 2010)

1.2.2 Factors Contributing to the Growth of the Service Economy

The growth of the service sector was not magical, but is attributed to the changing nature of human and societal needs, the increasing importance of stakeholders, the impact of technology and the changing nature of today`s business practices. The factors contributing to the growth of the service economy are discussed next.

The growth of the service economy is firstly attributed to the increasing intermediate demand (outsourcing) from firms. As firms becomes more competitive and resort to specialisation by focusing on their core competence, outsourcing becomes the modus operandi of doing business. This involves firms using other firms to perform functions they cannot perform. Domberger`s (1998) analysis of intra-firm transactions substantiates the contribution of intermediate firms to the growth of the service sector. In addition, increasing government regulations, stakeholders' interest and social change in recent years, have compelled organisations to outsource legal, accountancy and financial services in order to comply with such requirements. This has led to the creation of new services in the economy and contributed to the growth of the service economy (Gordon and Gupta 2004; Banga and Goldar 2004; Maroto-Sanchez 2010). According to economic researchers, about 40% of all employment in the economy is attributed to intermediate demand from firms and outsourcing (OECD 2005a; Maroto-Sanchez 2010). Greenhalgh and Gregory (2001) and Gregory and Russo (2006) both observed that outsourcing between service industries is a major contributor to the growth of the service economy.

Secondly, the growth of the service economy is attributed to the multiplier effect of services. Palmer (2008) identified multiplier effects of services as contributing to the growth of the service sector. This relates to the impact of the growth of a service industry on other service industries, for example, the impact of the holiday and leisure industry on the airline industry. Khan et al. (1995) for instance noted that multiplier effect has a positive impact on economic growth. Thirdly, the increasing number of new products from the manufacturing sector to the consumer market has contributed to the growth of service economies. For instance, Osberg et al. (1989) observed that the increasing demand for manufacturing outputs positively impacts on service sector growth. Melvin (1995), therefore, concluded that the expansion of the manufacturing sector has a positive impact on the service sector and vice

versa. Aarnio (1999) further asserts that both goods and services are complementary to each other and that an increase in demand for one will impact positively on the demand for the other. Other scholars have also observed a positive relationship between manufacturing and service sector growth through intermediate demand and outsourcing (OECD 2005b; Gregory and Russo 2006; Baker 2007).

Fourthly, the importance of Information and Communication Technology (ICT) in organisational activities has contributed to the growth of the service economy. ICT has been found to be associated with the growth of services (Glasmeier and Howland 1994; Jorgenson and Stiroh 1999). Finally, increasing household income and purchasing power as well as increasing life expectancy particularly in developed economies have contributed to the growth of service economies (Maroto-Sanchez 2010, Gleich et al. 2009).

1.2.3 Debates "Against" the Productivity Growth of the Service Economy

Despite the importance and growth of the service economy, particularly in terms of GDP and employment, most economists have regarded productivity of services as lagging behind manufacturing (Baumol 1967; Roach 1991; Brynjolfsson 1991; Maclean 1997; Wölfl 2003, 2005; D'Agostino et al. 2006, Maroto-Sanchez 2010). For instance, Maclean (1997) contends that, while the service sector has been growing rapidly as a share of total output, Aggregate Productivity Growth (hereafter, AGP) has generally lagged behind that of the manufacturing sector. These studies have found greater APG in manufacturing than in services (Rowthorn and Ramaswamy 1997; Scarpetta et al. 2000; Wölfl 2003, 2005; D'Agostino et al. 2006). An OECD report observed that the diverse nature of the service sector has led to different productivity growth rates in services ranging from negative and low growth rates to high growth rates exceeding high growth manufacturing industries. This situation has led to the productivity level in services being regarded by most economists as lagging behind manufacturing (Wölfl 2003).

The perception among most economists that productivity in services lags behind manufacturing has led to the diagnosis of the service sector with "Baumol disease" and been referred to by some other economists as a "productivity paradox", resulting in the "manufacturing matters" and "deindustrialisation" debates. In Baumol`s (1967) seminal paper, he argued that productivity is unbalanced between the manufacturing and service sectors of the economy, which he termed "progressive" and "stagnant" sectors respectively. Baumol further argued that the unbalanced growth between these sectors encourages the diversion of resources to the stagnant service sector, which ends up slowing down APG in the economy, a situation which he referred to as the "Baumol disease". Roach (1991) and Brynjolfsson (1991) observed a similar scenario three decades later, which they referred to as the "productivity paradox". This relates to the situation in services, whereby there is increasing employment in services and significant investment in ICT, yet productivity levels remains low.

On the deindustrialisation debate, proponents argue that the transformation of the economy into a service economy is an illusion. This is because output in manufacturing has not shrunk; instead, employment has gone down, which is good news for manufacturing (Tomlinson 1997). Bacon and Eltis (1976) also, in their deindustrialisation debate, criticised the growth of the service economy based on classification problems and the nature of service jobs, which are low paid. Concerning the manufacturing matters debate, Cohen and Zysman (1987) in their book, "The Myth of the Post-Industrial Economy", challenged the existence of the post-industrial economy (service economy) as a misleading myth, particularly the suggestion that developed countries can strategise on services at the expense of manufacturing. They further argued that the existence of the service economy would not be possible without a strong manufacturing sector, to which a significant amount of services are rendered.

1.2.4 Debates "For" The Productivity Growth of the Service Economy

In countering the preceding arguments against the productivity growth of the service economy, several scholars have challenged the characterisation of the service sector growth as Baumol disease and a productivity paradox, as well as the deindustrialisation and manufacturing matters debates, based on the conceptual and methodological approaches used, which favoured the measurement of manufacturing output over service outputs (Panko 1991; Griliches 1994; Oulton 2001; Wolfi 2003; Triplett and Bosworth 2003; 2006, Hartwig 2006; Pugno 2006).

The commonly held belief among economists that productivity of service industries lags behind manufacturing industries has been challenged on the grounds that productivity is inappropriately measured in services using manufacturing based measures (Maclean 1997; Wölfl 2003; Paton et al. 2004). Wölfl (2003) attributed the productivity mismeasurement in services to underestimation of productivity growth in services, which further leads to underestimation of APG, through aggregation effects and the flows of intermediate inputs. The mismeasurement of service productivity (hereafter, SP) has been attributed to problems of accounting for multiple inputs and outputs in services, the labour-intensive nature of services and the characteristics of services (Brynjolfsson 1993; Nordhaus 2002; Wölfl 2003). In addition, various scholars have attributed the mismeasurement of productivity in services to the following:

- The piecemeal nature of SP research, which is limited to individual service industry rather than the entire service sector (Singh et al. 2000; Sahay 2005; Zemguliene 2009);
- The inadequacy of definition of SP (Vuorinen et al. 1998; Tangen 2002; Johnston and Jones 2004)
- The lack of proper specification and documentation of the production process in services (Adam et al. 1981; Mills et al. 1983; Shostack 1987)
- The overreliance of traditional and manufacturing based methods and concepts of measuring productivity (McLaughlin and Coffey 1990; Nachum 1999; Grönroos and Ojasalo 2004; Djellal and Gallouj 2008).

Concerning the aforementioned points, Maroto-Sanchez (2010) concluded that productivity in services is inadequately studied by researchers, underestimated by politicians and insufficiently exploited by businesses and as a result, the traditional perception of services as unproductive still persists. In addition, Linna et al. (2010) describes the task of measuring productivity in services as a challenge for both researchers and practitioners.

As a result of the preceding arguments, several scholars have observed and commented on the inadequacy of SP conceptualisation and measurement (Lindsay 1982; Arnett and Schmeichel 1984; Cutcher-Gershenfeld 1996; Vuorinen et al. 1998; Nachum 1999; Tangen 2002; Rutkauskas and Paulaviciene 2005; Djellal and Gallouj 2008). In view of this, several other scholars have called for service-specific productivity concepts and measures to capture the unique characteristics of services (Hoque and Falk 2000; Hipp and Grupp 2005; Linna et al. 2010). This involve as a starting point, an understanding of the production process in services as well as defining SP holistically. It also involves the proper specification of inputs and outputs and the conceptualisation of service-specific productivity concepts and measures (Mills et al. 1983; McLaughlin and Coffey 1990; Gummesson 1991; 1994; Vuorinen et al. 1998; Nachum 1999; Dobni 2004; Grönroos and Ojasalo 2004; Linna et al. 2010).

Based on the aforementioned discussions on the background to this study, this thesis addresses the productivity mismeasurement issues in services by developing a holistic model for measuring SP, which conceptualises SP by taking into consideration the characteristics of services, the production processes in services and, the nature of inputs and outputs/outcomes in services. The research aim and objectives are discussed next.

1. 3 RESEARCH AIM AND OBJECTIVES

The mismeasurement of productivity in services has attracted scholarly research into SP. Extant research so far has been limited to specific service industries rather than the entire service sector (Singh et al. 2000; Sahay 2005; Zemguliene 2009). In addition, scholarly research has failed to define SP properly and failed to specify the production process in services, which is a precondition to any development in the measurement of productivity in services. Furthermore, existing research has relied on traditional productivity measures, which are grounded in manufacturing productivity concepts as well as classical and neoclassical economic theories focusing on the interest of the organisation/shareholders rather than the overall interest of all stakeholders. Based on the aforementioned problems, it is the understanding of the researcher that the measurement of SP is possible, practical and meaningful only if it is measured holistically by:

- Understanding the production process in services.
- Defining SP holistically.
- Developing a theoretical model that integrates the production process in services and the holistic definition of SP, represents the overall stakeholder perspective and conceptualises SP from a multidisciplinary perspective.

This thesis, therefore, extends the knowledge on SP from a theoretical, methodological and managerial perspective by advancing our understanding of productivity measurement in services and contributes to the multidisciplinary theory building on SP by establishing the determinants of SP and proposing and validating a model for measuring SP. In addition, it highlights the factors that service managers can use in measuring, managing and improving productivity in their organisations. The aim and objectives of this PhD thesis are discussed next:

1.3.1 PhD Thesis Aim

The aim of this thesis is to develop a theoretically grounded model for measuring productivity in services which is tested in Business and Management Schools of the HE sector.

1.3.2 PhD Thesis Objectives

The objectives of this thesis are:

- To understand the production processes in services.
- To define productivity holistically in the service context.
- To identify the determinants of productivity in services.
- To develop a theoretically grounded model and a scale to measure the determinants of SP.
- To carry out an empirical examination of the proposed model in Business and Management Schools of the HE sector.

1.4 RESEARCH CONTEXT

This thesis proposes a model for measuring productivity in services, which is tested in Business and Management Schools within the HE sector in different countries. Based on this proposition, the background of the service industry and the HE sector is discussed next (See also Chapter Two for an in-depth discussion on the background of the HE sector in Finland, Ghana, India and the UK).

1.4.1 Nature of the Service Industry

The rapid expansion of the service sector has become a symbol of prosperity and growth in many economies around the world particularly in the developed economies and in recent times in emerging and developing economies. Hill (1977) noted that services have become a characteristic feature in most economies around the world[1]. The service industry refers to the industry within an economy that creates intangible outputs rather than tangible output as in the case of manufacturing and agricultural industry and involves the provision of services to consumers, businesses and government. The distinction between services and other industries has been debated on four main characteristics. These are intangibility, inseparability, heterogeneity and perishability (Grönroos 1990; Kotler and Keller 2006). In addition, the service industry has been classified into different sectors and sub-sectors. Table 1.1 presents a summary of the classification of the service industry.

[1] See Section 1.2.1 for further information on the importance of service to GDP and employment

Table 1.1: Service Industry Classification

Sources	Classification
OSHA (2011)	Transportation service Communications service Electric, Gas, and Sanitary services Wholesale Trade services Retail Trade services Financial services Insurance services Real Estate services Public Administration services Hotel services Personal services Business services Automotive Repair services Parking services Miscellaneous Repair services Amusement and Recreation services Health services Legal services Educational services Social services Museums, Art Galleries, Botanical and Zoological Gardens Services
World Trade Organisation (1991)	Business services Professional services Computer and Related services Research and Development services Real Estate services Rental/Leasing services Other Business services Communication services Construction and Related Engineering services Distribution services Environmental services Financial services Health Related and Social services Tourism and Travel Related services Recreational, Cultural and Sporting services Transport services Educational services[2]

[2] Educational services are categorised into primary education services; secondary education services; HE services ; adult education; other education services

1.4.2 Higher Education Sector - Research Context Justification

The context of this thesis is the HE sector. The HE sector includes a wide range of institutions including colleges, specialist institutions and universities (Browne 2010). In addition, HE institutions have been categorised based on subject discipline into different faculties and schools. These include Engineering, Health and Life Sciences, Law, International Studies, Social Science, Languages, Computing, Art and Design and Business and Management Schools. The importance of the HE sector includes the creation of skills, knowledge, and values that guides a civilised society, as well as higher economic growth and improved health of a nation. Chapter Two presents a detailed discussion on the background information of the HE sector in Finland, Ghana, India and the UK as well as the challenges facing the HE sector in the 21st century. In addition, Section 6.7 discusses the rationale for collecting data in Finland, Ghana, India and the UK.

The HE sector was chosen as a context for this study for several reasons. Firstly, several scholars in the service sector have utilised sampling approach in selecting a sample of service industry/industries as representative of the service sector. In developing the SERVQUAL model, Parasuraman et al. (1988) selected five service industries as presenting a broad section of the service sector based on Lovelock`s (1980) classification of services. On the SP domain, several prominent scholars have selected a sample of service industries as representative of the service sector. These include: management consulting industry (Nachum 1999), engineering service industry (Sahay 2005) and insurance industry (Vuorinen et al. 1998). In addition, convenience, cost, time and practicality considerations were given to the choice of the sampled service sector. Based on the preceding discussion, this thesis selected the HE sector as representative of the service sector. Data was, therefore, collected in the HE sector while the result was generalised to the service industry. The reasons for selecting the HE sector in addition to the aforementioned reasons are as follows:

Firstly, the HE sector was selected for practicality and convenience reasons. Access to data is a very important criterion in every researcher's decision making, particularly in productivity and performance research. This is because, in the recent economic crises, productivity is a sensitive issue for organisations; therefore, collecting data from

organisations was anticipated to be very difficult. The researcher envisaged problems of low response rate and bias in respondent responses. As a result of these difficulties, the HE sector was selected because of the researcher's access to employees within the HE sector and academics` appreciation and respect for research; therefore, academics will be more willing to respond to questionnaires. Also, since the researcher works within the HE sector, access to data and key personnel were easy and convenient.

Secondly, the HE sector possesses the characteristics of all services industries, which are intangibility (the output of education is reflected in change of behaviour and thinking); inseparability (requires both provider and student presence to co-produce); heterogeneity (lectures cannot be standardised because of their dependence on individual lecturer and student needs); and perishability (a lecture delivered cannot be stored) (Shostack 1977; Shanka and Terigin 2009). In addition, since productivity is about the measurement of the service process, the HE sector possesses all the different service transformation processes identified in the literature[3]. Table 1.2 presents the different service transformation processes in the HE sector.

Further, the HE sector has some commonality with most of the other service sectors as well as performing similar functions to those performed by other service industries. For instance, the HE sector, apart from teaching and research, undertakes professional and consultancy services to businesses. Furthermore, while most HEIs are considered as public sector entities, they perform similar functions and managerial practices available in the private sector. These include generating income, attracting and satisfying customers, cost saving, profit making, improving reputation and ranking and international trading through selling of services abroad and validating degrees overseas. Shostack (1977) in his most widely cited and accepted paper on the characteristics of services, identified the education sector as the most intangible, along with consultancy services; thus providing some degree of convergence.

Thirdly, the HE sector provides an important and interesting context for SP research. This is because HEIs are currently facing global, national and technological challenges and competition as well as coming under increasing scrutiny and pressure from various

[3] See Section 4.3 for classification of service process

stakeholders to prove their value for money. Thus, productivity issues have become an important dialogue in HE agendas and discussions. Finally, since this thesis proposed to collect data in an international context, the HE sector was chosen because of its ease to measure and commonness in a global context (O`Mahony and Steven 2004).

Based on the preceding discussion, the proposed theoretical model for SP was developed for the service sector and empirically tested within the HE sector, with the objective of contributing conceptually and practically to the measurement of productivity in the service sector in general and in the HE sector in particular. However, it must be emphasised that, despite the similarities of the HE sector to other services, the HE sector also differs from other services, particularly the service factories, in terms of its specific inputs, processes and outputs/outcomes and as a result, the application of the empirical evaluation of the proposed SP model should be taken with caution.

Table 1.2: Higher Education Process Types

Service Process Type	**Higher Education Process**
Provider only	Academic research activities, back office and administrative duties, journal and book writing and preparation of lecture materials.
Provider and Customer	Lecture, tutorials, seminars and pastoral care.
Customer + Customer(s)	Student group works and presentations.
Customer only	Distance learning, assignment and course work preparation and submission.

Source: Author

1.5 RESEARCH APPROACH

Having defined SP and its related constructs and identified its determinants, a positivist approach was adopted for this thesis. Extant literature was systematically reviewed from multidisciplinary perspectives to develop a conceptual model, propose six hypotheses

and identify items for the new scales relating to SP and its related constructs. In addition, a semi-structured interview was undertaken to generate an item pool for the scale development. Following that, a card sort exercise was undertaken to refine the scale. Further, a pilot study was undertaken to critique the measurement instrument and questionnaire. Furthermore, an EFA study was undertaken in order to identify the underlying constructs capturing the item pool. Finally, the main study was undertaken using a sample size of 447. Respondents were business and management academics within HEIs across four countries. Respondents responded to a self-administered questionnaire on their perception of the productivity of their institution. Structural equation modelling techniques were employed to validate the scale and conceptual model as well as to test the research hypotheses.

1.6 RESEARCH CONTRIBUTION

The contributions of this thesis can be discussed from a theoretical and managerial perspective (See Section 10.7 for a detailed discussion). These are discussed next:

1.6.1 Theoretical Contribution

Theoretically, this thesis furthers our understanding of the production process in services, the service encounter as well as contributes to the definition of SP from a holistic perspective. In addition, it advances our understanding of productivity measurement in services particularly in the HE sector by establishing the factors/determinants of SP and by introducing the constructs employee readiness, customer readiness, resource commitment and stakeholder satisfaction to the SP and HE productivity research domain as well as in the service marketing/management, operational and human resource management research domain.

Furthermore, this thesis adds value to current research themes in service management including the service dominant logic of marketing, customer co-production/integration and value co-creation concepts. Moreover, it extends the concept of value to a stakeholder perspective as opposed to current marketing perspectives, which limits value concepts to customer and organisational domain. The theoretical contributions of this thesis, will in the long run further the understanding and measurement of APG in services among economists and statisticians.

1.6.2 Managerial Contribution

From a practitioner`s perspective, this thesis enhances the tools for measuring productivity in services particularly in the HE sector. The proposed model highlights the antecedents and consequences of SP, therefore, enabling service managers to update or adopt new measures, tools and, approaches for measuring and managing productivity in their organisations. In addition, the proposed model will enable service managers to identify productivity problems in their organisations and provides possible solutions. Further, this thesis offers solutions to service managers on the strategies by which employee and customer readiness can be developed and managed towards the co-production of service. Furthermore, the proposed service production process and conceptual framework will enable service managers to design/re-design their service blueprints and servicescapes; identify problematic areas within their production process; and provide possible solutions that will enhance the service encounter and experience. Finally, this thesis offers service managers the strategies for enhancing organisational tactical and strategic decision making and developing relationships with stakeholders.

1.7 THESIS STRUCTURE

To achieve the aim and objectives of this research, this thesis is structured into different chapters, with each chapter structured around a set of questions which build upon each other to meet the overall aim and objectives of this thesis. Figure 1.3 shows the structure of the thesis. This thesis is organised into ten chapters as follows:

Chapter One: This chapter provides the background to this research and outlines the aim and objectives of this thesis as well as the scope and context, significance and contribution of this thesis.

Chapter Two: Explores the background to the HE sector in different countries, followed by a discussion on the productivity issues and challenges pertaining to the HE sector in the 21st century.

Chapter Three: Provides a review of extant literature on productivity and performance in general and the various concepts, measures and approaches in measuring productivity in the different sectors of the economy.

Chapter Four: Sets the scene for the researcher's conceptualisation by reviewing how the extant literature has defined and conceptualised SP and its related constructs in terms of its contribution and limitations to this study.

Chapter Five: Presents the conceptual model and theoretical framework underpinning this study. It defines SP holistically and conceptualises SP by proposing a model for measuring productivity in services and identifying the determinants of productivity in services, which relates to the antecedents and consequence of SP and hypothesised relationships between SP and its related constructs.

Chapter Six: : Discusses and justifies how the researcher evaluated the various philosophical paradigms as well as the data collection and analysis strategies in making the optimum choice regarding the research methods for tackling the research aim and objectives. This chapter

covers the data collection and analysis methods for the scale development and purification study and the norm development study. In addition, strategies for dealing with anticipated problems and errors, and the ethical considerations relating to this research are covered.

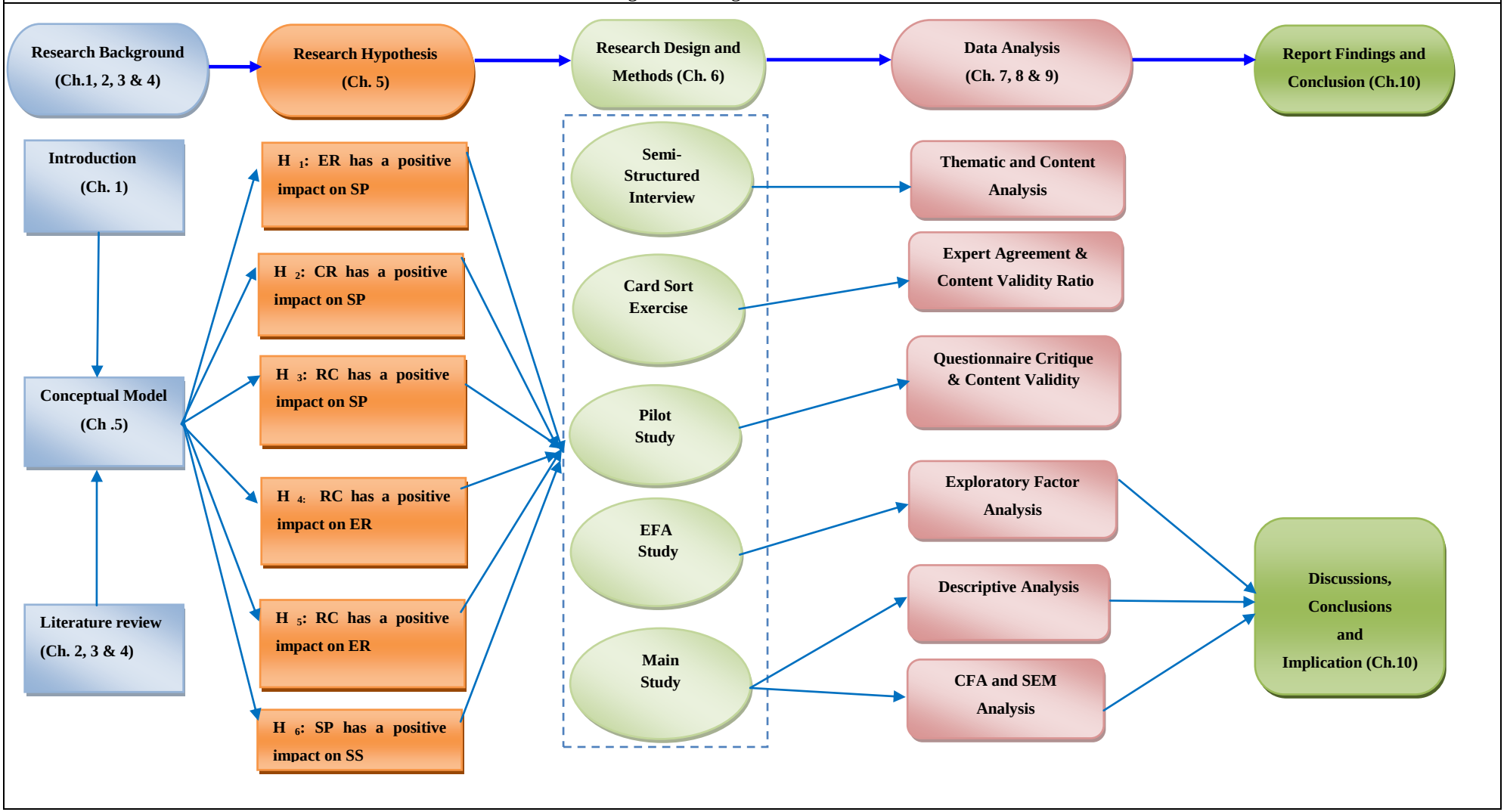
Chapter Seven: Presents an overview of the scale development process used to develop the research instrument. It delineates how the scale items were identified and purified and reports the findings of the different data collection methods used to develop the scale. This reports the findings of the semi-structured interviews, card sort exercise, pilot study and EFA study.

Chapter Eight: Presents a descriptive analysis of the demographic characteristics of the research samples and the scale items for the main study. This provides an overview of the demographic characteristics of the samples under the study; provides insights into the normality of data, which relates to the identification of outliers and missing data and provides an overview of the descriptive analysis of the proposed model constructs.

Chapter Nine: Evaluates and reports the results of the proposed measurement and structural model fit, as well as the reliability and validity of the proposed model and further presents and interprets the results of the researcher's hypotheses.

Chapter Ten: The final chapter discusses the findings of the study in relation to the literature review, with particular emphasis on the proposed SP model and with the aim of answering the research questions. It further outlines the theoretical, methodological and managerial implications of the findings and finally concludes with a reflection on the research limitations and highlights the avenues for future research.

Figure 1.3 : Organisation of Thesis



1.8 CONCLUSION

In summary, this chapter presented the rationale for undertaking this thesis, which aims to develop a model for measuring productivity in services, which is tested in Business and Management Schools of the HE sector. It highlighted the aim and objectives on which this thesis has been structured.

The next chapter explores the background to the HE sector in Finland, Ghana, India and the UK and discusses the emerging issues within the HE sector, including the productivity challenges facing the HE sector in the 21st century and the determinants of productivity in HE.

CHAPTER TWO: BACKGROUND TO THE HIGHER EDUCATION SECTOR AND PRODUCTIVITY ISSUES

2.1 INTRODUCTION

This study develops a theoretically grounded model for measuring productivity in services, which is tested in the HE sector. Based on this backdrop, this chapter firstly explores the background to the HE sector in Finland, Ghana, India and the UK. It then discusses the emerging issues within the HE sector, which entail an understanding of the productivity challenges facing the HE sector in the 21st century and finally discusses the determinants of productivity in HE. This understanding is necessary as the proposed theoretical model of SP will be applied within the HE sector.

2.2 BACKGROUND TO THE HE SECTOR

Among the key objectives of this thesis was to carry out an empirical examination of the proposed SP model within the HE sector. This necessitates a better understanding of the HE sector, particularly, an understanding of the HE sector across the different countries from which data was collected. For this reason, the background to the HE sector in Finland, Ghana, India and the UK is discussed next. These countries were selected for convenience reasons as well as representing developed (UK and Finland); emerging (India); and developing (Ghana)

economies. See Sections 6.7.1, 6.7.2, 6.7.3 and 6.7.4 for the rationale for selecting these countries.

2.2.1 Higher Education Sector in Finland

The Finnish HE sector comprises two parallel sectors: universities and polytechnics (Ministry of Education 2005). There are 20 universities in Finland and are all state-owned and mostly financed by the state. In addition, the military academy under the Ministry of Defence provides university-level education (Vossensteyn 2008). The universities focus on scientific research and education and have the right to award Bachelor's and Master's degrees, and postgraduate licentiates and doctorates. There are also university centres in areas with no university of their own and these centres organise university activities in the region (Ministry of Education 2008).

The first university in Finland was established in Turku in 1640 (Eurydice 2007; 2008). The second university; Helsinki University of Technology, was founded two centuries after and between 1910 and 1920, Finnish-language and Swedish-language universities were also established. Three decades on, universities specialising in economics and technology were established as a result of business and industry needs (CHEPS 2008). However, the most rapid expansion within the sector took place between the 1960s and 1970s. This was fuelled by rapid economic growth, an increased number of people with secondary education qualification, high demand for a highly educated labour-force as well as the drive for equality in HE (Vossensteyn 2008).

In addition, the polytechnics were set up over a period of ten years to offer professional competence. There are 29 polytechnics and the first polytechnics gained a permanent status in 1996. The polytechnics have the right to award Bachelor and polytechnic Master degrees. In addition to the physical polytechnics, there is also a virtual polytechnic**,** which is a network of all the polytechnics in Finland brought together with the aim of developing, producing and offering flexible education using technology (Vossensteyn 2008). Polytechnics are municipal or private institutions but are regulated by the government in

terms of their educational mission, fields of education, student numbers and location while the polytechnics make decisions on their internal affairs . In addition, the cost of running polytechnics is shared by both the government and local authorities (Ministry of Education 2008).

Participation in the Finnish HE sector is high; according to Statistics Finland (2008), the total participation rate in HE is 73% of the relevant age group. Among these, 43% are in universities while 30% are in the polytechnics (OECD 2007). In 2006, of all HE students studying in Finland, 62% were studying for a higher tertiary degree while 24% were studying for a lower tertiary degree. In addition, a total of 14% of all students were studying at the doctorate level or attending specialist training of doctors. In the same year, the proportion of women attending HE was 54% and the number of international students in Finnish universities was about 5,400 (Ministry of Education 2007a).

Further, the drop-out rates are relatively low with 4.7% in universities and 6.4% in polytechnics (Ministry of Education 2007a). In 2006, the universities awarded 19,400 university degrees while the polytechnics awarded 20,000 polytechnic degrees and 200 polytechnic Master's degrees (Ministry of Education 2007b). Furthermore, in 2001, the unemployment rate among HE graduates was 6% compared with the overall unemployment rate of 12%, and 19% among those with no post-compulsory qualifications. On average, university graduates earn € 45,000 a year while the annual income of HE graduates is € 36,000. This is far better as compared to the national average income of € 27,000 (Vossensteyn 2008).

The HE sector in Finland employs about 8400 and 6300 teaching and research staff respectively. Among the employees, 60% are lecturers and 22% are professors (Ministry of Education 2005). The student-teacher ratio in universities is 22:1 and there are 1.6 Master's degrees awarded per teacher and 0.6 doctorates per professor (Vossensteyn 2008). The general qualification requirement for teaching and research staff is academic competence; however, recently more attention has also been paid to teaching skills (Vossensteyn 2008). In the polytechnics, about 26.4% and 38% of the teachers have PhDs and licentiates respectively (Ministry of Education 2005). Polytechnic teachers` duties entail teaching and guiding students however, research is gradually being developed at Finnish polytechnics as well (CHEPS 2008).

In order to improve the performance of the HE sector in Finland, the government has outlined the future development strategies for the sector with the objective of improving and strengthening the quality assurance in universities and polytechnics. Among them, is the HE Development Act (1966 and 1987). This aimed to ensure a steady growth of resources; increasing the number of study places; increasing international competiveness as well as shifting emphasis towards performance based government steering of the HE system (Vossensteyn 2008). In addition, there are a number of developments going on in the Finnish HE sector. The major issues under consideration in 2008 are listed here: combating drop-out; polytechnic-university co-operation; increasing externally funded research contract activities; improving on the autonomy and legal status of HEIs; and developing strategies for the internationalisation of the Finnish HE sector (Vossensteyn 2008).

2.2.2 Higher Education Sector in Ghana

HE in Ghana is offered by universities, polytechnics, colleges and training institutes (Morley et al. 2007). Historically, although the Achimota College was the first institution to offer HE courses in engineering, the University of Ghana (formerly, the University College of the Gold Coast) established in 1948, was the first recognised university in the country. Following this, the Kwame Nkrumah University of Science and Technology (formerly, Kumasi College of Technology) and the University College of Cape Coast were also established in 1951 and 1962 respectively (Morley et al. 2007). Three decades later, the University of Education, University of Development Studies, and the University of Mines and Technology were also established (Effah 2003; NCTE 2006a). In addition, the Ghana Institute of Languages and the University College of Agriculture and Environmental Studies were established in 1961 and 1963 respectively (NCTE 2006a).

Further, although the polytechnics were initially established to provide non-tertiary qualifications, in 1987, as a result of the skills gap in labour supply for industries, the Government of Ghana formed the University Rationalisation Committee (URC) in order to restructure HE in Ghana. This led to the promulgation of the Polytechnic Law, 1992 (PNDCL 321), which upgraded the polytechnics into HE status and subsequently, the commencement

of Higher Education Diploma (HND) programmes in 1994 (Boakye-Agyeman 2006). Further, the National Council on Tertiary Education (NCTE) was established in 1993 to ensure the efficiency and effectiveness of the HE sector. This was followed by the formation of the National Accreditation Board (NAB) and the National Board for Professional and Technician Examinations (NABTEX) for accrediting degree level programmes and professional and technician examinations institutions (Morley et al. 2007).

Over the last decade, the HE sector in Ghana which was predominantly public owned, has witnessed increased participation of the private sector. This has been attributed to government reforms in HE, the deregulation of the HE sector, improved democratisation in Ghana, declining capacity of public universities, the emphasis on a highly skilled labour-force and increased demand for HE (Teferra and Altbach 2004; Adu 2009). The increase in demand for HE has been attributed to the increasing participation of females and people from poorer social backgrounds as well as Ghana`s attraction for international students particularly from Nigeria as a result of Ghana`s stability, democracy and culture (Morley et al. 2007; Costa 2012). For instance, between 1999 and 2006, student numbers doubled to more than 118,000 and in 2006, private universities enrolled 9,500(8%) of all HE students, while the polytechnics had 24,660 (20%) students (Adu 2009).

In addition, overall enrolments have increased more than ten times over the past two decades as a result of the political and social pressures on HE (Adu 2009). In 2003/2004 over 18,000 students enrolled in the seven public universities while over 5,000 students enrolled in the private university and by 2005/6, this figure had increased to over 9,000 (Ofori-Attah 2005;NCTE, 2006b). And between 2001/2002 and 2007/2008 academic years, enrolment in polytechnics and public universities increased by 69% and 103% respectively (Bailey et al. 2010.).

Despite the importance of the HE sector to Ghana`s economy as well as government reforms and the increasing number of private sector participants in Ghana`s HE sector, HE providers have failed to meet the growing demands. For instance, the University of Ghana, despite the high number of prospective students who applied in 2008, only 38% were admitted (Adu 2009). In addition, funding for HEIs has decreased substantially since the establishment of the first public university, leading to the introduction of tuition fees in 1988-89 academic year (Morley et al. 2007). To illustrate this point, the government contribution

per student, in real terms decreased by almost 75% during the 1990s and currently, the government provides about 70% of the total costs of running HE while the public universities raise the remaining 30% from tuition fees and donations (Adu 2009). According to Girdwood (2009), expenditure per FTE student reduced from an average of US $2,500 a year per university student in 1990, to approximately US $900 in 1997; and from US $180 a year in the polytechnics to about US $74 in 1997. Adu (2009) identified that the economic returns on investment in primary education in Ghana is higher than that of the HE sector.

Girdwood (2009) attributed these problems to the failure of the HE sector to implement cost-sharing, cost-recovery mechanisms and inability to generate sufficient income. In summarising the problems facing Africa`s HE sector in general, Teferra and Altbach (2004) identified financial, misallocation and poor prioritisation of available resources; inability of students to afford tuition fees; shortages of teaching and research resources; delays in salaries; excessive non-academic staff; and brain-drain to overseas or other sectors of the economy. For instance, a study comparing the salary levels in the different sectors of Ghana`s economy, revealed that the pay levels in the financial, energy and media sectors were higher than in the HE sector (Effah 2003).

In an attempt for Ghana to address these problems and to increase the productivity of the HE sector, a number of initiatives have been suggested. These include attracting highly qualified academics with PhDs, increasing research output, increasing funding, making HE accessible to females and people from poor economic background and attracting international students ((Morley et al. 2007; Bailey et al. 2010). In addition, a survey conducted in 2002 suggested that over 70% of students in Ghana are willing to pay higher fees for quality education; suggesting the importance of service quality to HE students in Ghana (Adu 2009).

2.2.3 Higher Education Sector in India

Prior to the British entry into India to establish schools in the medium of English language in 1818, India had three distinct traditions of advanced scholarship including the Hindu *Gurukulas*, the Buddhist *Viharas*, and the Quranic *Madarasas* (Perkin 2006). In 1857,

three federal universities under the London University were set up in Calcutta, Bombay and Madras and 27 existing colleges were affiliated to these three universities. At the time of independence in 1947, there were 19 universities and several hundred affiliated colleges (CABE 2005). In the three decades after independence, the HE system in India grew rapidly and by 1980, there were 132 universities and 4738 colleges and the enrolment rate among the eligible age group in HE was about 5% (Agarwal 2006).

Currently, India has the third largest HE system in the world in terms of enrolment (after China and the USA). In addition, India is the largest HE system in the world in terms of number of institutions. It has 17973 colleges and universities and the number of institutions is more than four times the number of institutions in both the United States and the whole of Europe (Agarwal 2006). The number of universities has increased from 25 in 1947 to 348 while the number of colleges has also increased from 700 in 1947 to 17625 in 2005. In addition, the total enrolment increased from a mere 0.1 million in 1947 to 10.48 million in 2005. The colleges that are affiliated to universities constitute the largest market of the HE sector and contribute about 89% of the total enrolment (Agarwal 2006).

The growth of India's HE sector can be divided into three phases. The first phase was from 1947 to 1980 and is characterised as highly regulated by the government, hence affecting the autonomy of institutions and subsequently affecting standards of education. The second phase was from 1980 to 2000 and witnessed considerable demand on government funding as a result an unprecedented demand for HE in meeting the needs of business and industries. Also, this stage witnessed the increased participation of the private sector in HE as a result of the increase in people`s ability to pay higher tuition fees and limited spaces in public universities. The third phase is 2000 onwards, which witnessed the massive growth of private universities, distance education providers and self-financing in public institutions. This phase also foresaw increased enrolment of women from 10% in 1950/51 to 40% in 2003/04 (Agarwal 2006).

The expansion of the HE sector in India however, has been problematic. The drive to make HE socially inclusive has led to a sudden and dramatic increase in numbers of institutions without a proportionate increase in material and intellectual resources and as a result, academic standards have been jeopardised (Béteille 2005; Agarwal 2006). There are numerous problems facing India`s HE sector today. These include inadequate infrastructure

and facilities, insufficient academic staff, decline in research and teaching standards and quality, unprepared students and overcrowded classrooms (Agarwal 2006). In addition to these problems, Agarwal (2006) reported possible exploitation of many students by private universities. Further, the average HE enrolment rate in India is only about 500-600 students, whereas a typical HEI in United States or China would have about 3000-4000 and 8000-9000 students respectively, making India's HE sector highly fragmented and difficult to manage (Agarwal 2006).

2.2. 4 Higher Education Sector in UK

The HE sector in the UK has a long history, which dates back to 1096 when teaching began in the city of Oxford, making the University of Oxford the oldest university in the English-speaking world. A century on, the University of Cambridge was founded in 1209 and three centuries onwards, four Scottish universities (St Andrews, Glasgow, Aberdeen, and Edinburgh) were also established. However, the largest expansion in the HE sector began in the 19th century including the establishment of Durham University, the University of Wales, King's College London, and University College London as well as the establishment of the so-called 'redbrick' universities including Birmingham and Manchester University. In addition, nine other universities and a number of university colleges were established by the end of World War II, which were accredited by University of London (Baskerville et al. 2011). After World War II, the UK government expanded the HE sector as a response to the increasing population and demand for HE as well as changes in the economy. New colleges were established and were awarded university status in 1966. In addition, several colleges were awarded university status and other polytechnics and institutions were granted university status through the Further and HE Act 1 in 1992; these universities are referred to as "modern" or "post-92" universities (Baskerville et al. 2011).

UK HEIs differ in size ranging from 4,500 students (University of Abertay Dundee) to around 40,000 students (Leeds Metropolitan University and the University of Manchester) and the sector has expanded massively in recent decades, with student numbers rising from 400,000 in the 1960s to 2,000,000 at the turn of the new century (Greenaway and Haynes

2003). In 2009/10 for instance, the number of students enrolled in UK HEIs was 2,493,415 and about 80% of all full-time UK students successfully complete their studies as compared to around 70% of their counterparts in OECD countries (OECD 2010). In addition, the UK remains the most popular destination for students after the United States, with 13% of the international student market (OECD 2010). In addition, 16% of all UK students are international students and they contribute about £2.3 billion (equivalent to over 14% of all receipts from overseas visitors to the UK for the year 2007) into the UK economy. However, recent changes in immigration laws might impact on this position as well as its contribution to the economy (Universities UK 2011). Figure 2.1 highlights the international markets for the HE sector around the world.

There is also one private university: the University of Buckingham, which has about 1,000 students. In addition, the Open University, which provides distance learning to students both in UK and internationally, has more than 209,000 students (Baskerville et al. 2011; HEFCE 2009). UK Universities have their own degree-awarding powers while the HE colleges on the other hand, can award their own degree or can be accredited by a university or national accreditation body. In addition, HEIs are legally independent entities and their decisions and managements are the responsibility of the governing bodies.

The HE sector contributes enormously to the UK economy. For instance, between 2007 to 2008, the HE sector contributed about £60 billion and generated about 2.3 % of GDP to the UK economy and in terms of employment, the sector contributes through direct and secondary effects over 668,500 full time equivalent jobs in 2007/08 (Universities UK, 2009; Baskerville et al. 2011). In addition, HEIs employs about 375,000 staff as at 2009/2010. Among academic staff, 26% are employed on teaching-only contracts and 22% as full-time researchers, but overall 52% of all academics are engaged in both teaching and research (HEFCE 2009). See Appendix 1 for further information on the contribution of the UK`s HE sector to GDP and employment.

Further, UK HEIs are widely acknowledged by their international reputations and rankings. For instance, in 2009, four UK universities were in the world's top 10 in the QS World University Rankings (Baskerville et al. 2011). Furthermore, the Quality Assurance Agency (QAA) was also established in 1997 to provide independent assessment on academic standards and quality within HEIs (HEFCE 2009).

In regard to funding, there are four main HE funding bodies in the UK and funds are allocated for teaching and research depending on the number of students at an institution and the subject area of specialisation as well as the volume and quality of research. HEIs also generate funds from tuition fees, sponsorship and donations as well as income from other services and consultancy provided. For instance in 2008/09, UK's universities and colleges in total received about £26.8 billion in funding (Baskerville et al. 2011). In addition, funding for tuition fees has evolved with a gradual shift of the burden from government and other funding agencies to students (Callender 2003; Baker 1993; HEFCE 2009). This is evident in the Robbins, Dearing and recently Browne`s reports on the review of HE funding and student finance.

As a result of these changes, UK nationals in English HE institutions for instance, are expected to contribute up to £9000 as tuition fees per year, resulting in students demanding more from HE institutions in terms of quality of services and involvement in institutional decision making (Altbach et al. 2011). However, Scotland and Wales have different policies. For instance, since 2000, the Student Awards Agency for Scotland paid tuition fees for students studying in Scotland. Also in 2006, under the 2004 HE Act, the National Assembly for Wales was given the power to set its own student support and tuition fees (HEFCE 2009).

Figure 2.1 Global Destinations for International Students In 2009[4]

Source: OECD (2010)

[4] Based on a 2,302,286 total number of international students

2.3 PRODUCTIVITY ISSUES IN HIGHER EDUCATION

Measuring and managing productivity in the HE sector has been the Achilles of most scholars and practitioners alike in trying to understand how productivity can be measured and managed holistically, particularly in capturing the key determinants of productivity within the HE sector. This requires an understanding of the transformation taking place within the HE sector as well as the productivity challenges facing the sector in the 21st century. It also requires an understanding of the function of HEIs as well as an understanding of the determinants of productivity in HE.

2.4 HIGHER EDUCATION IN THE 21ST CENTURY

The HE sector has undergone several transformations from elite education to its current state in the 21st century of education for the masses (Scott 1995; Silver 2009; Altbach et al. 2011). These transformations include technological, demographical, student empowerment, stakeholder participation, competition, privatisation and the adoption of business models in HE. These are discussed next.

Technologically, HE institutions have witnessed the emergence of innovative technologies for enhancing teaching and learning and student performance and satisfaction (Gumport and Chun 1999; Rogers 2000; Noble 2002). In addition, technology has become a competitive tool among HE institutions in attracting students and employees, improving institutional ranking and attracting funding (McCann et al 1998; Gumport and Chun 1999). Furthermore, technology has introduced competition within HE institutions by creating other HE markets which include online and distance learning institutions as opposed to traditional classroom institutions (Davis and Botkin 1994; Hanna 1998).

Demographically, opportunities for HE have shifted from the education of the elite to the education of the masses, which involves making HE accessible to all, regardless of gender, age, racial, sociocultural and economic background. This has been made possible with the introduction of the creation of the Office Of Fair Access (OFFA), and other international legislation and policies on equality on education including the Universal Declaration Of Education For All (EFA 1996); the Convention on the Rights of the Child (UN 1989); and Standard Rules for the Equalisation of Opportunities (UN 1994). This resulted in increasing numbers of students entering HE from different demographic backgrounds as well as from both national and international markets, hence increasing demand for HE. As commented by Altbach and Peterson (1999), demand for HE will keep rising in the 21st century and beyond.

In addition, the HE sector has witnessed increasing shift of power from HE institutions to students. Benno Schmidt, former president of Yale University predicted this trend and attributed this to budget cuts and financial constraints on HE institutions (Robinson 1998:30). This has its background in the gradual shift of the burden of tuition fees from government and other funding agencies to students. As a result of these changes, UK nationals in English HE institutions for instance, are expected to contribute up to £9000 as tuition fees per year, resulting in students demanding more from HE institutions in terms of quality of services and involvement in institutional decision making (Altbach et al. 2011).

Further, HE institutions have witnessed increasing competition as a result of the emergence of alternative markets of HE (online and distance learning); increasing number of students both nationally and internationally; and the reduction of funding for HE institutions. This has resulted in HE institutions competing nationally and internationally for students, traditional institutions competing with online and distance learning institutions and competition for funding and ranking (Davis and Botkin 1994; Hanna 1998; Marginson 2006). Furthermore, stakeholder involvement in HE decision making has become commonplace in HE discussions. Altbach and Peterson (1999) emphasised the need to integrate all HE stakeholders in decision making and implementation. This is vital and relevant since HE inputs and outcomes have implications for several stakeholders. HE stakeholders include students, employers, government, funding agencies and, communities (Köksal and Eğitman 1998; Yorke 2000).

Finally, considering the above discussion and the shift from state-ownership to privatisation, the commercialisation of HE institutions and the shrinking of HE funding, HE institutions are faced with increasing pressure on their capacity to accommodate rising demands of students (Barringer 2010). For instance, the UK`s government decision to cut HE funding from £7.2bn to £4.2bn by 2014-2015 representing about a 42% cut in spending has resulted in institutions strategising on different ways of generating income to sustain their existence and growth (Cook 2010). The cuts in HE funding have meant that HEIs have to adopt business models to manage the increasing demand on their limited capacity in order to generate income and funding to sustain their existence (Bok 2003; Hemsley-Brown and Oplatka 2006). This is evident in the recognition of students as customers, the emphasis on student satisfaction, service quality and productivity and the provision of research and other services for funding and income generation by HEIs (Altbach et al. 2011). Recently, David Willetts, the UK universities minister, challenged universities to adopt a marketing orientation by competing for students and putting students in the driving seats of HE (BBC 2011).

As a consequence of these transformations, productivity issues have become topical discussions among HEIs, academics, students, funders and other HE stakeholders. Pfeiffer (2009) argues for the efficient provision of educational services as a result of these changes. In addition, Seymour (1995) commented that the future of HE depends on its productivity, which entails doing more research, teaching and learning with lesser or the same resources. These issues relate to efficiency and effectiveness of institutional performance, quality of services, student satisfaction, research impact, institutional ranking, REF outputs, students` destination and employer`s feedback. These have consequential effect on HEIs in terms of attracting students, employees and funding as well as gaining favourable reputation and ranking and graduate employment for students.

2.5 21ST CENTURY PRODUCTIVITY CHALLENGE IN THE HIGHER EDUCATION SECTOR

The review of literature relating to the background of the HE sector in Finland, Ghana, India and the UK as well as the transformations taking place within the HE sector discussed in the preceding sections highlights the changes shaping the landscape of the HE sector globally. In addition, current media attention, political and policy debates, and practitioner and scholarly discussions have focused on the soaring cost of HE; public funding decline ; falling quality standards in the education process; and the inability of the HE sector to meet the increasing demand (Gate and Stone 1997; Sullivan et al. 2012).

The increasing demands for HE coupled with the current decline in public funds and quality standards over the last three decades have changed the landscape and nature of the HE sector across the globe. Amongst the changes taking place within the HE sector globally are the increasing participation of the private sector and foreign providers; increasing competition; stakeholder engagement and participation; cost sharing; the adoption of a business orientation with the aim of developing, securing and maintaining a competitive edge and revenue; quality improvement initiatives; and technological transformation. In addition, Postiglione (2006) highlighted the emerging trends in the HE sector in a chronological order. These are increased student/enrolment numbers; the inability of public funds to meet the demand for HE; increased participation of the private sector; cost sharing; and accountability. Further, Johnstone (2006) identified cost-sharing as the new worldwide funding phenomenon shaping the landscape of the HE sector as a result of the decline in public funding.

Furthermore, Professor Beer in his study on the key challenges facing the HE sector, highlighted the following broad factors : input/customer expectations (relates to the use of technology in delivering learning as well as understanding students/stakeholder expectations); output expectations (meeting students/stakeholder expectations); process expectations (improving quality in the process of delivering teaching and learning) (Beer 2008). In addition, a recent consultation study undertaking by PA Consulting Group, on the re-thinking of the new economics of HE highlighted certain factors as shaping the landscape of the 21st century HEIs. These include the nature and presentation of HE products; meeting

the needs of different customers (stakeholder satisfaction); institutional re-organisation and management; and capability building and quality assurance (PA Consulting Group 2010).

As a result of these changes, Sullivan et al. (2012) emphasised that the concept of productivity and accountability becomes central to any discussion in the HE sector and that a better understanding of productivity within the HE sector may generate insights on how institutional, departmental and educational processes can be improved. However, despite productivity improvement being recognised as the long term strategy for dealing with the problems facing the HE sector, particularly resource/funding constraints, the concept of productivity is poorly understood and subsequently, defining and measuring productivity in the sector has proven to be a difficult task (Gate and Stone 1997).

With regards to understanding productivity within the HE context, Gate and Stone defined it as "how much individuals and society are getting from the education sector, given the resources they put in" (Gate and Stone 1997: 4). This entails an understanding of efficiency and effectiveness concepts and involves meeting the increasing demand while at the same time maintaining the quality of services provided; increasing revenue; attracting and enrolling students from poorer/disadvantaged backgrounds; and meeting stakeholder expectations (Gate and Stone 1997). However, existing studies on HE productivity have focused on efficiency measures only. These measures include graduation rates, retention rates, and cost per degree. Sullivan et al. (2012) observed this and as a result commented that the sole focus on efficiency measures ignores the current performance challenges facing the HE sector and that a better understanding of productivity requires both efficiency and effectiveness measures. These include the quality of the education instruction and process. They further recommended the consideration of the quality and quantity of the sector`s inputs and outputs as well as the outcomes of HE (Sullivan et al. 2012).

2.6 DETERMINANTS OF PRODUCTIVITY IN HIGHER EDUCATION

The understanding of the determinants of productivity in HE, as Becher and Kogan (1992) suggest, requires a better understanding of the basic units or functions of HE. These functions include teaching, research and support services (Clark 1978; Becher and Kogan 1992; Mancing 1999). This is in tune with Clark`s (1978) comment that HEIs and academics are expected to perform research, teaching and support services. Therefore, the understanding of the determinants of productivity in HE will be explored from research, teaching and support services perspectives.

2.6.1 Research Productivity

Research forms a very important function of HEIs. The key characteristics of research in HE as explained by Becher and Kogan (1992) are: research depends largely on external funding; is directed by tenured academics; is staffed by people on short term contract; and if research is successful, it earns a group, department or institution credits or reputation. Research activities can be classified into three main categories. These are humanistic research; scientific research; and artistic research (Mancing 1999).

Various studies have been undertaken to investigate the determinant of research productivity. Ehrenberg and Hurst (1996) identified research productivity as highly related to reputation. As explained by Grunig (1997), reputation for research and scholarly excellence has the ability to entice highly intelligent researchers, students and research funding and they further identified that organisation size affects research productivity within HEIs. Glisson and Martin (1980) also identified structure, size and age as determinants of productivity. In identifying and analysing the determinants of research productivity within the HE sector, Dundar and Lewis (1998) identified individual, departmental and institutional levels as units of analysis. A summary of the various determinants of research productivity identified at the various levels is presented in Table 2.1.

Table 2.1 Determinants of Research Productivity of HE.

Author	Level of Analysis	Dimension
Tien and Blackburn (1996); Clack and Lewis (1985); Braxton and Bayer (1986) ; Clemente (1973); Babu and Singh (1998); Hall and Blackburn (1975)	**Individual**	Age; Gender; Educational Background; Socio-Economic Status ; Intellectual Synergy (Networking); Experience; Learning Capability ; Culture; Level of IT Usage; Age At 1st Publication; Yrs Between Bachelor Degree & PhD; Age at 1st Publication; Publication Before PhD; Persistence; Resource Adequacy; Access to Literature; Initiative; Intelligence; Concern for Advancement; External Orientation; Professional Commitment. Creativity; Simulative Leadership; Habit of Publication; Disciplinary Field; Years in HE; Academic Rank; Interest in Research; Salary; Number of Journal Subscriptions; Years in Current Institution; and Communication with others.
Massy and Wilger (1995); Grunig (1997); Johnes (1988); Golden et al.(1992) ; Jordan et al. (1989) ; Crewe (1988); Clemente (1973) ; Hall and Blackburn (1975)	**Departmental**	Departmental Size; Number of Full-Time Professors; No. of Research Students; No. of Academic Staff; Availability of Administrative and Teaching Assistance; Staff/Student Ratio; % of Department Holding on Research Grant; No. of Students in Department; Annual Research Spending; Departmental Norms; Culture and Socialisation; Quality of Departmental Doctoral Training; Publication as Criterion for Promotion.
Rushton and Meltzer (1981); Dundar and Lewis (1998); Golden and Carstensen (1992); Jordan et al (1989); Hall and Blackburn (1975)	**Institutional**	Reputation; Size; Library Size; Quality of Computing Facilities; Institutional Control Type; Institutional Norm; No. of Institution Associated Publications; Level of Institutional Revenue; Number of Research Students and Academic Staff; Available Library Books and Journals ; Publication as Criterion for Promotion.

2.6.1.1 Individual Level

At the individual level, several studies have identified various factors as determinants of research productivity. Tien and Blackburn (1996), Clack and Lewis (1985), Braxton and Bayer (1986) identified gender, age, educational and socio-economic background as determinants of research productivity. Clemente (1973) identified age at first publication; years between bachelor degree and PhD; and publication before PhD. As explained by Dundar and Lewis (1998), in economic theory, there is a relationship between age, experience and productivity: which is, as age and experience increases, productivity also increases. However, Levin and Stephen (1989) identified that the relationship between age, experience and productivity is dependent on the discipline of study.

Babu and Singh (1998) identified the following as determinants of research productivity: external orientation, persistence, access to literature, initiative, learning capability, concern for advancement, intelligence, professional commitment, resource adequacy, creativity, and simulative leadership. Hall and Blackburn (1975) identified in order of importance habit of publication, disciplinary field, years in HE, academic rank, interest in research, salary, number of journal subscriptions, years in current institution, and communication with others (networking).

Other studies have identified institutional and departmental culture as affecting the productivity of individuals in HEIs. Culture as explained by Dundar and Lewis (1998) relates to the shared values and attitudes in an academic department or institution. Organisational or institutional culture as pointed out by Mackenzie (1986) and Owens (1987) is a useful variable in assessing the productivity of individuals within an institution. Table 2.1 presents a summary of the various determinants of research productivity at the individual level.

2.6.1.2 Departmental Level

At the departmental level, various factors have been identified as affecting research productivity. These include technology availability and usage, quality of computing facilities, annual research spending, percentage of departmental research holding, number of students, student/staff ratio, library size, percentage of department research grant holdings, availability

of teaching and administrative assistance, quality of department doctorial training, and publication as a criterion for promotion (Massy and Wilger 1995; Grunig 1997; Johnes 1988; Clemente1973; Hall and Blackburn 1975).

Various scholars have also studied the relationship between departmental size and research productivity (Kyvik 1995; Johnson et al. 1995; Golden et al. 1992). Dundar and Lewis (1998) explain the underlying reasons why departmental size can affect research productivity based on Kyvik`s (1995) work. Firstly, larger departments are likely to attract highly qualified researchers, thereby having departmental members with the propensity to actively produce more research. Secondly, larger departments facilitate collaborative research teams. This is based on the assumption that larger departments are likely to have individuals with similar research interests leading to more collaboration, networking and intellectual synergy. Lastly, large departments have a huge amount of resources as compared to smaller departments, therefore, having more freedom in their research spending and training.

Crewe (1988) in his study on department size and research productivity in the UK observed a positive relationship between department size and research productivity. This was attributed to research opportunities and resources availability/size (Crewe 1988). In explaining the relationship between large department size and resources availability, Dundar and Lewis (1998) explain that larger departments are powerful in institutions; therefore, they can lobby and receive more resources than smaller departments. In addition, they explain that departmental size may lead to departmental economies of scale due to their size and shared use of available resources.

Notwithstanding the advantages associated with large departmental size and research productivity, Dundar and Lewis (1998) are of the view that larger size departments come with their shortfalls. They pointed out that, as the size of a department increases, there is a tendency for more formal rules, procedures and routines to be implemented, which may subsequently hinder innovation and initiative of researchers (Dundar and Lewis 1998). As explained by Tracy and Azumi (1976), the more an organisation or department increases in size, the greater the need for clarity, planning and predictability. Martin and Skea (1992) and Kyvik (1995) both observed a negative relationship between departmental size and research productivity in British and Norwegian universities.

In addition, other scholars have observed a positive relationship between departmental size and research productivity but with a twist (Jordan et al.1989). They identified that departmental research productivity increases only to a certain point with size and diminishes after the number of faculty increases beyond a certain point. This can be related to the law of diminishing return (Johns et al. 1999; Färe 1976). Gilson and Martin (1980) on the other hand, are of the view that both larger and smaller organisations and departments can hamper productivity due to more policies and procedures or the lack of them. They rather suggest that medium size organisations or departments can rather foster productivity. Table 2.1 presents a summary of the various determinants of research productivity at the departmental level.

2.6.1.3 Institutional Level

At the institutional level, Dundar and Lewis (1998) explain that institutions play a vital role in determining the productivity at the individual and departmental level. Despite the importance of institutions in determining the productivity of departments and individuals, inadequate studies have been undertaken to understand this relationship. This may be attributed to lack of output data at institutional level and measurement difficulties across institutions (Dundar and Lewis 1998).

Rushton and Meltzer (1981) identified level of institutional revenue, number of research students and academic staff, available library books and journals and, the number of institutional associated publications. Others have also identified favourable reputation as impacting on institutional productivity (Dundar and Lewis 1998). This is based on the premise that a highly reputable institution is likely to attract qualified and highly skilled researchers, academics and students, which will subsequently impact on institutional productivity.

Dundar and Lewis (1998) identified institutional control as an important factor affecting institutional research productivity. They identified public and private institutions as having different forms of control and objectives. Golden and Carstensen (1992) described private institutions as emphasising research over teaching and other services while public institutions emphasise teaching and community services over research. Jordan et al. (1989) in their research on the relationship between organisational type and research productivity

observed a strong relationship between private institutions and research productivity. See Table 2.1 for a summary of the various determinants of research productivity at the institutional level.

2.6.2 Teaching Productivity

Teaching, which forms a very important function of any HEI has been largely ignored by most HE productivity scholars. Brown and Atkin (2002) described effective teaching as a complex, intellectually demanding and socially challenging task, which consists of a set of skills that can be acquired, improved and extended. They further explained that effective teaching is intellectually demanding in the sense that teachers or lectures should acquire and possess knowledge on a subject area as well as appropriate and pedagogically sound teaching techniques. In addition, it is socially challenging in the sense that teaching takes place in the context of department and institution, whereby there exist unexamined traditions and conflicting goals and values (Brown and Atkin 2002).

Teaching in HE involves different methods of delivery, which depend upon disciplinary and student type (Brown and Atkin 2002). Among the well known methods of teaching are practical skills, problem solving, games, computer assisted learning, correspondence and lecturing. Among them, lecturing is the most popular and recognised teaching method in HE (Brown and Guilding 1993). In addition, as explained by Aoki and Pogroszewski (1998), there is a substantial rise in distance learning using computer and information technology assisted learning. However, while the efficiency of the different teaching and delivery methods has been studied, little has been done on the overall effectiveness and productivity of teaching in HE.

2.6.2.1 Determinant of Teaching Productivity in HE

The changing nature of the HE sector includes widening assess, increased students intake, the emergence of information technologies and the pressing call from government and other stakeholders for HE to prove its value for money. In addition, as commented by Lannuzzi (1999), HEIs should constantly evaluate their teaching functions and assess student learning outcomes. If not, others will most certainly hold them accountable. This has made it necessary for HEIs to adopt an economic model of education, which Ramsden (2000) described as a process of converting inputs (e.g. salaries) into output (number of students graduated).

In measuring teaching productivity, various models, dimensions and determinants have been suggested. Cohen (1981) suggested systematic, stimulating and caring as dimensions of effective teaching, while Marsh (1987) identified empathy, openness, workload, quality of assessment procedure and, teachers' explanation as dimensions of teaching effectiveness. Ramsden (2000) on the other hand, identified the following as indicators for measuring the performance of teaching: student employment destinations, wastage and, completion rates. Sullivan et al. (2012) also identified graduation rates, completion and enrolment ratios, time to degree, student-faculty ratios and, cost per credit or degree.

Others scholars have also called for a better understanding of teaching productivity, which requires different HE stakeholder perspectives (Seyoum 2008). Maassen (2000) defines stakeholders in HE by referring to specific groups of actors that have a direct or indirect interest in HE and cannot always be covered by the consumer-provider analogy. Campbell and Rozsnyai (2002:133) define it as all those that are participating in and benefitting from education. In HE context, stakeholders are groups that have interest in the process and standard of outcomes of teaching, learning and research. These include students, employees, employers, government, institutions, sponsors and taxpayers**.**

2.6.3 Support Services Productivity

Support services are another important function for HEI (Becher and Kogan 1992; Mancing 1999). Becher and Kogan (1992) describe HE support services as an indispensable function to teaching and research. Aoki and Pogroszewski (1998) categorised support services into four core components. These are administrative services, student services, faculty services and resource services. They identified administrative services as dealing with admissions, course cataloguing, course scheduling, registration, transcript, payment, financial aid, degree auditing, arbitration, bookstore and scholarships. Student services include careers services, accommodation services, counselling services and international student services. Faculty services include one-on-one face-to-face interaction during office hours, preparation of exams, marking, feedback, communication, and record keeping. Finally, resources services include the library, computing and other technical support offered to students and staff.

Despite the vital role of support services in the overall efficiency, effectiveness and productivity of HEIs, their impact are reflective on the productivity of research and teaching. As explained by Becher and Kogan (1992), the ultimate role of HE support services is to provide support for teaching and research. It is therefore necessary that support services are assessed on their impact on teaching and research. Support services are, therefore, considered as an indirect variable to HE productivity and as a direct variable to teaching and research productivity.

2.7 CONCLUSION

This chapter highlighted the background to the HE sector in Finland, Ghana, India and the UK and discussed the productivity issues and challenges facing the HE sector in the 21st century as well as the various determinants of productivity in HE.

It emerged that the HE sector`s in the different countries have different historical backgrounds and have undergone several transformation. However, they all share one

common purpose, which is societal contribution through teaching and research. In addition, it emerged that an understanding of the determinants of HE productivity is best understood if analysed from teaching and research perspectives.

The next chapter reviews extant literature on productivity concepts, measures and approaches by exploring their advantages and disadvantages. Following that, it discusses the importance of productivity to the economy, organisation and individuals and explores the various perspectives on productivity measurement. Lastly, the various productivity measures in use in the different sectors of the economy are discussed.

CHAPTER THREE: LITERATURE REVIEW - PRODUCTIVITY CONCEPTS AND MEASUREMENTS

3.1 INTRODUCTION

Productivity as generally defined expresses the relationship between output and input (Cooper and Edgett 2008). While defining and measuring productivity in this way is generally accepted, defining and measuring productivity in practical terms is not a straightforward exercise (Djellal and Gallouj 2010). This is because different sectors and industries within an economy vary in terms of production process, inputs and outputs. Therefore, any attempt to define productivity and develop productivity measures must have the power to capture the important information and factors that are peculiar to the economic sector and industry being measured. This is to ensure that productivity measurement outcomes reflect the realities in national and organisational performance, as well as aiding in the specification and development of strategies that improve productivity.

This chapter, firstly, highlights what performance measurement is and its association with productivity and explores the various definitions of productivity as well as the importance of productivity to the economy, organisations and individuals. It then discusses the various concepts, measures, approaches and perspectives in productivity measurement by exploring their advantages and disadvantages. Lastly, it discusses the various productivity measures in use in the different sectors of the economy by highlighting how productivity measures have evolved to their current state in the various sectors of the economy.

3.2 PERFORMANCE MEASUREMENT

Performance is a recurrent theme occurring in most branches of management discussion and is preoccupied with debates and discussions relating to its conceptualisation, measurement, terminologies and level of analysis (Ford and Schellenberg 1982). In addition, performance measurement takes a centre position in practitioner and academic discussions as its understanding is vital to competitive advantage and organisational success (Schmitz and Platts 2004). Performance measures are, therefore, a vital tool in organisational strategy implementation and management (Neely et al. 2005). Neely et al. (1995) associated performance measurement with efficiency and effectiveness concepts and described it as the process of quantifying the efficiency and effectiveness of organisational action. Schneier et al. (1995) described it as a tool to help strategy implementation, which involves assessing and quantifying experience, events, and objects by assigning numerical values to them in a consistent fashion. Schmitz and Platts (2004) identified the following as the functions of a performance measure: strategy formulation and clarification, management information, horizontal and vertical communication, decision-making and prioritising, coordination and alignment and motivation and learning.

In justifying the importance of performance measures and why performance should be measured, Behn (2003) identified its importance as including evaluation, motivation, controlling, learning, promotion, improvement, celebration and, budgeting. Lubieniecki and Desrocher (2003) further identified competitive benchmarking, superior resource allocation and effective activity prioritisation. As explained, performance measures are tools for evaluating, controlling and comparing the performance of organisations, departments, plants, teams and, employees in order to improve the production process (Heim and Compton 1992:43). Valos and Vocino (2006) explain that performance measures provide feedback on the attainment of organisational goals and objectives, and relate to the probability of attaining these goals in an efficient and effective manner. Performance measurement, therefore, enables managers to monitor, evaluate and implement strategies in relation to organisational goals and objectives in an efficient and effective manner.

3.2.1 Traditional Versus Non-Traditional Performance Measures

Despite the importance of performance measurement to organisations, available performance measures have been found to be inadequate in capturing the reality of today's organisations, as they lack a multidimensional perspective and are financially and objectively focused (Ghalayini and Noble 1996; Yeniyurt 2003). In explaining the differences between traditional and non-traditional performance measures, Ghalayini and Noble (1996) and Ghalayini et al. (1997) illustrated the historical context of the evolution of performance measures. According to these authors, performance measures, historically, have evolved from a greater reliance on financial and objective measures, which they termed traditional performance measures, to their current state, where the emphasis is on quality and competitive advantage, which they termed non-traditional performance measures. Table 3.1 highlights the differences between traditional and non-traditional performance measures.

Table 3.1: Difference between Traditional and Non-Traditional Performance Measures

Traditional Performance Measures	**Non-Traditional Performance Measures**
• Based on outdated traditional accounting system • Mainly financial measures • Intended for middle and high managers • Lagging metrics (weekly or monthly) • Difficult, confusing and misleading • Lead to employee frustration • Neglected at the shop floor • Have a fixed format • Do not vary between locations • Do not change over time • Intended mainly for monitoring performance • Not applicable for JIT and TQM, • Hinders continuous improvement	• Based on company strategy • Mainly non-financial measures • Intended for all employees • On-time metrics (hourly, or daily) • Simple, accurate and easy to use • Lead to employee satisfaction • Frequently used at the shop floor • Have no fixed format (depends on needs) • Vary between locations • Change over time as the need change • Intended to improve performance • Applicable for JIT and TQM. • Help in achieving continuous improvement

Adopted from Ghalayini and Noble (1996)

In justifying the case for the importance of non-traditional performance measures, several scholars have criticised traditional performance measures (Ghalayini et al. 1997; Olve et al. 1999; Bourne et al. 2000; Burgess et al. 2007; Olsen et al. 2007). For instance, both Ghalayini et al. (1997) and Olve et al. (1999) explained that traditional performance measures have no relevance in modern organisations and attributed this to the changing global competiveness and customer empowerment. Neely (1999) also attributed this to increased competition, development in information technology, the changing nature of external demands and organisational role, the nature of today`s work environment and the introduction of national and international quality awards.

Based on the aforementioned points, various performance measurement systems have emerged as a result of the limitations of traditional performance measures. These include the Balanced Scorecard (Kaplan and Norton 1993;1996); the Cambridge PM Process (Neely et al. 1996); the 7-step TPM Process (Zigon 1999); Total Measurement Development Method (TMDM) (Tarkenton Productivity Group 2000); TPM Process (Jones and Schilling 2000); and Performance Prism (Neely 2002). For instance, Kaplan and Norton (1996:10) in their Balanced Score Card emphasised the need for performance measures to integrate financial and non-financial measures; internal and external perspectives; drivers and outcomes of performance and as objective and subjective measures. In addition, Sink (1983) recommended that organisational performance should be evaluated using the following criteria: efficiency, effectiveness, quality of work life, productivity, innovation, quality and profitability.

3.2.2 Principles of a Good Performance Measurement

The limitations of traditional performance measures discussed in the preceding section have necessitated the design of a good performance measure that reflects and captures today`s business reality. In designing and utilising any performance measure, it must adhere to certain principles. Tangen (2002; 2004) highlighted the following principles that performance measures must adhere to:

- Relevance, timely and accurate information.
- Understandable, relevant and accessible to users.
- Achievable with a limited number of performance measures that consist of financial and non-financial measures.
- Strategically focused, balanced and avoid sub-optimisation.

In addition, Flapper et al. (1996) identified three dimensions that any performance management system must adhere to. These are: decision type (strategic /tactical/operational), level of aggregation (overall/ partial) and measurement unit (monetary/physical). Further, Carneiro et al. (2005) identified an analytical framework for characterising business performance measurement constructs. This is shown in Table 3.2.

Table 3.2: Analytical Framework for the Characterisation of Business Performance Constructs

Conceptual Aspect				**Methodological Aspect**		
Stakeholder Viewpoint	**Classes Of Measures**	**Frame Of Reference**	**Temporal Orientation**	**Unit Of Analysis**	**Mode Of Assessment**	**Indicators Structure**
Stockholders Employees Customers Managers Suppliers Business Partners Local Community Government	Economic Market Internal Business Process Innovation and Learning Strategic Social Environmental Overall	Absolute Relative	**Static** Recent Past Future Expectations **Dynamic** Change in Recent Past Expected Change for the Future	Country Region Industry Firm SBU Product Market Venture (PMV)	**Objective** Secondary sources Self –reported **Subjective primary sources** Self - Evaluation Evaluation by Competitor Evaluation by Experts	**Independent Indicators** Single Multiple **Composite Scales** Reflective Formative

Adapted from Carneiro et al. (2005)

3.3 PRODUCTIVITY- A PERFORMANCE MEASUREMENT TOOL

Performance and productivity measurements are of great importance to academics and practitioners alike, as well as investors, shareholders, managers, employees and customers in determining and justifying profitability, dividends, rewards, bonuses, promotion and the success of an organisation, departments, employees and other stakeholders. In addition, performance and productivity concepts have been used interchangeably by academics and practitioners in measuring and analysing organisational and departmental achievements (Stainer and Stainer 2000; Linna et al. 2010). However, it must be stressed that these concepts, although related, are conceptually different (Holzer and Lee 2004). In differentiating between these two concepts, Ghalayini and Noble (1996) identified productivity as a primary indicator of performance while Byus and Lomerson (2004) described productivity as one of the many ways of defining and measuring performance. Several other scholars have recognised productivity as an important element and a tool in organisational performance measurement and management (Sink 1983; Misterek et al. 1992; Hannula 1999; Tangen 2005).

Productivity has its background in classical and neoclassical economics and production theories (Garrigosa and Tatje 1992). Adam Smith (1776) for instance, in his classical masterpiece, "The Wealth of a Nations", emphasised the creation of national surplus, division of labour and the importance of productivity and since then productivity has gained popularity in both national and organisational discussions. In understanding productivity, the term productivity, as commonly used, conveys different meanings to different people. These include performance, outputs, job satisfaction, effectiveness, efficiency, sales, turnover, customer satisfaction and service quality (Gupta and Dey 2010). These meanings reflect the backgrounds of different scholars and practitioners and the economic sector in which productivity is being defined (Jaaskelainen 2009).

The term productivity as commonly used, measures the relationship between output and input. Defining productivity in this manner is generally accepted despite the various meanings attached to this general definition. Prokopenko (1987) explained the reasons behind the acceptance of the general definition of productivity. Firstly, its meaning translates to the

context of the economy, industry, organisation and individuals and, secondly, regardless of the political, economic and production system used worldwide, the output/input relationship still holds water in all these economic systems and organisations.

Productivity measures are expressed quantitatively as a relationship between output and input (Capalbo and Antle 1988). Brynjolfsson and Hitt (1998: 1) defined it as "the amount of output produced per unit of input". Others described it as a relationship (in the form of an index or ratio) between output (goods and/or services) produced and input (resources) used to produce output (Sink 1983; Hannula 2002). Productivity, therefore, expresses the relationship between the total output of a production process and the total quantity of resources used in the production process to produce a sum of output. Putting this in perspective, Oyeranti (2003) argues that productivity involves the achievement of the highest level of output or outcome with the lowest possible use of resources. Building on this, Coelli (2005) described productivity as expressing the ratio of outputs to inputs and further elaborated that higher value of productivity ratios translate into higher productivity and vice versa[5].

3.3.1 Importance of Productivity

The importance of productivity to global economies, industries, organisations and employees/individuals cannot be disputed. As emphasised by Madan and Mukerjee (1989), the importance of productivity hardly needs any emphasis because of its importance to modern economies. Productivity is of great significance and concern for many including individuals, employees, firms, governmental institutions and international organisations and its importance is fundamental to economic growth within the economy; profitability within the organisation; and improved standard of living for employees and individuals. Thus, without productivity measures, it will be difficult to assess how well an economy, organisation, employees and individuals are performing in order to make comparisons among countries, industries, organisations and individuals. In demonstrating the importance of productivity, Oyeranti (2003) asserted the importance of productivity as operating on national, organisations and individual levels.

[5] See Section 4.4 for further clarification on the meaning of productivity, efficiency and effectiveness.

At a national level, Oyeranti (2003) postulated that an increased and steady growth in productivity ensures a non-inflationary increase in employee earnings, lower unemployment levels, currency stabilisation and, increase balance of trade surplus. Anderson et al. (1997) and Linna et al. (2010) viewed improved productivity as a source of economic growth. Further, Sharpe (2002) observed a positive relationship between productivity, GPD per capita and standard of living. Sharpe (2002) concluded that productivity is a relevant indicator for determining standard of living and further explained that an increase in productivity has greater impact on the standard of living of poorer countries than richer countries.

At the organisational level, improved productivity as theorised by Oyeranti (2003), impacts positively on organisational cash flow and profitability. Earlier, McLaughlin and Coffey (1990) proposed that productivity measures provide benchmarks for organisations in evaluating their performance, improving the use of their factors of production and aid in developing equitable rewards systems for employees. OECD (2001) also identified productivity as a means to benchmarking production processes. Productivity measures, therefore, assist organisations in identifying how well organisational resources are utilised (efficiency); compare results achieved with desired results (effectiveness); and track productivity changes over time (Hoque and Falk 2000).

In addition, productivity measures contribute to organisational strategic, tactical and internal management and planning of organisational decision making and evaluation (Teague and Eilon 1973). Jaaskelainen and Uusi-Rauva (2011) identified productivity as a managerial tool in monitoring organisational productivity progress and in identifying targets of productivity improvement. Further, the use of productivity measures in organisations has been found as a strategic tool in gaining competitive advantage both locally and internationally (Kaplan and Atkinson 1998).

At the individual level, productivity measures facilitate the comparison of individual employee performance (Shrivastava and Purang 2011). Isaksson et al. (2005) and Linna et al. (2010) both associated the importance of productivity at individual level to improved standard of living and poverty reduction. Oyeranti (2003) proposed that productivity can impact on the standard of living within a country and subsequently identified a positive relationship between productivity levels and standard of living. In trying to explain how productivity impacts on standard of living, Uche (1991) identified certain factors that

improvements in productivity can influence. These include higher real earnings, increased supply of consumer goods at lower prices and improved work and life balance.

3.4 PRODUCTIVITY MEASUREMENT TYPES

Productivity has been measured using several approaches. These include partial-factor productivity, multi-factor productivity and total-factor productivity (Gupta and Dey 2010). Partial-factor productivity is a non-parametric method for measuring productivity. It emerges as a result of the labour-intensive nature of the agricultural and manufacturing sectors. Partial-factor productivity is a ratio of total output per some input factor (Gupta and Dey 2010), with labour being the most widely used factor. Partial-factor productivity is the most widely used productivity measure, which expresses a single output per unit of a particular input such as labour or land (Alston et al. 2009). Labour productivity is the most widely used partial productivity measure and this has been attributed to the dominant role of labour during the earlier days of agriculture and industrialisation (Misterek et al. 1992). See Table 3.3 for its advantages and disadvantages.

Multi-factor productivity measures relate to the measurement of output to a bundle of inputs (Gupta and Dey 2010). It measures the volume of output produced with a given amount of labour and capital (Rao and Sharpe 2002). The use of multi-factor productivity measures is preferable to partial-factor productivity because of its ability to measure the efficiency with which labour and capital are jointly utilised in the production process (Baily and Chakrabarti 1988). See Table 3.3 for its advantages and disadvantages.

Total-factor productivity measures are used to measure changes in productivity in most areas of an organisation. Total-factor productivity is the total output produced divided by the total inputs used (Gupta and Dey 2010). Sumanth (1985) described total-factor productivity as the measurement of the overall effect of all input factors of a production process to produce output. These factors include labour, capital, materials and energy. Total-factor productivity is, therefore, determined by how efficiently and intensively organisational

inputs are utilised in the production process (Comin 2006). See Table 3.3 for its advantages and disadvantages.

Table 3.3: Fundamental Productivity Measurement Types

Productivity Measurement Type	**Advantages**	**Disadvantages**
Partial-factor Productivity (TFP)	• Feasible and simple. • Easy to collect data. • Easy to measure and understand. • Ease of specifying specific areas that need improvement.	• Difficulty in identifying causal factors accounting for productivity growth. • It overstates increase in productivity. • Neglect of other input factors • lopsided importance to productivity improvement. • Can be misleading, because they do not reflect differences in factor prices. • Unable to handle multiple outputs.
Multi-factor Productivity (MFP)	• Can take account of both capital and labour productivity. • Easy to make productivity comparison. • Better measure of firm and industry efficiency.	• Varying results based on different ways of weighting production factor. • Difficulty in tracking activities that improve productivity. • Difficulty in obtaining data • Lack of data can affect productivity measurements. • Failure to quantify the effect of technical substitution.
Total- Factor Productivity (TFP)	• Portrays overall productivity picture. • It avoids productivity measurement bias. • Better measure of firm and industry efficiency. • Provides valuable information for assessing productivity growth. • Useful for analysing productivity of individual product line as well as overall productivity.	• Lack of data can affect productivity measurements. • Too broad in diagnosing specific areas that need improvement. • Difficult to measure and understand. • Provides limited information for managerial use.

Sources: Abramovitz 1956; Craig and Harris 1973; Brynjolfsson 1991; Grossman 1993; Sumanth 1994; Disney et al. 2000; Foster et al. 2001; Tangen 2003

3.5 PRODUCTIVITY MEASUREMENT APPROACHES

Productivity measures reflect the performance of an organisation at different time periods and relate to measuring productivity level or change (Uusi-Rauva 1997). Different measurement approaches have been proposed for measuring and analysing productivity level and/or change within an economy, organisation and department. These approaches are discussed next.

3.5.1 Static Versus Dynamic Productivity Measures

Static and dynamic measures have been identified as capturing productivity level or change (Sink 1983; Oyeranti 2003). Static productivity measures deal with productivity in a given time period and provide productivity information for a current period, which can be used as a yardstick for comparing the performance of different organisational units at a certain point in time (Oyeranti 2003; Jaaskelainen 2009). Dynamic productivity measures, on the other hand, deal with the comparison of static productivity measures at different periods in time, with a previous period being used as a base period and compared to the current period (Oyeranti 2003). Jaaskelainen (2009) also describes dynamic measures as measures used for comparing the current result of a measure to a former result of the same measure. The advantages of dynamic measures over static measures are the ease of comparing the productivity of an organisation providing different outputs and the ability to use their results in monitoring progress in productivity levels or change (Oyeranti 2003; Jaaskelainen 2009).

3.5.2 Aggregate Versus Disaggregate Productivity Measures

Productivity within an organisation is measured at different levels. This entails measuring productivity at the organisational, departmental, product line or at a process level.

As Utterback (1991) elucidates, productivity measurement of any organisational activity requires proper and appropriate specification of the unit of analysis. In specifying the units of analysis for productivity measurement in any organisation; aggregate and disaggregate measures have been identified as the appropriate measurement approaches to organisational productivity measurement (McLaughlin and Coffey 1990).

Aggregate productivity measures involve productivity measurement at the firm level or strategic level, and involve evaluating the overall productivity of the firm/organisation (McLaughlin and Coffey 1990; Jaaskelainen 2009). As McLaughlin and Coffey (1990) argues, aggregate measures are best for evaluating the overall economic policy of the firm and making strategic decisions on products and services as well as on the allocation of labour and capital inputs. However, it must be noted that, despite the importance of aggregate measures, their use is limited as they cannot be used in diagnosing and improving inefficiency and ineffectiveness in an organisation (McLaughlin and Coffey 1990).

Disaggregate productivity measures, on the other hand, measure productivity of a single activity or a business unit and relate to productivity measures of a firm process and/or product line (McLaughlin and Coffey 1990; Jaaskelainen 2009; Jaaskelainen and Lonnqvist 2009). The importance of disaggregate measures includes aiding in operational decision making and the development of employee reward systems (McLaughlin and Coffey 1990). However, it must also be emphasised that the development of disaggregate measures is difficult for complex service organisations using and producing multiple inputs and outputs simultaneously in a business unit. In addition, it is costly to obtain productivity information using disaggregate productivity measures (McLaughlin and Coffey 1990; Autrey et al. 2010).

Taking into consideration the advantages and disadvantages of aggregate and disaggregate measures, several other scholars have recommended the use of both measures in a complementary fashion. This involves the use of disaggregate measures as a starting point to capture the tangible and intangible elements and differences in the different business units, followed by the design of an aggregate productivity measure to capture the sum of all the disaggregate measures (Jaaskelainen 2009; Jaaskelainen and Lonnqvist 2009).

3.5.3 Financial Versus Non-Financial Productivity Measures

Productivity has been measured using financial or non-financial measures. In chronicling the evolution of financial and non-financial performance measures, Ghalayini and Noble (1996:63), noted the years between 1880 to 1980 as the phase of financial measure dominance, and the late 1980s onwards as the emergence of non-financial measures. The emergence of non-financial measures has been attributed to the changes in the global market, which led to an emphasis on competitive advantage, quality, flexibility and, dependability (Ghalayini and Noble 1996: Ghalayini et al. 1997).

Traditionally, financial measures have been used extensively in measuring organisational productivity in both manufacturing and service sectors. Financial measures have their background in the ultimate objective of all firms, which is profitability (Kaplan and Norton 1996; Ittner et al. 2003). Schiff and Hoffman (1996) observed that organisational executives are more favourable towards financial measures as opposed to non-financial measures when assessing organisational performance. Tangen (2003) identified profit margins, return on assets and return on equity as examples of the most widely used financial productivity measures.

Non-financial measures on the other hand, emerged as a consequence of the emphasis of manufacturing firms on adopting a customer centric perspective; the growing importance of the service sector; and the emphasis on organisational intangible elements and brand image on stock price determination and valuation (Ghalayini and Noble 1996: Ghalayini et al. 1997). Perera et al. (1997) also found a positive relationship between customer-focused strategy and the use of non-financial performance measures. Ittner and Larcker (1998) suggest that non-financial measures on organisational intangible assets are better predictors of future financial performance. This view is supported by other researchers (Deloitte Touche Tohmatsu International 1994; Kaplan and Norton 1996). As a result, several scholars have called for the disclosure of non-financial performance information in organisational annual reports (Kaplan and Norton 1996: Edvinsson and Malone 1997). For instance, Kaplan and Norton (1996:10) as part of their Balanced Score Card emphasised the need for performance measures to integrate non-financial measures.

However, despite the emphasis on non-financial measures in current performance measures over a decade ago, Yeniyurt (2003) observed that most organisations still rely on financial measures, despite their imitations. The limitations of financial measures are: firstly, financial measures are only concerned with cost factors, therefore, quantifying organisational performance solely on financial terms and ignoring the real cost of quality improvement. Secondly, financial measures impede business decision making as organisational financial reports are usually produced monthly and are results of decisions that were made one or two months previously. Lastly, financial measures have preset formats used across all departments, ignoring the fact that many departments may have their own unique priorities and characteristics (Ghalayini et al. 1997; Tangen 2004).

In addition, Tangen (2003) argues that financial measures are based on the simple cost accounting systems of the 1900s, which focus on controlling and reducing labour cost, and therefore are not appropriate for today`s business environment. This is because the current business environment, particularly in services, demands that organisations provide high quality services, satisfy their customers and focus on long-term objectives. Crawford and Cox (1990) explain that financial measures are based on utilisation and cost efficiency measures and have the tendency of directing managers' efforts towards the attainment of short-term objectives rather than focusing on the strategic long-term objectives of the organisation. Tangen (2003) further noted that financial measures place greater emphasis on cost rather than focusing on other important elements of organisational performance, including customer satisfaction, employee satisfaction and stakeholder satisfaction.

Specifically in a services context, Grönroos and Ojasalo (2004) observed that pure financial measures are not conducive to measuring productivity in services. They attributed this to the difficulties in calculating the value of service output due to its heterogeneity, customer participation in the service process and problems of standardising service outputs. In addition, price fluctuation in service pricing hinders the use of pure financial measures in the measurement of SP (Jones 1988). The limitations of financial measures particularly in services have attracted significant interest recently among academics and practitioners in finding other alternative measures appropriate for services (Ross et al. 1993; Tangen 2004). As a result, various scholars have called for a better understanding of productivity measurement in services (Spitzer 2007; Dion and Fay 2008).

3.5.4 Subjective Versus Objective Productivity Measures

The debate over the choice of productivity measure has been a major theme among scholars for more than a century. This hinges on the choice between subjective and objective measures. Muckler and Seven (1992) highlighted the controversy surrounding these debates. Specifically, they argued that the definitions of subjectivity and objectivity are difficult to come across and normally centre on the degree to which human feelings, experience and learning are involved in the derivation of reality. In distinguishing between objective and subjective measures, Wang and Gianakis (1999) noted that the key distinction between the two lies in whether the measure is based on empirical observation or on attitudes, beliefs or perceptions. Organisational productivity has been measured using either subjective or objectives measures or both **(**Grönroos and Ojasalo 2004**)**.

On objective measures, Scheffler (1967) points out that objectivity is a goal for every rational study or inquiry. Objective measurement relates to the direct measure of an object, recorded by an investigator or through a technological means and data measured directly from the product during the process (McClelland 1995). Examples of objective measures include time taken to complete a task, time study, set-up time, time reporting, profits, and input cost (McLaughlin and Coffey 1990).

Subjective measures, on the other hand, have their foundation on Protagoras (480-410 BC) famous saying, "man is the measure of all things". This view was supported by Descartes (1596-1650) who considered knowledge as emitting from human experience and emphasised that knowledge and human experience are inseparable, therefore, confirming the importance of subjective measures capturing human experience in deducing knowledge. Subjective measures assess the extent to which people think they know as opposed to how much they know. Wang and Gianakis (1999) defined subjective measures as an indicator used to assess individuals` experience, attitude, and perception of an organisation`s performance.

Dawes (1999) identified subjective measures as a measure used when a company's performance data is derived using a scale with anchors such as "very poor" to "very good," or

"much lower" to "much higher". As explained by Wang and Gianakis (1999) subjective measures assess an individual's perceptions, attitudes or assessments toward a firm`s goods/service and performance. Subjective measures, therefore, assess a subject`s internal feeling, perception and experience derived with a rating scale. Such measures may include customer experience with a product/service, service quality, and satisfaction. Others include employee perception about a firm's performance and productivity and shareholder perception about organisational performance. Typical methods used for subjective measures include rating and ranking methods, interviews, questionnaires and, checklists (Sinclair 1995a).

In recommending subjective measures, Moray et al. (1979) explains that, although subjective measures are not empirically or quantitatively appealing, it can be argued that such measures are appropriate since employees are likely to work according to their feelings, and it is these feelings that are solicited by subjective measures. In addition, Kemppilä and Lönnqvist (2003) identify circumstances when objective measures may not be appropriate for productivity measurement. These are:

- When output is a plan for the future.
- When there is a large variation in quantity and quality of inputs and outputs.
- When there is lack of measurement in the research domain.
- Where direct measures are not practical and indirect measures are not easily measureable (intangibility, atmosphere, lack of competence).
- In situations where output is created for different stakeholders (for example HE education output serves different stakeholders` needs separately).
- Where a large variety of different products/services should be taken into account in measurement.

Dawes (1999) justified the importance of subjective measures as follows. Firstly, subjective measures are better measures of cross-industry performance than objective measures because of their ability to allow managers to consider the relative performance of their industry when providing a response. Secondly, objective measures such as profitability may not accurately indicate the underlying financial health of a company. Profitability may

vary due to reasons such as the level of investment in research and development and/or marketing activity, which might have longer term effects.

In the service context, Grönroos and Ojasalo (2004) also criticised the use of objective (physical) measures as providing misleading information for productivity measurement; ignoring quality variation and customers` input; and failing to provide management with appropriate instruments for measuring and managing productivity. In addition, Corsten and Gössinger (2007) and Lasshof (2006) both highlighted the problems of using objective input measures including labour hours and number of labour in SP measurement because of the heterogeneity of the different inputs. These include the variation in employees' qualification and experience, the varying work climate and motivational factor. This is consistent with Nachum`s (1999) comment that productivity measures in services have to capture the variation in labour quality because of its immense impact on the production process. Therefore, he concluded that, the variation in labour rules out the possibility of using standardised/objective measures in services (Nachum 1999: 927).

Furthermore, several researchers have identified a high correlation between subjective and objective performance and productivity measures (Dess and Robinson 1984; Hart and Banbury 1994; Dawes 1999). Wall et al. (2004) observed a similar relationship between subjective and objective measures and concluded that subjective measures as compared to objective measures had convergent, discriminant and construct validity. Table 3.4 highlights the advantages and disadvantages of objective and subjective measures, while Appendix 2 highlights the studies that have used objective and subjective performance measures. However, while subjective measures have been advocated by several scholars, Cushman and Rosenberg (1991) caution that researchers using subjective measures/data should take the following into consideration:

- If the subjects in a study do not fit the user profile, data obtained may not be valid.
- Attitude and self-report measures may be distorted by biasing factors, such as the "halo effect", acquiescence, and cognitive dissonance
- Subjects' preferences are affected by events in the recent past.

3.4: Advantages and Disadvantages of Objective and Subjective Measures

Advantages	Disadvantages
Objective Measures	
• Do not rely on personal judgement, therefore, not influenced by personal bias and subjects' ignorance. • Data collected is deemed as exact and free from measurement errors.	• Expensive to collect data. • Do not indicate certain ground level information. • Quantification of certain measures requires coding, which raises questions about how they were coded. • Reluctance of managers to give sensitive and confidential performance data.
Subjective Measures	
• Data can be easily collected and assembled. • Ensure face validity (easily acceptable by workers) and represent a valid measurement. • Ease of use and administration of questionnaire • Comparable. • Avoid confidentiality problems particularly when collecting data. • Easy to implement. • Non-intrusive. • Low cost. • Sensitive to work-load variation. • Offer wide range of techniques. • Easy to collect and analyse large samples. • Questions can be tailored to suit each case and can cover the phenomenon comprehensively. • Provide direct means for measuring user opinion.	• Over reliance on personal judgement may be flawed. • High degree of variability due to unrelated factors and measurement error. • Cross country comparison are difficult due cultural difference. • Lack of control over survey and analysis. • Can produce unstable and inconsistent response. • Less reliable and influenced by rater's biases.

Source: Dess and Robinson 1984; Nicoletti and Pryor 2006; Campbell 1990; Cushman and Rosenberg 1991; Leaman and Bordass 1999; Kemppilä and Lönnqvist 2003; InsKo 2003;

3.5.5 Traditional Productivity Measures Versus Non-traditional Productivity Measures

Productivity measures have for a long time been considered as synonymous with performance measures as well as a key performance tool and indicator (Sink 1983; Misterek et al. 1992; Ghalayini and Noble 1996; Hannula 1999; Tangent 2005). As a result, productivity measurement perspectives have followed similar trends to performance

measurement perspectives. Ghalayini et al. (1997) illustrated the historical evolution of performance measures[6]. The authors differentiated between traditional performance measures and non-traditional performance measures. Traditional performance measures focus on monitoring and controlling, as well as emphasising financial and objectives perspectives. Non-traditional performance measures, on the other hand, emerged as a result of the changing nature of business environments and focus on process improvement, system optimisation and addressing the dynamics of changing systems, as well as emphasising quality and competitive advantage (Ghalayini et al. 1997).

In the productivity domain, a similar trend in the historical evolution of measure development is evident. For example, traditional productivity measures are characterised as financially, quantitatively and objectively focused (Kemppilä and Lönnqvist 2003; Yeniyurt 2003), as well as being a tool for monitoring and controlling the organisation (Teague and Eilon 1973; Jaaskelainen and Uusi-Rauva 2011). In addition, productivity measures have evolved from efficiency to effectiveness measures in response to the changing nature of today`s business environment, which includes quality and intangible elements of organisational process and outputs. This is consistent with Ghalayini and Noble`s (1996) characterisation of the historical evolution of performance measures. Based on the similarities between the evolution of performance and productivity measures, productivity measures will be categorised using Ghalayini et al.`s (1997) classification of performance measures into traditional and non traditional measures.

3.5.5.1 Traditional Productivity Measures

Traditional productivity measures are described as being financially, quantitatively and objectively focused; short-term focused on organisation growth; and over-reliant on economics and manufacturing based concepts and approaches[7]. The development of traditional productivity measures is influenced by economic theories and financial and manufacturing concepts and relies on objective and quantitative measures (Maskell 1991; Ghalayini et al. 1997; Jagdev et al. 1997; Vuorinen et al. 1998; Nachum 1999; Hannula 2002; Tangen 2003; Kemppilä and Lönnqvist 2003; Tangen 2004). Examples of traditional

[6] See Section 3.2.1

[7] Traditional productivity measures will be used interchangeably with manufacturing-based productivity measures

productivity measures include profit margins, return on assets, return on equity, time study, set-up time, cycle time, stop-watch-timing, time reporting, profits and input cost and efficiency and utilisation ratios (McLaughlin and Coffey 1990; Tangen 2003).

3.5.5.2 Non-traditional Productivity Measures

Non-traditional productivity measures emerged as a consequence of the changing nature of today's business environment and the limitations of traditional productivity measures, particularly financial measures (Tolentino 1997; Tangen 2003) as well as the dominant position of the service economy (Hoque and Falk 2000; Hipp and Grupp 2005). As a result, several scholars have branded traditional productivity measures as obsolete, problematic, narrow and value-laden, therefore, unsuitable and irrelevant for today's business environment, particularly in the service sector (Vuorinen et al. 1998; Olve et al. 1999; Kemppilä and Lönnqvist 2003).

Subsequently, several scholars have emphasised the importance of adopting a new perspective on productivity measurement. In arguing for the case for a new perspective on productivity measurement, Dawson and Lee (2005) emphasised the need for productivity measures to take a broader and strategic perspective. Other scholars have called for a multidisciplinary approach in productivity measurement (Manzoni and Islam 2009). This involves integration of different concepts from various disciplines including human resources, marketing, organisational strategy, organisational behaviour, psychology and ethical and corporate social responsibility (Stainer and Stainer 1995: Tolentino 1997; Prokopenko 1999; Dollard 2000; Anderson et al. 2002; Kemppilä and Lönnqvist 2003; Sahay 2005).

In addition, other scholars have emphasised the integration of quality, effectiveness, outcome and stakeholder concepts in productivity measurements. For example, Sink (1983) recommended that organisational performance and productivity should be evaluated using the following criteria: efficiency, effectiveness, quality of work life, productivity, innovation, quality and, profitability. Furthermore, other scholars have emphasised work-life balance, human resource development, value creation, equitable reward sharing among stakeholders

and, stakeholder integration in modern productivity concepts (Tolentino 1997; Prokopenko 1999).

In summary, non-traditional productivity measures are described as subjectively and qualitatively focused, emphasising service quality, stakeholder value, long-term organisational strategic objectives, responsiveness to changing business environment and, multidisciplinary in its approach. Examples of non-traditional productivity measures include employee productivity, motivation, satisfaction and loyalty; customer productivity, satisfaction, and loyalty; stakeholder satisfaction; service quality; and effectiveness.

3.6 SOURCES OF PRODUCTIVITY MEASUREMENT

Productivity in any organisation can be measured objectively or subjectively depending on the nature and type of information required, as well as the audience for the productivity report. Doyle (1994) identified and recommended the consideration of various stakeholders' perspectives and expectations in organisational performance and productivity measurement and analysis. Antikainen and Lonnqvist (2005) also recommended stakeholders as a better channel for measuring organisational productivity. Several sources for assessing productivity in organisations have been identified. These are: employees, managers/supervisors, customers, suppliers and, government (Kemppilä and Lönnqvist 2003; Accel-Team 2010). These are discussed next.

3.6.1 Managers/Supervisors

Managers and supervisors are key channels in measuring the performance and productivity of any organisation because of their possession of vital information regarding organisation inputs and outputs. Ingram and Fraenkel (2006), for instance, used management

perception for measuring productivity among Swiss hotels. Sureshchandar et al. (2002) also used management's subjective perception of total service quality in measuring organisational performance while Pe´rotin and Robinson (2000) used management perception in assessing organisational productivity. However, it should be emphasised that management's obligation to provide shareholders with financial and profitability data makes them more inclined to concentrate on objective measures as opposed to subjective measures. In addition, as explained by Hooley et al. (2011), managerial focus on short term gains for career advancement encourages them to focus on short term gains (sales and efficiency) as opposed to long term gains.

Further, using management subjective performance measures can be biased. As Lawler (1971) and Hamner (1987) identified, employees do not trust their managers/supervisors in assessing their productivity subjectively as their evaluations can be biased depending on who the manager/supervisor favours. As a result, managers/supervisors prefer objective measures to subjective measures, for the simple reason that objective measures generate fewer grievances with disgruntled employees than subjective measures (Hamner 1987).

3.6.2 Shareholders

Another group of organisational stakeholders used in assessing organisational productivity and performance are its shareholders. Because profitability is the main objective of organisational shareholders, performance and productivity measures have traditionally focused on financial measures. As Schiff and Hoffman (1996) commented, organisational executives are more favourable towards financial measures as opposed to non-financial measures when assessing organisational performance. Such measures include profit margins, return on assets and return on equity (Tangen 2003). Therefore, shareholders are more inclined to rely on objective measures as opposed to subjective measures because of their profitability objective.

3.6.3 Government and Society

Organisations have certain obligations and commitments to the government and communities in which they operate. These obligations relate to corporate social responsibilities, organisational ethical behaviour, taxes and duties and, compliance with government and regulators laws and policies. This requires organisations to take several initiatives to fulfil those obligations and commitments in order to be perceived positively. As a consequence, governments and communities are more inclined to use objective or/and subjective measures to assess the fulfilment of organisational obligations and commitments to governments and societies. The choice over these measures depends on the expectations of communities and governments. For example, the assessment of organisational tax responsibilities by the government may require an objective measure, while the assessment of organisational social responsibilities to a community may require a subjective measure.

3.6.4 Customers

The inseparable and intangible characteristics of services have emphasised the importance of the customer`s role in the service production process and the assessment of SP. As Sureshchandar et al. (2002) posit, the customer's voice is of great importance in services, particularly in service quality assessment and business performance. In addition, as Hooley et al. (2011) put it, customers are the ultimate source of shareholder value. Various performance and productivity measures have utilised customer perceptions in assessing organisational performance variables. These include the assessment of service quality and customer satisfaction (Fick and Ritchie 1991; Parasuraman et al. 1988, 1994; Cronin and Taylor 1992; Stevens et al. 1995).

3.6.5 Employees

The labour-intensive nature of services underlines the important role of employees in the service production process and in the evaluation of organisational performance and productivity. As explained by Hooley et al. (2011) job satisfaction and security motivate employees to focus on the long term interest of the organisation. In addition, as identified in the service marketing triangle, employees play an important role in both the internal and interactive marketing dimension of the organisation (Grönroos 2000). The important role of employees in services positions them as mediators between the organisation and its customers, and hence, as a channel of information flow between the organisation and its customers. Employee role as intermediaries places them in an influential position, particularly during the interactive marketing process, as an authentic source of information regarding the productivity of an organisation.

Further, several scholars have identified employees as a vital source for understanding and measurement of organisational productivity (Guest and Conway 1999; Hartog et al. 2004). Others have also used employee perceptions in identifying the determinants of firm productivity and performance (Hansen and Wernerfelt 1989; Patterson et al. 2003) and in measuring organisational productivity and profitability (Koopman et al. 2002; Silvestro 2002).

3.7 SECTOR - BASED PRODUCTIVITY MEASUREMENTS

Every economic sector is unique in its own way and as proposed by Fisher (1939) and Clark (1940) and later by Kuznets (1966), economic sectors are unique and come with thier own characteristics and differences. Clark (1940) suggested that all economies are expected to go through different stages during their development, which Clark (1940) identified as primary, secondary and tertiary sectors. These were later refined by Kuznets (1966) as

agricultural, manufacturing and service sectors respectively. The differences among these sectors are well documented (Corden and Neary 1982).

The differences among these sectors create difficulties in quantifying inputs and outputs at national, sectoral and, organisational levels and this has impacted on the different productivity measurements approaches adopted in the different sectors of the economy. Hoque and Falk (2000) recognised these differences and, therefore, recommended the adoption of different approaches to measuring productivity in different industries and sectors. Hoque and Falk (2000) further recognised that greater differences exist between industries than within an industry and these differences should be reflected in the design of productivity measures. This has led to the development of agricultural, manufacturing and service based productivity measures, which are discussed next.

3.7.1 Agricultural - Based Productivity Measurements

Productivity measures have their roots in the agrarian society period. The agriculture sector during this period and particularly post World War Two was viewed as a necessary precondition for the growth of the rest of the economy (Ruttan 2002). This period marks the age of development in productivity measures, which were used to assess the performance of land and labour (Mazoyer and Roudart 2006). Land and labour productivity measures dominated productivity measures during this period as they represented important elements/factors in the agricultural industry (Griliches 1968).

As explained by Ruttan (2002), agricultural productivity measures have evolved since the beginning of the 20th century from natural resource-based measures to scientific and technological-based measures. White (2000) demonstrated the technological transformation of the agricultural sector from manual tools to technological tools. Ruttan (2002) identified the transition of agricultural productivity measures in three stages. These are:

- Stage one: Dominated by partial-factor productivity measures, with land and labour being the main factors for measurement.

- Stage two: Involved the use of multi-factor productivity measures including land, labour, livestock, machinery and fertilizers. The Cobb-Douglas production function dominated this stage.
- Stage three: Involved the use of total-factor productivity measures that entail using all input factors in their measurement. Production frontier methods dominated this stage.

3.7.2 Manufacturing - Based Productivity Measurements

Manufacturing involves the transformation of raw materials or semi-raw materials into large-scale finished goods and includes different industries ranging from food and beverage, clothing, automobile and others[8]. In highlighting the historical background of the manufacturing sector Gorski (1998) explicates that the dominance of the manufacturing sector began during the industrial revolution in the late 18th century and early 19th century and that this emerged in developed countries and later spread to the rest of the world. This became the age of industrialisation. Most economists during this era viewed manufacturing as the most prosperous sector of the economy, and at the same time, the capitalist view dominated the manufacturing economy, which emphasised profitability as the main objective of every productive organisation and as a result financial measures became popular in productivity measurement.

Historically, the labour-intensive nature of the manufacturing sector during its earlier development led to the adoption of partial productivity measures, particularly labour productivity measures. Lieberman et al. (1990) identified the popularity of labour productivity measures in Toyota, Ford and Nissan between 1960 and 1983. Later on, multi-factor productivity measures gained importance as manufacturing improved and other factors of production, particularly capital resources become indispensable in the growth of manufacturing. This led to the dominance of labour and capital resources in manufacturing production processes during the early twentieth century. This reflects Adam Smith and Karl Marx's identification of labour and capital (machines) respectively as important sources of productivity improvements (Sabel and Zeitlin 1986). Sabel and Zeitlin (1986) further explain

[8] See the Office of National Statistics for an exhaustive list of examples of manufacturing industries.

that, around this time, other important concepts emerged in the manufacturing sector. These include mass production, lean manufacturing, Just-In-Time and mass customisation.

Manufacturing, later, reached the stage of development where quality and productivity gained importance and came to be seen as indispensable components in gaining competitive advantage. The development of quality approaches became a strategic tool and was reinforced by government regulations as a means of meeting the expectations of customers. This period saw the introduction of several concepts, including the Six Sigma, Total Quality Management, Quality Circles or Kaizen, Balanced Score Card, Taguchi methods, ISO and Quality Awards (Drucker 1990).

The emphasis on quality became the modus operandi of achieving higher profits and as a result profitability became an important agenda in industrial discussions and led to the dominance of financial productivity measures (Drucker 1990 and Kueng 2002). Examples of financial productivity measures include return on investment, cash flow, profit margins, return on assets, return on equity and Activity-Based Costing (ABC) (Dhavale 1992; Tangen 2003). Further examples of manufacturing-based productivity measures and approaches include time study, questionnaires, activity sampling, input/output ratios, work sampling; pre-determined time standards, historical standards and time reporting (McLaughlin and Coffey 1990; Adrian 2004). Appendix 3a highlights examples of productivity measurements in the manufacturing sector.

3.7.3 Service- Based Productivity Measurements

Productivity measurements in services have their root in classical economics when Adam Smith considered services as unproductive. As described by Melvin (1995), Smith's view on spending on non-productive activities put restrictions on capital formation, thereby slowing down the development of the economy. Smith considered the services of lawyers, doctors, priest, musicians, and all professionals now considered as part of services as unproductive labour. As explained by Melvin (1995), although Adam Smith, Ricardo and J. S. Mill considered services as unproductive, others like Heinrich Storch (1766–1835)

considered services as productive in terms of value creation. The period between 1930 and 1970 marks the beginning of services gaining their recognition because of their growing importance to the economy and the period when concerns about productivity in services were first raised. Services later gained greater attention in national accounting measures when the US forced the discussion of services on the General Agreement on Tariffs and Trade (GATT) agenda in 1982 (Braman 1990).

While the growth of services is persuasive, well documented and contributes significantly to GDP, employment and standard of living (Garner 2004; D'Agostino et al. 2006; Chesbrough and Spohrer 2006), several economists have disputed and criticised the growth and supremacy of the service sector. These include the "deindustrialisation" and "manufacturing matters" debates and the "Baumol disease" and "productivity paradox"[9]. In order for services to counter the preceding criticisms, several scholars have argued that low productivity growth in services is associated with productivity mis-measurements (Nordhaus 2002). Brynjolfsson (1993) highlighted the difficulty in defining measurable units of output and adjusting for quality changes, while Paton et al. (2004) indicated the overreliance on manufacturing and traditional economic models in productivity measurements in services.

This has led to the call for services to take a different approach in measuring their productivity, which has led to a number of approaches to measuring productivity in services. Among them is the inclusion of quality, customer role, effectiveness and outcome measures. These will be discussed in greater detail in Chapters 4 and 5. Appendix 3b illustrates examples of productivity measurement methods in services.

[9] See Section 1.2.3 for further details

3.8 CONCLUSION

This chapter was designed as an introduction to productivity concepts and measures. It highlighted the importance of productivity measures to the economy, organisations and individuals. It reviewed extant literature on productivity concepts, measures and approaches by exploring their advantages and disadvantages. This is demonstrated by the various productivity measurements available in the agricultural, manufacturing and service sectors of the economy. It further clarifies some of the conceptual and measurement issues in the different sectors of the economy and the various perspectives on the measurement and management of productivity in the different sectors of the economy.

It emerged that there are different approaches to productivity measurement, and each approach has its advantages and disadvantages, particularly its use in the different sectors of the economy. In addition, it emerged that the various sectors of the economy are different and require different concepts and measures to be adopted towards productivity measurements, analysis and management.

The next chapter is the literature review on SP. This chapter reviews extant literature on SP by differentiating the production process in services from the manufacturing dominant production process. In addition, it reviews the various definitions of SP as well as existing conceptual models and the various determinants relating to SP.

CHAPTER FOUR : LITERATURE REVIEW- SERVICE PRODUCTIVITY

4.1 INTRODUCTION

The growing importance of services in terms of employment and GDP growth has attracted much research in the services marketing arena. Most of this research has been confined to the service quality and customer satisfaction domain. Researches on SP, however, has rather been slow, despite the recognition by several scholars and practitioners that productivity in services is mismeasured and lacks conceptual underpinnings. In an attempt to address these issues, several scholars have proposed different definitions and conceptualised different frameworks and models for measuring SP.

This chapter, therefore, sets the scene for the researcher's conceptualisation by reviewing extant literature on the definition and conceptualisation of SP, in terms of its contribution to the current study and limitations. It firstly highlights the background to SP conceptualisation and measurement problems. It then delineates the production process in services as distinct from the manufacturing-based production process. Following that, it reviews the various definitions of SP. Moving on from this, the various perspectives and determinants of SP proposed in extant literature are discussed. Finally, existing models and frameworks for measuring SP are critically and systematically reviewed in terms of their contribution and limitations in the context of this thesis.

4. 2 PRODUCTIVITY IN SERVICES

The service sector contributes significantly to national economies in terms of employment, improved standard of living, poverty reduction, GDP growth as well as providing support and anchor for other sectors of the economy (Garner 2004; Chesbrough and Spohrer 2006). The service sector in OECD countries contributes about 70% to 80% to aggregate productivity and employment and this is expected to grow further (Wölfl 2003).

Despite the importance of services, particularly in terms of GDP and employment, several economists have regarded productivity in services as lagging behind those in manufacturing (Baumol 1967; Maclean 1997). Other economists have referred to this productivity situation in services as "Baumol disease" and a "productivity paradox" and have further resulted in the "manufacturing matters" and "deindustrialisation" debates[10]. An OECD report attributed this situation to the diverse nature of the service sector, which has led to different productivity growth rates in services ranging from negative and low rates to growth rates exceeding those of high-growth manufacturing industries (Wölfl 2003). As Maclean (1997) explains, while the service sector has been growing rapidly as a share of total output, APG has generally lagged behind that of the goods sector.

In dealing with the aforementioned problems relating to productivity growth in services and demonstrating the real value of the service sector to the economy, the commonly held belief among economists that productivity of service industries lags behind manufacturing industries has been challenged on the grounds that productivity is mismeasured in services using manufacturing based measures (Maclean 1997; Wölfl 2003; Paton et al. 2004). As explained by Wölfl (2003), productivity mismeasurement in services can be attributed to underestimation of SP growth, which further leads to underestimation of APG, through aggregation effects and the flows of intermediate inputs.

In addition, the mismeasurement of SP has been attributed to problems of accounting for multiple inputs and outputs in services, the labour-intensive nature of services and the

[10] See Sections 1.2.3 and 3.7.3 for further details

characteristics of services (Brynjolfsson 1993; Nordhaus 2002; Wölfl 2003). Others scholars have attributed this to the diverse nature of the service industry (Wolfe 2003) and the piecemeal nature of SP research, which is limited to individual service industry rather than the entire service sector (Singh et al. 2000; Sahay 2005; Zemguliene 2009). Furthermore, some scholars have attributed productivity mismeasurement in services to the inadequacy of proper definition of SP, misspecification and inadequacy of documentation of the production process in services and the over reliance on traditional and manufacturing based productivity measures (Adam et al. 1981; Mills et al. 1983; Shostack 1987; McLaughlin and Coffey 1990; Nachum 1999; Grönroos and Ojasalo 2004; Djellal and Gallouj 2008).

As a result of the problems of measuring productivity in services, several scholars have observed and commented on the inadequacy of conceptualisation of SP (Arnett and Schmeichel 1984; Vuorinen et al. 1998; Nachum 1999; Tangen 2002; Rutkauskas and Paulaviciene 2005; Djellal and Gallouj 2008, Linna et al. 2010). In view of that, several other scholars have called for the widening of the traditional perspective for measuring productivity in services as well as the adoption of service-specific productivity concepts and measures that capture the unique characteristics of services (Hoque and Falk 2000; Hipp and Grupp 2005, Linna et al. 2010).

This involves, as a starting point, an understanding of the production process in services as well as defining SP holistically. It also involves the proper specification of inputs and outputs and the conceptualisation of service-specific productivity measures and concepts (Mills et al. 1983; McLaughlin and Coffey 1990; Gummesson 1991; 1994; Vuorinen et al. 1998; Nachum 1999; Dobni 2004; Grönroos and Ojasalo 2004). In addition, this requires that approaches, definitions and measures of productivity in services deviate from traditional methods of defining and measuring productivity as discussed in Chapter Three, and rather define and measure productivity as a reflection of the unique characteristics of the service industry. In response to the preceding discussion, several scholars have defined SP differently and proposed various determinants and models for conceptualising and measuring productivity in services. However, since productivity centres on the measurement of the production process, the service production process will be discussed first.

4.3 SERVICE PRODUCTION PROCESS

Every industry, whether manufacturing or services, is involved in a production process, which is termed by Saari (2006) as the "Real Process" of a business and involves the transformation of inputs to outputs. Production processes have been an important topic in various disciplines particularly in industrial engineering and operational management (Shostack 1987). Furthermore, as indicated by Shostack (1987), these disciplines share the following key concepts on production processes. These are, breaking down processes into logical sequences and steps aimed at facilitating control over the process/system; each process accommodates a number of variables in which outcomes may vary due to the effect of judgement or chance; and each system recognises that processes happens in "real time" and may not conform to a prescribed set of standards.

Productivity, as a performance measure, measures the performance of a production process. As explained by Saari (2006), productivity in any organisation is created in its real process, which relates to its transformation process. Productivity is, therefore, considered as a measurement of the organisational process of creating and delivering its goods and services. Traditionally, the production process involves an input, transformation process, and output dimension. Productivity in this sense, relates to the performance of the transformation process dimension, which measures the relationship between inputs and outputs (Albino et al. 2002).

In the services marketing and management literature, however, little description of production process can be found (Shostack 1987). This is attributed to researchers' failure to study and document the production process in services (Adam et al. 1981). In addition, it may be that the understanding of the production process in services is not a straight-forward concept because of the distinguishing characteristics of services, particularly the inseparability and intangibility characteristics (Zemguliene 2009). Adam et al. (1981), therefore, concluded that the lack of understanding of the production process of services is a major obstacle in the pursuit of productivity measurement in services.

The lack of understanding and inadequacy of research on the production processes in services has been attributed to the characteristics of services (Zemguliene 2009). As Zemguliene (2009) explained, the characteristics of services, particularly, the inseparability and intangibility characteristics, affect the understanding of the production process in services. For instance, the inseparability characteristic of services changes the structure of the production process in services, particularly the input and transformation process dimensions. In relation to the input dimension, customer inputs in addition to organisational inputs are required in the co-production of services. In relation to the transformation process dimension, both customers and employees are actors in the co-production of services (Vargo and Lusch 2004; 2006; 2008). In addition, the intangibility characteristic of services makes the production process in services different from the manufacturing-based production process in terms of its output dimension to outcome dimension. This is based on the premise that service outputs are intangible and subjective (dependent on the customer and determined by the outcome of the service on the customer) (Benítez et al. 2007; Hirota 2009; Leverty and Grace 2010).

As a consequence of the preceding discussion, Zemguliene (2009) explained that the characteristics of services affect the structure of the production process in services. Mills et al. (1983), therefore, suggest that a better understanding of the production process in services can be achieved by analysing the process of producing services. In analysing the process of producing services and differentiating it from manufacturing-based production process, some scholars have described them as similar in terms of input, transformation process and output (Slack et al. 2004; Reid and Sanders 2005), while others have disagreed and argued that, differences exist, which have been attributed to the inseparability and intangibility characteristics of services (Grönroos 1998; Grönroos and Ojasalo 2004; Zemguliene 2009).

In differentiating between the manufacturing production process and service production process, Grönroos (1998) and later Grönroos and Ojasalo (2004) described them as closed and open processes/systems respectively. In a closed process, customers do not participate in organisational production process and output is determined by the organisation based on conformance to requirements and quality standards. An open process on the other hand, involves customer input and participation in the production process and output is

determined by customers based on their satisfaction (Grönroos 1998; Grönroos and Ojasalo 2004).

In summarising the work of the following authors (Bauer 2001; Lasshof 2006; Corsten and Gössinger 2007; Gleich et al. 2009), Gotsch et al. (2011) classified the production process in services as entailing potential orientation, process orientation and result orientation. Potential orientation relates to the service provider`s readiness to provide the service. This includes the service provider`s ability, skills, willingness and resources. This stage is referred to by Corsten and Gössinger (2007) as the "pre-combination stage" and relates to the value proposition stage in the service-dominant logic of marketing. The process orientation relates to the transformation process or the process of delivering services. This stage relates to value co-creation and includes both internal (provider`s input/service readiness) and external (customer) inputs. Lastly, the result orientation refers to the outcome of the service provided or the value the customer receives, and relates to Corsten and Gössinger`s (2007) end-combination stage of the service production process. In addition, Mills et al. (1983) delineated the service production system as comprising "system input", "conversion process", "system output" and, "quality output".

While the aforementioned differences have been acknowledged in service marketing and management literatures, the output dimension has been the most controversial and problematic dimension in these discussions. This relates to problems of quantifying service outputs, problems of measuring the multiple nature of service outputs and problems of incorporating service quality in the conceptualisation and measurement of service outputs (Brynjolfsson 1993; Johnston and Jones 2004).

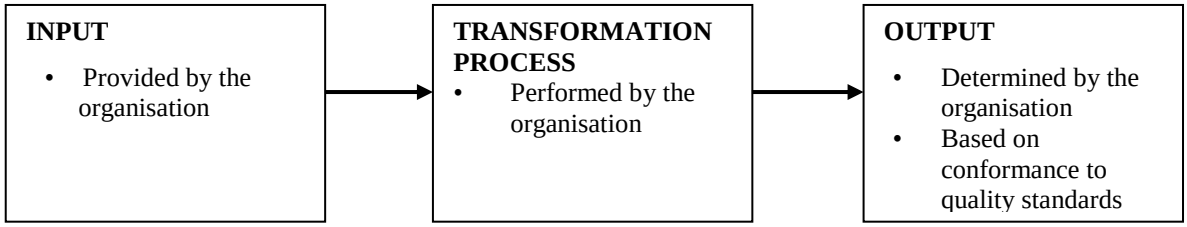
As a result of the aforementioned problems with the output dimension of the service production process, service outcomes have been emphasised in the production process in services (Grönroos 1998; Kyrillidou 2002); in productivity measurement in services (O`Mahony and Stevens, 2004) as well as in the definition of services (Hill 1977; Grönroos 2000). Service outcome is defined as "a change in customer's utility, attributed to the service provided" (Žemgulienė 2009:85). Mills et al. (1983) termed this as output quality, which relates to the consequence of service on the customer or the status of the customer after receiving the service. Extending this to a stakeholder perspective, Conway (2008)

emphasised impact measures, which relate to the impact of service value on users and other stakeholders. As a result of the importance of service outcome, the output dimension is replaced with an outcome dimension, which has been described as a better alternative to the output dimension (Žemgulienė 2009).

Based on the preceding discussion, there is a clear demarcation between the production process in services and manufacturing. In services, the production process involves an input, transformation process and outcome dimensions. Inputs in services extend beyond the manufacturing-based production process to include customer inputs. In addition, the transformation process involves customer participation in the service process, while outcome is determined by the customer and other stakeholders and is dependent on the consequence of the service on customers and other stakeholders. The manufacturing-based production process, on the other hand, entails input, transformation process and output and excludes customer input and participation in the production process, as well as disregarding the impact of the production process on customers and stakeholders. The dimensions of the manufacturing-based and service-based production process are presented in Figures 4.1 and 4.2 respectively[11]. The input, transformation process and outcome dimensions of the production process in services are discussed next.

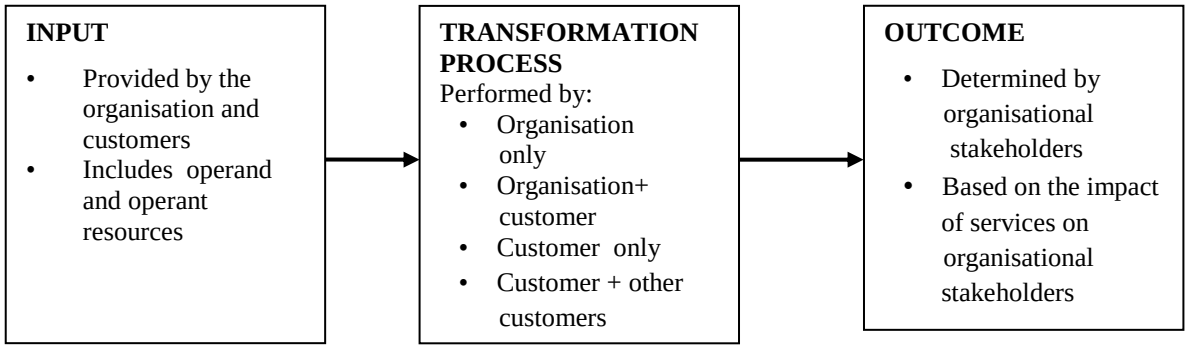
[11] See Appendix4 for examples of inputs, transformations processes, outputs and outcomes examples in different service industries.

Figure 4. 1: Manufacturing - Based Production Process



Source: Author

Figure 4.2: Service Based Production Process



Source: Author

4.3.1 Inputs

Improved productivity would not be possible without input resources. Input resources play a central role in every organisation`s production activities and relate to the transformed resources in the service process (Mills et al. 1983). Zemguliene (2009) described input as the resources used in the transformation process, which includes capital, labour and intermediate goods. Kyrillidou (2002) identified inputs as including human, material and financial resources. Inputs, in this case, refer to the injection of organisational resources, in the form of financial, human, managerial, physical and technological resources to the production

process (Grant 1991; Huselid 1995). While in manufacturing input resources are limited to organisational resources invested in services, they extend to include customer inputs. Customer inputs include mental, emotional and physical resources (Rodie and Kleine 2000). Mills et al. (1983) referred to this as system input, which includes both organisational and customer inputs.

In addition, other scholars have categorised input resources in services into operand and operant resources (Vargo and Lusch 2004; 2008; Holttinen 2010). Constantin and Lusch (1994) referred to operant resources as the intangible, dynamic resources of the firm, such as knowledge, innovation and technology. They further referred to operand resources as the tangible and static resources of the firm such as machines, buildings, and tools. Operand resources are tools and appliances (machines, materials) whereas operant resources are knowledge and skills (employees and customers' knowledge, skills, expertise) used for the co-production and co-creation of value (Vargo and Lusch 2004; 2008). Furthermore, the management of input resources has been associated with the Resource Based View (RBV) theory (Nath, et al. 2010). The RBV is based on the fundamental premise that the management and utilisation of valuable resources at the firm's disposal is the key to the attainment of competitive advantage (Mahoney and Pandian 1992; Smith and Rupp 2002; Hooley and Greenley 2005; Liebermann and Dhawan 2005).

The utilisation and management of input resources, both operand and operant resources as well as organisational and customer inputs have implication for organisational performance and productivity (Mahoney and Pandian 1992; Huselid 1995; Rugman and Verbeke 2002; Helfat and Peteref 2003; Lopez and Rodríguez 2005). Misterek et al. (1992) illustrated the impact of varying input quantity on firm efficiency. Several scholars have illustrated the relationship between inputs and efficiency in their definition of efficiency (Epstein 1992; Sumanth 1994; Klassen et al. 1998; Vuorinen et al. 1998; Jackson 2000; Keh et al. 2006). Others have also associated the quality of input resources with organisational effectiveness (Cheng 1996). In addition, customer inputs have been identified as impacting on organisational productivity and performance (Lovelock and Young 1979; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003).

4.3.2 Transformation Process

All organisations, whether manufacturing or services, profit or non- profit, are engaged in transformational activities, which Mills et al. (1983) referred to as a conversion process. Services by their very nature and definition relate to the transformation of customers and/or their properties (Hill 1977; Grönroos 2000). The transformation process has been identified as a key factor in the extended marketing mix and in the service marketing triangle (interactive marketing dimension). The transformation process in services as explained by Rafiq and Ahmed (1993) relates to how a customer receives a service/product. Mills et al. (1983) on the other hand, described it as the alteration of input resources. In addition, Grönroos (1998) referred to it as the consumption process while Corsten and Gössinger (2007) describes it as the conversion of internal, external and client-related factors of production into outputs.

In understanding and classifying the transformation process (also referred as sub-process) in services, Chase (1978) explains that, the classification of the service transformation process will enable the development of a more effective service operation that will subsequently impact on productivity. The service transformation process has been classified differently. These classifications include Thomas`s (1978) identification of equipment based and people based services; Chase`s (1978) high and low customer contact services; and Kotler`s (1980) equipment based services, people based services and extent of client/customer presence. In addition, several other scholars have classified the service transformation process based on the level of customer involvement into firm production, joint production and customer production (Meuter and Bitner 1998; Zeithmal and Bitner 2000). Grönroos and Ojasalo (2004) classified the service transformation process into three types in their SP model. These were service provider producing the service in isolation from the customer; provider producing the service with the customer; and customer producing the service in isolation from the service provider. Other scholars have extended this typology to include customers co-producing service with other customers (Gummesson 1994; Ojasalo 2003).

In sum, the transformation process in services entails the service provider producing the service in isolation from the customer; provider producing the service with the customer;

customer producing the service in isolation from the service provider; and customers co-producing service with other customers (Gummesson 1994; Ojasalo 2003).

4.3.3 Outcome

The concept of outputs, whether in economics, manufacturing or services, is generally defined in relation to goods and services produced. Kyrillidou (2002) defined outputs as the activities the system produces while Saari (2006) describe them as the result of the organisation`s real process. Examples of outputs indicators in services include total revenues of the university, grants and contracts, number of publication, number of undergraduate degrees, number of PhD degrees, graduation rate, number of people served and the speed of response to reported abuse (Afonso and Aubyn 2004; Bonaccorsi et al. 2007).

In services, the measurement and management of outputs have been problematic. Such problems as been identified as both conceptual and empirical (Griliches 1992; Triplett and Bosworth 2000; O`Mahony and Stevens 2004)[12]. McLaughlin and Coffey (1992) explain that, inputs are more controllable in services than outputs due to the characteristics of services. In addition, Mills et al. (1983) identified the bundle nature of service outputs and the intangible nature of service outputs as contributing to the difficulties in measuring service outputs. Others have also highlighted the inability for output measures to reflect the true benefit the customer receives from the service provided (O`Mahony and Stevens 2004). Based on this background, Triplett and Bosworth (2000) described the service industry as the most problematic sector when it comes to defining and measuring outputs.

The problems of conceptualising and measuring service outputs as discussed earlier have been identified as both conceptually and empirically problematic. Consequently, several scholars have recommended different approaches in dealing with the problem of service outputs. These include the use of proxies (including financial measures); direct observation of the service process; separating immediate outputs from mediate outputs; and separating tangible and controllable output from intangible and uncontrollable outputs and measuring

[12] Problems of measuring service output are well documented these researchers (Griliches 1992; Sherwood 1994; Triplett and Bosworth 2000).

those that are tangible and controllable (Drucker 1974; Gadrey 1988; Flipo 1988; Vuorinen et al. 1998)[13].

While the aforementioned suggested approaches have addressed some of the problems of measuring service outputs, they have also contributed to the dominance of financial and traditional (manufacturing) based productivity measures in services, despite the limitations associated with these measures, particularly financial measures as discussed earlier (See Section 3.5.3). As a consequence, several scholars have rejected output measures and advocated outcome measures as a better alternative (Grönroos 1998; Kyrillidou 2002; Martin 2007; Linna et al. 2010). For instance, O`Mahony and Stevens (2004) argued that there are strong theoretical arguments in using outcome measures in services. This is because the lack of prices and inadequate information in services suggest that outcome measures may provides more accurate performance results on the effectiveness of services than output performance results. Examples of outcome measures are lifetime earnings as a result of education, test scores and increase in average years of life due to medical intervention (O`Mahony and Stevens 2004).

In differentiating between output and outcome, Mills et al. (1983) related them to system output and quality output respectively. Mills et al. (1983) described system output as measured by physical indicators while quality output relates to service quality, which is the condition of the customer on receipt of services and is determined by the customer`s perceived service quality. Netten and Forder (2010) and Hastings (2004) both differentiated outcome from output measures by describing outputs as a measure of service volume and outcome as a measure of improvements in people's lives. Outcomes, in this sense, relate to the change in customer's utility, attributed to the service provided (Žemgulienė 2009) and can be a satisfactory or unsatisfactory outcome (Grönroos 1998).

As a follow-up of the preceding discussion, Conway`s (2008) emphasised the importance of impact measures, which relates to the importance of service value and its impact on users. For instance, Stankiewicz (2002) and Djellal and Gallouj (2010) both suggested replacing output measures with the concept of valorité. The concept of valorité refers to the effectiveness of outputs other than the mere volume of output produced and

[13] Cited in McLaughlin and Coffey (1990)

takes into consideration the value of service outputs, which includes customer satisfaction, quality and demand responsiveness (Djellal and Gallouj 2010). According to Djellal and Gallouj (2010), the concept of valorité deviates from the neoclassical view (emphasising on volume/quantity of outputs) to a neo-schumpeterian view (emphasising on quality of output).

Consequently, various scholars have identified and used service quality as a measure of organisational outcome (Cameron 1978; Jarvinen et al. 1996; Vuorinen et al. 1998; Fixler and Zieschang 1999; Seth et al. 2005; Picazo-Tadeo et al. 2008; Kumar and Managi 2010). For instance, Owusu-Frimpong et al. (2010) related the outcome of the service process to service quality, while Mills et al. (1983) referred to this as quality of output, which they described as the consequence of service on the customer. This is consistent with Hill`s and Grönroos` definition of services (Hill 1977; Grönroos 2000). Recently, Linna et al. (2010), identified outcome measures as a better alternative in measuring SP, particularly in the public-sector.

In addition, several scholars have emphasised the need for productivity measures to take into account the wider impact of organisational activities. Lowe (2003) and Djellal and Gallouj (2008) both advocated productivity measures to go beyond the interest of its immediate stakeholders by considering the organisation`s social and environmental impact. Windham (1976) for instance, used "spillover effect" as an indicator of educational effectiveness, which he described as the impact of education on individuals that was neither intended nor the basis for the provision of education. Furthermore, various performance measures have emphasised and integrated a stakeholder perspective in their conceptualisation of organisational performance measures. These include the balanced scorecard and the performance prism (Kaplan and Norton 2001; Neely and Adams 2001; 2002).

In sum, the service production process entails input, transformation process and outcome dimensions. The input dimension extends beyond the traditional or manufacturing-based concepts to include customer inputs. In addition, the transformation process dimension includes customer participation, while the output dimension is replaced with an outcome dimension, which refers to the direct and indirect impact of organisational activities, processes, and products/services on stakeholders.

4.4 DEFINING SERVICE PRODUCTIVITY

Although defining SP is not an easy endeavour, the importance of productivity to service organisations has compelled various scholars and practitioners to develop an understanding of SP. As a result, various definitions of SP have been proposed by several researchers, which are presented in Table 4.1

Table 4.1: Service Productivity Definitions

Author	Definition
Achabal et al. (1984)	A measure of the capability to meet demand.
Armistead et al. (1988)	Achievement of organisational goals.
Järvinen et al. (1996)	The ability of a service organization to use its inputs for providing services with quality matching the expectations of customers.
Klassen et al. (1998)	A ratio of output value to its related input value. .
Vuorinen et al. (1998)	A quantity of output and quality of output in relation to quantity of input and quality of input.
Al-Darrab (2000)	The relationship between output, input and quality.
Moseng and Rolstadas (2001)	The ability to satisfy the customers' needs with minimum total resource utilisation.
Grönroos and Ojasalo (2004)	A function both of internal efficiency and cost effective use of production resources and of external efficiency and customer perceived quality.

Despite the various definitions of SP presented in Table 4.1, the term SP has been confused with efficiency and effectiveness and has been used interchangeably, as if they are synonymous with each other (Johnston and Jones 2004). Arnett and Schmeichel (1984: 122) observed the confusion surrounding productivity, thereby commenting that "productivity is a complex subject in regards to its meaning, concepts and measurement". In addition, Stone and Cutcher-Gershenfeld (1996) observed that these terms are misunderstood by academics and practitioners alike and attributed this to different academic research perspectives and the different levels of analysis used (national, industry or organisational). While these misconceptions have survived, current researchers on SP have emphasised the need for better

understanding on these key concepts **(**Vuorinen et al. 1998; Tangen 2002; Johnston and Jones 2004). Table 4.2 provides an overview of the various definitions of efficiency and effectiveness.

Table 4.2: Efficiency and Effectiveness Definitions

Measure	**Author**	**Definition**
Efficiency	Drucker (1974: 45)	Doing things right.
	Epstein (1992)	The level and quality of service which is obtained from the given amount of resources.
	Sumanth (1994)	The ratio of actual output attained to standard output expected, and reflects how well the resources are utilised to accomplish the result.
	Klassen et al. (1998)	Is achieved by minimising inputs for a given level of outputs.
	Vuorinen et al. (1998)	The degree to which a service process or activity produces the greatest possible outputs within the minimum use of resources.
	Jackson (2000)	Relates to how much cost is expended compared with the minimum cost level that is theoretically required to run the desired operations in a given system.
Effectiveness	Drucker (1974: 45)	Doing the right things.
	Sumanth (1994)	The degree of accomplishment of objectives, and shows how well a set of results is accomplished.
	Neely et al. (1995)	The extent to which the customer requirements are met.
	Gate and Stone (1997)	The extent to which the provider meets the needs and demands of stakeholders or customers.
	Klassen et al. (1998)	The achievement of goals.
	Grönroos (2000)	The capability of a firm to produces a certain level of perceived service quality with a given resources.
	Jackson (2000)	The extent to which cost is used to create revenues.
	Johnston and Jones (2004)	The degree to which end results are achieved relative to the required standard.

4.5 MEASURING PRODUCTIVITY IN SERVICES

The debates over the growth of the service sector, the problems of conceptualising and measuring SP previously discussed, the changing nature of today`s business environment and the increasing pressure from different stakeholders for service organisations to prove their value for money, require that service organisations adopt appropriate measurement methods in their pursuit to measure productivity in their organisation. As a consequence, several scholars have attempted to conceptualise SP by proposing a number of determinants, conceptual models and theoretical frameworks for measuring SP. The following sections discuss the various perspectives and determinants of SP and the various theoretical models contributing to the conceptualisation and measurement of SP.

4.6 SERVICE PRODUCTIVITY MEASUREMENT PERSPECTIVES

SP relates to the measurement of the performance of the service transformation process, which has been described as an open system as opposed to the closed system in manufacturing (Grönroos 1998; Grönroos and Ojasalo 2004). The open system nature of the production process in services implies that productivity in services is affected by several factors within and beyond organisational control. In addition, in their review of the state-of-the-art of SP research, Bartsch et al. (2011) highlighted the following streams of literature dealing with SP: industrial productivity (e.g. Levitt 1972); service production (e.g. Corsten and Gössinger 2007); customer integration (e.g. Johnston and Jones 2004); service marketing (e.g. Grönroos and Ojasalo 2004).

Based on this understanding, several scholars have advocated a holistic perspective on the conceptualisation and measurement of productivity in services (Sahay 2005). This requires that the quest to measure productivity in services should entail a broader understanding of the various perspectives that impact on the productivity of service

organisations. Further, the interdisciplinary nature of services has been emphasised in existing literature (Spohrer and Maglio 2010), while Vitamo and Toivonen (2011) emphasised on the socio-economic view of SP. As a result, the conceptualisation of the measurement of SP has been explored from multiple perspectives including marketing, psychology, stakeholder, operational, economics, organisational, managerial and human resource perspectives.

4.6.1 Marketing Perspective

From the marketing perspective, productivity in services relates to the impact of organisational marketing activities on organisational performance and stakeholder perceptions. This is in line with Linna et al. `s (2010) assertion that the importance of service quality and customer involvement in the production process in services requires a marketing perspective in the understanding of SP. This would entail an understanding of marketing concepts including customer integration, customer citizenship behaviour, dysfunctional customer behaviour, service co-production, service co-creation of value, the service triangle, service blueprint, servicescapes, service quality, marketing communication and customer satisfaction.

The concept of Customer Citizenship Behaviour (hereafter, CCB), relates to customer discretionary and voluntary behaviour that affects the successful delivery of services and further impacts on organisational, employee and other customers` productivity (Groth 2005). Dysfunctional Customer Behaviour (hereafter, DCB) on the other hand, relates to customer behaviour within the service delivery process that deviates from the norm expected and negatively impacts on organisational, employee and other customers` productivity (Reynolds and Harris 2009; Fisk et al. 2010). In terms of customer integration, Büttgen (2007) related this to service co-production and co-creation of value. These concepts have been identified as impacting on SP (Mills and Morris 1986; Kelley et al. 1990; Schneider and Bowen 1995; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003).

Further, on the service triangle concept, service marketing scholars have emphasised the importance of the organisation, employees and customers in the internal, external and interactive process in services and their impact on organisational performance (Ahmed and Rafiq 2000 Grönroos 2000). Furthermore, on service quality and customer satisfaction concepts, productivity conceptualisations in extant literature has emphasised the importance of service quality and customer satisfaction as output/outcome of the production process in services (Haynes and DuVall 1992; Jaaskelainen 2009). Finally, on the gap model and marketing communication, these concepts play a vital role in assessing customer and stakeholder expectations and perceptions of service outcomes (Parasuraman et al. 1985).

4.6.2 Psychological Perspective

From a psychological point of view, productivity in services has a psychological underpinning. This is because services are labour-intensive and as a result, involve human feelings and experiences. This relates to employee and customer feelings, experiences and perception towards the organisation, its employees and other customers involved in the co-production of services. Several scholars have studied the psychological impact of employee mode, behaviour, attitude, perception on productivity (Dollard et al. 2000 Cunningham et al. 2002). Janssen et al. (2010) for instance, found a positive relationship between employee emotional exhaustion, stress and productivity. This is because the service encounter is a psychological phenomenon that exerts impact on the actors of the service process as well as on the outcome of the service process. Solomon et al. (1995) related social psychology to the service encounter and further explained that the service outcome is dependent on the behaviour of the participants involved in the co-production process (Solomon et al. 1995).

4.6.3 Human Resource Perspective

The labour-intensive nature of services and the importance of organisational human resources in services reinforce the need for understanding of the human resource perspective in the conceptualisation of SP. Several scholars have conceptualised and found a positive relationship between employee behaviour and productivity (Huselid 1995; Delaney and Huselid 1996; Ichniowski et al. 1997; Wood and De Menezes 1998). In understanding this relationship, several other scholars have identified a relationship between organisational human resource practices, employee behaviour and productivity improvements (Huselid 1995; Delaney and Huselid 1996). Organisational human resource practices include employee recruitment and selection, training and motivation. In addition, the recognition of customers as part-time employees has led to the call for a similar perspective in the management of organisational customer resources (Schneider and Bowen 1995; Zeithaml and Bitner 1996).

4.6.4 Stakeholder Perspective

The impact of productivity improvement is not restricted to the organisation and its customers only, but rather extends beyond its immediate stakeholders to include other external stakeholders, therefore, emphasising the importance of stakeholder perspective in the conceptualisation of SP. Extant literature have emphasised the need for organisations to prioritise stakeholders in their organisational decision making and behaviour (Stevens et al. 2005; Berrone et al. 2007). Consequently, various concepts have emerged in the assessment of organisational performance. These include organisational ethical behaviour, corporate social responsibilities, customer satisfaction, service quality, customer value, stockholder value and employee satisfaction. Gundlach and Wilkie (2010) also advocated the inclusion of a stakeholder perspective in the definition of marketing. This is because a firm`s marketing activities go beyond the interest of its immediate customers to include others affected by the firm`s activities (Bhattacharya and Korschun 2008; Gundlach and Wilkie 2010).

In services, Djellal and Gallouj (2008) advocated that productivity measures should go beyond the interest of immediate stakeholders by considering social and environmental cost. Furthermore, various performance measures have emphasised and integrated a stakeholder perspective in their conceptualisation of organisational performance measures including the balanced scorecard and the performance prism (Kaplan and Norton 2001; Neely and Adams 2001; 2002).

4.6.5 Operational Management Perspective

Productivity is about the performance of the organisational transformation process, which relates to the conversion of inputs to outcomes. Based on this understanding, operational management, which is about the management of the production/transformation process and entails the management of inputs resources to the transformation process to produce outputs (goods/services) in an efficient and effective manner, has gained a stronger footing in the understanding of productivity (McMahon-Beattie and Yeoman 2004). While in manufacturing this is a universal phenomenon, in services, extant literature on service operations has limited this logic to service factories only, although Lewis et al. (2009) argued that, operational management logic is applicable to all services.

The application of operational management logic in services includes the following functions of operational management: staff management, quality monitoring, customer control and management in the service process, demand and supply management and revenue and pricing of services (McMahon-Beattie and Yeoman 2004). The application of these functions has implications for productivity in services. For instance, the management of service quality, customers and employees behaviour is positively related to productivity (Huselid 1995; Delaney and Huselid 1996; Ichniowski et al. 1997; Wood and De Menezes 1998; Parasuraman 2002). As a result, it is vital that operational management perspectives are captured in the conceptualisation and measurement of SP.

4.6.6 Economic Perspective

Economic theories have been fundamental in performance and productivity discussions, conceptualisations and measurements. Productivity has been an essential concept in eminent economists discussions on the scarcity of resources. For instance, Adam Smith distinguished between productive and unproductive labour, while several other economists have debated on the productivity of labour and technology as well as the productivity of the different sectors of the economy (Baumol 1967; Brynjolfsson 1991; Wölfl 2003). In addition, productivity issues in economics have focused on the macro and micro levels of the economy and the firm respectively (Bulkley and Alstyne 2004). At the macro level, productivity impacts on standard of living, GDP growth and employment while at the micro level, productivity impacts on organisational profitability and consumer welfare (Bulkley and Alstyne 2004).

Further, economists have related productivity as measuring the relationship between output and input (Oraee et al. 2010). This relates to technological and labour impact on productivity. Others have related the economic concepts of efficiency and effectiveness of cost, inputs and outputs/outcomes to productivity (Parson 1997; Coelli et al. 2005). Based on the preceding discussion, economic concepts play a central role in the understanding and conceptualisation of SP. These relate to the efficiency and effectiveness of organisational inputs and outputs, customers and societal welfare, organisational profitability and economic growth.

4.6.7 Organisational and Managerial Perspective

The organisation and its management play a central role in the productivity and performance of the organisation as well as the productivity and performance of its employees and other third parties involved the production process. An Organisation`s ability to invest adequate resources into its production process has been identified as impacting positively on its productivity (Smith and Rupp 2002; Hooley and Greenley 2005). Similarly, organisational

ability to invest in human resources has been found to impact on employee productivity as well as organisational productivity (Huselid 1995; Wood and de Menezes 1998).

In addition, managerial practices and behaviour have also been found to impact positively on employee motivation and productivity and subsequently on organisational productivity (Patterson et al. 2005). In the service setting, an organisation`s ability to invest adequately in its customers (part-time employees) impacts positively on its customer productivity, which in turn impacts on its employee productivity and subsequently on organisational productivity (Bowen 1986). Based on the preceding discussion, it is evident that the organisation and its management play a vital role in the productivity of its employees and customers as well as on the overall organisational productivity and performance.

In summary, the holistic measurement of SP is a multifaceted concept, which entails a multidisciplinary perspective in its conceptualisation. These perspectives include marketing, psychology, stakeholder, operational, economics, organisational, managerial and human resource perspectives.

4.7 DETERMINANTS OF SERVICE PRODUCTIVITY

Productivity measures have been used as a managerial tool in identifying the factors affecting productivity change (Zemgulene 2009). In identifying the factors affecting productivity change in service, SP has been conceptualised and measured from either partial, multi-factor or total-factor perspectives. While partial measures have their advantages, particularly in terms of ease of measurement and use, they come with several disadvantages. These relate to the difficulties in identifying causal factors accounting for productivity growth or change; problems of overstating increases in productivity; and neglect of other input

factors[14]. Other extant literature has emphasised the importance of multi-factor or total-factor productivity measures (Bernard and Jones 1996; Brynjolfsson and Hitt 1998). In services, Triplett and Bosworth (2002) identified multi-factor productivity as a better alternative to labour or partial-factor productivity measures, while others identified total-factor productivity measures as the optimum alternative (Stainer and Stainer 2003; Djellal and Gallouj 2008).

In addition, Dotchin and Oakland (1994) explain that the understanding of the determinants of productivity in any service industry requires a better understanding of services in general and other service industries. In seeking to understand the determinants of productivity in services, extant literature on SP was systematically reviewed from a service generic perspective and an individual service industry perspective in order to identify the various determinants of productivity in services. Several researchers have identified different determinants of SP. These are illustrated in Table 4.3, there the determinants of SP are identified from services in general and from individual service industries.

The identified determinants of SP comprise employee related factors including knowledge, skills and demographic characteristics and customer related factors including customer involvement. Others factors include efficiency and effectiveness, quality and quantity, organisational factors and resources, technological factors and, external/environmental factors.

[14] The advantages and disadvantages of partial, multi-factor and total productivity are highlighted in chapter three (Table 3.3)

Table 4.3: Determinants of Service Productivity

Author	**Industry**	**Determinants**
Spohrer et al. 2007	Services	Efficiency and effectiveness.
McLaughlin and Coffey 1992	Services	Degree of customer contact and level of customisation; complexity of inputs and outputs and, the degree of aggregation or disaggregation.
Soderbom and Teal 2001	Services	Firm size and human capital.
Vuorinen et al. 1998	Services	Quality and quantity of inputs and outputs.
Armistead et al. 1988	Services	Volume, variety and variation.
Francalanci and Galal 1998	Life Insurance Companies	IT investment and worker composition.
Henderson and Cockburn 1996	Pharmaceutical Research Company	Scope, scale and spillover.
Hall and Blackburn 1975	HE Research Productivity	Habit of publication, disciplinary field, years in HE, academic rank, interest in research, salary, number of journal subscription, years in current institution, networking.
Ehrenberg and Hurst 1996; Tien and Blackburn 1996; Clack and Lewis 1985 ;Clemente 1973	HE Research	Reputation, gender, age educational and socio-economic backgrounds, age at first publication, years between bachelor degree and PhD and publication before PhD.
Babu and Singh 1998	Research Productivity Of Scientist	External orientation, persistence, access to literature, initiative, learning capability, concern for advancement, intelligence, professional commitment, resource adequacy, creativity, and simulative leadership.
Glisson and Martin 1980	Human Service Organisations	Structure, size and age.
Francalanci and Galal 1998	Life Insurance Industry	Information technology and worker composition.
Grigorian and Manole 2002	Commercial Bank	Bank specific variables, macroeconomic environment in country, regulatory and general business environment.
Inklaar et al. 2008	Market Services	ICT capital and human capital.
Griffith et al. 2003	Retail Productivity	Management, labour force skills and ICT.
Higón et al. 2009	Retail Productivity	Skills and knowledge transfer and ICT.

4.8 SERVICE PRODUCTIVITY MODELS

In addition to the preceding discussion and identification of the various determinants of SP highlighted in Table 4.3, various researchers have proposed different theoretical models and frameworks in contributing to the conceptualisation and measurement of SP. These models were critically reviewed and are presented in Table 4.4 with their contributions and limitations to the conceptualisation and measurement of SP.

Table 4.4: Review of Existing Productivity Measures in Service

Author	**Model**	**Contribution to SP Conceptualisation and Measurement**	**Limitations**
Mills et al. (1983)	Model for employee-client transaction interface in services	• Utilised the service production process in understanding employee and customer co-production. • Recognised employee and customer role in services. • Recognised customer and employee willingness and expertise as a key factor in service co-production. • Identified customer and employee willingness as comprising motivation, role and goal clarity and team working. • Recognised service outcome as related to the consequence of service on the customer.	• Less emphasis on the importance of organisational resources in the production of services. • Lacks a stakeholder perspective.
McLaughlin and Coffey (1990)	Framework for measuring productivity in services	• Emphasised employee role in the development and implementation of SP measures.	• Limited to manufacturing-based measures. • Framework applicable to service factories only. • Downplayed the importance of service quality. • Lacks a stakeholder perspective. • Ignored the labour intensive nature of services
Haynes and DuVall (1992)	Homeostatic model of SP	• Identified SP as the attainment of customer and service provider`s mutual satisfaction through service quality and profitability respectively. • Identified customer and service provider satisfaction as outcome of services. • Emphasise balancing customer and provider outcomes.	• Ignored the input dimension of the service production process. • Disregarding the role of employees, customers and, organisational resources as input to the production process. • Ignored the satisfaction of other relevant organisational stakeholders.
			Continued on next page

Table 4.4: Review of Existing Productivity Measures in Service

Author	**Model**	**Contribution to SP Conceptualisation and Measurement**	**Limitations**
Vuorinen et al. (1998)	Content and measurement of productivity in the service sector	• Identified quantity and quality of inputs and outputs as dimensions of SP. • Related input quality to tangible and intangible elements. • Related output to customer perceived service quality.	• Inappropriate operationalisation of service quality using observation and service process documentation. • Problems of using objective and financial indicators for SP measurement. • Failed to recognise customer role in services. • Lacks a stakeholder perspective.
Nachum (1999)	Productivity measurement in professional services	• Considered the multiply nature of input and outputs of services. • Recognised customer, employee and, organisational resource as inputs into the production process and as influencing productivity in services. • Measured service output as the consequence of services on customer and service provider.	• Inappropriate operationalisation of service quality using market share. • Problems of using objectives and financial indicators for SP measurement. • Lacks a stakeholder perspective.
Ojasalo (2003)	Model for understanding customer influence on SP	• Recognised customer role as impacting positively or negatively on SP. • Customer input impact on the service production process and the service outcome. • Identified service quality and customer satisfaction as service outputs. • Identified the quality level of customer's resources, customer competence, customer willingness to co-produce and customer selection as impacting on SP.	• Limited to customer perspective.

Continued on next page

Table 4.4: Review of Existing Productivity Measures in Service

Author	**Model**	**Contribution to SP Conceptualisation and Measurement**	**Limitations**
Johnston and Jones (2004)	Framework on the analysis of SP through customer and operational productivity	• Recognised customers as inputs to the service process. • Recognised organisational input (organisational resources) in services. • Measured service output from customer and provider perspective. • Customer output relates to customer experience, customer outcome and value. • Linked customer participation and inputs to SP.	• Provided a disintegrated approach to productivity measurement in service rather than a holistic approach (separate analysis of customer and operational productivity). • Problems of using objective and financial indicators for SP measurement.
Oke (2004)	Model for measuring productivity in HE.	• Identified organisational resources including employees as input factors in productivity measurement. • Related service output to community service undertaking by employees.	• Failure to apply service-specific concepts. • Overreliance on industrial engineering concepts. • Ignored the impact of service quality on productivity. • Problems of using objective and financial indicators for SP measurement. • Lacks a stakeholder perspective • Disregarded customer role as inputs to the service process.
Dobni (2004)	Model for analysing service worker productivity	• Emphasised a multi-discipline perspective in SP conceptualisation and measurement. • Recognised employees` physical and emotional well-being as impacting on the service production process and SP. • Considered job domain, interpersonal relationship, environmental and organisational factors as impacting on the service production process and SP. • Identified service quality as an indicator of SP.	• Limited to employee perspective of SP measurement. • Lacks a stakeholder perspective.

Continued on next page

Table 4.4: Review of Existing Productivity Measures in Service

Author	**Model**	**Contribution to SP Conceptualisation and Measurement**	**Limitations**
Fließ and Kleinaltenkamp (2004)	SP conceptualisation	• Contributed to the understanding of the production process in SP conceptualisation and measurement. • Recognised organisational operand and operant resources. • Recognised customer inputs in services. • Recognised and utilised outcome measures as opposed to output measures.	• Lacks a stakeholder perspective. • Disregarded customer operant resources.
Grönroos and Ojasalo (2004)	SP measurement model	• Differentiated between service and manufacturing production process. • Emphasised efficiency and effectiveness perspectives in productivity measurement. • Recognised organisational and customer inputs in productivity measurement. • Identified customer perceived quality as service output.	• Problems of using objectives and financial indicators for SP measurement. • Failure to consider the financial, physical and psychological resources customers invest in the service production process. • Lacks a stakeholder perspective.
Sahay (2005)	Multi-factor productivity measurement model for services	• Emphasised a multi-factor approach to productivity measurement. • Focused on long-term and sustainable productivity and growth. • Applied a productivity measure that taps into the strategic and operational level as well as aggregate and disaggregate levels of the organisation.	• Problems of using objective and financial indicators for SP measurement. • Down-played the importance of service quality. • Lacks a customer perspective.
			Continued on next page

Table 4.4: Review of Existing Productivity Measures in Service

Author	**Model**	**Contribution to SP Conceptualisation and Measurement**	**Limitations**
Corsten and Gössinger (2007)	SP stages	• Contributed to the understanding of the production process in SP conceptualisation and measurement. • Recognised customer inputs. • Recognised qualitative measures in SP measurement. • Related output to service outcome on the customer.	• Lacks a stakeholder perspective. • Failed to recognise the impact of customer participation on employees, organisational resources and service delivery.
Jaaskelainen (2009)	Framework on the factors affecting and driving productivity in public services	• Identified input and output as determinants of SP. • Identified employee input (employee competence) as affecting productivity. • Linked productivity outcome to service quality and customer satisfaction.	• Downplayed customer role and inputs in services. • Lacks a multidisciplinary perspective • Disregarded other stakeholders.

4.9 CONCLUSION

This chapter reviewed extant literature on the production process in services and the various definitions of SP. It then reviewed the perspectives, determinants and models for conceptualising and measuring SP. It identified the service production process as entailing input, transformation process and outcome dimensions. The input dimension extends beyond the traditional or manufacturing-based concepts to include customer inputs. In addition, the transformation process dimension includes customer participation, while the output dimension of the manufacturing-based production process is replaced in services with an outcome dimension, which refers to the direct and indirect impact of the organisation`s activities, processes, and products/services on its stakeholders. It further reviewed the various definitions of SP and differentiated it from its related efficiency and effectiveness concepts.

Finally, it reviewed extant literature on the determinants of SP and the models for conceptualising and measuring SP by identifying their contribution and limitations to the conceptualisation and measurement of SP in the context of this thesis. It identified the role of employees, customers and organisational resources as impacting on the service transformation process as well as the consequence of services on organisational stakeholders as themes emerging from the review of extant literature. It also highlighted the various perspectives for conceptualising and measuring SP.

Based on the contribution and limitations of the reviewed papers as well as the piecemeal nature of extant literature on the conceptualisation of SP, the next chapter, which is the conceptualisation chapter, conceptualises SP by taking advantage of the contributions of extant literature discussed so far and by bringing together the piecemeal nature of the above discussed literature in a unified fashion in order to define SP holistically, identify the determinants of SP and propose a model for measuring SP.

CHAPTER FIVE: CONCEPTUALISATION OF SERVICE PRODUCTIVITY

5.1 INTRODUCTION

In the previous chapter relating to the literature review on Service Productivity (SP), the production process in services was discussed and the various definition of SP were reviewed. In addition, several determinants of SP were identified and the extant literature relating to SP and its related constructs was critically and systematically reviewed by identifying its contribution and limitations in the context of this thesis. As a result of the review on extant literature, a new approach to SP conceptualisation and measurement is required. This should take a holistic and multidisciplinary perspective by considering the inputs and outcomes of SP, the unique characteristics of services, the production process in services and the different theories and concepts relating to SP.

This chapter, therefore, sets the scene for achieving the aim of this thesis, which is to develop a theoretically grounded model for measuring productivity in services which is tested in Business and Management Schools of the HE sector. It conceptualise SP by defining SP holistically; proposing a framework and model for measuring productivity in services; identifies the determinants of productivity in services, which relates to the antecedents and consequence of SP; and hypothesises certain relationships between SP and its related constructs.

5.2 SERVICE PRODUCTIVITY - A HOLISTIC DEFINITION

In trying to grasp the meaning of SP and differentiate it from other related concepts, particularly efficiency and effectiveness as discussed in Section 4.4, Coelli et al. (2005) described these terms as conceptually different. In illustrating the conceptual differences between these terms, Järvinen et al. (1996) define SP as the ability of a service organisation to use its inputs for providing services with quality matching the expectations of customers. Drucker (1974: 45) on the other hand, defines efficiency as "doing things right" and effectiveness as "doing the right things".

In addition, in trying to understand the relationship between these concepts, Parson (1997) identified efficiency and effectiveness as core elements in defining productivity. She describes effectiveness as relating to the relationship between output and organisational objectives and efficiency as the relationship between inputs and outputs. She further recommends the adoption of a multifaceted approach in measuring productivity; which involves both effectiveness and efficiency. In that respect, Grönroos and Ojasalo (2004) developed a model, which integrates efficiency and effectiveness in its framework for measuring SP. As posited by Grönroos and Ojasalo (2004), productivity measures in manufacturing are equated to efficiency measures only due to the closed systems in which traditional manufacturing operate[15]. In contrast, services involve the participation of customers in the production and consumption process, which they refer to as an open system; therefore, both efficiency and effectiveness are required in measuring productivity. Productivity measurements in services, therefore, require a dual approach, which entails both efficiency and effectiveness perspectives. Furthermore, Ghalayini and Noble (1996) identified effectiveness and efficiency as elements in achieving organisational strategic objectives.

Therefore, in order to gain an in-depth understanding of SP, it is an imperative that the unique characteristics of services are captured in its definition. This requires a holistic

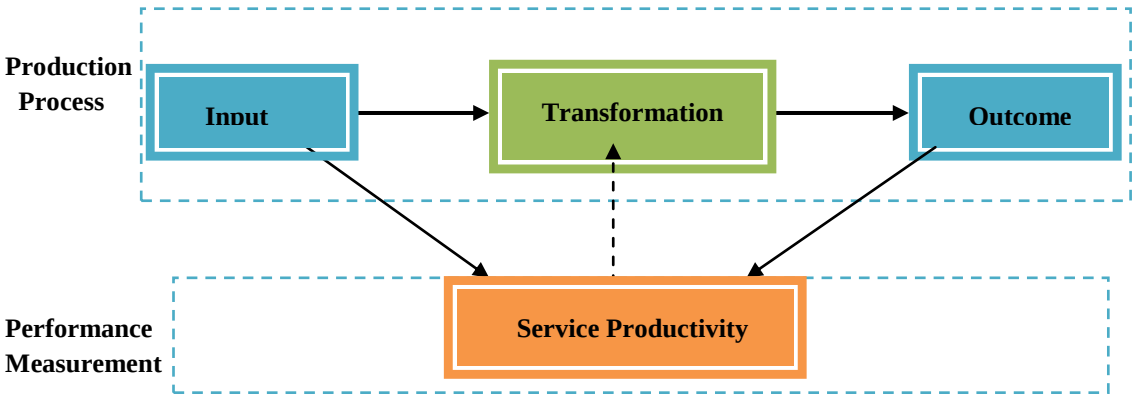
[15] Closed system as Grönroos and Ojasalo (2004) described it, involves the separation of the production and consumption processes.

definition of productivity in services which identifies and measures productivity inclusively. This thesis, therefore, takes into consideration effectiveness and efficiency concepts, the characteristics of services and the understanding of the service production process in defining SP. SP, therefore, relates to the measurement of the performance of the service transformation process and is defined as:

> *The relationship between the outcome of the service transformation process and the input to the service transformation process*[16]:

From the preceding definition, inputs relate to the resources a service organisation uses in its transformation process towards the attainment of its outcome objectives. Such resources include both organisational and customer resources (both operant and operand resources). Service outcome, on the other hand, relates to the impact of the service transformation process, products and services on its stakeholders. The proposed definition represents an inclusive and holistic definition of SP, identifies the areas in which productivity in services should be measured and managed and is conceptually applicable in all services. Figure 5.1 represents a schematic diagram of the proposed definition of SP.

Figure 5.1: Schematic Diagram of a Holistic Definition of Service Productivity



Source: Author

[16] Proposed definition published in Academy of Marketing Conference (2009) proceedings by the author

5.3 MODELLING SERVICE PRODUCTIVITY

As previously discussed in Chapter Four, several scholars attempted to conceptualise and measure SP by proposing a number of models and determinants as relating to and contributing to the conceptualisation and measurement of SP. Tables 4.3 and 4.4 highlighted the various determinants of SP and the contribution and limitations of extant literature in the conceptualisation and measurement of SP respectively.

While some attempts have been made by these scholars to propose a number of determinants and models for conceptualising and measuring SP, reviewed in the preceding chapter, these studies conceptualised and measured SP in a piecemeal fashion, focusing on a single service industry, employee productivity, customer productivity, and from either a partial or multi-factor perspective and lacked an outcome, stakeholder and multidisciplinary perspective. This is consistent with Singh et al. `s (2000) comment that SP measures are too diverse and of a piecemeal nature. In addition, existing measures have relied on manufacturing-based concepts and focused on objective measures particularly financial indicators. However, these studies taken together add different perspectives to SP conceptualisation and measurement. Table 5.1 highlights the contribution of extant literature to this thesis conceptualisation.

As a result of the systematic review of existing literature, this thesis argues that, for a measure of productivity in services to be effective, holistic and capture the realities in service organisations, it requires that it captures the salient factors that affect productivity in services and identifies the outcomes emanating from productivity. This requires taking into consideration the unique characteristics of services, the nature of the production process in services, the co-production nature of services, and the importance of organisational resources, employees and customers in the service production process. In addition, SP measures should take into consideration the impact of the organisation`s activities, processes and products on its wider stakeholders. Based on the abovementioned argument and position of this thesis, the next section proposes a model for measuring SP and its related constructs.

Table 5.1: Examples of Literature Supporting the Research Constructs

Construct	Research Summary	Author
Service Productivity	• Identified SP as s a function of how effectively input resources are transformed to outputs in the form of service outcome.	• Grönroos and Ojasalo 2004
	• Identified SP as the attainment of customer`s and service provider`s mutual satisfaction through service quality and cost reduction respectively.	• Haynes and DuVall 1992
	• Identified employees and customer as impacting on the productivity in services.	• Mills et al. 1983
	• Identified customer, employee and organisational factors as affecting SP and expressed SP as a function of service quality and cost efficiency.	• Jaaskelainen 2009
Resource Commitment	• Classified service resources into operant and operand resources and emphasised the importance of resources at the firm disposal to value co-creation.	• Vargo and Lusch 2008
	• Identified managerial, technological and financial resources as organisational resources.	• Park et al. 2002
	• Described resource commitment as the allocation of tangible and intangible resources at the firm disposal to enhance productivity.	• Hunt 2000; Richey et al. 2005
	• Identified managerial, technological and financial resources committed to an activity as indicators of resource commitment.	• Daugherty et al. 2001; 2005
	• Identified resource commitment to be positively related to productivity.	• Sumanth 1994 ; Neely et al. 1995; Moseng and Rolstadas 2001; Rugman and Verbeke 2002; Helfat and Peteref 2003; Lopez et al. 2005; Tangen 2005

Continue on the next page

Table 5.1: Examples of Literature Supporting the Research Construct

Construct	Research Summary	Author
Employee Readiness	• Identified services as labour-intensive and emphasised employee importance in services.	• Fixler and Siegel 1999
	• Identified workplace factors and employee perception factors as impacting on employee readiness.	• Armenakis et al. 1999; Eby, et al. 2000
	• Identified employee skills, job knowledge and logistic and system support as impacting on employee level of readiness.	• Miller et al. 2006; Rafferty and Simons 2006
	• Identified employee role as impacting on productivity.	• Delaney and Huselid 1996; Kozlowski and Klein 2000
	• Associated employee experience, skills, socialisation and motivation to improved productivity.	• Huselid 1995; Grant 2008; Lynch and Buckner-Hayden 2010
	• Identified employee's motivation, role clarity and goal clarity as factors affecting productivity in services.	• Mills et al. 1983
Customer Readiness	• Recognised customer participation and role in service.	• Chase 1978; Mills 1986; Grönroos 1994; Bitner et al.1997; Kotzé and Plessis 2003
	• Customer role in services includes productive resource, contributor to quality, satisfaction and value, competitor to the service organisation resources, worker (co-producer), buyer and beneficiary.	• Lengnick-Hall 1996; Bitner 1997
	• Customer role in services impacts positively and negatively on SP.	• Lovelock and Young 1979; Zeithaml and Bitner 1996; Bitner et al. 1997; Gummesson 1998; Grönroos and Ojasalo 2004; Hsieh et al. 2004; Bruhn 2011
	• Conceptualised and identified CCB to be positively related to SP.	• Groth 2005
	• Conceptualised and identified DCB to be negatively related to SP.	• Reynolds and Harris 2009; Fisk et al. 2010

Continue on the next page

Table 5.1: Examples of Literature Supporting the Research Constructs

Construct	Research Summary	Author
Customer Readiness	• Identified customers as value co-producers, value co-creators and value destroyers in service production process.	• Bendapudi and Leone 2003; Lusch et al. 2007; Spohrer et al. 2008; Edvardsson et al. 2010
	• Highlighted that the preparedness of customers has impact on service outcomes.	• Spohrer et al. 2007
	• Identified customer expertise, socialisation and motivation as impacting on customer productivity.	• Alba and Hutchinson 1987; Lengnick-Hall 1996; Meuter et al. 2005
	• Identified customer motivation, role clarity and goal clarity as factors affecting productivity in services.	• Mills et al. 1983; Bowen 1986
Stakeholder Satisfaction	• Identified outcome measures as relevant indicators for productivity measurement in services	• O`Mahony and Stevens (2004)
	• Emphasised the prioritisation of organisational stakeholders in organisational decision making and behaviour.	• Stevens et al. 2005 ; Berrone et al. 2007; Djellal and Gallouj 2008
	• Identified stakeholders as constituting employees, government, consumers, institutions/organisations and society.	• Stainer and Stainer 2003; Gundlach and Wilkie 2010
	• Defined stakeholder satisfaction as a criterion indicating the extent to which organisational stakeholders` expectations are met.	• Berrone et al. 2007
	• Emphasised the fulfilment and satisfaction of organisational stakeholders as an indicator of organisational performance and effectiveness.	• Friedlander and Pickle 1968
	• Identified improved productivity as impacting positively on stakeholder satisfaction.	• Schneiderman 1999; Stainer and Stainer 2003; Ambler 2009

5.4 PROPOSED MODEL FOR SERVICE PRODUCTIVITY

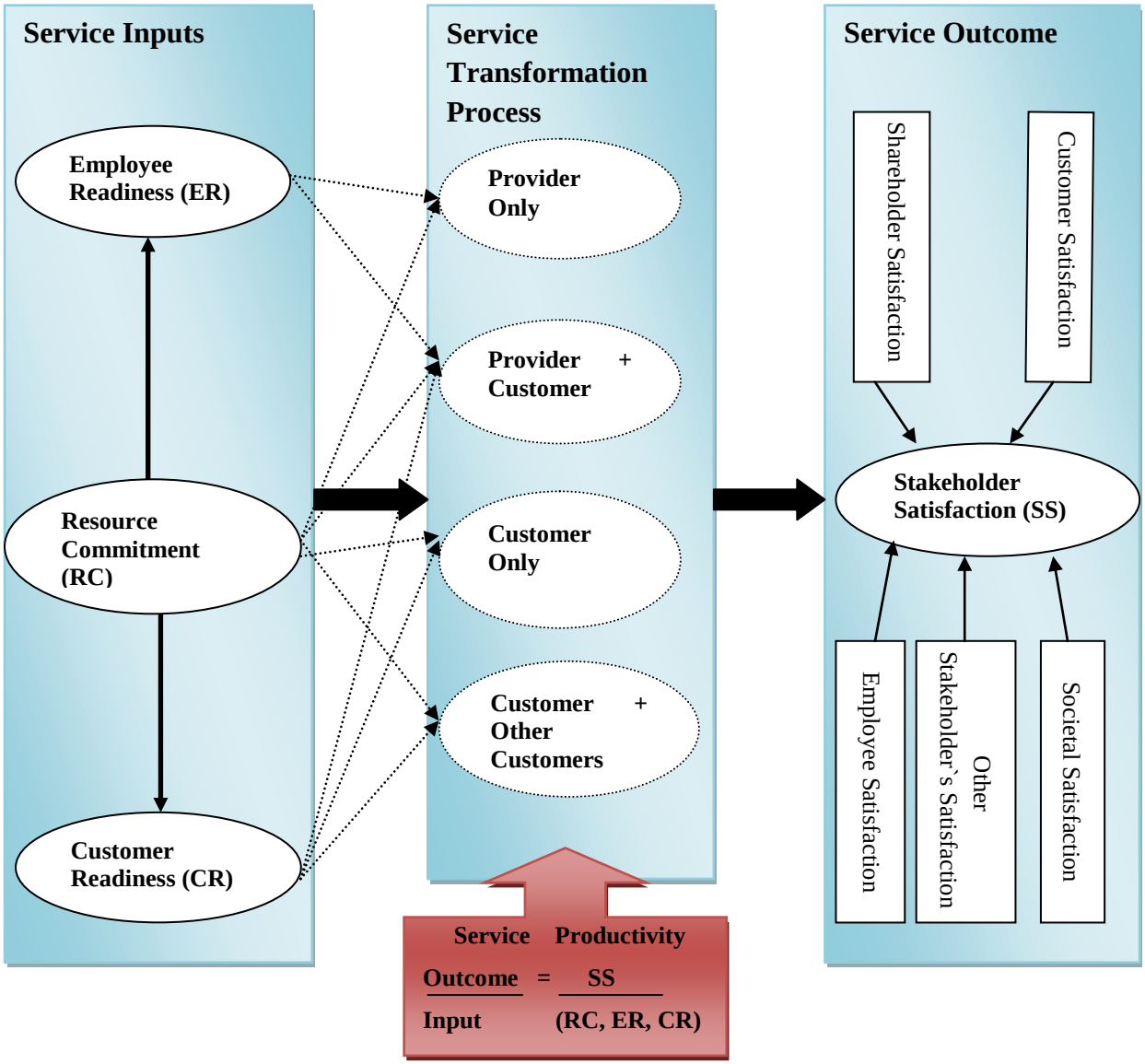
As a result of the systematic review of extant literature on the conceptualisation and measurement of SP, the following determinants of SP are proposed by the researcher. These are: "Resource Commitment", "Employee Readiness" and, "Customer Readiness" as antecedents of SP and "Stakeholder Satisfaction", as the consequence of SP. Table 5.1 highlights the literature supporting the conceptualisation of SP and its related constructs. These constructs are explained and justified in the following sections.

Figures 5.2 and 5.3, present the proposed conceptual framework and model for SP and its related constructs respectively. Figure 5.2 integrates the proposed definition for SP; the production process in services discussed in Chapter Four; and proposed determinants relating to SP. It firstly highlights how the service provider commitment of resources to the service transformation process impacts on SP as well as on the readiness level of employees and customers. It further highlights the impact of resource commitment, employee readiness and customer readiness on SP. Finally, it highlights the outcome/consequence of services on stakeholders[17].

It identifies resource commitment, employee readiness and, customer readiness as inputs to the service process and stakeholder satisfaction as the outcome of the service process. In addition, it identifies the measurement of SP as measuring the performance of the service transformation process, which is expressed as a ratio of outcome per input, or specifically, as a function of stakeholder satisfaction per resource commitment, employee readiness and customer readiness.

[17] Figure 5.2 is presented to give a detailed illustration of the author`s conceptual model in Figure 5.3

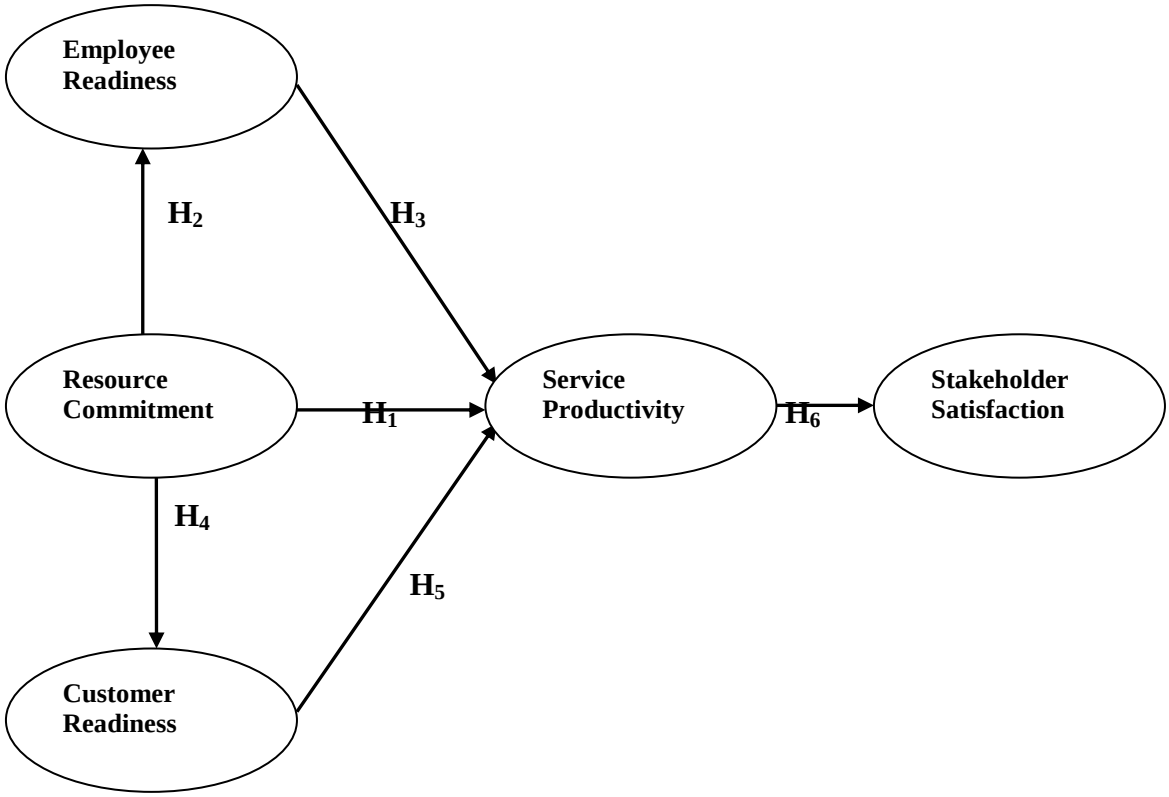
Figure 5.2: Service Productivity Conceptual Framework



Source – Author

Figure 5.3 presents the proposed conceptual model and its associated hypotheses for each of the conceptualised constructs. Firstly, the proposed conceptual model places SP as the focal point in determining its relationship with its related constructs. Secondly, the proposed model assumes two key relationships, which identify the determinant of SP as antecedent and consequence and as having a direct relationship with the central concept (SP). The relationship and significance of each determinant is discussed at a later stage in this thesis. Each construct and theoretical relationship hypothesised is discussed next.

Figure 5.3: Proposed Service Productivity Conceptual Model and Hypotheses



Source - Author

5.5 SERVICE PRODUCTIVITY (SP)

Despite the importance of productivity in services discussed in earlier chapters, several scholars have observed and commented on the inadequacy of conceptualisation on SP as well as its misunderstanding among scholars and practitioners (Lindsay 1982; Stone and Cutcher-Gershenfeld 1996). Vuorinen et al. (1998) noted that SP research is in its formative stage and requires that its understanding focus on the basics, which relates to its conceptual underpinnings. Subsequently, other scholars have emphasised the need for better understanding of the key concepts relating to SP (Tangen 2002; Johnston and Jones 2004). This has led to the call for service-specific productivity concepts and measures in capturing the unique characteristics of services (Hoque and Falk 2000; Hipp and Grupp 2005).

In seeking to understand the key concepts relating to SP, several scholars have differentiated SP from its related concepts including efficiency and effectiveness by defining it differently[18]. For instance, Al-Darrab (2000) defined SP as the relationship between output, input and quality, while Grönroos and Ojasalo (2004) defined it as a function both of internal efficiency and cost effective use of production resources and external efficiency and customer perceived quality. However, existing definitions have their deficiencies and as a result, this thesis defined SP as[19]:

> *The relationship between the outcome of the service transformation process and the input to the service transformation process.*

In conceptualising and measuring SP, several researchers have used different approaches. These include the use of manufacturing /traditional based measures as opposed to service specific measures. McLaughlin and Coffey (1992) for instance, utilised and recommended the use of manufacturing based measures in services, while others have recommended and utilised service specific measures (Nachum 1999; Johnston and Jones 2003; Sahay 2004; Grönroos and Ojasalo 2004). In addition, SP has been conceptualised and

[18] See Sections 4.4
[19] See Section 5.2

measured using partial-factor, multi-factor or total-factor productivity measures[20]. However, the limitations of partial-factor productivity measures in services have led to the advocacy of multi-factor and total-factor productivity measures[21] (Vuorinen et al. 1998; Parasuraman 2002; Sahay 2004; Grönroos and Ojasalo 2004).

Further, taking into consideration the importance of the service sector to the economy, organisations and individual, the changing nature of today's business environment; the severity of productivity mismeasurement in services and the disadvantages of partial-factor and multi-factor productivity measures highlighted in Table 3.3, several scholars have advocated the use of total-factor productivity measures as a holistic approach to SP conceptualisation and measurement (Vuorinen et al. 1998; Grönroos and Ojasalo 2004). Furthermore, advocates of a holistic approach to SP conceptualisation and measurement have called for the integration of different perspectives on the conceptualisation and measurement of SP. These perspectives are presented in Table 5.2.

Moreover, several scholars have identified different drivers/inputs factors as impacting on organisational productivity. These include employees (Delaney and Huselid 1996; Ichniowski et al. 1997; Qammar et al. 2007); customers (Lovelock and Young 1979; Bateson 2002; Grönroos 1990; Ojasalo 1999, 2003; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Kotzé and Plessis 2003); and organisational resources (Rugman and Verbeke 2002; Lopez et al. 2005, Helfat and Peteref 2003). Other scholars have also identified stakeholder satisfaction as the outcome of organisational productivity (Schneiderman 1999; Stainer and Stainer 2003; Ambler 2009). This is consistent with Kaplan and Norton`s (1996:10) emphasise on the importance of integrating both drivers and outcomes of performance when developing performance measures.

From the preceding discussion, the conceptualisation and measurement of SP, therefore, should take a holistic perspective by considering the role of employees, customer and organisational tangible and intangible resources as well as the impact of services on organisational stakeholders. The next section discusses the determinants of SP and hypothesises certain relationships between SP and its related constructs.

[20] See Section 3.4 on their differences and their advantages and disadvantages
[21] Total factor measures are also known as global/holistic measures.

Table 5.2- Perspectives on SP Conceptualisation and Measurement

Perspective	**Source**
Marketing Perspective: Customer integration, customer citizenship behaviour, dysfunctional customer behaviour, service co-production, service co-creation of value, service triangle, service blueprint, servicescapes, service quality, marketing communication and customer satisfaction	Lovelock and Young 1979; Mills et al. 1983; Parasuraman et al. 1985; Mills and Morris 1986; Kelley et al. 1990; Nachum 1990; Grönroos 1990; Haynes and DuVall 1992; Schneider and Bowen 1995; Bitner et al. 1997; Gummesson 1998; Vuorinen et al. 1998; Ahmed and Rafiq 2000; Grönroos 2000; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003; Ojasalo 2003; Johnston and Jones 2004; Grönroos and Ojasalo 2004; Groth 2005; Büttgen 2007; Reynolds and Harris 2009; Jaaskelainen 2009; Fisk et al. 2010.
Psychological Perspective: Employee and customer mode, behaviour, attitude and perception and social psychology	Bowen 1986; Solomon et al. 1995; Dollard et al. 2000; Cunningham et al. 2002.
Human Resource Perspective: Human resource practices and employee behaviour	Mills et al.1983; Nachum 1990 ; Huselid 1995; Delaney and Huselid 1996; Ichniowski et al. 1997; Wood and De Menezes 1998; Dobni 2004
Stakeholder Perspective: Ethical behaviour, corporate social responsibilities, customer satisfaction, service quality, customer value, stockholder value, employee satisfaction and social and environmental cost.	Kaplan and Norton 2001; Neely and Adams 2001; 2002; Stainer and Stainer 2003; Stevens et al. 2005; Berrone et al. 2007; Bhattacharya and Korschun 2008; Djellal and Gallouj, 2008; Gundlach and Wilkie 2010
Operational Management Perspective: Management of service quality, customers and employees behaviour; staff management, quality monitoring, customer control and management in the service process, demand and supply management and, revenue and pricing of services.	Huselid 1995; Delaney and Huselid 1996; Ichniowski et al. 1997; Wood and De Menezes 1998; Parasuraman 2002; Yeoman et al. 2003; McMahon-Beattie and Yeoman 2004.
Economic Perspective: Standard of living, GDP growth, unemployment level, organisational profitability, efficiency and effectiveness of organisational inputs and outputs and customers and societal welfare.	Parson 1997; Chase and Haynes 2000; Johnston and Jones 2004; Bulkley and Alstyne 2004; Coelli et al. 2005; Spohrer et al. 2007; Oraee et al. 2010.
Organisational and Managerial Perspective: Resource commitment and managerial practice and behaviour	Mills et al.1983; Barney 1991; Huselid 1995; Wood and de Menezes 1998; Hunt 2000; Smith and Rupp 2002; Smith and Rupp 2002; Hooley and Greenley 2005; Hooley and Greenley 2005; Vargo and Lusch 2008 Patterson et al. 2005.

5.6 DETERMINANTS OF SERVICE PRODUCTIVITY

The proposed theoretical model supporting this thesis highlights certain antecedents and consequences as the determinants of SP[22]. Causal/antecedents determinants (resource commitment, employee readiness and customer readiness) deal with the input perspective of SP while the consequential determinant (stakeholder satisfaction) deals with the outcome perspective of SP. The determinants of SP are discussed next with their corresponding hypotheses.

5.6.1 Resource Commitment (RC)

Scarcity of resources is a fundamental economic problem and the basis of economic studies. The scarcity of organisational resources means that organisations (profit or non-profit) should identify strategies in generating, managing and, distributing resources to different organisational activities. As pointed out, organisations should pursue strategies that generate sufficient resources to maintain their operations efficiently and effectively (Seashore and Yuchtman 1967; Scott 1998). Organisational resources include physical, financial, human, managerial and technological resources (Grant 1991; Barney 1991; Park et al. 2002). Hunt (2000) classified them into tangible and intangible resources while in the service marketing context, Vargo and Lusch (2008) classified them into operant and operand resources. Taking it a step further, Morgan and Hunt (1999) described organisational resources as a firm`s cooperate culture, climate, structure and systematic and routine processes that enable the organisation to have efficient and effective production.

The scarcity of resources calls for organisations to develop appropriate strategies towards the management of their resources in order to perform better and to gain a competitive edge. The management of organisational resources has been associated with the Resource Based View (hereafter, RBV) theory. RBV is founded on the fundamental premise

[22] See Figure 5.3

that the management and utilisation of valuable resources at the firm's disposal are central to the attainment of competitive advantage, productivity and performance (Smith and Rupp 2002; Hooley and Greenley 2005). According to Porter (1998; 2000), productivity is measured by the value of resources added to goods and services produced. In defining productivity, various researchers have related it to resource utilisation (Hill 1993; Bernolak 1997; Moseng and Rolstadas 2001). For instance, Tangen (2005) associated high productivity to the value of resources added to goods and services during their transformation and delivery process. Therefore, the strategic management of organisational resources has implications for organisational productivity and performance (Sink and Tuttle 1989; Sumanth 1994; Neely et al. 1995; Morgan and Hunt 1999; Rugman and Verbeke 2002; Helfat and Peteref 2003; Lopez et al. 2005).

As a result of the importance of resources to organisational productivity and performance as well as their scarcity, and the high level of competition among the different functions within an organisation; organisations are trapped in the dilemma of allocating available resources to their various functions and activities as the misallocation of resources can have severe repercussions for the organisation. As Amaldos et al. (2000) observed, one of the greatest challenges in today`s business environment relates to the ability and level at which organisations are willing to allocate and commit resources to organisational activities. The allocation and commitment of organisational resources relates to Hunt`s (2000) proposed Resource Commitment (hereafter RC). By RC, Hunt (2000) referred to the allocation of tangible and intangible resources at the firm`s disposal to facilitate an efficient and effective marketing offering. Richey et al. (2005) further related RC to the allocation of organisational valuable resources to an activity that will produce the most good. RC is, therefore, defined as:

> *The allocation of tangible and intangible resources at the firm disposal to enhance productivity.*

Commitment here relates to the state of being dedicated or engaged to a cause or activity. It involves the making of short-term sacrifices in order to attain long-term benefits. In conceptualising commitment, Anderson and Weitz (1992) conceptualised it in terms of

input commitment (willingness to invest important assets, which is followed by action) and attitudinal commitment (demonstration of dependability). Input commitments include idiosyncratic investments, pledges and resource allocation and may involve both tangible and intangible resources (Gundlach et al. 1995). Attitudinal commitment relates to affective commitment, psychological identification and value congruence (Allen and Meyer 1990). Further, Scanzom (1979) identified temporal commitment, which is the demonstration of consistency over time and relates to long-term and continuous commitment for a cause or activity (Gundlach et al. 1995).

In addition, the importance of resources to organisational productivity and profitability emphasises the view that organisations that commit their resources appropriately to their production process and other relevant organisational activities are more likely to enjoy superior performance through improvement in their production process and subsequently on productivity (Angle and Perry 1981; Chen and Li 2008). As explained by Daugherty et al. (2005), organisations that commit their resources appropriately to specific programme and activities are more likely to enjoy superior performance. Further, Jacobs and Rapoport (2004) related greater RC to increased organisational output. Furthermore, a positive relationship has been found between RC, performance and productivity (Arthur 1994; Theoharakis and Hodey 2003; Richey et al. 2005).

From the preceding discussion, it can be concluded that the level of resources an organisation commits to its service production process impacts positively on organisational productivity. Based on this discussion, this thesis, therefore, proposes the hypothesis that:

H_1: Resource commitment has a positive impact on service productivity.

5.6.2 Employee Readiness (ER)

Employees are important assets for every organisation, particularly service organisations, which are characterised as labour-intensive (Fixler and Siegel 1999). The importance of employees has been associated with efficiency, effectiveness, service quality, productivity and profitability, which is well documented in both manufacturing and services (Peters and Waterman 1982; Pfeffer 1994; Delaney and Huselid 1996; Kozlowski and Klein 2000; Kattara et al. 2008).

Taking into consideration the importance of employees in services, particularly their co-production role and impact on service quality, productivity and profitability, an understanding of the factors that can induce employees to perform better is paramount. Several studies have been undertaken to understand the factors impacting on employee behaviour towards the attainment of organisational goals and objectives, particularly from the human relations and organisational studies disciplines. These studies have related employee attitudes and behaviours in the workplace to organisational goals and objectives (Bernerth 2004; Rafferty and Simons 2006; Susanto 2008), while others have conceptualised this as "employee readiness" to organisational change and technology acceptance (Jimmieson et al. 2004; Peach et al. 2005; Lai et al. 2008). Readiness in this context is defined as *"A state of mind reflecting a willingness or receptiveness to changing the way one thinks. Readiness is a cognitive state comprising the beliefs, attitudes, and intentions toward a change effort"* (Armenakis et al. 1999:15). Several scholars have also highlighted the link between employee readiness and employee attitude and behaviour (Armenakis et al. 1993; Hanpachern et al.1998; Eby et al. 2000; Bernerth 2004; Madsen et al. 2005; Rafferty and Simons 2006)

In addition, several scholars have also identified different factors as affecting employee level of readiness. These are: employee demographic factors, skills and knowledge on the job, social relationships in the workplace, organisational capability, processes, commitment and, culture (Hanpachern et al. 1998; Eby et al. 2000; Cunningham et al. 2002; Madsen et al. 2005; Rafferty and Simons 2006). Further, other scholars have categorised these factors into workplace (organisational) factors and individual (employee) factors (Cunningham et al. 2002; Madsen et al. 2005; Rafferty and Simon 2006; Holt et al. 2007;

Elias 2009). Tables 5.3 and 5.4 highlights the workplace and individual factors affecting employee readiness respectively. Furthermore, several scholars have identified various employee related factors as affecting organisational productivity. These include employee experience, skills, socialisation and motivation. Table 5.5 highlights employee related factors affecting organisational productivity.

Table 5.3: Workplace Employee Readiness Factors

Factor	**Source**
Communication	Armenakis and Fredenberger 1997; Wanberg and Banas 2000; Holt et al. 2007
Discrepancy	Armenakis et al. 1993; Armenakis and Harris 2002
Policies and Procedures	Eby et al. 2000; Rafferty and Simons 2006
Job Demands	Hanpachern et al. 1998; Cunningham et al. 2002; Miller et al. 2006
Job Knowledge and Skills	Hanpachern 1998; Cunningham et al. 2002 Miller et al. 2006
Logistic and System Support	Eby et al. 2000; Rafferty and Simons 2006
Management and Leadership	Hanpachern et al. 1998; Miller et al. 2006
Organisational Commitment	Madsen et al. 2005; Elias 2009
Organisational Culture	McNabb and Sepic 1995; Hanpachern et al. 1998; Lehman et al. 2002
Perceived Organisational support	Eby et al. 2000; Rafferty and Simons 2006; Holt et al. 2007
Job demands	Miller et al. 2006
Social Relations and support at Workplace	Hanpachern et al. 1998; Wanberg and Banas 2000 ; Cunningham et al. 2002; Madsen et al. 2005

Adapted from Shah 2009

Table 5.4: Individual Employee Readiness Factors

Factor	Source
Adaptability	Lehman *et al.* 2002
Autonomy	Weber and Weber 2001
Beliefs	Peach *et al.* 2005
Demography	Hanpachern *et al.* 1998; Wanberg and Banas 2000; Weber and Weber 2001; Madsen *et al.* 2005; Holt *et al.* 2007
Emotional Exhaustion	Cunningham *et al.* 2002
Intention to Quit	Wanberg and Banas 2000
Self efficacy	Armenakis and Bedian1999; Eby *et al.*2000; Wanberg and Banas 2000; Cunningham *et al.* 2002; Lehman *et al.* 2002; Rafferty and Simons 2006
Job Satisfaction	Wanberg and Banas 2000
Participation	Armenakis and Fredenberger 1997; Eby *et al.* 2000; Wanberg and Banas 2000; Weber and Weber 2001; Cunningham *et al.* 2002; Rafferty and Simons 2006
Personal Resilience	Wanberg and Banas 2000
Skills Variety	Eby *et al.* 2000
Supervisory Support	Weber and Weber 2001
Team Work	Eby *et al.* 2000
Trust (in Peers; management; Senior Leaders)	Rafferty and Simons 2006; Eby *et al.* 2000; Weber and Weber 2001

Adapted from Shah 2009

Table 5.5: Employee Factors Affecting Organisational Productivity

Author	**Factors**
Huselid 1995; Jacobs 2002; Chevalier et al. 2003; Skirbekk 2008; Bhattacharya et al. 2005; Keep et al. 2006; Lin and Bozeman 2006; Holzer 2008 ; Jaaskelainen 2009	Previous Experience ; Tenure in Current Job; Skills; Competence; Expertise ; Education ; Abilities
Putai 1993; Huselid 1995; Grant 2008	Motivation; Reward System
Wiegand and Geller 2004; Jaaskelainen 2009	Supportive Workplace Climate and Atmosphere
Galenson and Weinberg 2000; Skirbekk 2008; Hamilton e*t al*. 2004; Tang and Macleod 2006; Skirbekk 2008	Gender; Age; Educational and Socio-Economic Backgrounds
Hall and Blackburn 1975	Habit Of Publication; Disciplinary Field; Years In HE; Academic Rank; Interest In Research; Salary; Number Of Journal Subscription; Years In Current Institution; Networking
Chen and Klimoski 2003; Sparks et al. 2006; Lynch and Buckner-Hayden 2010	Socialisation and Newcomer Socialisation
Buckley and Giannakopoulos 2007	Work-Life Balance
Babu and Singh 1998	Persistence; Access to Literature; Initiative; Learning Capability; Concern for Advancement; Intelligence; Professional Commitment; Resource Adequacy; Creativity; and Simulative Leadership

While numerous studies have been undertaken on the factors impacting employee performance/behaviour particularly from the human relations and organisational studies disciplines, these have focused on situations involving an employee working alone or with other employees rather than taking into consideration the co-production scenario. This understanding is paramount in services because of the customer participation and co-production role in services as well as customer impact on employee behaviour and productivity (Kelley et al. 1990; Kotzé and Plessis 2003). In view of that, it is important that an understanding of the factors affecting employees' behaviour in services takes into

consideration the co-production scenario in services. In order, therefore, to understand the factors affecting employee behaviour during service co-production, this thesis conceptualises the concept of "Employee Readiness" (hereafter ER) which refers to the factors that induce and prepare an employee to perform better during service co-production. This thesis defines ER as:

> *Employee`s state of preparedness to perform their service related task successfully with other entities during service co-production.*

In understanding the factors affecting the readiness level of service employees, organisational resource commitment on its human resource development has been associated with employee willingness to work harder towards the attainment of organisational objectives (Arthur 1994; Wood and De Menezes 1998). Using theories of social exchange, motivation and norm of reciprocity (Homans 1961; Blau 1964) to illustrate this, organisations that commit their resources to activities aimed at developing and preparing their employees for the performance of organisational duties will have a positive impact on employee attitude and behaviour towards work (Arthur 1994; Huselid 1995; Wood and de Menezes 1998; Salanova et al. 2005). This is based on the premise that employees make inferences on their organisation`s behaviour towards them (organisational justice/fairness) and such inferences result in employees reacting and behaving positively or negatively depending on their perception of the organisation`s behaviour towards them. In addition, good organisational behaviour towards employees is positively related to employee citizenship behaviours (Allen et al. 2003). These include employee commitment, attitude, loyalty, satisfaction and trust in organisation. Further, employee citizenship behaviour is positively related to organisational outcomes and performance (Moorman et al. 1993).

Furthermore, several scholars have identified various factors as impacting on employee behaviour and organisational productivity (Arthur 1994; Huselid 1995; Delaney and Huselid 1996; Ichniowski et al. 1997). Table 5.5 highlights the factors affecting employee behaviour and productivity. Other scholars have found a positive relationship

between employee behaviour, productivity and performance (Ostroff and Bowen 2000; Whitener 2001; Qammar et al. 2007)

From the preceding discussion, it can be inferred that the commitment of organisational resources to organisational activities and production process impacts on ER to service co-production. In addition, improved ER to co-production impacts positively on SP and vice versa. This is consistent with Qammar et al. `s (2007) findings that employees` perception about their organisational support impacts on their motivation and behaviour and subsequently impacts on organisational performance and productivity. Based on the preceding discussion, this thesis, therefore, proposes the following hypotheses:

$H_{2:}$ Resource commitment has a positive impact on employee readiness.

H_{3}: Employee readiness has a positive impact on service productivity.

5.6.3 Customer Readiness (CR)

Customer participation in organisational activities has been recognised in operational management, organisational studies and service marketing and management literatures (Chase 1978; Mills and Morris 1986; Grönroos 1994; Bitner et al. 1997). The importance of customer participation and involvement in services has also been recognised (Kotzé and Plessis 2003; Büttgen, 2009), and its impacts on service quality, productivity and performance have also been studied (Lovelock and Young 1979; Mills and Morris 1986; Kelley et al. 1990; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003; Büttgen, 2009).

In services, the inseparability characteristic of services demands that customers are involved in the production and delivery of services (Lovelock and Young 1979; Hubbert 1995; Bitner et al. 1997; Bendapudi and Leone 2003). Accordingly, some scholars have recognised customers as partial employees or part-time employees (Mills and Morris 1986;

Bowen 1986; Gummesson 1991) while others have called for the redefinition of the customer role in modern services (Owusu-Frimpong and Danso 2007). In view of that, several factors relating to the recruitment, selection and management of organisational employees have been adopted in the customer co-production and productivity domain. These include customer recruitment and socialisation, drafting of customer job description, rewarding of customers and customer performance review (Schneider and Bowen 1995; Zeithaml and Bitner 1996).

In addition, customer participation in services has been identified as involving different and varying roles. These roles have been categorised as productive resource, contributor to quality, satisfaction and value and competitor to the service organisation resources (Bitner et al. 1997). Lengnick-Hall (1996) categorised these roles as worker (co-producer), buyer, beneficiary and, service product. Further, other scholars have categorised customer participation in services into input-focused customer contribution and output-focused customer contribution (Lengnick-Hall 1996) and in-role and extra-role behaviours (Bettencourt 1997). Furthermore, customer input resources have been categorised into mental, emotional and physical inputs (Rodie and Kleine 2000).

Moreover, customer participation in services has been conceptualised in terms of customer's level of involvement in the production process. Bendapudi and Leone (2003) identified two levels of customer participation, which are participation and no participation. Others identified three levels of customer participation across services: high, moderate and low (Hubbert 1995; Claycomb et al. 2001) and customer only participation, customer and employee participation and employee only participation (Grönroos and Ojasalo 2004. Others have recognised customer participation in service and have further categorised customer participation in services into customer only participation, customer and customer participation, customer and employee participation and employee only participation (Meuter and Bitner 1998; Zeithmal and Bitner 2000; Libai et al. 2010: 267).

As a result of the preceding discussion, various conceptualisations have been put forward in regards to the impact of customer level of involvement/participation on organisational performance and productivity. These relate to the impact of customer involvement on organisational productivity and profitability; customers` productivity, satisfaction and service quality; and employee productivity and satisfaction (Lovelock and

Young 1979; Mills et al. 1983; Mills and Morris 1986; Kelley et al. 1990; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Heskett et al. 1997; Bitner et al. 1997; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003). Subsequently two schools of thought have emerged regarding customer level of participation and its impact on organisational productivity and other performance variables including service quality. The first school of thought is of the view that customer participation in services minimises productivity and calls for the elimination or reduction of customers` role in services (Chase 1978; Lengnick-Hall 1996; Hsieh et al. 2004). The second school of thought is of the view that customer participation in services maximises productivity and, therefore, calls for the active inclusion of customers in the service process (Lovelock and Young 1979; Mills et al. 1983; Bitner et al. 1997; Gummesson 1998; Ojasalo 2003; Grönroos and Ojasalo 2004).

Regardless of the differences between these schools of thought, in terms of their advocacy of increased/minimisation/elimination of customer involvement in the service delivery process, it is clear that the basis of the arguments among these schools of thought centres on the impact of customer involvement on certain performance variables, including service quality, customer satisfaction, efficiency, effectiveness, employee performance, productivity and profitability. Subsequently, this has also led to the identification of customers as value co-producers, value co-creators/destroyers and productivity enhancers or detractors (Bendapudi and Leone 2003; Ojasalo 2003; Lusch et al. 2007; Spohrer et al. 2008; Edvardsson et al. 2010). This is consistent with Bitner et al. `s (1997) explanation that customers` role as co-producers can either enhance or detract from value and satisfaction as well as impact on organisational productivity and quality and quantity of outputs.

Therefore, from the preceding discussion, it can be inferred that customer behaviour in the service process (good/bad) can impact positively or negatively on organisational performance variables particularly productivity, and as a result, customers may be labelled as value co-creators or value destroyers as well as productivity enhancers or deterrents. However, in order for customers to be labelled as value co-creators or destroyers and/or productivity enhancers or deterrents, it is necessary that, an understanding is developed of the factors affecting customer behaviour to become value co-creators or destroyers and/or productivity enhancers and deterrents during service co-production.

In understanding the factors affecting customers' behaviour during service co-production and delivery, several scholars have focused solely on either the positive or negative factors affecting customer behaviour in services. For instance, Groth (2005) focused on the positive factors of customer behaviour and conceptualised this as Customer Citizenship Behaviour (CCB) while Fisk et al. (2010) on the other hand, focused on the negative behaviour of customers and conceptualised this as Dysfunctional Customer Behaviour (DCB). In addition, these studies have focused on the impact of customer behaviour on service quality and satisfaction rather than the overall productivity of the firm. Further, during service co-production, customers are expected to perform certain tasks in order to enhance the delivery of services and value. However, this literature has focused solely on the extra-role (voluntary and discretionary) behaviour customers perform during service co-production.

Therefore, in order to understand the factors affecting customer behaviour during service co-production, this thesis focuses on both the in-role and extra-role customer behaviours (expected and voluntary roles respectively) during service co-production that impact positively or negatively on SP. This thesis, therefore, conceptualises Customer Readiness (hereafter CR)[23] as capturing the factors affecting customer behaviour during service co-production. In conceptualising CR, Meuter et al. (2005) related this to customer trial of self-service technologies, which they define as a condition or state in which a consumer is prepared and likely to use an innovation for the first time. Several other scholars have related CR to the customer`s state of mind or predisposition towards something (Meuter et al. 2005; Liljander et al. 2006; Ho and Ko 2008).

In addition, customer motivation, role clarity and ability have been identified as affecting customer level of readiness (Meuter et al. 2005). As explained by Spohrer et al. (2007), the preparedness of customers is important in determining the outcome of services and the better prepared customers are, the more likely it is that service expectations will be attained. Spohrer et al. (2007) further identified CR as an important construct for organisational customer selection. While Meuter et al. (2005) relates the construct CR to self-

[23] Readiness in this context is defined as "a state of mind reflecting a willingness or receptiveness to changing the way one thinks. Readiness is a cognitive state comprising the beliefs, attitudes, and intentions toward a change effort" (Armenakis et al. 1999:15). See Section 5.6.2

service technologies, this thesis relates CR to service co-production and therefore, defines it *as:*

> *Customers` state of preparedness to perform their service related task successfully with other entities during service co- production.*

To provide an understanding of the factors impacting on customer behaviour or state of preparedness to perform their service co-production related task successfully, Table 5.6 highlights the extant literature that has studied the factors affecting customer behaviour during service co-production.

Table 5.6: Factors Affecting Customer Behaviour during Service Co-production

Author	Factors
Schneider and Bowen 1995 ;Auh et al. 2007	Incentives for Co-Production, Willingness to Co-Produce
Fuchs 1968; Lengnick-Hall 1996; Halepota 2005; Naar-King et al. 2010	Motivation
Alba and Hutchinson 1987; Kelley et al. 1990; 1992 ; Galt 2000	Socialisation
Parasuraman and Grewal 2000	Technological Readiness
Alba and Hutchinson 1987; Lengnick-Hall 1996	Knowledge, Skills, Expertise, Experience
Zeithaml and Bitner 1996	Recruitment of Customers, Socialisation of Customers, Drafting of Customer Job Description, Rewarding of Customers, Evaluation of Customer Performance
Meuter et al. 2005	Motivation , Role Clarity, Customer Ability

However, while these studies enrich the conceptualisation of CR, these studies are limited and as a result, this thesis utilises employee behaviour and performance/productivity theories as analogous to customer behaviour and performance. This position is taken as a result of the inadequacy of extant literature on the study domain and the identification of customer role as part-time/partial employees of service organisations, hence, working side by side with organisational employees (Mills and Morris 1986; Bowen 1986; Mills et al. 1983). Bowen (1986) supports this analogical assertion by commenting that human resource management practices when applied within the customer context can influence the performance of customers within services. As a consequence, this thesis adopts similar strategies to those used by organisations in developing, equipping and preparing employees to perform their service related task successfully in the customer co-production scenario. Hence theories on social exchange, motivation and norm of reciprocity and organisation justice (Homans 1961; Blau 1964; Greenberg 1987; 1990) discussed in Section 5.6.2 will have similar applicability here.

On that basis, it can be inferred that an organisation`s commitment of its resources towards the development of its customer resources will have reciprocal effect on its customer behaviour and performance. For instance, Bowen (1986) elucidates that organisations that commit their resources to customers` resource development can impact on customers` ability, role clarity and motivation to contribute to the service production and delivery process. Mill and Morries (1986) also emphasised the importance of resources in developing and enacting the required customer behaviour during service co-production. Consequently, Bitner et al. (1997) recommended that service organisations develop strategies that can enhance customers` effective participation. Other researchers have also observed a positive relationship between organisational resource commitment and customer satisfaction and loyalty (Theoharakis and Hooley 2003; Salanova et al. 2005).

Therefore, it can be inferred further that organisations that commit appropriate resources in developing and preparing their customers towards co-production will have a positive reciprocate behaviour and attitude from customers towards the organisation during co-production and vice versa. As Bruner (1966) pointed out, readiness is nurtured through the resources provided towards its development. Furthermore, several scholars have identified a strong positive relationship between customer behaviour and productivity (Lovelock and

Young 1979; Bateson 2002; Mills and Morris 1986; Kelley et al. 1990; Grönroos 1990; Schneider and Bowen 1995; Ojasalo 1999, 2003; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Kotzé and Plessis 2003). Therefore, the preparedness of service customers has impact on organisational productivity.

From the preceding discussions, it can be concluded that the commitment of organisational resources to organisational processes and activities impacts on CR to service co-production. In addition, the development and improvement of CR to co-production impact positively on SP and vice versa. Based on the above discussion, this thesis, therefore, proposes the following hypotheses:

H_4: Resource commitment has a positive impact on customer readiness.

H_5: Customer readiness has a positive impact on service productivity.

5.6.4 Stakeholder Satisfaction (SS)

The past few decades have witnessed growing interest among researchers and practitioners on the importance of adopting a stakeholder perspective in organisational day-to-day and strategic decision making. Research relating to this domain has been high on both industry and research agendas (McWilliams et al. 2006; Lindgreen and Swaen 2010). In addition, government regulations, media scrutiny on organisational practices and increasing pressure from various stakeholders as heighten the pressure on organisations to consider and prioritise their stakeholders in their organisational decision making and behaviour (Stevens et al.2005; Berrone et al. 2007). For instance, the recent stakeholder reaction on the current global financial crisis and British Petroleum's (BP) worst disaster in Corporate America history bear witness to the increasing pressure by various stakeholders for organisations to be accountable for their behaviour and performance. This is in line with the comment that " if a

specific required behaviour is right or wrong, ethical or unethical, is often determined by stakeholders, such as investors, customers, interest groups, employees, the legal system, and the community" (Ferrell et al. 2000: 6).

The increasing importance of stakeholders in organisational behaviour and performance evaluation has led to the development of various concepts in business and management research and practitioner agendas (Scholes and Clutterbuck 1998). These include organisational ethical behaviour, corporate social responsibilities, customer satisfaction, service quality, customer value, stockholder value and employee satisfaction. In marketing for instance, Gundlach and Wilkie (2010) advocated the need for the American Marketing Association to include a stakeholder perspective in its definition of marketing. They argued that a firm`s marketing activities go beyond the interest of its immediate customers to include others affected by the firm`s activities (Bhattacharya and Korschun 2008; Gundlach and Wilkie 2010).

In addition, there is an increasing shift in emphasis from individual stakeholder perspective to an integrated and holistic perspective in organisational productivity and performance discussions and behaviours, emphasising the interest of all organisational stakeholders (Dentchev and Heene 2004). For instance, Djellal and Gallouj (2008) advocated that productivity measures in services should go beyond the interest of immediate stakeholders by considering social and environmental cost. Furthermore, various performance measures including the balanced scorecard and the performance prism have emphasised and integrated a stakeholder perspective in their conceptualisations (Kaplan and Norton 2001; Neely and Adams 2001; 2002).

With regards to indentifying who organisational stakeholders are, Mitchell et al. (1997:855) posed the question, "Who is a Stakeholder?". To answer this question, they reviewed extant literature on the definition and types of stakeholders. Freeman defined a stakeholder as "Any group or individual who can affect or is affected by the achievement of the organisation's objectives" (Freeman 1984: 46), while Bhattacharya and Korschun (2008) described it as all those affected by firm activities.

In regard to "Who is a Stakeholder?", Mitchell et al. (1997) categorised stakeholders as those having power to influence the organisation; the legitimacy of the stakeholder`s relationship with the organisation; and the urgency of stakeholders claim on the organisation. They further categorised stakeholders as primary and secondary stakeholders; as owners and non-owners of the firm; as owners of capital or owners of less tangible assets; as actors or those acted upon; as those existing in a voluntary or an involuntary relationship with the firm; as rights-holders, contractors, or moral claimants; as resource providers to or dependents of the firm; as risk-takers or influencers; and as legal principals to whom agent-managers bear a fiduciary duty (Mitchell et al. 1997). Others have categorised stakeholders into primary (shareholders and employees); secondary (government and customers); internal (employees and managers); external (community, government and customer); and interface (board of directors and auditors) (Baum and Byrne 1986; Savage 1991). Various stakeholders have been identified as belonging to the organisation. These include individuals, employees, government, consumers, institutions, society, communities and other constituents (Stainer and Stainer 2003; Grojean et al. 2004; Rawwas et al. 2005, Rockiness and Rockiness 2005; Gundlach and Wilkie 2010).

Therefore, in order for organisations to adopt a stakeholder perspective and satisfy stakeholders accordingly, Neely et al. (2002) in their study on the performance prism, identified stakeholder satisfaction as central to the assessment of organisational performance and further posed the key questions every organisation should ask, which are: "Who are our stakeholders and what do they want and need?" (Neely et al. 2002:4). Doyle (1994) recommended the consideration of all organisational stakeholders' expectations in firm performance measurement and analysis. Figure 5.4 presents the various organisational stakeholders' expectations.

With regard to stakeholders' expectations and fulfilling them accordingly, several scholars have called for equitable sharing of productivity gains among organisational stakeholders (Tolentino 1997; Prokopenko 1999). Charnes and Stedry (1965) also emphasised the need for organisations to extend beyond the maximisation of profit objectives to goals beyond self interest. This requires organisations to maximise the return on their investment from society while at the same time satisfying society accordingly (Friedlander and Pickle 1968). Friedlander and Pickle (1986) referred to this as fulfilment, which they

described as the degree to which organisational and environmental components are satisfied. They further categorised fulfilment as owner fulfilment, employee fulfilment and societal fulfilment (Friedlander and Pickle 1968). In addition, Davis (1994) identifies the attainment of social values, economic values and personal values as objectives firms should strive to fulfil.

Furthermore, although the gap model was designed for customer satisfaction, Taylor (1993) recommended that its use can be extended to the satisfaction of other stakeholders. Subsequently, Strong et al. (2001) used this concept to propose their stakeholder satisfaction construct, and developed a model for stakeholder satisfaction, which measures stakeholder's expectations and actual performance.

The determination of stakeholder satisfaction is, therefore, dependent on stakeholders` assessment of a firm's behaviour and stakeholder expectations (Berrone et al. 2007). Thus, when there is congruence between organisational behaviour and stakeholder expectation, stakeholder satisfaction (hereafter, SS) is improved (Berrone et al. 2007). SS is, therefore, defined as "*The extent to which organisational stakeholders' expectations are fulfilled*" (Berrone et al., 2007:3). Dixon (1996) recommended the use of the SS construct as a better measure when input and outputs are ambiguous, which is the case in services.

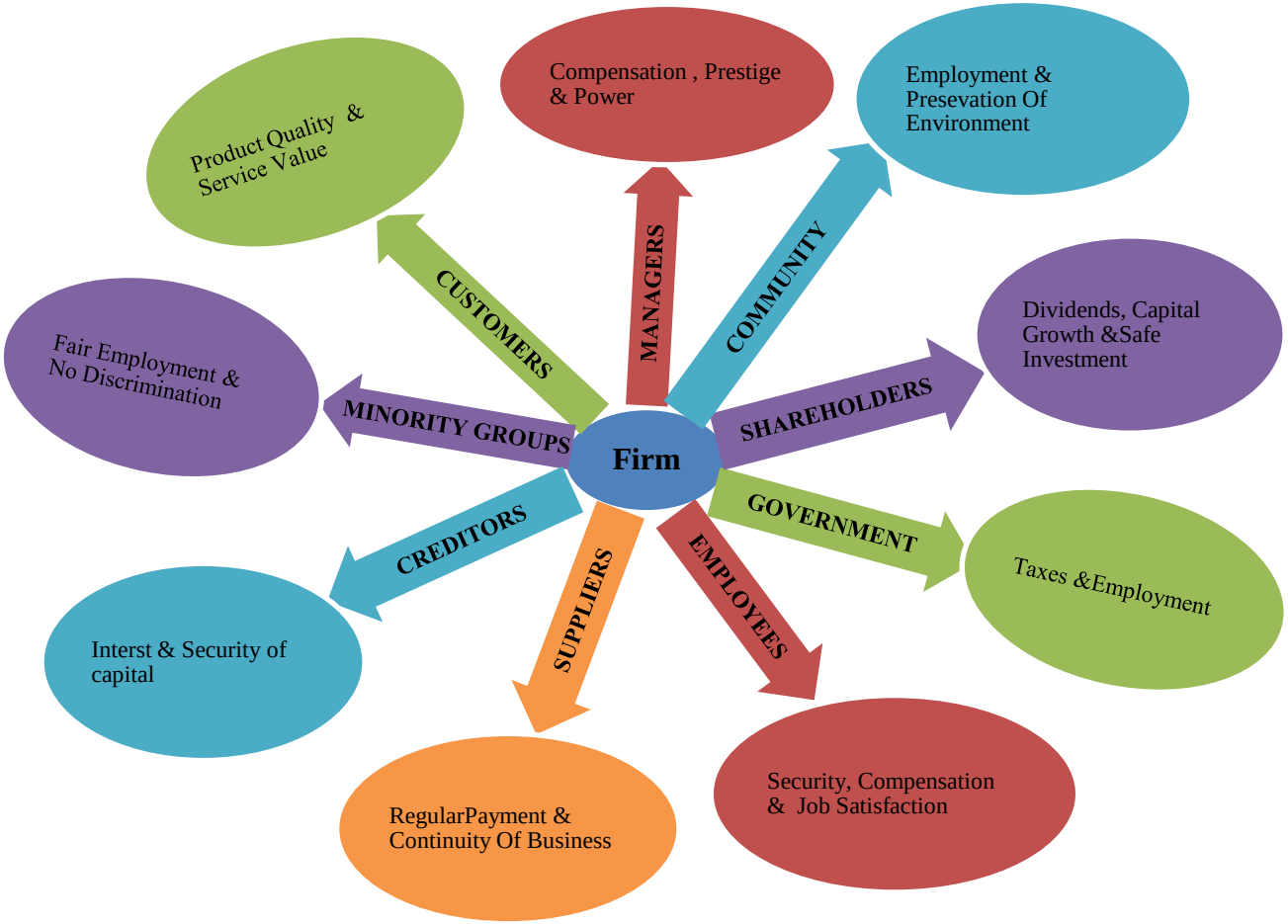
Relating productivity to SS, various researchers have related organisational productivity and performance to SS (Kaplan and Norton 2001; Neely and Adams 2001; 2002). In illustrating the link between productivity and SS, Heskett et al. (1994:1997) for instance, in their service profit chain concept, highlighted the relationship between SP and customer, employee and shareholder value/satisfaction by road-mapping the impact of employee and organisational productivity on customer satisfaction and value and shareholder satisfaction and value. Further, the attainment of customer value and satisfaction, organisational profit and shareholder value and satisfaction impacts on employee satisfaction (Anderson et al. 1994; Hinterhuber et al. 2003; Rust et al. 1995; Stahl et al. 2003; Matzler et al. 2005; Guo et al. 2004; Koonmee et al. 2010). This relationship has been referred to as the "cycle of success" and "cycle of failure"(Schlesinger and Heskett 1991).

Furthermore, productivity has wider impact beyond the satisfaction of shareholders, employees and customers. This includes the satisfaction of external stakeholders including government, regulatory bodies, community and society in general. This is reflected in organisational ethical and corporate social behaviours. Also productive and successful organisations have been identified as having a tendency of being committed to corporate social responsibilities (Daft 2000; Snider et al. 2003; Broadhurst et al. 2003; Sharma et al. 2009: Daft et al. 2010; Boone and Kurtz 2010).

Finally, several scholars have emphasised the importance of SS as a measure of organisational performance, effectiveness and productivity (Friedlander and Pickle 1968; Berman 1998; Schneiderman 1999; Stainer and Stainer 2003; Blazey 2008; Ambler 2009; Hertz 2010). Stainer and Stainer (2003) also identified a positive relationship between productivity and SS. Based on the preceding discussion, this thesis, therefore, proposes the hypothesis that:

H_6: Service productivity has a positive impact on stakeholder satisfaction.

Figure 5.4: Stakeholders` Expectation



Adapted from Doyle (1994)

5.7 PROPOSED HYPOTHESES

Based on the preceding discussions, this thesis proposes the following hypotheses to be tested:

H_1: Resource commitment has a positive impact on service productivity.

$H_{2:}$ Resource commitment has a positive impact on employee readiness.

H_3: Employee readiness has a positive impact on service productivity.

H_4: Resource commitment has a positive impact on customer readiness.

H_5: Customer readiness has a positive impact on service productivity.

H_6: Service productivity has a positive impact on stakeholder satisfaction.

5.8 CONCLUSION

This chapter set the scene for achieving the research aim and objectives by defining SP holistically and by conceptualising and proposing a model for measuring SP and its related constructs. This thesis conceptualises SP with its antecedents (RC, ER and CR) and consequence (SS). This chapter further proposed six hypotheses about the relationships between SP and its related constructs.

The next chapter explains the research design and methods. It describes how the author evaluated the various philosophical paradigms as well as data collection and analysis strategies to make the optimum choice on the research methods for tackling the research aim and objectives and addressing the research questions.

CHAPTER SIX: RESEARCH DESIGN AND METHODS

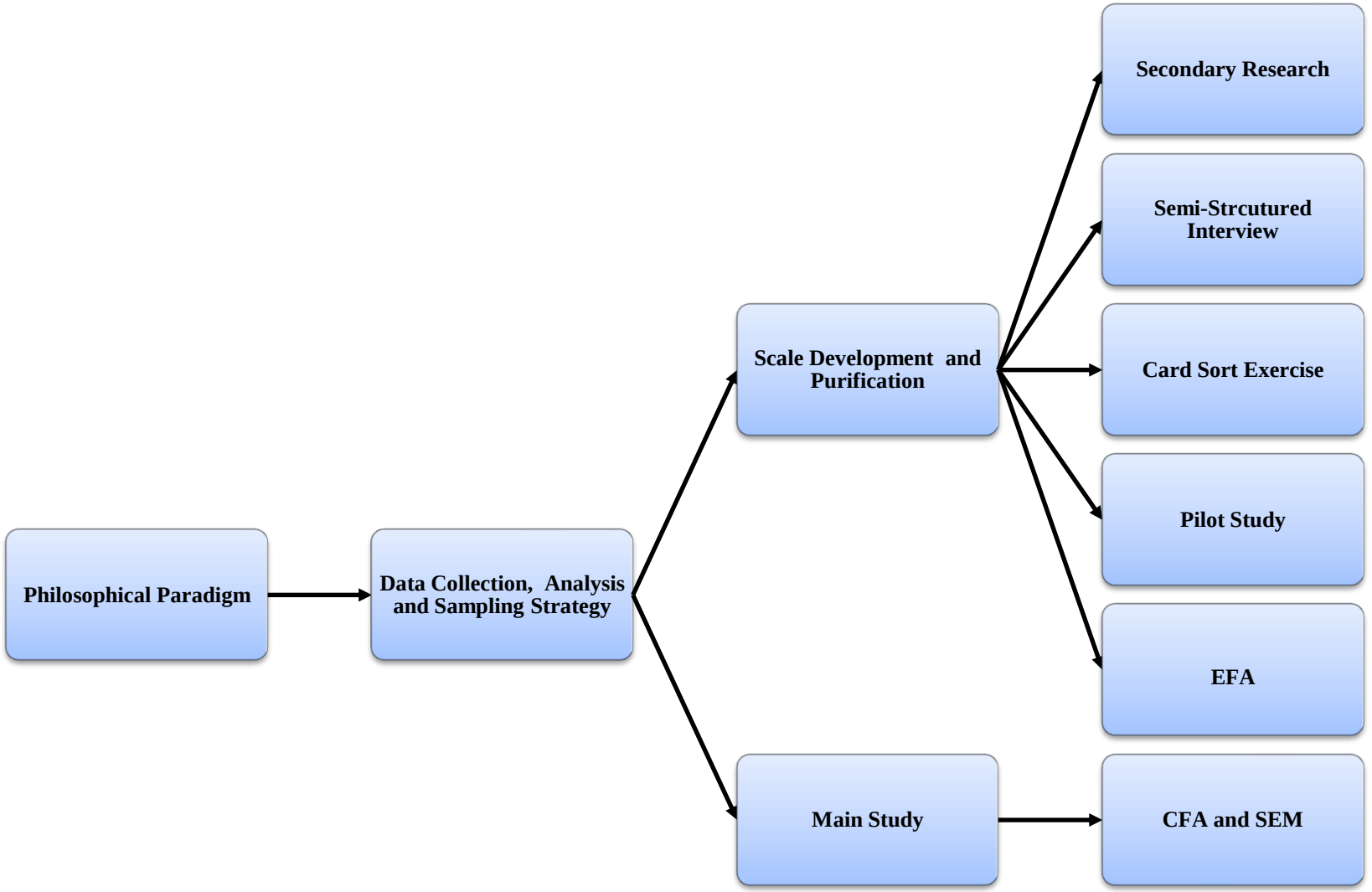
6.1 INTRODUCTION

This chapter describes how the author evaluated the various philosophical paradigms as well as the data collection and analysis strategies in making the optimum choice on the research methods for tackling the research aim and objectives and in addressing the research questions. A methodology relates to how a researcher goes about finding knowledge (Guba 1990; Grix 2004).

As a continuation from the conceptual chapter, several targets for this chapter are highlighted. This chapter firstly discusses the dominant philosophical paradigms within the marketing discipline and provides the justification for the researcher`s choice of philosophical paradigm adopted for this thesis. It further describes the various methods used by the researcher in tackling the research aim and objectives. Frankfort-Nachmias and Nachmias (1996) describe research method as a researcher`s guideline for attaining the research objectives and further describe it as a system of explicit rules and procedures in which a researcher ground his/her research and against which claims from the research outcome are evaluated.

This chapter, therefore, covers the data collection and analysis methods for the scale development and purification studies and the norm development study (main study). In addition, the strategies for dealing with anticipated problems and errors, and the ethical considerations relating to this thesis are addressed. Figure 6.1 provides an overview of the organisation of this chapter.

Figure 6.1: Organisation of Research Design and Methods Chapter



6.2 PHILOSOPHICAL PARADIGM

Researchers work within a paradigm that defines the approaches, boundaries and outcomes of their research. Such paradigms determine how knowledge is developed and perceived (Grix 2004). A paradigm is the "basic belief system or worldview that guides the investigator" (Guba and Lincoln 1994: 105). While many paradigms exist including religious, adversarial and judgemental paradigms (Guba 1990), this thesis focuses on the paradigm that directs an academic and a disciplined inquiry which is classified as: Ontology (nature of knowledge/reality); Epistemology (nature of relationship between the inquirer and the knowledge); and Methodology (how the inquirer goes about finding knowledge) (Guba 1990; Grix 2004). Grix (2004:66) provides an overview of a research process in Figure 6.2.

Figure 6.2: Blocks of Research

(Source: Grix 2004:66)

Paradigms serve as a guide for researchers in a specific discipline and provide sense-making of a phenomenon. In addition, they assist in determining the tools and methodologies to be used and provide the epistemological perspective which can be viewed as organising principles for carrying out the "normal work" within a discipline (Filstead 1979: 34). It is, therefore, important that a researcher identifies the philosophical paradigm on which a research is grounded, as the whole research process (i.e. arriving at research questions and hypotheses; developing the methods for data collection; analysing and interpreting data; and reporting key findings) may vary depending on the philosophical stance a researcher adopts. As Baker (2002) explains, a researcher`s choice of philosophical paradigm is interrelated with the research method and process.

In addition, it is imperative for researchers to have a clear philosophical research approach, as it allows more informed decisions to be made about research design and data collection and analysis strategies, resulting in better answers being provided to the research questions. By considering the various research approaches available, a researcher will be able to identify the boundaries of the different philosophical paradigms, allowing the optimum approach to be chosen. This will enable a researcher to use the best research design to cater for any constraints in advance.

Philosophical paradigms in general include positivism, critical theory, constructivism, realism, relativistic, pragmatism, interpretivism, phenomenology and, post-positivism. Historically marketing research has been dominated by the positivist and interpretivist paradigms and the researcher's choice between these paradigms is dependent on the nature of research problem as well as the researcher's preferred methods for addressing the research problem (Grix 2004). Tables 6.1 and 6.2 highlight the key differences between positivist and interpretivism paradigms.

Interpretivism relates to the systematic analysis of social behaviour through the direct observation of participants in their natural settings aimed at interpreting and understanding their social world (Neuman 1994:71). In addition, interpretivists hold the view that the world and "reality" are socially constructed and given meaning by people (Carcary 2009). The key methodologies used are qualitative research, which employs interviews, ethnography, thematic and content analysis as data collection and analysis methods. The advantages and disadvantages of interpretivism are highlighted in Table 6.3.

Unlike interpretivism, positivism is often associated with scientific research, mainly using quantitative data and follows the norms of science, which is defined as "an objective, logical and systematic method of analysing a phenomenon, devised to permit the accumulation of realistic knowledge" (Lastrucci 1963:6). Guba (1990) highlights the core tenets of positivism as Ontology (dealing with the belief that there exists a reality out there, which is driving by immutable natural laws); Epistemology (data is objective and there is emphasis on the importance of the inquirer keeping a distance from data derived); and Methodology (empirical experimentation). As Bryman (1988) explained, positivist uses questionnaires in operationalising a construct and testing relationships between variables using path analysis and other techniques. Table 6.3 highlights the advantages and

disadvantages of the positivist paradigm. This thesis research adopts a positivist approach. The rationale for adopting a positivist paradigm is discussed in the section that follows.

Table 6.1: Marketing Research: Main Scientific Paradigms and their Elements

(Source: Grix 2004)

Table 6.2: Characteristics of Social Research Paradigms

Criterion	**Positivism**	**Interpretivism**
Reality	• Objective, out there to be found.	• Subjective, in people's minds • Interpreted differently by people.
Science	• Based on strict rules and procedures • Deductive • Value free	• Based on common sense • Inductive • Not value free
Purpose of Research	• To explain social life • To discover the laws of social life	• To interpret social life • To understand social life • To discover people's meanings
Common Methodologies	• Experiments/surveys: verification of hypotheses, chiefly quantitative methods	• Hermeneutical/dialectical; researcher is a "passionate participant" within the world being investigated

(Source: Healy and Perry 2005:119)

Table 6.3: Advantages and Disadvantages of Interpretivism and Positivism

Advantages	Disadvantages
Interpretivism	
• Generate rich and detailed theory in social science. • Ability to understand social phenomenon.	• Result limited to individual subjective • experience and interpretation. • Lack statistical vigor. • Limited samples. • Lacks causation and generalisation. • Costly and time consuming. • Lack replication. • Researcher bias. • Validity and reliability problems.
Positivism	
• Clear theoretical focus. • Easily comparable data. • Greater control of research process • Economical cheap to collect large amount of data.	• Weak at understanding social phenomenon • Inflexible approach cannot be changed once data collected has started. • Often does not discover the meaning people attach to social phenomena.

Sources: Easterby-Smith et al. 1991; Arksey and Knight 1999; Blaxter et al. 2001; Descombe 2002; Kim 2003; Carcary 2009

6.2.1 Rationale for Positivist Paradigm

This research adopts a positivist approach and the rationales behind this decision are as follows. Firstly, this thesis` aim and objectives rely greatly on theory testing rather than theory building, which is in line with the core tenet of the positivist paradigm. Secondly, the scale development strategies recommended for marketing researchers, particularly Churchill`s (1979) approach, which this thesis utilised, is underpinned by positivism and relies extensively on quantitative research and analysis, thereby favouring the use of positivism. Thirdly, the majority of studies within the marketing and SP domain have used the positivist paradigm as its core philosophical paradigm (Szmigin and Foxall 2000). For instance, Kim (2003) suggested that positivist research should be employed as the central methodological framework in investigating organisational performance issues. This is consistent with most performance and productivity studies, which have relied extensively on positivism (Dollard et al. 2000).

Fourthly, the data analysis strategies used for this thesis are based on quantitative analysis and hypothesis testing, as well as validity and reliability evaluations. This is because the proposed constructs needs to be operationalised in order to obtain facts quantitatively. Finally, issues of reliability, validity and generalisability of research outcomes are vital in the evaluation of social science and marketing researches. This is consistent with the core tenets of positivism (Carcary 2009). This thesis, therefore, utilised a positivist paradigm in justifying the reliability, validity and generalisability of the research outcome.

Based on the preceding discussion, this thesis utilised positivism through survey questionnaires in collecting data from a large sample size 143 (EFA study) and 447 (main study) and analysed data using exploratory factor analysis, confirmatory factor analysis and structural equation modelling methods. The data collection and analysis strategies are discussed next.

6.3 DATA COLLECTION AND ANALYSIS STRATEGIES

As a follow-up to the discussion on philosophical paradigm underpinning this thesis, the objective of this section is to delineate the methods and procedures used to collect and analyse data. Data collection refers to the systematic gathering of information relevant to a researcher`s aims and objectives (Burns and Grove 2005:42). Data analysis, on the other hand, relates to the collection of methods that enable the description of facts, detection of patterns, development of explanations, and the testing of hypotheses (Levine 1996).

This thesis adopted a triangulation research strategy, which involves the use of two or more data gathering and analysis methods within the same study (Denzin 1970; Litosseliti 2010). Four main types of triangulation research strategies have been identified. These include data triangulation, researcher triangulation, theoretical triangulation and methodological triangulation (Denzin 1989). The importance of triangulation research includes its ability to decrease researcher bias, improve research validity and strengthen the

interpretational potential of the research outcome (Denzin 1970). The use of a triangulation research strategy enabled the researcher to use different data collection and analysis strategies.

In addition, the use of triangulation strategy ensured that there is convergence in findings; elimination or minimisation of plausible alternative explanations for conclusions drawn and the elucidation of the divergent aspects of the research (Johnson and Turner 2003). Furthermore, it ensured that the methods complement each other`s limitations (Johnson and Turner 2003; Collis and Hussey 2003). Lastly, it improved the researcher's ability to make confident conclusions and communicate recommendations to managers with greater confidence and clarity (Scandura and Williams 2000).

In developing, purifying and validating the scale as well as in developing norms, the researcher utilised extant literature and existing scales (secondary research), semi-structured interviews, a card sort exercise and a survey questionnaire for collecting data, while thematic and content analysis, content validity ratio, EFA, CFA and structural equation modelling were used in analysing the data collected.

Data collection and analysis were conducted in two phases. Phase one focused on scale development and purification, which involves secondary research, semi-structured interviews, a card sort exercise, pilot study and EFA study. Phase two on the other hand, focused on the main study, which validated the scale and tested the relationships between the proposed constructs. The sections that follow explain the overall sampling strategy adopted for this thesis as well as the data collection and analysis methods adopted by the researcher during the different stages and studies relating to this thesis. Figure 6.3 and Table 6.4 give an overview of the different data collection and analysis methods adopted by the researcher during the different stages relating to this thesis.

Figure 6.3: Overview of the Data Collection and Analysis Methods

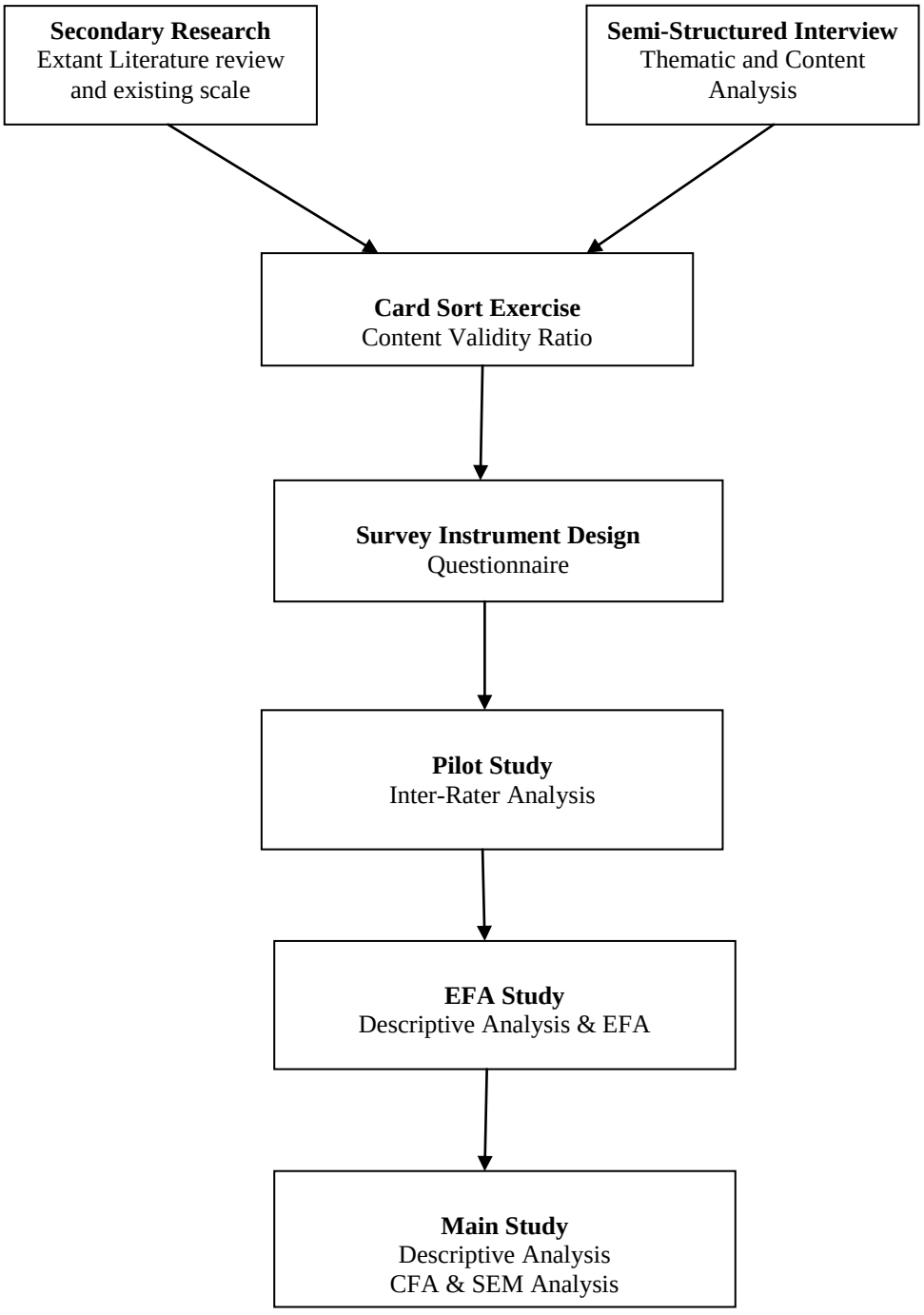


Table 6.4: Overview of Data Collection and Analysis Methods/Strategy

Phase	Study No.	Study	Overall Objective /Rationale	Analysis Method	Sample Size	Time Scale
Phase One- Scale Development and Validation	1	Secondary Data- Review of Extant Literature and Scales	To clearly identify and define SP and its related constructs and to theorise these construct in relation to other related constructs. To generate a large pool of items for each construct.	**Deductive approach** Literature Review Review of Existing Scales Thematic and Content Analysis	N/A	N/A
	2	Semi-Structured Interview	To identify items to be included in the scale development.	Thematic and content analysis	6	4th-11th May , 2010
	3	Card Sort Exercise	To refine and select items for the scale and questionnaire development. To relate items to their respective constructs.	Inter-Rater Agreement Content Validity Ratio	5	18th-21st May, 2010
	4	Pilot Study	To critique and refine the survey instrument To test the time needed for questionnaire completion.	Inter-Rater Analysis Content Validity Ratio	40	1st-19th June, 2010
	5	EFA Study	To identify the underlying factors (constructs) capturing each scale item. To assess the reliability of the developed scale.	EFA Reliability analysis- Cronbach alpha	143	6-8th July 2010
Phase Two - Main Study	6	Main Study	To further purify and validate the measure. To study the relationship between items and their representative constructs. To study relationship between SP and its related constructs and to develop norms.	CFA and SEM	447[24]	Sept. , 2010- Feb., 2011

[24] Samples were split into 224 (calibration data) and 223 (validation data)

6.3.1 Sampling Strategy

The data collection process entails making a decision on the sampling strategy. Sampling refers to the selection of a sub-section of the research population as representative of the population upon which generalisations will be made. Sampling involves a number of key decisions. These include defining the population and samples under the study, sampling method and sample size. The sampling method and sample size for each study will be discussed under each study.

As the main objective of this thesis is to develop a model for measuring productivity in services, which is tested in HE Business and Management Schools, the population for this study, therefore, covers all service industries within the service sector. However, the service industry consists of a wide range of different sectors; therefore, it was impractical to collect data from all the sectors[25]. As a result, sampling was used in selecting a sub-section of the population as a representative of the research population. The HE sector was selected as representative of the service industry (See Section 1.4.2 for the rationale for using HE sector as the research context and Chapter Two for background information on the HE sector). In addition, Business and Management Schools were further chosen as a sub-population of the HE sector and employees (HE academics) were used as respondents for the questionnaire. Sections 6.3.1.1 and 6.3.1.2 justify the rationale for using HE Business and Management Schools and HE academic employees respectively as representative samples for this study.

Overall, the sampling strategy adopted for this thesis is non-probability sampling using convenience sampling. Convenience sampling was used in selecting HE Business and Management Schools as the context of study and in selecting academic employees as respondents for the study. The rationale for selecting HE Business and Management School academics was based on the research context and objective of this thesis, which is to empirically test the developed scale and proposed conceptual model in HE Business and Management Schools. These are explained and justified in the sections that follow.

[25] See the Office of National Statistics classification of services and Table 1.1 on various classifications of services

6.3.1.1 Justification for Business and Management Schools

The diverse nature of the HE sector in terms of the different disciplines including engineering, health and medical sciences and business and management meant that, it was impractical to collect adequate and proportionate data from all the various disciplines within the HE sector[26]. In addition, collecting data from all the various disciplines within the HE sector was impractical in terms of time, cost and accessibility. This necessitated the use of a sub-sampling strategy. As a result, Business and Management Schools were chosen for convenience and practicality. This is because, the researcher works within the business and management discipline; therefore, access to Business and Management School employees was easier. In addition, the researcher`s institution's hosting of the Academy of Marketing 2010 conference provided the best opportunity for the researcher to collect data from business and management academics.

6.3.1.2 Justification for using HE academic Employees

Productivity and performance measurement in any organisation can be evaluated from several sources. These include customers, managers, employees, government and society[27]. As a result, a decision has to be made in selecting the most appropriate source to collect data from, as the failure to use the right respondents can jeopardise the outcome of the research. Therefore, since this thesis is about productivity measurement in services, service employees were identified as a viable and legitimate source to collect data from. The rationale for selecting service employees is as follows:

Firstly, service employees play an important role in services, particularly their role in the co-production process and in the service marketing triangle concept (Kotler and Armstrong 1991; Vargo and Lusch 2008). The co-production role of employees and the importance of employees in the interactive, internal and external marketing dimensions of the service triangle position employees in a strategic position to possess key productivity information relating to the organisation and its customers. Secondly, several scholars have recommended and utilised employees as key informants in organisational productivity and

[26] See Section 1.4.2 for further information on the context of this study
[27] See Section 3.6 for further detailed discussion.

performance studies (Kemppilä and Lönnqvist 2003; Manning et al. 2005; Johnston et al. 2010). Thirdly, business and management academics were selected conveniently in order to attain a high response rate as the researcher works within the HE sector and as a result, has access to HE academics through its network and academic conferences. Lastly, business and management academics were selected based on the condition of having the responsibility for performing teaching, research and administrative/support duties, which are the core functions of HE institutions.

6.4 PHASE ONE - SCALE DEVELOPMENT AND PURIFICATION

Social scientists trying to understand a theory (phenomenon of interest) express it in the form of constructs (latent variables), which by themselves are unobservable and therefore, cannot be quantified directly. Constructs by their very nature relate to theoretical abstracts with no objective reality (Spector 1992). Judd et al. (1991:42) defined them as "abstractions that social and behavioural scientists discuss in their theories". Such theoretical abstractions called constructs are unobservable and are measured through observable indicators or items[28].

The measurement of a theory (construct) requires that social scientists develop a scale to measure the phenomenon of interest (Netemeyer et al. 2003). Such scales involve the use of multiple items to capture the full meaning of the construct of interest (DeVellis 2003). Several marketing scholars have recommended and demonstrated the procedures required in developing better measures in marketing (Churchill 1979; DeVellis 1991; Rossiter 2002; Netemeyer et al. 2004). Among them is Churchill`s (1979) procedure, which is the most popular and widely used procedure for developing scales in marketing.

The scale development strategy used for this thesis followed Churchill`s (1979) procedure for scale development in marketing and also took insights from Rossiter`s (2002) C-OAR-SE six-step procedure for scale development in marketing which overcomes the

[28] Indicators/items will be used interchangeably

limitations with Churchill's (1979) procedure, in terms of its lack of content validity. The C-OAR-SE procedure emphasises construct definition and conceptualisation, thereby addressing the weakness in Churchill's (1979) procedure, which relies greatly on EFA and internal consistency. The rationale for using Churchill`s (1979) procedure was to enhance the reliability and validity of the scale and the outcome of this thesis.

Churchill`s (1979) procedure for scale development involves the following eight steps: specification of domain of construct; generation of sample of items; collection of data; purification of measure; collection of data; assessment of reliability; assessment of validity; and development of norms. Rossiter`s (2002) C-OAR-SE procedure, on the other hand, involves six steps: construct definition; object classification; attribute classification; rater identification; scale formulation; and enumeration. However, having considered C-OAR-SE`s strengths on content validity and its limitations of reliability and other forms of validity, this thesis relies on Churchill`s procedure, but integrates C-OAR-SE construct definition stage to overcomes the shortfall of Churchill`s approach. The following sections explain the scale development process as depicted in Figure 6.3 and Table 6.4.

6.4.1 Secondary Research Method

Secondary research involves using data that is already in the public domain and collected by a third party for another purpose. In secondary research, data is collected from extant literature and research, company and market research reports. While using secondary data is cost effective, its disadvantages are that the data may not be relevant to current research and the researcher have limited knowledge of the methods used in collecting the data, resulting in the data having a conflicting view with the current study (Jugenheimer et al. 2010). Churchill`s (1979) procedure for scale development recommends the use of extant literature and existing scales in developing scales. This thesis reviewed extant literatures and existing scales relating to the domain constructs in defining and generating a sample of items for the scale development.

6.4.2 Semi-Structured Interview

An interview entails a verbal interchange between an interviewer and interviewee whereby the interviewer elicits information from the interviewee by asking questions (Clifford and Valentine 2003). A qualitative research interview seeks to describe and identify the meanings and themes emerging from an interview in the life world of the subjects. Interview methods are the most widely used qualitative research methods and are categorised as in-depth, exploratory, semi-structured or unstructured (King and Horrocks 2010). Among the several interviewing methods, a semi-structured interview method was chosen for this study. This is because semi-structured interview offers a flexible approach, resulting in new questions and information emerging in the course of the interview, thus, allowing themes to emerge during the interview, while at the same time, allowing the researcher to have control over the interview content (Dunn 2000:52). A semi-structured interview, therefore, is the most suitable tool for capturing how a person thinks of a particular phenomenon (Del Barrio 1999). Table 6.5 highlights the advantages and disadvantages of semi-structured interview.

Table 6.5: Advantages and Disadvantages of Semi-Structured Interview

Advantages	**Disadvantages**
Its ability to obtain rich, unique and adequate information. Its flexibility with the interview question content, allowing the researcher to tailor each interview to the interviewee level and understanding. It also allows the interviewer to clarify questions; read non-verbal cues during interview and ability to establish rapport and motivate respondents.	Its time-consuming in terms of data collection and analysis. Data collected are in haphazard fashion due to the emerging of themes not originally considered by the researcher. Problems of coding and analysing data. Interviewer bias.

Source: Kvale 1996; Del Barrio 1999; Sekaran 2003

6.4.2.1 Rationale and Objective of Semi-Structured Interview

Qualitative research, particularly interviewing methods, can be carried out from a range of different philosophical perspectives (Cassell et al. 2006). Among them is qualitative positivism, which seeks to quantify the outputs of qualitative research (Prasad and Prasad 2002:6). In developing the procedure for scale development in marketing, Churchill (1979) recommended the use of qualitative research in generating a sample of items. In addition, Churchill and Iacobucci (2005) recommend implementing qualitative interviews at the primary stage of a research study. Further, several scholars have emphasised the importance of incorporating qualitative research in understanding key business phenomena and productivity behaviours (Gummesson 2002; Martin 2009).

Therefore, taking into consideration the inadequacy of existing scales for measuring SP and its related constructs, this study utilised a qualitative research through semi-structured interviews to generate a sample of items for developing scales for SP and its related constructs.

6.4.2.2 Sampling and Data Collection Procedure

In addition to the overall sampling strategy adopted for this thesis in Section 6.3.1, participants for the semi-structured interviews were selected based on the condition of respondents being academics, their position within an institution and years of experience in HE. In addition, participants were selected conveniently based on proximity, time, and cost. Six (6) interviewees, consisting of three male and three female were selected for the interviews and among them, one had a managerial role; two had been academics for less than five years; and three had been academics for more than five years and all respondents were from HEIs within the West Midlands of the UK.

The interviews were structured to generate a sample of items relating to the domains constructs. All interviews were conducted by the researcher to ensure consistency in the administration process of the interview. Prospective interviewees were contacted either face to face or on the telephone to gain their verbal consent to participate in the interview. In addition, the interview setting, date and time were arranged based on the convenience of the

interviewees. Prior to undertaking each interview, interviewees were briefed about the interview objectives and procedure as well as handed a participant information sheet and consent form to be signed before the commencement of the interview. For ease of analysis, interviews were taped recorded and a total of four hours and three minutes of semi-structured interview was recorded and on average, each interview lasted between 30-45 minutes.[29]

6.4.2.3 Data Analysis Strategy

Thematic Content Analysis (TCA) is an extensive form of content analysis, which is described as a descriptive presentation of qualitative data (Anderson 2007). Krippendorff (2004) described it as a research technique used for making replicable and valid inference from text and speech to the context of their use. The use of TCA enable researcher`s to identify themes and items emerging from an interview through the texts provided (Anderson 2007).

Interviews were transcribed manually by the researcher by transferring the recorded interview onto computer software (Window Media Player). Following this, TCA was used in identifying themes and items emerging from the interviews and its association with their relevant construct (Kvale 1996; Ryan and Bernard 2003; Krippendorff 2004). Items were identified based on key words used by participants; the number of times a particular key word was used by participants during the interview; key word relation with constructs; and the content of participants' comments on the various constructs. Items generated from each interview were compared and contrasted with each other and common items emerging were selected.

[29] See Appendix 5 for interview script

6.4.3 Card Sort Exercise

A card sort exercise is a structured elicitation technique that requires participants to sort a pile of words written onto cards into different groups (Schensul et al. 1999; Cavusoglu et al. 2004). It is a technique for exploring how people group items in a way that maximises the probability of respondents being capable of identifying items to their representative group (Coxon 1999; Gaffney 2009). Gaffney (2009) noted that a card sort exercise is appropriate when a researcher identifies items that require categorisation. Camp et al. (2008) identified two types of card sorting, namely open and closed card sorting. In an open card sorting, subjects sort items into undetermined/undefined groups based on the participant`s perception, while in closed sorting, subjects are instructed to sort items into pre-defined groups. This thesis used a closed sorting approach to assess if the items capture the researcher`s proposed constructs. The advantage and disadvantages of the card sort exercise are presented in Table 6.6.

Table 6.6: Advantages and Disadvantages of Card Sort Exercise

Advantages	**Disadvantages**
Simplicity – Card sorts are easy for the researcher and the participants. **Cheapness –** Typically the cost is a stack of 3×5 index cards, sticky notes, a pen or printing labels, and your time. **Quick to execute –** You can perform several sorts in a short period of time, which provides you with a significant amount of data. **Involves users –** Because the information structure suggested by a card sort is based on real user input, not the gut feeling or strong opinions of the researcher, it should be easier to use. **Provides a good foundation –** It's not a silver bullet, but it does provide a good foundation for a research to begin from.	**Results may vary –**The card sort may provide fairly consistent results between participants, or may vary widely. **Analysis can be time consuming –**The sorting is quick, but the analysis of the data can be difficult and time consuming, particularly if there is little consistency between participants. **May capture "surface" characteristics only –**Participants may not consider what the content is about or how they would use it to complete a task and may just sort it by surface characteristics.

Adapted from Spencer and Warfel (2004)

6.4.3.1 Rationale and Objectives of Card Sort Exercise

The identification of several items from extant literature, existing scales and semi-structured interviews as relating to the conceptual domain requires categorisation and refinement of scale items. A card sort exercise provides an opportunity for researchers to categorise and/or relate scale items to their representative group as well as to refine scale items (Coxon 1999; Gaffney 2009). In addition, Hinkin (1995) suggest the use of a card sort exercise for deleting irrelevant items from a sample of items. Having identified several scale items from extant literature, existing scales and semi-structured interviews as relating to the conceptual domain, the objectives of the card sort exercise were to:

- Refine scale items identified from extant literature, existing scales and semi-structured interviews that relates to the operational definition of SP and its related constructs.

6.4.3.2 Sampling and Data Collection Procedure

Spenser and Warfel (2004) identified the following procedures for card sort exercise**:** content selection, participant's selection and card preparation. These are explained next:

Content Selection - Items for the card sort exercise were developed from extant literature, existing scales and the semi-structured interviews.

Participants/Sample Selection- Participants were selected based on convenience sampling[30]. Participants were selected based on being HE Business and Management School academics and conveniently based on proximity, time, cost, convenience and, accessibility. Five (5) participants from the West Midlands in the UK were selected for the card sort exercise[31].

Card Preparation /Sorting Procedure- Each item was typed and printed on 3×2 inch index card in the same type font and colour. Cards were shuffled and numbered randomly on the back of each card (for ease of analysis). Prior to each card sorting exercise, cards were shuffled and presented to each participant separately to perform the card sorting exercise

[30] See Section 6.3.1 for overall sampling strategy for this thesis
[31] These participants were different from those used for the semi-structured interview

independently. A placement board was prepared using a cardboard divided into sections with each construct written boldly on each section and one section labelled "Not Relevant"[32].

Participants were contacted personally and informed of the objectives of the study, the procedure and duration of the exercise and their participation rights. Prior to each card sort exercise, participants were presented with a participant information sheet, consent form and a standardised instruction on the procedures for the exercise[33]. In addition, before the commencement of each exercise, the researcher performed a trial sort exercise to demonstrate to the participant the required procedure for the actual card sort exercise, using a set of sampled items not related to the research. In the actual card sort exercise, participants were given some time to read and sign consent forms and to ask any question about the exercise. Participants were then asked to sort items into relevant constructs; to record items which they found belonging to more than one construct and to record items that were ambiguous, not clear, not simple or contained grammatical errors. Prior to each exercise, items were shuffled before presenting them to participants. This was to ensure that the preceding exercise did not affect the order of items and subsequent participant`s choice. Items were subsequently recorded using their associated numbers on the back of items on a sheet purposely designed for the card sorting exercise.

6.4.3.3 Data Analysis

Results of the card sort exercise were transferred to an Excel Spreadsheet Template designed by Lamantia (2003) for analysing card sort results. The spreadsheet template provides a visually attractive analysis on the following:

- Construct (category) in which each card appears.
- Number of times a card appears in any given construct (category).
- Percentage of card appearance within a construct.
- The number of unique cards in a construct (category).

[32] This is intended to capture items that do not belong to any of the domain constructs.
[33] See Appendix 6a for card sort brief.

These were analysed based on the number of participants identifying a particular item as belonging to a particular construct using the percentile of participants' agreement on items to their related constructs. Lawshe`s (1975) Content Validity Ratio (hereafter, CVR) was used in analysing the data to assess raters agreement on items as belonging to a construct. The thesis selected items as belonging to a construct based on ≥ 99.9% of raters` agreement. This is based on Lawshe`s (1975) CVR[34], which proposes that studies with five raters should have a minimum rater agreement of ≥99.9% before an item will be deemed as having a content validity. Furthermore, in order for the item to be considered as representing a construct, consideration was given to comments made by participants on the item wording, clarity, simplicity and ambiguity and items found faulty within any of these criteria were rejected.

6.4.4 Survey Questionnaire/Instrument

Having identified and refined the scale items, the next stage is to design a questionnaire using these items. Survey questionnaires have been used extensively in marketing and management research. Oppenheim (2005) describes it as an important instrument for data collection, which consists of rigidly constructed scales and questions and in the form of attitude scales, check list and rating scales. Survey questionnaire methods include self-completion questionnaire and interviewer-administered questionnaire (Brace 2008). Self-completion questionnaires can be categorised into paper-based and electronic-based (Brace 2008). Oppenheim (2005) also categorised them into postal, telephone and face-to-face. The use of a survey questionnaire ensures a high respondent rate, accurate sampling and minimise bias (Oppenheim 2005).

The use of a questionnaire method was found to be appropriate for this thesis as it ensures high response rate, minimises interviewer's bias and can be used to accurately sample participants that are representative of the main population. The paper-based self-administered questionnaire method using face-to-face and postal data collection strategy was used in collecting data. The questionnaire design process is discussed next.

[34] See Appendix 6b for CVR calculation and card sort results.

6.4.4.1 Questionnaire Design Process

The scale development process identified multi-item scales for measuring SP and its related constructs. This entailed specifying the operational definitions and operationalising the variables relating to SP and its related constructs. Taking into consideration the main objective of this thesis, a multi-item scale method was chosen in order to ensure reliability of underlying true scores for the proposed constructs (Hayes 1998). The content of the questions for the questionnaire was based on the final scale items identified from the card sort exercise. The wording of the questions was short, simple, clear, unambiguous and avoided double barrelled and leading questions (Kassim 2001). In addition, some questions were reverse ordered in order to minimise response set bias (Spector 1992).

Labelled and multiple closed-ended scales were used for the questionnaire design. Multiple closed-ended scales were used for soliciting respondents` demographic characteristics while a labelled Likert scale was also used to solicit respondents` perception about their organisational productivity using the scale items. A labelled Likert scale was used because of its wide application in marketing and perception studies and its ability to provide likelihood response and reliable results (Kassim 2001; Burns and Bush 2002). A five-point labelled Likert scale was used for all the scale items. Several researchers have recommended the use of a five-point Likert scale (Parasuraman 1991; Aaker et al. 2000; Sekaran 2003; Hair et al. 2003). The five-point Likert scale categories were labelled from left to right as "Strongly Disagree"; "Disagree"; "Neutral"; "Agree" and; "Strongly Agree"[35].

The questionnaire was structured into three parts. Part A solicited background information on respondent`s years of employment in HE, affiliated department, duties and the country in which the respondent`s institution is located. Part B, involves the use of the 27 scale items to assess respondents` perception of the factors affecting their institution`s productivity and Part C solicited demographic information on respondents` gender and age. Instructions began with a general statement on the type of information required from respondents and the assurance of confidentiality relating to the information provided. Each section advised respondents on how questions should be answered. The final instruction assured respondents once again of the confidentiality of information provided and further

[35] Initially this was anchored from strongly agree to strongly disagree, which a mid-point labelled neutral and with no labelled for points 2 and 4 for the scale but was revised after pilot study. See Section 7.5

advised respondents on how to return the completed questionnaire. The studies which utilised the developed questionnaire are discussed next.

6.4.5 Pilot Study

Having designed the research questionnaire, a pilot study is a necessary precondition before undertaking any further study. Churchill (1979) recommended its use in scale development. A pilot study refers to a small scale study undertaken prior to the main study in order to check the feasibility of the main study and to test and improve the research methods proposed for the main study (Burns and Grove 2005). A pilot study can be used in detecting problems with a questionnaire prior to its implementation (Burns and Bush 2002). In addition, it can also be used to refine research instruments; determine whether samples are representative of population; and to refine the data collection and analysis methods (Prescott and Socken 1989).

6.4.5.1 Rationale and Objectives of Pilot Study

The development of the research instrument/questionnaire and the specification of the data collection methods require further scrutiny and evaluation in order to assess the feasibility of the EFA study and the main study. The pilot study, therefore, sets out to critique the developed questionnaire prior to the EFA study and the main study. Its objectives were to:

- Provide feedback on the wording of the items based on their clarity, simplicity, ambiguity and grammatical/spelling error.
- Understand how respondents interpreted the questionnaire.
- Test the time needed for questionnaire completion.
- Check the clarity of instructions.

6.4.5.2 Sampling, Data Collection and Analysis Methods

The pilot study was undertaken using non-probability sampling through convenience sampling[36]. Convenience sampling was used based on the researcher`s network within HE Business and Management schools in Ghana, India and the UK. A sample size of 40 was selected through the researcher's colleagues and networks within HE Business and Management Schools in the different counties selected for this study. Table 6.7 highlights the sample profile of the respondents for the pilot study.

As the EFA and the main study were intended to use a questionnaire approach, questionnaires were found to be appropriate for the pilot study. The developed instrument was used to collect data through a survey questionnaire. Respondents were contacted to seek their consent to participate in the pilot study. Following this, the questionnaire, evaluation sheet, participant information sheet and consent form were emailed to respondents with instructions on how to return them[37]. SPSS version 17 software was used in analysing the data collected. Data collected from the pilot study were analysed using descriptive analysis and inter-rater analysis.

Table 6.7: Sample Profile for Pilot Study

Country	**Gender**		**Age**			**Sample Size**
	Male	**Female**	**18-40**	**41-60**	**Over 60**	
Ghana	6	4	4	5	1	10
India	7	3	5	3	2	10
UK	9	11	13	7	0	20
Total	**22**	**18**	**22**	**15**	**3**	**40**

[36] See Section 6.3.1 for overall sampling strategy for this thesis.
[37] See Appendix 7 for pilot study questionnaire and evaluation sheet

6.5 EXPLORATORY FACTOR ANALYSIS (EFA) STUDY

Churchill (1979) identified measure purification as a fundamental procedure in the development of a scale. This has its foundation on the domain sampling theory, which emphasises that all items relating to a conceptual domain should have an equal amount of common core (Nunnally 1967). In addition, Churchill (1979) highlighted the need for a set of sampled items relating to a construct to possess unidimensionality. Unidimensionality relates to the existence of a single trait for a set of measures (Hattie 1985). The importance of unidimensionality is asserted by Hattie: "A set items forming an instrument all measures just one thing in common is a most critical and basic assumption of measurement theory" (Hattie 1985:49). Subsequently, several researchers have identified EFA as a means of achieving the above objectives. EFA aims to discover meaningful underlying constructs within variables and can be used as a preliminary study for the assessment of unidimensionality and reliability of a developed scale (Gerbing and Anderson 1988; Li et al. 2002). The importance of EFA has been emphasised in situations when there is insufficient detailed theory about the relationship between items and their underlying constructs (Gerbing and Anderson, 1988) and can also be used in suggesting dimensions within a domain (Churchill, 1979).

6.5.1 Rationale and Objectives of EFA Study

Having refined the questionnaire through the pilot study[38], an EFA study was undertaken in order to purify the developed scale and to identify underlying constructs capturing each item as a result of inadequacy of conceptualisation in the study domain. Based on these underlying assumptions, an EFA study was undertaken to:

- Identify the underlying constructs capturing a set of items.
- Assess the unidimensionality of the underlying constructs.
- Assess the reliability of the measure.

[38] Prior to the EFA study, the questionnaire; evaluation sheet and supporting documents were revived by colleagues who had expertise in questionnaire design and were academics.

6.5.2 Sampling and Data Collection Procedure

Having made a decision on the overall sampling strategy adopted for this thesis (See Section 6.3.1), the next decision was about the method of selecting samples and the numbers of samples required in order to make valid and reliable generalisation. This study was undertaken using non-probability sampling through convenience sampling. Convenience sampling was used due to access to data and respondents. Sample size was determined using Ford et al. `s (1986) recommendation of a 5:1 sample size per variable ratio and Hair et al.`s (2006) recommendations of a sample size of 100 and larger as preferable. As a result, a sample size of 143 was found to be appropriate

The Academy of Marketing Conference 2010, which was organised by Coventry University Marketing and Advertising department, of which the researcher was part of the conference organising team, was used as a venue in collecting data. The Academy of Marketing Conference brings together academics (mainly academics from Business and Management Schools across the world). Conference participants were relevant to this research as they represent academic employees within HE Business and Management Schools. This study was undertaken between 6th-8th July, 2010 using the developed research instrument/questionnaire and resulted in a sample of 143[39].

The newly developed questionnaire was used to collect the data. Prospective respondents were approached by the researcher/colleagues and if they consented to participate in the research, the researcher/colleague handed them a questionnaire, participant information sheet and consent form (all in a self-addressed envelope) to be completed and returned to the researcher, with instructions on how to return the completed questionnaire and consent form[40]. Ethical procedures were followed in the data collection and no respondent was forced to participate in the research.

[39] See Appendices 8a and 8b for final questionnaire and participant information sheet respectively.
[40] Respondents were advised to return questionnaires at the conference reception. In addition, a self- addressed envelope was provided for postal return of questionnaires.

6.5.3 Data Analysis for EFA Study

The data analysis strategy adopted for the pilot study entailed a descriptive analysis and an EFA. The descriptive analysis presented the demographic characteristics of the respondents and the scale items using SPSS version 17. This provided an overview of the samples under the study as well as insights on the normality of data, which relates to the identification of outliers and missing data. In addition, mean, standard deviation, skewness and kurtosis were examined in evaluating data normality and outliers. Several guidelines have been recommended in determining the normality of data. Skewness values ≤ 3 indicate normality in data (Hu et al. 1992; Chou and Bentler 1995; Kline 1998). In regard to kurtosis, values ≤ 10 indicate normality in data (Kline 1998; Kassim 2001).

EFA on the other hand was undertaken using SPSS version 17 to identify the underlying structure among the set of items relating to the research domain; to assess the unidimensionality of the underlying constructs; and to assess the reliability of the measure (Hair et al., 1998: 2006). The EFA strategy is presented in Figure 6.4 and the EFA process and evaluation criteria is presented in Table 6.8. The next stage is to evaluate the validity and reliability of the developed scale. These are discussed in the next section.

Figure 6.4: Exploratory Factor Analysis Strategy

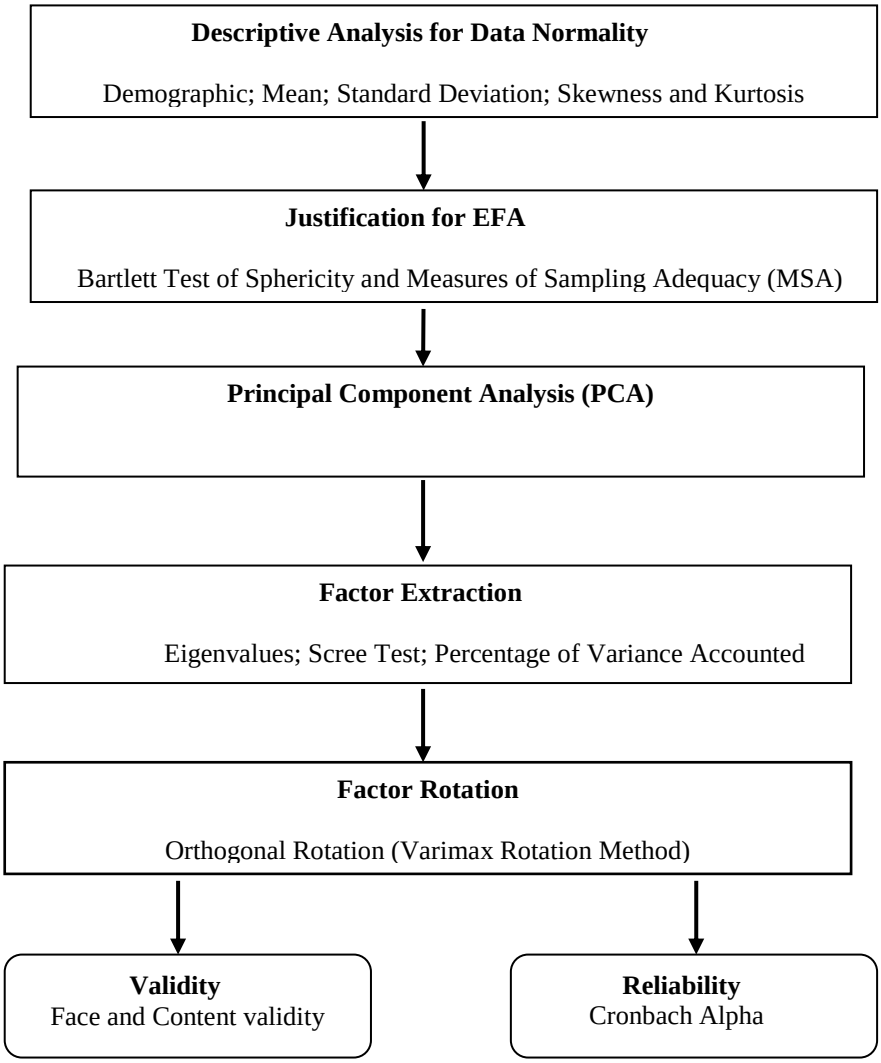


Table 6.8: EFA Process and Evaluation Criteria

Process	Description	Criteria and interpretation
Justification for EFA	The use of EFA requires sufficient correlation among dataset (Hair et al. 2006).	A Bartlett`s test of sphericity significant at .05 or less is recommended (Hair et al. 1998). MSA ranges from 0 to 1, with 1 predicting error-free variables (Hair et al. 2006). MSA values are interpreted as (≥ .80 meritorious; ≥.70 middling; ≥.60 mediocre; ≥ .50 miserable and ≤. 50 is unacceptable) (Kaiser 1974). It is recommended that MSA >.60 is acceptable and represents mediocre value (Hair et al. 2006).
Principal Component Analysis (PCA)	Is a technique for data processing, analysis and dimension reduction (Tipping and Bishop 1997)	PCA was chosen over common factor analysis, because of its data reduction ability and its ability to identify the number of underlying factors in a set of variables (Tabachnick and Fidell 2001; Hair et al. 2006)
Factor Extraction	Used to determine the number of factors to extract.	Eigenvalues >1 (Kaiser 1956; Hair et al. 2006) Percentage of variance accounted ≥ 60% (Hair et al. 2006) Scree test is based on visual inspection of the scree plot (Hair et al. 2006).
Factor Rotation	Used to determine the loading pattern in order to determine the role and contribution of individual variables in the factor structure. This can result in a decision of deleting variables as well as changing the factor extraction and rotation methods used (Hair et al. 2006).	Rotation method- Orthogonal rotation using Varimax Factor loadings ≥±.50; Communalities ≥±.50; Deletion of cross-loading items (Hair et al. 2006).
Factor Labelling	The naming/labelling of factors representing each of the derived factors (Hair et al. 2006).	Researcher`s intuition and the appropriateness of variables representing an underlying dimension of the factors extracted (Hair et al. 2006).

6.5.4 Validity and Reliability of the Developed Measurement Scale

Having developed and purified the scale for SP and its related constructs through a literature review, semi-structured interviews, card sort exercise, pilot study and an EFA study, it was essential that the validity and reliability of the developed scale be established. Validity refers to the extent to which a measuring instrument does what it is intended to do (Nunnally 1967:75) while reliability relates to "the extent to which measurements are repeatable"(Nunnally 1967:172). Hair et al. (2006) recommend the evaluation of face and content validity and reliability using Cronbach alpha as part of the scale development process. These are discussed next.

6.5.4.1 Face and Content Validity

The assessment of face and content validity is not determined statistically, but rather as a semantic evaluation. This relates to the internal consistency of the language representing a construct and its conceptual relationship with its operationalisations (Remenyi 2007). Face validity relates to the extent to which a particular measure relating to a construct makes sense on its face (Riffe et al. 2005). Content validity, on the other hand, assesses whether a scale measures the constructs it is intended to measure (Mak and Sockel 2001). The assessment of face validity is dependent on the extent to which representative samples consider indicators as relevant to a construct on interest (Riffe et al. 2005). Content validity is based on the researcher`s judgment of the procedures followed in developing the scale (Mahour 2006). This relates to the scale development process and the extent to which items cover the content of the domain they represent (Nunnally 1978). Content validity can also be established through the use of relevant literature and existing scales (Mak and Sockel 2001).

6.5.4.2 Reliability

Reliability assesses the degree of consistency between multiple measurements of a variable. Internal consistency is the most widely used measure of reliability. Internal consistency relates to the homogeneity among a set of items for a scale (Yu 2005) and ensures that all items of the same scale measures the same underlying construct and are

highly intercorrelated (Nunnally 1978; Hair et al. 2006). Cronbach`s alpha is the most widely used measure for internal consistency. In addition, inter-item correlation and item-to-total correlation have also been recommended. This thesis used Cronbach`s alpha ≥.70; inter-item correlation >.30 and item-to-total correlation >.50 as indicating reliability of the scale (Cronk 2004; Hair et al. 2006).

6.6 PHASE TWO - MAIN STUDY

Having developed and purified the scale through semi-structured interviews, card sort exercise, pilot study and an EFA study, the objective at this stage was to validate the scale and to understand the relationship between scale items and its related constructs and the relationship between the domain`s constructs. CFA and Structural Equation Modelling (hereafter SEM) provides the means of achieving these objectives. CFA and SEM are analytical techniques for understanding the relationship between observed variables (indicators/items) and unobserved variables (latent variables/constructs) in a study (Brown 2006).

CFA was used to assess the fit of the proposed measurement model to the data and the reliability and validity of the proposed scale. SEM, on the other hand, deals with the relationship between constructs relating to a study domain (Kline 2005). SEM is, therefore, an analytical strategy for assessing the theoretical relationship between latent variables. The objectives at this stage of the research were:

- Test the reliability and validity of the proposed scale.
- Develop a theoretical understanding between items and constructs.
- Understand the relationship between SP and its related constructs.

6.7 SAMPLING AND DATA COLLECTION PROCEDURE

The overall sampling strategy adopted for this thesis is a non-probability sampling technique based on convenience sampling. This is based on the criteria that respondents are academics within HE Business and Management Schools and are involved in teaching, research and administrative duties (See Sections 1.4.2, and 6.3.1 for further information). Having made a decision on the sampling strategy, the next decision was about the method of selecting samples and the sample size required in order to make valid and reliable generalisation. A convenience sampling method was further adopted for this study and as a result, academics within HEIs in Finland, Ghana, India and the UK were selected for this study (See Section 2.2 for background to the HE sector in the aforementioned countries). The rationale for selecting each country is discussed in the section that follows.

The sample size for the main study was determined using Hair et al. `s (1998, 2006) recommendation of a sample size between 200-500 as sufficient for data analysis. This thesis used a sample size of 447. In choosing this sample size, consideration was given to time and cost constraints. Out of 650 questions distributed, 457 questionnaires were returned, representing a 70.3% response rate. Out of 457 responses received, ten questionnaires were unusable; resulting in a usable sample size of 447, representing 68.7% response rate (See Table 6.9 for response rate in the different countries). The usable sample was split into two equal groups using SPSS split sampling technique, with one group of data categorised as calibration data (n=224) and the other group as validation data (n=223)[41].

[41] See Section 6.9.4.2 for further information on calibration and validation data.

Table 6.9: Data Collection Response Rate

Country	Questionnaires Distributed		Response Rate		Valid [42]Response Rate	
	Number	Percent (%)	Number	Percent (%)	Number	Percent (%)
Finland	100	15.4	33	33.0	33	33.0
India	150	23.1	108	72	104	69.3
Ghana	100	15.4	68	68.0	68	68.0
UK	300	46.1	248	82.6	242	80.6
Total	**650**	**100**	**457**	**70.3**	**447**	**68.7**

6.7.1 Rationale and Questionnaire Administration in Finland

The revised questionnaire relating to this thesis was administered in the Finnish HE sector for the following reasons. Firstly, the unique characteristics of the Finnish HE sector in terms of its predominant state ownership and control as well as its over-reliance on state funding as discussed in Section 2.2.1 provides an interesting perspective for this study. Secondly, the Finnish HE sector was selected for convenience reasons. This is because the researcher has a network of other academics within the Finnish HE sector; therefore providing an opportunity for the researcher to use this network in collecting data from HE business and management academics within Finland.

Data was collected using the newly developed scales through a survey questionnaire. Prospective respondents were approached by the researcher`s contact in Finland at academic conferences and at different Finnish HEIs and if they consented to participate in the study, the

[42] Valid response rate takes account of unusable returned questionnaires.

questionnaire, participant information sheet, consent form and instructions on how to return the completed questionnaire and consent form (all in an envelope) were handed to the respondents to be completed and returned to the researcher`s contact[43]. Prior to handing out the questionnaire and supporting documents, prospective respondents were asked about their level of understanding of English language; if they had a good level of understanding of English language, a questionnaire is handed out to be completed and returned. Ethical procedures were followed in the data collection and no respondent was forced to participate in the research. See Table 6.9 for response rate for the data collection in Finland.

6.7.2 Rationale and Questionnaire Administration in Ghana

The revised questionnaire relating to this thesis was administered in the HE sector in Ghana for the following reasons. Firstly, the HE sector in Ghana provides an interesting perspective for this study in terms of its recent increasing private sector participation as well as government participation as discussed in Section 2.2.2. Secondly, the HE sector in Ghana was selected for convenience reasons. This is because the researcher has a network of other academics within the HE sector in Ghana, which provided an opportunity for the researcher to use these contacts in collecting data from HE business and management academics within Ghana.

Data was collected using the newly developed scales through a survey questionnaire. Prospective respondents were approached by the researcher`s contact in Ghana at different academic conferences and HEIs and if they consented to participate in the research, the research questionnaire, participant information sheet, consent form and instructions on how to return the completed questionnaire and consent form (all in an envelope) were handed to the respondents to be completed and returned to the researcher`s contact. Ethical procedures were followed in the data collection and no respondent was forced to participate in the research. See Table 6.9 for response rate for the data collection in Ghana.

[43] See Appendix 8a for final questionnaire and Appendix 8b for participant information sheet

6.7.3 Rationale and Questionnaire Administration in India

The revised questionnaire relating to this thesis was administered in the HE sector in India based on the following reasons. Firstly, India's HE sector provides an interesting perspective in terms of its size and massive private participation in the HE sector as well as the productivity challenges currently facing the HE sector in India discussed in Section 2.2.3. Secondly, India`s HE sector was selected for convenience reasons. This is because the researcher has a network of other academics within the HE sector in India, which provided an opportunity for the researcher to use these contacts in collecting data from HE business and management academics within India. .

Data was collected using the newly developed scales through a survey questionnaire. Prospective respondents were approached by the researcher`s contact in India at different HEIs and academic conferences and if they consented to participate in the study, the research questionnaire and supporting documents as well as instructions on how to return the completed questionnaire and consent form (all in an envelope) were handed to the respondents to be completed and returned to the researcher`s contact. Ethical procedures were followed in the data collection and no respondent was forced to participate in the research. See Table 6.9 for response rate for the data collection in India.

6.7.4 Rationale and Questionnaire Administration in the UK

The revised questionnaire relating to this thesis was administered in the HE sector in the UK for the following reasons. Firstly, the HE sector in the UK provides an interesting perspective in terms of its size, international competitiveness, and current changes and challenges facing the sector including changes in funding and tuition fees as discussed in Section 2.2.4. Secondly, the UK`s HE sector was selected for the researcher`s convenience. As the researcher is based in the UK and works within the UK HE sector, this provided an opportunity for the researcher to use his network of academics within business and management schools in the UK in collecting data at different academic conferences and HEIs

in the UK. In addition, the researcher was working as part of the team in the planning and hosting of the Academy of Marketing 2010 conference, which provided an opportunity for the researcher to gain access to business and management academics.

The newly developed scales were used to collect data through a survey questionnaire. Prospective respondents were approached by the researcher/colleagues at academic conferences and at different HEIs in the UK and if they consented to participate in the research, the researcher/colleagues handed out the questionnaire, participant information sheet and consent form (all in a self-addressed envelope) to be completed and returned to the researcher, with instructions on how to return the completed questionnaire and consent form. Ethical procedures were followed in the data collection and no respondent was forced to participate in the research. See Table 6.9 for response rate for the data collection in the UK.

6.8 MULTIVARIATE DATA ANALYSIS - STRUCTURAL EQUATION MODELLING (SEM)

The data analysis strategy adopted for the main study involved both a descriptive analysis and a multivariate data analysis using SEM. Data preparation is fundamental to multivariate analysis (Hair et al. 2006). Data preparation and descriptive analysis of the demographic characteristics of the respondents and the scale items were analysed using SPSS version 17 and AMOS 19. This provided an overview of respondents` demographic characteristics as well as insights on the normality of data, which relates to the identification of outliers, missing data and univariate and mulvariate patterns in data[44].

Multivariate data analysis on the other hand was employed because of its ability improve the explanatory power and statistical efficiency of a research (Hair et al. 2006). Multivariate data analysis techniques have been used extensively in both academic and practitioner based research. This can be attributed to the increasing and complex nature of

[44] The data preparation and descriptive analysis will be integrated into the SEM process using the six stages recommended by Hair et al. (2006). See Figure 6.5.

organisational problems in today's business environment. Multivariate data analysis primary objectives relate to the expansion of the explanatory power and statistical efficiency of a research (Hair et al. 2006). Hair et al. (1998; 2006) explains that, in order for an analysis to be considered as multivariate, all variables must be random and interrelated in such a manner that their different effects cannot be meaningfully interpreted separately. Various techniques have been employed in undertaking multivariate data analysis. These include Factor Analysis, Multiple Regression Analysis, Multivariate Analysis of Variance, Conjoint Analysis, Cluster Analysis, Multidimensional Scaling and Correspondence Analysis (Hair et al. 2006).

However, these analysis techniques share one core disadvantage, which is, their limitation of examining only a single relationship at a time (Hair et al. 2006). As a result of this limitation, researchers trying to answer a set of interrelated questions relating to SP and its related constructs are hindered from understanding such questions under one broad technique (Hair et al. 2006). As a result, SEM emerged as a multivariate analytical technique for resolving the above problem. SEM, therefore, is a multivariate analytical technique for analysing a set of interrelated questions simultaneously using one technique (Hair et al. 1998; 2006). As Garson (2011) explains, SEM is a powerful alternative to path analysis, multiple regression, factor analysis and covariance analysis and deals with measurement errors, correlated error terms, modelling of interactions, nonlinearities, independent correlation and analysis of multiple latent variables each measured by multiple indicators. In addition, SEM involves the assessment of both measurement and structural sub-models (Anderson and Gerbing 1988; Hurlimann et al. 2008).

The advantages of SEM are ability to deal with measurement error through the use of multiple indicators per construct; ability to test the overall model at once; ability to deal with multiple constructs each measured by multiple indicators; ability to model error terms; ability to handle large and difficult data (missing data); flexible approach (allowing interpretation even in the face of multicollinearity); a powerful graphical interface; and ability to compare alternative models in order to achieve the most parsimonious model (Garson 2011). Based on the advantages of SEM over other multivariate techniques, a SEM analysis was undertaken using the AMOS 19 analysis software. The following section highlights the fundamentals of SEM; the model development strategies; the stages for the measurement and

structural model development; and the assessment of the measurement and structural model fit using Anderson and Gerbing (1988) two-step approach.

6.8.1 Structural Equation Modelling Strategy

The decision to use SEM analysis requires a further decision on the modelling strategy. Three mains types of modelling strategies have been identified. These are confirmatory modelling, competing modelling and model development strategy (Joreskog and Sorbom 1993; Hoyle 1995; Hair et al. 2010).

A confirmatory modelling strategy relates to the specification of a single model, which is evaluated and based on the result of the model fit with data, the model is accepted or rejected (Hair et al. 2010; Hamid et al. 2011). Competing modelling strategy on the other hand, refers to the specification and evaluation of competing/alternative models to select the most parsimonious model (Hair et al. 2010; Hamid et al. 2011). Lastly, the model development strategy relates to the specification of an initial model, which is tested for its fitness. If it fails to fit the data, the model is re-specified and re-evaluated based on modification (Hoyle 1995). Theoretical and statistical justification should be the backbone of model re-specification and modification (Hair et al. 2006; 2010; Hamid et al. 2011).

In making a decision on the modelling strategy to adopt, consideration was given to the inadequacy of conceptualisation in the study domain and the ability of SEM in using both theory and empirical data in developing and identifying the most parsimonious model. This necessitated the adoption of a model development strategy for this thesis. This entails the specification of an initial model, with the objective of developing and improving the model`s fit through model re-specification and modification.

6.8.2 Approaches to Structural Equation Modelling Analysis

Having made a decision on the modelling strategy, the next decision relates to the approach for estimating the proposed measurement and structural models[45]. Various approaches have been recommended, including the one-step approach; the two-step approach; and the four step approach. The one-step approach involves the estimation of both measurement and structural models within a single context (Bentler 1978). The four step approach involves the following steps: EFA; CFA for the measurement model; CFA for the structural model and finally, testing the nested models to identify the most parsimonious model (Mulaik and Millsap 2000).

The two-step approach on the other hand involves separate estimation (if necessary re-specification) of the measurement model prior to simultaneous estimation the measurement and structural sub-models (Anderson and Gerbing 1988). This is consistent with Thompson`s comment that "It makes little sense to relate constructs within a SEM model if the factors specified as part of the model are not worthy of further attention" (Thompson 2004:110). In justifying the case for the two-step approach, Joreskog and Sorbom commented:

> *"The testing of the structural model, i.e. the testing of the initially specified theory, may be meaningless unless it is first established that the measurement model holds. If the chosen indicators for a construct do not measure that construct, the specified theory must be modified before it can be tested. Therefore, the measurement model should be tested before the structural relationships are tested" (Joreskog and Sorbom 1993: 113).*

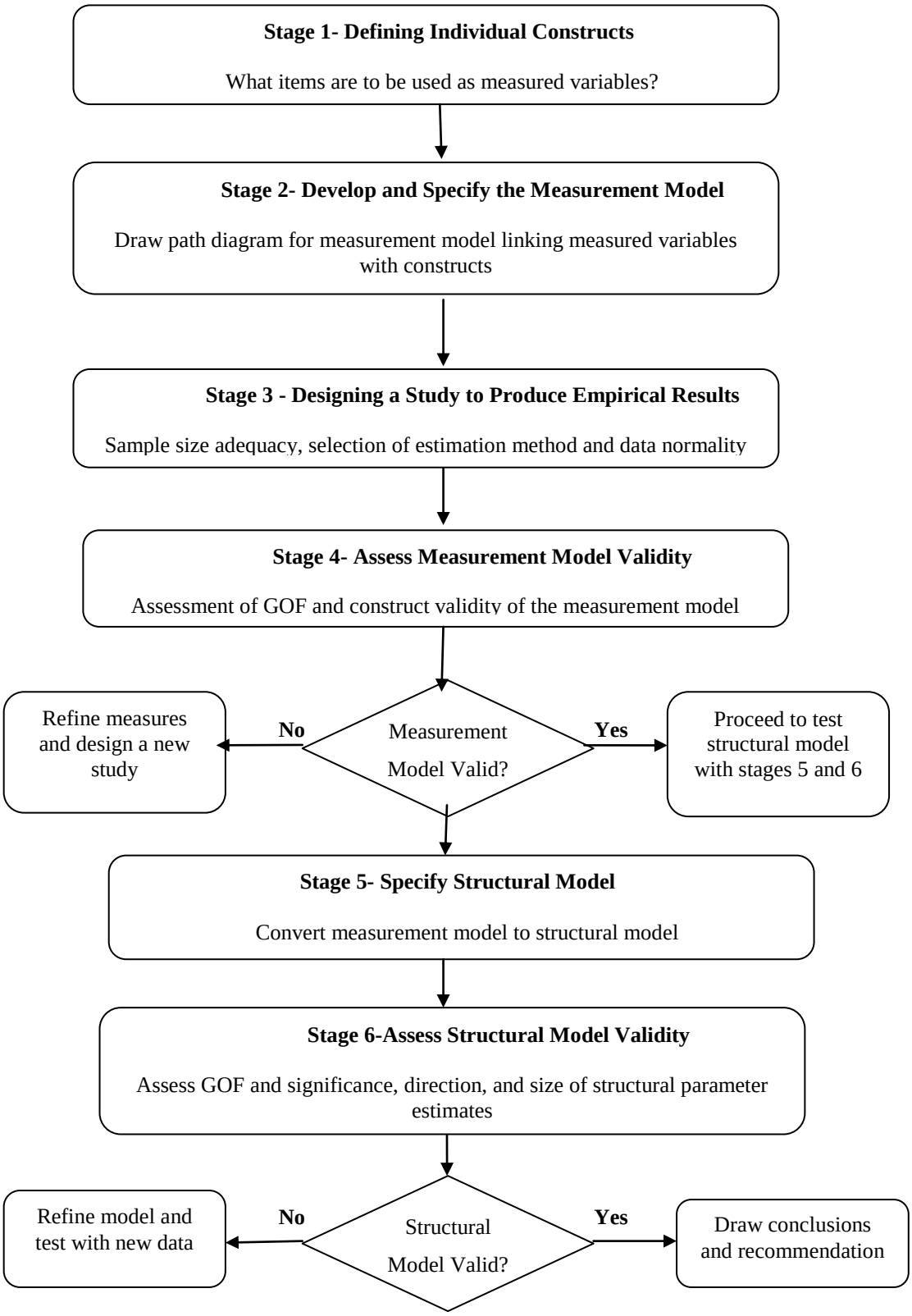
[4545] Measurement model refers to the relationship between a set of observed variables (multiple indicators of a construct) while structural model refers to the relationship between a set of theoretical constructs representing a theoretical model (Randall et al. 2004; Hurlimann et al. 2008)

The two-step approach is theoretically and empirically grounded, therefore, providing the basis of making meaningful inferences. It also can impact on chi-square value and has the ability to deal with epistemological fallibilism and interpretational confounding (Anderson and Gerbing 1988). In addition, several renowned methodological scholars have recommended its use (Anderson and Gerbing 1988; Joreskog and Sorbom 1993; Diamantopoulos and Siguaw 2000). Based on the advantages and popularity of the two-step approach, this thesis utilised the two-step approach in estimating the measurement and structural models.

6.9 STAGES IN STRUCTURAL EQUATION MODELLING

The use of SEM requires the researcher to make a number of important decisions in order to achieve the research aim and objectives. Having made a decision on the SEM modelling strategy (model development strategy) and the SEM analysis approach (two-step approach), the researcher required a roadmap on the stages in the development and analysis of the measurement and structural models relating to this thesis. This involves defining the domain constructs; developing and specifying the measurement model; designing a study to produce empirical data; assessment of measurement model fit/validity (if necessary modification); specification of the structural model; and assessment of structural model validity (fit). These are presented in Figure 6.5 and discussed next.

Figure 6.5: Stages in SEM



Adapt from Hair et al. (2006)

6.9.1 Stage 1- Defining the Domains Constructs

The construct definition stage was dealt with in the conceptualisation chapter. See Chapter Five for the definition and conceptualisation of the proposed constructs.

6.9.2 Stage 2- Developing and Specifying the Measurement Model

Developing and specifying the measurement model involves the assignment of items to their representative constructs. This stage entails the representation of the developed scale into an equation or a diagram. For simplicity, the measurement model was represented in a diagram. This involved the representation of the latent variables, observed variables and the error terms of each variable. The specification of the measurement model requires theoretical justification for relating items to their representative constructs and a decision on the number of items per construct to specify. The relationship between items and their representative constructs were depicted as reflective indicators as opposed to formative indicators (Hair et al. 2006).

The development and specification of the measurement model took into consideration identification issues (Bollen 1989; Hoyle 1995; Schumacker and Lomax 2004). Various types of model identification have been proposed. These are under-identified model, just-indentified model and over-identified model. An under-identified model is a model in which the free parameters to be estimated are more than the number of its item variance and covariance (Hoyle 1995; Hair et al. 2006; Brown 2006). The use of under-identified models is prohibited under SEM since no unique solution can be found (Hoyle 1995). A just-identified model on the other hand, is a model in which the number of parameters to be estimated equals the number of its items variance and covariance (Hancock 2006). While such models are permitted under SEM, their outcomes are uninteresting; only one estimate is possible; they do not test theories; and they fit the data perfectly (Hair et al. 2006).

Based on the limitations of under-identified and just-identified models, over-identified models have been recommended at the optimum choice for SEM estimation (Holye 1995; Brown 2006). Over-identified models are models in which the number of its items variance and covariance exceeds the number of free parameters to be estimated. Over-identified models are preferable in SEM because there are more known than unknown parameters (Hoyle 1995; Hair et al. 2006). In recommending the criteria for over-identified models, Hair et al. (2006) suggested the use of three or more items per construct as an optimum strategy for attaining an over-identified model. In developing and specifying the measurement model for this thesis, the measurement model was represented in a path diagram. The conceptualisation chapter and EFA study were fundamental components underpinning this undertaking.

6.9.3 Stage 3- Designing a Study to Produce Empirical Data

The use of certain SEM techniques requires strict conformance to certain assumptions. For example, the use of the maximum likelihood technique requires the assumption of data normality and is very sensitive to sample size and missing data. In addition, data related problems can cause SEM programme to crash during analysis and wrongly detect a good fitting model as faulty (Kline 2005). As a result, data preparation and examination were undertaking prior to SEM analysis for two reasons. Statistically, it yields reliable and valid results and ensures the use of the most appropriate estimation techniques (Kline 2005). Economically, it saves time and resources, ensuring that the researcher identifies problems with data prior to analysis in order to use the appropriate techniques and acquire resources in addressing the research problem (Kline 2005).

The researcher at this stage must, therefore, address issues relating to missing data, sample size and estimation technique and software choice. These issues are discussed and presented in Table 6.10

Table 6.10: Research Design and Model Estimation Issues

Issue	Description	Criteria/ Interpretation
Sample Size	Relates to the number of sampling units to be included in a study (Hair et al. 2006).	Models with five or less constructs, each with more than three items and with communalities ≥ 0.60 can be estimated adequately with a sample size between 100-150 (Hair et al. 2006).
Missing Data	Missing data can be attributed to the non-response to a question or a set of questions by a respondent or procedural error. The existence of missing data in a study can impact severely on sample size and could result in biased result (Hair et al. 2006).	If missing data is random; is accommodated explicitly in the technique; and less than 10% in the data, no action is required (Hair et al. 2006).
Multivariate Outliers	Relates to cases/observations in a data set with scores very different from the rest of cases/observations in the data set (Kline 2005; Hair et al. 2006). This occurs when responses to an observation are extremely high or low and stand out from others (Hair et al. 2006).	Mahalanobis distance based on D/D² statistics has been recommended as techniques in identifying and dealing with outliner's in data. Hair et al. (2006) recommend that outliers should be retained unless there is justification that they deviate and are not representative of the population.
Assessment of Normality	The use of SEM is founded on the assumption that data should be normally distributed (Hair et al. 2006). In SEM analysis, violations of normality assumption impacts adversely on the validity and reliability of the researcher`s model (Baumgartner and Homburg 1996; Kassim 2001).	The assessment of normality involves both univariate and multivariate normality. **Univariate Normality** Skewness, values < 3 indicates data normality (Hu et al. 1992; Chou and Bentler 1995; Kline 1998). Kurtosis, values <10 indicates data normality (Hoyle 1995; Kline 1998; Kassim 2001). **Multivariate Normality** Mardia statistic ≤3 (Mardia 1970, 1980; Sanders 2006) Standardised Residuals ≤ 2.58 is an indication of normality and vice versa (Joreskog and Sorbom 1989).
		Continue on Next Page

Table 6.10: Research Design and Model Estimation Issues

Issue	Description	Criteria/ Interpretation
Bootstrapping	Relates to the random re-sampling from original non-normal samples to support the analysis of Goodness-of-Fit for an empirical investigation (Byrne 2001). Bootstrapping method deals with situations whereby multivariate data normality problems exist (Bollen and Stine 1992).	It is recommended that Bollen-Stine bootstrap p-value ($p \geq 0.05$) is accepted and vice versa (Bollen and Stine 1992)
Multicollinearity	Defined as the "extent to which a variable can be explained by the other variables in the analysis" (Hair et al. 2006:103). The presence of multicollinearity can lead to model re-specification (Brummans 2006).	A cut-off correlation value <.90 between pairs of variables exogenous variables is recommended as demonstrating the absence of multicollinearity (Hair et al. 2006; Chu 2010).
Estimation Technique	Relates to the mathematical algorithm used in estimating the free parameters of the researcher's recursive model (Hair et al. 2006).	Maximum Likelihood (ML), relates to the maximisation of the likelihood of making continuous generalisation that data were drawn from the population. ML was choosing as opposed to other estimation techniques based on the following reasons: • Ability to produce valid results for smaller sample sizes. • Popularity and Efficient approach to missing dataEfficiency and unbiased estimation approach. • Robustness to violations of non-normality. • Ability to produce reliable results under various circumstances. • Ability to perform simultaneous estimates and produce full information. (Arbuckle 1996; Marsh and Jackson 1999; Schaefer and Graham 2002; Hair et al. 2006; Enders 2009).
SEM Software and Version	Statistical software for undertaking SEM analysis	AMOS (version 19) as opposed to LISREL; EQS and other SEM packages was used for this study because of its graphical interface, user friendliness, its integration to SPSS, its bootstrapping utility, ability to tolerate missing data and the researcher`s experience with the software.

6.9.4 Stage 4- Assessment of Measurement Model Validity (Fit)

The use of the two-step approach involves the evaluation of the measurement model prior to the simultaneous estimation of the measurement and structural sub-models (Anderson and Gerbing 1988). Based on this approach, the measurement model was evaluated first in order to assess the relationship between observed variables (items) and their representative latent variables (construct) and to the validity of measurement model. This was assessed using fit indices, model diagnostic and modification tools and validity and reliability measures.

Fit indices are statistical tests used to explain how well a researcher`s measurement and structural models explain the data. Such indices are used to evaluate the sum of variance or residual accounted for by the researcher`s model (Hu and Bentler 1998) and to estimate the extent to which a model is correctly or incorrectly specified (Fan et al. 1999). As Yuan (2005) explains, fitting the data to the researcher's conceptualised model is the most important step in SEM. Hair et al. (2006) recommend the use of multiple indices in assessing model fit. These include x^2 and associated df, absolute fit index, relative/incremental fit index and a parsimonious index, which include a Goodness- of- Fit index and a Badness of Fit Index (Hair et al. 2006). Hu and Bentler (1998;1999) recommend the reporting of RMSEA, TLI and CFI as demonstrating good reporting of model fit after their extensive research.

Table 6.11 gives a snapshot of the various fit indices and model diagnostic and modification tools reported by the researcher with their description, cut-off values and, their interpretation for assessing and modifying the measurement and structural models fit for this thesis. In addition, model re-specification and modification were undertaken as a result of the diagnoses of the proposed measurement model as problematic. Finally, the model was validated with a new data set. These steps are discussed next.

Table 6.11: Criteria, Description and Interpretation of Selected Goodness-of-Fit and Modification Indices

Index	**Description**	**Acceptable Value and Interpretation**
Fundamental Measures		
Chi-Square (X^2) (Hu and Bentler 1999	Measures the degree of discrepancy between the sample and fitted covariance matrices.	There is no criterion for evaluating model fit, degree of freedom closer to chi-square is acceptable (Thacker et al. 1989). Low $\chi 2$ relative to degrees of freedom with an insignificant *p-value* (p > 0.05) (Hooper et al. 2008)
Degree of freedom (df)	The numbers of knowns minus the number of free parameters.	
Relative Chi-Square - (*CMIN*/*DF*) Wheaton et al. (1977)	This is obtained by the chi-square fit index divided by degrees of freedom. Its estimate of differences between the obtained chi-square and the expected chi-square and overcomes the problems associated with the chi-square index (small sample size sensitivity; type 1 error).	CMIN/df ≤2 as adequate fit. (Byrne 1989 ; Tabachnick and Fidell 2007)
Absolute Fit Indices		
Goodness- of- Fit Index (GFI) (Joreskog and Sorbom 1993)	Estimates the proportion of observed variance and covariance accounted for by a proposed model.	GFI ≥ 0.90 acceptable fit (Byrne 1994; Jais 2007) GFI >.85[46] adequate fit (Schafter 2007 ; Diamantopoulos and Siguaw 2000; Kelloway 1998)
Root-Mean-Square Error of Approximation (RMSEA) (Steiger 1990)	Measures how well a proposed model fits its sample and population matrix per degree of freedom.	RMSEA values range between 0 (good fit) and 1 (bad fit). RMSEA < 0.07 acceptable (Steiger 2007). RMSEA values ≤ .05(good fit): < 05 and .08 (adequate fit); <.08 and.10 as a mediocre fit; > .10 Unacceptable (Browne and Cudeck 1993)
Standardized Root Mean Square Residual ((SRMR) (Joreskog and Sorbom 1993)	Measures the average size of residuals between the fitted and sample covariance matrices.	SRMR values range between 0 (good fit) and 1 (bad fit) SRMR < .05 suggest acceptable fit Diamantopoulos and Siguaw 2000). Hu and Bentler (1995) recommend a cut-off value close to .08.
Expected Cross Validation Index (ECVI) (Browne and Cudeck 1993)	Measures how well a proposed model fit well in both calibration and validation sample.	The ECVI value is compared against that of the independence and saturated models and the model with the smallest value is accepted (Kelloway 1998)

Continue on next page

[46] Due to small-medium sample size used

Table 6.11: Criteria, Description and Interpretation of Selected Goodness-of-Fit and Modification Indices

Index	**Description**	**Acceptable Value and Interpretation**
Relative /Incremental Fit Indices		
Comparative Fit Index (CFI) (Bentler 1990; Browne and Cudeck 1993)	Determining the relative improvement in fit between a target model and a baseline model.	CFI ≥ 0.90 good fit (Hair et al. 2006)
Tucker-Lewis Index (TLI) (Tucker and Lewis 1973)	Measures the proportionate improvement in model fit between baseline and target model per degree of freedom.	TLI values ≥.90 good fit (Bentler and Bonett 1980)
Normed Fit Index (NFI) (Bentler and Bonnett 1980)	Measures the degree of improvement fit from a baseline model to a target model.	NFI ≥ .95 (Hu and Bentler 1999; Schumacker and Lomax 2004).
Parsimonious Fit Indices		
Akaike's Information Criterion (AIC) Akaike, (Hirotugu 1974)	Is an information –theoretic measurement of the distance between a model and reality (data) (Stauffer 2008).	Lowest value of AIC is the best fitting model and most parsimonious model (Arbuckle and Wothke, 1999)
Model Diagnostic and Modification Tools		
Bollen-Stein index	Is a statistical re-sampling method for establishing data normality (Diaconis and Efron 1983; Bollen and Stine 1993; Raoprasert and Islam 2010)	Bollen-Stine bootstrap p-value ≥ 0.05 is acceptable and vice versa (Bollen and Stine 1992; Siedlecki et al. 2009).
Standardised Residuals	Used in examining model fit as well as in examining patterns of model ill-fit in a residual matrix (Joreskog 1993).	Standardised residuals ≥ ±2.58 represents bad fit and should be deleted (Bagozzi and Yi 1988; Jöreskog and Sörbom 1989).
Path Estimates and Squared Multiple Correlations	Refers to the standardised estimated loadings linking observed variables to their latent variables in a measurement model and can be used for examining a measurement model fit (Hair et al. 2006).	Completely standardised loadings ≥.70 represents a significant loading, while values below this threshold are candidate for deletion (Hair et al. 2006). Squared multiple correlations (R^2), $R^2 \geq 0.50$ represents a good fit for a measurement model (Hair et al. 1998).
Modification Indices (MI)	Used in revealing paths when added will have most impact in terms of improving the model fit (Diamantopoulos et al. 2000). MI is used in predicting the path(s) if added would decrease chi-square fit indices (Steiger 1990).	Model modifications require MI index ≥ 4.0. (Torkzadeh, et al. 2005). Theoretical and statistical justification should be the basis for model modification (Hoyle 1995; Diamantopoulos et al. 2000; Hair et al. 2006).

6.9.4.1 Model Re-specification and Modification

Having evaluated the measurement model using the fit indices in Table 6.11, which resulted in a poor fit, model modification/re-specification was undertaken. Model modification/re-specification is a strategy used for improving ill-fit models and identifying problems not revealed during the initial CFA analysis (Hair et al. 2006). As stated, "If a model is rejected by the data, the problem is to determine what is wrong with the model and how the model should be modified to fit the data" (Joreskog 1993:298). This involves the use of standardised loadings and Squared Multiple Correlation, standardised residuals and modification indices in diagnosing and justifying the need for model re-specification (Hair et al. 2006).

In addition, as part of diagnosing, modifying and re-specifying the ill-fit measurement model, correlating measurement errors have been identified as a strategy in improving model fit. The use of correlated measurement error has been recommended as a method of modelling systematic errors in measurement models (John and Reve 1982; Marsh, 1988; Cote and Greenberg 1990). See Appendix 9 for manuscript on correlating measurement errors. As stated "Correlated measurement errors may be specified between any two indicators in a measurement model, provided the model is identified" (Gerbing and Anderson 1984: 572). It has been recommended that the use of correlated measurement errors should be empirically and theoretically justified and does not alter the parameter estimates of both measurement and structural models (Fornell 1983; Bagozzi 1983).

The use of correlated measurement errors was restricted to "within construct and between-indicators" and was justified empirically and theoretically. Empirically, Modification Indices (MI) reveals paths when added will have most impact in terms of decreasing chi-square fit indices and improving the model fit (Steiger 1990; Diamantopoulos et al. 2000). MI values ≥ 4 was used as a criterion in modifying the model starting with the largest MI value. Theoretically, using reflective indicators with two or more items capturing the same construct within one study is likely to have a priming/halo/interaction effect on subsequent response to items relating to the same construct. This relates to "within-variable between construct correlated errors" (Reddy 1992). Stanton et al. (2002) attribute the existence of correlated errors within the same constructs to semantic similarities among items and items repeatedly tapping into the same underlying meaning.

In addition, an identified model and parameter estimates differences is recommended as a condition for evaluating the modified model fit. It is recommended that parameter estimates differences between measurement and structured model should not differ significantly (Fornell 1983; Bagozzi 1983). Hair et al. (2006: 855) recommend fluctuations ≤.05 in parameter estimates as indicating the absence of interpretational confounding and vice versa.

6.9.4.2 Model Validation

Accepting a re-specified and modified measurement model with the same data set can be problematic and will render the model unstable. Cross validation or replication study, therefore, provides a strategy for dealing with this problem (Hair et al. 2006; Mastorakis 2009). This involves using a different dataset from the same sample in validating the modified model. Taking into consideration time, cost and resource limitations associated with collecting a new data set, Schumacher and Lomax (2004) recommend randomly splitting the collected data into two groups (based on a sufficient sample size) and undertaking model modification with one set of data and validating the modified model with the other set of data and subsequently comparing the result of the model fit with the two sets of data. Cudeck and Browne (1983) referred to the first dataset as calibration data and the second dataset as validation data[47].

6.9.4.3 Construct Validity and Reliability

Unreliable and invalid assessment of the measurement model can cast doubt on the credibility of research findings and impact on the validity of the structural model (Sitzia 1999). As a result, the importance of establishing reliability and validity has been emphasised. Table 6.12 highlights the criteria for evaluating the validity and reliability of the structural model.

[47] See Section 6.7 for further clarification.

Table 6.12 Criteria for Evaluating Construct Validity and Reliability

Validity and Reliability Measure	Description	Criteria/ Interpretation
Construct Validity	Defined as "the degree to which a test measure some hypothetical construct (Frick et al. 2009: 37) The degree of correspondence between a construct and its operationalisation (Dröge 1997)	This involves the assessment of convergent validity and discriminant validity (Tabachnick and Fidell 2007).
Convergent Validity	Measures the extent to which a set of measures of the same concept are correlated and the extent to which a scale is measuring the proposed construct (Solberg 2006). It answers the question as to whether the same result is obtained when the same construct is measured with two different methods (Craig and Douglas 2005).	A value ≥ 0.70 for all the items loading unto a construct (factor loadings) and an SMC ≥.50 in a model demonstrate a strong convergent validity (Hair et al. 1998; 2006). Average Variance Extracted (AVE) for each construct > 0.50 and factor loading ≥ .70 are good indicators of convergent validity (Gefen and Straub 2005).
Discriminant Validity	Determines whether a specific construct differ from other constructs (Craig and Douglas 2005; Neuenburg 2010). The extent to which a construct and its respective items are different from other constructs (Bagozzi and Phillips 1991)	Correlation between constructs ≤ 0.85 is an indication of discriminant validity (Kline 1998). The absence of cross-loading as an indicator of discriminant validity (Hair et al. 2006) Larger AVE values as compared to the respective squared inter-construct correlation (SIC) estimates as an indicator of discriminant validity (Fornell and Larcker 1981; Rai et al. 2006; Neuenburg 2010).
Construct Reliability	Measures how well a construct is explained through its indicators (Weigl 2008; 205). It is also a method of calculating the internal consistency among a measure (Fornell and Larcker 1981).	Cronbach alpha ≥.70 demonstrates construct reliability (internal consistency)(Nunnally 1978). Composite reliability > .70 demonstrates construct reliability (Bollen 1989; Krafft et al. 2005). Cronbach alpha >.70; Composite Reliability >.70 and AVE > .50. (Neuenburg 2010)

6.9.5 Stage 5- Structural Model Specification

Having evaluated and validated the measurement model, the next stage is the specification of the structural model. Structural modelling involves assigning relationships between constructs based on the theoretical model and hypotheses specified by the researcher a prior (Hair et al. 2006). It is recommended that the specification of relationships between constructs should be theoretically justified (Aaker and Bagozzi 1979). This thesis` structural model was presented as a path diagram, depicting the theoretical relationships hypothesised by the researcher a *prior*. This was developed by changing some arrows in the measurement model from a two-headed to one-headed arrows[48]. In addition, this involves the specification of the relationship between exogenous latent variables and endogenous latent variables; endogenous variable disturbance (error); and the specification of free and fixed parameters within the structural model (Hair et al. 2006). The theoretical justification for the assignment of relationships between constructs was discussed in Chapter Five (conceptual chapter).

Further, the evaluation of single specified fitting structural model does not guarantee that the model is the best model representing a phenomenon but rather, is among the several possible explanations of the phenomenon. As a result, the researcher must specify other alternative models (nested models) as representing the phenomenon in order to ensure that the best fitting model is chosen among other alternative models (McDonald and Ho 2002; Schumacker and Lomax 2004; Ketchen and Bergh 2006). Also Joreskog and Sorbom (1993) recommended the evaluation of chi-square difference among alternative models as a method for evaluating best fitting model.

[48] Arrows connecting latent variables

6.9.6 Stage 6- Assessment of the Structural Sub-Model Validity (Fit)

The confirmation of the validity and reliability of the measurement model gave a green light to proceed with the assessment of the structural model validity (Bagozzi and Yi 1988; Kline 2005; Hair et al. 2006). It is recommended that the assessment of the structural model validity should use the same fit indices used for the assessment of the measurement model. The same criteria were used in evaluating the researcher`s proposed alternative models to identify the best fitting model (Hair et al. 2006). In addition, it is recommended that the stability of the measurement and structural model parameter estimates should be established in order to avoid interpretational confounding (Hair et al. 2006). Hair et al. (2006: 854-855) recommend fluctuations ≤.05 in parameter estimates as acceptable.

Further, the explanatory power of the model should be evaluated as part of evaluating the validity of the model (Ringle 2004; Krafft et al. 2005). This is achieved by the assessment of the amount of variance in endogenous variables, which is explained by the exogenous variables (Neuenburg 2010; Mueller 2011). This is determined by the value R^2 for the model`s endogenous variables. R^2 values ranges from 0 to 1, with 0 indicating that the exogenous variables in the model are unable to explain the variance in the endogenous variables and 1 indicating that the exogenous variables in the model explain the variance in the endogenous variables (Neuenburg 2010). To Backhaus et al. (2006), the evaluation of R^2 is part of the assessment of the model`s Goodness-of-Fit. Chin (1998: 323) recommended that R^2 should be interpreted as follows: $R^2 \geq .67$ as substantial; $R^2 \geq .33$ as moderate and; $R^2 \leq .19$ as weak explanatory power.

Furthermore, In addition to evaluating model fit, it is necessary that the researcher`s proposed structural theory is tested. This involves examination of the parameter estimates in terms of statistical significance, size and direction. Parameter estimates greater than zero are interpreted as having a positive relationship and vice versa (Hair et al. 2006). Chin (1998) recommends a minimum threshold value of .20 path coefficient as expressing a meaningful influence of the exogenous variables` impact on the endogenous variables. Finally, it has been suggested that standardised path coefficients should be interpreted as follows: standardised path coefficient < .10 (small effect); <.30(medium effect); ≥ .50 (large effect) (Cohen 1988; Kline 2005:121-122).

6.10 RESEARCH ERRORS AND ETHICAL ISSUES

This section discusses how the researcher evaluated and dealt with the errors associated with this thesis. It also discusses the ethical issues associated with this thesis and how the researcher dealt with them.

Errors in measurement are omnipresent in behavioural and social sciences and comprises of random and systematic errors (Reddy 1992; Waltz et al. 2005). Such errors can impact negatively on the reliability and validity of a study (Hair et al. 2006). As Duncan (1975:113) explains, all observations are fallible, no matter how refined the measurement instrument and how careful the procedure of applying such instrument. Research errors include measurement error (random error and systematic error), researcher`s error and respondent`s error (Steenkamp and Baumgartner 2000).

Measurement errors are ubiquitous in every social science and behavioural research (Cote and Greenberg 1990). In particular self-reported and performance measures are known to be prone to measurement errors (Jacobs and Kozlowski 1985; Michels et al. 2004). Measurement error relates to systematic and random error. Random error is attributed to environmental effect while systematic error is attributed to method effect (Steenkamp and Baumgartner 2000). SEM analysis has been recommended as a strategy for dealing with measurement error, particularly random error (Garson 2011). In addition, the use of correlated measurement error has been recommended as a strategy for modelling systematic errors [49](John and Reve 1982; Marsh 1988; Cote and Greenberg 1990).

Errors in research can also be attributed to researchers` error in the research design and the data collection and analysis process. Such errors are the result of the researcher's bias and wrong choice of theory, samples and analysis methods. Several strategies were used to prevent potential errors. These include in-depth analysis of extant literature from a multidisciplinary perspective; semi-structured interviews; discussion of conceptual model, scale development process and data collection and analysis strategies with colleagues and at

[49] See Section 6.9.4.1 and Appendix 9 for further information on correlating measurement errors.

various conferences; and the use of a triangulation strategy to overcome the limitation of the methods used.

In addition, errors in research can be attributed to the respondent`s error in a study. Respondents` may err as a result of responding to an item in a questionnaire differently from what the item was originally developed to assess (Paulhus 1991). Further, respondents` may err due to uncertainty about a question or response style used, which can affect the validity of the result and conclusion drawn (Baumgartner and Steenkamp 2001). Other errors include respondent misreading and misinterpreting a researcher`s question and instruction.

Several strategies were used to avoid respondent error. These include undertaking a trial sort exercise with respondent prior to card sort exercise in order for respondents to understand the card sort exercise procedure. It also included making questions clearer, well explained and interactive during the semi-structured interview. In addition, the questionnaire was designed using short, simple, clear, unambiguous questions and avoided double barrelled and leading questions (Kassim 2001). In addition, some items/questions were reverse ordered in order to minimise response bias (Spector 1992).

Finally, the conduct of any research which involves the researcher dealing with humans as well as sensitive and confidential issues/information requires ethical consideration in its data collection, storage and publication process. The failure to evaluate the ethical implications of research can have detrimental effect on the researcher, the researcher`s affiliate, organisation and profession as well as on the research participants' and society**.** The following were considered to ensure that ethical procedures were followed throughout this thesis research.

Firstly, the researcher evaluated the ethical challenges that this thesis was likely to encounter and took the necessary precautionary steps to avoid them. Secondly, the research had undergone ethical clearance with Coventry University before the data collection process was undertaken[50]. Lastly, participants for the research were treated with respect and their information was treated with strict confidence.

[50] See Appendix 10 for ethical approval from Coventry University

6.11 CONCLUSION

As a continuation from the conceptual chapter, several targets were highlighted for this chapter. This chapter discussed and justified the philosophical paradigm position for this thesis. It then discussed and justified the various methods the author utilised in gathering and analysing the relevant information to tackle the research aim and objectives. It covered the data collection and analysis strategies for the scale development, purification and validation as well as the norm development process. In addition, strategies for dealing with anticipated problems and errors, and the ethical considerations relating to this thesis were also covered.

The research utilised secondary research, semi-structured interviews, card sort exercise and a survey (pilot study, EFA study and main study) in collecting data. In addition, thematic and content analysis, content validity ratios, EFA, CFA and SEM analytical methods were used in analysing the data collected. Consideration was given to ethics, practicality, advantages, disadvantages, and limitations of the various data collection and analysis strategies used.

The next chapter reports the findings for the scale development and purification studies, which relates to the different studies employed in developing and purifying the scale. It reports the findings of the semi-structured interviews, card sort exercise, pilot study and EFA study and further assesses the reliability and validity of the scale items.

CHAPTER SEVEN: SCALE DEVELOPMENT AND PURIFICATION STUDY RESULTS

7.1 INTRODUCTION

Having conceptualised and proposed the theories and theoretical model underpinning this thesis as well as the process of achieving the research objectives, the researcher`s aim at this stage was to operationalise the conceptual model in order to be tested empirically. This required the development of a scale for capturing the researcher`s proposed constructs. Scales have been identified as an instrument in measuring theoretical abstractions (constructs) and such theoretical abstractions are measured using reflective indicators.

This chapter reports the results of the scale development and purification phase of this thesis. The scale development process consisted of five stages; firstly, a combination of deductive and inductive approach was used to define SP and its related constructs and generate a pool of items from extant literature and scales on the domain of study. Secondly, semi-structured interviews with academics were undertaken to generate a pool of items relating to the researcher`s proposed constructs.

Thirdly, a card sort exercise was undertaken to refine the scale. Fourthly, a pilot study using a structured questionnaire was undertaken to critique the questionnaire and lastly, an EFA study using a structured questionnaire was undertaken to purify the developed scale using EFA prior to main study (CFA and SEM). See Figure 6.3 and Table 6.4 for an overview of the data collection and analysis strategy.

7.2 GENERATION OF SAMPLE OF ITEMS

Having defined the domain`s constructs in Chapter Five (See Table 7.1 for a summary on the definitions of the proposed constructs), the next stage was to generate a sample of items representing the domain`s constructs. The essence of item generation was to identify a set of items tapping into each construct of interest. Samples of items representing a domain of study can be identified from literature search, focus groups, experience survey, and critical incidents (Churchill 1979). To identifying the pool of items relating to the study domain, both deductive and inductive approaches to scale development were used. Extant literature and scales were reviewed to identify existing items and scales. An extensive literature search was undertaken to identify scales items relating to the domain constructs. In addition, existing scale items were reviewed in relation to their relevance to the domain`s constructs and applicability to the current study and where a scale was non-existent, new scales were developed. Appendix 11 presents original scale item wording, their representative constructs and Cronbach`s Alpha.

The analysis of existing scales revealed inadequacy of existing scales in measuring the researcher`s proposed constructs directly as most of the domain constructs were new to the service marketing and SP domain. Therefore, new scales had to be developed[51]. Analysis of extant literature and existing scales identified 94 items in developing the new scales[52]. These items were later refined to 19 items. In addition, due to the inadequacy of conceptualisation in the domain of study and non-existence of existing scales for the proposed constructs, a semi-structured interview was also undertaken to identify items for the scale development. The semi-structured interview process and outcome are discussed next.

[51] Although a scale existed for measuring RC, the scale did not fit the context of the current study.
[52] Out of this, 4 items were derived from existing scales measuring key areas in the context of this thesis` definition of its proposed constructs.

Table 7.1- Definitions of Research Constructs[53]

Construct	**Definition**	**Source**
Service Productivity	• A function both of internal efficiency and cost effective use of production resources and of external efficiency and customer perceived quality. • The ability of a service organisation to use its inputs for providing services with quality matching the expectations of customers. • Achievement of organisational goals. • *The relationship between the outcome of the service transformation process and the input to the service transformation process.*	• Grönroos and Ojasalo (2004) • Järvinen et al. (1996) • Armistead et al. (1988) • Author
Employee Readiness	• The extent to which a follower has the ability and willingness to accomplish a specific task. • Employee`s capacity for independence of action at work. • *Employees` state of preparedness to perform their service related task successfully with other entities during service co-production.*	• Hersey and Blanchard (1988:174) • Goodson et al. (1989) • Author
Customer Readiness	• No existing definition. • *Customers` state of preparedness to perform their service related task successfully with other entities during service co-production.*	• N/A • Author
Resource Commitment	• The allocation of valuable resources to an activity that will produce the most good. • The allocation of tangible and intangible resources at the firm`s disposal to facilitate an efficient and effective marketing offering. • *The allocation of tangible and intangible resources at the firm`s disposal to enhance productivity***.**	• Richey et al. (2005) • Hunt (2000) • Author
Stakeholder Satisfaction	• *The extent to which organisational stakeholders` expectations are fulfilled.*	• Berrone et al. (2007)

[53] Definitions used by author for the present study are italicised.

7.3 SEMI-STRUCTURED INTERVIEW RESULTS

After the generation of a sample of items from extant literature and scales, semi-structured interviews were undertaken because of the inadequacy of existing scales in capturing the domain's constructs. The interviews were undertaken independently with six interviewees in order to identify items relating to the domain`s constructs. This was to ensure content and face validity.

The data collected from the semi-structured interviews were analysed using TCA. The discussion that follows presents the result of the analysis of the semi-structured interviews in relation to its contribution in identifying items for the scale development. In addition, Table 7.2 highlights the items identified from the literature review and semi-structured interviews[54].

In relation to SP, interviewees identified meeting targets and expectations, outputs, outcomes, promptness in delivering service, activity levels within organisation, balancing efficiency and effectiveness and balancing quantity and quality as key indicators in measuring SP. Two interviewees commented:

> *"Productivity approaches are always biased ..., in order for productivity to be measured appropriately, efficiency and effectiveness of inputs, outputs and outcomes are important."*

> *"Productivity is about balancing efficiency and effectiveness of organisational outputs."*

On ER, interviewees highlighted the importance of employee willingness and preparedness of co-creating services with others due to the inseparability nature of services.

[54] Overall, 31 items were identified from the semi-structured interviews, while 19 items were derived from the review of extant literature and scales. These items were reviewed together and after further refinement, 40 items were generated.

In addition, interviewees highlighted the importance of employee professionalism, knowledge, competence, accurate performance, loyalty, motivation, and level of ICT skills as key indicators for measuring ER. Two interviewees commented:

> *"Obviously employees are the glue to organisational processes, without them both process and customers can`t function properly."*

> *"If employees are not well trained and competent in delivering the service, customers will notice this and can have negative impact on the organisation performance."*

On CR, interviewees identified customer willingness and preparation to co-create services with others. Items identified as relating to CR include customer knowledge, experience, preparation, cooperation, motivation and ICT skills to perform their role in services. One interviewee commented:

> "*Students for instance are customers in higher education, and if they fail to prepare for classes and seminars, it will affect the performance of other students and the tutor."*

In relation to RC, interviewers identified human resources, financial, technological and managerial commitment as key indicators for measuring RC. Two interviewees commented:

> *"At the moment, I need software to facilitate teaching and learning but my employers are not willing to provide this. This is a big blow on my motivation and student experience.* "

> *"Relevant and adequacy of resources are vital for every organisation. Its impact on employee motivation and performance as well as customer perception."*

Lastly, on SS, all the interviewees highlighted the satisfaction of all organisational stakeholders as a key indicator of SS. Items identified as relating to SS are: customer satisfaction; organisational contribution to society; organisational reputation and profitability; report from employers regarding students/graduates performance; shareholder satisfaction; and compliance with government regulations. Two interviewees commented:

> *"Productivity is not just about satisfying shareholders and attaining top management expectations, it goes beyond that ..., it requires the ability to satisfy all parties involved in the delivery of services."*

> *"Whatever the organisation does, it`s vital that its stakeholders are happy, then the firm can claim that they are productive."*

Table 7.2 : Items Identified from literature Review and Semi-Structured Interview

Construct	Items	Source	Author
Service Productivity	• Balancing efficiency and effectiveness	• Interview/Literature Review	• Grönroos and Ojasalo (2004)
	• Outputs	• Interview/ Literature Review	• Vuorinen et al. (1998)
	• Outcome	• Interview/ Literature Review	• Zemguliene 2009
	• Meeting performance targets and expectations	• Interview	• N/A
	• Promptness	• Interview	• N/A
	• Activity levels	• Interview/ Literature Review*	• Yamin et al. (1997)
	• Quality	• Interview/ Literature Review	• Vuorinen et al. (1998)
	• Quantity	• Interview/ Literature Review	• Vuorinen et al .(1998)
Resource Commitment	• Adequacy of financial resources	• Interview /literature review*	• Das and Teng (2000)
	• Management involvement and motivation to productivity issues and initiatives	• Interview	• N/A
	• Resource availability and provision	• Interview /literature review	• Das and Teng (2000)
	• Top managerial support	• Interview /literature review*	• Das and Teng (2000)
	• Availability of technologies resources	• Interview /literature review*	• Das and Teng (2000)
	• Human resource capability	• Interview /literature review	• Grant (1991); Barney (1991)
	• Corporate culture and climate	• Literature review	• Morgan and Hunt (1999)
	• Routine process	• Interview /literature review	• Morgan and Hunt (1999)
Employee Readiness	• Professionalism	• Interview	• N/A
	• Knowledgeable about our products and services	• Interview	• N/A
	• Motivation	• Interview/ Literature Review	• Huselid (1995); Grant (2008)
	• Level of training and competency	• Interview/ Literature Review	• Huselid (1995); Holzer (2008)
	• Accuracy of performance	• Interview	• N/A
	• Knowledge about job and responsibility	• Literature Review	• Haueter et al. (2003)
	• Understanding of duties	• Literature Review	• Haueter et al. (2003)
	• Group work contribution to organisational goal	• Literature Review	• Haueter et al. (2003)
	• Technological readiness	• Interview/Literature Review	• Parasuraman and Grewal (2000)

Note: Literature source items marked * were derived from existing scales relevant to the criteria defining the proposed constructs. See Appendix 11 for the original scale item wording, their representative constructs and Cronbach alpha.

Continue on the next page

Table 7.2 Cont.: Items Identified from literature Review and Semi-Structured Interview

Construct	Items	Source	Author
Customer Readiness	• Knowledgeable about expected role	• Interview/literature review	• Zeithaml et al. (2009); Schmitz and Reifferscheid (2011)
	• Motivation	• Interview/literature review	• Lengnick-Hall (1996); Halepota (2005); Meuter et al. (2005); Naar-King et al. (2010), Groth (2005)
	• Preparation	• Interview and literature review	• Auh et al. (2007); Schmitz and Reifferscheid (2011)
	• Prior experience	• Literature review	• Alba and Hutchinson (1987); Lengnick-Hall (1996)
	• Customer recruitment/selection	• Literature review	• Schneider and Bowen (1995); Zeithaml and Bitner (1996)
	• Cooperation	• Interview /literature review	• Auh et al. (2007); Schmitz and Reifferscheid (2011)
Stakeholder Satisfaction	• Complaints or recommendations from third parties	• Interview/ literature review	• Cameron (1978)
	• Reputation	• Interview/literature review	• Walsh and Wiedmann (2004) Fombrun et al. (2000)
	• Contribution to society	• Interview/literature review	• Friedlander and Pickle (1968)
	• Complying with legislation and regulation	• Interview/literature review	• Doyle (1994)
	• Customer satisfaction	• Interview/literature review	• Cameron (1978)
	• Employee satisfaction	• Interview/literature review	• Cameron (1978)
	• Stakeholders happiness with organisation	• Interview/literature review	• Singhapakdi et al. (1995)
	• Improved financial performance	• Interview/literature review	• Heskett et al. (1994;1997)
	• Shareholder satisfaction	• Interview	• N/A

7.4 CARD SORT EXERCISE RESULTS

Items emerging from extant literature, existing scales and semi-structured interviews were reviewed and edited to ensure that they are related to the domain of study and were as precise as possible (Churchill 1979). Following the identification of a sample of 40 items as representing the domain`s constructs, a card sort exercise was undertaken independently with five (5) participants with the objective of refining the scale items. Hinkin (1995) suggested the use a of card sort exercise for deleting irrelevant items after using inductive and deductive approaches to item generation.

Results from the card sort exercise were transferred to Excel Spreadsheet Template designed by Lamantia (2003) for analysing card sort data. Analysis was based on percentage of participants' agreement using CVR analysis. Percentage of participants' agreement on an item belonging to a construct was based on rater's agreement $\geq$ 99.9% (Lawshe 1975). Lawshe (1975) identified 99.9% as the minimum value for ensuring that participant agreement is unlikely to be due to chance when using five participants (n=5)[55]. The outcome of the card sort exercise resulted in the reduction of the scale items from 40 to 27 items. In addition, items relating to the study domain were linked to their related constructs (See Table 7.3 for final items generated with the labelled codes).

[55] See Appendix 6b for analysis of participant agreement and CVR results.

Table 7.3: Final New Items for Questionnaire Design

Construct	Item Code	Item	Source
Service Productivity (SP)	SP1	Activity levels in our institution have increased.	Yamin et al. (1997)
	SP2	Balancing the efficiency and effectiveness of our institution`s outputs is a top priority.	New item
	SP3	Our institution delivers its services promptly.	New item
	SP4	Our institution meets its performance targets and expectations.	New item
Resource Commitment (RC)	RC1	Our institution`s managers are highly involved when it comes to productivity issues.	New
	RC2	Our institution is committed in providing the necessary technological resources required to improve productivity	Das and Teng (2000)
	RC3	Our institution has adequate resources.	New
	RC4	Our institution is committed in providing the necessary managerial support.	Das and Teng (2000)
	RC5	Financial resources made available to our institution are inadequate.	Das and Teng (2000)
	RC6	Whenever resources are required to perform a service, our institution provides it.	New
Employee Readiness (ER)	ER1	Most employees in our institution are knowledgeable about our products and services.	New
	ER2	Employees in our institution are well trained and competent to perform their work accurately.	New
	ER3	Employees in our institution know their job and responsibilities for which they are hired.	New
	ER4	In the course of performing jobs in our institution, employees understand how to complete necessary forms/ paperwork (e.g., time sheets, expense reports, order forms, computer access forms).	New
	ER5	Employees in our institution understand how the different work groups contribute to the organisation`s goals.	New
	ER6	Our institution`s employees are professional when performing their duties.	New
Customer Readiness (CR)	CR1	Most students in our institution are highly motivated to perform their role during lectures and seminars.	New
	CR2	Students in our institution, works cooperatively with their tutors.	New
	CR3	In general, students in our institution prepare for classes before attending lectures and seminars.	New
	CR4	Most students in our institution are knowledgeable about their expected role during classes and seminar.	New

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Table 7.3: Final New Items for Questionnaire Design

Construct	**Item Code**	**Item**	**Source**
Stakeholder Satisfaction (SS)	SS1	Complaint from employers regarding our graduates/students performance at work is high.	New
	SS2	Our institution contributes to society.	New
	SS3	Our institution complies with government regulations.	New
	SS4	If our institution`s stakeholders are unhappy, nothing else matters.	New
	SS5	Most employees in our institution would leave to take a similar job at another institution if given a choice.	New
	SS6	There seems to be a feeling that dissatisfaction is high among students in our institution.	New
	SS7	Our institution`s reputation has improved.	New

7.5 PILOT STUDY RESULTS

Analysis of the demographic characteristics of the pilot study respondents revealed that about 45% and 55% of all respondents were male and female respectively. In addition, 45% and 50% of all respondents were between the ages of 18-40 years and 41-60 years respectively. Finally, about 52.55 and 47.5% of all respondents had been employed in the HE sector for up to 9 years and over 10 years respectively

Analysis of the pilot study results revealed certain deficiencies in the questionnaire instructions, response scale and revision of items (statements). On the scale items[56], respondents identified item (ER4) as relevant but highlighted certain aspect of the item as irrelevant for academics and suggested they be removed. This related to examples cited as part of the statement. In addition, item (SS2) was identified as relevant but not clear in terms of the direction of the institution`s contribution to society. Subsequently item (ER4) was revised by deleting the section of the statement relating to (e.g. time sheets, expense reports, order forms, computer access forms). In addition, item (SS2) was revised by making the statement clearer.

Instructions were revised based on respondents comments. In addition, most respondents commented on the no labelled for points 2 and 4 of the Likert scale used. Most respondents expressed uncertainty of what these empty spaces meant. As a result, the response scale was revised into a 5-point Likert scale, which was anchored from (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; and (5) strongly agree.

All respondents agreed that the layout was clear and attractive and did not object to answering any question on the questionnaire. Moreover, 97.5% of respondents indicated that the instructions were clear. In terms of time taken to complete the questionnaire, analysis of the results indicated that about 80% of respondents completed the questionnaire within 11-20 minutes. This assisted in specifying on the information sheet how long it would take

[56] Based on items presented in Table 7.3

respondents to complete the questionnaire. Based on the findings, the final questionnaire was revised and redesigned. See Appendix 8a for the final questionnaire.

Finally, the revised questionnaire was evaluated by two colleagues, who were academics; had expertise in questionnaire design; and were representative of the final study samples. This was to ensure that errors were avoided, and the questionnaire was feasible for the main study. Respondents' feedback was taken into consideration and further amendments were made to the questionnaire for the next study.

7.6 EXPLORATORY FACTOR ANALYSIS STUDY

Churchill`s (1979) procedure for scale development in marketing emphasised the importance of scale purification using EFA prior to the final administrative of the final scale. As Li et al. (2002) explain, the essence of scale purification is to identify items that reliably measure a single underlying construct. This section presents a descriptive analysis of the scale items and the demographic characteristics of the respondents for the study as well as the EFA results for the study.

The objectives of the EFA study were to:

- Identify the underlying constructs capturing a set of items.
- Assess the unidimensionality of the underlying constructs.
- Assess the reliability of the measure.

7.6.1 Demographic and Scale Item Descriptive Analysis

This section provides insights into trends and patterns among the demographics variables. In addition, it provides insights on the deviations in scale items, which relates to the identification of outliers and missing data.

Demographics are vital variables in the evaluation of every research as they provide descriptive information about population under study. Demographic analysis has the capability of adding meaning to the ways different people occupy social space and involves assembling pieces of demographic information into a joint demographic profile of the population under study (Funnell et al. 2004). Table 7.4 presents an overview of respondents` gender, age, years of employment, affiliated departments, and respondents' teaching, research and administrative duties**.**

In addition, the descriptive analysis results of the scale items are presented in Table 7.5. The measurement scale initially consisted of 27 items. This was later reduced to 24 items after factor analysis. The final scale items consisted of ER (6 items); CR (4 items); RC (4 items); SP (4 items); and SS (6 items). The study participants were asked to respond to each item on the questionnaire using a five-point Likert scale, which was labelled from (1) strongly disagree; (2) disagree; (3) neutral; (4) agree; and (5) strongly agree.

Analysis of the mean scores of the initial 27 scale items as presented in Table 7.5, indicates that the overall majority of respondents agreed on most of the items relating to SS, particularly item SS4 , which states, #`If my institution`s stakeholders are unhappy, nothing else matters" (M= 4.15;SD=.839), while, item RC4 was the lowest scoring item among the 27 items (M= 3.16;SD=1.066) In addition, the majority of respondents agreed on all the items and items relating to SP, RC and CR were spread across strongly agree to strongly disagree with the majority agreeing on items[57].

[57] See Appendix 12 for descriptive Statistics on Response to Scale Items for EFA

Table 7.4: Respondent Demographic Characteristics

Demographic	**Category**	**Percentage % (based on *N*=143)**
Gender	Male	55.2
	Female	44.8
Age	18 to 25	1.4
	26-30	10.5
	31-35	14.7
	36-40	21.7
	41-45	21.7
	46-50	10.5
	51-55	8.4
	56-60	7.0
	61+	4.2
Years of Employment	Less than 1 yr	6.3
	1-3 yrs	9.8
	4-6 yrs	22.4
	7-9 yrs	24.5
	10-12 yrs	16.8
	13-15 yrs	4.2
	16-18 yrs	5.6
	19-21 yrs	4.2
	Over 22yrs	6.3
Institutional Department	Human Resource Management.	4.9
	Economics	10.5
	Finance	11.9
	Accounting	4.9
	Marketing and Advertising	39.2
	Strategy	3.5
	Banking	2.1
	Hospitality, Leisure and Tourism and sport Management	8.4
	Management Science	3.5
	Operations Management	6.3
	Other	4.9
Teaching Responsibility(%)	0-20	4.2
	21-40	19.6
	41-60	46.9
	61+	29.3
Research Responsibility (%)	0-20	40.6
	21-40	44.7
	41-60	14.0
	61+	.70
Administrative Responsibility (%)	0-20	89.5
	21-40	9.1
	41-60	1.4
	61+	0

7.5 : Descriptive Statistics for Scale Items

Item	N	Missing	Mean	Median	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
CR1	143	0	3.19	4.00	1.068	-.596	.203	-.663	.403
CR2	143	0	3.44	4.00	.861	-.519	.203	-.140	.403
CR3	143	0	3.18	3.00	.954	-.620	.203	-.449	.403
CR4	143	0	3.30	4.00	.896	-.573	.203	-.862	.403
ER1	143	0	3.64	4.00	.783	-.775	.203	.580	.403
ER2	143	0	3.69	4.00	.745	-1.072	.203	1.286	.403
ER3	143	0	3.79	4.00	.691	-.349	.203	.243	.403
ER4	143	0	3.66	4.00	.787	-.559	.203	.457	.403
ER5	143	0	3.59	4.00	.754	-.853	.203	.627	.403
ER6	143	0	3.74	4.00	.699	-.347	.203	.170	.403
RC1	143	0	3.45	4.00	1.079	-.545	.203	-.584	.403
RC2	143	0	3.25	4.00	1.110	-.545	.203	-.886	.403
RC3	143	0	3.36	4.00	1.024	-.404	.203	-.618	.403
RC4	143	0	3.16	4.00	1.066	-.575	.203	-1.023	.403
RC5	143	0	3.22	4.00	1.170	-.673	.203	-.613	.403
RC6	143	0	3.17	4.00	1.041	-.646	.203	-.912	.403
SP1	143	0	3.33	3.00	1.106	-.239	.203	-.752	.403
SP2	143	0	3.42	4.00	1.116	-.366	.203	-.572	.403
SP3	143	0	3.31	3.00	1.223	-.235	.203	-.983	.403
SP4	143	0	3.23	3.00	1.243	-.114	.203	-1.055	.403
SS1	143	0	3.80	4.00	.975	-1.059	.203	.991	.403
SS2	143	0	4.08	4.00	.672	-.232	.203	-.266	.403
SS3	143	0	3.99	4.00	.727	-.213	.203	-.466	.403
SS4	143	0	4.15	4.00	.839	-.792	.203	.088	.403
SS5	143	0	3.84	4.00	.836	-1.007	.203	1.419	.403
SS6	143	0	3.84	4.00	.893	-.999	.203	1.218	.403
SS7	143	0	4.14	4.00	.908	-.910	.203	.081	.403

7.6.2 Exploratory Factor Analysis Result

An EFA was undertaken using SPSS (version17) with a sample size of 143 and 27 items. The sample size was considered adequate based on Hair et al.`s (2006) recommendation of sample size of 100 and larger as preferable and Ford et al.`s (1986) recommendation of 5:1 sample size per variable ratio (therefore 143>135).

Initial analysis began with the assessment of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett`s test of sphericity to substantiate the need to undertake EFA (Hair et al. 2006). The result of the initial EFA identified the degree of common variance among 27 variables as being meritorious, with KMO>.80 at .895 and Bartlett`s test of sphericity significant at ($X^2(351) = 3718$; $p < .001$. The results identified the sufficiency of correlation among the variables, therefore, justifying the appropriateness to undertake factor analysis. Overall reliability was .946 and communalities were good ranging from 0.613-0.875, with the exception of item SS2 (.058) <.60[58]. Therefore, a decision was made to delete item SS2. Although an item with a communality =.581 is acceptable, consideration was given to issues identified with the item during the card sort exercise and the researcher`s view of the item as being too vague[59]. In addition, theoretical considerations were given to item SS2 prior to its deletion. It was discovered that the deletion of the item would not affect the theoretical definition of the construct and some of the remaining items shared some underlying core with the item.

The deletion of item SS2 necessitated a second EFA. The result of the second EFA identified the degree of common variance among 26 variables as being meritorious, with KMO>.80 at .896 and Bartlett`s test of sphericity significant at ($X^2(325) = 3620$; $p < .001$. The result, therefore, justified the appropriateness to undertake an EFA. Overall reliability was .946 and communalities were good ranging from 0.609-0.892,

The next stage involved a decision on the factor extraction method and the number of factors to extract. The principal component analysis method was used and this was assessed using Kaiser's (1956) "eigenvalues greater than one" rule; percentage of variance accounted;

[58] Based on Hair et al. `s (2006) recommendation for communalities ≥ .60 as acceptable.
[59] Our institution contributes to society

and the scree test. Factor extraction extracted five (5) factors, with 76% of variance extracted. This is based on Hair et al.`s (2006) recommendation of over 60% variance extracted as acceptable. This was confirmed using a scree plot, which identified five factors as well.

Following the factor extraction, the next decision involved the rotation method to use with the objective of improving the psychometric properties of the scale in terms of its reliability and validity and generating substantive meaning of extracted factors (Ford et al. 1986). Orthogonal rotation (Varimax) was applied to load items to their representative factors[60]. Items loaded as expected with the exception of items RC3 and RC1. Items RC3 and RC1 both cross-loaded unto factor 1(ER) and factor 3(RC). Subsequently, items RC1 and RC3 were deleted based on Hair et al.`s (2006) recommendation. Theoretical justification was considered prior to the decision to delete the items. It was discovered that the deletion of the items would not affect the theoretical definition of their representative constructs and some of the remaining items shared some underlying core with these items.

The deletion of items RC1 and RC3 necessitated a third and final EFA. The result of the third EFA identified the degree of common variance among the remaining 24 variables as being meritorious, with KMO> .80 at .886 and Bartlett`s test of sphericity significant at ($X^2(276)=3223$; $p< .001$. The result justified the appropriateness to undertake a factor analysis. Communalities were good ranging from 0.620- 893 and overall reliability was .938. Factor extraction extracted five (5) factors, with a cumulative extraction loading of 77% (See Table 7.6). This was confirmed using a scree plot[61], which identified five factors as well. Subsequently, these were rotated using Varimax rotation; the remaining 24 items loaded as expected (See Table 7.7).

Finally, the remaining items were labelled taking into consideration the content of items loading unto each factor. The interpretation and labelling of the factors relied on the researcher`s judgement, semantics and statistical evidence using the factor loadings (Swanson and Holton 2005). Reliability analysis was subsequently undertaken for each factor. Tables 7.7 and 7.8 highlight the rotated component matrix and internal consistence and reliability analysis for each factor respectively[62].

[60] Based on a factor loading of .50 with a sample size of less than 150 (Hair et al. 2006)
[61] See Appendix 13 for scree plot output produced by SPSS version 17
[62] See Appendix 14 for item-to-total statistics for the final scale

Table 7.6: KMO and Bartlett's Test

Kaiser –Meyer-Olkin Measure Of Sampling Adequacy		.886
Bartlett's Test Of Sphericity	Chi-square	3223
	Df	276
	Significance	.000
Cumulative Variance Extraction		77%

Table 7.7: Rotated Component Matrix

Item	Component[63]				
	1	2	3	4	5
ER1-Employee knowledge	.852				
ER2-Employees` training and competence	.767				
ER3-Employees know their job and responsibilities	.805				
ER4-Employees complete necessary forms/ paperwork	.780				
ER5-Work groups contribute to the organisation`s goals	.633				
ER6-Employees` professionalism	.594				
SS1-Employers` complaints on graduates` and or students` performance		.654			
SS3-Complies with government regulations		.785			
SS4-Stakeholder happiness		.729			
SS5-Job satisfaction		.902			
SS6-Student dissatisfaction		.925			
SS7-Institution reputation		.758			
RC2-Commitment to technological resources			.751		
RC4-Managerial support			.762		
RC5-Financial resources			.732		
RC6-Resources provision			.772		
CR1-Students` motivation				.793	
CR2-Students` cooperation				.696	
CR3-Students` preparation				.738	
CR4-Knowledgeable about expected role				.599	
SP1-Activity levels					.811
SP2-Balancing the efficiency and effectiveness					.840
SP3-Delivering service promptly					.784
SP4-Meeting performance targets and expectations					.891
Eigenvalues	4.421	4.396	3.448	3.126	3.056
Percentage of Variance explained	18.421	18.318	14.368	13.023	12.735
Cumulative %	18.421	36.739	51.107	64.131	76.866

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization
Rotation converged in 6 iterations.

[63] Using a factor loading of .50 cut-off point (Hair et al. 2006)

Table 7.8 : Final Scale Items` Communality and Reliability

Construct /Item	**Code**	**Communality**[64]
Service Productivity	**SP**	**.881**
• Activity levels in our institution have increased	SP1	.814
• Balancing the efficiency and effectiveness of our institution`s outputs is a top priority	SP2	.817
• Our institution delivers its services promptly	SP3	.719
• Our institution meets its performance targets and expectations	SP4	.831
Resource Commitment	***RC***	**.909**
• Our institution is committed in providing the necessary technological resources required to improve productivity	RC2	**.**844
• Our institution is committed in providing the necessary managerial support	RC4	.840
• Financial resources made available to our institution are inadequate	RC5	.652
• Whenever resources are required to perform a service, our institution provides it.	RC6	.888
Employee Readiness	**ER**	**.915**
• Most employees in our institution are knowledgeable about our products and services	ER1	.847
• Employees in our institution are well trained and competent to perform their work accurately	ER2	.784
• Employees in our institution know their job and responsibilities for which they are hired	ER3	.738
• In the course of performing jobs in our institution, employees understand how to complete necessary forms/ paperwork	ER4	.689
• Employees in our institution understand how the different work groups contribute to the organisation`s goals	ER5	.646
• Our institution`s employees are professional when performing their duties	ER6	.693
Customer Readiness	**CR**	**.890**
• Most students in our institution are highly motivated to perform their role during lectures and seminars	CR1	.856
• Students in our institution, works cooperatively with their tutors	CR2	.762
• In general, students in our institution prepare for classes before attending lectures and seminars	CR3	.761
• Most students in our institution are knowledgeable about their expected role during classes and seminars	CR4	.620
Stakeholder Satisfaction	**SS**	**.922**
• Complaint from employers regarding our graduates/students performance at work is high	SS1	.638
• Our institution complies with government regulations	SS3	.636
• If our institution`s stakeholders are unhappy, nothing else matters	SS4	.780
• Most employees in our institution would leave to take a similar job at another institution if given a choice	SS5	.852
• There seems to be a feeling that dissatisfaction is high among students in our institution	SS6	.893
• Our institution`s reputation has improved	SS7	.803

[64] Construct Cronbach alpha is in bold ; Overall Cronbach alpha for the 24 items was .938

7.7 SCALE EVALUATION

The following stages of the scale development process (generation of items from extant literature and existing scales, semi-structured interviews, card sort exercise and pilot study) were devoted purely to the development of the new measures and research instrument (questionnaire), while the EFA study was devoted to scale purification. Scale purification has been emphasised by Churchill's (1979) procedure for scale development.

Based on the result of the scale purification, the EFA identified five factors, each with their respective items loading unto them. Each factor was examined and labelled based on the content of the items loading and their theoretical definition. All the factors (constructs) were consistent with the theoretical underpinning supporting them. For each of the five constructs, an evaluation was made concerning whether the remaining items are sufficiently representative of their respective constructs. The remaining items used in the main survey are reported in Tables 7.7 and 7.8. A full validity and reliability evaluation on each construct based on the EFA study is discussed next.

7.7.1 Service Productivity

The construct SP demonstrated a very good content and face validity. Items were identified using extant literature and scales, semi-structured interviews and card sort exercise. The initial conceptualisation of SP was covered by eight items. Four items were dropped by the judges during the card sort exercise as they did not relate to the construct and further analysis using EFA indicated that the remaining four items loaded highly unto the same underlying construct and were all theoretically relevant in capturing the construct SP. The remaining four items demonstrated a very good face and content validity. Reliability analysis using Cronbach alpha resulted in 0.881, indicating a very high reliability and internal consistency.

7.7.2 Resource Commitment

The construct RC demonstrated a very good content and face validity. Items were identified using extant literature and scales, semi-structured interviews and card sort exercise. The initial conceptualisation of RC was covered by eight items. Two items were dropped by the judges during the card sort exercise as they did not relate to the construct and further analysis using EFA lead to the deletion of item RC1 and RC3[65]. The remaining four items loaded highly unto the same underlying construct and were all theoretically relevant in capturing the construct RC. The remaining four items demonstrated a very good face and content validity. Reliability analysis using Cronbach`s alpha resulted in 0.909, indicating a very high reliability and internal consistency.

7.7.3 Employee Readiness

The construct ER demonstrated a very good content and face validity. Items were identified using extant literature and scales, semi-structured interviews and card sort exercise. The initial conceptualisation of ER was covered by nine items. Three items were dropped by the judges during card sort exercise as they did not relate to the construct. Further analyses using EFA confirmed that the remaining six items are part of the same underlying construct and were all theoretically relevant in capturing the construct ER. The remaining six items demonstrated a very good face and content validity. Reliability analysis using Cronbach`s alpha resulted in 0.915, indicating a very high reliability and internal consistency.

7.7.4 Customer Readiness

The construct CR demonstrated a very good content and face validity. Six items were identified using extant literature and scales, semi-structured interviews and card sort exercise as representing the conceptualisation of CR. Two items were dropped by the judges during

[65] Item RC1 and RC3 cross-loaded

the card sort exercise as they did not relate to the construct and further analysis using EFA confirmed that the remaining four items are part of the same underlying construct and are all theoretically relevant in capturing the construct CR. The remaining four items demonstrated a very good face and content validity. Reliability analysis using Cronbach`s alpha resulted in 0.890, indicating a very high reliability and internal consistency.

7.7.5 Stakeholder Satisfaction

Finally, the construct SS demonstrated a very good content and face validity. Items were identified using extant literature and scales, semi-structured interviews and card sort exercise. The initial conceptualisation of SS was covered by nine items. Two items were dropped by the judges during the card sort exercise as they did not relate to the construct and EFA led to the deletion of item SS2[66]. Further analysis using EFA confirmed that the remaining six items loaded highly to the construct and are part of the same underlying construct and are all theoretically relevant in capturing the construct SS. The remaining six items demonstrated a very good face and content validity. Reliability analysis using Cronbach`s alpha resulted in 0.922, indicating a very high reliability and internal consistency.

7.8 CONCLUSION

This chapter focused on the development and purification of the scale, which consisted of two stages. The first stage dealt with the construct definition and item generation for the scales while the second stage dealt with purifying the scale using EFA.

The construct definition and item generation stage consisted of the following. Firstly, definitions and a pool of items were generated from existing scales and extant literature.

[66] Item SS2 had a low communality and was too vague.

Secondly, semi-structured interviews were undertaken to identify items relating to the domain`s constructs. Thirdly, a card sort exercise was undertaken to reduce, select and refine the items relating to the domain`s constructs for the scales. This resulted in the generation of 27 items and the design of the initial research instrument/questionnaire. Finally, a pilot study was undertaken to critique and refine the questionnaire, which led to the design of the questionnaire for the EFA study.

The scale purification stage dealt with the identification of underlying constructs and the assessment of the reliability and validity of the developed scale using EFA. The pool of 27 items was reduced to 24 items after factor analysis using the principal component and orthogonal rotation (Varimax) technique, which identified five factors/constructs which were subsequently labelled as Service Productivity (SP); Resource Commitment (RC); Employee Readiness (ER); Customer Readiness (CR); and Stakeholder Satisfaction (SS).

The final scale demonstrated a very good face and content validity as well as a very high internal consistency (reliability) for each construct. Tables 7.7 and 7.8 represent the final set of items forming the basis of the development of the main/final questionnaire for this thesis. The results of the literature review, semi-structured interviews, card sort exercise, pilot study and EFA study were positive, which provided a stronger basis to undertake the main study. The full results from the main study are reported and discussed in the next three chapters.

The next chapter presents the descriptive analysis of the demographic characteristics of the respondents and the scale items for the main study. This provides an overview of the demographic characteristics of the samples under the study and insights into the normality of the data for the main study.

CHAPTER EIGHT: DESCRIPTIVE ANALYSIS

8.1 INTRODUCTION

This chapter presents the descriptive analysis of the demographic characteristics of the respondents and the scale items relating to the main study. This entails a descriptive analysis of the demographic characteristics of the samples under the study and an evaluation of data normality. The discussion mainly focuses firstly on the overall data followed by a discussion on the data collected from Finland, Ghana, India, and the UK[67].

8.2 DESCRIPTIVE ANALYSIS FOR OVERALL DATA

This section presents a descriptive analysis of the demographic characteristics and the scale items relating to the main study overall data. This analysis provides an insight into the trends and patterns among the demographic variables. In addition, it provides insights into the deviations in the scale items; which relate to outliers, missing data, univariate and mulvariate patterns in the data. These were used as the basis for justifying the normality in data prior to undertaking SEM analysis.

[67] Overall data refers to the combined data from Finland, Ghana, India, and the UK.

8.2.1 Demographic Descriptive Analysis of Respondents

A sample size of 447 consisting of HE academics within Business and Management Schools across different parts of the world was used as respondents for the main study. Respondents` demographic data such as gender, age, years of employment in HE, affiliated department, respondents` institutional country location and respondents` teaching, research and administrative duties were collected and analysed. These are discussed next.

8.2.1.1 Gender of Respondents

Analysis of respondents gender, as shown in Table 8.1, indicates that out of the 447 respondents who participated in this study, 244(54.6%) and 203(45.4%) were males and females respectively with M=1.45 and SD=.498 indicating there is no difference between males and females.

Table 8.1: Respondents` Gender

Gender	Frequency	Valid Percent (%)
Male	244	54.6
Female	203	45.4
Total	**447**	**100.0**

8.2.1.2 Age of Respondents

Analysis of respondents` age, as shown in Table 8.2, indicates that the majority of respondents (59.8%) were within the age range of 26-45 years, while only 4.5%, 26.6 and 2.9% were in the age ranges of 18-25 years, 46-60 years and 61 years and over respectively.

Table 8.2: Respondents` Age

Age	Frequency	Valid Percent (%)
18- 25	20	4.5
26-30	49	11.0
31-35	72	16.1
36-40	67	15.0
41-45	108	24.2
46-50	39	8.7
51-55	45	10.1
56-60	34	7.6
61+	13	2.9
Total	**447**	**100.0**

8.2.1.3 Respondents` Years of Employment

Analysis of respondents` years of employment within HEIs, as shown in Table 8.3 indicates that about 63.1% of all respondents had been employed as academics in HE between 4-12 years, while only 15.6%, 15.9% and 5.4% had been employed for up to three years, 13-21 years and over 22 years respectively.

Table 8.3: Respondents` Years of Employment

Years Employed	Frequency	Valid Percent (%)
Less than 1 yr	27	6.0
1-3 yrs	43	9.6
4-6yrs	102	22.8
7-9yrs	97	21.7
10-12yrs	83	18.6
13-15yrs	25	5.6
16-18yrs	34	7.6
19-21yrs	12	2.7
Over 22yrs	24	5.4
Total	**447**	**100.0**

8.2.1.4 Respondents` Affiliated Department

Analysis of the department to which respondents were affiliated indicates that 27%, 13.2% and 10.1% of all respondents were from Marketing and Advertising, Economics and Human Resource Management departments respectively (See Table 8.4).

Table 8.4: Respondents` Affiliated Department

Department	Frequency	Valid Percent (%)
Human Resource Management	45	10.1
Economics	59	13.2
Finance	44	9.8
Accounting	44	9.8
Marketing and Advertising	121	27.1
Strategy	27	6.0
Banking	21	4.7
Hospitality Leisure and Tourism Management Sports	26	5.8
Management Science	7	1.6
Operations Management	31	6.9
Other	22	4.9
Total	**447**	**100.0**

8.2.1.5 Respondents' Institutional Country Location

Analysis of respondents` country of institution location indicates that about 7.4 %, 15.2%, 23.3% and 54.1% of all respondents were from Finland, Ghana, India and the UK respectively (See Table 8.5).

Table 8.5: Respondents` Country of Institution Location

Country	Frequency	Valid Percent (%)
Finland	33	7.4
Ghana	68	15.2
India	104	23.3
UK	242	54.1
Total	**447**	**100.0**

8.2.1.6 Respondents` Teaching, Research and Administrative Duties

Analysis of respondents` duties within HE resulted in M= 5.70, 2.85; 1.56 and SD=1.639; 1.253; 0.767 for teaching, research and administrative duties respectively. This means that the time academics spent on their different responsibilities/duties within HE varied. In addition, the results from Tables 8.6, 8.7 and 8.8 indicate that about 60%; 3% and 1% of academics spent over 50 percent of their time on teaching, research and administration duties respectively.

Table 8.6: Teaching Duties (%)

Time Spent (%)	Frequency	Valid Percent (%)
0-10%	3	.7
11-20%	16	3.6
21-30%	34	7.6
31-40%	44	9.8
41-50%	83	18.6
51-60%	111	24.8
61-70%	94	21.0
71-80%	62	13.9
Total	**447**	**100.0**

Table 8.7: Research Duties (%)

Time spent (%)	Frequency	Valid Percent (%)
0-10%	58	13.0
11-20%	136	30.4
21-30%	128	28.6
31-40%	79	17.7
41-50%	33	7.4
51-60%	11	2.5
61-70%	2	.4
Total	**447**	**100.0**

Table 8.8: Administrative Duties (%)

Time Spent (%)	Frequency	Percent (%)
0-10%	253	56.7
11-20%	148	33.2
21-30%	40	9.0
31-40%	2	.4
51-60%	3	.7
Total	446	100
Missing	1	-
Total	**447**	**100.0**

8.2.2 Data and Scale Items Screening for Overall Data

Normality and accuracy of data are a pre-requisite for undertaking SEM analysis. Data preparation, examination and screening are therefore necessary to identify concealed deviations overlooked in the data and for examining data normality (Hair et al. 2006). Issues relating to missing data, outliers and data normality are examined next.

82.2.1 Missing Data

In relation to missing data, only one missing data was reported[68]. This may be attributed to the good questionnaire design process followed and Likert scale used.

8.2.2.2 Outliers, Univariate and Multivariate Normality

Outliers were examined using univariate and multivariate detection strategies. Firstly, skewness and kurtosis were assessed and the result ranged from (-) .419 - .996 and (±) .002 - .893 respectively, which were within the acceptable range. Secondly, univariate normality assessment of the data using z scores (standardised residuals) identified an extreme value relating to items RC6 and SS4 (5.492), which is greater than the recommended value of 3.29 (Tabachnick and Fidell 2007). In addition, assessment of D^2/df identified that all D^2/df values exceeded the recommended value of 4 (Hair et al. 2006).

Thirdly, mulvariate normality was evaluated and the result indicated a relatively high value of 190.6 as compared to the recommended Mardia's statistic ≤3 (Mardia 1970, 1980; Sanders 2006). Lastly, in relation to outliers, examination of multivariate normality and Mahalanobis distance identified several cases as outliers. These were examined visually and individually by the researcher and no problem of outliers was identified with the exception of item SS3, which indicated an extremely high response. This was attributed to the nature of the item[69]. However, the researcher decided not to delete item SS3 but rather to monitor it in further analysis as recommended by Hair et al. (2006) as a strategy for dealing with outliers.

[68] This relates to respondent`s response relating to his/her administrative duties.

Overall, the result indicated that the data may not be normally distributed and as a result may have severe implications for the use of the maximum likelihood estimation technique, in terms of its impact on chi-square, standard error and test of significance (Browne 1982; 1984). The identification of non-normality in the researcher's data necessitated undertaking a action to resolve this problem. Review of Mahalanobis distance reported by AMOS recommended the deletion of 102 cases (representing about 23% of the total sample size of 447). This suggested that the use of Mahalanobis distance in dealing with non-normality in the data was impractical and unrealistic. Therefore, bootstrap sampling using Bollen-Stine bootstrap p-value was used. Table 8.9 reports the univariate and multivariate normality assessment of the scale items. See Appendices 15a, 15b and 15c for descriptive statistics for respondents' response to scale items for overall data, calibration data and validation date. Also see Appendix 21 for the scale items` cross correlation matrix.

[69] Item SS3- Our institution complies with government regulations.

Table 8.9: Univariate and Multivariate Normality Assessment

Variable	Min	Max	Skew	C.R.	Kurtosis	C.R.
SS1	1.000	5.000	-.728	-6.280	-.494	-2.130
SS3	2.000	5.000	-.419	-3.620	.424	1.832
SS4	1.000	5.000	-.796	-6.868	-.375	-1.619
SS5	1.000	5.000	-.911	-7.863	.263	1.136
SS6	1.000	5.000	-.767	-6.619	-.116	-.501
SS7	1.000	5.000	-.794	-6.857	.002	.007
SP1	1.000	5.000	-.627	-5.413	-.329	-1.419
SP2	1.000	5.000	-.635	-5.483	-.359	-1.548
SP3	1.000	5.000	-.682	-5.883	-.320	-1.380
SP4	1.000	5.000	-.592	-5.107	-.516	-2.227
CR1	1.000	5.000	-.737	-6.359	-.839	-3.620
CR2	1.000	5.000	-.641	-5.535	-.534	-2.304
CR3	1.000	5.000	-.582	-5.025	-.893	-3.854
CR4	1.000	5.000	-.860	-7.421	-.754	-3.254
ER1	2.000	5.000	-.893	-7.712	.740	3.195
ER2	2.000	5.000	-.996	-8.595	.664	2.866
ER3	2.000	5.000	-.829	-7.152	.581	2.506
ER4	2.000	5.000	-.791	-6.828	.248	1.070
ER5	2.000	5.000	-.933	-8.056	.565	2.437
ER6	2.000	5.000	-.730	-6.302	.511	2.204
RC2	1.000	5.000	-.879	-7.584	-.443	-1.912
RC4	1.000	5.000	-.874	-7.546	-.427	-1.844
RC5	1.000	5.000	-.805	-6.951	-.441	-1.902
RC6	1.000	5.000	-.787	-6.791	-.436	-1.881
Multivariate					**190.610**	**57.038**

8.3 DESCRIPTIVE ANALYSIS – CROSS-COUNTRY ANALYSIS

This section presents a cross-country comparative descriptive analysis of the demographic characteristics of respondents and the scale items relating to the main study. This analysis provided an insight into the trends and patterns among the demographic variables in the different countries where data were collected. In addition, it provided an insight into the deviations in the scale items, which relates to response to scale items. This was used as the basis for examining if there are differences in the different countries` demographic characteristics and response to scale items that may have influenced the overall results of the study.

8.3.1 Demographic Descriptive Analysis of Respondents

Sample sizes of 33, 68, 104 and 242 from Finland, Ghana, India, and the UK respectively were used as respondents for the main study (See Section 8.2.1.5 and Table 8.5 for respondents` country of institutional location and Table 6.9 for response rate). These respondents consisted of HE academics within Business and Management Schools. Respondents' demographic characteristics data such as gender, age, years of employment in HE, affiliated department, and respondents teaching, research and administrative duties were collected and analysed. Table 8.10 presents a summary of respondents' demographic characteristics from the different countries.

Table 8.10: Respondents` Demographic Characteristics- Cross-Country Data

DEMOGRAPHIC CATEGORY		**PERCENTAGE (%)**			
Country (number of respondents)	**Overall (447)**	**Finland (33)**	**India (104)**	**Ghana (68)**	**UK (242)**
Gender					
Male	54.6	66.7	53.8	51.5	54.1
Female	45.4	33.3	46.2	48.5	45.9
Age					
18 to 25	4.5	9.1	5.8	4.4	3.3
26-30	11.0	15.2	10.6	10.3	10.7
31-35	16.1	6.1	17.3	17.6	16.5
36-40	15.0	3.0	15.4	19.1	15.3
41-45	24.2	27.3	22.1	19.1	26.0
46-50	8.7	27.3	8.7	2.9	7.9
51-55	10.1	9.1	13.5	13.2	7.9
56-60	7.6	3.0	5.8	7.4	9.1
61+	2.9	0.0	1.0	5.9	3.3
Years Employed					
Less than 1 yr	6.0	0.00	3.8	2.9	8.7
1-3yrs	9.6	12.1	12.5	5.9	9.1
4-6yrs	22.8	24.2	24.0	25.0	21.5
7-9yrs	21.7	21.2	9.6	29.4	24.8
10-12yrs	18.6	18.2	27.9	16.2	15.3
13-15yrs	5.6	3.0	4.8	5.9	6.2
16-18 yrs	7.6	6.1	5.8	7.4	8.7
19-21 yrs	2.7	12.1	2.9	7.4	2.1
Over 22yrs	5.4	3.0	8.7	0.0	3.7
Institutional Department					
Human Resource Management	10.1	9.1	8.7	4.4	12.4
Economics	13.2	9.1	13.5	13.2	13.6
Finance	9.8	12.1	4.8	20.6	8.7
Accounting	9.8	9.1	4.8	19.1	9.5
Marketing and Advertising	27.1	24.2	26.0	22.1	29.3
Strategy	6.0	6.1	4.8	5.9	6.6
Banking	4.7	3.0	8.7	0.0	4.5
Hospitality, Leisure, Tourism and Sport Management	5.8	15.2	12.5	0.0	3.3
Management Science	1.6	0.00	2.9	0.0	1.7
Operations Management	6.9	0.00	10.6	7.4	6.2
Other	4.9	12.1	2.9	7.4	4.1

Continue on next page

Table 8.10: Respondents` Demographic Characteristics- Cross-Country Data

DEMOGRAPHIC CATEGORY		**PERCENTAGE (%)**			
Country (number of respondents)	**Overall (447)**	**Finland (33)**	**India (104)**	**Ghana (68)**	**UK (242)**
Teaching Responsibility (%)					
0-10%	0.7	0.0	0.0	0.0	1.2
11-20%	3.6	12.1	1.0	0.0	4.5
21-30%	7.6	12.1	2.9	1.5	10.7
31-40%	9.8	18.2	3.8	2.9	13.2
41-50%	18.6	12.1	3.8	11.8	27.7
51-60%	24.8	9.1	27.9	19.1	27.3
61-70%	21.0	30.3	33.7	35.3	10.3
71-80%	13.9	6.1	26.9	29.4	5.0
Research Responsibility (%)					
0-10%	13.0	6.1	23.1	23.5	6.6
11-20%	30.4	33.3	31.7	42.6	26.0
21-30%	28.6	15.2	32.7	26.4	29.3
31-40%	17.7	18.2	9.6	4.4	24.8
41-50%	7.4	9.1	2.9	10.0	10.3
51-60%	2.5	12.1	0.0	0.0	2.9
61-70%	.4	6.1	0.0	0.0	0.0
71-80%	0.0	0.0	0.0	0.0	0.0
Administrative Responsibility (%)					
0-10%	56.7	63.6	83.7	82.4	36.9
11-20%	33.2	30.3	16.3	17.6	45.2
21-30%	9.0	6.1	0.0	0.0	15.8
31-40%	0.4	0.0	0.0	0.0	0.8
41-50%	0.0	0.0	0.0	0.0	0.0
51-60%	0.7	0.0	0.0	0.0	1.2
61-70%	0.0	0.0	0.0	0.0	0.0
71-80%	0.0	0.0	0.0	0.0	0.0

8.3.1.1 Gender of Respondents

Analysis of respondents gender, as shown in Table 8.10, indicates that the gender differences between the countries were less than 10% and slightly similar to the overall data, with the exception of Finland, where about two thirds (67%) of respondents were male. An ANOVA was undertaken and resulted in F (3,443) =.748, p>.05. The results indicated that respondents' gender did not differ significantly in the different countries. (See Appendix 16 for ANOVA result)[70].

8.3.1.2 Age of Respondents

Analysis of respondents' age differences between the countries as indicated in Table 8.10, showed that the majority of respondents were aged between 26-45, with the exception of Finland, where about 3% of respondents were between the ages of 36-40 and about 55% of respondents were between the ages of 41- 50. An ANOVA was undertaken and resulted in F (3,443) =.244, p>.05. The results indicated that respondents' age did not differ significantly in the different countries (See Appendix 16).

8.3.1.3 Respondent`s Years of Employment

Analysis of respondents` years of employment within HE in the different countries, as shown in Table 8.10, indicated that the majority of respondent have been employed as academics in HE for between 4-12 years. An ANOVA was undertaken and resulted in F (3,443) = 1.072, p>.05, indicating that there is no significant difference among the different number of years respondents in the different countries were employed in HE (See Appendix 16).

[70] F-critical using alpha level .05 for degree of freedom (3,443)= 2.63. F-critical criterion was used for all ANOVA analysis in this section.

8.3.1.4 Respondents` Affiliated Department

Analysis of the department to which respondents from the different countries were affiliated indicates that the majority of respondents were from Marketing and Advertising Departments with the rest spread across the different departments (See Table 8.10). An ANOVA was undertaken and resulted in F (3,443) =2.466, p>.05 (See Appendix 16). The results indicated that there is no significant difference in respondents` affiliated departments within the different countries.

8.3.1.5 Respondents` Teaching, Research and Administrative Duties

Analysis of respondents` duties in HE identified that over 80% of respondents in Ghana and India spent over 50% of their time on teaching duties as compared to their counterparts in UK and Finland, where roughly about 45% of respondents spent 50% of their time on teaching duties (See Table 8.10). An ANOVA was undertaken and resulted in F (3,443) =41.439, p<.05 (See Appendix 16). The results indicated that there is a significant difference in respondents` teaching duties among the different countries.

In regard to research duties, 45%, 38%, 14.4% and 12.5% of respondents from Finland, UK, Ghana and India respectively spent over 30% of their time on research duties, while 18.2% respondents from Finland spent over 50% of their time on research. An ANOVA was undertaken and resulted in F (3,443) =21.190, p<.05 (See Appendix 16). The results indicated that there is a significant difference in respondents` research duties among the different countries.

On administrative duties, over 80% of respondents from India and Ghana spent 10% or less of their time on administrative duties while in Finland and UK about 63% and 37% respectively of respondents spent 10% or less of the time on administrative duties. In addition, about 6% and 18% of respondents from Finland and the UK respectively spent over 20% of the time on administrative duties. An ANOVA was undertaken and resulted in F (3,442) =32.968, p<.05 (See Appendix 16). The results indicated that there is a significant difference in respondents` administrative duties among the different countries.

8.3.2 Cross-Country Descriptive Analysis of Scale Items

This section presents a descriptive analysis of the scale items from a cross-country perspective in order to evaluate if there are differences in the different countries` responses to the scale items relating to the researcher`s proposed constructs. This is discussed from an individual construct perspective. Table 8.11 presents a summary of respondents' responses to the scale items from the different countries.

8.3.2.1 Service Productivity (SP)

From Table 8.11, the construct SP was measured by four items. The items means and standard deviations from the different countries did not differ significantly and ranged from 3.31-3.58 and .951-1.149 respectively. This was also compared to the overall data`s mean and standard deviation and the result did not differ significantly. This was confirmed using ANOVA and the result indicated that there is no significant difference among the different countries` response to the scale items relating to the construct SP (See Appendix 17 for ANOVA results for the scale items).

8.3.2.2 Resource Commitment (RC)

From Table 8.11, the construct RC was measured by four items. The items means and standard deviations from the different countries did not differ significantly and ranged from 3.16-3.93 and .974- 1.194 respectively. This was compared to the overall data`s mean and standard deviation and the result did not differ significantly as well. This was confirmed using ANOVA and the result indicated that there is no significant difference among the different countries` responses to the scale items relating to the construct RC (See Appendix 17).

8.3.2.3 Employee Readiness (ER)

From Table 8.11, the construct ER was measured by six items. The items means and standard deviations from the different countries did not differ significantly and ranged from 3.58-3.94 and .704-.916 respectively. This was compared to the overall data`s mean and standard deviation and the result did not differ significantly. This was confirmed using ANOVA and the result indicated that there is no significant difference among the different countries` response to the scale items relating to the construct ER (See Appendix 17).

8.3.2.4 Customer Readiness (CR)

From Table 8.11, the construct CR was measured by four items. The items means and standard deviations from respondents' responses ranged from 3.09-3.64 and .895-1.206 respectively[71]. This was compared to the overall data`s mean and standard deviation and the result did not differ significantly as well. This was confirmed using ANOVA and the result indicated that there is no significant difference among the different countries` responses to the scale items relating to the construct CR (See Appendix 17).

8.3.2.5 Stakeholder Satisfaction (SS)

From Table 8.11, the construct SS was measured by six items. The items means and standard deviations ranged from 3.38-4.16 and .604-1.466 respectively[72]. This was compared to the overall data`s mean and standard deviation and the result did not differ significantly. This was confirmed using ANOVA and the result indicated that there is no significant difference among the different countries` respondent`s responses to the scale items relating to the construct SS (See Appendix 17).

[71] The huge difference in standard deviation is attributed to item CR4 which was subsequently eliminated during the model modification stage in Section 9.5.1.
[72] The huge difference in the mean and standard deviation is attributed to the items SS1 and SS3 which were subsequently eliminated during the model modification stage in Section 9.5.1.

Table 8.11: Cross-Country Comparison of Scale Items Response

Country (No. of Respondents)	Overall (447)		Finland (33)		India (104)		Ghana (68)		UK (242)	
Construct	**Mean**	**SD**[73]	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Service Productivity										
SP1	3.48	1.004	3.39	1.059	3.46	1.033	3.31	1.110	3.55	.951
SP2	3.51	1.024	3.42	.936	3.52	1.088	3.40	1.024	3.55	1.010
SP3	3.53	1.065	3.52	1.149	3.55	1.060	3.31	1.110	3.58	1.040
SP4	3.51	1.084	3.55	1.092	3.52	1.070	3.24	1.121	3.57	1.072
Employee Readiness										
ER1	3.82	.774	3.61	.704	3.80	.742	3.68	.837	3.89	.771
ER2	3.79	.806	3.58	.751	3.83	.806	3.68	.837	3.84	.801
ER3	3.88	.802	3.73	.839	3.94	.722	3.72	.912	3.92	.793
ER4	3.79	.829	3.61	.788	3.79	.809	3.71	.830	3.83	.843
ER5	3.73	.772	3.61	.704	3.70	.787	3.60	.756	3.80	.776
ER6	3.86	.777	3.73	.761	3.87	.764	3.76	.916	3.90	.742
Resource Commitment										
RC2	3.34	1.044	3.36	1.194	3.30	.974	3.28	1.091	3.37	1.044
RC4	3.39	1.005	3.42	1.091	3.35	.983	3.24	1.094	3.45	.977
RC5	3.36	1.049	3.42	1.001	3.34	1.076	3.16	1.101	3.42	1.028
RC6	3.90	1.086	3.85	1.228	3.89	1.033	3.81	1.175	3.93	1.068
Continued of next page										

[73] SD-Standard Deviation

Table 8.11: Cross-Country Comparison of Scale Items Response

Country (No. of Respondents)	**Overall (447)**		**Finland (33)**		**India (104)**		**Ghana (68)**		**UK (242)**	
Construct	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Customer Readiness										
CR1	3.22	1.087	3.39	.998	3.09	1.133	3.26	1.060	3.24	1.086
CR2	3.40	1.005	3.64	.895	3.27	.997	3.40	.964	3.42	1.032
CR3	3.26	1.057	3.33	.990	3.24	1.057	3.24	.964	3.27	1.096
CR4	3.25	1.064	3.27	1.206	3.13	1.062	3.21	1.073	3.30	1.045
Stakeholder Satisfaction										
SS1	3.61	1.170	3.55	1.092	3.57	1.147	3.38	1.466	3.69	1.092
SS3	4.12	.653	4.09	.631	4.16	.609	4.01	.763	4.14	.642
SS4	3.88	1.093	3.82	1.357	3.89	.975	3.81	1.225	3.90	1.068
SS5	3.62	.972	3.42	1.091	3.63	.904	3.46	1.085	3.69	.947
SS6	3.65	.973	3.48	.972	3.63	.861	3.60	1.053	3.69	.997
SS7	3.65	.954	3.42	1.091	3.61	.841	3.60	1.053	3.71	.951

8.4 CONCLUSION

This chapter analysed and summarised the descriptive statistics of the demographic characteristics and the scale items relating to the main study`s overall data and the data collected from the different countries. In addition, the scale items relating to the domain constructs were evaluated for missing items, outliers and univariate and multivariate normality. Further the demographic and scale items were evaluated from a cross-country perspective to examine if there are differences in the different countries` demographic characteristics and responses to scale items that may have influenced the overall results of the study.

No severe variation in respondents' demographical characteristics across the different countries was observed, although some variations in respondents' time spent on teaching, research and administrative duties were identified. In relation to the scale items, no significant differences in respondents' responses to the scale items across the different countries were identified. Further, analysis of the overall data indicated that the data was not normally distributed and as a result, Bollen-Stein p value was identified as the most appropriate approach for justifying the use of SEM analysis and in establishing the normality of the data.

The next chapter reports the multivariate data analysis and model validation. This reports the results of the CFA and SEM analysis, which entailed the analysis of the measurement and structural model fit, reliability and validity.

CHAPTER NINE: MULTIVARIATE DATA ANALYSIS AND MODEL VALIDATION

9.1 INTRODUCTION

Structural Equation Modelling (SEM) provides opportunities for researchers to evaluate a set of interrelated questions simultaneously using a single technique (Hair et al. 2006). Having hypothesised certain relationships between items and their related constructs and between SP and its related constructs, SEM offers the best approach in testing the researcher`s hypotheses and in achieving the aim and objectives of this thesis. The research design and methods chapter (Chapter Six) discussed the fundamentals of SEM and provided an outline of how SEM was used in analysing the data collected.

This thesis employed a SEM technique to develop a theoretical understanding of the relationship between observed variables (items) and unobserved variables (constructs) and the relationship between SP and its related constructs. This chapter reports the results of the measurement and structural model fit, as well as the reliability and validity of the researcher`s proposed conceptual model and further presents the results of the testing of the researcher`s hypotheses.

9. 2 ANALYSIS STRATEGY

The analysis strategy adopted for the evaluation of the measurement and structural models involves the use of model development strategy using the two-step approach advocated by Anderson and Gerbing (1988). Structural Equation Modelling (SEM) using the Maximum Likelihood (ML) estimation technique was found appropriate for this thesis and AMOS software (version 19) was used in analysing data[74].

The analysis strategy was as follows:

- Measurement model development and specification.
- Evaluation of data for accuracy and normality.
- Assessment of measurement model validity/fit.
- Assessment of measurement model reliability and validity.
- Structural model development and specification.
- Simultaneous assessment of the measurement and structural sub-models` validity/fit.
- Testing of hypothesised relationships between the domain`s constructs.

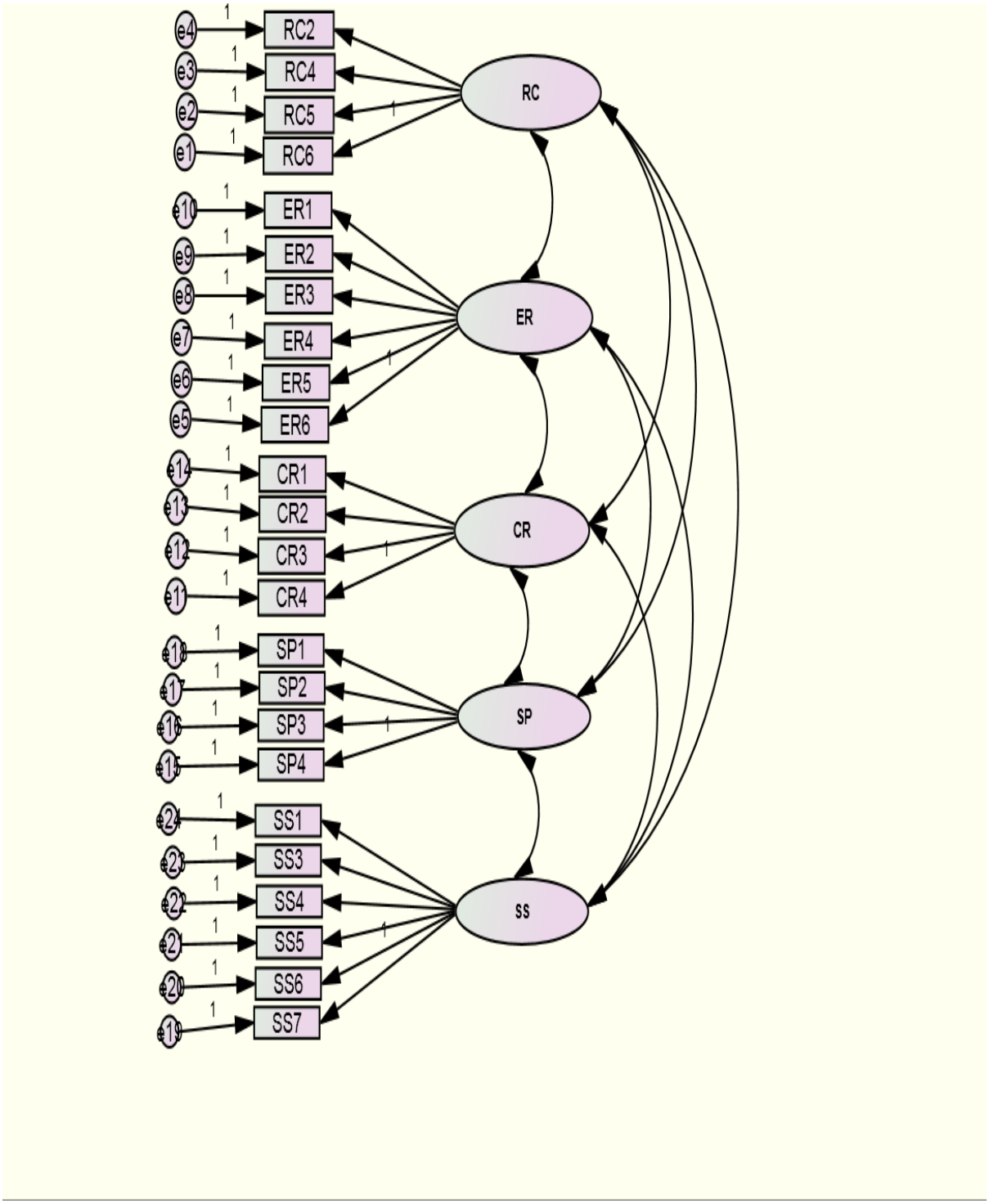
9.3 MEASUREMENT MODEL DEVELOPMENT AND SPECIFICATION

In developing and specifying the measurement model, the conceptualisation chapter and the scale development and purification chapter were fundamental components underpinning this undertaking. The measurement model was represented in a path diagram, with 5 constructs, 24 items (observed endogenous variables) and 24 error variables and the items were represented as reflective indicators. An over-identified model was specified as the

[74] See Table 6.10 on justification for using ML technique

number of items exceeded the number of parameters to be estimated. In addition, AMOS reported the model as a recursive model, meaning that each latent variable is an independent cause and cannot be influenced by a prior latent variable (Guess and Farnham 2000). See Figure 9.1 for the measurement model specified.

Figure 9.1: Measurement Model Specification[75]



[75] Output produced by AMOS 19

9.4 EVALUATION OF DATA ACCURACY AND NORMALITY

Prior to the assessment of the measurement and structural model fit, it is required that the researcher demonstrate the normality of data, which is a prerequisite for undertaking SEM. From Chapter Eight, both univariate and multivariate normality were assessed. Univariate normality assessment indicated that the data does not deviate from the norm. However, multivariate normality evaluation indicated that data may not be normally distributed. Therefore, bootstrap sampling using Bollen-Stine p-value was used in establishing normality in the data. In addition, see Appendix 21 for the scale items cross correlation matrix.

9.5 ASSESSMENT OF MEASUREMENT MODEL VALIDITY (FIT)

Following the development and specification of the measurement model and the evaluation of data normality, the measurement model`s validity was evaluated next. The assessment of the measurement model`s validity answers the questions relating to how well the data fit theory. This relates to the assessment of the relationship between observed variables (items) and their representative latent variables (construct). The validity of the measurement model is dependent on its Goodness-of-Fit and construct validity and reliability (Hair et al. 2006). See Table 6.11 for the various fit indices and modification indices for evaluating the measurement model. In addition, see Table 6.12 for the criteria for evaluating the validity and reliability of the measurement model.

9.5.1 Measurement Model Fit Estimates

The initial measurement model was evaluated using the calibration data with a sample size of 224[76], which resulted in a Bollen-Stine bootstrap p-value of .004 < .05, indicating that the data was not normally distributed. In addition, the measurement model fit estimates demonstrated a weak fit (χ^2 = 773; *df* = 242; p < 0.01; CMIN/df=3.20; GFI= .80; CFI=.93; NFI= .90; TLI= .93; RMSEA= .10; ECVI= 3.988[77]; AIC =889.4[78])[79]. Based on these estimates, a model re-specification was undertaken by examining the results of the standardised residual, path estimates/loadings, Squared Multiple Correlation (R^2) and modification indices (MI) produced by AMOS as appropriate tools for examining model fit as well as a diagnostic tool for problematic models and for model re-specification (Hair et al. 2006).

Standardised residual identified the following items (SS1; SS4; CR4; RC6) as having values greater than the cut-off values recommended. In addition, item SS3 had standardised regression weight and Squared Multiple Correlations (SMC/R^2) values below the recommended threshold (See Table 9.1 for further details). This suggested that these items should be deleted. Furthermore, the modification indices (MI) suggested correlating measurement errors. This was based on restricting measurement errors within the same construct[80]. This resulted in correlating measurement errors for the following items: Employee Readiness {ER6 (e5) to ER1 (e10); ER2 (e9) to ER1 (e10)}; and Service Productivity {SP4 (e15) to SP3 (e16)}. See Table 9.1 for measurement model modification process and results.

The modified measurement model was represented by 5 constructs; 19 items (observed endogenous variables); and 19 error variables[81]. An over-identified model was specified and the modified measurement model was identified as a recursive model. The final/modified measurement model resulted in a Bollen-Stine bootstrap p-value of .11 > .05,

[76]See Sections 6.7 and 6.9.4.2 for further information on calibration and validation data. See also Section 9.5.2 for the evaluation of the measurement model using the validation data.
[77] ECVI value for proposed model (default model) > saturated model
[78] AIC value for proposed model (default model) > saturated model
[79] See Table 6.11 for criteria for demonstrating good fit.
[80] See Section 6.9.4.1 and Appendix 9 for further information on correlating measurement error.
[81] See Appendix 18 for modified measurement model produced by AMOS19.

indicating that the parameter estimates in the modified model were unaffected by the sample size and data normality was good, therefore, justifying the appropriateness of undertaking SEM analysis. In addition, the re-specified/modified measurement model demonstrated good fit (χ^2 = 208; *df* = 139; p < 0.01; CMIN/df= 1.50; GFI= .91; CFI=.99; NFI= .97; TLI= .98 RMSEA=.05; ECVI=1.394[82]; AIC= 310.8[83]).

This indicated that the modified measurement model fits well with the observed data and is a valid and reliable model in representing the phenomenon of interest. The final measurement model resulted in five (5) constructs and nineteen (19) items and was theoretically and statistically meaningful and adequate in capturing the phenomenon of interest. This gave the green light to proceed with the assessment of the theoretical relationships between SP and its related constructs (structural model).

However, before proceeding with the assessment of the structure model`s validity, the measurement model was cross validated using a new set of data. In addition, the validity and reliability of the measurement model were established and further, the measurement model was evaluated in terms of the impact of individual items on their representative constructs. These are discussed in the sections that follow.

[82] ECVI value for default model < saturated and independence models
[83] AIC value for default model < saturated and independence models

Table 9.1: Modification Indices

Step	Modification	MI change	χ^2	DF	CMIN/DF	GFI	CFI	NFI	TLI	RMSEA	ECVI	AIC	Bollen-Stine (p) value[84]
N/A	**Initial measurement model**	**N/A**	**773**	**242**	**3.20**	**.80**	**.93**	**.90**	**.93**	**.10**	**3.988[85]**	**889.4[86]**	**.004**
1	Deletion of items (SS1;SS3;SS4;RC6 & CR4) [87]	N/A	256	142	1.80	.89	.98	.96	97	.06	1.580	352.2	.04
2	e 15 ⟷ e16[88]	29.69	221	141	1.57	.91	.99	.97	.98	.05	1.433	319.4	.09
3	e 9 ⟷ e10	5.00	214	140	1.53	.91	.99	.97	.98	.05	1.412	314.7	.10
4	e 5 ⟷ e10	4.90	208	139	1.50	.91	.99	.97	.98	.05	1.394	310.8	.11
N/A	**Modified/final measurement Model**	**N/A**	**208**	**139**	**1.50**	**.91**	**.99**	**.97**	**.98**	**.05**	**1.394[89]**	**310.8[90]**	**.11**

[84] Based on a bootstrap sample of 250
[85] ECVI value for proposed model (default model) > saturated model
[86] AIC value for proposed model (default model) < saturated and independence model
[87] Standardized Residual Covariance of items SS1 and CR4 =2.98; SS1 and RC6=2.87; SS4 and RC6= 3.88 > 2.58 (Bagozzi and Yi 1988; Jöreskog and Sörbom 1989) and item SS3= .67(standardised regression weight < .7 and R^2 =.43 (R^2 < .50)(Hair et al. 1998:2008)
[88] ⟷ represent correlating measurement errors
[89] [89] ECVI value for default model < saturated and independence models
[90] AIC value for default model < saturated and independence models

9.5.2 Cross-Validation of Measurement Model

Before proceeding with the assessment of the structural model, it is necessary that the measurement model is validated using a different set of data collected from the same population[91]. The modification of the initial measurement model using the calibrated sample (N=224) necessitated the need to validate the measurement model with a new data set (validation samples; N=223)[92] in order to test the stability of the model (if the measurement model will fit new data). Cross–validation provides a confirmation that the measurement model survived initial testing and is stable with other samples (Hair et al. 2006; Mastorakis 2009). This involves evaluating the fit of the measurement model in the two dataset and if the two data sets fit the model then cross validation is established and the researcher can proceed with further analyses. In addition, it is recommended that the estimates from the calibration and validation data should have the same degree of freedom (Hair et al. 2006).

As indicated in Table 9.2, the results of both the calibration and validation data resulted in an acceptable fit, indicating that the model is stable and as a result the researcher can proceed with further analyses.

[91] See Sections 6.7 and 6.9.4.2 for further information on calibration and validation data
[92] See Appendices 15b and 15c for descriptive analysis of the calibration and validation data

Table 9.2: CFA Result for Cross-Validation Samples

Fit Indices	Calibration Sample N=224	Validation Sample N=223
χ^2	208	207
df	139	139
CMIN/DF	1.50	1.50
GFI	.91	.91
CFI	.99	.99
NFI	.97	.97
TLI	.98	.98
RMSEA	.05	.05
ECVI	1.394< Saturated and independent models	1.391<Saturated and independent models
AIC	310.8< Saturated and independent models	308.7< Saturated and independent models
Bollen-Stein p	.112	.155

9.5.3 Descriptive and CFA Analysis of the Model's Constructs

Having established and validated the measurement model as demonstrating a good fit, it is important to gain an insight into each construct, in terms of the impact of individual items on their representative construct as well as the amount of variance due to random factors beyond the researcher's control. Regression weight (factor loading) and error variance were analysed for each item in relation to their respective latent variable (construct). The impact of each item on its representative construct is discussed next.

9.5.3.1 Service Productivity (SP)

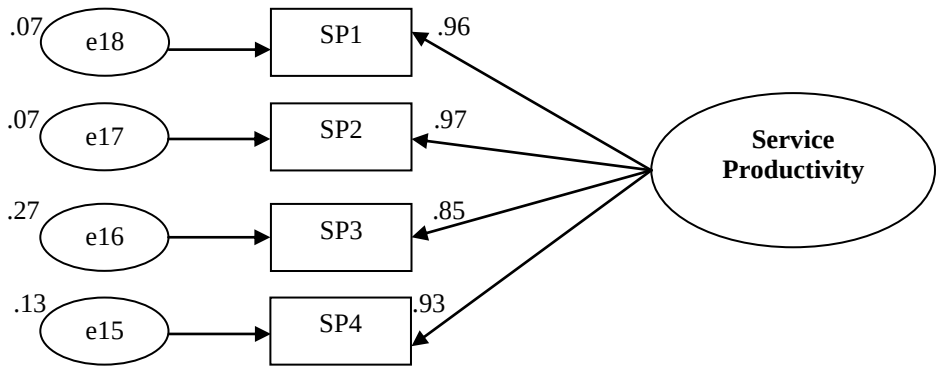
SP was measured using four (4) items. Respondents were asked to indicate the extent to which each item reflected their perception of their institution`s productivity. Table 9.3 highlights respondents' evaluation of the scale items relating to the construct SP. The analysis of the items relating to the construct indicated that respondents rated items relatively the same, with item SP3 being the most influential indicator and item SP1 being the least influential item in defining the construct SP, while items SP2 and SP4 had the same influence on SP.

In addition, as indicated in Figure 9.2, all the items had a positive effect on SP, indicating that, the four items were all significant and related to the construct. The regression weight ranged from .85 to .97, with item SP2 being the most effective/influential indicator of SP and item SP3 being the least influential indicator of SP. Further, all items indicated high construct reliability> .70 (Hair et al. 2006). The error variances for SP1, SP2, SP3 and SP4 were .07, .07, .27 and .13 respectively, with item SP3 accounting for the largest error in the scale while items SP1 and SP2 accounted for the least error in the scale.

Table 9.3: Mean and Standard Deviation for the Service Productivity Construct

Item	Mean	Std. Deviation
SP1- Activity levels in my institution have increased.	3.47	1.015
SP2- Balancing the efficiency and effectiveness of my institution`s outputs is a major priority for my institution.	3.50	1.033
SP3- My institution delivers its services promptly.	3.52	1.067
SP4- My institution meets its performance targets and expectations.	3.50	1.092

Figure 9.2: Service Productivity Regression Weight



9.5.3.2 Resource Commitment (RC)

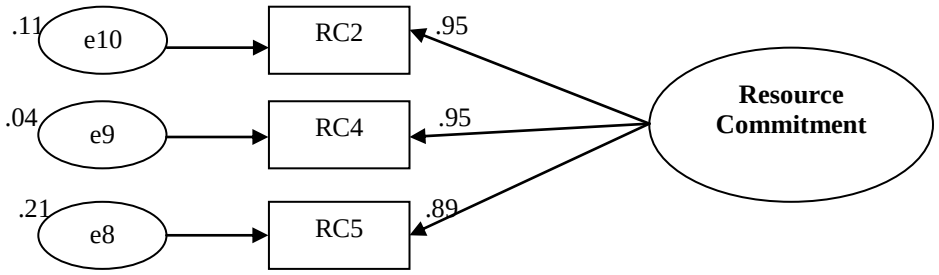
RC was measured using three (3) items. Table 9.4 highlights respondents' evaluation of the scale items relating to the construct RC. The analysis of the items relating to the construct indicated that respondents rated the items relatively the same, with item RC4 being the most influential indicator and item RC2 being the least influential indicator in defining the construct RC.

In addition, as indicated in Figure 9.3, all the items had a positive impact on RC, indicating that, the three items are all significant and related to the construct. The regression weight ranged from .89 to .95, with items RC2 and RC4 being the most effective/influential indicators of ER and item RC5 being the least influential indicator of RC. All items indicated high construct reliability. The error variances for RC2, RC4 and RC5 were .11, .04 and .21 respectively with item RC5 accounting for the largest error in the scale while item RC4 accounted for the least error in the scale.

Table 9.4: Mean and Standard Deviation for the Resource Commitment Construct

Item	Mean	Std. Deviation
RC2- My institution is committed in providing the necessary technological resources required to improve productivity.	3.34	1.043
RC4- My institution is committed in providing the necessary managerial support.	3.39	1.005
RC5- Financial resources made available to my institution are inadequate.	3.35	1.053

Figure 9.3 : Resource Commitment Regression Weight



9.5.3.3 Employee Readiness (ER)

ER was measured using six (6) items. Table 9.5 highlights respondents' evaluation of the scale items relating to the construct ER. The analysis of the items relating to the construct indicated that respondents rated items relatively the same, meaning that each item had the same influence on the construct ER.

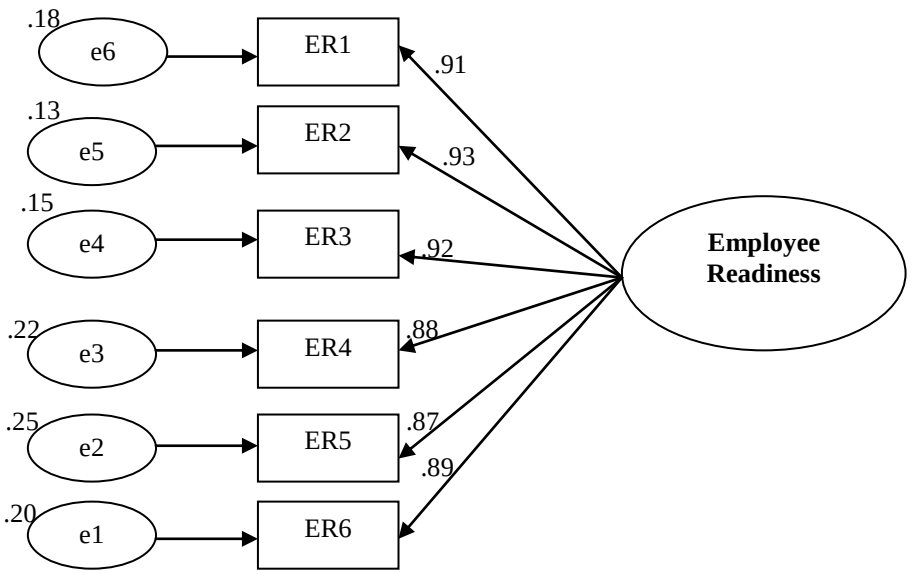
As indicated in Figure 9.4, all the items had a positive effect on ER, indicating that the six items were all significant and related to the construct. The regression weight ranged from .87 to .93, with item ER2 being the most effective/influential indicator of ER and item ER5 being the least influential indicator of ER.

All items indicated high construct reliability. The error variances for ER1, ER2, ER3, ER4, ER5 and ER6 were, 0.18, 0.13, 0.15, .22, .25 and .20 respectively with item ER5 accounting for the largest error in the scale while item ER2 accounted for the least error in the scale.

Table 9.5: Mean and Standard Deviation for the Employee Readiness Construct

Item	Median	Std. Deviation
ER1- Employees in my institution are knowledgeable about our products and services	4.00	.774
ER2- Employees in my institution are well trained and competent to perform their work accurately.	4.00	.807
ER3- Employees in my institution know their job and responsibilities for which they are hired.	4.00	.803
ER4- In the course of performing tasks in my institution, employees understand how to complete necessary forms/ paperwork.	4.00	.836
ER5- Employees in my institution understand how different work groups contribute to the organisation`s goals.	4.00	.776
ER6- My institution`s employees are professional when performing their duties	4.00	.777

Figure 9.4: Employee Readiness Regression Weight



9.5.3.4 Customer Readiness (CR)

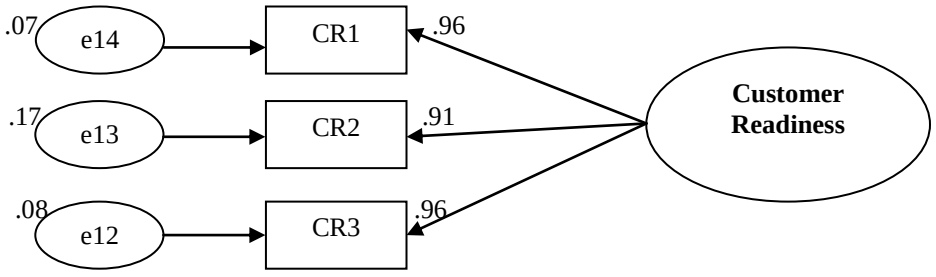
CR was measured using three (3) items. Table 9.6 highlights respondents' evaluation of the scale items relating to the construct CR. The analysis of the items relating to the construct indicated that respondents rated items relatively the same, with item CR2 being the most influential item and item CR1 being the influential item in defining the construct CR

In addition, as highlighted in Figure 9.5, all the items had a positive impact on CR, indicating that the three items are all significant and related to the construct. The regression weight ranged from .91 to .96, with items CR1 and CR3 being the most effective/influential indicator of CR and item CR2 being the least influential indicator of CR. All items indicated high construct reliability. The error variances for CR1, CR2 and CR3 were, 0.7, 0.17 and 0.08, respectively with item CR2 accounting for the largest error in the scale while item CR3 accounted for the least error in the scale.

Table 9.6: Mean and Standard Deviation for the Customer Readiness Construct

Item	Mean	Std. Deviation
CR1: Students in my institution are highly motivated to perform their role during seminars.	3.22	1.089
CR2: Students in my institution work cooperatively with their tutors	3.40	1.006
CR3 : Students in my institution prepare before attending seminars	3.26	1.058

Figure 9.5: Customer Readiness Regression Weight



9.5.3.5 Stakeholder Satisfaction (SS)

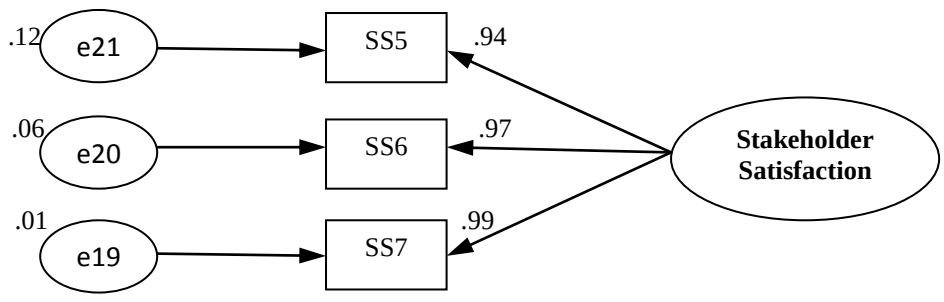
Finally, the construct SS was measured using three (3) items. Table 9.7 highlights respondents' evaluation of the scale items relating to the construct SS. The analysis of the items relating to the construct indicated that most respondents rated items relatively the same, with item SS6 and SS7 being the most influential indicators and item SS5 being the least influential item in defining the construct SS.

As indicated in Figure 9.6, all the items had a positive effect on SS, indicating that the three items are all significant and related to the construct. The regression weight ranged from .94 to .99, with item SS7 being the most effective/influential indicator of SS and item SS5 being the least influential indicator of ER. All items indicated high construct reliability (Hair et al. 2006). The error variances for SS5, SS6 and SS7 were, 0.12, 0.06 and 0.01 respectively, with item SS5 accounting for the largest error in the scale while item SS7 accounted for the least error in the scale.

Table 9.7: Mean and Standard Deviation for the Stakeholder Satisfaction Construct

Item	Mean	Std. Deviation
SS5- Employees in my institution would leave to take a similar job at another institution if given a choice.	3.62	.972
SS6- There seems to be a feeling that dissatisfaction is high among students in my Institution.	3.65	.973
SS7- My institution`s reputation has improved	3.65	.954

Figure 9.6: Stakeholder Satisfaction Regression Weight



9.5.4 Assessment of Validity and Reliability

The assessment of a measurement model`s validity requires the demonstration of the model`s construct validity and reliability. This involves demonstrating face, content and construct validity as well as construct reliability. As demonstrated in Chapter Seven, the scales demonstrated strong content and face validity[93]. Having established face and content validity of the scales, it is important that construct validity is also demonstrated (See Table 6.12 for the criteria for evaluating construct validity). This involves establishing convergent and discriminant validity. In demonstrating convergent validity, the measurement model had factor loadings and SMC (R^2) values ranging from .85 to .99 and .73 to .99 respectively. In addition, from Tables 9.8 and 9.9, all AVE values $\geq$ .50 and Composite Reliability $\geq$ .70 demonstrated strong convergent validity (Mak and Sockel 2001; Gefen and Straub 2005; Hair et al. 1998; 2006).

In relation to discriminant validity, examination of the result identified no cross-loading and the measurement model identified the highest correlation between constructs as .82; therefore, all inter-construct correlations (IC) were <.85, indicating discriminant validity as well as the absence of multicollinearity (Kline 1998; Chu 2010). In addition, all the AVE estimates in Table 9.9 were larger than their corresponding inter-construct correlation (SIC) estimates, indicating that the indicators have more in common with their respective constructs than the other construct in the study domain. Therefore, the measurement model demonstrated strong discriminant validity and the absence of multicollinearity (Fornell and Larcker 1981; Chin and Newsted 1999; Rai et al. 2006).

Construct reliability, on the other hand, was assessed using Cronbach`s alpha by evaluating the overall model reliability and the reliability for each construct (See Table 6.12 for the criteria for evaluating construct reliability). Overall, the measurement model demonstrated a very high reliability of .97. In addition, all the domain`s constructs demonstrated high reliability and internal consistency among items and their representative construct (Resource Commitment =.95; Employee Readiness =.96; Customer Readiness =.96; Service Productivity =.96; Stakeholder Satisfaction = .98). Based on the preceding

[93] See Section 7.7

discussion, it can be concluded that the modified measurement model is valid and reliable and indicated a good fit with its observed data.

Table 9.8: Inter-Construct Correlation[94]

Construct	Item	Standardised Factor Loading	Squared Standardised Factor Loading (R^2)	Measurement Error (1-R^2)	AVE	CR[95]	SIC
Service Productivity (SP)	SP1	.96	.93	.07	.87	.96	.53, .62. , .53, .49
	SP2	.97	.93	.07			
	SP3	.85	.73	.27			
	SP4	.93	.87	.13			
Resource Commitment (RC)	RC2	.95	.89	.11	.87	.95	.60,.62, .67, .62
	RC4	.95	.91	.04			
	RC5	.89	.79	.21			
Employee Readiness (ER)	ER1	.91	.83	.18	.83	.96	.60, .49, .41, .52
	ER2	.93	.87	.13			
	ER3	.92	.85	.15			
	ER4	.88	.78	.22			
	ER5	.87	.75	.25			
	ER6	.89	.80	.20			
Customer Readiness (CR)	CR1	.96	.93	.07	.90	.96	.41, .53, .67, .53
	CR2	.91	.83	.17			
	CR3	.96	.92	.08			
Stakeholder Satisfaction (SS)	SS5	.94	.96	.12	.94	.98	.53, .62, .52, .53
	SS6	.97	.94	.06			
	SS7	.99	.99	.01			

Table 9.9: Inter-Construct Correlation (IC) and AVE[96]

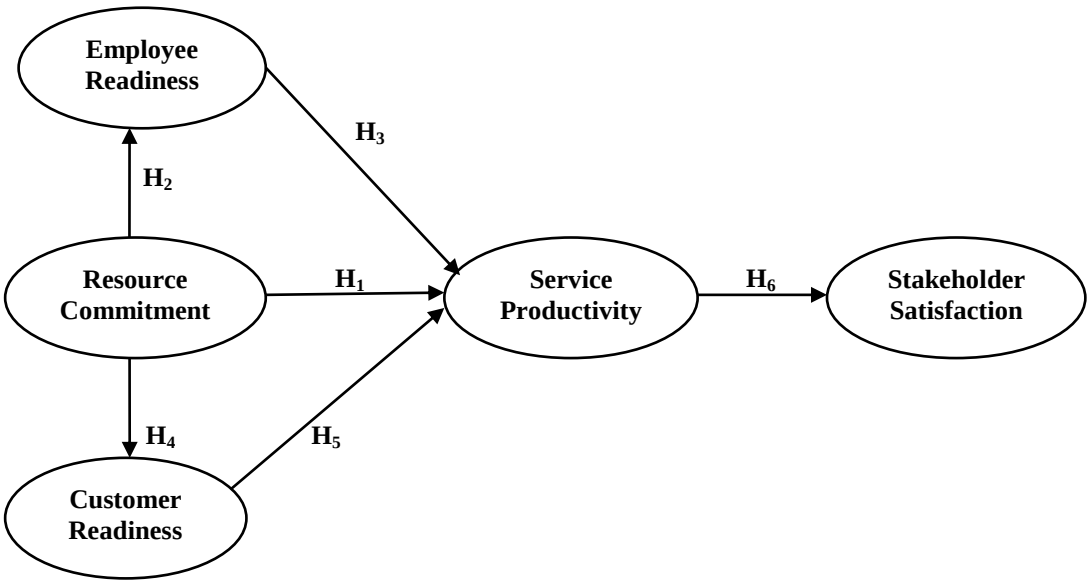
Construct	RC	ER	CR	SP	SS
RC	**.87**				
ER	.77	**.83**			
CR	.82	.64	**.90**		
SP	.79	.70	.73	**.87**	
SS	.79	.72	.73	.73	**.94**

[94] See Appendix 19 on AVE, CR and, SIC meaning and calculation. SIC values were created from IC values in Table 9.9.
[95] CR here refers to Composite Reliability and differs from the construct Customer Readiness (CR)
[96] Diagonal values (in bold) represent AVE

9.6 STRUCTURAL MODEL DEVELOPMENT AND SPECIFICATION

Figure 9.7 depicts the theoretical relationships hypothesised by the researcher in the conceptualisation chapter. The measurement and structural sub-models presented in Appendix 20 was represented in a path diagram, with 4 unobserved endogenous variables/constructs (ER; CR; SP; SS); 1 unobserved exogenous variables/constructs (RC); 19 items (observed endogenous variables); 19 error variables; and 4 disturbance variables. In addition, the items were represented as reflective indicators and an over-identified and recursive model was specified.

Figure 9.7: Structural Model



9.7 ASSESSMENT OF STRUCTURAL MODEL VALIDITY AND HYPOTHESES TESTING

This thesis proposition to use the two-step approach as previously discussed requires the estimation of the measurement model and subsequent simultaneous estimation of the measurement and structural sub-models. Having validated the measurement model, the simultaneous estimation of the measurement and structural sub-models was evaluated next to assess the overall structural model`s validity and to test the hypothesised relationships.

9.7.1 Structural Model Validity

The structural model fit estimates demonstrated a good fit (χ^2= 285 *df* = 143; p < 0.01; CMIN/df= 1.99; GFI=.89; CFI=.97; TLI=.97; RMSEA= .06; ECVI=1.703[97]; AIC= 379.8[98]). Table 9.10 highlights a comparison between the fit indices for the measurement model`s calibration and validation data and structural model. In addition, Table 9.11 highlights the parameter estimates differences for the measurement and structural model. This is necessary to establish the stability of the measurement and structural model and to avoid interpretational confounding (Hair et al. 2006). Fluctuations in parameter estimates ≤ .05 are recommended as acceptable (Hair et al. 2006: 884-855).

From Table 9.11, the standardised regression weights of the parameter estimates produced by AMOS did not show any significant deviation. The parameter estimate differences were < .05, indicating that parameter estimates are stable among the measured items. This suggests the absence of interpretational confounding and further establishes the stability of the proposed model. It can, therefore, be concluded that the proposed structural model is valid and indicates a good fit with its observed data.

[97] ECVI value for proposed model (default model) < saturated and independence model
[98] AIC value for proposed model (default model) < saturated and independence model

Table 9.10: Measurement and Structural Model Fit Indices

Fit Indices	Calibration Measurement Model *N*=224	Validation Measurement Model *N*= 223	Structural Model *N*=224
χ^2	208	207	285
df	139	139	143
CMIN/DF	1.50	1.50	1.99
GFI	.91	.91	.89
CFI	.99	.99	.98
NFI	.97	.97	.96
TLI	.98	.98	. 97
ECVI	1.394	1.391	1.703
RMSEA	.05	.05	.06
AIC	310.8	308.7	379.8

Table 9.11: Parameter Estimates Difference between Measurement and Structural Models

Item	Standardized Regression Weights		Parameter Differences
	Measurement Model	Structural Model	
ER6	.89	.89	-
ER5	.87	.87	-
ER4	.88	.88	-
ER3	.92	.92	-
ER2	.93	.93	-
ER1	.91	.91	-
RC5	.89	.89	-
RC4	.95	.95	-
RC2	.95	.94	**.01**
CR3	.96	.96	-
CR2	.91	.91	-
CR1	.96	.97	**.01**
SP4	.93	.93	-
SP3	.85	.86	**.01**
SP2	.97	.96	**.01**
SP1	.96	.96	-
SS7	.99	1.00	**.01**
SS6	.97	.97	-
SS5	.94	.94	-

9.7.2 Testing Alternative Models

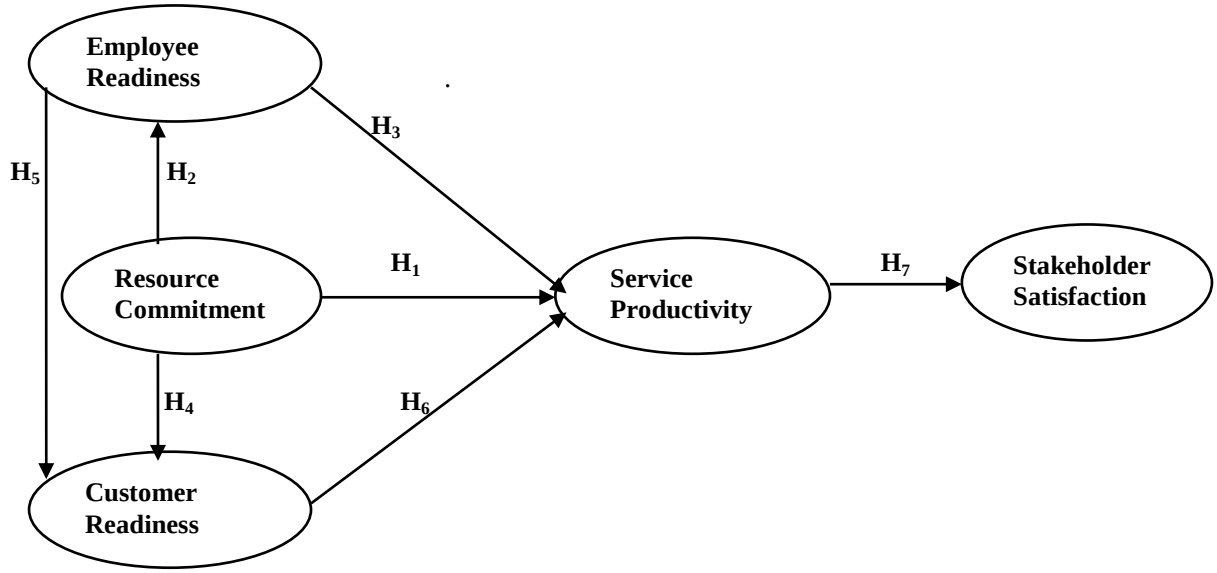
A fitting structural model in SEM does not guarantee that the model is the best and ultimate model representing a phenomenon but rather, one of the possible explanations of the phenomenon. As a result, the researcher has to ensure that the best fitting model is chosen among other alternative models. McDonald and Ringo Ho (2002) recommended that researchers using SEM should justify their chosen model by testing with other alternative models. This assures the researcher that their chosen model scores the best fit among other alternative models (Schumacker and Lomax 2004). As explained, a theoretically sound model has alternative competing models with different relationships hypothesised between its latent variables, and it is important that the researcher evaluates these models together with his/her proposed model in order to select the best fitting model (Ketchen and Bergh 2006). Based on these recommendations, four (4) alternative nested models (B, C, D and E) were rationally and theoretically specified[99]. These are discussed next:

9.7.2.1 Alternative Model B

Model B differs from the proposed model A by hypothesising and theorising a relationship between ER and CR. In addition to the theoretical arguments put forward in Chapter Five. Model B further argues that service employee behaviour have impact on customer behaviour during co-production **(**See Figure 9.8). This view is supported by Jones (2009), by highlighting the impact of employee training and competence on customer behaviour and productivity. Several other scholars have identified a positive relationship between employee behaviour and customer satisfaction and performance related behaviour (Heskett et al. 1994; Brooks 2000; Koys 2001; Sweetman 2001; Corporate Leadership Council 2003; Konrad 2006).

[99] The researcher proposed model was be labelled as model A

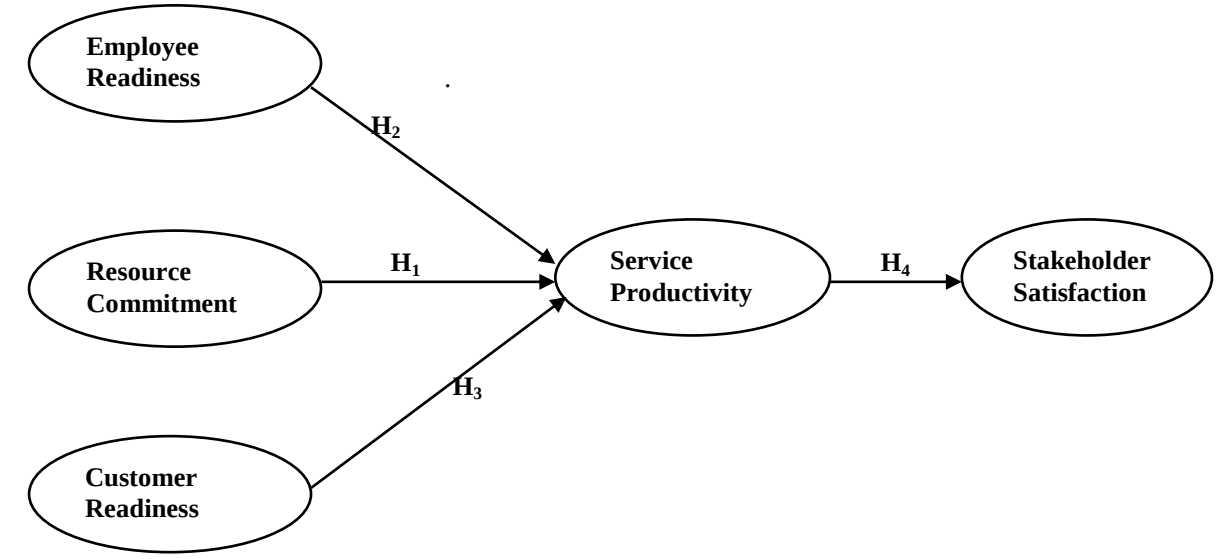
Figure 9.8: Alternative Model B



9.7.2.2 Alternative Model C

Model C theorises that ER, RC and CR directly impact on SP and SP directly impacts on SS (See Chapter Five). This differs from the proposed model A, for the reason that RC has no relationship with ER and CR. The argument here is that resource commitment does not impact on ER or CR **(**See Figure 9.9).

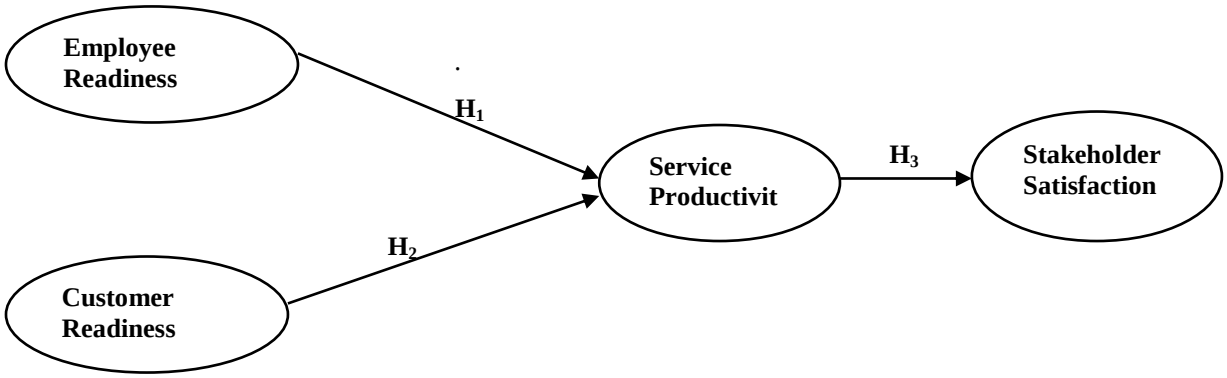
Figure 9.9: Alternative Model C



9.7.2.3 Alternative Model D

Model D theorises that ER and CR impact directly on SP and further SP impacts directly on SS (See Chapter Five). This differs from proposed model A since the construct RC is not integrated into the model; therefore, there is no relationship between RC and ER, CR and, SP (See Figure 9.10).

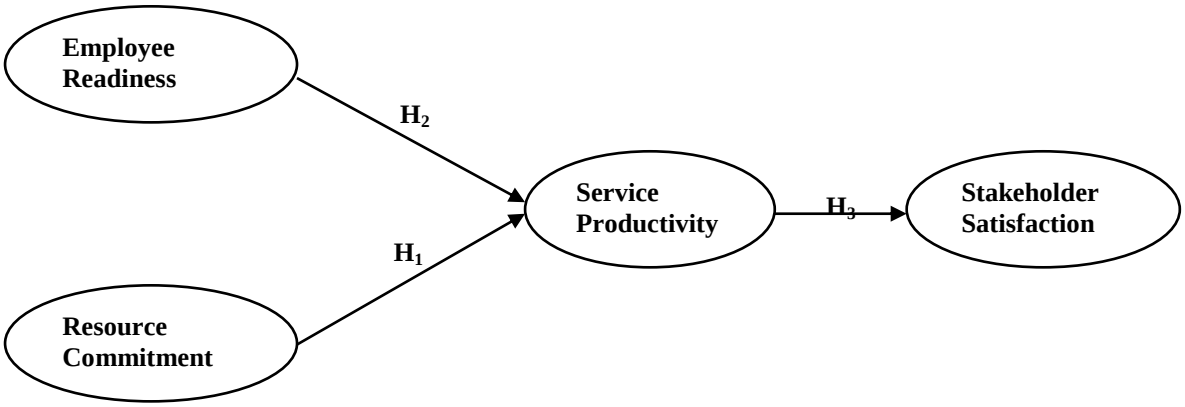
Figure 9.10: Alternative Model D



9.7.2.4: Alternative Model E

Model E theorises that the constructs ER and RC impact directly on SP and further SP impacts directly on SS (See Chapter Five). This differs from the proposed model A because CR is not integrated into the model. This is based on the argument that customers are free input to the service process (Bateson 1992); therefore, there is no relationship between CR and RC and SP (See Table 9.11).

Figure 9.11: Alternative Model E



9.7.3 Evaluation of Alternative Model Fit

The researcher`s proposed structural model (A) together with the four alternative models were evaluated for the best fitting and most parsimonious model representing this thesis` phenomenon. From Table 9.12, it can be seen that the researcher`s proposed model A had a better fit than the alternative models (B, C, D, and E). Model A indices were within the recommended acceptable fit indices while Model B was the next close fit model. In addition, Joreskog and Sorbom (1993) recommended chi-square difference test as a method for evaluating the best fitting model among alternatives. From Table 9.13, it is clear that model A represents the best fitting and most parsimonious model with chi-square differences of 1, 397, 22 and 105 with model B, C, D and E respectively. It can, therefore, be concluded that the researcher`s proposed model (model A) is the most parsimonious model to represent this thesis phenomenon. Based on this understanding, further evaluation, hypotheses testing and discussions were centred on model A.

Table 9.12: Fit Indices for Alternative Structural Models

Model	***X*²**	***df***	**CMIN/df**	**GFI**	**CFI**	**NFI**	**TLI**	**ECVI**	**RMSEA**	**AIC[100]**
Main model A (5 constructs)	285	143	1.99	.89	.98	.96	.97	1.70	.06	379.8
Alternative model B (5 constructs)	286	142	2.00	.89	.97	.96	.96	1.71[101]	.07	381.8
Alternative model C (5 constructs)	682	145	4.70	.77	.91	.89	.90	3.46[102]	.13	771.9
Alternative model D (4constructs)	307	98	3.14	.87	.96	.94	.96	1.72[103]	.10	383.7
Alternative model E (4 constructs)	390	98	3.98	.84	.94	.93	.93	2.09[104]	.12	466.6

Table 9.13: Chi-square Differences between Alternative Models

Model comparison	**$\Delta\chi^2$**	**Δd.f.**
A-B	1	(-)1
A -C	397	(+)2
A-D	22	(-)45
A-E	105	(-)45

9.8 STRUCTURAL MODEL STRENGTH

Prior to the testing of the researcher`s hypotheses, it is necessary that the explanatory power of the structural model is evaluated and discussed. This is achieved by evaluating the amount of variance in endogenous variables, which is explained by the exogenous variables (Sharma 1996; Neuenburg 2010). This is determined by the R^2 values for the model`s

[100] AIC value for main model A was < saturated and independence model. Model (B, C, D, E) AIC values on the other hand was > saturated model. Therefore Model A was the most parsimonious model among the alternative models

[101] ECVI index < Saturated Model

[102] ECVI index > Saturated Model

[103] ECVI index < Saturated Model

[104] ECVI index > Saturated Model

endogenous variables[105]. Table 9.14 presents the R^2 values for the endogenous variables. From Table 9.14, the endogenous variables (ER; CR; SP; SS) all had R^2 >.50, meaning that the theoretical model had a significant and substantial proportion of their variance explained in the model. Section 9.9.1(hypothesis interpretation) discusses the structural model`s strength for each endogenous variable in the context of hypotheses testing.

Table 9.14: R^2 Values for the Endogenous Variables

Endogenous variable	R^2	R^2 (%)
ER	.60	(60%)
CR	.67	(67%)
SP	.68	(68%)
SS	.56	(56%)

9.9 STRUCTURAL MODEL HYPOTHESIS TESTING

The theory on SP expects that RC, ER, CR and SS are all related to SP but in different ways. This is discussed in detail in the conceptualisation chapter. Based on these conceptualisations, the following six hypotheses were proposed:

H_1: Resource commitment has a positive impact on service productivity.
$H_{2:}$ Resource commitment has a positive impact on employee readiness.
H_3: Employee readiness has a positive impact on service productivity.
H_4: Resource commitment has a positive impact on customer readiness.
H_5: Customer readiness has a positive impact on service productivity.
H_6: Service productivity has a positive impact on stakeholder satisfaction.

The result of the testing of the theoretical relationships/hypotheses proposed by the researcher is presented in Figure 9.12 and Table 9.15. From the result, all hypotheses were

[105] R^2 represent the variance in the model

supported and significant, with each hypothesised relationship having direct effects ranging from medium to large effects on their related constructs.

Figure 9.12: Structural Model Path Co-efficient [106]

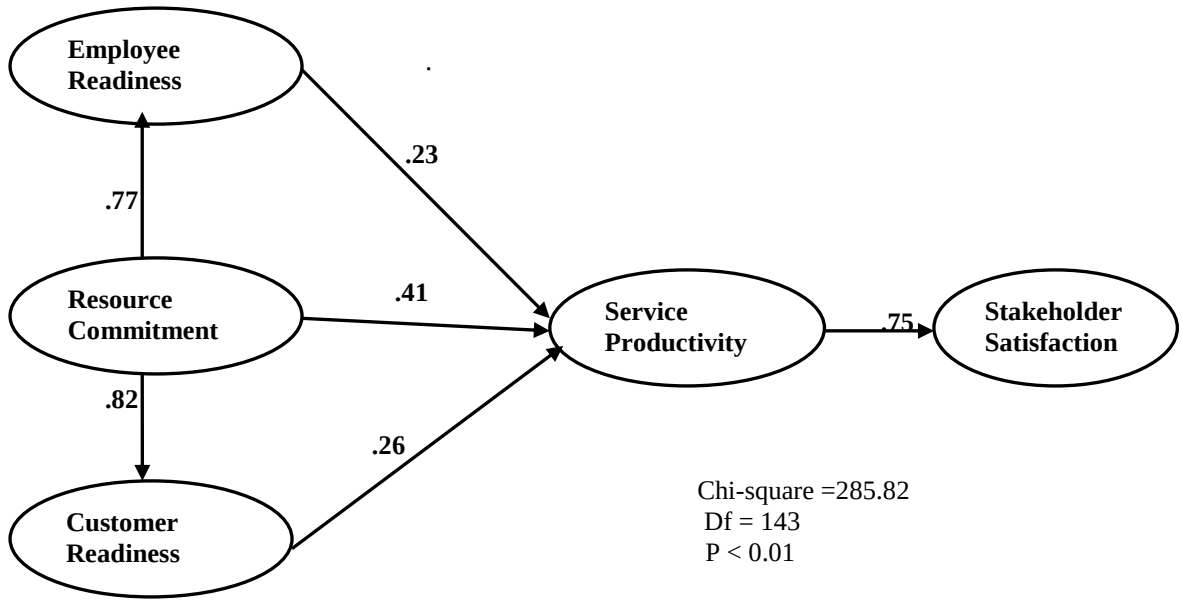


Table 9.15: Hypothesis Testing Summary

Hypothesis	**Path Coefficient**	**Effect**	**Supported**
H_1: Resource commitment has a positive impact on service productivity.	.41*	Medium	Yes
H_2: Resource commitment has a positive impact on employee readiness.	.77*	Large	Yes
H_3: Employee readiness has a positive impact on service productivity.	.23*	Medium	Yes
H_4: Resource commitment has a positive impact on customer readiness.	.82*	Large	Yes
H_5: Customer readiness has a positive impact on service productivity	.26*	Medium	Yes
H_6: Service productivity has a positive impact on stakeholder satisfaction.	.75*	Large	Yes
χ^2= 285 *df* = 143; p < 0.01; CMIN/df= 1.99; GFI=.89; CFI=.97; TLI=.97; RMSEA= .06; ECVI=1.703; AIC= 379.8 * Significant at 0.001 (two-tailed)			

[106] See Appendix 20 for AMOS output of the measurement and structural sub-models

9.9.1 Hypothesis Interpretation (Acceptance/Rejection)

Having tested the researcher`s hypotheses, which were presented as a structural model in Figure 9.12 and in the hypotheses testing summary in Table 9.15, each hypothesis is interpreted as follows:

H_1: Resource commitment has a positive impact on service productivity.

From Figure 9.12 and Table 9.15, the direct effect of RC on SP is .41, representing a positive medium and significant effect (P<.001). This means that a 1-point (standard deviation) increase in RC predicts a 0.41 (medium effect) increase in SP. The hypothesis (H_1) is, thus accepted and it can be inferred that greater resource commitment impacts positively and moderately on service productivity. It can, therefore, be concluded that the hypothesis (H_1) is valid and significant.

H_2: Resource commitment has a positive impact on employee readiness.

From Figure 9.12 and Table 9.15, the direct effect of RC on ER is .77, representing a positive large and significant effect (P<.001). This means that a 1-point (standard deviation) increase in RC, predicts a 0.77(large effect) increase in ER. The hypothesis (H_2) is, therefore, accepted and it can be inferred that greater resource commitment positively and significantly improves employee readiness. In addition, from Table 9.14, RC accounts for 60% of the variance (R^2) in ER. Thus, a substantial part of the variance in ER was accounted for by the model. It can, therefore, be concluded that the hypothesis (H_2) is valid and significant.

H_3: Employee readiness has a positive impact on service productivity.

From Figure 9.12 and Table 9.15, the direct effect of ER on SP is .23, representing a positive medium and significant effect (P<.001). This means that a 1-point (standard deviation) increase in ER, predicts a 0.23(medium effect) increase in SP. The hypothesis (H_3) is, therefore, accepted and it can be inferred that improved employee readiness positively and moderately improves service productivity. In addition, from Table 9.14, the proportion of total variance (R^2) in ER explained by its direct cause (exogenous variable) RC is 60%, while

40% of the variance in ER cannot be explained. Thus, a substantial part of the variance in ER was accounted for by the model. Hence, it can be concluded that the hypothesis (H_3) is valid and significant.

H $_4$: Resource commitment has a positive impact on customer readiness.

From Figure 9.12 and Table 9.15, the direct effect of RC on CR is .82, representing a positive large and significant effect (P<.001). This means that a 1-point (standard deviation) increase in RC, predicts a 0.82(large effect) increase in CR. The hypothesis (H_4) is, therefore, accepted and it can be inferred that greater resource commitment positively and significantly improves customer readiness. In addition, from Table 9.14, RC accounts for about 67% of the variance (R^2) in CR. Hence, it can be deduced that a substantial part of the variance in CR was accounted for by the model. It can, therefore, be concluded that the hypothesis (H_4) is valid and significant.

H $_5$: Customer readiness has a positive impact on service productivity.

From Figure 9.12 and Table 9.15, the direct effect of CR on SP is .26, representing a positive medium and significant effect (P<.001). This means that a 1-point (standard deviation) increase in CR, predicts a .26 (medium effect) increase in SP. The hypothesis (H_5) is, therefore, accepted and as a result, it can be inferred that improved customer readiness positively and moderately improves service productivity. In addition, from Table 9.14, the proportion of variance (R^2) in CR explained by its direct cause (exogenous variable) RC is 67%, while 33% cannot be explained. Therefore, a substantial part of the variance was accounted for by the model. Hence, it can be inferred that the hypothesis (H_5) is valid and significant.

H $_6$: Service productivity has a positive impact on stakeholder satisfaction.

From Figure 9.12 and Table 9.15, the direct effect of SP on SS is .75, representing a large positive and significant effect (P<.001). This means that a 1-point (standard deviation) increase in SP, predicts a 0.75 (large effect) increase in SS. The hypothesis (H_6) is, therefore, accepted and it can be inferred that improved service productivity positively and significantly improves stakeholder satisfaction. In addition, from Table 9.14, the proportion of total

variance (R^2) in SP explained by its hypothetical direct causes ER, RC and, CR is 68%, while 32% of the variance cannot be explained by its exogenous variables in the model. Furthermore, the proportion of total variance (R^2) in SS explained by its hypothetical direct causes SP is 56%, while 44% of the variance cannot be explained by its exogenous variable SP. The variance in SS represented the least explanatory power in the model, although it is still moderately significant. It can, therefore, be concluded that, the hypothesis (H_6) is valid and significant.

9.10 CONCLUSION

This chapter presented the findings for the evaluation of the measurement and structural model`s validity and reliability and the testing of the hypothesised relationships proposed by the researcher. The model development strategy using the two-step approach was adopted and data analysis was facilitated using SEM.

The measurement model demonstrated good fit after model re-specification (theoretically and statistically justified). In addition, the measurement model was identified as a valid and reliable measure. Further, the evaluation of the structural model`s validity demonstrated a good fit. Subsequently, the proposed hypotheses were tested and all hypotheses performed as predicted by the researcher. All antecedents' determinants (ER, CR, and RC) had medium effect on SP with RC having the greatest impact. In addition, SP had a large consequential effect on SS and represented the largest effect of the determinants of SP. Furthermore, the hypothesised relationships between the antecedent constructs (RC, ER and, CR) all had large effects.

The next chapter contains the conclusion and discussion of the thesis. This chapter discusses the findings of this thesis in relation to the literature review, with particular emphasis on the proposed SP model. It further draws conclusions on the study and provides recommendations for practitioners and scholars.

CHAPTER TEN: CONCLUSION AND DISCUSSION

10.1 INTRODUCTION

Productivity in services has been recognised in extant literature because of its importance to the economy, organisations and employees/individuals. The importance of productivity growth in services includes increased employment, improved standard of living, poverty reduction, GDP growth in national and global economies and support and anchor for the other sectors of the economy (Garner 2004; D'Agostino et al. 2006; Chesbrough and Spohrer 2006; WHO 2010).

Despite the importance of productivity in services, its conceptualisation and measurement have been problematic. As a result of the problems of conceptualising and measuring productivity in services, this thesis set out with the aim of developing a theoretically grounded model for measuring productivity in services which is tested in Business and Management Schools of the HE sector. The objectives of this thesis as highlighted in Section 1.3 were to:

- Understand the production processes in services.
- Define productivity holistically in a service context.
- Identify the determinants of productivity in services.
- Develop a theoretically grounded model and a scale to measure the determinants of SP.
- Carry out an empirical examination of the propose model within Business and Management Schools of the HE sector.

To achieve these aim and objectives, this thesis conceptualised Service Productivity (SP) through a conceptual model, which highlighted the antecedents and consequence as the determinants of SP. Causal determinants (antecedents) were Resource Commitment (RC), Employee Readiness (ER), and Customer Readiness (CR) while the outcome determinant (consequence) was Stakeholder Satisfaction (SS). In addition, certain relationships were hypothesised among these constructs in order to understand the nature of interactions among them.

The proposed conceptual model together with its hypothesised relationships was empirically tested and validated among academics within Business and Management Schools across Finland, Ghana, India and the UK and all hypothesised relationships were confirmed as positive and significant. Having validated the conceptual model and tested the researcher`s proposed hypotheses, the objective of the present chapter is to discuss the findings of the study, in relation to the literature review with particular emphasis on the proposed SP model and with the aim of addressing the research aim and objectives.

This chapter, therefore, discusses the findings of this thesis in terms of a general discussion for each construct, followed by a discussion on each hypothesis and how the research aim and objectives were achieved. It then discusses the contribution of this thesis in terms of its theoretical, methodological and managerial perspectives. Following this, the limitations of the thesis are discussed and finally, directions for future research into SP and its related constructs are suggested.

10.2 GENERAL FINDINGS AND DISCUSSION

In order to achieve the aim and objectives of this thesis discussed previously, the extant literature relating to this study was reviewed in order to understand the phenomenon better and to develop a theoretical model for SP. This led to the identification of Service Productivity (SP) as the central construct; Resource Commitment (RC), Employee Readiness (ER), Customer Readiness (CR) as the antecedents of SP and Stakeholder Satisfaction (SS) as

the consequence of SP. In addition, extant literature, existing scales and the results of the semi-structured interview were reviewed, which led to the identification of multi-item scales for capturing the researcher`s proposed constructs. Further, a card sort exercise was undertaken to refine the scale items, which led to the development of the initial measurement instrument (questionnaire). Following that, a pilot study was undertaken to critique the questionnaire and lastly an EFA study was undertaken to identify the underlying constructs capturing the set of item pool and to assess the reliability of the scale.

Having identified and confirmed the indicators capturing SP and its related constructs, the measurement model was tested amongst academics within Business and Management Schools across Finland, Ghana, India and the UK in order to investigate if the measurement model theoretically fits the data (empirically). Using the calibration data (n=224), the initial measurement model was re-specified by deleting five indicators and correlating measurement errors, which resulted in an acceptable model fit. This was theoretically and statistically justified. This was further validated using the validation data (n=223), which validated the measurement model as an acceptable fit. Each construct was measured by multiple indicators, which were developed, purified and identified as valid and reliable measures. This resulted in nineteen indicators for measuring the five constructs. Each construct is discussed next with its related items listed in order of its impact/importance on their related construct.

Service Productivity (SP) relates to the measurement of the performance of the service transformation process and was defined earlier in Chapter Five as the relationship between the outcome of the service transformation process and the input to the service transformation process. This was measured using the newly developed scale with four (4) items, including balancing the efficiency and effectiveness, increased activity levels, meeting performance targets and expectations, and delivering service promptly. Balancing efficiency and effectiveness was identified as the most influential indicator in determining service productivity. This is consistent with semi-structured interview and extant literature identification of efficiency and effectiveness as key concepts in the understanding and measurement of service productivity (Parson 1997; Grönroos and Ojasalo 2004).

Resource Commitment (RC) was defined as the allocation of tangible and intangible resources at the firm disposal to enhance productivity. This was measured using the newly developed scale with three (3) items, including technological resources, managerial

support and financial resources. Technological resources were identified as the most influential indicator of organisational resource commitment to organisational activities. The findings are consistent with Park et al.`s (2002) conceptualisation of resource commitment, which identified managerial, technological and financial resources. These items are also consistent with semi-structured interview results as well as Hunt`s (2000) identification of tangible and intangible resources and Vargo and Lusch`s (2008) classification of service resources into operant and operand resources.

Employee Readiness (ER) was defined as employees` state of preparedness to perform their service-related task successfully with other entities during service co-production. This was measured using the newly developed scale with six (6) indicators, including employees` training and competence, employee knowledge about job roles and responsibilities, employee knowledge about organisational products and services, employees` professionalism, employee understanding of how to complete job, and employee understanding of workgroup expectations. These indicators emphasised the importance of employee training, competence and knowledge in the performance of their required role during service co-production. This is consistent with semi-structured interview and extant literature on employee readiness factors, which identified employee training, knowledge and competence as key factors in determining employee readiness and employees` performance-related behaviours (Madsen et al. 2005; Miller et al. 2006; Jaaskelainen and lonnqvist 2009).

Customer Readiness (CR) was defined as customers` state of preparedness to perform their service-related task successfully with other entities during service co-production. This was measured using the newly developed scale with three (3) items, including customer motivation, customer preparation and customer cooperation with employees. These items emphasise the need for service organisations to motivate their customers in order for customers to perform their required role during co-production successfully. This is consistent with the identification of customer motivation and willingness as impacting on customer behaviour and readiness (Meuter et al. 2005; Halepota 2005; Auh et al. 2007). In addition, it also emphasises the need for customers to do some preparation (in terms of learning and rehearsing their required role) prior to their participation in the service process as well as to cooperate with service employees and other customers during service co-production.

Stakeholder Satisfaction (SS) was defined as the extent to which organisational stakeholders' expectations are fulfilled (Berrone et al. 2007:3). This was measured using the newly developed scale with three (3) items, including organisational reputation, customer satisfaction and, employee satisfaction. It identified organisational reputation as the most influential indicator in determining stakeholder satisfaction. This is consistent with Luoma-aho`s (2008) identification of organisational reputation as an important determinant when assessing stakeholders' satisfaction. Therefore, when organisational reputation is high and customers and employees are satisfied, the organisations stakeholders can be said to be satisfied.

10.3 DISCUSSION OF RESEARCH HYPOTHESES

Having identified the indicators capturing service productivity and its related constructs, a SEM analysis was applied to test the research hypotheses, which relate to the relationships among the five constructs. All six hypotheses were supported and significant[107]. The findings for each hypothesis are discussed next under the headings of the antecedence and consequence of service productivity.

10.4 ANTECEDENTS OF SERVICE PRODUCTIVITY

Earlier, in Chapter Five, the constructs RC, ER, and CR were identified as the antecedents of SP and as a result, certain hypotheses were proposed and tested. Each hypothesis is discussed under the heading of its relevant construct.

[107] See Table 9.15

10.4.1 Resource Commitment (Hypothesis H_1)

From the results in Chapter Nine and Table 9.15, it is evident that this thesis supports the first hypothesis *(H_1)*, that a positive relationship exists between resource commitment and service productivity. Hypothesis *(H_1)* was supported and the relationship was statistically significant; meaning that the allocation of tangible and intangible resources at the firm`s disposal improves and enhances organisational productivity. In addition, among the antecedent determinants of SP, RC had the largest impact on SP, therefore, emphasising the importance of organisational commitment of resources on productivity in services. This finding is consistent with the findings of other scholars who identified tangible and intangible resources as impacting on productivity (Arthur 1994; Richey et al. 2005). Further, this finding deviates from Vargo and Lusch`s (2004; 2008) sole emphasis on operant resources by establishing the importance of both operand and operant resources (tangible and intangible resources respectively) on value co-creation and productivity in services.

10.4.2 Employee Readiness (Hypotheses H_2 and H_3)

From Table 9.15, hypothesis (H_2) was supported, indicating that there is a positive relationship between resource commitment and employee readiness. This relationship was supported and statistically significant, meaning that, when service organisations allocate intangible and tangible resources to their organisational activities, it improves employees` preparedness to perform their service related task successfully with other co-producers. This finding is consistent with the theory of social exchange, motivation norm of reciprocity and organisational justice (Homans 1961; Blau 1964; Greenberg 1987; 1990) as well as the findings of other extant literature on the impact of organisational resource commitment on human resource development and employee willingness to work harder towards the attainment of organisational objectives (Arthur 1994; Wood and De Menezes 1998; Barnes and McClure 2009).

In addition, hypothesis (H_3) suggested a positive relationship between employee readiness and service productivity. From Table 9.15**,** hypothesis (H_3) was supported and the

relationship was statistically significant, meaning that, when service employees are prepared and willing to perform their service related task successfully with other co-producers, productivity within the organisation improves. These findings were consistent with the findings of other scholars on the relationship between employee behaviour and organisational productivity (Ostroff and Bowen 2000; Whitener 2001; Qammar et al. 2007).

Overall, hypotheses (H_2) and (H_3) suggest that productivity levels in service organisations can be improved if service organisations strategise and devote greater and appropriate resources towards the development of their employee readiness to perform their service related task successfully with other employees and customers. This emphasises the importance of employees in service organisations and how employee recruitment, selection, development and socialisation can impact on organisational productivity.

10.4.3 Customer Readiness (Hypotheses H_4 and H_5)

From Table 9.15, it is evident that this thesis supports the fourth hypothesis (H_4), that a positive relationship exists between resource commitment and customer readiness. This hypothesis was supported and the relationship was statistically significant, meaning that, when service organisations allocate intangible and tangible resources towards their organisational activities and the development of their customer (partial employee) resources, its improve customer level of preparedness to perform their service related task successfully during service co-production.

This is consistent with Bowen`s (1986) assertion that the commitment of organisational resources towards customer resource development can impact on customers` ability, role clarity and motivation to contribute to the service production and delivery process. In addition, this is consistent with Bitner et al.`s (1997) suggestion that customer`s effective participation can be enhanced by service organisations. These findings suggest that service organisations that treat their co-production customers as partial employees (customer resources) by investing in them in similar ways as their employees will improve customer behaviour, performance and effective participation in the service co-production process.

Further, hypothesis (H_5) suggested a positive relationship between customer readiness and service productivity. From Table 9.15, hypothesis (H_5) was supported and the relationship was statistically significant, meaning that, when customers are prepared and willing to perform their service related task successfully during service co-production, productivity within the service organisation improves and vice versa. These findings are consistent with other extant literature, which identified a positive relationship between customer behaviour and organisational productivity (Lovelock and Young 1979; Gronroos 1990; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Bateson, 2002; Ojasalo 1999, 2003; Kotzé and Plessis 2003).

Overall, hypotheses (H_4) and (H_5) suggest that productivity levels in service organisations can be improved if customer readiness is developed and ameliorated. This involves the recognition of customers as partial employees, as well as the devotion of organisational resources towards the development of customer readiness (customer resources) to perform their co-production role successfully with other entities during service co-production. This entails the devotion of organisational time and resources to selecting and targeting (customer segmentation) the right customers; providing customers with the right skills and knowledge to perform their expected roles during co-production; and socialising and motivating customers into the organisational production system.

10.5 CONSEQUENCE OF SERVICE PRODUCTIVITY

Earlier, in Chapter Five, the construct stakeholder satisfaction was identified as the consequence (outcome) of service productivity and as a result, hypothesis (H_6) was proposed and tested. This is discussed next.

10.5.1 Stakeholder Satisfaction (Hypothesis H_6)

The last hypothesis (H_6) suggested a positive relationship between service productivity and stakeholder satisfaction. From Table 9.15, hypothesis (H_6) was supported

and the relationship was statistically significant, meaning that, when a service organisation is productive, it impacts positively on the satisfaction of its stakeholders. Therefore, when organisational productivity improves, it can be inferred that its stakeholders are satisfied as well. This finding is consistent with Stainer and Stainer` (2003) findings, which identified a positive relationship between productivity and stakeholder satisfaction. Similarly, these findings conform with the service profit chain concept by identifying the relationship between SP and the satisfaction of organisational stakeholders (Heskett et al. 1994:1997) and the concept of a "cycle of success" and "cycle of failure"(Schlesinger and Heskett 1991).

In summary, the key findings are that resource commitment impacts positively on both employee readiness and customer readiness (hypotheses H_2 and H_4). Subsequently, resource commitment, employee readiness and customer readiness (hypotheses H_1; H_3 and; H_5) together impact positively on service productivity. Finally, service productivity impacts positively on stakeholder satisfaction (hypothesis H_6).

Based on these findings, productivity in service is, therefore, determined by the extent to which service organisations are willing to commitment adequate and appropriate resources to organisational activities and the extent to which organisational employees and customers are prepared to co-produce services during service co-production. An interesting finding that emerged was the identification of customer role and impact on service productivity. The research identified customer motivation, preparation and cooperation as core factors defining customer readiness to co-produce services with other co-producers and further identified customer role as impacting on service productivity.

These findings differ from other findings that have relied predominately on the traditional/manufacturing-based productivity concepts by identifying the impact of service customers on service productivity. In addition, the research findings extend the traditional productivity concept, which limits productivity gains to organisational and customer value/satisfaction to include all organisational stakeholders including employees, society and government. Therefore, an organisation is deemed productive only when all of its stakeholders are satisfied with the performance and behaviour of the organisation.

10.6 ACHIEVING THE THESIS OBJECTIVES AND AIM

This thesis set out with the aim of developing a theoretically grounded model for measuring productivity in services which was tested in Business and Management Schools of the HE sector. The first objective was to understand the production processes in services. This was achieved through the review of extant literature. From the result, the production process in services differs from the dominant manufacturing-based production process. In services, the production process entails an input, transformation process and outcome dimensions. Inputs in services extend beyond the manufacturing-based production process to include customer input. In addition, the transformation process involves customer participation and outcome is determined by the customer and other stakeholders and is dependent on the consequence of the services on all stakeholders.

The second objective was to define productivity holistically in the service context and this was achieved through the review of extant literature. SP was defined holistically as the relationship between the outcome of the service transformation process and the input to the service transformation process. From this definition, inputs relate to the resources a service organisation uses in its transformation process towards the attainment of organisational outcome objectives. These resources include both organisational and customer resources (both operant and operand resources or tangible and intangible resources). Service outcome, on the other hand, relates to the impact of the service transformation process, products/services on its stakeholders. The proposed definition, therefore, identifies the areas in which productivity in services should be measured and managed and is conceptually applicable in all services.

The third objective was to identify the determinants of productivity in services. This objective was achieved through the review of extant literature and further refinement through semi-structured interviews, a card sort exercise and EFA study. Based on the results, the constructs RC, ER and CR were identified as antecedent determinants of SP, while SS was identified as a consequence (outcome) determinant of SP.

Based on the identification of the determinants of SP, the fourth objective was to develop a theoretically grounded model and scales to measure the determinants of SP. This

was achieved through the review of extant literature, semi-structured interviews, a card sort exercise, pilot study and an EFA study. This led to the proposition of the conceptual framework and conceptual model for measuring productivity in services (See Figures 5.2 and 5.3). The proposed conceptual framework and model placed SP as the focal point in determining the relationship between SP and its related constructs by assuming two key relationships. This entails the identification of certain factors as antecedents and consequential determinants of SP as well as the identification of these determinants as having direct relationship with the central concept (SP). Further, this led to the development of multi-item scales for measuring SP and its related constructs. The final scales measuring SP and its related constructs demonstrated a very good face and content validity as well as a very high internal consistency (reliability).

The fifth and final objective was to carry out an empirical examination of the propose SP model in Business and Management Schools of the HE sector. To achieve this objective, empirical data was collected using the designed questionnaire from 447 HE Business and Management School academics across Finland, Ghana, India and the UK. Based on the result of the statistical analysis using SEM, the findings revealed that resource commitment positively and significantly influences the level of employee readiness and customer readiness. In addition, resource commitment, employee readiness and customer readiness positively and significantly influence service productivity. Finally, service productivity positively and significantly influences stakeholder satisfaction.

Based on the preceding objectives discussed, the main aim of this thesis, which was to develop a theoretically grounded model for measuring productivity in services was achieved. This was achieved through the proposition and development of the SP model and the testing of the relationships between SP and its related constructs.

10.7 CONTRIBUTION OF THE THESIS

This thesis contribution can be discussed from theoretical, methodological and managerial perspectives. These are discussed next:

10.7.1 Theoretical and Methodological Contributions

Theoretically, this thesis contributes to multidisciplinary theory-building on SP, the service production process, employee productivity, customer productivity and, service co-production/co-creation of value. In addition, this thesis contributes to the methodological issues in measuring SP and its related constructs. These are discussed next:

1. Prior studies on SP have relied on manufacturing-based production processes in its conceptualisation. This thesis, therefore, advances our understanding of the production process in services by explicitly differentiating it from manufacturing-based production processes. It identified the production process in services as entailing an input, transformation process and outcome dimensions. The outcome dimension resolves the problems of measuring service output under the manufacturing-based productivity logic. In addition, it recognises service outcome as determined by all stakeholders within an organisation and having impact on all organisational stakeholders as opposed to the manufacturing logic, in which output is determined by the producer alone and its impact is limited to shareholder value and profitability. This thesis goes a step further by recognising that service outcomes impact not only on the organisation and its customers but on other stakeholders as well.

   The understanding and demarcation of the production process in services would, therefore, enhance the conceptualisation and measurement of SP, particularly in the HE sector, whose production process entails an input, process and outcome dimensions. This understanding will further impact on the validity of the

conceptualisation and measurement of SP and its related constructs. This is consistent with Adam et al.`s (1981) view that the understanding of the production process in services is fundamental to any progress on the measurement of productivity in services. Therefore, it is imperative that service productivity researchers resort to the use of the proposed service production process identified by this thesis in their conceptualisation and measurement of productivity in services.

2. This thesis advances our understanding of productivity measurement in services by defining SP holistically and proposing a conceptual model for measuring SP. The proposed definition of SP differs from existing definitions by embracing a holistic approach that integrates the aforementioned production process in services. In addition, the proposed conceptual model differs from existing conceptualisations of SP by taking a holistic approach as opposed to existing conceptualisations, which have been criticised as being piecemeal; focusing on partial-factor productivity measures; and lacking a multidisciplinary perspective (Singh et al. 2000; Sahay 2005; Zemguliene 2009).

3. This thesis advances our understanding on the conceptualisation of productivity measurement in services by establishing the factors/determinants of SP and introducing the constructs "employee readiness"; "customer readiness"; "resource commitment"; and "stakeholder satisfaction" These newly proposed constructs holistically capture the factors that affect productivity in services. This takes into consideration the open system nature of the production process in services, which involves organisational resources, employees and customers co-producing services and recognises the impact of these factors on organisational productivity.

   The research also identified the consequence of service outcome as impacting beyond the interest of the organisation by recognising that productivity outcomes in services impact on all organisational stakeholders and are determined by all stakeholders based on their satisfaction with the organisational behaviour, processes and products. These findings add a flavour to Vargo and Lusch`s (2004; 2008) conceptualisation of the service-dominant logic of marketing by establishing the impact of operant resources (employee and customer readiness) and operand resources (organisational resources) on productivity. Furthermore, the proposed constructs add to the arsenal of variables

and constructs available to SP researchers for undertaking their pursued research interest.

4. The introduction of the construct CR to the SP research domain enhances our understanding of customer co-production behaviour and productivity by identifying the factors affecting customer behaviour to become value co-creators or destroyers and productivity enhancers or deterrents, which is lacking in existing literature. This thesis identified customer motivation, preparation and cooperation as key indicators in determining the readiness level of customers to co-produce services.

   In addition, it identified service customers as an important determinant in the understanding and measurement of productivity in services by conceptualising and empirically confirming customer impact on SP. These findings are consistent with extant literature conceptualisation, which identified customer role as impacting on SP (Lovelock and Young 1979; Mills and Morris 1986; Kelley et al. 1990; Schneider and Bowen 1995; Zeithaml and Bitner 1996; Rodie and Kleine 2000; Bateson 2002; Kotzé and Plessis 2003). However, this thesis goes a step further by empirically identifying the factors impacting on customer behaviour to become productive or unproductive and/or value enhancers or detractors, which is lacking in extant literature.

   It further recognised the importance of organisational resources as a key factor impacting on customer level of readiness to co-produce services with other co-producers. Furthermore, it extends the theory on organisational human resources management to the customer domain by identifying that the investment and development of customer resources has implications for organisational productivity. This reconfirms the recognition in extant literature of customers as part-time employees in services.

5. The introduction of the construct ER to the SP research domain enhances our understanding on the theory relating to employee impact on productivity by extending it to the service co-production scenario. This thesis identified employees` training and competence, employee knowledge and understanding about job roles and responsibilities, employee knowledge about organisational products and services, employee professionalism, employee understanding of how to complete the job and,

employee understanding of workgroup expectations as key indicators in determining the readiness level of employees to co-produce services. In addition, it identified employees as a key determinant in the understanding and measurement of productivity in services by conceptualising and empirically confirming the impact of employees on SP. It further recognised the importance of organisational resources as a key factor impacting on employees` level of readiness to co-produce with customers.

6. This thesis extends the concept of value to a stakeholder perspective as opposed to the current marketing perspective, which describes value as created by the organisation and further limits the concept of value to the customer and shareholder domain (Slywotzky 1996; Woodruff 1997). This thesis recognises service outcome as value co-created and impacting on different stakeholders. This is consistent with Vargo and Lusch`s (2008) conceptualisation of the service dominant logic. However, while Vargo and Lusch (2008) limit this to the producer and customer domain, this thesis identified that productivity outcome in services impact beyond the producer and customer domain to include other stakeholders including employees, government and communities, by identifying the outcome of productivity in services as impacting on the satisfaction and value of all organisational stakeholders. This understanding further contributes to current research themes in service marketing/management literature including the service dominant logic of marketing and value co-creation by taking a broader stakeholder perspective.

7. On the methodological front, this thesis contributes to the existing scales in marketing by proposing new constructs and developing multi-item scales to measure these constructs. These scales were identified as having high reliability and validity and as a result, other researchers may adopt these scales in further studies relating to SP and its related constructs.

8. Finally, the theoretical contribution of this thesis discussed so far will in the long run further the understanding and measurement of aggregate productivity growth in services by economists and statisticians.

10.7.2 Managerial Contributions

Managerially, this thesis contributes to the managerial understanding on the measurement and management of productivity in services with particular emphasis on the HE sector. These are discussed next:

1. The proposed and validated SP model and conceptual framework highlighted the factors in which service managers can use in measuring, managing and improving productivity in their organisations[108]. These factors include human resources, customer resources and, organisational resources. In addition, it provides service managers with potential tools for diagnosing productivity problems and finding solutions to these problems.

   In the HE context, the proposed model will enable HE managers to prioritise their resources, employees and customers (particularly students) in their teaching, research and administrative processes in ways that will provide better outcomes for stakeholders. In addition, the proposed model will assist HE managers in identifying productivity problems based on the level and type of resources committed to organisational activities; the readiness level of customers and employees; and the satisfaction level of organisational stakeholders.

2. This thesis offers service managers guidelines on the strategies by which employees and customers' readiness can be developed and managed towards the co-production of service. The multi-scale items capturing the ER and CR constructs offer several clues on the factors affecting employee and customer preparedness for co-production. This understanding will assist service managers in recruiting and selecting the right employees as well as in developing employees' skills, knowledge and competence. More importantly, on the customer front, the understanding of CR will assist service managers in selecting the right customers; segmenting customers into different customer groups based on their readiness level; socialising customers to the

[108] See Figures 5.2 and 5.3 respectively.

organisation; motivating customers to perform their required role; and developing customers` skills and knowledge on their co-production role.

For instance, in the HE sector, the ER construct will assist HE managers in developing strategies that attracts the right employees (academics with PhD's, high publication rate and experience with teaching and student support) as well as socialising employees to the organisation and providing employees with the necessary skills and knowledge to perform their co-production role successfully. In addition, the CR construct will assist HE managers in developing strategies to attract and recruit highly qualified students; socialise students to the institutional cultural and procedures; develop students' knowledge and skills to participate fully in academic and other institutional activities; and provide appropriate rewards (both intrinsic and extrinsic) for students behaviour and performance. This thesis, therefore, enhances organisational strategies for managing employee and customer behaviour during co-production, which is fundamental to productivity improvement in services.

3. The proposed service production process and conceptual framework (See Figures 4.2 and 5.2/5.3 respectively) will enable service managers to identify problematic areas within their production process, service blueprints and servicescapes; to design/re-design their production process, service blueprints and servicescapes; and to provide possible solutions that enhance the service encounter and experience. This is consistent with Shostack`s (1984) and Fließ and Kleinaltenkamp`s (2004) suggestion that the use of service specific production process in designing organisational service blueprints and processes will facilitate the management of the service encounter and experience.

   In the HE context, the proposed service production process and conceptual framework will facilitate the design of service blueprints within the HE sector. This is because, traditionally, HE production process models have relied greatly on manufacturing-based concepts, resulting in the failure to design appropriate service blueprints for managing customer experience and service encounter. This has resulted in the failure to recognise students as co-producers and inputs resources and the overreliance on output measures instead of outcome measures. The proposed service production process and conceptual framework recognises students as inputs and co-producers to

teaching, research and administrative processes within HEIs. It further recognises that teaching, research and administrative processes results in outcomes beyond the interest of HEIs to include students, employees, funding agencies, industries, communities, society and government. This emphasises the need for HE managers to prioritise all stakeholders in their service delivery process and decision making.

The proposed service production process, therefore, offers HE managers a framework for designing their service blueprint, as well as in identifying problematic areas within their production process and service blueprints and provides possible solutions that will enhance the service encounter and experience of all organisational stakeholders.

4. Finally, considering the growing importance of stakeholders in organisational behaviour and performance issues, this thesis offers service managers the strategies for developing and enhancing their relationships with different stakeholders. The proposed SS construct offers service managers the opportunity to understand and involve stakeholders in organisational decision making; thereby providing the platform for organisations to develop good relationships with their stakeholders, leading to stakeholder loyalty, commitment and satisfaction. In addition, the proposed SS construct offers service managers the opportunity to understand stakeholders` expectations and perception about organisational productivity and performance. This understanding will enable service managers to obtain and utilise diverse perspectives in their organisational tactical and strategic decision-making, thereby enhancing the organisational decision-making process and outcomes.

   Relating this to the HE context, this thesis offers HE managers the ability to listen to and incorporate various stakeholders` views/perspectives in their institutional tactical and strategic decisions. Tactically, this will enable HE managers to understand the expectations of stakeholders prior to undertaking production activities (teaching, research and administrative activities). Strategically, this will assist HEIs in forging long-term partnership/relationship with their stakeholders. This will in turn impact on institutional reputation, funding and student and employee experience, satisfaction and loyalty.

10.8 LIMITATIONS OF THE STUDY

As in all research, there are limitations to this thesis, which should be reviewed and be used as a pointer for future research. Several conceptual and methodological limitations were identified earlier and were resolved using data triangulation, theoretical triangulation and methodological triangulation (Denzin 1989)[109]. However, not all limitations were dealt with. These are discussed next:

1. Although the proposed and validated theoretical model was generalised to the entire service sector, this study was empirically tested in Business and Management Schools within the HE sector as a result of the similarities of the HE sector with other services industries as discussed in Section 1.4.2. However, it must also be emphasised that the HE sector also differs from other services, particularly the service factories, in terms of its specific inputs, processes and outputs/outcomes. As a result, the application of the theoretical model in other services may produce varying outcomes in relation to the direction and importance of the relationships among the proposed model specified constructs.

   In addition, the application of the proposed and validated theoretical model within the different disciplines or schools within the HE sector may also produce varying outcomes, as a result of the differences between the different disciplines and schools in terms of the nature of inputs, processes and outcomes.

2. Although the data were collected from different countries, data volume per country was insufficient to evaluate the proposed model from a country perspective in order to determine how well the model fits in different countries, as well as the nature and strength of relationship among the researcher`s proposed constructs in different countries. In addition, although the demographic characteristics of the respondents' from the different countries and their response to the scale items did not differ significantly; respondents` time allocated to teaching, research and administrative duties varied significantly across the different countries. This may have impacted the

[109] See Chapters Five and Six

overall result of this study as well as the nature and strength of the theoretical relationship among the proposed constructs in the different countries.

3. Despite the importance of students and other support service employees in HE productivity measurement and management, this study only selected academic employees as respondents for the study[110]. This may have impacted on the holistic evaluation of the proposed constructs, particularly on the constructs customer readiness, employee readiness and stakeholder satisfaction.

4. This thesis was limited to factors/determinants within the control of the organisation, while external factors were not considered. External factors include competition, political, economic, social, legal, technological and environmental. For example, the nature of competition, legal, technological and social factors prevailing within an economy or business environment can influence customer and employee readiness to participate in the co-production process as well as impact on service productivity. However, this thesis did not consider the effect of these factors on the proposed constructs, particularly on SP.

5. The impacts of employee and customer demographic variables on SP were not studied, despite the recognition of demographic variables impacting on customer/employee readiness level (Hanpachern et al. 1998; Wanberg and Banas 2000; Weber and Weber 2001; Madsen et al. 2005; Holt et al. 2007) and organisational productivity (Hamilton et al. 2004; Tang and Macleod 2006; Skirbekk 2008).

6. The current economic situation and changes in the HE sector might have impacted on employee response to the questionnaire items, especially as this study relates to productivity issues.

7. Lastly, the high level of abstraction adopted in this thesis` conceptualisation meant that the scope of the construct dimensionality was restricted to a first order specification and as a result, failed to understand in greater detail the dimensionality of the proposed constructs (Jarvis et al. 2003; Carneiro et al. 2007)

[110] See Section 3.6 for the justification for using service employees and Section 6.3.1.2 for using academic employees.

10.9 RECOMMENDATIONS FOR FUTURE RESEARCH

The development of a theory to explain a complex phenomenon such as service productivity requires the integration of an unlimited number of factors in order to understand the phenomenon wholly. However, researchers are limited in the number of factors to consider in their research due to time, cost, methodological and disciplinary constraints, as well as the researcher`s imperfect understanding of the phenomenon prior to its investigation. As a result, not all the factors relating to a phenomenon can be studied; therefore, parsimony is the ultimate ideal. In achieving parsimony, certain recommendations are made for future research. These are discussed next:

1. It is recommended that future research on SP should replicate this study in other service settings as this thesis was limited to the HE sector. This will enable us to ascertain whether the determinants of SP identified in this thesis are universal among all services or whether different service industries have distinct determinants, particularly in the service factories where customer involvement is limited. In addition, future studies should apply the proposed and validated theoretical model in other disciplines or schools within the HE sector, as this study was limited to Business and Management Schools.

2. Future studies on SP should replicate this study in different countries to see if the researcher`s proposed theoretical model will fit in individual countries or in developing, emerging and developed economies and to confirm if the determinants are universal among different countries.

3. Future studies on HE productivity should examine if the researcher`s proposed model will fit or produce varying results in research-focused and teaching-focused HEIs as well as examine the impact of teaching, research and administrative duties on the evaluation of the proposed model and other HE productivity models and measures.

4. Future research on SP and its related constructs should adopt a stakeholder perspective in its sampling decisions as well as in the selection of respondents,

particularly on studies capturing employee readiness, customer readiness and stakeholder satisfaction.

5. The high level of abstraction used in this thesis for understanding the phenomenon meant that the newly proposed constructs should be studied individually as a second-order constructs in order to further our understanding on the multidimensional nature of the proposed constructs.

6. Future studies should look at the cyclical effect of SS on ER, CR, RC and SP, as this thesis was limited to productivity at a point in time. Therefore, if resources and time permit, studying SP longitudinally rather than a cross-sectional study will offer more useful information on the robustness of the proposed model over time.

7. Future research should focus on the impact of external and demographic variables on the researcher`s proposed constructs.

8. Finally, future methodological research should be directed towards our understanding of the nature and causes of bias in service employee subjective measures of their organisational productivity and on the ER construct. This is due to this thesis` correlation of measurement errors between SP indicators and ER indicators[111]. This has been attributed to the priming/halo effect and interaction effect (Reddy 1992). However, there is a need for research attention to understand this better, particularly with reference to the constructs SP and ER.

[111] This relates to within-construct error correlation (See Table 9.1 and Appendix 9)

10.10 CONCLUSION

Research on service productivity holds a promising prospect as the service sector dominates world economies and as economics, management and marketing concepts evolves from organisational power/control to stakeholder empowerment. This thesis, therefore, set the pace on managerial and scholarly research relating to productivity measurement in services.

Overall, as a result of the inadequacy of conceptualisations of SP, this thesis developed and empirically tested and validated the proposed conceptual model on SP. From the result of the empirical studies, the researcher concluded that SP should be measured from antecedents and consequence perspectives. It further concluded that SP should be measured and managed using the level of ER, CR, RC as well as the extent of SS. Therefore, service organisations that commit appropriate and adequate resources to their production process in preparing and developing employee and customer readiness to perform their service co-production related task successfully, will become more productive and subsequently impact on stakeholders' satisfaction and vice versa.

Finally, it is hoped that the findings of this research and its recommendations will be embraced by scholars and service practitioners including HE managers, to understand, measure and manage productivity in services.

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APPENDICES

APPENDIX 1

UK`s HE Sector Contribution to GDP and Employment (2008/2009)

HE Contribution to UK GDP Compared to other Sectors (2007/2008)

Source: Universities UK (2009)

Impact of the HE Sector on the UK Economy (2007/2008)

Source: Universities UK (2009

[112] All employment figures are full-time equivalents

APPENDIX 2

Objective and Subjective Performance Measures Studies

SOURCE	PERFORMANCE MEASURES
OBJECTIVE MEASURES	
• Au and Tse (1995)	• Hotel Occupancy Rates.
• Jaworski and Kohli (1993)	• Market Share.
• Diamantopoulos and Hart (1993)	• Sales growth and average profit margin compared to industry average.
• Esslemont and Lewis (1991)	• Return on investment and change in Return on investment.
• Anderson (1994)	• Market share, and profitability using national customer satisfaction index and return on investment.
SUBJECTIVE MEASURES	
• Deshpandé et al. (1993)	• Subjective evaluation of profit, size, market share and growth compared to largest competitor.
• Slater and Narver (1993)	• Subjective evaluation of ROA, sales growth and new product success, relative to competitors.
• Pelham and Wilson (1996)	• Subjective evaluation of business position relative to expectations.
• Patterson et al. 2003	• Explore employee attitudes on company effectiveness and company financial performance.
• Fick and Ritchie (1991)	• Service quality in the travel and tourism Industry.
• Stevens et al. (1995)	• Measuring service quality in restaurants by guest perception.

APPENDIX 3A

Manufacturing Sector Productivity Measures

RESEARCH	MEASUREMENT TYPE	DESCRIPTION
Diewert and Nakamura (1993) McLaughlin and Coffey (1990)	Input/output ratios	Measures the relationship between manufactured output and input and are normally associated with partial productivity measurements. Referred to as the rubric of factor productivity
Mundel and Danner (1998)	Time study	Analyses specific job in an effort to find the most efficient method in terms of time.
Buchholz,et al. (1996)	Time standard methods- work sampling	Work sampling, involves observation of worker(s) at either random or fixed time in providing an estimate of time spent in completing a task.
Marley et al. (1954)	Methods-Time Measurement (MTM); Stop-Watch-Timing; Predetermined Time Standards; Historical Standards; Time Reporting	Involves the determination of methods and times from a table of standard time values for the fundamental body motions used in industrial work. Body motions involves reach, move, turn, grasp, position, disengage, and release.

APPENDIX 3B

Productivity Measurements in Services

RESEARCH	SERVICE INDUSTRY	PRODUCTIVITY MEASUREMENT METHOD	SERVICE INPUT	SERVICE OUTPUT
Johnes (2006)	Higher Education	Data Envelopment Analysis	· The number of undergraduates · Average A level score of undergraduate entrants	· Number of graduates achieving 'good' degrees · Number of graduates going into employment.
Färe, Grosskopf and Roos (1989)	Hospital Service	Malmquist Approach	· Total costs for treatment in fixed years prices	· Number of patients · Average change in daily life activities
Cavin and Stafford (1985)	Employment Service	Production Frontier Analysis	· Total Cost Of Staff	· Average wage for those who had obtained jobs · Number of young people given jobs · Number of individuals given jobs
Cummins and Weiss (1998)	Insurance Industry	Frontier Efficiency Methods		· Present value of losses incurred
Hooper and Hensher (1997)	Airline Industry/ Airport	Total Factor Productivity Index		· Deflated income
Paton et al. (2004)	Gambling Industry	Stochastic Frontier Analysis	· Materials · Energy · Employment	· Gross Output Gross Value Added
Duncan and Elliott (2004)	Financial Services	Data Envelopment Analysis; Expense/Income Ratio and Return on Assets	· Total deposits · Total non-interest expense	· Total Income
Althin and Behrenz (2005)	Employment Services	Relative, Technical Efficiency and Malmquist Productivity Indices	· Number of full-time assistants · Number of full-time placement officers · Number of full-time counsellors · Office space-Square meters	· Number of individuals with open market jobs · Number of individuals with placement in part-time work.

Continued on next page

APPENDIX 3B

Productivity Measurements in Services

RESEARCH	SERVICE INDUSTRY	PRODUCTIVITY MEASUREMENT METHOD	SERVICE INPUT	SERVICE OUTPUT
Miller and Adam(1996)	Health services	Partial Factor Productivity for each input; Total Factor Productivity; Data Envelopment Analysis	· Dollar value of all labour · Percentage rate of return on facility usage · Expenditures dedicated to the maintenance of assets · Dollar value of all supplies and services purchased	· Output-dollar amount of patient charges
Yu and Ramanathan (2008)	Retail sector	(DEA); (MPI), bootstrapped Tobit Regression Model	· Total assets · Shareholders funds ·Number of employee turnover · Profit	· Turnover · Profit before taxation
Lozano-Vivasa, and Humphrey (2002)	Banking industry	DEA (Malmquist index) ; Stochastic Cost Frontier	· Savings deposits · Time deposits · Certificates of deposits (CDs)	· Business loans · Consumer loans · Securities demand deposits
Chalos and Cherian (1995)	Public-sector	Data Envelopment Analysis	· Operating expenditure per-pupil · Attendance rate · Percentage rate of teachers with masters degree · Teacher-pupil ratio · Years of experience · Percentage of Non-low income families. · % Non-minority families	· Math IGAP · Verbal IGAP

APPENDIX 4

Inputs, Transformation Process, Outputs and Outcomes Examples in Services

Service	Input	Transformation Process	Output	Outcome
Health	Labour and skill of doctors and nurses. Prescription drugs and other medical supplies. Hospitals, clinics and other buildings.	Operations carried out. Drugs administered. Advice given.	Health care: change in physical capability and additional health knowledge gained.	Better quality of life (more social interaction, mental well-being, etc). Longer life. Enhanced employment prospects.
Education	Labour and teaching skill of teachers and support staff. Teaching aids. Buildings and computers.	Lessons taught. Homework marked. Guidance given.	Additional knowledge and skills imparted – proxied by full-time equivalent. Number of students effectively attending lessons.	Better job/earning prospects. Improved citizenship. Enhanced life skills. Enhanced health and nutrition knowledge.
Social Care	Labour of staff processing claims. Welfare officers Stationary and meals. Buildings and equipment.	Accommodation provided. Cleaning and catering services. Equipment provided. Advice given and assessments made.	Social care – a change in physical or mental state – proxied by care-weeks.	Better quality of life (more social interaction, safer, mental wellbeing).

Adapted from Camus (2007)

APPENDIX 5

Interview Script

Thank you for your decision to participation in this interview. Productivity is an important and challenging topic in services particularly in higher education and its meaning and understanding varies from industry to industry and from individuals. Based on this and the objectives of my research, I would like to know your opinion on the following.

- In general, how do you describe productivity in services?
- Narrowing down to the HE sector, how would you describe productivity in the HE sector?
- What does productivity mean to you as an academic?
- What are the main aspects that one ought to consider when measuring productivity in services?
- What does employee readiness, customer readiness, resource commitment and stakeholder satisfaction mean to you?
- What criteria would you use in determining the productivity of higher education institutions?
- What criteria would you use in determining the employee readiness, customer readiness, resource commitment and stakeholder satisfaction?
- Would you use a different criterion in determining service productivity, employee readiness, customer readiness, resource commitment and stakeholder satisfaction in other service sectors? If yes, what are these?
- Do you think, efficiency and effectiveness play an important role in the understanding and measurement of productivity in services?
- Is there anything else you would like to say?

Thank you for your participation and valuable contribution

APPENDIX 6A

Card Sort Exercise Brief

Thesis Title: Service Productivity Measurement: An Application to Higher Education Business and Management Schools

Task for Card Sorting Exercise

Thanks for your decision to participate in this exercise. This exercise will involve the following task. This exercise will involve the following task.

Task 1:

Please identify the most relevant items to measure each construct/dimension by placing cards into appropriate board indicating the relevant construct/dimension and if an item is irrelevant for the identified construct/dimension, please card into N/A board.

Task 2:

Once items are selected for each construct/dimension and placed into appropriate board, Please rank each items selected for each construct on its importance/relevance to the construct.

Task 3:

Please concentrate on the wording of the items, is there any comment about the clarity, simplicity and ambiguity on any items.

APPENDIX 6B

Analysis of Card Sort Participant Agreement and Content Validity

No	Items	SP	CR	ER	RC	SS	N/A[113]	CPA[114]	AAC[115]	CVR[116]
1	Our institution is not only concerned about the quantity of its output but the quality as well	40%	0%	0%	0%	60%	0%	2	50%	<1
2	If our institution`s stakeholders are unhappy, nothing else matters	0%	0%	0%	0%	**100%**	0%	1	100%	1
3	our institution`s financial performance has improved	40%	0%	0%	20%	20%	20%	4	25%	<1
4	our institution`s reputation has improved	0%	0%	0%	0%	**100%**	0%	1	100%	1
5	In general after students leave this institution, they maintain a strong commitment to the institution	0%	60%	0%	0%	40%	0%	2	50%	<1
6	Most employees in our institution would leave to take a similar job at another institution if given a choice	0%	0%	0%	0%	**100%**	0%	1	100%	1
7	Our institution contribute to society	0%	0%	0%	0%	**100%**	0%	1	100%	1
8	Our institution complies with government laws and regulations	0%	0%	0%	0%	**100%**	0%	1	100%	1
9	Financial resources made available to our department is inadequate	0%	0%	0%	**100%**	0%	0%	1	100%	1
10	Our institution management are highly involved when it comes to productivity issues.	0%	0%	0%	**100%**	0%	0%	1	100%	1
11	Our institution is committed in providing the necessary technological resources required to improve productivity	0%	0%	0%	**100%**	0%	0%	1	100%	1
12	There is a lot of support from top management when it comes to productivity improvement	0%	0%	0%	**100%**	0%	0%	1	100%	1
13	Most students in our institution are knowledgeable about their expected role during lectures and seminars	0%	**100%**	0%	0%	0%	0%	1	100%	1
14	There seems to be a feeling that dissatisfaction is high among students in our institution	0%	0%	0%	0%	**100%**	0%	1	100%	1
15	There is a high level of complaints from employers regarding our student performance at work	0%	0%	0%	0%	**100%**	0%	1	100%	1
16	Whenever resources are required to perform a service, our institution provides it.	0%	0%	0%	**100%**	0%	0%	1	100%	1
17	Our institution`s student will recommend our institution to prospective students	20%	40%	0%	0%	40%	0%	3	33%	<1
18	Most students in our institution are highly motivated to perform their role during lectures and seminars	0%	**100%**	0%	0%	0%	0%	1	100%	1
19	Most students in our institution are experienced in Higher Education services	17%	67%	0%	0%	0%	17%	3	33%	<1

Continue on next page

23[113] Not Appropriate

[114] Categories per card (number of construct items is associated to)

[115] Average Agreement Per Category

[116] Content Validity Ratio. [116] Lawshe (1975) CVR is calculated as = (Ne - N/2)/(N/2), where Ne= number of raters indicating "essential", N= total number of raters. CVR results range from -1 to +1, where 1 means all raters agree that the item is essential, 0 means 50% of raters agree that the item is essential and -1 means all raters agree that the item is not essential.

No	Items	SP	CR	ER	RC	SS	N/A	CPA	AAC	CVR
20	Students in our institution work cooperatively with their tutors	0%	**100%**	0%	0%	0%	0%	1	100%	1
21	In general, students in our institution prepare for classes before attending lectures and seminars	0%	**100%**	0%	0%	0%	0%	1	100%	1
22	Our institution communicate to students during induction about their roles and responsibilities as students	0%	60%	0%	0%	20%	20%	3	33%	<1
23	I believe self-service technologies in our institution are more convenient and safe for students to use	40%	60%	0%	0%	0%	0%	2	50%	<1
24	Our institution`s employees are professional when performing their duties	0%	0%	**100%**	0%	0%	0%	1	100%	1
25	Most student I speak to in general, finds class activities in our institution boring	40%	40%	0%	0%	20%	0%	3	33%	<1
26	Most employees in our institution are knowledgeable about our products and services	0%	0%	**100%**	0%	0%	0%	1	100%	1
27	Most employees in our institution are well trained and competent to perform their work accurately	0%	0%	**100%**	0%	0%	0%	1	100%	1
28	Most employees in our institution are highly motivated to perform and deliver service with customers	40%	0%	60%	0%	0%	0%	2	50%	<1
29	Employees in our institution feel confident that machines will follow through with what they instructed them to do	20%	0%	80%	0%	0%	0%	2	50%	<1
30	Employees in our institution know their job and responsibilities for which they are hired	0%	0%	**100%**	0%	0%	0%	1	100%	1
31	Our institution deliver its service promptly	**100%**	0%	0%	0%	0%	0%	1	100%	1
32	Activity levels in our institution have increased	**100%**	0%	0%	0%	0%	0%	1	100%	1
33	Balancing the efficiency and effectiveness of our institution`s outputs is a top priority	**100%**	0%	0%	0%	0%	0%	1	100%	1
34	Our institution emphasise on both output maximisation and input minimisation	80%	0%	0%	0%	0%	20%	2	50%	<1
35	Our institution outputs exceeds expectations	60%	0%	0%	0%	40%	0%	2	50%	<1
36	Our institution`s products or services are produced in a cost-effective manner	60%	0%	0%	0%	40%	0%	2	50%	<1
37	In the course of performing jobs in our institution, employees understand how to complete necessary forms/ paperwork (e.g. time sheets, expense reports, order forms, computer access forms)	0%	0%	**100%**	0%	0%	0%	1	100%	1
38	Employees in our institution understand how the different work groups contributes to the organisation`s goals	0%	0%	**100%**	0%	0%	0%	1	100%	1
39	Our institution meets its performance targets and expectations	**100%**	0%	0%	0%	0%	0%	1	100%	1
40	Our institution are committed in providing the necessary managerial support	0%	0%	0%	**100%**	0%	0%	1	100%	1

APPENDIX 7

Pilot Study Questionnaire and Evaluation Sheet

Section A

Please complete the attached questionnaire by reading each statement and instruction carefully. After completing the questionnaire, Please complete the following question below based on your experience in completing the attached questionnaire.

How long did it take to complete the questionnaire (in minutes):

1-10 ☐ 11-20 ☐ 21-30 ☐ over 31 ☐

Were the instructions clear:

Yes ☐ No ☐ : If no, which section(s):

Did you object to answering any questions:

Yes ☐ No ☐ : if yes, which question(s):

Was the layout clear and attractive:

Yes ☐ No ☐

Any other comments (please write below):

Section B

Please read each statement carefully and critique each statement based on its clarity; simplicity; relevance and grammatical error. Please circle the letter Y for yes and N for no based on your assessment of the following statements against each criteria highlighted on the first row in bold.

For example: If you think the statement below is clear, circle Y; it's not simple, circle N; it's relevant, circle Y and its contain a grammatical error, circle Y

No.	Statement	**Clarity**	**Simplicity**	**Relevance**	**Grammatical Error**
1	Employees are cautious and reluctance to undertake extra roles	(Y) N	Y (N)	(Y) N	(Y) N

Please complete the questionnaire below based on the instruction on Section B above:

No.	Statement	**Clarity**	**Simplicity**	**Relevance**	**Grammatical Error**
1	Students in my institution are highly motivated to perform their role during seminars	Y N	Y N	Y N	Y N
2	Students in my institution work cooperatively with their tutors	Y N	Y N	Y N	Y N
3	Students in my institution prepare before attending seminars	Y N	Y N	Y N	Y N
4	Employees in my institution are knowledgeable about our products and services	Y N	Y N	Y N	Y N
5	Employees in my institution are well trained and competent to perform their work accurately.	Y N	Y N	Y N	Y N
6	Employees in my institution know their job and responsibilities for which they are hired	Y N	Y N	Y N	Y N
7	Activity levels in my institution have increased	Y N	Y N	Y N	Y N

		Clarity		Simplicity		Relevance		Grammatical Error	
8	Balancing the efficiency and effectiveness of my institution`s outputs is a major priority for my institution	Y	N	Y	N	Y	N	Y	N
9	In the course of performing jobs in my institution, employees understand how to complete necessary forms/ paperwork (e.g. time sheets, expense reports, order forms, computer access forms).	Y	N	Y	N	Y	N	Y	N
10	My institution`s reputation has improve	Y	N	Y	N	Y	N	Y	N
11	My institution contributes positively to society	Y	N	Y	N	Y	N	Y	N
12	My institution complies with government regulations	Y	N	Y	N	Y	N	Y	N
13	My institution`s managers are highly involved when it comes to productivity issues	Y	N	Y	N	Y	N	Y	N
14	Employees in my institution understand how different work groups contribute to the organisation`s goals	Y	N	Y	N	Y	N	Y	N
15	My institution is committed in providing the necessary technological resources required to improve productivity	Y	N	Y	N	Y	N	Y	N
16	My institution`s senior managements are committed to productivity improvement initiatives	Y	N	Y	N	Y	N	Y	N
17	My institution deliver its services promptly	Y	N	Y	N	Y	N	Y	N
18	My institution meets its performance targets and expectations	Y	N	Y	N	Y	N	Y	N
19	My institution is committed in providing the necessary managerial support	Y	N	Y	N	Y	N	Y	N
20	My institution`s employees are professional when performing their duties.	Y	N	Y	N	Y	N	Y	N
21	If my institution`s stakeholders are unhappy, nothing else matters	Y	N	Y	N	Y	N	Y	N
22	Employees in my institution would leave to take a similar job at another institution if given a choice	Y	N	Y	N	Y	N	Y	N
23	Financial resources made available to my institution are inadequate	Y	N	Y	N	Y	N	Y	N
24	Students in my institution are knowledgeable about their expected role during lectures and seminars	Y	N	Y	N	Y	N	Y	N
25	There seems to be a feeling that dissatisfaction is high among students in my institution	Y	N	Y	N	Y	N	Y	N
26	Complaints from employers regarding my institution`s graduates/students performance at work is on the increase	Y	N	Y	N	Y	N	Y	N
27	Whenever resources are required to perform a service, my institution provides them	Y	N	Y	N	Y	N	Y	N

Any other comments (please write below):

Many thanks for your time and support in completing this questionnaire. All information you provide will be treated in strict confidence and as an individual you will not be identified. I would appreciate it if you could complete and return the completed questionnaire in the envelop provided on or before ***19th June 2010.***

APPENDIX 8A

Academic Employee Perception of Institutional Productivity Questionnaire

Academic Employee Perception of Institutional Productivity Questionnaire

The following questions/statements relate to your perception as an academic of your institution`s productivity. Please follow instructions under each section on how to complete the questionnaire. All information you provide will be treated in strict confidence and as an individual you will not be identified. Your response will be aggregated purely for modelling purposes.

Section A – Background Information

Please complete each question by ticking the box that relates to you.

Please specify the country your institution is located. Please write below

Years of employment as an academic in Higher Education:

Less than 1 year ☐	1-3 years ☐	4-6 years ☐
7-9 years ☐	10-12 years ☐	13-15 years ☐
16-18 years ☐	19-21 years ☐	over 22 years ☐
Prefer not to say ☐		

To what Department do you belong in your institution?

HRM ☐	Economics ☐	Finance ☐	Accounting ☐
Marketing and Advertising ☐		Strategy ☐	Banking ☐
Hospitality, Leisure and Tourism Management ☐			Sports ☐
Management Science ☐		Operations Management ☐	

Other (Please specify).....

Please split your duties at your institution between teaching, research and administration in percentages (Please write the percentage of split in each box)

Teaching ☐	Research ☐	Administration ☐

Section B

The following statements relates to your personal rating of your institution`s productivity. Please read each statement carefully and then indicate the extent to which you believe the statement to be relevant to your institution. Please circle the number that most closely represents your opinion regarding the statement

	Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
Students in my institution are highly motivated to perform their role during lectures and seminars	1	2	3	4	5
Students in my institution work cooperatively with their tutors	1	2	3	4	5
Students in my institution prepare for classes before attending lectures and seminars	1	2	3	4	5
Employees in my institution are knowledgeable about our products and services	1	2	3	4	5
Employees in my institution are well trained and competent to perform their work accurately.	1	2	3	4	5
Employees in my institution know their job and responsibilities for which they are hired	1	2	3	4	5
Activity levels in my institution have increased	1	2	3	4	5
Balancing the efficiency and effectiveness of my institution`s outputs is a top priority for my institution	1	2	3	4	5
In the course of performing jobs in my institution, employees understand how to complete necessary forms/ paperwork.	1	2	3	4	5
My institution`s reputation has improved	1	2	3	4	5
My institution contributes positively to society	1	2	3	4	5
My institution complies with government regulations.	1	2	3	4	5
My institution`s managers are highly involved when it comes to productivity issues	1	2	3	4	5
Employees in my institution understand how the different work groups contribute to the organisation`s goals	1	2	3	4	5
My institution is committed in providing the necessary technological resources required to improve productivity	1	2	3	4	5
My institution`s senior managements are committed to productivity improvement initiatives	1	2	3	4	5
My institution deliver its services promptly	1	2	3	4	5
My institution meets its performance targets and expectations	1	2	3	4	5

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
My institution is committed in providing the necessary managerial support	1	2	3	4	5
My institution`s employees are professional when performing their duties.	1	2	3	4	5
If my institution`s stakeholders are unhappy, nothing else matters	1	2	3	4	5
Employees in my institution would leave to take a similar job at another institution if given a choice	1	2	3	4	5
Financial resources made available to my institution are inadequate	1	2	3	4	5
Students in my institution are knowledgeable about their expected role during lectures and seminars	1	2	3	4	5
There seems to be a feeling that dissatisfaction is high among students in my institution	1	2	3	4	5
Complaints from employers regarding my institution`s graduates/students performance at work is on the increase	1	2	3	4	5
Whenever resources are required to perform a service, my institution provides them	1	2	3	4	5

Section C - Personal Information

Please complete each question by ticking the box that relates to you.

What is your sex? Male ☐ Female ☐ Prefer not to say ☐

What is your age? 18-25 ☐ 26-30 ☐ 31-35 ☐

36-40 ☐ 41-45 ☐ 46-50 ☐

51-55 ☐ 56- 60 ☐ 61+ ☐

Prefer not to say ☐

Many thanks for your time and support in completing this questionnaire.

APPENDIX 8B

Participant Information Sheet

Thesis Title: Service Productivity Measurement: An Application to Higher Education Business and Management Schools

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INTRODUCTION

This research is a for a PhD thesis on service productivity. The aim of the thesis is to establish the determinants of productivity in services and to develop a model for measuring productivity in services, applied to the higher education sector. The outcome of the research will contribute to the measurement of productivity in services and in higher education using employee perceptions.

WHAT IS REQUIRED

As a participant, you are asked to complete the attached survey questionnaire based on your perception of your institution`s productivity. Participation will take approximately 10-20 minutes of your time. Following the completion of the questionnaire, please return the completed questionnaire and consent form in the self-addressed and stamped envelope.

YOUR RIGHTS

Your participation in this study is entirely voluntary. If you wish to withdraw, you can do so at any at any time. In addition, you can decline to answer any question you are not comfortable with. If you wish to withdraw simply send me an email and I will withdraw you from the survey.

CONFIDENTIALITY

All information/data collected will be kept securely and with strict confidentiality (in line with Coventry University's ethics requirements). Your information will be stored anonymously and securely. On completion of the research, all data collected from you will be destroyed and no mention of your name, institution and department will be required or be mentioned in any research publication.

WHO HAS REVIEWED THE STUDY?

Coventry University ethics committee has reviewed and approved this study.

PUBLICATION OF RESULTS

Publication of the results of this study will be presented as a PhD thesis and will also be published and presented in journals and conferences.

CONTACT/ COMPLAINTS

Should you have any queries, or wish to know more about the research outcome/publication please contact the researcher using the address above. If you have a complaint, please contact
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APPENDIX 9

Manuscript on Correlating Measurement Error

Model Modification: Correlating Measurement Errors Restricted To Within Constructs

Errors in measurement are omnipresent in behavioural and social sciences and such errors include both random and systematic errors (Reddy1992; Waltz et al. 2005) As explained, all observations are fallible no matter how refined the measurement instrument (Duncan 1975:113), therefore its impractical to undertake a measure in social sciences without error. While random error are dealt within SEM, systematic errors on the other hand are attributed to method effect (Steenkamp and Baumgartner 2000) and are ubiquitous in every social science and behavioural research (Cote and Greenberg 1990) and particularly self-reported measures and performance measures are known to be prone to measurement errors (Michels et al. 2004; Jacobs and Kozlowski 1985). For instance, Cushman and Rosenberg (1991) identified the use of subjective measures has having halo effect on the measurement scale.

The use of correlated measurement error has been recommended as a method of modelling systematic errors into a measurement model (John and Reve 1982; Cote and Greenberg 1990). As Gerbing and Anderson states "A correlated measurement errors may be specified between any two indicators in a measurement model, provided the model is identified" (Gerbing and Anderson 1994: 572). In addition, the use of correlated measurement error has been recognised in social sciences particularly its importance to model fit improvement (Reddy 1992). Furthermore, its impact on overall model estimate through model mis-specification has also been recognised (Bagozzi 1983; Gerbing and Anderson 1984). Mis-specification can occur when researchers incorrectly specify correlated/covariance errors and such mis-specification as a result can infuse bias and error, particularly systematic error into measurement and structural estimates (Reddy 1992; Cote and Greenberg 1990).

As a result, the failure to properly model systematic errors into measurement model can led to biased estimates of the measurement model parameters and subsequently structural model estimates and theoretical conclusions (Reddy 1992; Gerbing and Anderson 1994; Cote and Greenberg 1990). For instance, Reddy (1992) proved that, the inclusion of correlated measurement error mistakenly has less negative impact on both measurement and structural

model parameter estimate difference than the failure to exclude correlate measurement error when required. Correlated measurement errors have been applied by various eminent researchers in social science (Gerbing and Anderson 1994; Reddy 1992). Other eminent methodological scholars have emphasised and permitted the use of correlated measurement errors (Joreskog and Sorbom 1984; Bentler 1989).

McDonald (1997) recognised three classes of models known to be identified. These are: uncorrelated error models, correlated error restricted to exogenous variables models and correlated errors restricted to pairs of casually unordered variables (variable not connected by uni-directed paths). Brito and Pearl (2002) identified another class of identified recursive model. This relates to correlated errors restricted to pairs of variables that are not directly link (not having any direct casual relationship). However, in general, two sources of correlated measurement errors have been identified. These are: within-variable between construct correlated error and within construct between-variable correlated error (Reddy 1992). These errors are attributed to the contamination of a respondent's response to a second and subsequent question on a questionnaire (Reddy 1992). Within construct between-variable correlated errors are referred in psychological literatures as priming effect or halo effect (Reddy 1992; Bryant and Oliver 2009).

Despite the importance of correlating measurement errors, it has been indiscriminately used without justification and rationale. As a result, it use has been criticised as lacking theoretical underpinnings and solely used for model improvement (Bagozzi 1983; Fornell 1983). As a result, it has been recommended that the use of correlated errors should be empirically and theoretically justified and that, its use should not alter parameter estimates of both measurement and structural models (Fornell 1983; Bagozzi 1983).

The present study used correlated measurement errors restricted within- factor which relates to Reddy`s "within construct between-variable correlated error model" (Reddy 1992)[117]. The use of correlated measurement errors restricted to within construct between-variable model is justified based on the recommendation that the use of correlated errors should be empirically and theoretically justified; the model should be identified and; it should not significantly alter measurement model parameter estimates and structural models

[117] See Section 9.5.1 and Table 9.1 for the process of collating measurement error.

parameter estimates (Fornell 1983; Bagozzi 1983). Hair et al. (2006: 855) recommend fluctuations ≤.05 in parameter estimates as acceptable

Empirically, using Modification Indices (MI) from AMOS (version 19), modification indices are used in revealing paths when added will have most impact in terms of decreasing chi-square fit indices and improving the model fit (Steiger 1990; Diamantopoulos and Siguaw 2000). Using MI values ≥4, errors were correlated restricted to paths within exogenous variables and starting with the largest MI value. Theoretically, as a result of using reflective indicators in capturing the same construct within one study, it is likely to have a priming or halo effect and interaction effect on subsequent response relating to these items. This relates to Reddy`s "within-variable between construct correlated error" (Reddy 1992). Therefore Stanton et al. (2002) attributed the existence of correlated errors within the same constructs to semantic similarities among items and items repeatedly tapping into the same underlying meaning.

APPENDIX 10

Ethical Approval

Principal Investigator Certification

Please ensure that you:

Tick all the boxes below that are relevant to your project and sign this checklist.

Students must get their Director of Studies to countersign this declaration.

I believe that this project **does not require research ethics peer review**. I have completed Sections 1-2 and kept a copy for my own records. I realise I may be asked to provide a copy of this checklist at any time.	
I request that this project is **exempt from internal research ethics peer review** because it will be, or has been, reviewed by an external research ethics committee. I have completed Sections 1-4 and have attached/will attach a copy of the favourable ethical review issued by the external research ethics committee. Please give the name of the external research ethics committee here: Send to ethics.uni@coventry.ac.uk	
I **request an ethics peer review** and confirm that I have answered all relevant questions in this checklist honestly. Send to ethics.uni@coventry.ac.uk	X
I confirm that I will carry out the project in the ways described in this checklist. I will immediately suspend research and request new ethical approval if the project subsequently changes the information I have given in this checklist.	X
I confirm that I, and all members of my research team (if any), have read and agreed to abide by the Code of Research Ethics issued by the relevant national learned society.	X
I confirm that I, and all members of my research team (if any), have read and agreed to abide by the University's Research Ethics, Governance and Integrity Framework.	X

Signatures

If you submit this checklist and any attachments by e-mail, you should type your name in the signature space. An email attachment sent from your University inbox will be assumed to have been signed electronically.

Principal Investigator

Signed ANDREWS AGYA YALLEY(Principal Investigator or Student)

Date 07/10/10

Students submitting this checklist by email must append to it an email from their Director of Studies confirming that they are prepared to make the declaration above and to countersign this checklist. This email will be taken as an electronic countersignature.

Student's Director of Studies

Countersigned DR HARJIT SEKHON (Director of Studies)

Date 07/10/10

I have read this checklist and confirm that it covers all the ethical issues raised by this project fully and frankly. I also confirm that these issues have been discussed with the student and will continue to be reviewed in the course of supervision. Note: This checklist is based on an ethics approval form produce by Research Office of the College of Business, Law and Social Sciences at Nottingham Trent University. Copyright is acknowledged.

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Initial assessment

Date checklist initially received:	22/10/2010	
Ethical review required		**No**
CRB check required		**No**
Submitted to an external research ethics committee		
External research ethics committee (Name)		**No**
Copy of external ethical clearance received	DD/MM/YYYY	
Ethics Panel Review		
Date sent to reviewer 1 (Katy Graley)	22/10/2010	
Date sent to reviewer 2 (Name)	DD/MM/YYYY	
Original Decision (Consultation with Chair UARC/Chair RDSC)		
Approve		
Approve with conditions (specify)		
Resubmission		
Reject		
Date of letter to applicant		
Resubmission		
Date of receipt of resubmission:		
Date sent to reviewer 1 (Name)		
Date sent to reviewer 2 (Name)		
Final decision recorded (Consultation with Chair UARC/Chair RDSC)		
Approve	**Yes**	
Approve with conditions (specify)		
Reject		
Date of letter to applicant	DD/MM/YYYY	

Signature KGraley .....(Chair of UARC/Chair RDSC)

Date 27/10/10.....

APPENDIX 11

Original Scale Item Wording, Their Representative Constructs and Cronbach Alpha

Author/s	**Item**	**Construct**	**Cronbach Alpha**	**Measurement Scales Employed**	**Justification for Using Item**
Yamin et al. (1997)	Activity levels ..... have improved.	Organisational productivity	.082	5-point Likert – scale (1= not important and 5= very important)	This item was used in generating items for SP. Further this item was identified by participants of the semi-structured interviews as relating to SP.
Das and Teng (2000)	Technological resource commitment to ... Managerial resource commitment to ... Financial resource commitment to ...	Resource commitment	.87	7-point Likert scale (1=little and 7=substantial)	Used these indicators together with items from semi-structured interviews developing the scale for the construct RC.

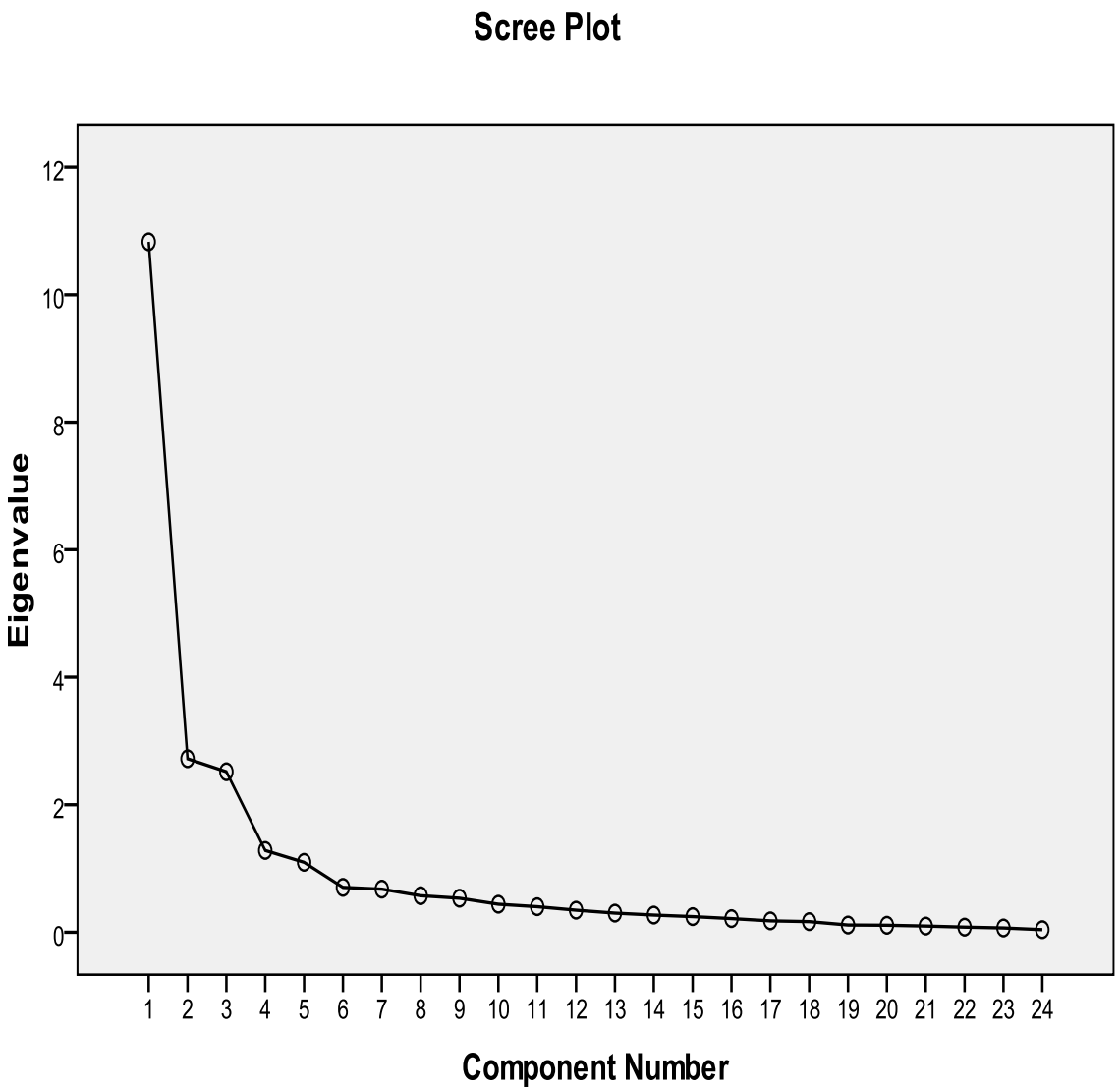
APPENDIX 12

Descriptive Statistics on Response to Scale Item for EFA Study

Item	Strongly Agree (%)	Agree (%)	Neither Agree /Disagree (%)	Disagree (%)	Strongly Disagree (%)	Total Sample
CR1	8.4	19.6	21.0	46.9	4.2	143
CR2	1.4	14.0	30.1	48.3	6.3	143
CR3	5.6	18.9	29.4	44.1	2.1	143
CR4	1.4	23.1	21.7	51.7	2.1	143
ER1	.7	9.1	23.8	58.7	7.7	143
ER2	.7	8.4	18.9	65.7	6.3	143
ER3	-	3.5	25.9	58.7	11.9	143
ER4	.7	7.0	28.0	53.8	10.5	143
ER5	.7	9.1	25.9	59.4	4.9	143
ER6		4.2	28.0	57.3	10.5	143
RC1	4.2	19.6	16.1	46.9	13.3	143
RC2	7.0	24.5	11.2	51.0	6.3	143
RC3	3.5	20.3	23.1	43.4	9.8	143
RC4	7.0	26.6	11.9	52.4	2.1	143
RC5	13.3	12.6	20.3	46.9	7.0	143
RC6	7.0	24.5	14.7	52.4	1.4	143
SP1	4.9	20.3	26.6	33.6	14.7	143
SP2	5.6	15.4	28.0	33.6	17.5	143
SP3	7.7	21.7	21.7	30.1	18.9	143
SP4	8.4	23.8	23.1	25.9	18.9	143
SS1	3.5	8.4	13.3	54.5	20.3	143
SS2	-	.7	16.8	56.6	25.9	143
SS3	-	1.4	22.4	51.7	24.5	143
SS4	-	4.9	14.0	42.7	38.5	143
SS5	1.4	7.0	14.7	60.1	16.8	143
SS6	2.1	7.0	15.4	55.9	19.6	143
SS7	-	7.7	11.9	39.2	41.3	143

APPENDIX 13

Scree Plot Output Produced by SPSS



APPENDIX 14

Final Scale Item-Total Statistics for EFA Study

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Cronbach's Alpha if Item Deleted	Item –to-Total Correlation
CR1	81.87	191.947	.933	.876
CR2	81.62	196.858	.934	.778
CR3	81.87	195.731	.934	.787
CR4	81.76	198.341	.935	.611
ER1	81.42	200.034	.935	.835
ER2	81.37	199.333	.934	.822
ER3	81.27	201.182	.935	.816
ER4	81.39	202.268	.936	.697
ER5	81.47	200.209	.935	.678
ER6	81.31	199.668	.934	.732
RC2	81.80	190.736	.933	.838
RC4	81.90	191.306	.933	.871
RC5	81.84	196.277	.937	.622
RC6	81.89	190.945	.932	.873
SP1	81.73	197.890	.937	.735
SP2	81.64	198.134	.937	.772
SP3	81.75	200.781	.940	.650
SP4	81.83	198.286	.939	.822
SS1	81.26	197.545	.935	.681
SS3	81.06	206.186	.938	.634
SS4	80.91	197.140	.934	.821
SS5	81.22	201.425	.936	.831
SS6	81.22	200.270	.936	.864
SS7	80.92	195.782	.934	.845

APPENDIX 15A

Descriptive Statistics on Response to Scale Item for Overall Data

Item	Strongly Agree (%)	Agree (%)	Neither Agree /Disagree (%)	Disagree (%)	Strongly Disagree (%)	Total Sample
ER1	-	9.4	12.5	65.1	13.0	447
ER2	-	12.1	8.7	67.1	12.1	447
ER3	-	8.9	11.9	61.3	17.9	447
ER4	-	11.4	13.0	61.1	14.5	447
ER5	-	11.0	13.9	66.2	8.9	447
ER6	-	7.6	15.2	60.6	16.6	447
CR1	8.5	22.6	9.6	57.0	2.2	447
CR2	3.6	20.6	15.7	53.0	7.2	447
CR3	5.4	25.5	11.2	53.5	4.5	447
CR4	8.1	22.1	7.8	61.1	.9	447
RC2	6.7	19.5	10.5	59.7	3.6	447
RC4	4.5	21.0	9.2	61.3	4.0	447
RC5	6.3	19.2	12.1	57.0	5.4	447
RC6	1.3	15.7	9.4	38.9	34.7	447
SP1	3.4	17.0	18.8	50.1	10.7	447
SP2	3.4	17.2	16.8	50.1	12.5	447
SP3	4.5	16.3	15.4	49.4	14.3	447
SP4	4.3	18.1	15.4	47.0	15.2	447
SS1	5.8	17.4	8.5	46.8	21.5	447
SS3		1.3	11.9	60.0	26.8	447
SS4	1.8	15.2	9.8	39.4	33.8	447
SS5	3.1	13.9	13.0	57.9	12.1	447
SS6	1.8	16.1	12.1	55.7	14.3	447
SS7	1.8	15.2	13.0	56.6	13.4	447

APPENDIX 15B

Descriptive Statistics on Response to Scale Item for Calibration Data

Item	Strongly Agree (%)	Agree (%)	Neither Agree /Disagree (%)	Disagree (%)	Strongly Disagree (%)	Total Sample
ER1	-	9.4	12.5	65.2	12.9	224
ER2	-	12.1	8.9	67.0	12.1	224
ER3	-	8.9	12.1	61.2	17.9	224
ER4	-	11.6	12.9	60.7	14.7	224
ER5	-	11.2	13.8	66.1	8.9	224
ER6	-	7.6	15.2	60.7	16.5	224
CR1	8.5	22.8	9.4	57.1	2.2	224
CR2	3.6	20.5	15.6	53.1	7.1	224
CR3	5.4	25.4	11.2	53.6	4.5	224
CR4	8.0	22.3	7.6	61.2	.9	224
RC2	6.7	19.2	10.7	59.8	3.6	224
RC4	4.5	21.0	9.4	61.2	4.0	224
RC5	6.3	19.6	12.1	56.7	5.4	224
RC6	1.3	15.6	9.4	38.8	34.8	224
SP1	3.6	17.4	18.3	50.0	10.7	224
SP2	3.6	17.4	16.5	50.0	12.5	224
SP3	4.5	16.5	15.6	49.1	14.3	224
SP4	4.5	18.3	15.2	46.9	15.2	224
SS1	5.8	17.4	8.5	46.9	21.4	224
SS3	-	1.3	11.6	60.3	26.8	224
SS4	1.8	15.2	9.8	39.3	33.9	224
SS5	3.1	13.8	12.9	58.0	12.1	224
SS6	1.8	16.1	12.1	55.8	14.3	224
SS7	1.8	15.2	12.9	56.7	13.4	224

APPENDIX 15C

Descriptive Statistics on Response to Scale Item for Validation Data

Item	Strongly Agree (%)	Agree (%)	Neither Agree /Disagree (%)	Disagree (%)	Strongly Disagree (%)	Total Sample
ER1	-	9.4	12.6	65.0	13.0	223
ER2	-	12.1	8.5	67.7	12.1	223
ER3	-	9.0	11.7	61.4	17.9	223
ER4	-	11.2	13.0	61.4	14.3	223
ER5	-	10.8	13.9	66.4	9.0	223
ER6		7.6	15.2	60.5	16.6	223
CR1	8.5	22.4	9.9	57.0	2.2	223
CR2	3.6	20.5	15.7	52.9	7.2	223
CR3	5.4	25.6	11.2	53.4	4.5	223
CR4	8.1	22.0	8.1	61.0	0.9	223
RC2	6.7	19.7	10.3	59.6	3.6	223
RC4	4.5	21.1	9.0	61.4	4.0	223
RC5	6.3	18.8	12.1	57.4	5.4	223
RC6	1.3	15.7	9.4	39.0	34.5	223
SP1	3.1	16.6	19.3	50.2	10.8	223
SP2	3.1	17.0	17.0	50.2	12.6	223
SP3	4.5	16.1	15.2	49.8	14.3	223
SP4	4.0	17.9	15.7	47.1	15.2	223
SS1	5.8	17.5	8.5	46.6	21.5	223
SS3	-	1.3	12.1	59.6	26.9	223
SS4	1.8	15.2	9.9	39.5	33.6	223
SS5	3.1	13.9	13.0	57.8	12.1	223
SS6	1.8	16.1	12.1	55.6	14.3	223
SS7	1.8	15.2	13.0	56.5	13.5	223

APPENDIX 16

ANOVA – Cross Country Analysis of Respondents Demographic Characteristics

		Sum of Squares	df	Mean Square	F	Sig.
Years of Employment	Between Groups	12.664	3	4.221	1.072	.361
	Within Groups	1745.166	443	3.939		
	Total	1757.830	446			
Gender	Between Groups	.558	3	.186	.748	.524
	Within Groups	110.252	443	.249		
	Total	110.810	446			
Age	Between Groups	2.961	3	.987	.244	.866
	Within Groups	1792.292	443	4.046		
	Total	1795.253	446			
Institutional Dept	Between Groups	57.390	3	19.130	2.466	.062
	Within Groups	3435.979	443	7.756		
	Total	3493.369	446			
Teaching Responsibility (%)	Between Groups	262.482	3	87.494	41.439	.000
	Within Groups	935.348	443	2.111		
	Total	1197.830	446			
Research Responsibility (%)	Between Groups	87.875	3	29.292	21.190	.000
	Within Groups	612.380	443	1.382		
	Total	700.255	446			
Administrative Responsibility (%)	Between Groups	47.903	3	15.968	32.968	.000
	Within Groups	214.081	442	.484		
	Total	261.984	445			

APPENDIX 17

ANOVA – Cross Country Analysis of Scale Items

Item		Sum of Squares	df	Mean Square	F	Sig.
CR1	Between Groups	3.080	3	1.027	.869	.457
	Within Groups	523.434	443	1.182		
	TOTAL	526.515	446			
CR2	Between Groups	3.688	3	1.229	1.218	.303
	Within Groups	447.224	443	1.010		
	TOTAL	450.913	446			
CR3	Between Groups	.276	3	.092	.082	.970
	Within Groups	498.100	443	1.124		
	TOTAL	498.376	446			
CR4	Between Groups	2.173	3	.724	.638	.591
	Within Groups	502.758	443	1.135		
	TOTAL	504.931	446			
ER1	Between Groups	4.230	3	1.410	2.378	.069
	Within Groups	262.727	443	.593		
	TOTAL	266.957	446			
ER2	Between Groups	3.109	3	1.036	1.602	.188
	Within Groups	286.542	443	.647		
	TOTAL	289.651	446			
ER3	Between Groups	3.317	3	1.106	1.728	.160
	Within Groups	283.399	443	.640		
	TOTAL	286.716	446			
ER4	Between Groups	2.079	3	.693	1.007	.389
	Within Groups	304.731	443	.688		
	TOTAL	306.810	446			
ER5	Between Groups	2.789	3	.930	1.566	.197
	Within Groups	262.996	443	.594		
	TOTAL	265.785	446			
ER6	Between Groups	1.690	3	.563	.932	.425
	Within Groups	267.710	443	.604		
	TOTAL	269.400	446			
RC2	Between Groups	.697	3	.232	.212	.888
	Within Groups	485.616	443	1.096		
	TOTAL	486.313	446			
RC4	Between Groups	2.868	3	.956	.946	.418
	Within Groups	447.834	443	1.011		
	TOTAL	450.702	446			
RC5	Between Groups	3.662	3	1.221	1.110	.345
	Within Groups	487.349	443	1.100		
	TOTAL	491.011	446			

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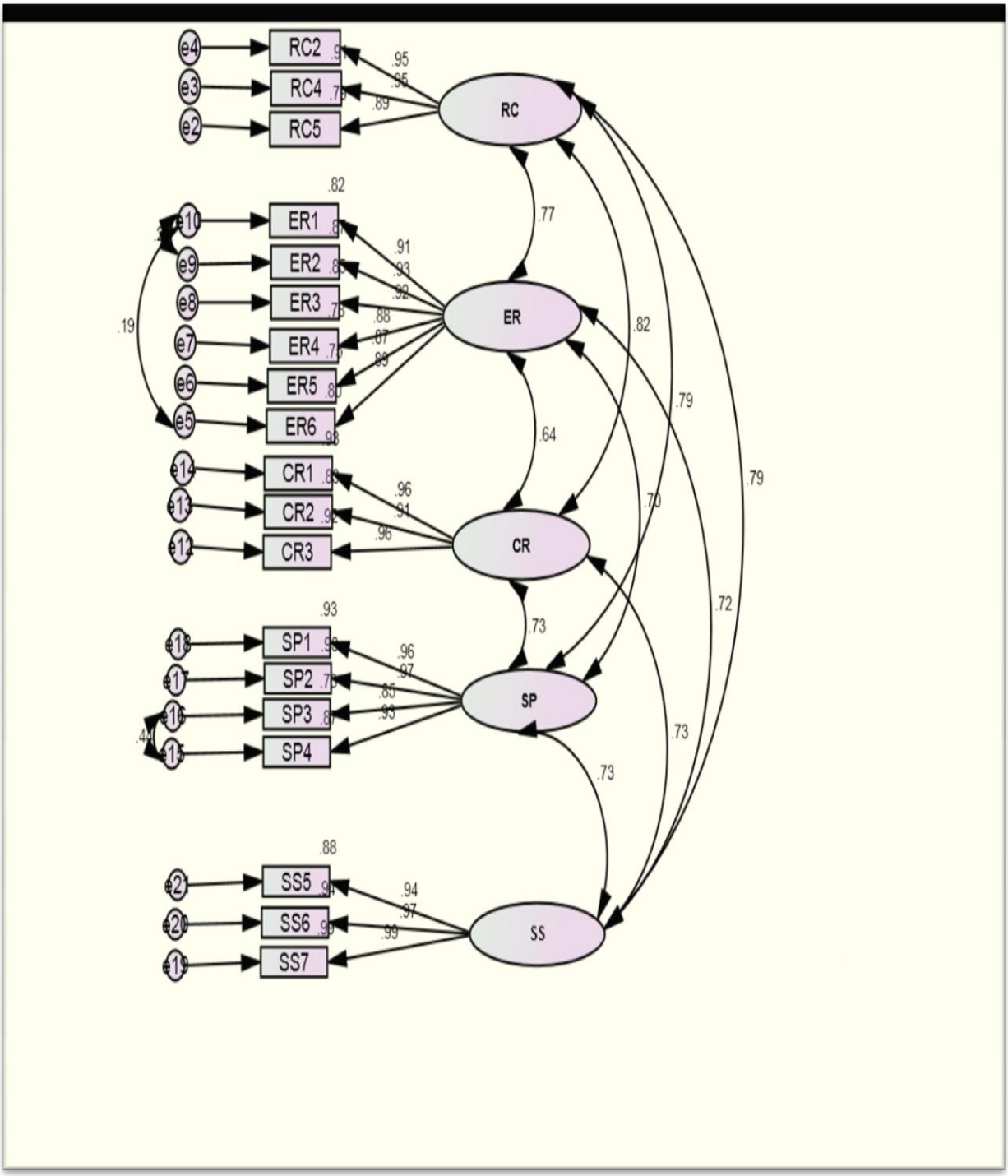
Item		Sum of Squares	df	Mean Square	F	Sig.
RC6	Between Groups	.934	3	.311	.262	.852
	Within Groups	525.536	443	1.186		
	TOTAL	526.470	446			
SP1	Between Groups	3.308	3	1.103	1.095	.351
	Within Groups	446.240	443	1.007		
	TOTAL	449.548	446			
SP2	Between Groups	1.579	3	.526	.500	.682
	Within Groups	466.103	443	1.052		
	TOTAL	467.682	446			
SP3	Between Groups	4.037	3	1.346	1.189	.314
	Within Groups	501.364	443	1.132		
	TOTAL	505.400	446			
SP4	Between Groups	6.183	3	2.061	1.764	.153
	Within Groups	517.540	443	1.168		
	TOTAL	523.723	446			
SS1	Between Groups	5.561	3	1.854	1.357	.255
	Within Groups	605.141	443	1.366		
	TOTAL	610.702	446			
SS3	Between Groups	1.076	3	.359	.840	.473
	Within Groups	189.157	443	.427		
	TOTAL	190.233	446			
SS4	Between Groups	.641	3	.214	.178	.911
	Within Groups	532.074	443	1.201		
	TOTAL	532.716	446			
SS5	Between Groups	4.171	3	1.390	1.476	.220
	Within Groups	417.176	443	.942		
	TOTAL	421.347	446			
SS6	Between Groups	1.499	3	.500	.526	.664
	Within Groups	420.653	443	.950		
	TOTAL	422.152	446			
SS7	Between Groups	2.806	3	.935	1.027	.380
	Within Groups	403.346	443	.910		
	TOTAL	406.152	446			

APPENDIX 18

AMOS 19 Output for the Modified Measurement Model



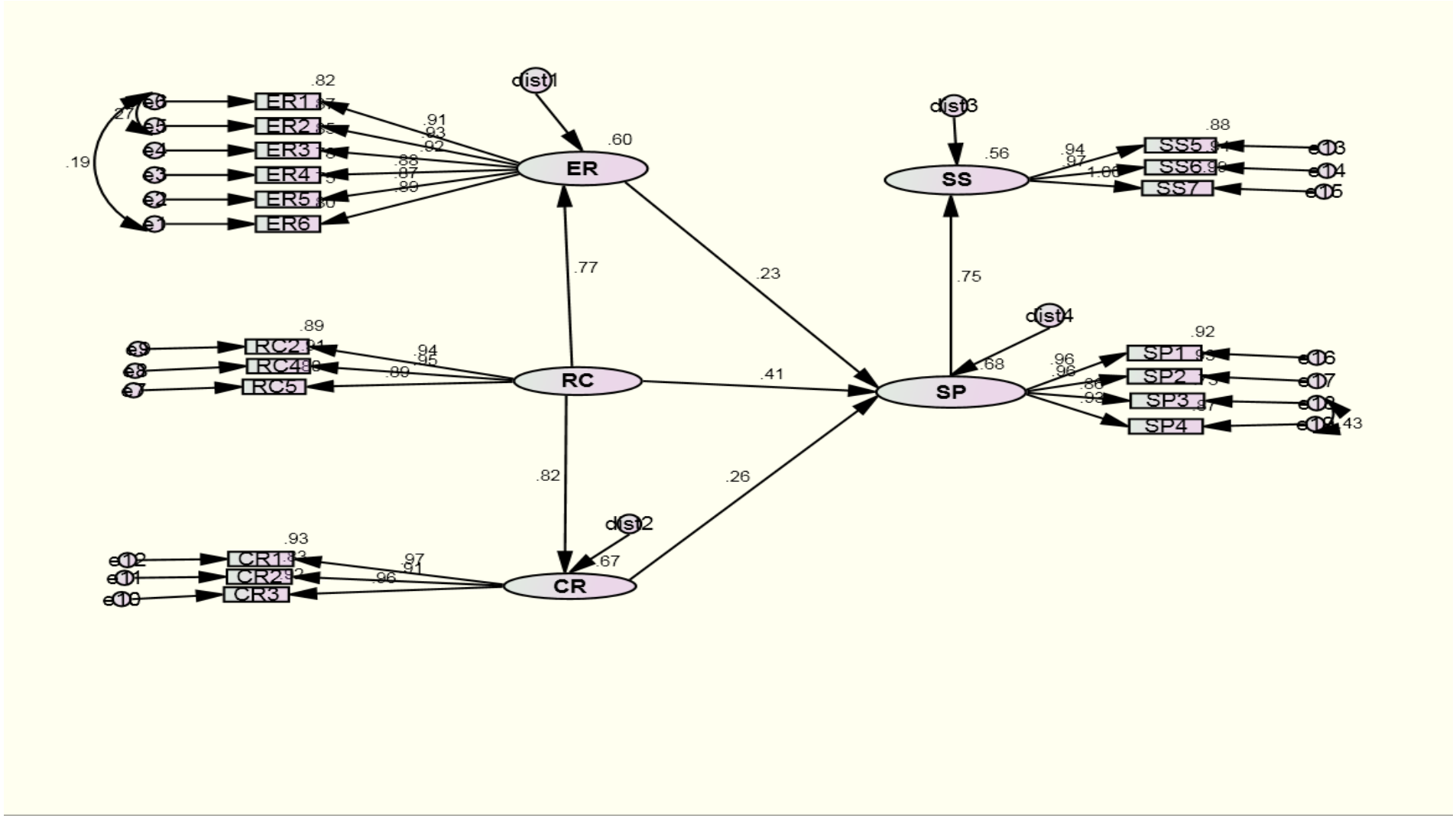
APPENDIX 19

AVE, CR, SIC Calculation

Average Variance Extracted (AVE) = (Sum of Squared Standardized Loading) / (Sum of Squared Standardized Loading + Sum of Indicator Measurement Error)	
Construct	**Calculation**
Service productivity (SP)	(.93+.93+.73+.87)/ (.93+.93+.73+.87)+ (.07+.07+.27+.13)
Resource Commitment (RC)	(.89+.91+.79)/ (.89+.91+.79)+ (.11+.04+.21)
Employee readiness (ER)	(.83+.87+.85+.78+.75+.80)/ (.83+.87+.85+.78+.75+.80)+(.18+.13+.15+.22+.25+.20)
Customer readiness (CR0	(.93+.83+.92)/ (.93+.83+.92)+ (.07+.17+.08)
Stakeholder satisfaction (SS)	(.96+.94+.99)/ (.96+.94+.99)+ (.12+.06+.01)
Composite Reliability (CR) = (Sum of Standardised Factor Loading)² / [(Sum of Standardised Factor Loading) ² + Sum of Indicator Measurement Error (The Sum of the Variance Due to Random Measurement Error for Each Loading- 1 the Square ff Each Loading]	
Construct	**Calculation**
Service productivity (SP)	(.96+.97+.85+.93)²/ (.96+.97+.85+.93)² + (.07+.07+.27+.13)
Resource Commitment (RC)	(.95+.95+.89)²/ (.95+.95+.89)² + (.11+.04+.21)
Employee readiness (ER)	(.91+.93+.92+.88+.87+.89)²/ (.91+.93+.92+.88+.87+.89)² +(.18+.13+.15+.22+.25+.20)
Customer readiness (CR0	(.96+.91+.96)²/ (.96+.91+.96)² + (.07+.17+.08)
Stakeholder satisfaction (SS)	(.94+.97+.99)²/ (.94+.97+.99)² + (.12+.06+.01)
Squared Inter-construct Correlation (SIC) = (Inter-Construct Correlation)²	
Construct	**Calculation**
Service productivity (SP)	(.79)² ; (.70)²; (.73)²; (.73)²
Resource Commitment (RC)	(.77)² ; (.82)²; (.79)²; (.79)²
Employee readiness (ER)	(.77)² ; (.64)²; (.70)²; (.72)²
Customer readiness (CR)	(.82)² ; (.64)²; (.73)²; (.73)²
Stakeholder satisfaction (SS)	(.79)² ; (.72)²; (.73)²; (.73)²

APPENDIX 20

AMOS 19 Output for the Measurement and Structural Sub-Models


.82
dist1
.60
ER
ER1
ER2
ER3
ER4
ER5
ER6
.91
.93
.92
.88
.87
.99
.19
.77
.23
dist3
.56
SS
.88
SS5
SS6
SS7
.94
.97
1.00
.75
dist4
.92
SP
SP1
SP2
SP3
SP4
.96
.96
.88
.93
.68
.89
RC
RC2
RC4
RC5
.94
.85
.89
.41
.82
.26
dist2
.67
.93
CR
CR1
CR2
CR3
.97
.91
.96

APPENDIX 21

SPSS 17 Output - Cross Correlation Matrix

**. Correlation is significant at the 0.01 level (2-tailed).

		CR1	CR2	CR3	CR4	ER1	ER2	ER3	ER4	ER5	ER6	RC2	RC4	RC5	RC6	SP1	SP2	SP3	SP4	SS1	SS3	SS4	SS5	SS6	SS7
CR1	Pearson Correlation	1	.887**	.928**	.841**	.507**	.552**	.537**	.582**	.477**	.551**	.735**	.748**	.686**	.697**	.672**	.667**	.642**	.669**	.713**	.461**	.654**	.674**	.650**	.672**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
CR2	Pearson Correlation	.887**	1	.866**	.825**	.503**	.528**	.509**	.572**	.484**	.541**	.732**	.713**	.678**	.704**	.636**	.639**	.619**	.630**	.724**	.458**	.661**	.678**	.643**	.665**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
CR3	Pearson Correlation	.928**	.866**	1	.842**	.552**	.590**	.576**	.619**	.487**	.585**	.750**	.770**	.709**	.728**	.703**	.700**	.652**	.682**	.740**	.515**	.681**	.726**	.701**	.719**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
CR4	Pearson Correlation	.841**	.825**	.842**	1	.594**	.612**	.578**	.662**	.572**	.665**	.806**	.808**	.764**	.764**	.708**	.713**	.671**	.702**	.788**	.527**	.725**	.754**	.743**	.757**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
ER1	Pearson Correlation	.507**	.503**	.552**	.594**	1	.888**	.840**	.806**	.796**	.845**	.669**	.652**	.623**	.623**	.587**	.583**	.553**	.555**	.609**	.577**	.579**	.676**	.605**	.635**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
ER2	Pearson Correlation	.552**	.528**	.590**	.612**	.888**	1	.867**	.826**	.797**	.834**	.668**	.677**	.638**	.632**	.642**	.643**	.609**	.627**	.693**	.547**	.619**	.683**	.627**	.656**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447

		CR1	CR2	CR3	CR4	ER1	ER2	ER3	ER4	ER5	ER6	RC2	RC4	RC5	RC6	SP1	SP2	SP3	SP4	SS1	SS3	SS4	SS5	SS6	SS7
ER3	Pearson Correlation	.537**	.509**	.576**	.578**	.840**	.867**	1	.825**	.803**	.808**	.651**	.659**	.629**	.609**	.603**	.612**	.578**	.609**	.667**	.589**	.572**	.684**	.619**	.648**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
ER4	Pearson Correlation	.582**	.572**	.619**	.662**	.806**	.826**	.825**	1	.744**	.789**	.648**	.663**	.601**	.650**	.621**	.612**	.551**	.592**	.667**	.495**	.588**	.678**	.618**	.647**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
ER5	Pearson Correlation	.477**	.484**	.487**	.572**	.796**	.797**	.803**	.744**	1	.797**	.653**	.662**	.601**	.604**	.594**	.594**	.566**	.598**	.607**	.599**	.557**	.664**	.626**	.638**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
ER6	Pearson Correlation	.551**	.541**	.585**	.665**	.845**	.834**	.808**	.789**	.797**	1	.694**	.701**	.633**	.653**	.608**	.619**	.566**	.622**	.665**	.581**	.609**	.708**	.664**	.677**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
RC2	Pearson Correlation	.735**	.732**	.750**	.806**	.669**	.668**	.651**	.648**	.653**	.694**	1	.902**	.848**	.785**	.706**	.724**	.728**	.719**	.741**	.566**	.731**	.771**	.748**	.762**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
RC4	Pearson Correlation	.748**	.713**	.770**	.808**	.652**	.677**	.659**	.663**	.662**	.701**	.902**	1	.856**	.720**	.708**	.723**	.681**	.713**	.731**	.554**	.698**	.750**	.730**	.748**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447

		CR1	CR2	CR3	CR4	ER1	ER2	ER3	ER4	ER5	ER6	RC2	RC4	RC5	RC6	SP1	SP2	SP3	SP4	SS1	SS3	SS4	SS5	SS6	SS7
RC5	Pearson Correlation	.686**	.678**	.709**	.764**	.623**	.638**	.629**	.601**	.601**	.633**	.848**	.856**	1	.687**	.687**	.711**	.725**	.708**	.682**	.488**	.661**	.697**	.657**	.674**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
RC6	Pearson Correlation	.697**	.704**	.728**	.764**	.623**	.632**	.609**	.650**	.604**	.653**	.785**	.720**	.687**	1	.673**	.683**	.680**	.668**	.791**	.536**	.872**	.855**	.866**	.883**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SP1	Pearson Correlation	.672**	.636**	.703**	.708**	.587**	.642**	.603**	.621**	.594**	.608**	.706**	.708**	.687**	.673**	1	.930**	.814**	.897**	.647**	.546**	.644**	.709**	.674**	.701**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SP2	Pearson Correlation	.667**	.639**	.700**	.713**	.583**	.643**	.612**	.612**	.594**	.619**	.724**	.723**	.711**	.683**	.930**	1	.821**	.899**	.655**	.556**	.659**	.714**	.691**	.713**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SP3	Pearson Correlation	.642**	.619**	.652**	.671**	.553**	.609**	.578**	.551**	.566**	.566**	.728**	.681**	.725**	.680**	.814**	.821**	1	.879**	.660**	.500**	.665**	.684**	.635**	.661**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SP4	Pearson Correlation	.669**	.630**	.682**	.702**	.555**	.627**	.609**	.592**	.598**	.622**	.719**	.713**	.708**	.668**	.897**	.899**	.879**	1	.667**	.558**	.642**	.695**	.673**	.699**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447

		CR1	CR2	CR3	CR4	ER1	ER2	ER3	ER4	ER5	ER6	RC2	RC4	RC5	RC6	SP1	SP2	SP3	SP4	SS1	SS3	SS4	SS5	SS6	SS7
SS1	Pearson Correlation	.713**	.724**	.740**	.788**	.609**	.693**	.667**	.667**	.607**	.665**	.741**	.731**	.682**	.791**	.647**	.655**	.660**	.667**	1	.568**	.728**	.802**	.795**	.795**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SS3	Pearson Correlation	.461**	.458**	.515**	.527**	.577**	.547**	.589**	.495**	.599**	.581**	.566**	.554**	.488**	.536**	.546**	.556**	.500**	.558**	.568**	1	.476**	.625**	.654**	.653**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SS4	Pearson Correlation	.654**	.661**	.681**	.725**	.579**	.619**	.572**	.588**	.557**	.609**	.731**	.698**	.661**	.872**	.644**	.659**	.665**	.642**	.728**	.476**	1	.789**	.787**	.815**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SS5	Pearson Correlation	.674**	.678**	.726**	.754**	.676**	.683**	.684**	.678**	.664**	.708**	.771**	.750**	.697**	.855**	.709**	.714**	.684**	.695**	.802**	.625**	.789**	1	.906**	.933**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SS6	Pearson Correlation	.650**	.643**	.701**	.743**	.605**	.627**	.619**	.618**	.626**	.664**	.748**	.730**	.657**	.866**	.674**	.691**	.635**	.673**	.795**	.654**	.787**	.906**	1	.966**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447
SS7	Pearson Correlation	.672**	.665**	.719**	.757**	.635**	.656**	.648**	.647**	.638**	.677**	.762**	.748**	.674**	.883**	.701**	.713**	.661**	.699**	.795**	.653**	.815**	.933**	.966**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447	447