Cranfield University

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The Performance Impact of Using Measurement Diversity in Executives' Annual Incentive Systems

SCHOOL OF MANAGEMENT

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ABSTRACT

The purpose of this research is twofold. Firstly, it examines the relationship between the use of financial and non-financial performance measures in executives' annual incentive systems and firm performance. Secondly, it looks at the extent to which this relationship is influenced by five different organisational contingencies (business risk, ownership structure, organisational culture, the quality of the performance measures used in executives' annual incentives and the effectiveness of the executives' reward system).

Agency theory and contingency theory are used to develop the theoretical framework that underpins this study. The research design is based on survey and archival data from 132 private and publicly quoted organisations based in the UK. Data is studied using multivariate analysis, in particular, multiple regression analysis with main and interaction effects.

Contrary to expectations, the study finds that the relationship between the use of financial and non-financial performance measures in executives' annual incentives and economic firm performance (measured by return on assets and sales annual growth) is negative rather than positive. However, this relationship is not universalistic. Results suggest that when organisations operate in high or low business risk environments or when organisations have clan or adhocracy cultural values the use of multi-criteria performance measures in executives' annual incentives is beneficial as it facilitates the achievement of business goals. Results also suggest that ownership structure, the quality of performance measures and the effectiveness of executives' reward systems are organisational contingencies that do not influence the performance impact of using multi-criteria performance measures in executives' annual incentive systems.

This thesis contributes to the management literature; in particular, to the literature that looks at the use of non-financial performance measures in management control systems. It contributes to agency-based research by providing empirical evidence that refutes some of its premises regarding the use of multi-criteria performance measures in incentive systems. This thesis also contributes to contingency-based research as it supports the notion that there is no universally appropriate management control system –in this case, the executive incentive system– which applies equally to all organisations in all circumstances.

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Monica Franco-Santos

June 2007

This thesis is dedicated to my family

Ismael, Javier, Gloria, Luis Maria and Carolina

OUTPUTS AND DISSEMINATION OF RESEARCH

The following list of references presents the outputs the author of this thesis has produced or contributed to during the course of her doctoral research.

■ Publications under Review/ for Submission

Franco-Santos, M., Bourne, M. (2nd review), The impact of Strategic Performance Measurement Systems: a review of the evidence, *International Journal of Operations and Production Management*.

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1. INTRODUCTION

This chapter provides an overview of the thesis. It is structured in five sections. Section 1.1 briefly presents the research background of the research and its main purpose. Section 1.2 indicates the organisational theories that underpin the study. Section 1.3 describes the research philosophy and research methods employed, the research process and a summary of the aspects taken into consideration in order to ensure the validity of this study. Section 1.4 summarises the expected contributions of the research. Finally, section 1.5 shows an outline of the thesis.

1.1. Background and purpose

In the management literature, many studies have been devoted to the examination of the impact of management control systems (MCSs) on firm performance. MCSs are the systems "that provide information that is intended to be useful to managers in performing their jobs and to assist organizations in developing and maintaining viable patterns of behaviour" (Otley, 1999, p. 364). Examples of MCSs are budgetary and compensation systems (Flamholtz, Das and Tsui, 1985).

In the case of compensation systems, an extensive review of the empirical and theoretical literature on the relationship between compensation systems and firm performance carried out by Gomez-Mejia (1994) suggests that "despite the vast volume of research on this topic, we know little about compensation and its impact on business results" (p. 199). Some issues related to this topic have not been addressed and most research has only been based on US archival data. Thus, Gomez-Mejia (1994) concludes, there is still a "window of opportunity" for insightful and novel research in this area. Other scholars such as Becker and Gerhart (1996), Bloom (1999), Bloom and Michel (2002), and Brown, Sturman and Simmering (2003) have also argued that more research on the firm performance implications of compensation systems is still required.

One issue that has been overlooked in the management literature is the linkage among compensation systems, strategic performance measurement systems such as Balanced Scorecards (Kaplan and Norton, 1996) and firms' performance (Ittner and Larcker, 1997; Ittner, Larcker and Meyer 2003). At present, the lack of knowledge in this area is of particular importance to academics and practitioners (e.g. Banker, Potter and Srinivasan 2000; Van der Stede, Chow and Lin, 2006)[1]. Many organisations are now replacing

[1] When multiple references are cited, they are included in alphabetical order.

their accounting-based performance measurement systems with more sophisticated mechanisms that incorporate multi-criteria indicators of organisational performance –that is financial as well as non financial[2] (Ittner and Larcker, 2003). Most of these organisations are making their executives' compensation contingent upon these multi-criteria indicators (William Mercer and Co., 1999; Towers Perrin, 1996). However, the performance impact of using financial and non-financial information for compensation purposes is far from being understood (e.g. Ittner et al., 2003).

Researchers such as Said, HassabElnaby and Wier (2003), Ittner and Larcker (2003), Hoque and James (2000) and Van der Stede et al., (2006) have found that the use of financial and non-financial measures of performance in compensation systems has a positive impact on economic performance. However, researchers such as Perera, Harrison and Poole (1997) or Ittner, Larcker and Meyer (2003) have also found that the use of performance measurement diversity might not be associated with enhanced organisational performance.

[2] The use of "financial as well as non-financial", "measurement diversity", and "multi-criteria measures" are concepts that will be used interchangeably throughout the thesis.

Based on these contradictory findings, some scholars have argued that the different performance effects of the use of financial and non-financial information for evaluating and rewarding managerial actions can be explained when specific organisational conditions are taken into consideration. Hoque (2005) suggests that it is under conditions of high environmental uncertainty that the use of measurement diversity is most useful in improving firms' economic performance. Nevertheless, there are many other organisational conditions that may influence the relationship between measurement diversity in compensation systems and firm performance (e.g. Govindarajan and Gupta, 1985; Said et al., 2003).

Academic research investigating the relationship between the use of multi-criteria performance measures for evaluating and rewarding managerial actions and firm performance, and the effects of specific organisational conditions on this relationship, is still limited (Hoque, 2004; Ittner and Larker, 1997). This thesis aims to contribute to this area of knowledge by focusing on two key research questions. Firstly, *what effect does the use of measurement diversity in executives' incentive systems has on firm performance?* Secondly, *to what extent is the relationship between measurement diversity in executives' incentive pay and firm performance influenced by organisational contingencies, in particular: business risk, ownership structure, organisational culture, quality of performance measures and reward system effectiveness?*

1.2. Theoretical background

The theories underpinning this thesis are agency theory (Fama and Jensen, 1983; Jensen and Meckling, 1976), specifically the positivist agency theory (Eisenhardt, 1989), and contingency theory (Donaldson, 2001). Agency theory is the most important theory guiding organisational research on the use of performance measures for compensation purposes (Bloom and Milkovich, 1998; Lambert, 2001). It predicts that the use of performance measures in compensation systems is positively associated with organisational success (e.g. Larcker, 1983; Banker, Lee and Potter, 1996; Lazear, 2000).

The contingency theory of organisations mainly predicts that the relationship between an organisation's characteristic such as its structure or its management control system and organisational performance depends upon specific organisational conditions, also known as contingencies (Donaldson, 2001). For instance, contingency researchers examining management control systems such as accounting argue that the design of an appropriate accounting system should depend upon the specific circumstances in which an organisation finds itself in order to positively affect organisational performance (Fisher, 1995b; 1998; Hayes, 1977; Otley, 1980).

Since the late eighties, agency theorists have directly or indirectly adopted contingency theory premises for explaining inconsistencies arising

from the empirical testing of their predictions. Consequently, agency theorists have started to suggest that the positive relationship between executive pay and firm performance is dependent upon (1) particular organisational contingencies such as business risk (uncertainty about outcomes or future events) (e.g. Bloom and Milkovich, 1998; Gray and Cannella, 1997; Miller, Wiseman and Gomez-Mejia, 2002), ownership structure (e.g. Gomez-Mejia, Tosi and Hinkin, 1987; Tosi and Gomez-Mejia, 1994), culture (e.g. Ekanayake, 2004); and (2) specific factors related to the design and implementation of compensation systems such as the quality of the performance measures (Indjejikian, 1999) and the perceived effectiveness of the reward system (Diaz and Gomez-Mejia, 1997).

In short, the hypotheses proposed in this research are based mainly on agency theory (Hypothesis 1) and on the integration of both agency theory and contingency theory (Hypotheses 2, 3, 4, 5, and 6).

1.3. Research philosophy, methods, process and validity

Most agency and contingency predictions looking at compensation systems have been tested using a positivist approach (Donaldson, 2001; Eisenhardt, 1989). The positivist research philosophy corresponds with the author's research philosophy and, therefore, this thesis has been conducted under a positivist paradigm.

In the literature examining the different research philosophies that can be adopted when conducting studies in social sciences, the concept of positivism has been defined in various ways (e.g. Easterby-Smith, Thorpe and Lowe, 1999). Most definitions describe positivism by focusing on its assumptions. Positivism assumes that social phenomena can be studied as hard facts and that the relationships between these facts can be established as scientific laws. Scientific laws have the status of truth and social objects can be investigated using the research methods developed for the study of natural objects (e.g. Blaikie, 1993; Smith, 1998).

The general principles of the positivist philosophy of science have a number of implications for social research. These implications are summarised in Table 1-1.

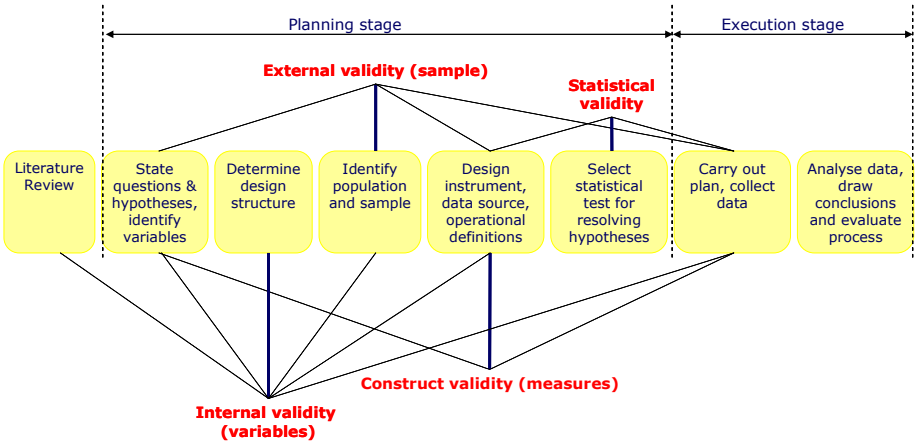
Table 1-1 Research implication of Positivism (adapted from Easterby-Smith et al. (1999))

Implications	**Description**
Methodological	All research conducted using this philosophical approach should be quantitative. Only quantitative research can be the basis for valid generalisations and scientific laws.
Value-freedom	The choice of what to study and how to study it should be determined by objective criteria rather than human experiences, beliefs or interests.
Causality	Its main aim is to identify causal relationships and fundamental laws that explain human behaviour.
Deduction	Hypotheses are proposed based on a logical deduction process.
Operationalisation	Concepts or variables under study need to be operationalised in a way that enables facts to be measured quantitatively.
Independence	The role of the researcher is independent of the subject under examination.
Reductionism	The phenomenon under study is better understood if it is reduced to the simplest possible elements.

Based on the above implications: (1) this study has been conducted using quantitative methods only –that is survey and archival research; (2) the phenomenon that the study addresses has emerged from previous research within the performance measurement literature (e.g. Ittner and Larcker, 1997; Ittner, Larcker and Meyer, 2003); (3) the purpose of the study is to examine to what extent the use of measurement diversity in executives' incentives causes a positive impact on firm performance; and to what extent this relationship is moderated by specific organisational contingencies; (4) a logical deductive approach has been used to arrive at the research hypotheses; (5) all study variables have been operationalised using quantitative measures; (6) the researcher has played an external observer role with no involvement whatsoever with the organisations under investigation; and (7) the phenomenon under study has been reduced and modelled to its simplest possible elements (Chapter 3 shows the theoretical framework used in this study).

In line with the positivist view of the world, the research has been conducted using the process suggested by Black (1999) (see Figure 1-1).

Figure 1-1 Research process (adapted from Black (1999))



First, a review of the performance measurement literature was conducted. Second, the research questions and hypothesis were proposed (see Table 1-2). Third, the research design structure was specified –that is the development of a survey and the extraction of financial and contextual data from the financial database FAME. Fourth, the population and sample frame were selected. It was decided that the study was going to be focused on large organisations based in the UK. This decision was taken based on the study of Hoque and James (2000) who found that larger organisations are the ones which are more likely to use non-financial performance measures in addition to financial performance measures in their management control systems. Also, the fact that the researcher is based in the UK facilitated the access to data. Fifth, the research instruments and the operationalisation of the study variables were developed and, subsequently, they were tested by means of a pilot study. Sixth, the statistical tests for data analysis were chosen. The data was tested using multivariate data analysis, in particular, multiple regression analysis with the use of interaction effects. Seventh, the research data was collected. This was done between November 2003 and March 2004. Finally, the research data was analysed and conclusions were reached.

Table 1-2 Summary of research questions, hypotheses and study variables

Research questions, hypothesis and variables	
Research questions	**RQ1:** What effect does the use of measurement diversity in executives' incentive systems has on firm performance? **RQ2:** To what extent is the relationship between measurement diversity in executives' incentive pay and firm performance influenced by business risk, ownership structure, organisational culture, quality of performance measures and reward system effectiveness?

Research questions, hypothesis and variables	
Hypotheses	**H1:** There is a positive relationship between measurement diversity in executive incentive pay and firm performance. **H2:** The relationship between measurement diversity in executive incentive pay and firm performance is moderated by the quality of the performance measures such that measurement diversity is positively associated with firm performance when the quality of performance measures is high. **H3:** The relationship between measurement diversity in executive incentive pay and firm performance is mediated by reward effectiveness such that measurement diversity is not related to firm performance when reward effectiveness is controlled. **H4:** The relationship between measurement diversity in executive incentive pay and firm performance is moderated by business risk such that measurement diversity in executive incentive pay is positively associated with firm performance when business risk is high or low and negatively associated with firm performance when business risk is moderate. **H5:** The relationship between measurement diversity in executive incentive pay and firm performance is moderated by ownership structure such that measurement diversity in executive incentive pay is positively associated with firm performance when firms are manager-controlled and negatively associated with firm performance when firms are owner-controlled. **H6:** The relationship between measurement diversity in executive incentive pay and firm performance is moderated by organisational culture such that measurement diversity is positively associated with firm performance when organisational culture is perceived to be clan and adhocracy, and negatively associated with firm performance, when organisational culture is perceived to be market and hierarchy.
Study Variables	**Dependent variable:** Firm performance. **Independent variable:** Measurement diversity in executives' annual incentive systems. **Moderator variables:** Business risk, ownership structure, organisational culture, and quality of performance measures. **Mediator variable:** Reward system effectiveness. **Control variables:** Firm size and industry.

Issues related to the validity of the study were addressed in each of the research phases as suggested by Black (1999). Four constituent types of validity were taken into consideration: construct validity, internal validity,

external validity and statistical validity (Black, 1999). *Construct validity* –making sure that the survey instrument measures what it is supposed to measure– was carefully considered not only during the design of the instrument but also during the framing of the research questions, hypotheses and key variables. In order to minimise the threats to construct validity, scales that had already been tested in previous high quality[3] research were chosen when available and when they were not available they were created following the recommendations of DeVellis (2003).

Internal validity –ensuring that the independent variables are responsible for the change in the dependent variable– was dealt with during the time when the research design was being determined but also during the stages highlighted in Figure 1-1. The threats to internal validity were addressed by: (1) focusing the research in well grounded organisational theories –these are agency and contingency theory–; (2) cautiously selecting the research population and sample frame; (3) using measures of independent and dependent variables that had been previously used in similar research (e.g. Ittner, Larcker and Randall 2003); and (4) including control variables –firm's size and industry– that had been found to be

[3] In this context, high quality research refers to research published in highly rated peer reviewed academic journals.

associated with the firm's performance in earlier related research (e.g. Gupta, 1987; Ittner and Larcker, 1995; Ittner, Larcker and Randall, 2003).

External validity –taking care that the results of the study can be generalised to a larger population– was addressed mainly during the selection of the population and sample frame; although previous and later research phases were also considered. In order to minimise the threats to external validity the sample frame was methodically selected by making sure that each of the industries represented in the UK population were represented in the same proportion in the sample frame. In addition to this, the data were collected at one point in time (financial year 2003/04) and, once the data had been collected, several sample bias analyses were conducted for estimating the degree of generalisability of the study.

Finally, *statistical validity* –ensuring that the appropriate statistical tests are used– was considered when the research instrument was being developed, when the statistical methods were decided upon, and when the data were collected. Threats to statistical validity were tackled mainly by carefully operationalising the variables under study and by choosing the statistical analysis method that had been previously recommended in the literature –that is, multiple regression analysis with main and interaction effects (e.g. Hartmann and Moers, 1999; Schoonhoven, 1981; Venkatraman, 1989).

1.4. Findings and expected contributions

The findings of this thesis are summarised as follows. Contrary to expectations, this study finds that the use of financial and non-financial performance measures in executives' annual incentives is negatively related to return on assets and sales annual growth. The study suggests that neither the quality of performance measures, the effectiveness of the reward system or the organisational ownership structure seem to interact with the relationship between measurement diversity and firm performance. The study shows that business risk has a significant impact on the relationship between measurement diversity in executives' incentive systems and business goals achievement. When business risk is high or low the relationship between measurement diversity in executives' incentives and business goals achievement is positive and when business risk is moderate the same relationship is negative. Finally, the study finds that organisational culture also has a significant impact on the measurement diversity-business goals achievement relationship. When firms have a clan or adhocracy organisational culture –according to Cameron and Quinn's (1999) cultural typology–, the use of measurement diversity in executives' annual incentives is positively associated with business goals achievement. However, when firms have a market or hierarchy organisational culture the relationship between measurement diversity and business goals achievement is negative.

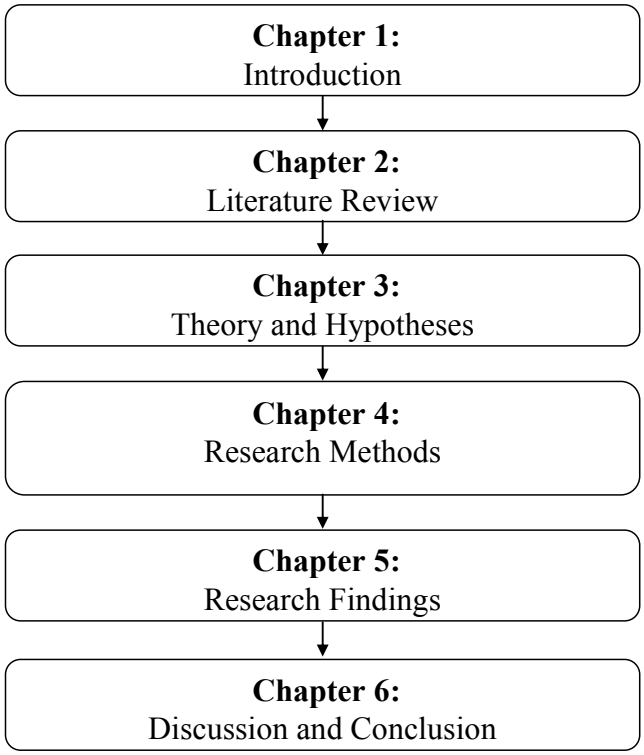
This research contributes to the management literature, more specifically to the performance measurement literature, in several ways. Firstly, it contributes to the body of research looking at the performance impact of measurement diversity (e.g. Banker et al., 2000; Hoque and James, 2000; Ittner and Larcker, 1995; Ittner, Larcker and Randall, 2003; Said et al., 2003; Van der Stede et al., 2006). Secondly, it contributes to the body of research looking at the moderator factors that may affect the relationship between measurement diversity and firm performance (e.g. Hoque, 2004; 2005). Thirdly, this thesis contributes to agency theory research in four ways: (1) by providing empirical evidence for the predictions of authors such as Feltham and Xie (1994) and Hemmer (1996) –these authors have predicted that the use of non-financial information in addition to financial information in incentives will be associated with higher organisational performance; (2) by providing theoretical arguments that associate agency theory with organisational culture using the Competing Values Framework (Cameron and Quinn, 1999, 2005); (3) by providing data obtained in the UK as the majority of the agency-based executive compensation and performance measurement research has been conducted in the US (Merchant, Van der Stede and Zheng, 2003); and (4) by providing an example of a research that applies a survey methodology in combination with archival data. This last contribution is important because agency-based hypotheses have been mainly tested using archival data alone, which has serious limitations for producing valuable insights (Gomez-Mejia, 1994).

Finally, this study contributes to the contingency theory of management control systems by providing empirical evidence concerning the notion that there is no universally appropriate management control system –in this case, the executive incentive system– which applies equally to all organisations in all circumstances (Fisher, 1995b; 1998; Otley, 1980).

1.5. Research outline

The outline of the thesis is presented below (see Figure 1-2). The structure of this thesis has been informed by the typical structure followed by academic papers such as the ones published in the Academy of Management Journal (http://www.jstor.org/journals/00014273.html).

Figure 1-2 Outline of the thesis



2. LITERATURE REVIEW

This chapter reviews the management literature, specifically the performance measurement[4] literature that looks at the adoption and impact of non-financial performance measures. Four key review questions were used when investigating this literature. These were: (1) What definitions of non-financial performance measures are used in previous research studies? (2) Why do organisations use non-financial information for measuring and rewarding executives' performance? (3) What is the performance impact of using non-financial information in performance measurement and compensation? and (4) what are the organisational theories that support and explain the use of non-financial information for determining executives' incentive pay?

This chapter is structured according to the four questions used to review the literature. Section 2.1 reviews the different definitions found in previous investigations and presents the definition of non-financial performance measures employed in this research. Section 2.2 shows the

[4] The performance measurement literature comprises studies from many management disciplines (Neely, 2002). The most salient ones are: operations, accounting, strategy and human resources management (Franco-Santos and Bourne, 2005).

reasons why organisations use non-financial measures. Section 2.3 summarises the findings of previous research looking at the association between the use of non-financial performance measures in incentive compensation and performance. Section 2.4 describes the main theories that support the use of non-financial metrics for compensation purposes.

2.1. Towards a definition of non-financial performance measures

In the literature, the distinction between financial and non-financial performance measures is often left to the reader's common understanding of those terms (Morissette, 1996). When performance measurement scholars introduce the concept of non-financial measures, they tend to do it by providing specific examples of these measures. For instance, Lau and Sholihin (2005) describe non-financial performance measures as "those measures that relate to the customer, internal business process, and learning and growth performance perspectives" (p. 390), which is a description frequently used by Balanced Scorecard promoters (Kaplan and Norton, 1992; 1996; 2001; 2004; 2006). Other researchers, for example, Banker, et al. (2000) and Ittner, Larcker and Rajan (1997) are more specific and define non-financial measures as measures such as product quality, customer satisfaction, and market share.

This method of providing the meaning of a term by listing the objects that fall under the definition of the term in question is known as an *extensional definition* (Matthews, 1997). This type of definition is considered to be appropriate if the number of objects required for explaining the meaning of a term is limited or fixed. In the case of non-financial performance measures, it can be argued that there are an unlimited number of examples that can be use for describing what a non-financial measure is by extension. Thus, the use of just a couple of examples may generate confusion and misunderstanding. For instance, some researchers use the measure *market share* as an example of a non-financial performance measure (e.g. Banker et al., 2000), whereas others consider this measure to be a financial performance measure (e.g. Morissette, 1996).

Confusion and misunderstanding about the meaning of non-financial performance measures might not only be occurring in academic research. Practitioners also seem to have difficulties comprehending what non-financial performance measures are. Evidence of this lack of understanding is mentioned by Morissette (1996) in his doctoral dissertation. He argues that there is "anecdotal evidence suggesting that managers who are asked to identify non-financial information often confound qualitative information (i.e. information that is not expressed in terms of numerical metrics) with non-financial numerical expressions" (p. 12). Actually, Van der Stede, et al. (2006) have tried to reflect this qualitative notion of non-financial performance measures by making a clear distinction between non-financial

measures that are "quantitative and objectively derived (e.g. defect rates) and those that are qualitative and subjectively determined (e.g. an assessment of the degree of cooperation or knowledge sharing across departmental borders)" (p. 186). However, these authors also fail to provide a clear definition of what they mean by non-financial measures; they just describe both objective and subjective non-financial measures by citing examples of these measures.

After reviewing the performance measurement literature, it seems that the only definition that offers some clarity, facilitating the understanding of what non-financial performance measures are, is the one provided by Morissette (1996). He reviews how financial performance measures are defined in the literature and then he defines non-financial performance measures using a similar structure. He suggests that financial information is "(1) a piece of information expressed as a monetary unit; (2) ratios resulting from mathematical manipulations of information expressed in monetary units; and (3) a piece of information resulting from a ratio that includes a piece of information expressed in a monetary unit and a non-monetary unit" (p. 12). As opposed to this, he proposes that non-financial performance measures are "any quantitative measure, (1) expressed in a metric other than a monetary unit, or (2) that results from mathematical manipulations or

ratios of pieces of information expressed in metrics other than monetary unit" (p. 13)[5]. Despite the fact that this definition is the most comprehensive found in the literature, it is not free of criticism. If the work of Van der Stede, et al. (2006) is taken into account, unfortunately, this definition could be considered incomplete as it leaves out the notion of qualitative or subjective non-financial information.

As concluding remarks, this section argues that the common lack of attention to the non-financial performance measures definition in the performance measurement literature may be generating research comparability and generalisability issues. With the aim of addressing this limitation, a definition based on the work of Morissette (1996) and Van der Stede, et al. (2006), is here presented: Non-financial performance information is considered to be *(1) any qualitative or subjective performance measure, and (2) any quantitative performance measure that is expressed in a metric other than a monetary unit, or that results from mathematical manipulations or ratios of pieces of information expressed in*

[5] Based on this definition of non-financial measures it can be understood why Morissette (1996) classifies market share as financial information, contrary to other authors who suggest that this measure is non-financial. According to Morissette, market share tends to be measured as total organisational sales divided by total market sales, both of which are monetary metrics.

metrics other than monetary units. The role of this definition has been crucial for assessing the relevance of the findings found in prior research.

Prior research on non-financial performance measures has been mainly concerned with two phenomena. On the one hand, scholars have been interested in why firms should adopt non-financial metrics in their business performance measurement and compensation systems. On the other hand, scholars have focused on what effects the use of non-financial measures has on performance and/or behaviour. Both of these bodies of research are summarised in the next two sections.

2.2. Reasons for using non-financial performance measures

Scholars and practitioners use a diverse set of reasons to explain the use of non-financial information for measuring and rewarding managerial performance. The most common reason is based on the idea that non-financial measures can focus managerial attention on the long-term as these measures contain forward-looking information about performance that is absent in financial indicators (Brancato, 1995; Fisher, 1995a; Ittner and Larcker, 1998). In fact, evidence suggests that non-financial performance measures are useful in predicting future financial performance (e.g. Anderson, Fornell and Lehmann, 1994; Behn and Riley, 1999; Nagar and Rajan, 2005; Rucci, Kirn and Quinn, 1998). Based on this idea, scholars and

practitioners assert that non-financial performance measures can be employed to overcome the short-termism[6] of relying on financial information only (Banks and Wheelwright, 1979; Hayes and Abernathy, 1980; Indjejikian, 1999; Kaplan and Norton, 1992; Neely, 1998; 1999).

Another reason that has been suggested in the literature is the notion that only a collection of financial and non-financial performance measures can properly align the efforts of an organisation with its strategic objectives The rationale behind this argument is based on the idea that non-financial performance measures can provide strategic information about customers, internal processes, competitors, intangible assets, etc. that are difficult to capture with the use of financial information only (e.g. Amir and Lev, 1996; Ittner and Larcker, 1998; 2003; Kaplan and Norton, 1992; 1996; 2001; 2004;2006; Neely, Mills, Platts, Richards, Gregory, Bourne and Kennerley, 2000a; Neely, Adams and Kennerley, 2002; Otley, 1999). Perera et al. (1997) also argue that non-financial measures have been said to be critical because they deal with causes and not effects. They use a quote taken from another author to further explain this particular attribute of non-financial measures: "Profit measures [as an example of financial measures] show the effects of non-financial activities and achievements; [but] they do not pin

[6] Shor-termism is defined as the concentration on immediate profit or advantage at the expense of long-term security (Fowler, Fowler and Pearsall, 2004).

down precisely what it is in your business that you are getting right or wrong (Singleton-Green, 1993, p. 52)" (in Perera et al., 1997, p. 561).

An additional reason for the use of non-financial information is the belief that, due to the existing competitive realities organisations face (e.g. increased customisation, flexibility, innovation and responsiveness), traditional financial measures are no longer appropriate for managing the performance of an organisation. Non-financial performance measures together with financial performance measures are required to deal with the complexity and uncertainty of today's business world (Dixon, Nanni and Vollmann, 1990; Ijiri, 1975; Ittner and Larcker, 1998; Neely, 1999).

Finally, based on the premise that managers have an incentive to concentrate on those activities for which their performance is measured, often at the expense of other relevant but non-measured activities (Hopwood, 1974), a greater measurement diversity is being proposed as a way to reduce such dysfunctional effects (Lillis, 2002; Van der Stede et al., 2006). Agency theory authors support this argument. They have shown that the use of non-financial measures for determining incentive pay can improve contracting as those measures provide information on managerial action that financial measures cannot fully capture (e.g. Datar, Kulp and Lambert, 2001; Feltham and Xie, 1994; Hemmer, 1996; Holmstrom, 1979; Lambert, 2001).

Despite the encouraging reasons supporting the use of non-financial information for performance measurement and compensation purposes, researchers have also highlighted potential drawbacks to the use of a diverse set of measures to manage business performance and compensation. There is evidence to show that the use of non-financial performance measures in addition to financial performance measures increases systems complexity and may affect managers' cognitive abilities (Banker, Chang and Pizzini, 2004; Gosh and Lusch, 2000; Lipe and Salterio, 2000; 2002; Van der Stede et al., 2006). The use of non-financial performance measures in addition to financial performance measures in incentives also complicates the process of assigning relative weights to the different measures (Ittner and Larcker, 1998; Moers, 2005). Furthermore, the use of multi-criteria measures may generate internal conflicts due to the pursuit of incongruent goals (e.g. increase innovation and reduce cost) (Baker, 1992; Holmstrom and Milgrom, 1991; Lillis, 2002; Van der Stede et al., 2006; Wong-On-Wing, Guo, Li and Yang, 2007).

Chatterji and Levine (2006) also suggest that the administrative costs of the use of non-financial performance measures in addition to financial performance measures may be substantial; the accuracy of non-financial performance measures may be limited –due to measurement bias and subjectivity–; the introduction of additional measures may dilute the importance of previous measures, which suggests that more measurement might not always be advisable; multi-criteria performance measures may be

benefiting poor performers; and even worse, when non-financial measures do not appropriately measure what they are supposed to measure, increased measurement may actually diminish overall performance.

It is crucial that researchers take into consideration all these drawbacks to the use of multi-criteria performance measures. However, to date, most conceptual work in this area seems to support the use of measurement diversity. In the majority of the cases, this is due to the assumed beneficial effect of the use of multi-criteria performance measures on firm's performance. The following section aims to summarise the literature that focuses on the association between the use of non-financial performance measures and performance.

2.3. The impact of using non-financial information

Accounting research has traditionally been interested in the association between the use of performance measures and a firm's business results. For many years, scholars have dedicated their time and efforts to examining (1) the association of accounting variables and firm performance (e.g. Bernard and Noel, 1991); (2) the ability of financial statements to predict future performance (e.g. Stober, 1993); and (3) the behavioural and performance consequences of greater reliance on accounting measures in performance evaluation (e.g. Briers and Hirst, 1990; Brownell, 1982; Dunk,

1990; Harrison, 1993; Hartmann, 2000; Hopwood, 1972; Otley, 1978; Otley and Fakiolas, 2000). During the Eighties (e.g. Hayes and Abernathy, 1980; Johnson and Kaplan, 1987) and early Nineties (e.g. Feltham and Xie, 1994; Kaplan and Norton, 1992), the limitations of financial measures for valuing a firm's performance were highlighted; and the discussions that came afterwards resulted in an increased research interest in the use of non-financial information and its effects on organisational performance.

It must be noted though that it was not the first time the idea of using non-financial performance measures in organisations had entered the research arena. For instance, as suggested by Ridgway (1956), investigators in the Soviet Union "had concluded by 1940 that no single measure of success of a firm [e.g. profit] is adequate in itself and that there is no substitute for genuine analysis of all the elements entering into a firm's work [e.g. financial as well as non-financial aspects of performance]" (p. 243). In the Fifties, operation researchers were already concerned with the right choice of multi-criteria performance measures in manufacturing settings (Hitch and McKean, 1954); and management consultants such as Peter Drucker (1954) were stressing the importance of multi-criteria measures for evaluating managerial performance. However, it is from the late Eighties and early Nineties that empirical research into the adoption and consequences of diverse measurement at all organisational levels had a significant increase (Neely, 1999).

The body of literature looking at the performance impact of using non-financial information in performance measurement and compensation systems can be classified as follows. On the one hand, work in this area has looked at the performance impact of employing financial as well as non-financial performance information in performance measurement systems (e.g. Total Quality Management and Balanced Scorecards), managerial evaluation and reward practices. On the other hand, research in this area has also paid attention to the different moderators that may affect the relationship between the use of multi-criteria performance measures for evaluating and rewarding employees and firm performance. The findings of both of these streams of research are now described. Table 2-1 summarises the key details of the body of literature looking at the performance impact of using multi-criteria performance measures for evaluating and/or rewarding managerial action.

Table 2-1 Empirical papers looking at the performance impact of using multi-criteria performance measures for evaluating and/or rewarding managerial action

Author(s)	Date	Location of study	Indust.	Data collection method (sample)	Data analysis method	Org. theory	Key findings
Banker, R.D.//Potter, G.//Srinivasan, D.	2000	US	Leisure	Archival data, and interviews with senior managers (18 hotels)	Regression analysis (time series)	Agency theory	Non-financial measures of customer satisfaction are significantly associated with future financial performance and contain additional information not reflected in the past financial measures. Furthermore, both non-financial and financial performance improved following the implementation of an incentive plan that includes non-financial performance measures.
Boulianne, E.	2002	Canada	Manufact. and service	Survey (90 business units, 24% res. rate)	Regression analysis	Not clearly explicit	Results suggest that the impact of broad scope information usage on performance will be more beneficial for managers operating in prospector-type firms than for managers operating in defender-type firms.
Chenhall, R.H.	1997	US	Manufact.	Survey (39 firms)	Descriptive statistics and regression analysis (interaction)	Not clearly explicit	The association between TQM and performance is stronger where diverse manufacturing performance measures (MPMs) are used as part of managerial evaluation (MPMs provide feedback that focuses attention).
Chenhall, R.H.	1996	Australia	Manufact.	Survey (37 BUs)	Descriptive statistics and regression analysis	Not clearly explicit	The study finds that the performance of entities which had a high degree of manufacturing flexibility were positively associated with the extent to which managers were evaluated using diverse performance measures.
Chenhall, R.H.// Langfieldsmith, K.	1998	Australia	Manufact.	Survey (140 firms)	Cluster analysis	Contingency theory	The authors study how combinations of management techniques and management accounting practices (including the use of diverse measurement) enhance the performance of organisations, under particular strategic priorities.
Govindarajan,	1985	US	Various	Survey and	Qualitative	Not clearly	The authors find a positive association between strategy, incentive bonuses

Author(s)	Date	Location of study	Indust.	Data collection method (sample)	Data analysis method	Org. theory	Key findings
V.//Gupta, A. K.			industries	interviews (58 BUs)	analysis and regression analysis (interaction)	explicit	that include non-financial indicators and effectiveness at strategic business unit level.
Gupta, A.K.	1987	US	Various industries (Diversif. Fortune 500 firms)	Survey and interviews (58 SBIs and Managers in 8 firms)	Regression analysis (interaction)	Not clearly explicit	The present study examined the effects of 2 dimensions of SBUs strategic contexts: strategic mission and competitive strategy, on the performance implications of 3 aspects of corporate-SBU relations. Results show that, for SBUs trying to build market share or to pursue differentiation as a competitive strategy, openness in corporate-SBU relations and subjectivity in performance assessment are positively associated with effectiveness. For SBUs trying to maximise short-term earnings or to pursue low cost as a competitive strategy, the corresponding associations are negative. In contrast, corporate-SBU decentralisation is found to be positively associated with SBUs' effectiveness regardless of their strategic contexts; although SBUs' competitive strategies moderate the magnitude of that association, their strategic missions do not.
Hoque, Z.	2004	Australia	Manufact.	Survey (52 resp., 52% resp. rate)	Descriptive statistics and regression analysis (path analysis)	Contingency theory	The study found a significant and positive association between management's strategic choice and organisational performance acting through management's high use of non-financial measures for performance evaluation.
Hoque, Z.	2005	Australia	Manufact.	Survey (52 resp., 52% resp. rate)	Descriptive statistics and regression analysis (interaction)	Contingency theory	The study finds that the use of non-financial performance measures would lead to improved organisational performance under conditions of increased environmental uncertainty.
Hoque, Z.//James, Wendy	2000	Australia	Manufact.	Survey (66 firms, 35%	Descriptive statistics,	Not clearly explicit	Larger firms make more use of multi-criteria performance measures (balanced scorecard). In addition, firms that have a higher proportion of new

Author(s)	Date	Location of study	Indust.	Data collection method (sample)	Data analysis method	Org. theory	Key findings
				resp. rate)	correlation, regression and ANOVA analysis		products have a greater tendency to make use of measures related to new products. A firm's market position has not been found to be associated significantly with greater balanced scorecard usage. It is also suggested that greater balanced scorecard usage is associated with improved performance, but this relationship does not depend significantly on organisation size, product life cycle, or market position.
Ittner, C.D.//Larcker, D.F.	1995	Canada, Germany, Japan & US	Automob. & computer industries	Survey (249 firms, 85% resp. rate)	Description statistics, canonical correlation analysis, ANOVA and regression analysis	Contingency theory	Self-reported use of manufacturing measures by managers had a positive impact on perceived performance in some manufacturing settings but not in others.
Ittner, C.D.//Larcker, D.F.	2003	US	Service (financial) & Manufact.	Survey (140 senior exec. and 157 CFOs) and interv. (60)	Descriptive statistics	Not clearly explicit	They find a positive relationship between the use of non-financial performance measures and performance (measured by return on assets and return on equity)
Ittner, C.D.//Larcker, D.F.//Meyer, M.W.	2003	US	Financial (retail banking)	Archival financial and employee survey data (1 firm)	Regression analysis	Agency theory	The use of measurement diversity (balanced scorecard) generated subjectivity and allowed superiors to reduce the "balance" in bonus awards by placing most of the weight on financial measures, to incorporate factors other than the scorecard measures in performance evaluations, to change evaluation criteria from quarter to quarter, to ignore measures that were predictive of future financial performance, and to weight measures that were not predictive of desired results. These outcomes led many branch managers to complain about favouritism in bonus awards and uncertainty in the criteria being used to determine rewards, and caused corporate executive and human resource managers to question the use of measurement diversity

Author(s)	Date	Location of study	Indust.	Data collection method (sample)	Data analysis method	Org. theory	Key findings
							for compensation purposes.
Ittner, C.D.//Larcker, D.F.//Randall, T.	2003	US	Service (Financial)	Survey & archival data (140 firms)	Regression analysis	Agency theory & contingency theory	This study presents evidence that firms making more extensive use of a broad set of financial and non-financial measures than firms with similar strategies or value drivers have higher measurement system satisfaction and stock market returns. This study also shows that the use measurement diversity is negatively related to ROA (although regression coefficient not significant)
Olson, E.M.// Slater, S.F.	2002	US	Various industries	Survey (200 businesses, 23% resp. rate)	Descriptive statistics	Not explicit	This study suggests that the use of measurement diversity (balanced scorecard) is related to the firms' overall success. For prospector firms the balanced scorecard approach actually represents the best management standard. However, for low-cost defenders an unbalanced approach actually represents the best management standard.
Perera, S.//Harrison, G.//Poole, M.	1997	Australia	Manufact. firms/ divisions	Survey (109 resp., 54.5% resp. rate)	Descriptive statistics and regression analysis	Contingency theory	Firms that maintain a customer-focused manufacturing strategy also maintain an emphasis on non-financial (operations-based) measures in their performance measurement systems but this association is not linked to an increase in performance
Said, A.A.//HassabElnaby, H.R.//Wier, B.	2003	US	Various industries	Archival (2882 public quoted firms)	Regression analysis	Agency theory	Firms that use diverse measurement have significantly higher mean levels of return on assets and higher levels of market returns. Although the authors find evidence that the adoption of non-financial measures improves firms' current and future stock market performance, these authors find only partial support for accounting performance improvements. The association between measurement diversity and firm performance is contingent on the firms' operational and competitive characteristics.
Scott, T.W.// Tiessen, P.	1999 Apr	US	Various industries (for profit) & not for	Survey (248 respondents from 12 org. for profit & 15 org. non-	Correlation, regression analysis (path analysis)	Agency theory	Team performance is positively associated with the variety and comprehensiveness of performance measures used. This relationship is enhanced if members participate in setting performance targets. Further, team performance is enhanced when team performance is given a greater weight in compensation. Finally, these effects are mutually reinforcing, such

Author(s)	Date	Location of study	Indust.	Data collection method (sample)	Data analysis method	Org. theory	Key findings
			profit	for-profit)			that team performance is substantially better when comprehensive and diverse performance measurement is combined with the participation of team members and a larger weight for team performance in their compensation.
Sim, K.L.// Killough, L.N.	1998	US	Electronics	Survey (89 plants, 68% resp. rate)	Descriptive statistics, and regression analysis	Not explicit	This study finds a positive relationship between the use of non-financial measures and firm performance
Van der Stede, W.A.// Chow, C.W.// Lin, T.W.	2006	US (Southern California) & Europe (Belgium)	Manufact.	Survey (128 firms)	Descriptive statistics and regression analysis	Agency theory & Conting. theory	Performance measurement diversity, per se, is beneficial. Firms with extensive performance measurement systems –especially those that include objective and subjective non-financial measures– have higher performance. They also find that firms which emphasise quality in manufacturing use more of both objective and subjective non-financial measures. However, there is only a positive effect on performance from pairing a quality based manufacturing strategy with extensive use of subjective measures, but not with objective non-financial measures.

2.3.1. The performance impact of diverse measurement

Within the stream of research looking at the direct impact of using multi-criteria performance information in performance measurement and/or compensation systems and firm performance, the work of Ittner and Larker (1995), Chenhall (1996; 1997), Chenhall and Langfieldsmith (1998), Sim and Killough (1998), Scott and Tiessen (1999) and Banker et al. (2000) can be highlighted.

Ittner and Larcker (1995) are among the scholars that have examined the relationship between the use of non-financial information, Total Quality Management (TQM) practices and organisational performance. In their analytical research conducted in two different manufacturing industries (automotive and computer) in Canada, Germany, Japan and the United States, they find that "in organisations without extensive formal quality programs, greater reliance on non-traditional[7] information and reward systems is associated with higher performance levels" (p. 2). However, they

[7] Here, the meaning of non-traditional information can be compared to the meaning of non-financial information. Ittner and Larcker (1995) define non-traditional performance measurement systems as those that "provide more timely physical measure of operational performance, increase provision of problem-solving information to the workers actually performing the job, and reward systems that focus more on non-financial measures (e.g. customer satisfaction or quality)" (p. 2).

find no support for the proposition that, holding other determinants of performance constant, organisations making the greatest use of TQM, non-traditional information and reward systems are the ones with higher organisational performance. Perera et al. (1997) find similar results in a survey of 200 managers of manufacturing firms in Australia. Their study shows that greater use of non-financial information is not associated with enhance performance for firms pursuing a customer-focused strategy driven by the employment of TQM practices –referred as "advanced management practices" (p. 562)– and advanced manufacturing technology (e.g. automation).

Evidence provided by Chenhall (1996; 1997), Chenhall and Langfieldsmith (1998) and Sim and Killough (1998) contradicts the findings suggested by Ittner and Larcker (1995) and Perera et al. (1997) above. Chenhall (1996; 1997) and Chenhall and Langfieldsmith (1998) conducted their research in Australian and US manufacturing industries. Their results suggest that reliance on the non-financial performance measures included in TQM practices for evaluating individual performance is associated with higher organisational performance. Sim and Killough (1998) examined the use of measurement diversity in production systems (e.g. TQM) and performance-related rewards in US manufacturing plants. They find that plants using non-financial performance measures in addition to financial performance measures in their production and reward systems achieve higher performance.

Scott and Tiessen (1999) examine the influence and importance of diverse performance measurement for team performance. They conduct a survey in 27 organisations in the US with a total sample of 248 respondents. Their findings suggest that "team performance is positively associated with the variety and comprehensiveness of performance measures used. This relationship is enhanced if members participate in setting performance targets. Further, team performance is enhanced when team performance is given a greater weight in compensation. Finally, these effects are mutually reinforcing, such that team performance is substantially better when diverse and comprehensive performance measurement is combined with the participation of team members and a larger weight for team performance in their compensation" (p. 263).

Banker et al. (2000) look at the relationship between the use of specific non-financial performance measures (e.g. customer satisfaction) for incentive compensation purposes and performance in the hotels of a US lodging chain. They find that when non-financial measures are use for evaluation and compensation purposes, managers more closely align their efforts to those measures, resulting in increased performance. They also find that, in the case of the lodging chain, improvements in non-financial measures are followed by increases in revenue and profit, and that the lag between the non-financial measures and changes in revenue and operating profit is six months.

In summary, two key learning points can be drawn from this stream of literature. On the one hand, the positive association of the use of non-financial performance measures and performance is far from being conclusive. Some researchers have found convincing evidence of the positive relationship between both variables (e.g. Sim and Killough, 1998), others have found mixed results (e.g. Ittner, Larcker and Randall, 2003), and some have found no association whatsoever (e.g. Perera et al., 1997). On the other hand, the consequences of measurement diversity usage seem to be mediated by the relationship of these types of measures with performance evaluation and/or compensation practices (e.g. Chenhall, 1997; Scott and Tiessen, 1999).

2.3.2. Contextual factors that affect the performance impact of diverse measurement

Within the body of research examining the different moderators that may influence the relationship between the use of measurement diversity in evaluation or reward systems and firm performance, the studies of Boulianne (2002), Govindarajan and Gupta (1985), Gupta (1987), Hoque (2004; 2005), Hoque and James (2000), Ittner and Larcker (2003), Ittner, Larcker and Randall (2003), Olson and Slater (2002), Said et al. (2003), and Van der Stede et al. (2006) should be cited.

Govindarajan and Gupta (1985) and Gupta (1987) are among the first researchers to empirically test the association between the use of "subjective (non-formula)" or "long-run criteria" of performance (i.e. non-financial measures) in the determination of incentive pay and business unit's (BU) performance. In their research they use BU's strategy as a variable, moderating the relationship between reliance on non-financial information and performance. They find that greater reliance on non-financial information for rewarding the BU's management team contributes to better performance in the case of "build" (increased market share) BUs but hampers it in the case of "harvest" (maximisation of short-term earnings and cash flow) BUs. They also find that the association between reliance of short-run criteria (i.e. financial information) and performance is independent of BU's strategy. In line with these findings, Olson and Slater (2002), Hoque (2004) and Boulianne (2002) provide evidence suggesting that the association between measurement diversity and performance is dependent on business strategy.

Hoque and James (2000) examine the relationship between several contextual factors (organisation size, product life-cycle stage, market position), the use of financial as well as non-financial scorecard performance measures, and organisational performance. They conducted a survey of 66 Australian manufacturing companies finding that the use of the scorecard measurement diversity was associated with improved organisational performance. Other researchers have also looked at the

performance consequences of using the multi-criteria performance measures comprised in Balanced Scorecard systems. This is the case with Ittner and Larcker (2003) and Ittner, Larcker and Randall (2003).

Ittner and Larcker (2003), based on data extracted from 157 Chief Financial Officers in a broad range of industries and 140 senior executives in the financial services industry, claim that firms which adopt non-financial measures and then establish a causal link between those measures and financial outcomes, produce a significantly higher return on assets and return on equity over a five-year period than those firms which do not. In a different paper published in the same year and based on the survey data obtained from the 140 senior executives in the financial service industry, Ittner, Larcker and Randall (2003) report less positive results. Their findings suggest that firms making a more extensive use of a broad set of financial and non-financial measures than firms with similar strategies or value drivers have higher measurement system satisfaction and higher performance measured by 1-year stock market return. However, measurement diversity does not seem to be associated with performance when it is measured by return on assets, sales growth or 3-year stock returns.

In the same year, Said et al. (2003) published the results of a study investigating the implications of the use of multi-criteria measures in compensation contracts on current and future performance. They examine

1441 organisations and, in line with Ittner and Larcker's (2003) research, they find support for the proposition that firms employing a combination of financial and non-financial measures of performance have significantly higher current and future performance (measured by mean levels of return on assets and market returns). However, they also find that the association between multi-criteria measures and firm performance is contingent on the firm's operational and competitive characteristics.

More recently, Hoque (2005), based on data collected from 52 New Zealand firms, provides evidence suggesting that the increase use of financial and non-financial performance measures leads to improve organisational performance but only under conditions of increased environmental uncertainty. Finally, Van der Stede et al. (2006) in a survey of 128 US and Belgian manufacturing firms find that, regardless of strategy, firms with more extensive performance measurement systems –especially those that include objective and subjective non-financial measures– have a higher performance.

In summary, the impact of using non-financial performance measures seems to be highly moderated by contextual variables such as business strategy (e.g. Govindarajan and Gupta, 1985), environmental uncertainty (e.g. Hoque, 2005), and other firm's operational and competitive characteristics (e.g. Said et al., 2003).

In the next section, the theories that have been used to explain these findings are explored with the aim of better understanding why and how measurement diversity might be associated with performance.

2.4. Theoretical underpinning

The majority of studies on the use and performance impact of non-financial information are based on agency theory either by itself or in conjunction with other organisational theories such as contingency theory. The foundations, main streams and most important investigations of both of these theories are reviewed and summarised next.

2.4.1. Agency theory

2.4.1.1. Agency research foundations

Agency theory has been regularly used in performance measurement research (Otley, 1999) and it is the dominant theory guiding organisational research on pay-for-performance relationships (Bloom and Milkovich, 1998; Jensen & Meckling, 1976)[8]. It has received a large amount of

[8] In the economic and accounting literature several agency theory literature reviews can be found. The most cited ones –together with agency empirical work– have been used for the

attention in management literature as it provides a framework for examining the relationship between information systems, compensation, firm performance and behaviour (Lambert, 2001).

Agency researchers suggest that this economic theory emerged from the work of Berle and Means (1932) on the separation of ownership and control in large North American firms. Ever since then, a whole body of literature worldwide has been dedicated to the study of the relationships between owners or shareholders –referred to as "principals"– and managers –referred to as "agents". Owners own the capital of the firm, bear the financial risk and are represented by a board of directors who delegate their duties to managers (Davis and Edge, 2004). Managers work on behalf of the owners, coordinating and controlling activities within the firm and making decisions. The employment relationship between both parties is specified in a mutually agreed upon contract[9] (Baiman, 1990).

The employment contract is the central, most crucial concept in agency theory because it distinguishes agency theory from classical and

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elaboration of this section (e.g. Baiman, 1982; 1990; Bourguignon and Chiapello, 2005; Eisenhardt, 1989; Indjejikian, 1999; Lambert, 2001; Levinthal, 1988).

[9] According to Fama and Jensen (1983) a contract is an agreement that specifies the right of the parties, the system for monitoring the agent's action, and the reward structure, including the degree to which managerial incentives are aligned with the interest of the owner. The total components of the contract might not always be explicit, some might be implicit (Baiman, 1990).

neoclassical economics (Fama and Jensen, 1983). In classical and neoclassical economics, market forces act as a disciplining mechanism on the owner who actively manages firms and firms are thought to behave in a value maximising way. On the other hand, in agency theory, the written and unwritten contracts among owners and managers are the mechanisms that provide the structure, which facilitates the analysis of the conflict of interests between both parties and the resulting equilibrium behaviour of the organisations (Jensen, 1994).

According to the basic agency model, of which key aspects are outlined in Table 2-2, both owners and managers are assumed to be fully rational, with well-defined preferences, and motivated self-interest[10] (i.e. willing to increase their own wealth with minimal effort). Additionally, managers are assumed to be both effort-averse, and risk-averse (i.e. prefer to avoid both work and risk). Shareholders are considered to be risk-neutral since they can diversify their capital across a variety of firms (Eisenhardt, 1989; Fama, 1980; Jensen and Meckling, 1976). These different behaviours create conflicts of interest or, as agency researchers refer to them, "agency problems".

[10] Self-interest behaviour is often referred to as "opportunistic behaviour" (Baiman, 1990).

Agency theory aims to address two particular problems arising from the owner-agent relationship (Eisenhardt, 1989; Fama, 1980; Jensen and Meckling, 1976). One problem is known as *moral hazard* (hidden action or behaviour), the other as *adverse selection* (hidden information). A *moral hazard* problem arises due to the self-interest behaviours of both parties and the fact that it is difficult or expensive for principals to verify agents' actions. The principal cannot directly observe whether agents are behaving as expected (i.e. in his/her best interest). An *adverse selection* problem arises due to the different levels of information the principal and the agents have regarding, for example, agents' skills or private interests. Taking into account that the principal and the agents have different attitudes towards risk, agents may choose to misrepresent their private information and pursue actions that might not be aligned with the principal's interests –e.g. receive ridiculously high salaries that are out of line with industry standards (Gomez-Mejia, 1994). Both, moral hazard and adverse selection problems are characterised by information asymmetry between agents and principals. If these problems are not resolved, they will lead to a loss in efficiency and a reduction in firm performance. This phenomenon is known as agency costs (Baiman, 1982).

Agency costs are seen as "necessary evils that can be reduced, yet seldom or perhaps never eliminated" (Gomez-Mejia, 1994). The agency-based literature argues that in order to reduce the agency costs, principals need to find an optimal contractual relationship with their agents[11] (Baiman, 1982). In order to do so, principals may purchase information about the agents and design a compensation mechanism that makes them contingent upon the information purchased (Eisenhardt, 1989; Jensen and Meckling, 1976; Lambert, Larcker and Weigelt, 1993). In agency theory, information is regarded as a commodity and it has a cost. Principals need to balance the cost of purchasing information with the benefits that this information will provide. For instance, the cost of motivating misreporting through the use of a specific performance measure must be balanced against the benefit derived from choosing that specific performance measure in the first place (Baiman, 1982; Lambert, 2001).

As suggested by Feltham and Xie (1994), managerial actions and strategies are not directly observable, so managers cannot be compensated for their concrete contributions to the firm. In addition to this, the full consequences of managerial actions are not observable. This is mainly

[11] Agency theorists assume that the inherent nature of people cannot be changed. Rather, what can be changed are the formal and informal employment relationships that are themselves created by people to govern their interactions (Jensen and Meckling, 1994).

because the impacts of those actions tend to expand beyond the managers' areas of responsibility (i.e. his/her business unit) and beyond their time as managers of those areas of responsibility. Furthermore, uncontrollable events (e.g. mergers and acquisitions, economic crisis) may influence the consequences that are observed. As a result of these constraints, agency theorists argue that principals can only invest in the purchase of information mechanisms –these are performance measures– that may be employed as proxies or surrogates for assessing the consequences of managerial actions (Ijiri, 1975).

Due to the fact that performance measures are proxies, they are frequently incomplete or imperfect representations of the consequences of managerial action. With this limitation in mind, agency theorists predict that the better principals' performance measurement system reports agents' actions impact, and the better performance contingent compensation mechanism motivates agents to focus on achieving principals' goals, then the less adverse selection and moral hazard problems will be created (Baiman, 1982; Eisenhardt, 1989). If adverse selection and moral hazard problems are reduced then principals' expected goals are more likely to be achieved and, in turn, firms' overall performance will improve (Jensen and Meckling, 1976).

Table 2-2 Agency basic model (adapted from Eisenhardt (1989) and Lambert (2001))

Key elements	Description
Main idea	▪ Agency theory looks at the principal-agent employment relationship.
Unit of analysis	▪ Contract between principal and agent.
Human nature assumptions	▪ Agents are self-interested, rational, risk-averse and effort averse. ▪ Principals are self-interested, rational and risk-neutral.
Organisational assumptions	▪ Goal-conflict between principal and agents due to self-interested preferences. ▪ Information asymmetry between principal and agent.
Information assumption	▪ Information is a purchasable commodity.
Contracting problems	▪ Moral hazard and adverse selection.
Potential solutions to agency problems	▪ Purchase information through monitoring and compensation.
Sequence of events	▪ Single period (normally one year): (1) Contract agreed upon (2) agent selects actions (3) performance measures are observed (4) agent is paid and principal received the organisational outcomes (minus salaries).

From its origins, the basic agency model has been extended in a number of ways. Normally specific assumptions are relaxed, such as the assumption of agent's risk-aversion (e.g. Harris and Raviv, 1979) or the assumption of goal-conflict between the principal and the agent (e.g. Demski, 1980). The basic agency model has also been extended by adapting it to multi-agents (e.g. Holmstrom, 1982) or multi-period situations (e.g. Indjejikian and Nanda, 1999). Overall, the multiple agency models

developed in recent decades can be grouped into two categories: the principal-agency models and the positivist agency models (Eisenhardt, 1989; Jensen, 1983)[12]. Both of these streams of research are now described.

2.4.1.2. Agency research streams

The principal-agent and positivist agency-based models provide similar frameworks for analysing agency problems and their solutions; they both use the same unit of analysis: the contract between principals and agents; and they share common assumptions about human beings, organisations and information. However, they differ in their mathematical rigour, their dependent variables, their style, and in their focus on different aspects of a common research agenda (Baiman, 1990; Eisenhardt, 1989). The agency theory common research agenda includes: (1) the modelling of the underlying economic context that generates the agency problems; (2) the examination of optimal employment relationships and the understanding of how different contractual relationships alleviate the underlying agency

[12] It must be noted that Baiman (1990) classifies the agency literature into three streams: principal-agent, transaction cost economics and the Rochester literature. However, it can be argued that the Rochester stream is equivalent to the positivist stream suggested by Eisenhardt (1989) and that the transaction cost economics (Williamson, 1975) stream cannot be considered as part of the agency theory literature (Donma and Schrender, 1998). Transaction cost economics shares specific aspects of agency theory but it has a complete different research focus. For instance, its unit of analysis is not the contract (as it is in the principal-agent and positivist literatures) but the transactions that take place across markets or within organisations (Donma and Schrender, 1998).

problems; and (3) the comparison of results to observed practice as a check on the initial modelling and analysis (Baiman, 1990). Table 2-3 summarises the key elements of each agency-based research stream.

Table 2-3 Agency-based research streams (adapted from Eisenhardt, 1989 and Baiman, 1990)

	Positivist	**Principal-agent**
Main focus	▪ Interest on investigating how agency problems arise. ▪ Description of governance mechanisms (e.g. monitoring technology, executive compensation) that alleviate opportunistic behaviours. ▪ Special focus on the relationship between owner(s) and manager(s) of large, public corporations. ▪ It offers a more complex view of organisations. ▪ Its main aim is to test its theoretical frameworks with real data.	▪ Interested in the formulation of a general theory of the relationship between principal(s) and agent(s). A theory that can be used for employer-employee, buyer-supplier, lawyer-client and other agency relationships. ▪ It focuses on the optimal choice and design of ex-ante employment contracts between principal(s) and agent(s) and information systems. ▪ Special interest in the trade-off between the cost of measuring behaviour and the cost of measuring outcomes and transferring risk to the agent.
Models	▪ Less mathematical than principal-agent models. ▪ Terms are not as well specified as they are in principal-agent models.	▪ Models are carefully specified and followed by logical deduction and mathematical proof.
Key references	▪ Jensen and Meckling (1976), Fama (1980), Fama and Jensen (1983).	▪ Holmstrom (1979, 1982), Shavell (1979).
Criticisms	▪ Poor specification of its models.	▪ Abstract and hard to understand for non-agency experts (due to the degree of mathematical knowledge required). ▪ Models tend to be very simplistic and unrepresentative of reality.

Both research streams have produced studies looking at issues related to performance measurement and compensation. The contributions of both

literatures to these areas of investigation are reviewed in the next two sub-sections.

2.4.1.3. Agency research on performance measurement and incentive pay

The major areas of concern for agency-based researchers looking at the relationship between performance measures and compensation seem to be: (1) the selection of the "best" measures of performance for determining pay; and (2) the relationship between performance contingent pay and firm performance. These two areas are now discussed in turn.

2.4.1.3.1. The selection of the "best" measures of performance

Performance measures affect the way in which people behave and make decisions (Indjejikian, 1999). As a consequence, one of the major concerns in agency-based research has been, and still is, how to select the most appropriate measures of performance (i.e. those that reduce the agency problems). Two key principles –the informativeness and controllability principles– and several other factors have been proposed by agency researchers in order to guide the selection of the "best" performance measures for evaluating and rewarding managerial performance. The performance measures' principles and key factors investigated using agency theory are summarised as follows.

Performance measures' informativeness

According to agency theorists, the most important aspect to take into account when selecting measures of performance is the *informativeness principle* (Holmstrom, 1979). This principle states that additional performance measures should potentially increase the expected utilities of the principal and the agent in order to be used to increase agent's incentives or improve the risk sharing of the contract (Lambert, 2001). In other words, a measure should be included in the firm's performance measurement or compensation system if it provides information about the dimensions of managerial action that the owner wishes to motivate (Ittner et al., 1997). According to this principle, the question is not what is the best measure of organisational performance but what combination of performance measures most appropriately reflects an agent's contribution to the organisation (Indjejikian, 1999).

Performance measures' controllability

Agency theorists have also suggested what is known as the *controllability principle* (e.g. Demski and Feltham, 1978). This principle suggests that an individual should be evaluated and rewarded by a performance measure, if he or she can control or significantly influence that measure (Indjejikian, 1999). Antle and Demski (1988) and Demski (1994), relying on the informativeness principle, provide a more precise notion of the controllability principle by arguing that managerial performance

evaluation should be based on the concept of *conditional controllability*. "A performance measure is conditionally controllable if the information content of the measure is controllable conditional on whatever other information is being observed (e.g. an index computed from the performance of competitors firms is not controllable by a manager in the traditional sense, but may be informative –i.e. conditionally controllable– and hence useful for relative performance evaluation purposes)" (Indjejikian, 1999, p. 150).

- **Performance measures' relative weights: sensitivity and precision**

Due to the fact that measures tend to be aggregated in order to assess and reward managerial performance, agency researchers have been particularly interested in the investigation of the relative weight or importance placed on a pair of performance measures. Scholars such as Banker and Datar (1989) suggest that the weight of a performance measure should be based on its *sensitivity* and *precision.* The sensitivity of a measure refers to the degree to which the result of a performance measure changes with the agent's actions. The precision of a measure refers to the lack of noise in a measure or, in other words, the ability of a measure to be

consistent and accurate[13]. The noisier a measure is, the smaller its weight should be. The more sensitive to changes of managerial action a measure is, the greater the weight on that measure should be.

For instance, when an accounting-based measure and a price-based measure are used for determining an incentive contract, then the relative weight of both measures can be calculated as a ratio of the "sensitive-times-precision" of the accounting-based measure relative to the "sensitive-times-precision" of the price-based measure (Indjejikian, 1999). Numerous agency researchers have examined the sensitivity and precision concepts through empirical studies (e.g. Bushman and Indjejikian, 1993; Kim and Suh, 1993; Lambert, 1993). As an extension, some researchers have found that firm- and manager-specific characteristics also have an influence on the relative weight placed on two measures of performance. Lambert and Larcker (1987), for example, found evidence suggesting that firms place relatively more weight on market performance (and less weight on accounting performance) in compensation contracts for situations in which (1) the variance of the accounting measure of performance is high relative to the variance of the market measure of performance, (2) the firm is experiencing

[13] In statistical terms and as suggested by Banker and Datar (1989), sensitivity is calculated by the change in the mean of a performance measure in response to a change in the agent's action. Precision is calculated as the inverse of the variance of a performance measure.

high growth rates in assets and sales, and (3) the value of the manager's personal holdings of his firm's stock is low.

- **Performance measures' congruence**

Another aspect that has been examined by agency theory is the importance of performance measures' congruence. Performance measures and incentive schemes are designed to align agents' interests with principals' interest. In agency-based research, alignment is achieved when the value agents assign to the different dimensions of their work is similar to the value principals assign to the dimensions of agents' work (Schnedler, 2005). This notion of alignment is also referred to as goal congruence between principal and agent (Anthony and Govindarajan, 1995).

Performance measures can be employed in order to create goal congruence (Schnedler, 2005). However, not all measures of performance can be used for aligning the interests of both agents and principals. Some agency theorists have focused on the search for alternative methods of creating congruent performance measures. Others have paid more attention to alternative sets of performance measures that might be used to deal with the problems of goal congruence. The work of Feltham and Xie (1994) is crucial in this latter area of research as they find that the use of a non-congruent performance measure (e.g. profit) will induce suboptimal effort allocation across tasks and that this non-congruity can be reduced with the use of additional measures of performance (e.g. non-financial measures).

Feltham and Xie (1994) are among the first authors who explored the benefits of using a diverse set of measures (financial as well as non-financial) for incentive purposes. Other researchers have followed their work and their findings are summarised in the following subsection.

- **Performance measures' diversity**

Agency-based research has traditionally been concerned with the use of financial measures of performance in incentive pay. In recent decades, the work of authors such as Johnson and Kaplan (1987) or Anthony and Govindarajan (1995) on the practical use of multi-criteria performance measures has had a great influence on agency research. Several extensions to the theory have been developed (e.g. Feltham and Xie, 1994; Sliwka, 2002) and a number of empirical studies have been conducted in order to test the new theory developments.

Analytical research conducted by Feltham and Xie (1994) has actually found that financial measures alone may not provide the most efficient means to motivate agents to act in the manner desired by the principal. Hemmer (1996), through a mathematical model, argues that given that financial measures are not completely effective, they should be supplemented or replaced by non-financial measures, which are more informative. Holmstrom and Milgrom's (1991) research adds a different perspective to the use of diverse measurement since they find that the use of financial and non-financial metrics may direct agents' efforts to tasks that

are easily measured at the expense of tasks that are harder to measure. In summary, the true benefit of having multi-criteria measures of performance is still unclear (Ittner et al., 1997).

Together with the interest in the key characteristics of performance measures in incentive schemes, agency researchers have devoted time and attention to the relationship between performance contingent incentive pay and firm's economic results. A summary of this other body of research is presented as follows.

2.4.1.3.2. Relationship between performance contingent pay and firm performance

Several agency researchers have compared executive and/or firm performance before and after the adoption of a performance contingent incentive pay. Among these researchers, the work of Larcker (1983), Banker et al.. (1996), Lazear (2000), and Wallace (1997) is of great relevance. Larcker (1983) shows that firms adopting long-term performance plans (when compared to similar non-adopting firms) exhibit significant growth in capital expenditures. Banker et al.. (1996) find that sales increased after a sales-based performance plan was implemented at a retail establishment and the effect continued over time. Lazear (2000) finds that the output of workers installing automobile windshields increased after a switch from hourly wages to piece rates. Finally, Wallace (1997) finds that firms decreased new capital investments, intensified the disposition of existing

assets and increased stock repurchases after adopting a residual income-based performance measure.

Recently, some researchers have devoted their attention to the investigation of the relationship between the measures used for compensation purposes and firm performance. For instance, Hayes and Schaefer (2000) show that future firm performance is positively associated with the type of performance measures used in executive compensation. Banker et al.. (2000) show that current non-financial indicators of performance are associated with future financial performance and that both financial and non-financial performance improve following the introduction of an incentive plan based on non-financial measures. Similarly, Ittner and Larcker (1998) find that the relations between customer satisfaction measures and future accounting performance are generally positive and statistically significant.

Concerning the relationship between incentives design and task performance, theoretically incentives can be used to align the actions of executives with desired organisational objectives (Baker, Jensen and Murphy, 1988; Jensen and Murphy, 1990; Tosi and Gomez-Mejia, 1989). Further, incentive pay affects executives' behaviour, which in turn improves task performance (Indjejikian, 1999). However, as evidence shows, the behaviours encouraged by incentives might not always be the desired ones. Healy's (1985) study provides evidence of earnings manipulation in

response to accounting-based incentive plans. In fact, financial incentives do not necessarily lead to increased task performance (e.g. Jenkins, Gupta, Mitra and Shaw, 1998). Thus, as Bonner, Hastie, Sprinkle, and Young (2000) suggest, when studying the effect of incentives on organisational performance, it is important to examine external variables that may interact with this relationship.

Agency-based research looking at the influence of a contextual factor (e.g. business risk, effort, culture) on the relationship between performance measurement or compensation systems and firm performance has been explicitly or implicitly based on contingency theory. Hence, a closer look at contingency theory research can help its understanding. However, before exploring the relevancy of contingency research, it is important to devote some attention to the criticisms that agency has received over the years.

2.4.1.4. Agency theory critics

Agency theory has received a number of criticisms. These criticisms can be classified into two groups. One set of criticisms has dealt with the limitations of classic agency theory. Critics within this group tend to support the theory by accepting most of its underlying assumptions; but have concerns with the simplicity, methods or findings of agency models. Most criticisms comprising the second group of critics to agency theory have come from disciplines such as psychology or sociology. These critics reject

the basic underlying assumptions of agency-based research and thus refute the whole theory. These two sets of criticisms are reviewed in turn.

The work of Baker et al. (1988) is an example of the type of critics included in the first set of criticisms. These scholars, who are supporters of agency theory premises, claim that, so far, agency findings have given us little insight into the form and shape of observed performance measurement and compensation systems. They also suggest that most employer-employee relationships are far more complex than that which classic agency theory predicts.

Other criticisms included in this first set of critics revolve around three related observations (Indjejikian, 1999). First, many employer-employee relationships are based on implicit arrangements rather than on an explicit contract, which is the basis of agency theory. Second, there are collective behaviours and interactions that affect the nature of an organisation's incentive problem beyond those captured by the classic agency model. Finally, organisations evolve over time. This evolution allows employees to learn and improve their performance. It also provides the employer with opportunities to redesign defective incentives and create long-term employment commitments. None of these circumstances is contemplated in the basic agency model.

Most of the criticisms in this first set have been addressed by recent agency models. For example, multi-tasking (e.g. Holmstrom and Milgrom,

1991) and multi-period models (e.g. Indjejikian and Nanda, 1999) have been developed in order to address the cited concerns. However, gaps still exist and further research is encouraged by agency supporters.

The second set of criticisms focuses on the underlying assumptions used in principal-agent models. As has been seen in previous sections, agency theory is based on a specific *model of man* originated in economics. This *model of man* sees human beings as self-centred individuals interested in maximising their own personal economic wealth. Due to this perceived nature of human beings, the issue for agency theorists is to design the most appropriate performance measures and incentives as control mechanisms.

However, psychologists and sociologists have challenged this *model of man* and have proposed another model. Their model sees human beings "as motivated by a need to achieve, to gain intrinsic satisfaction through successfully performing inherently challenging work, to exercise responsibility and authority, and thereby to gain recognition from peers and bosses" (Donaldson and Davis, 1991, p. 51). This view of human beings has served as the basis for what is known as stewardship theory. Under this theory, executives are stewards of corporate assets. Thus, performance measures and incentives are not required as the interests of shareholders are already aligned with the interests of executives. The issue for stewardship researchers is whether or not the organisation structure and the executive's collaborative relationship with shareholders helps the executive to formulate

and implement plans for achieving high corporate performance (Davis and Schoorman, 1997).

Scholars such as Sundaramurthy and Lewis (2003) argue that both agency theory and stewardship theory can be seen as complementary theories rather than supplementary. Both might be valid depending on the contextual circumstances in which they are applied. Citing the work of Ghoshal and Moran (1996, p. 41) they stress that: "The context in which social relations and economic exchange are embedded can induce self-aggrandizement or trust, individualism or collectivism, competition or cooperation among participants. Economic progress requires both kinds of behaviours in each set of alternatives, not just one or the other" (Sundaramurthy and Lewis, 2003, p. 411). For them the use of other theories such as contingency theory can further inform the conflict between agency and stewardship research.

In line with this suggestion and remarks highlighted in previous sections (see for example sections 2.3.2. or 2.4.1.3.2.), contingency theory is now reviewed.

2.4.2. Contingency theory

2.4.2.1. Contingency theory foundations

"Contingency theory of organizations is a major theoretical lens used to view organizations" (Donaldson, 2001, p. 1). This theory is a subset of

the contingency approach in science, which basically says that the effect of one variable (X) on another (Y) depends upon some third variable (W) called a "moderator" or "contingency". The contingency theory of organisations predicts that the relationship between an organisation's characteristics such as its structure or its management control system and organisational performance depends upon specific contingencies[14]. The key premise in this type of research is that organisational characteristics cannot be universally appropriate. Each organisation needs to be designed according to its circumstances to avoid loss of performance.

Contingency theorists use the concept of *fit* to designate the interest of organisations to be designed in accordance with their context so they can achieve higher performance. Van de Ven and Drazin (1985) argue that three different conceptual approaches to fit tend to be used in the development of contingency theory. These are: selection, interaction and systems approaches (see Table 2-4). Each of these three approaches modifies the essential meaning of a fit and the method in which fit is empirically tested. Researches need to be clear about the approach they are using in order to avoid misunderstandings and be aware of the limitations that each approach comprises (Drazin and Van de Ven, 1985; Van de Ven and Drazin, 1985).

[14] A contingency has been defined as "any variable that moderates the effect of an organisational characteristic on organizational performance" (Donaldson, 2001, p. 7)

Table 2-4 Interpretation of fit (adapted from Van de Ven and Drazin (1985))

Approach	Definition	Research method
Selection	▪ Fit is seen as congruence between context and the organisational characteristic being studied	▪ Correlation analysis between pairs of variables
Interaction	▪ Fit is the interaction between a pair of variables and performance (bivariate interaction)	▪ MANOVA or regression analysis (mediation and moderation analysis)
Systems	▪ Fit is the internal consistency of multiple contingencies and multiple organisational characteristics that affects performance (consistency analysis)	▪ Pattern analysis (analysis of deviations from ideal-type designs)

2.4.2.2. Contingency research streams

There are several streams within contingency research. Most contingency-based research has investigated organisational structure as the organisational characteristic that has to be aligned with organisational contingencies (Lawrence and Lorsch, 1969). This body of research is known as structural contingency theory. Nevertheless, there are contingency theories of many different organisational characteristics such as management information systems (e.g. Weill and Olson, 1989), human resource management (e.g. Delery and Doty, 1996). There is also a specific stream of contingency-based research looking at compensation (e.g. Balkin and Gomez-Mejia, 1987) and performance measurement systems (e.g. Hayes, 1977; Otley, 1980). The rest of this section focuses on these two specific bodies of research due to their relevance for this dissertation.

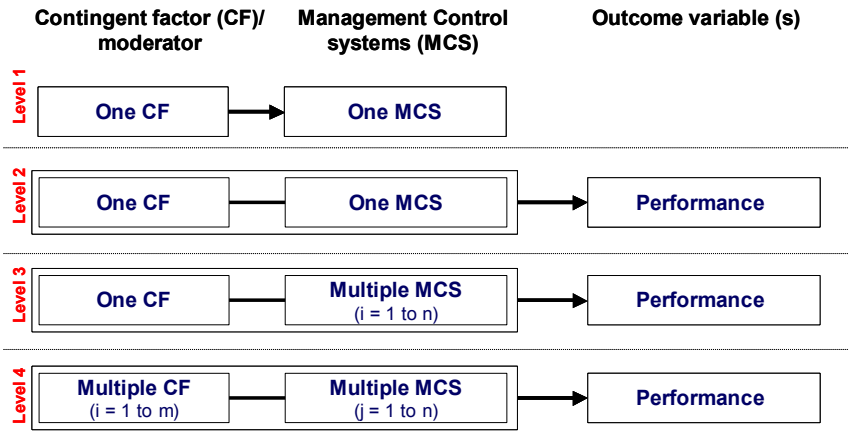
2.4.2.3. Contingency theory of performance measurement and compensation systems

Contingency-based research in the compensation literature has been mainly concerned with the relationship between compensation systems, organisational contingencies and organisational performance (Gomez-Mejia and Balkin, 1992). In the performance measurement literature, contingency-based studies have been mainly focused on the relationship between management accounting systems, contextual factors and organisational performance (Fisher, 1998). In both bodies of research the contingency factors that have been studied the most are: external environment (uncertainty or business risk), competitive strategy, culture (national and organisational), organisational size, organisational structure and industry (Balkin and Gomez-Mejia, 1987; Otley, 1980).

Contingency management control research, which includes performance measurement systems and compensation systems (Flamholtz, 1983), can be classified into four categories according to the level of analysis complexity (Fisher, 1995b)(see Figure 2-1). At the first level of analysis, one contingent factor is correlated with one management control system. From this perspective, no attempt is made to evaluate whether the correlation between the contingent factor and the control mechanism has any impact on an outcome variable (e.g. Merchant, 1985; Simons, 1990). The second level of analysis investigates the joint effect of a contingent factor and a control mechanism on an outcome variable, which is usually

firm performance. This second level of analysis is the most common in the control literature (Govindarajan and Gupta, 1985; Simons, 1987). At the third level of analysis, the joint linkage between multiple control mechanisms, a contingent factor, and an outcome variable is examined (Fisher and Govindarajan, 1993; Merchant, 1981). The last level of analysis is similar to the third level but looks at multiple contingency factors, rather than focusing on just one (e.g. Fisher and Govindarajan, 1993).

Figure 2-1 Levels of analysis complexity in contingency-based research (Fisher, 1995b)



It has been noted that most contingency management control research has been based on either the first or the second level of analysis. Fisher (1995b) argues that more third and fourth levels of analysis are needed in order to advance understanding of management control systems. The third level analysis can be useful given that different organisational control systems can be complementary (Govindarajan, 1988) or substitutable

(Otley, 1980). It is likely that some control systems are used in a complementary way and others are used as substitutes, depending on the firm's contingent factors (Fisher, 1995b). Regarding the fourth level analysis, Fisher suggests that this level of analysis can better capture the complexities of contingent control processes; even though, other issues may arise from this type of research.

For instance, if contingencies are consistent (i.e. they demand the same type of control for better organisational performance), then the design of an appropriate control system would be simple. If contingencies are inconsistent, then different characteristics of a control system would be required, which automatically would increase the difficulty of the control design process. To resolve this conflict, Fisher suggests that companies can design a control system to be consistent with one contingency while ignoring the others. However, it has been found that ignoring an important contingency may result in lower business unit performance (Gresov, 1989). Alternatively, companies can use a hybrid design that includes control components for each contingency. The problem then can be that a hybrid system may not be internally consistent. In other words, an internal misfit may exist in the control system design because it is trying to address conflicting contingencies. This misfit in design can result in lower firm performance (Child, 1975).

Clearly, the level of complexity involved in the third and fourth level of analysis can explain their absence in the literature but a more extensive use of either of them could help in our understanding of management control systems.

2.4.2.4. Contingency theory critics

The contingency theory of organisations has been mainly criticised for issues regarding its empirical testing. For example, Venkatraman (1989) points out that a major problem in contingency theory research is the lack of correspondence between the way in which hypotheses are stated and then tested. In Venkatraman's words "although it is common for theorists to postulate relationships using phrases and words such as *matched with*, *contingent upon*, *consistent with*, *fit*, *congruence*, and *coalignment*, precise guidelines for translating these verbal statements to the analytical level are seldom provided" (Venkatraman, 1989, p. 423). Van de Ven and Drazin (1985) have also argued that in the contingency theory literature there is an inadequate attention paid to the specification of the form of fit –that is, selection, interaction or systems.

Furthermore, Hartmann and Moers (1999) have criticised how the use of specific statistical methods, in particular multiple regression analysis with interaction effects, has been incorrectly used in research examining the impact of organisational contingencies on the design and implementation of management control systems such as budgeting. They even suggest that this

problem "seriously affects the interpretability and conclusions of individual budgetary research papers [using contingency theory premises], and may also affect the budgetary research paradigm as a whole" (Hartmann and Moers, 1999, p. 291). In sum, for contingency theory to progress, careful attention must be paid to the methodologies used to empirically test their hypotheses.

2.5. Chapter summary

This chapter has reviewed the definition of financial as well as non-financial performance measures, the reasons why non-financial information is used in performance measurement and compensation systems, and the research focused on the impact of non-financial measures on firm performance. It has also examined critical aspects of agency and contingency theory as these two organisational theories are crucial for understanding the phenomenon under investigation. The next chapter will be dedicated to the presentation of the theoretical framework that has been used to explain the relationship between the use of non-financial performance measures in incentive systems, organisational contingencies and firm performance.

3. THEORY AND HYPOTHESES

The aim of this chapter is twofold. Firstly, it develops a theoretical framework about the relationship between the use of non-financial performance measures in addition to financial performance measures in executives' incentive systems and firm performance. This framework is developed based on the premises of agency theory and contingency theory. Secondly, building on the literature reviewed in Chapter 2, and adding new bodies of research when applicable, this chapter formulates the hypotheses that will then be tested. The chapter is organised as follows. Section 3.1 outlines the theoretical framework that will help the reader to understand the different variables under study. Then, section 3.2 presents the hypotheses that predict the relationships between the different variables investigated and the impact of measurement diversity on firm performance.

3.1. Theoretical framework

Agency theory focuses on the different management mechanisms that can be used in order to align the interests of both principals and agents, reduce the so-called agency costs, and benefit firm performance (Eisenhardt, 1989; Jensen and Meckling, 1976). Agency theorists suggests that the use of financial performance measures for evaluating and rewarding managerial

performance may not be the most efficient means for aligning the interests of agents with those of principals (e.g. Feltham and Xie, 1994). These theorists base their predictions on the informativeness principle proposed by Holmstrom (1979).

Holmstrom (1979) asserts that any measure which provides information about the dimensions of managerial action is suitable for contractual purposes. Thus, the agency researchers propose that a combination of financial as well as non-financial performance measures will be more appropriate for assessing agents' contributions to the organisation than the use of financial performance measures only (Indjejikian, 1999). If measurement diversity –that is the use of financial as well as non-financial measures of performance– is an appropriate mechanism for evaluating and rewarding employees as it provides more information to the principal about agent's actions, then it will help to reduce the agency costs and, as a result, it will positively affect firm performance (Banker et al., 2000)

Several agency-based research studies have explored the performance implications of using measurement diversity in employee contracts. As presented in Chapter 2, some studies have found a positive relationship between the use of non-financial performance measures in addition to financial performance measures in incentive systems and business results (e.g. Said et al., 2003). Others have found mixed results in this relationship (e.g. Ittner, Larcker and Randall, 2003). Finally, a few studies have shown

that the use of measurement diversity for determining pay is negatively associated with firm performance (e.g. Perera et al., 1997). Contingency theory can provide an explanation for these inconclusive results (Hoque, 2005).

Contingency theory and, in particular the contingency theory of management control systems, states that the relationship between management control systems (e.g. performance measurement and incentive systems) and organisational performance is dependent on organisational conditions (e.g. Fisher, 1995b; 1998; Otley, 1980). There is a stream of research looking at the relationship between measurement diversity and firm performance that has taken into consideration the impact of specific organisational conditions –also referred to as organisational contingencies. This research has looked at the moderating effect of business strategy (e.g. Govindarajan and Gupta, 1985; Hoque, 2004; Olson and Slater, 2002), organisational size (e.g. Hoque and James, 2000), industry (e.g. Schiehll, 2001) and environmental uncertainty (e.g. Hoque, 2005). However, there are a number of additional internal and external contingencies that may influence the relationship between measurement diversity and firm performance (Hoque, 2004).

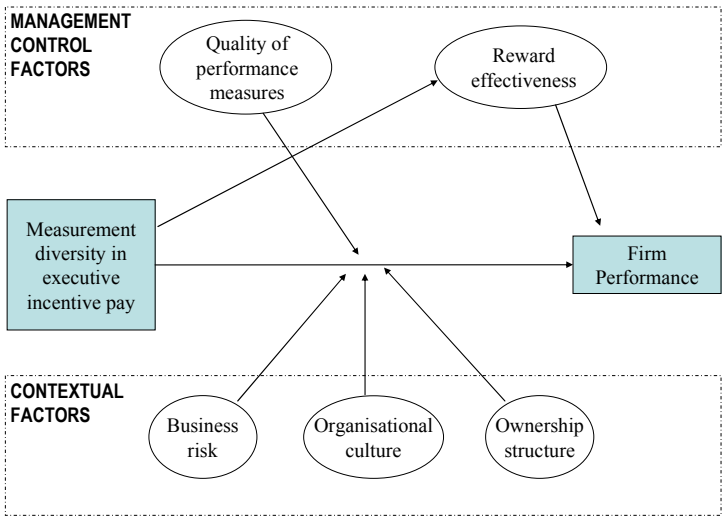
In recent years, agency research has been particularly interested on the moderating effects of contingencies such as business risk (e.g. Miller et al., 2002), ownership structure (e.g. Werner, Tosi and Gomez-Mejia, 2005), and

culture (e.g. Johnson and Droege, 2004) on the relationship between executive incentives and firm performance. Due to their recognised importance in agency studies, this research focuses on these three contingencies arguing that the impact of using measurement diversity in executive incentive systems on firm performance, apart from being moderated by business strategy, organisational size and industry, is also moderated by business risk, ownership structure, and organisational culture. The predicted ways in which these three contingencies moderate the relationship between measurement diversity and firm performance are described in Sections 3.2.3.1, 3.2.3.2 and 3.2.3.3 respectively.

Furthermore, the research examines two management control factors that may also influence the relationship between reliance on non-financial performance measurement and firm performance. These are: the quality of performance measures and the reward system's effectiveness. The specific reasons why these two factors have been selected are explained in Section 3.2.2.1 and 3.2.2.2.

Figure 3-1 shows the key variables under study and an overview of the relationships that are explored in this research. These relationships are now further discussed and specific hypotheses are proposed.

Figure 3-1 Theoretical framework



3.2. Hypotheses development

This section is divided into three subsections. The first subsection looks at the rationale underpinning the relationship between measurement diversity and firm performance. The second subsection focuses on the two management control factors that influence this relationship: the quality of performance measures and the effectiveness of the reward system. The quality of performance measure interacts with the main effect as a moderator whereas the reward system's effectiveness interacts with the main effect as a mediator. The third subsection discusses the moderating effects of three contextual factors commonly reviewed in the agency literature: business risk, ownership structure and organisational culture.

3.2.1. Measurement diversity and firm performance relationship

Agency theorists stress that not all performance measures are equally appropriate for evaluating and rewarding managerial action (Feltham and Xie, 1994). Some measures are suitable for assessing firms' value but may be unsuitable for determining individuals' incentive pay (Gjesdal, 1981). Some measures may be useful for driving individual performance whilst others may be not (Hoskisson, Hitt and Hill, 1993). Some measures may generate behaviours that help organisations meet their strategic objectives whilst others may generate dysfunctional behaviours that diminish organisations' economic results (Baker, 2000). Most research on the use of measurement diversity has relied on the informativeness principle (Holmstrom, 1979) together with the research of Feltham and Xie (1994) and Hemmer (1996).

The informativeness principle, as reviewed in Chapter 2, states that a measure should be included in an incentive system if it provides information about the dimensions of managerial action that the principal wishes to motivate (Holmstrom, 1979). Feltham and Xie (1994) extend this principle by suggesting that financial measures alone may not provide the most efficient means for aligning the interest of both principals and agents. Furthermore, Hemmer (1996) asserts that financial performance measures should be supplemented or replaced by non-financial measures in order to positively affect business results. Based on the work of these scholars, it can

be argued that the use of financial and non-financial measures is appropriate for evaluating and rewarding managerial performance; and that it will positively affect firm performance (e.g. Banker et al., 2000). As a result, the following hypothesis can be stated:

> ***Hypothesis 1:*** *There is a positive relationship between measurement diversity in executive incentive pay and firm performance.*

Contingency theory suggests that this relationship might be moderated by internal management control factors and external factors (Fisher, 1998; Otley, 1980). Even though internal control factors are crucial determinants of the effectiveness of multi-criteria incentive systems (Fisher, 1995b), little research has focused on them. In this study, it is proposed that the quality of the performance measures and the effectiveness of the reward system will have a great impact on the measurement diversity and firm performance relationship.

As per the external factors influencing this relationship, a number of studies have explored their influence on the impact of multi-criteria incentive systems. Some scholars have asserted that business strategy (Govindarajan and Gupta, 1985; Hoque, 2004; Olson and Slater, 2002), organisational size (Hoque and James, 2000), environmental uncertainty or business risk (Hoque, 2005), or industry (Schiehll, 2001) might be potential variables that moderate the measurement diversity and firm performance relationship. In this study, it is proposed that ownership structure and

organisational culture will also affect this relationship. Furthermore, it is hypothesised that business risk will affect the impact of multi-criteria executive incentive systems in a non-linear way, contrary to what Hoque (2005) suggests.

3.2.2. Management control factors influencing the measurement diversity and firm performance relationship

3.2.2.1. Quality of performance measures as a moderator

One factor that is highly likely to affect the performance impact of a multi-criteria incentive system is the quality of its performance measures. Quality is an elusive concept that may be interpreted in various ways. In this context, taking into consideration the quality definitions suggested by Smith (1993), quality of performance measures is defined as the degree to which performance measures conform to a set of specific attributes proposed by agency theory and performance measurement research. These attributes are: high controllability (e.g. Antle and Demski, 1988), high congruency (e.g. Anthony and Govindarajan, 1995), high objectivity (e.g. Bourguignon and Chiapello, 2005), high outcome orientation (e.g. Eisenhardt, 1989), low distortion (e.g. Baker, 2002), few in number and high understandability (e.g. Meyer, 2002). These attributes are now presented in turn.

According to agency researchers, together with the informativeness principle –that supports diverse measurement–, the controllability and congruency[15] principle may also have an effect on the performance impact of incentive systems (Indjejikian, 1999). On the one hand, the controllability principle suggests that individuals should be evaluated and rewarded by performance measures that they can have control over or significantly influence (Antle and Demski, 1988). On the other hand, the congruency principle specifies that performance measures should assess the achievement of goals that are congruent with principal's business objectives (Anthony and Govindarajan, 1995).

In spite of the informativeness, controllability and congruency agency principles, performance measurement research has also found other characteristics that may affect the likelihood of a measure to positively affect individual behaviour and, ultimately, firm performance. For instance, there is a vast body of research that shows that performance information used for compensation purposes should be outcome oriented (Eisenhardt,

[15] Agency researchers do not seem to use the term "congruency principle" as such. However, based on the vast amount of research that has proved the importance of this characteristic, in this dissertation the term "congruency principle" is used. Mainly because it is believed that this characteristic meets the Oxford dictionary definition of "principle": a fundamental truth or proposition that serves as the foundation for a system of belief or behaviour or for a chain of reasoning (Matthews, 1997).

1985) and objectively measured[16] (Bourguignon and Chiapello, 2005). Traditional agency research has suggested that outcome and objective measures of performance should be linked to incentive pay, whereas behavioural and subjective measures of performance should be linked to base pay (Colon and Parks, 1990; Eisenhardt, 1985; 1988).

Furthermore, it is known that users tend to distort the data used for measuring performance (Baker, 2002; Indjejikian, 1999). Thus, another characteristic that designers aiming to create high quality measures should take into consideration is the degree to which a measure can be manipulated by managerial actions. For instance, a study conducted by Eccles and Mavrinac (1995) has found that investors and financial analysts had the perception that some of the information reported to external shareholders had been prone to managerial manipulation. For instance, non-financial performance measures do not need to be audited before being reported to shareholders and this may motivate executives to distort some of their computations or chose for external reporting only the non-financial performance measures that show good firm results (Eccles and Mavrinac,

[16] Outcome oriented measures which tend to be objectively measured can have a non-financial nature. For example, customer satisfaction can be considered an outcome measure and, if it is assessed based on the responses to a survey, it can be argued that it will also be objective. Agency empirical research conducted previous to the work of Feltham & Xie (1994) tends to assume that outcome measures are financial measures only, mainly because that tended to be the case in most organisations in those days. However, recent agency empirical research does not make that assumption.

1995). This is why it is crucial that the measures included in executive incentive systems are those that are less subject to managerial distortion.

Finally, from a cognitive point of view, it has also been found that performance measures should be few in number and easy to understand (e.g. Meyer, 2002). Regarding the ideal number of measures, research suggests that the magic number is seven plus or minus two (Miller, 1956; Simons, 1999). Individuals can remember and pay attention to seven bits of information at one moment in time. With 10 or more bits of information, individuals suffer from information overload (Miller, 1956). Moreover, if people are assessed according to too many performance measures, no single initiative will receive enough attention to assure success (Simons, 1999). As per the understandability of performance information, researchers have found that performance measures should be easy to understand by individuals in order to drive decision-making and have a positive effect on performance (e.g. Lipe and Salterio, 2000; Meyer, 2002).

In summary, despite the notion that the use of diverse performance measures in incentive systems is positively associated with firm performance; there are other characteristics that performance measures must meet in order to positively affect firm performance. Performance measures should be (1) controllable by executives; (2) congruent with the owner's business objectives; (3) objectively measured; (4) outcome oriented; (5) with low opportunities for distortion; (6) few in number; and (7) easy to

understand. It can be argued that if performance measures meet all these criteria they will be perceived as high quality measures. Thus, when organisations use non-financial performance measures in addition to financial performance measures, and these measures are perceived to be of high quality, the expectation is that firm performance will be positively affected. This argument can be stated in the following hypothesis:

> ***Hypothesis 2:*** *The relationship between measurement diversity in executive incentive pay and firm performance is moderated by the quality of the performance measures such that measurement diversity is positively associated with firm performance when the quality of performance measures is high.*

3.2.2.2. Reward system effectiveness as a mediator

A variable which is likely to mediate the relationship between reliance on non-financial performance measurement and firm performance is reward system effectiveness. Reward system effectiveness has been defined as the extent to which the reward system contributes to the achievement of organisational goals (Balkin and Gomez-Mejia, 1987). Agency theorists have argued that the use of financial and non-financial performance measures for determining executive incentives can be beneficial as it reduces the agency costs (for further information on this point, please refer to Chapter 2).

Firstly, multi-criteria performance measures can be employed to overcome the short-term focus created by relying on financial information only for evaluating and rewarding managerial actions (e.g. Indjejikian,

1999). Secondly, this type of measure can enhance the alignment between principals' and agents' goals (e.g. Hemmer, 1996). Finally, the use of non-financial performance measures in addition to financial performance measures for determining pay can be used as a means of reducing dysfunctional behaviours (e.g. Feltham and Xie, 1994). As a result, if all these benefits are realised, it can be argued that reward systems dependent on diverse performance measures are more likely to be perceived as effective, i.e. they are more likely to facilitate the achievement of organisational goals. If that is the case, it is probable that firm performance will increase. This is the rationale for hypothesis 3:

> ***Hypothesis 3:*** *The relationship between measurement diversity in executive incentive pay and firm performance is mediated by reward system effectiveness such that measurement diversity is positively related to firm performance when the reward system is perceived to be effective.*

3.2.3. Contextual factors moderating the measurement diversity - firm performance relationship

3.2.3.1. Business risk

A contextual variable that is likely to moderate the relationship between reliance on non-financial performance measurement in executive incentives and firm performance is business risk, also known as environmental uncertainty (Hoque, 2005). Risk is "uncertainty about outcomes or events, especially with respect to the future"; and business risk has been defined as "greater variability in organisational returns and

increased chances for corporate ruin" (Bloom and Milkovich, 1998, p. 285). From a contingency point of view, it has been asserted that there is a linear association between the use of diverse measurement, business risk and firm performance (Hoque, 2004). According to this relationship, diverse measurement in incentives will lead to improved performance under situations of high business risk. However, based on recent agency research (e.g. Miller et al., 2002), it can be argued that this relationship is curvilinear rather than linear. This would mean that the use of diverse measurement will lead to improved firm performance under conditions of both high and low levels of business risk. The paragraphs that follow clarify the rationale supporting this argument.

From an agency theory perspective, high business risk is of concern to both principals and agents. From the principals' point of view, high levels of business risk make it difficult for them to determine whether variations in financial firm performance are the product of agents' decisions or specific external events outside the agents' control (Antle and Smith, 1986). Greater business risk aggravates the agency problem as the firm's financial measures used to determine incentives become less reliable, costly and hence less adequate to serve as proxies of managerial decision-making (Miller et al., 2002).

From the agents' point of view, high levels of business risk reduce their ability to influence the financial measures used to determine their

incentives. This is because external contingencies may affect the results of those measures. Moreover, agents' reduced control over their measures of performance can have detrimental effects on their incentive compensation and, ultimately, on their employment security (Bloom and Milkovich, 1998). Because high levels of business risk impose higher income and employment risk on agents, they may be pushed to adopt risk reduction strategies that damage principals' interests (Walsh and Seward, 1990). Examples of these types of strategies include broadening diversification at the expense of profits (Amihud and Lev, 1981), avoiding high-risk projects (Hoskisson et al., 1993), or reducing R&D expenditures (Baysinger and Hoskisson, 1990).

Based on the above agents' and principals' concerns, agency theorists propose that in order to reduce the additional agency problems generated by high business uncertainty, principals should reduce their reliance on incentive pay (Eisenhardt, 1989). Several agency researchers, using a diverse set of organisational samples, employee populations and measures, have empirically tested the relationship between business risk and incentive pay (e.g. Bloom and Milkovich, 1998; Eisenhardt, 1988; Gray and Cannella, 1997; Miller et al., 2002; Stroh, Brett and Bauman, 1996; Umanath, Ray and Campbell, 1996; Zajac and Westphal, 1994). They have found that under conditions of high business risk, it is less efficient to rely on incentive pay as a mechanism to reduce agency costs.

However, less emphasis on incentive pay may no longer be a solution for the agency problems generated by high business risk. The size of executive incentive pay in the majority of organisations these days is being set according to industry standards and organisational size. The degree of business risk is not even a variable being considered in the incentives' design process (e.g. Davis and Edge, 2004). If the size of executive incentive pay is something that in practice cannot be adjusted to neutralise the negative consequences of high levels of business risk on agents' behaviour (as this may motivate executives to seek opportunities elsewhere), then what other mechanisms can be used? An alternative solution to the agency problems generated by high levels of business risk may rest on balancing the use of financial and non-financial performance measures in the design of incentive pay systems.

Incentive pay can be contingent on different types of performance measures (i.e. financial and non-financial) as shown in Chapter 2. Previous research on the relationship between business risk and incentive pay has mainly relied on an assumption that incentive pay is just dependent on outcome measures, which are financial only (e.g. accounting or market based measures). For example, Gray and Cannella (1997) state that business risk affects "the personal risk of the executive when compensation is contingent upon firm-level outcomes such as profitability or stock price movements" (p. 521). However, this assumption may no longer hold for most organisations as the use of diverse measurement is increasing and

more and more firms are using a combination of financial as well as non-financial measures of performance to determine pay (e.g. Ittner and Larcker, 2003).

When business risk is high, non-financial performance measures, such as customer satisfaction or leadership, may be better suited to determine incentive pay. Non-financial performance measures can give agents strategic information about customers, internal processes, competitors, and human capital that are difficult to capture with the use of financial measures only (e.g. Amir and Lev, 1996; Feltham and Xie, 1994). Non-financial performance measures can be used to drive and better predict financial firm performance (Aaker and Jacobson, 1987; Anderson et al., 1997; Nagar and Rajan, 2005). Furthermore, under conditions of greater business risk, principals can use non-financial performance measures to better assess agents' performance as these measures are less likely to be subject to the effects of external factors and more likely to be influenced by agents' decisions (Hoque, 2005).

In short, it has been argued that when business risk is high agency problems will rise and the solution to these problems suggested by previous agency research (i.e. reduce the size of incentive pay) may no longer be valid. These days, the size of executive incentive pay is agreed based on criteria that do not take into consideration the level of environmental uncertainty surrounding the firm. If a firm facing high business risk decides

to reduce the size of their executives' pay, in the short-term executives may seek opportunities in other organisations offering more competitive incentives. Therefore, an alternative solution may be to focus on the design of an incentive system that includes not only financial measures of firm performance but also non-financial measures. Based on this rationale, it seems that firms under conditions of high business risk will be better off by mainly relying on non-financial performance measures rather than on financial performance measures. If they do so, the expectation is, according to contingency theory, that they will reach higher firm performance. This may be the case under conditions of high business risk, but what happens under conditions of low and moderate risk?

Under conditions of low business risk, incentive systems based on financial measures only may not be adequate. In low-risk firms, financial performance uncertainty and cause-effect ambiguity are low, therefore evaluating and rewarding executives for results that tend to be largely disassociated from their strategic decisions will not be economically rational (Miller et al., 2002). A high reliance on financial performance measures in circumstances of low business risk –where growth opportunities are absent– may even be counterproductive. Executives may be driven to take actions, which may damage the principals' interests (e.g. manipulating earnings, initiating mergers or acquisitions that are detrimental for the long term performance of the firm) (Miller et al., 2002; Rajagopalan and Finkelstein, 1992). As a result, greater reliance on non-financial measures of

performance might be a more appropriate solution for firms operating in low business risk environments.

In the case of moderate risk, a different selection of performance measures may be more effective. As suggested by Miller et al. (2002), "in contrast to those in high-risk settings, managers in settings with moderate risk should be able to share the uncertainty of performance outcomes with owners without bearing risk to such an extent that they are tempted to engage in risk reduction strategies prejudicial to shareholders [...]. Hence managerial risk reduction is not so critical an element in the design of incentive mechanisms in moderate risk firms as it is in high-risk firms. At the other end, risk sharing should be more meaningful in moderate-risk contexts than in low-risk contexts, since in moderate-risk settings there is sufficient variation in firm outcomes that CEOs stand to gain significant improvements in those results." (p. 747). Financial performance measures transfer greater risk to agents than non-financial performance measures and they may be sufficient to motivate the actions that best align the interests of both agents and principals. Thus, a higher reliance on financial measures for incentive pay purposes may be appropriate under conditions of moderate risk.

In summary, it has been argued that the level of business risk to which an organisation is exposed will affect the organisation's agency problems. Under conditions of high and low risk, organisations will be better off by

increasing their reliance on non-financial performance measures to determine executives' incentives. Under conditions of moderate risk organisations will be better off by mostly relying on financial performance measures to evaluate and reward their executives. Therefore, linking this reasoning to the relationship between the use of measurement diversity in executive incentives and firm performance, it is hypothesised that:

> ***Hypothesis 4****: The relationship between measurement diversity in executive incentive pay and firm performance is moderated by business risk such that measurement diversity in executive incentive pay is positively associated with firm performance when business risk is high or low and negatively associated with firm performance when business risk is moderate.*

3.2.3.2. Ownership structure

As will be argued here, the relationship between measurement diversity in executive incentive pay and firm performance may also be influenced by the firm's ownership structure. According to agency theory, ownership structure can be used to determine the degree of management power or managerial discretion[17] (i.e. top management latitude of action) (Hambrick and Finkelstein, 1995). It has been found that managerial discretion is positively associated to the use of diverse measurement in executive incentive systems (Schiehll, 2001). Therefore, by extension, it can

[17] Managerial discretion and ownership structure tend to be used interchangeably in the agency literature (e.g. Hambrick and Finkelstein, 1995) and they will be used as such in this study.

be argued that managerial discretion may also influence the relationship between measurement diversity and firm performance. The specific rationale underlying this statement is discussed as follows.

Managerial discretion is associated with the degree of principal-agent conflict of interest (Gomez-Mejia et al., 1987). The higher the discretion of an agent the more conflict would exist between his or her interest (i.e. maximise earnings) and the principals' interests (i.e. maximise profits) (Hambrick and Finkelstein, 1995). In the agency literature, most research on ownership structure adopts an approach that uses categorisation. Two extreme categories of ownership structure can be identified in large firms. These are manager-controlled firms and owner-controlled firms[18]. A manager-controlled firm has no single major owner. In this type of firm managerial discretion is considered to be high. Owners are supposed to exert little vigilance over managers and the owner-manager conflicts of interest are deemed to be notorious (Gomez-Mejia et al., 1987; Hambrick

[18] There is a third category of ownership structure named owner-managed firms. Owner-managed firms have at least one member of the management team as a major shareholder. In this situation, managerial discretion is high, but the role of the principal and the agent are the same so the conflicts of interest between both parties may be absent. This category has been less used in the literature as it is harder to identify. The majority of research on ownership and managerial discretion focuses on the two extreme categories –owner-controlled and manager-controlled– and this is why these two categories have been taken into consideration and owner-managed firms have been excluded from the argument.

and Finkelstein, 1995; Kroll, Simmons and Wright, 1990; Werner and Tosi, 1995; Werner et al., 2005).

In contrast, an owner-controlled firm has at least one major owner who is not a member of the management team. In this firm, managerial discretion is low and owners have more interest in controlling the management actions; thus, the conflicts of interest are supposed to be less problematic (Gomez-Mejia et al., 1987; Hambrick and Finkelstein, 1995; Kroll et al., 1990; Werner and Tosi, 1995; Werner et al., 2005).

Manager-controlled firms, when compared with owner-controlled firms, are considered to be more risk averse (Palmer, 1973); they tend to replace non-performing executives less readily (Salancik and Pfeffer, 1980); they engage in merger and acquisitions more frequently (Amihud and Lev, 1981; Kroll et al., 1990); they tend to over-report earnings (Salamon and Smith, 1979); they tend to have higher levels of administrative complexity (Pondy, 1969); and they are more likely to take part in actions that may violate antitrust laws (Blair and Kaserman, 1983). Theorists have argued that, in those firms where owners have limited control over the management team, executives will tend to maximise their own welfare by establishing management systems that will reduce their risk and increase their prestige, personal pay or employment security. They will do so although their actions might not maximise the owners' interests. On the other hand, in those firms where the owners have control over the management team, executives will

design management systems with the objectives of maximising the owners' interests and pleasing the board of directors (Hambrick and Finkelstein, 1995).

Previous agency research has suggested that the degree of managerial discretion in a firm is likely to influence the selection of the financial performance measures that determine executive incentive pay (e.g. Hambrick and Finkelstein, 1995). The majority of this research has focused on the relationship between managerial discretion and the choice of specific financial performance measures for evaluating and rewarding managerial performance. For example, Gomez-Mejia et al. (1987) found that manager-controlled firms tend to rely on measures of organisational size such as sales or revenues for rewarding their executives, whilst owner-controlled firms tend to rely on profitability measures (e.g. Gomez-Mejia et al., 1987).

Recent research has started to explore the impact of managerial discretion on the choice of both financial as well as non-financial performance measures. In his dissertation, Schiehll (2001) provides some evidence showing that greater managerial discretion may lead to greater emphasis on non-financial measures of performance in the CEO bonus plan. Ittner and Larcker (2003), based on anecdotal evidence, argue that "self-serving managers are able to choose –and manipulate– [non-financial] measures solely for the purpose of making themselves look good and earning nice bonuses" (p. 89). The underlying mechanisms that may explain

these relationships may be found if the ultimate goal of the performance measures used for rewarding purposes is investigated.

For instance, Hambrick and Finkelstein (1995) argue that in manager-controlled firms the performance measures used for determining pay have the ultimate goal of maximising executive pay, subject to the demonstration of legitimacy of that pay. In owner-controlled firms the performance measures for determining pay have the ultimate goal of minimising executive pay, subject to economic returns. This is probably why studies such as those conducted by Kroll et al. (1990) or Wright, Kroll and Elenkov (2002) have found that in manager-controlled firms executive pay tends to be based on performance criteria that executives can easily control. However, in owner-controlled firms executive pay tends to be based on performance criteria that directly reflect the owner's economic interest.

Non-financial performance measures are expected to be more subject to manipulation as managers have more control over their computation. For example, Eccles and Mavrinac (1995) found that analysts and investors perceived the non-financial data reported by companies to be biased. In their words: "analysts fear that such information [i.e. non-financial] could be manipulated without sanction by outside auditors, that companies might report only good measures, and that the ways the measures are calculated could change over time, making historical comparisons impossible" (p. 20). This may suggest that manager-controlled firms will tend to rely more on

the use of non-financial performance measures for determining incentives than owner-controlled firms. These types of measures in manager-controlled firms will maximise executives' pay above the level justified by the firm's overall performance.

Despite this driver to maximise their income, managers in manager-controlled firms will also have the desire to increase business results as they share some ownership of the firm. Therefore, managers will make sure that the measures included in their performance measurement and reward systems meet two requirements; they maximise their income but they are also appropriate for improving firm performance. As a result, the relationship between reliance on non-financial performance measurement and firm performance will be stronger in firms that are manager-controlled than in firms that are owner-controlled. This hypothesis can be formally stated as:

> ***Hypothesis 5:*** *The relationship between measurement diversity in executive incentive pay and firm performance is moderated by ownership structure such that measurement diversity in executive incentive pay is positively associated with firm performance when firms are manager-controlled and negatively associated with firm performance when firms are owner-controlled.*

3.2.3.3. Organisational culture

Another factor that is likely to affect the relationship between reliance on non-financial performance measurement and firm performance is organisational culture. Organisational culture is a variable that has received

a lot of attention in the management literature (see, for example, the reviews of Allaire and Firsirotu, 1984; Frost, Moore, Louis, Lundberg and Martin, 1991). Researchers have found that organisational culture helps to explain differences in organisational performance (Denison and Mishra, 1989; 1995; Kotter and Heskett, 1992; Marcoulides and Heck, 1993; Sorensen, 2002). Researchers have also found that organisational culture can influence the design and perceived effectiveness of management control systems (Bhimani, 2003; Gittell, 2000). In particular, organisational culture has been shown to influence the degree of measurement diversity that organisations use for evaluating their performance (Henri, 2006; Kerr and Slocum, 1987). In short, if organisational culture is likely to affect firms' performance and the degree of measurement diversity in management control systems, then it can be argued that it will also influence the relationship between measurement diversity and firm performance.

The following discussion explains how the moderating effect of culture can be explained based on agency and contingency theory premises. For clarity purposes, the argument is structured as follows. Firstly, a definition of culture and issues surrounding its research is first introduced. Secondly, the approach typically used in the performance measurement literature for investigating culture is reviewed. Thirdly, the key premises that help to frame the rationale underpinning the relationship between measurement diversity, firm performance and culture are discussed. Finally, a hypothesis is formulated.

3.2.3.3.1. Organisational culture definition

Organisational culture is a complex concept. A priori, there seems to be little consensus about the specific way in which organisational culture can be defined; the theoretical models that can be employed to explain it; or even the methodologies that can be used to observe it and measure it (Marcoulides and Heck, 1993). There seems to be some consensus, however, about a few aspects of organisational culture such as: (1) the notion that organisational culture reflects the pattern of shared values, beliefs and assumptions that organisations adopt in order to solve their problems; (2) the idea that organisational culture is an explanatory variable that helps to distinguish one organisation from another one; (3) the acknowledgement that any study of culture will not be free of limitation due to the complexity of this variable; and, after all, (4) the understanding that organisational culture research is crucial for the advancement of organisational sciences due its importance in the explanation of many organisational phenomena (Kotter and Heskett, 1992; Rousseau, 1990; Schein, 1990). Based on these aspects, and on the last two in particular, organisational culture researchers have devoted time and resources to overcome the theoretical and methodological limitations associated with the study of this variable.

A classic way used for overcoming the theoretical and methodological limitations associated with the study of organisational culture has been to

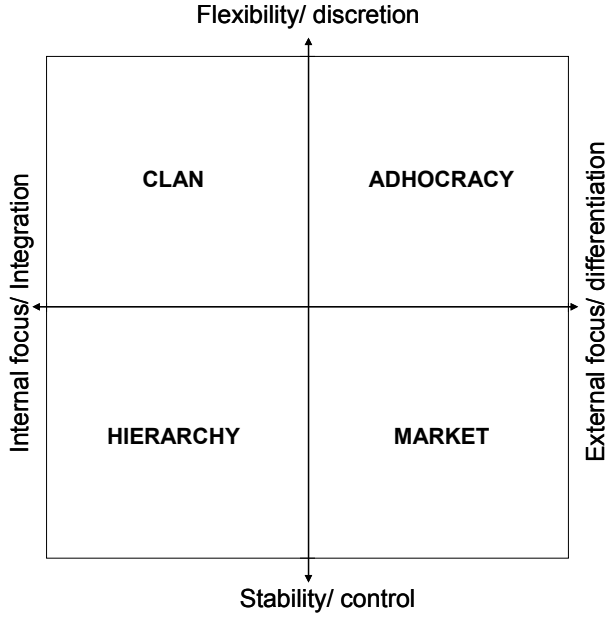
focus on the different layers of organisation culture proposed by Schein's (1990) research (Lenartowicz and Roth, 1999). Schein (1990) suggests that "culture manifests itself at three levels: the level of deep tacit assumptions that are the essence of the culture, the level of espoused values that often reflect what a group wishes ideally to be and the way it wants to present itself publicly, and the day-to-day behavior that represents a complex compromise among the espoused values, the deeper assumptions, and the immediate requirements of the situation. Overt behavior alone cannot be used to decipher culture because situational contingencies often make us behave in a manner that is inconsistent with our deeper values and assumptions. For this reason, one often sees 'inconsistencies' or 'conflicts' in overt behavior or between behavior and espoused values. To discover the basic elements of a culture, one must either observe behavior for a very long time or get directly at the underlying values and assumptions that drive the perceptions and thoughts of the group members" (p. 11). Other scholars have proposed a similar framework also based on three layers (e.g. Allaire and Firsirotu, 1984).

3.2.3.3.2. The Competing Values framework

Most of the management literature on the influence of culture on management control systems has looked at the second layer of culture: the level of espoused values (Harrison and Mckinnon, 1999). In particular, recent studies in this area such as Bhimani's (2003) or Henri's (2006) have

focused on organisational values and their impact on the design of performance measurement systems. In order to do so, they have used an organisational culture framework that has been praised for its clarity, validity and reliability (Garman, 2006) named: the Competing Values Model (Cameron and Quinn, 1999; 2005; Quinn and Rohrbaugh, 1983). This model has been extensively used in other areas of research such as leadership (Denison, Hooijberg and Quinn, 1995); information systems (Cooper and Quinn, 1993) or Total Quality Management (Prajogo and McDermott, 2005). This model is structured around two dimensions represented by two axes with each representing a superordinate continuum as shown in Figure 3-2.

Figure 3-2 The Competing Values Framework (Cameron and Quinn, 1999, p. 32)



The first dimension, located on the y-axes, refers to the level of flexibility or control that organisations demonstrate. In the words of Cameron and Quinn (1999), on the y-axes "the continuum ranges from organizational versatility and pliability on one end to organizational steadiness and durability on the other end" (p. 31). The second dimension, located on the x-axes, refers to the internal or external orientations organisations have. As Cameron and Quinn (1999) explain, on the x-axes "the continuum ranges from organizational cohesion and consonance on the one end to organizational separation and independence on the other" (p. 31). Based on these two dimensions, organisational culture is classified into four categories: clan, adhocracy, hierarchy, and market[19] (Cameron and Quinn, 1999; 2005; Quinn and Rohrbaugh, 1983)[20]. A brief summary of the key values and characteristics that each of these organisational cultures encompasses are presented in Table 3-1.

[19] It must be noted that these organisation culture's typologies represent ideal types. In practice some combination of these four categories is expected to occur (Cameron and Quinn, 1999; 2005).

[20] Quinn & Rohrbaugh (1983) developed these categories based on the work of scholars such as Weber (1947), Williamson (1975) or Ouchi (1979; 1980).

Table 3-1 Organisational culture typologies

Org. culture typology	Brief description based on the Competing Values Framework (Cameron and Quinn, 1999)
Market	▪ Results are all that matters ▪ Leaders are hard-driving producers and competitors, tough and demanding ▪ There is a great orientation to goals and targets ▪ Success is defined in terms of market share and penetration ▪ The most important thing is to be market leaders.
Adhocracy	▪ Dynamic, entrepreneurial and creative workplaces ▪ People are willing to take risks ▪ Leaders are visionary, innovative and risk-oriented ▪ Everyone is committed to experimentation and innovation as the emphasis is on developing new knowledge, products or services, the organisation long-term orientation is on growth.
Hierarchy	▪ Formal rules, procedures and policies hold the organisation together ▪ Effective leaders are good coordinators and organisers ▪ The long-term concerns of the organisation are stability, predictability and efficiency; and maintaining a smooth running organisation is important.
Clan	▪ People share a lot of themselves ▪ Leaders behave as mentors and parent figures ▪ Loyalty and tradition are paramount, employees are highly committed ▪ People development, teamwork, participation and consensus are greatly valued ▪ The focus is on the long-term.

3.2.3.3.3. Agency theory and the Competing Values framework

Before continuing with the discussion, it is important to clarify some key aspects of agency theory that are going to be used in order to advance the argument. In Chapter 2, agency-based research suggests that agency conflicts may be reduced, never eliminated, by employing certain control mechanisms such as performance-related rewards and performance measurement systems (Baiman, 1982; Eisenhardt, 1989; Indjejikian, 1999; Jensen and Meckling, 1976). Several extensions to this model have been

proposed (Baiman, 1982; 1990; Eisenhardt, 1989). Feltham and Xie (1994) suggest that principals may be better off using a combination of financial and non-financial performance measures in incentive systems for aligning their interests to those of the agents. However, this premise might not be universal. Based on their cultural values, some organisations will be more open to the use of non-financial information about agents' decisions and actions, whereas others will be more resistant to this idea.

Building on the Competing Values Framework (Quinn and Rohrbaugh, 1983) and taking into consideration the agency theory premises, it can be suggested that the four types of organisational culture will reveal different degrees of agency conflict and, as a result of this, different control mechanisms. This assertion can be better explained by adding two further dimensions to the ones proposed by Quinn and Rohrbaugh (1983). The first dimension will be the level of agency conflict found in each of the cultures (i.e. divergence between agents' and principals' interests) (Eisenhardt, 1989; Jensen and Meckling, 1976). This dimension will be reflected in the x-axes of the Competing Values Framework as shown in Figure 3-2. The second dimension will be the degree of reliance on non-financial performance measurement; i.e. measurement diversity (Eisenhardt, 1989; Feltham and Xie, 1994; Hemmer, 1996; Holmstrom, 1979). This dimension will be reflected in the y-axes of the Competing Values Framework. The implications of these dimensions are now considered and they are summarised in Table 3-2.

Figure 3-3 Agency-based adaptation of the Competing Values Framework

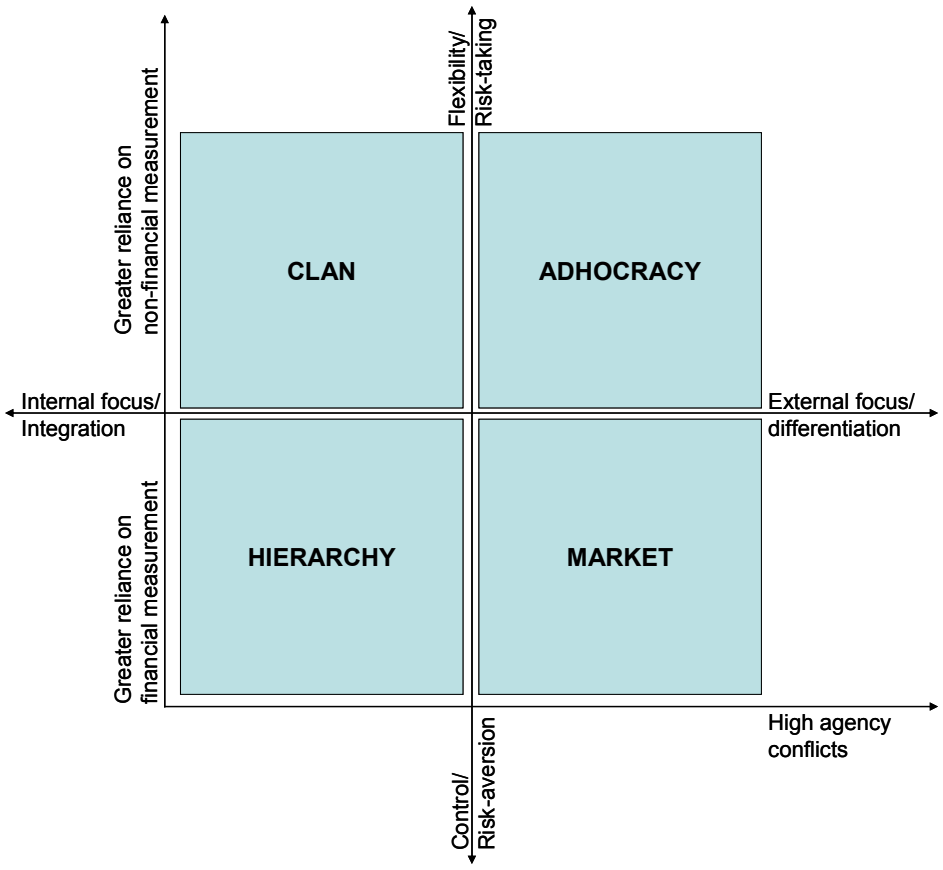


Table 3-2 Agency theory and the Competing Values framework

Org. culture typology	**Brief description using agency theory premises**
Market	▪ High agency conflicts (key assumption agents and principals self-interested) ▪ Strong focus on incentive pay and performance evaluation ▪ Greater reliance on financial performance measurement for evaluating and rewarding agents ▪ Greater reliance on monetary rewards
Adhocracy	▪ High agency conflicts (key assumption agents and principals self-interested) ▪ High focus on incentive pay and performance evaluation for improvement purposes ▪ Greater reliance on objective non-financial performance measurement for evaluating and rewarding agents ▪ Greater reliance on non-monetary formal rewards

Org. culture typology	Brief description using agency theory premises
Hierarchy	▪ Low agency conflicts (assumption agents and principals self-actualising) ▪ Low focus on incentive pay and performance evaluation for control purposes. The focus is on improvement ▪ Greater reliance on financial performance measurement for evaluating and rewarding agents ▪ Greater reliance on monetary rewards
Clan	▪ Low agency conflicts (assumption agents and principals self-actualising) ▪ Low focus on incentive pay and performance evaluation for control purposes. The focus is on improvement ▪ Greater reliance on subjective non-financial performance measurement for evaluating and rewarding agents ▪ Greater reliance on non-monetary informal rewards

Agency conflict and culture type

According to the level of agency conflict, it can be argued that organisations whose main cultures are market or adhocracy cultures are likely to have large agency conflicts whereas organisations whose main cultures are clan or hierarchy cultures are likely to have small agency conflicts.

Market cultures will match the description of "agency cultures" (Kulik, 2005, p. 349). Managers in this type of organisation are likely to behave as "corporate egoists" (Jones, Felps and Bigley, 2007, p. 144). In market cultures the central agency assumptions, those of self-interested agents and principals (Eisenhardt, 1989), and of risk-averse agents and risk-neutral principals, are highly likely to be manifested. In this type of organisation, the agents' main goal is to maximise their income and the

principals' main goal is to maximise their profits (Jensen and Meckling, 1976). Therefore, as suggested, the degree of agency conflict between agents and principals is likely to be high.

Adhocracy cultures are also likely to have high degrees of agency conflict but for different reasons to the ones applicable to market cultures. In adhocracy organisations the assumption about the risk preference of agents may not be manifested. In this type of culture managers are willing to take risks (Quinn and Rohrbaugh, 1983). These organisations, however, subscribe to the "doctrine of enlightened self-interest" (Jones et al., 2007, p. 147). Managers behave opportunistically but in a strategic way. Due to their risk orientation they will align their interests to those of stakeholders but only to the extent that it is personally advantageous to do so (Jones et al., 2007). Consequently, agency conflicts will also occur in these organisations.

Clan culture organisations will match the description of "stewardship cultures" (Kulik, 2005). In these cultures none of the agency main assumptions may be manifested. Agents and principals of clan cultures are self-actualising (i.e. they are rational individuals but they aim for the good of the organisation and not themselves) (Argyris, 1973) rather than self-interested. Agents and principals in clan cultures have risk-taking preferences instead of risk-averse and risk-neutral preferences. Then, it can be argued that under these circumstances the expectation is that agency conflicts will be low, or, as some researchers have suggested, agency

conflicts may be absent (e.g. Davis and Schoorman, 1997; Donaldson and Davis, 1991).

Hierarchy cultures are also likely to have low levels of agency conflicts, but the causes of these reduced conflicts are different from the ones suggested in clan cultures. In hierarchy cultures the agency assumption of self-interested agents and principals does not hold, but the assumption about the risk preferences of agents and principals does. In hierarchy cultures, agents are concerned with the long-term survival of the organisation. They prefer stability and predictability so they will avoid decisions that may put at risk their status quo. They will be risk-averse. Principals will behave in a risk neutral way as they are able to diversify their risk across different organisations. Thus, differences in the risk preferences of both agents and principals will generate low but noticeable agency problems.

- **Measurement diversity and culture types**

Regarding the second dimension proposed, i.e. measurement diversity, it can be suggested that organisations whose main cultures are market and hierarchy are likely to have greater reliance on financial performance measurement in incentive systems. On the other hand, organisations whose main cultures are clan or adhocracy are likely to have greater reliance on

non-financial performance measurement in incentive systems. The rationale underpinning these statements is explored below.

As suggested earlier, market cultures will be characterised for having large agency problems. In order to reduce these conflicts, principals will tend to use the control mechanisms proposed by classic agency models. In particular, those of great reliance on performance-related pay and outcome-oriented monitoring (Indjejikian, 1999). In a US study of fourteen organisations, Kerr and Slocum's (1987) study found six organisations that matched the description of market culture. These organisations were characterised by having (1) highly objective and quantifiable financial measures of performance that were strongly linked to employees' rewards (the qualitative aspects of performance were not evaluated); (2) a great orientation to short-term results regardless of the methods used to attain them; and (3) a clear focus on subordinates' outcome and not development (Kerr and Slocum, 1987). Based on this evidence, it can be proposed that organisations whose predominant values are market values will rely mainly on financial performance measures for evaluating and rewarding their executives.

In hierarchy cultures, where agents are believed to be self-actualising and risk-averse, agency conflicts will be small. They will require managerial control mechanisms though, for addressing the risk preference differences between agents and principals. The focus of principals is on stability,

predictability and efficiency. Principals might also be interested in benchmarking and on fairness. Therefore, it is probable that the management systems they design will rely highly on the outcome measures of performance. Outcome performance measures, such as financial measures, are perceived to be more appropriate for benchmarking purposes (Eccles and Mavrinac, 1995). They are also perceived to be more objective and fair than non-financial measures (Ittner, Larcker and Meyer, 2003). As a result, it can be argued that hierarchy cultures will rely greatly on financial performance measures to evaluate and reward their executives.

In clan cultures, as agents and principals are self-actualised and risk-taking, they will share the same goals and values. These goals and values will be both financial (e.g. profits) as well as non-financial (e.g. good climate, consensus, job satisfaction), even though the non-financial ones will predominate. This will occur as the long-term survival and consensus of the organisation is paramount. Based on this lack of misalignment between agents' and principals' interests, agency control mechanisms might not even be required here. However, taking into consideration that incentive pay these days seems to be ubiquitous (Hall, 2004) and that it is difficult to find organisations which do not display any of the control mechanisms proposed by agency theory, it can then be suggested that if clan culture organisations have agency management control mechanisms, these systems will be used for improvement purposes rather than control, and they will rely highly on non-financial performance measures.

In adhocracy cultures, where agents have risk-taking preferences but are self-interested, agency management systems are likely to be used to reduce agency conflicts. The main role of these management systems, however, is likely to be performance improvement rather than performance control. This might be so because the main organisational goal is growth and innovation rather than financial results. Agents are willing to take risks. They will exert effort to meet the principal's objectives but only to the extent that it is personally advantageous for them. Thus, principals will concentrate on developing agents' skills and on enhancing the organisational capabilities. This will make agents feel personally recognised and at the same time well rewarded (not necessarily in economic terms). Thus, in this type of organisation the expectation is that their incentive systems will rely heavily on non-financial performance measures, which are better methods for assessing aspects such as innovation, creativity, etc.

In summary, and going back to the focus of this study, it can be argued that organisational culture is likely to influence the impact of measurement diversity on firm performance. Market cultures and hierarchy cultures have different levels of agency conflicts but both are likely to rely on financial performance measures for evaluating and rewarding their executives. On the other hand, clan and adhocracy cultures are likely to rely on non-financial performance measures for evaluating and rewarding their executives. Taking into consideration contingency theory, this greater reliance on financial measures for market and hierarchy cultures, and on

non-financial measures for clan and adhocracy cultures, will be associated with higher firm performance. As a conclusion the following hypothesis is stated:

> ***Hypothesis 6:*** *The relationship between measurement diversity in executive incentive pay and firm performance is moderated by organisational culture such that measurement diversity is positively associated with firm performance when organisational culture is perceived to be clan and adhocracy and negatively associated with firm performance when organisational culture is perceived to be market and hierarchy.*

3.3. Chapter summary

In summary, this chapter proposes that measurement diversity has an impact on firm performance but that this impact is moderated by three external context variables –business risk, ownership structure and organisational culture–, and two internal context variables –performance measures quality and reward systems effectiveness. Figure 3-4 shows the specific relationships among these variables and Table 3-3 summarises the different hypotheses that have been proposed throughout the chapter. The next chapter explains how each of these variables has been operationalised in this study and what data collection and analysis methods have been used to test the hypotheses here presented.

Figure 3-4 Theoretical framework

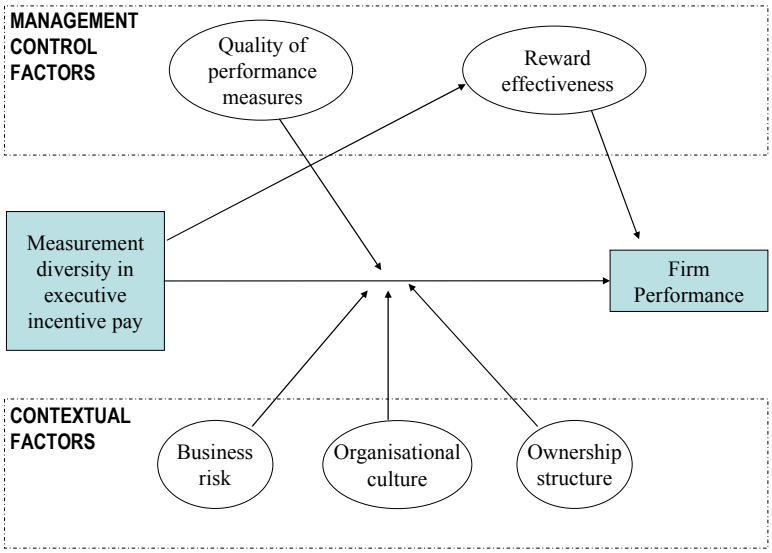


Table 3-3 Summary of hypotheses under investigation

	Key variables	Type of interaction	Type of relationship
H1	▪ Measurement diversity and firm performance	Main effect	Linear (positive)
H2	▪ Measurement diversity, firm performance, and quality of performance measures	Main effect and Moderator	Linear (positive)
H3	▪ Measurement diversity, firm performance and reward effectiveness	Main effect and Mediator	Linear (positive)
H4	▪ Measurement diversity, firm performance and business risk	Main effect and Moderator	Curvilinear (positive/negative)
H5	▪ Measurement diversity, firm performance and ownership structure	Main effect and Moderator	Linear (positive)
H6	▪ Measurement diversity, firm performance and organisational culture	Main effect and Moderator	Linear (positive)

4. RESEARCH METHODS

This chapter describes the research methods used to empirically test the theoretical framework proposed in Chapter 3. The chapter is divided into three sections. Section 4.1 outlines the methods of data collection, in which the sources of data, the sample selection, and the survey development process are described and presented. Section 4.2 explains how the different variables under investigation are measured. Finally, section 4.3 specifies the methods of data analysis that are used in order to test the hypotheses presented in Chapter 3.

4.1. Methods of data collection

In accordance with the research philosophy presented in Chapter 1, two methods of data collection have been used in this dissertation: survey research and archival research. Survey research was mainly used for collecting data on those variables for which information is unavailable or hardly accessible from public sources[21]. Archival research was used for

[21] Based on the Directors' remuneration report regulations published in 2002 (Queen's Printer of Acts of Parliament, 2002), public quoted firms now disclose information about the performance measures they use to determine Directors' annual incentive pay. This

collecting data that tends to be publicly available in economic databases and/or firm's annual reports. Archival research was also used for validating the information extracted from the survey research. The following sub-sections describe in detail how survey data and archival data were collected.

4.1.1. Survey research

The survey research comprised three stages. The first stage consisted of developing the survey instrument that was used to collect data for the purpose of this research. The second stage comprised the choice of sampling criteria and the selection of the study sample frame. The third stage consisted of the distribution of the survey instrument to the firms included in the sample frame and the collection of the data from those companies. Each of these stages is described in turn.

4.1.1.1. Survey development

The survey design process was conducted according to the guidelines provided by Dillman (1999) and Fowler (1995a; 1995b). The literature was searched for existing scales whenever available and those that were not

information is not audited but appears in their Annual Reports. However, the purpose of this research was to focus on public quoted, public non-quoted and private companies. Since only information of public quoted firms is publicly disclosed, the use of a survey instrument to gather performance measurement information was required.

available were created based on the recommendations of DeVellis (2003). The survey was developed with the support of the consultancy firm Watson Wyatt Ltd. and Worldatwork (previously known as the American Compensation Association). Watson Wyatt's support consisted of offering the financial resources needed for developing a glossy version and a web-version of the survey instrument. In addition to this, Watson Wyatt also helped the researcher to find contact details of companies included in the research sample frame. Worldatwork support consisted of providing the researcher with access to those companies included in the sample frame that were Worldatwork members.

A glossy paper version and a web-based version of the survey instrument were created between March and October of 2003. The survey took place from November 2003 to March 2004. A hard copy of the questionnaire was sent out by post to Human Resources and Finance Directors. An introductory letter explaining the purpose of the research and including a link to the web-based version of the questionnaire accompanied the questionnaire (a copy of this letter can be found in Appendix A). The Human Resources and Finance Directors were chosen as respondents for the survey as they were likely to be the most knowledgeable about the performance measurement and reward systems of their organisations.

The design of the survey instrument included: (1) consultations with academics, Watson Wyatt consultants, and Worldatwork personnel; and (2)

a pilot study where the instrument was tested. Appendix B presents the list of people that reviewed and participated in the pilot survey. The researcher reviewed the instrument and the results of the pilot study taking into consideration the feedback received from both academics and practitioners. In total, twelve versions of the survey instrument were developed until a definitive version was agreed. A copy of the final version of the survey questionnaire can be found in Appendix C.

The final version of the survey questionnaire comprised six sections. The first section looked at the performance measurement system used by the organisation to assess business performance. The second section included questions about the organisation's reward and performance evaluation practices. The third section explored the organisation's corporate culture. The fourth section examined the organisation's business strategy. Finally, the fifth section focused on demographic information and on the perceived organisational performance. It must be noted that not all the questions of the survey instrument were devised to address the theoretical framework under investigation in this research. Some questions were included for descriptive purposes only and not for addressing the research hypotheses included in this dissertation.

4.1.1.2. Sampling criteria and sample frame

The study sample was selected according to the following criteria. The starting point was to focus on large companies in the UK. This type of

company was chosen because there is evidence suggesting that they are the most likely to use non-financial performance measures in addition to financial performance measures to assess business performance (e.g. Bullinger and Huber, 1990; Hoque and James, 2000). The researcher was particularly interested in including within the sample both private and public companies. This was because one of the key variables under study was ownership structure, and because most previous research in compensation and performance measurement had only been based on public quoted firms (e.g., Bloom and Milkovich, 1998; Gomez-Mejia et al., 1987; Ittner et al., 1997; Morissette, 1996; Schiehll, 2001).

The FAME database, which includes not only publicly quoted companies' information but also private companies' information, was used to determine the study population, sample frame and final sample. A list of those companies meeting the DTI 2003 criteria for large companies (i.e. those with more than 250 employees and more than £22.8 million of turnover) was downloaded from FAME. A population of over 7000 companies (after omitting those that were in a 'dissolved', 'liquidation' and 'receivership' status) were retrieved from this database. Then, as recommended by Black (1999) for choosing the sample frame, a stratified random sample of 10% of the companies included in the population was selected. This selection was done based on industry classification. This option was chosen to ensure that all industry sectors were represented in proportion to their appearance in the population. Table 4-1 shows the

estimated population of UK large companies and the companies included in the sample frame classified by industry.

Table 4-1 Industry based stratified random sample

Industry sector[1]	**Population**[2] **Count (%)**	**Sample frame**[3] **Count (%)**
A,B,C: Agriculture, hunting and forestry; fishing; mining and quarrying	143 (2.0%)	14 (2.0%)
D: Manufacturing	2,241(31.0%)	218 (31.1%)
E: Electricity, gas and water supply; construction	589 (8.1%)	57 (8.1%)
G: Wholesale and retail trade; hotels and restaurants	1,572 (21.7%)	151(21.6%)
I: Transport, storage and communication	563 (7.8%)	54 (7.7%)
J: Financial intermediation; real estate, renting and business administration	2,128 (29.4%)	206 (29.4%)
Total	**7,236 (100%)**	**700 (100%)**

[1] UK Sector Industry Classification
[2] Data extracted from FAME (based on DTI 2003 large organisations criteria)
[3] Sample fractions randomly selected with SPSS (approximately 10% of the population)

4.1.1.3. Questionnaire distribution and final sample

A glossy paper copy of the survey instrument was sent out by post to the 700 companies included in the sample frame. After the questionnaire was sent out, follow ups were conducted by telephone, email and post. In total more than 250 hours were spent on the phone, three rounds of follow up letters were posted, and thousands of emails were sent out. Responses from 159 organisations were received (23 percent of the sample frame); but, unfortunately, only 132 organisations (19 percent or the sample frame) completed usable surveys (Appendix D shows the list of companies that participated in the research). Tables 4-2 summarises the composition of the final sample. The data extracted from the questionnaires received were inputted into a single file in SPSS.

Table 4-2 Final sample classification per industry sector

Industry	Count (%)
A,B,C: Agriculture, hunting and forestry; fishing; mining and quarrying	5 (3.8%)
D: Manufacturing	33 (25.0%)
E: Electricity, gas and water supply; construction	11 (8.3%)
G: Wholesale and retail trade; hotels and restaurants	19 (14.4%)
I: Transport, storage and communication	9 (6.8%)
J: Financial intermediation; real estate, renting and business administration	53 (40.2%)
Unknown	2 (1.5%)
Total	**132 (100%)**

In order to assess potential sample biases, four different tests were performed (Fowler, 1995). Firstly, telephone conversations with a random sample of 20 HR Directors and 20 Finance Directors of non-respondent companies were conducted. It was found that lack of time or interest in the topic stopped companies from returning the questionnaire. Secondly, a comparison of the variances of the study final sample and the variances of the study sample frame was developed. The purpose of this test was to investigate the null hypothesis that the group of non-respondent companies (N=567) was not significantly different from the group of companies included in the final study sample (N=132). Results suggest that the null hypotheses of equality of means and variances cannot be rejected, taking into account the companies total turnover; however, it can be rejected taking into account the companies' number of employees (at $p < .10$). These findings indicate that the study is biased towards organisations employing a large number of employees. Table 4-3 documents these results.

Table 4-3 Variances and means comparison between study sample and sample frame

Selection criteria	Sample group	Mean	Std. Dev.	Levene's test /F-test (Var)	T-test (Means)
Number employees 03/04	Study sample	12,030	23,325	23.42***	3.55***
	Sample frame	5,436	17,111		
Turnover 03/04 (ThGBP)	Study sample	3,134,562	3,588,587	1.85	1.27
	Sample frame	873,297	5,922,881		

*** p<.001

Thirdly, a non-respondent bias test was carried out by comparing the industry distribution of the final sample and the industry distribution of the sample frame. Table 4-4 shows this comparison.

Table 4-4 Industry distribution comparison

Industry sector*	Sample frame (%)	Final sample (%)	Percentage difference
A,B,C: Agriculture, hunting and forestry; fishing; mining and quarrying	14 (2.0%)	5 (3.8%)	1.8%
D: Manufacturing	218 (31.1%)	33 (25.0%)	-6.1%
E: Electricity, gas and water supply; construction	57 (8.1%)	11 (8.3%)	0.2%
G: Wholesale and retail trade; hotels and restaurants	151(21.6%)	19 (14.4%)	-7.2%
I: Transport, storage and communication	54 (7.7%)	9 (6.8%)	-0.9%
J: Financial intermediation; real estate, renting and business administration	206 (29.4%)	53 (40.2%)	10.8%
Unknown		2 (1.5%)	-1.5%
Total	**700 (100%)**	**132 (100%)**	

Finally, a non-respondent test comparing early versus late respondents (i.e. those who responded after the final follow-up phone call) was conducted with the metric survey variables used in the statistical analysis[22] (business goals achievement before it was converted into a dummy variable, quality of performance measures, and reward effectiveness). Results suggest that the null hypotheses of equality of means and variances cannot be rejected taking into account these variables (at $p < .10$) as shown in Table 4-5. This finding indicates that there is no statistical difference between the survey responses of early and late respondents.

Table 4-5 Variances and means comparison between early and late respondents

Selection criteria	Sample group	Mean	Std. Dev.	Levene's test /F-test (Var)	T-test (Means)
Business goals achievement (BGOALS)	Late resp.	3.24	.71	.86	.818
	Early resp.	3.10	.88		
Quality of performance measures (QPM)	Late resp.	4.06	.52	.45	1.09
	Early resp.	3.94	.54		
Reward effectiveness (RWEFF)	Late resp.	3.74	.50	1.71	.49
	Early resp.	3.68	.65		

The results of these tests show that the survey sample is biased towards organisations with large numbers of employees. This bias may be associated with the evidence provided by Hoque and James (2000) which

[22] The exercise of comparing variance (Levene's test) and means (t-test) can only be done with parametric data.

suggests that large organisations are more likely to rely on non-financial information for evaluating and rewarding their executives than medium and small organisations. Results also show that firms in the financial intermediation, real estate, renting and business administration industries have a greater representation in the study sample compared to firms operating in manufacturing and retail industries.

4.1.2. Archival research

Once the data from the survey were collected, then a matching exercise with the financial and contextual data included in the FAME database was conducted. The names of the companies that had completed the survey instrument were searched for through the FAME database and the data relating to their firm performance, ownership structure, industry, executive rewards and firm's size were downloaded. These data were then added to the file containing the collected survey information on SPSS.

In addition to this, Annual Reports from the year 2003-2004 were obtained from all the publicly quoted companies that had participated in the survey. The information included in the reports was compared to the data extracted from FAME. This exercise gave confidence to the researcher about the reliability of the FAME database. Furthermore, the Directors' Remuneration Reports contained in the Annual Reports were explored. Their information on Directors' annual incentives was contrasted with the

one provided by the companies in the survey instrument. It was found that the information provided in the survey about the type of financial performance measures used in executives' incentive systems matched the data that companies included in their Directors' Remuneration Reports. However, it was also found that most companies avoid disclosing the non-financial information used for evaluating and rewarding their executives in their Directors' Remuneration Reports. This finding verified the need for the survey research in order to gather this type information.

4.2. Measurement of study variables

This section describes in detail how each of the variables in this study has been measured. The main variables are *firm performance* as the dependent variable, and *measurement diversity* or reliance on non-financial performance measurement in executive incentive systems[23] as the independent variable. Four variables are examined as moderators: quality of performance measures, business risk, ownership structure, and organisational culture. One variable is investigated as a mediator: reward effectiveness. Finally, two variables are taken into consideration as control

[23] Measurement diversity and reliance on financial and non-financial performance measures in executive incentives are used interchangeably throughout the thesis.

variables: organisational size and industry. The operationalisation of these variables is reviewed next.

4.2.1. Dependent variable: Firm performance

Firm performance was assessed using a variety of measures extracted from both the research survey and FAME. As suggested by Gomez-Mejia et al. (1987) and many other scholars (e.g. Weiner and Mahoney, 1981), using multiple indicators of firm performance is crucial because any single measure may not reflect the complex nature of this variable. Most research looking at the performance impact of measurement diversity has operationalised firm performance using at least two empirical indicators: (1) publicly available information on the firm's accounting performance (e.g. return on assets, sales growth) and stock market performance (e.g. stock returns) (e.g. Ittner and Larcker, 1995; Ittner, Larcker and Randall, 2003; Said et al., 2003) and/or (2) a composite measure assessing managers' perception of firm performance (e.g. Hoque and James, 2000).

In order to facilitate the comparability of results with previous research and at the same time add new knowledge to the field, this research looks at firm performance using three different proxies. These are (1) the

extent to which firms achieve their business goals; (2) return on assets (fiscal year 2003/04); and (3) sales growth (fiscal years 2003/04 to 2005/06)[24]. Each of these measures is now described in turn.

Firstly, firm performance was operationalised in terms of the extent to which firms had achieved their overall business performance goals. In the survey, respondents were asked about their firm's degree of achievement of its business goals (see Appendix C, question 40). A four-Likert scale going from 'exceed its performance goals' (coded as 4) to 'significantly failed to meet its performance goals' (coded as 1) was developed. Due to the skewness of the data, this measure was transformed into a dummy variable where 'achievement of business goals' was coded as 1 and 'not achievement of business goals' was coded as 0. This measure is denoted as BGOALS.

Secondly, firm performance was assessed using the firms' return on assets (ROA) data. ROA is a "measure of the success of a firm in using assets to generate earnings independent of the financing (debt versus equity) of those assets" (Selling and Stickney, 1989, p. 43). ROA is a measure typically used in management research and in particular in the performance measurement and compensation literature (e.g. Ittner, Larcker and Randall,

[24] This research encompasses companies that are publicly quoted but also companies that are privately held. Thus, the research is unable to use stock market data as a measure of firm performance.

2003; Said et al., 2003; Werner and Tosi, 1995). ROA is calculated as Equation (1) shows. In this study ROA data for the fiscal year 2003/04 were extracted from FAME.

$$(1)\quad ROA = \frac{NetIncome + (1 - TaxRate)(InterestExpense)}{AverageTotalAssets}$$

Finally, firm performance was assessed using firms' sales annual percentage growth in order to increase the comparability of the results as this measure was also used by previous researchers in the field of performance measurement (e.g. Ittner, Larcker and Randall, 2003). This is a measure of how capable a firm is to increase its sales revenues over time. As recommended by Rockoff (2006), in this study sales growth was calculated as shown in Equation (2). Sales turnover data for years 2003/04 and 2005/06 were extracted from FAME.

$$(2)\quad SALESG = (\frac{LnTurnover2005/06 - LnTurnover2003/04}{2}) * 100\%$$

It must be noted that ROA and sales annual growth are expected to be associated with each other; whereas business goals achievement might not be associated with ROA and sales annual growth as it measures a different dimension of firm performance. It can be argued that the aim of business goals achievement is to capture the survey respondents' perception of how well an organisation is doing as a whole. The aim of ROA and sales annual growth is to capture the organisation's economic results.

4.2.2. Main independent variable: Measurement diversity in executive incentives

In order to obtain data about the performance measures used to determine top executives' annual incentives, a list of potential performance measures was included in the survey (see Appendix C, question 17). When completing the survey, respondents were asked to mark those measures that their organisations used for assessing business performance and for determining top executives' annual incentives. Only the measures used for incentive purposes were used in this study[25]. The list of performance measures included in the survey was created based on (1) the work of Ittner et al. (1997), Schiehll (2001) and Morissette (1996); (2) a review of the Director's Remuneration Report of a sample of 25 public listed companies; and (3) the researcher's own experience as a Compensation Consultant. Respondents could mark measures from the list and if required they could also write in additional measures.

[25] This differs from previous approaches taken in the literature where authors have only considered if firms "used" non-financial performance measures, meaning "the existence of a measure in the performance measurement and evaluation system" (Van der Stede et al., 2006, p. 192). However, practical and anecdotal evidence from the pilot study revealed that measures used for performance measurement and evaluation purposes might not be specifically used for reward purposes. This is the reason why a different approach to the one taken in previous research was used in this survey.

Consistent with the definition of financial and non-financial performance measures provided by Morissette (1996) and reviewed in Chapter 2, a table classifying the performance measures included in the survey was created (see Table 4-6). Morissette (1996) defines a financial measure as "(1) a piece of information expressed as a monetary unit, (2) a ratio resulting from mathematical manipulations of information expressed in monetary units (Ratio=Monetary metric/Monetary metric), or (3) a piece of information resulting from a ratio that includes a piece of information expressed in a monetary unit and a non-monetary unit (Ratio=Monetary metric/Non-Monetary metric)" (p. 13). According to this definition, measures such as profit, sales, cash flow, cost, return on assets and any other measure coming from a firm's balance sheet or profit and loss accounts is considered to be financial information[26].

Morissette (1996) defines a non-financial measure as "any quantitative measure (1) expressed in a metric other than a monetary unit, or (2) that results from mathematical manipulations or ratios of pieces of information expressed in metrics other than monetary units (Ratio=Non-Monetary metric/Non-Monetary metric)". Based on this definition, measures such as

[26] Measures such as *market share* may cause classification problems. *Market share* tends to be calculated as total organisation sales divided by total market sales so, according to Morissette's (1996) definition, it is considered to be a financial measure.

customer satisfaction, productivity/yield, and safety are considered non-financial information (p. 14).

Table 4-6 Classification of financial and non-financial performance measures

FINANCIAL MEASURES	NON-FINANCIAL MEASURES
Cash flow ratio	Capacity to innovate
Earnings per share (EPS)	Defects rates
EBITDA	Idea generation rate
EVA©	New product development
Gross margin	Productivity/yield
Net operating income	Service quality audit
Return on assets	Competitors measures
Return on equity	Customer loyalty
Revenues	Customer retention
Year-over-year growth	Customer satisfaction
TSR	Personal scorecard
Cost (quality, maintenance)	Employee satisfaction
Profit	Employee turnover
R&D spend	Leadership
Market share	Workforce capabilities
Advertising spend vs. sales	Safety incidents
	Core competencies and skills
Other financial measures	Other non-financial performance measures

Based on this classification of performance measures, the measurement diversity variable was operationalised as a dummy variable with codes 1 and 0 (e.g. Ittner et al., 1997). Code 1 was given to those companies which had financial as well as non-financial corporate performance measures in their executives' incentive system. Code 0 was given to those companies that only had financial corporate measures in their executives' incentive system.

4.2.3. Independent moderating variables: Quality of performance measures, business risk, ownership structure and organisational culture

4.2.3.1. Quality of performance measures

Perceptions about the quality of the performance measures used to determine executives' annual incentives were sampled with ten items. These items were designed by the researcher as no appropriate scale was found in the literature. In particular, the items were created based on previous performance measurement research (Busby and Williamson, 2000; Dixon et al, 1990; Franco-Santos and Bourne, 2005; Neely, Gregory, M.J. and Platts, 1995; Neely, Mills, Platts, Gregory, and Richards, 1996) and agency based research (Anthony and Govindarajan, 1995; Banker and Datar, 1989; Demski and Feltham, 1978; Indjejikian, 1999; Holmstrom, 1979) (see Appendix C, question 20). These items were evaluated using a five-point Likert scale going from 'strongly agree' (coded as 5) to 'strongly disagree' (coded as 1) (the option of 'don't know' was also included). The comprehensiveness and understandability of these items was assessed during the pilot study. Once the data from the survey were collected, a principal component analysis (varimax rotation) and a reliability analysis were conducted. Table 4-7 shows the results of these analyses.

Table 4-7 Performance measures quality: results of factor and reliability analysis

	F1	F2	F3
Quality of performance measures:			
q20a - TEs have control over measures	.610		
q20b - TEs' measures are few in number			
q20c - TEs' measures reflect strategic goals	.710		
q20d - TEs' measures reflect BU's goals	.763		
q20e - TEs' measures reflect individual goals		-.600	
q20f - TEs' measures are easy to understand	.754		
q20g - TEs' measures are easy to set	.653		
q20h - TEs' measures are easy to manipulate			.853
q20i - TEs' measures are outcome oriented	.515		
q20j - TEs' measures are objective	.589	.534	
Kaiser-Meyer-Olkin = .76			
Eigenvalues	3.29	1.39	1.09
Cronbach's alpha	.79	-	-

Note: Factor loadings less than .5 have not been included in the table.

Based on the outputs of these analyses, items q20b, q20e, and q20h were excluded[27]. Only one factor comprising items q20a, q20c, q20d, q20f, q20g, q20i, q20j had an eigenvalue greater than 1. Its Cronbach's alpha[28] was .79, which is considered to be valid (Nunnelly, 1978). Thus, the average of the value of those items was calculated and the result was considered to be the final measure of the quality of performance measures. This measure was denoted as QPM.

[27] Due to the size of the final sample (N=132), factor loadings above .5 are considered to be good provided that the Kaiser-Meyer-Olkin (KMO) measure is between .7 and .8 (Field, 2005; Kaiser, 1974; MacCallum, Widaman, Zhang and Hong, 1999).

[28] Values above .70 are acceptable values for Cronbach's alpha. Values substantially lower indicate an unreliable scale (Nunnally, 1978).

4.2.3.2. Business risk

In the last two decades, agency research has paid close attention to business risk as a variable influencing agency predictions (Miller and Bromiley, 1990). Most researchers have defined risk as the volatility in an organisation's performance and measured it in two ways: as variation in a firm's income stream (i.e. return on assets), and as variability in a firm's stock market return (e.g. Bloom and Milkovich, 1998; Gray and Cannella, 1997; Miller et al., 2002). This research only focuses on the volatility of a firm's income stream as most of the companies in the study sample are private companies or non-quoted public companies. Only a few are public quoted companies. Firm's income variability was measured as the standard deviation of firms' Return on Assets (ROA). For calculating this indicator ROA data from fiscal years 1999/00 to 2003/04 were downloaded from FAME data. The final measure of business risk was denoted as RISK.

4.2.3.3. Ownership structure

Similar to compensation studies conducted by Hambrick and Finkelstein (1995), Tosi and Gomez-Mejia (1989), and Werner et al (2005), ownership structure [OWN] is a dummy variable that classifies firms as

manager-controlled and owner-controlled[29]. Manager-controlled (MC) firms are those in which no individual or institution other than an employee benefit plan owns five percent or more of the firm's outstanding stock. Owner-controlled (OC) firms are those in which at least five percent of the firm's outstanding stock belongs to an individual or institution that is not involved in the management of the company and it is not an employee benefit plan.

In the United States a five percent cut-off point of the firm's outstanding stock is normally used as a proxy for ownership structure based on research developed by Hunt (1986). This measure is a common measure in compensation research (O'Reilly, Main and Crystal, 1988; Tosi and Gomez-Mejia, 1994; Werner et al., 2005) and for this reason, it was selected as a proxy for ownership structure in this study. However, the FAME database only reports ownership data with a cut-off point of 25 percent because in the UK this cut-off point is more common than the 5 percent cut-

[29] Some researchers have argued that ownership structure should be measured in continuous terms (Cubbin and Leech, 1983). However, Hambrick and Finkelstein (1995) examined the moderating effects of ownership structure on CEO pay, adopting both a categorical and a continuous approach to ownership structure. They found that "the categorical measure appeared to be actually a stronger moderator than the continuous measure, despite the fact that the categorical measure discards a great deal of variance" (1995: 188). This finding led them to conclude that the categorical approach to ownership control was valuable at least for issues related to executive pay.

off point. As a result, due to data constraints the 25 percent cut-off point had to be used instead of the 5 percent cut-off point.

FAME provides an indicator that represents the degree of independence of a company with regard to its shareholders. It is called the BvDEP Independence Indicator. Each of the companies of the sample for which financial data were found in FAME had a BvDEP indicator. This indicator has four categories. Companies are assigned an "A" BvDEP indicator when none of their known recorded shareholders has more than 25 percent of direct or total ownership. Companies are assigned a "B" BvDEP indicator when one or more of their known recorded shareholders have an ownership percentage greater than 25 percent. Companies are assigned a "C" BvDEP indicator when one of their shareholders has a total or a calculated total ownership over 50 percent. Companies are assigned a "D" BvDEP indicator when one of their shareholders has a direct ownership of over 50 percent.

Taking into account that the focus of this research is to differentiate between manager-controlled and owner-controlled companies, the BvDEP indicator was transformed into a dummy variable with codings 1 and 0. Code 1 represented companies with an "A" BvDEP indicator (MC). Code 0 represented companies with "B", "C" or "D" BvDEP indicators (OC). This transformed variable was denoted as OWN.

4.2.3.4. Organisational culture

This variable was operationalised in terms of the extent to which the firm's culture was considered to be a *clan* culture, an *adhocracy* culture, a *hierarchy* culture, or a *market* culture (Cameron and Quinn, 1999). Table 4-8 provides the definitions of each culture typology.

Table 4-8 Organisational culture typologies (Cameron and Quinn, 1999, p. 58)

Typology	Description
Clan culture	A very friendly place to work where people share a lot of themselves. It is like an extended family. The leaders are considered to be mentors and parent figures. The organisation is held together by loyalty or tradition. Commitment is high. The organisation emphasises the long-term benefit of human resources development and attaches great importance to cohesion and morale. Success is defined in terms of sensitivity to customers and concern for people. The organisation places a premium on team work, participation, and consensus.
Adhocracy culture	A dynamic, entrepreneurial, and creative place to work. People stick their necks out and take risks. The leaders are considered innovators and risk takers. The 'glue' that holds the organisation together is commitment to experimentation and innovation. The emphasis is on being at the leading edge. The organisation's long-term emphasis is on growth and acquiring new resources. Success means gaining unique and new products or services. Being a product or service leader is important. The organisation encourages individual initiative and freedom.
Hierarchy culture	A very formalised and structured place to work. Procedures govern what people do. The leaders pride themselves on being good coordinators and organisers who are efficiency-minded. Maintaining a smooth-running organisation is most critical. Formal rules and policies hold the organisation together. The long-term concern is on stability and performance with efficient, smooth operations. Success is defined in terms of dependable delivery, smooth scheduling, and low cost. The management of employees is concerned with secure employment and predictability.
Market culture	A results-oriented organisation whose major concern is getting the job done. People are competitive and goal-oriented. The leaders are hard drivers, producers, and competitors. They are tough and demanding. The glue that holds the organisation together is an emphasis on winning. Reputation and success are common concerns. The long-term focus is on competitive actions and achievement of measurable goals and targets. Success is defined in terms of market share and penetration. Competitive pricing and market leadership are important. The organisation style is hard-driving competitiveness.

Six dimensions were used for identifying the different culture typologies (see Appendix C, questions 27 to 32): The first dimension referred to the dominant characteristic of the organisation (i.e. people-oriented, dynamic and entrepreneurial, results-oriented, or control and structure-oriented); the second dimension referred to the organisation's management style; the third dimension referred to the leadership style or approach; the fourth dimension referred to the organisational 'glue' or bonding mechanism that holds the organisation together; the fifth dimension referred to the organisation's strategic focus; finally, the sixth dimension referred to the criteria of success that the organisation uses to define what gets measured, rewarded and celebrated.

The six culture dimensions were taken from the Organisational Culture Assessment Instrument (OCAI) developed by Cameron and Quinn (1999; 2005) and included in the research survey. Taking into account the different culture survey instruments that exist in the literature (e.g. Hofstede, Neuijen, Ohayv and Sanders, 1990; Kotter and Heskett, 1992), the OCAI was chosen due to its simplicity, clarity, validity and reliability[30] (Garman,

[30] Cronbach's alpha coefficients found in previous studies were: (1) .74 for the clan culture, .79 for the adhocracy culture, .73 for the hierarchy culture, and .71 for the market culture in a study conducted by Quinn and Spreitzer (1991) with 796 executives from 86 public utilities firms. (2) .79 for the clan culture, .79 for the adhocracy culture, .80 for the hierarchy culture, and .77 for the market culture in a study developed by Yeung, Brockbank and Ulrich (1991) with 10,300 executives in 1064 businesses; (3) .82 for the clan culture,

2006). Each culture dimension was assessed using a survey question with a 5-point Lickert scale ranging from 'strongly agree' (coded as 5) to 'strongly disagree' (coded as 1) (the option of 'don't know' was also included) (see Appendix, questions 27 to 32). The six culture questions had four items each. These items related to the four culture typologies: Item (a) of each culture question described aspects of a clan culture type; item (b) of each culture question described aspects of an adhocracy culture type; item (c) of each culture question described aspects of a market culture type; and item (d) of each culture question described aspects of a hierarchy culture type.

In order to verify the internal validity and reliability of the scales, a principal component analysis (varimax rotation method) and a reliability analysis were developed with the survey data. Table 4-9 shows the results of these analyses, which are similar to the ones obtained in previous studies.

.83 for the adhocracy culture, .67 for the hierarchy culture, and .78 for the market culture in a study conducted by Zammuto and Krakower (1991) with more than 1300 respondents in higher education institutions (Cameron and Quinn, 1999).

Table 4-9 Organisational culture: results of factor and reliability analysis

	F1 Market	F2 Clan	F3 Adhocracy	F4 Hierarchy
Organisational culture characteristics				
q27a - People oriented…		.685		
q27b - Dynamic and entrepreneurial…			.696	
q27c - Results oriented	.806			
q27d - Control and structure oriented				.742
Management style				
q28a - Teamwork, consensus…		.761		
q28b - Individual risk-taking…			.688	
q28c - Hard-driving…	.820			
q28d - Security of employment…				.519
Leadership				
q29a - Mentoring, facilitating…		.667		
q29b - Entrepreneurship, innovating…			.752	
q29c - An aggressive, results-oriented…	.695			
q29d - Coordinating, organising…				.584
Company "glue"				
q30a - Loyalty and mutual trust…		.776		
q30b - Commitment to innovation…			.774	
q30c - Emphasis on achievement…	.806			
q30d - Formal rules and policies…				.823
Company emphasis				
q31a - Human development…		.805		
q31b - Acquiring new resources…			.593	
q31c - Competitive actions…	.803			
q31d - Permanence and stability…				.747
Success definition				
q32a - Employee commitment…		.764		
q32b - Having the unique products…			.666	
q32c - Winning in the market place…	.603			
q32d - Efficiency…				.662
Kaiser-Meyer-Olkin = .83				
Eigenvalues	5.13	4.87	2.63	1.66
Cronbach's alpha	.82	.85	.88	.76

Note: Factor loadings less than .5 have not been included in the table.

Based on the above results, the measurement of the four culture types was developed as follows: The clan culture (denoted as CLAN) was measured using the average of all the values of the (a) items included in the six culture dimensions; the adhocracy culture (denoted as ADHOC) was

measured using the average of all the values of the (b) items included in the six culture dimensions; the market culture (denoted as MARKET) was measured using the average of all the values of the (c) items included in the six culture dimensions; and the hierarchy culture (denoted as HIER) was measured using the average of all the values of the (d) items included in the six culture dimensions.

Next, in order to obtain just one value –rather than four– for the corporate culture measure, an approach described by Henri (2006) in his work on the impact of culture on performance measurement systems was used. This approach focuses on the two key perspectives suggested by Cameron and Quinn (1999) as critical for differentiating between the four organisational cultures' typologies. These are control and flexibility as reviewed in Chapter 3. According to this approach, the value of clan culture (CLAN) was added to the value of adhocracy culture (ADHOC). The resulting value represents the extent to which the firm emphasises flexibility rather than control and was denoted as FLEX. Then, the value of market culture (MARKET) was added to the value of hierarchy culture (HIER). The resulting value represents the extent to which the firm emphasises control rather than flexibility and it was denoted as CONTROL. Finally, the value of CONTROL was subtracted from the value of FLEX. The resulting value was denoted as CULTdom as it indicates the emphasis the firm makes on flexibility (values closer to -10), control (values closer to 10) or both at

the same level (zero values). These operations are shown in Equations (3), (4), and (5).

(3) FLEX = ADHOCRACY + CLAN

(4) CONTROL = MARKET + HIERARCHY

(5) CULTdom = FLEX - CONTROL

4.2.4. Independent mediating variable: Reward effectiveness

Reward effectiveness was operationalised in terms of the extent to which reward systems contribute to the achievement of organisational goals. In order to allow comparability of the results of the study with previous research, six items previously developed and tested by Balkin and Gomez-Mejia (1987; 1990) were used to measure reward effectiveness (see Appendix C, question 21). These items were assessed using a five-point Likert scale going from 'strongly agree' (coded as 5) to 'strongly disagree' (coded as 1) (the option of 'don't know' was also included). A principal component analysis (varimax rotation) and reliability analysis was run with the collected survey data. Table 4-10 presents the results. Only one factor had an Eigenvalue greater than 1 and the Cronbach's alpha found for the items comprised in it was .89. Reward effectiveness was then calculated by averaging the values of q21a, q21b, q21c, q21d, q21e, and q21f. This measure was named RW_EFF in the research data analysis.

Table 4-10 Reward effectiveness: results of factor and reliability analysis

	F1
Reward system effectiveness:	
q21a - Overall effectiveness of TEs' rewards	.874
q21b - Rewards contribute to retention and attraction of TEs	.822
q21c - TEs happy with how rewards contribute to achievement of goals	.858
q21d - TEs understand their reward practices	.724
q21e - TEs accept their reward practices	.788
q21f - TEs are motivated by their reward practices	.846
Kaiser-Meyer-Olkin = .87	
Eigenvalues	4.03
Cronbach's alpha	.89

Note: Top executive (TE)

4.2.5. Control variables: Organisational size and industry

4.2.5.1. Firm's size

In performance measurement research, organisational size tends to be calculated as the logarithm of firm's assets (e.g. Ittner, Larcker and Randall, 2003) or the logarithm of firms' sales revenues (e.g. Bushman et al., 1996; Gupta, 1987). In the compensation literature, it is common to find organisational size measured as a composite of organisational total assets, turnover and number of employees (e.g. Gomez-Mejia et al., 1987; Werner and Tosi, 1995; Werner et al., 2005).

Data for the fiscal year of 2003/04 were extracted from FAME. In order to increase the comparability of the results of this study, the three key indicators of organisational size were measured and their logarithms were calculated, given the extreme variability found in them. The logarithms of the three indicators were factor analysed and one factor resulted from this

analysis with an Eigenvalue greater than 1. A composite measure of the logarithms of total assets, number of employees and turnover was then created (see Table 4-11). A reliability analysis was run and a Cronbach's alpha of .95 was obtained[31]. No specific prediction, however, is suggested about the effects of firm size as this variable was used mainly to preserve comparability with related work in the literature.

Table 4-11 Organisational size: results of factor and reliability analysis

	F1 Org. Size
LogASSETS03	.950
LogTURN03	.967
LogEMP03	.957
Kaiser-Meyer-Olkin = .76	
Eigenvalues	2.75
Cronbach's alpha	.95

4.2.5.2. Industry

The information used to compute the industry measures was downloaded from FAME (UK SIC codes). Six industry dummy variables were created, one per each of the sectors typically used in EUROSTAT's studies: (1) Agriculture, hunting and forestry, fishing, mining and quarrying; (2) manufacturing; (3) Electricity, gas and water supply, construction; (4) wholesale and retail trade; hotels and restaurants; (5) transport, storage and

[31] A scale of *number of employees* was also included in the survey (see Appendix C, q37). However, this scale was only used to contrast the reliability of the FAME's data. Data from FAME were found to be reliable when compared against the survey data.

communication; and (6) Financial intermediation; real estate, renting and business administration. Compared to the UK SIC sector classification, the classification used by EUROSTAT's studies is more concise, which was a critical criterion for this research due to its sample size. Appendix E shows the companies that have participated in the research organised according to their industries using both the UK SIC and the EUROSTAT SIC.

Previous research has found that regulated (e.g. Bushman et al., 1996; Ittner and Larcker, 1995) and financial industries (e.g. Ittner, Larcker and Randall, 2003) may be more likely to use measurement diversity in their executive pay packages with beneficial performance results. Thus, it is expected that the relationship between the use of financial and non-financial performance measures in executives' incentive pay and firm performance is positive when organisations operate in financial or utility industries. No specific prediction is made about the effect of other industries on the performance impact of measurement diversity.

4.3. Methods of data analysis

Due to the focus of this study and based on previous research conducted in the same area, the hypotheses suggested in Chapter 3 are tested using multivariate data analysis, specifically multiple regression analysis with interaction effects. The software used for conducting the quantitative analyses was SPSS version 14. Before the regression analyses were

performed the data extracted from the survey and from the FAME database were cleaned and outliers analysed[32]. In total, mainly due to missing values, the sample was reduced from 159 companies to 132 as discussed in Section 4.1.1.3. Once the data were cleaned and the statistical assumptions[33] for conducting multivariate analysis were tested, the regression equations were computed. The following subsections explain the equations that were used in order to test the research hypotheses.

4.3.1. Main effect

Hypothesis 1, shown in Chapter 3, describes the expected main effect between a predictor variable (measurement diversity) and a dependent variable (firm performance). This hypothesis is tested using Equation (1), where Y represents the dependent variable, which in this research is measured with three different proxy variables (business goals achievement, return on assets, and sales growth), X_1 and X_2 represent two control

[32] As suggested by Hair, Black, Babin, Anderson and Tatham (2005) and Field (2005), outliers were identified and studied with SPSS using boxplots and z-scores. Outliers were only deleted if they were thought to be truly aberrant, not representative of the population or with an absolute z-score greater than 3.00; otherwise they were retained.

[33] The four statistical assumptions required for conducting regression analysis –these are normality, homoscedasticity, linearity and absence of correlated errors (Hair et al., 2005) – were tested before any of the regression analysis was conducted. When required, data was transformed in order to achieve the necessary requirements. Due to the length of these analyses the full results are not reported in this thesis. However, they can be provided upon request.

variables, which in this research are firm size and industry, and X_3 represents the main predictor variable, which in this research is the use of measurement diversity in executives' annual incentive systems. Hypothesis 1 will be supported if β_3 is positive and statistically significant.

(1) $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

4.3.2. Interaction effects

According to Schoonhoven "when contingency theorists assert that there is a relationship between two variables […] which predicts a third variable […] they are stating that an interaction exists between the first two variables" (Schoonhoven, 1981, p. 351). Based on this definition, Hypotheses 2, 3, 4, 5 and 6 focus on interaction effects between measurement diversity and the quality of performance measures (H2); measurement diversity and reward system effectiveness (H3); measurement diversity and business risk (H4); measurement diversity and ownership structure (H5); and measurement diversity and organisational culture (H6). These effects are conceptually different. The interaction effect in Hypotheses 2, 4, 5 and 6 involves a moderation effect whereas the interaction effect in Hypothesis 3 involves a mediation effect. The methods used to test these two interaction effects are now described in turn.

4.3.2.1. Testing moderation effects

When the impact that a predictor variable has on a dependent variable is subject to the level of a third variable –termed as a moderator–, a 2-way moderation effect is said to exist. In this case, the "fit" between the moderator variable and the predictor variable is the primary determinant of the dependent variable (Venkatraman, 1989). If the interaction effect is considered to be linear then this "fit" can be mathematically expressed as Equation (2) shows, where two control variables have been included (Cohen, Cohen, West and Aiken, 2003; Hartmann and Moers, 1999; Jaccard and Turrisi, 2003; Venkatraman, 1989). In Equation (2), Y is the dependent variable, X_1 and X_2 are the two control variables, X_3 is the main predictor variable, X_4 is the moderator variable, and X_3X_4 is the interaction term.

$$(2)\ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_3 X_4 + \varepsilon$$

The moderation effect is supported when β_5 is statistically significant. This beta coefficient indicates by how many units the slope of Y on X is predicted to change given a one-unit change in the moderator variable X_4 (keeping the control variables constant). β_3 is a simple effect and reflects the impact of X_3 on Y when the rest of the variables are 0.

If the interaction effect is considered to be non-linear (curvilinear) this is mathematically expressed as Equation (3) shows (Cohen et al., 2003;

Jaccard and Turrisi, 2003). Moderation effects are tested when β_7 is statistically significant.

$$(3)\ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_4^2 + \beta_6 X_3 X_4 + \beta_7 X_3 X_4^2 + \varepsilon$$

When interaction terms are used in regression equations some researchers are concerned with multicollinearity issues. In order to reduce this issue Cohen et al. (2003) and Jaccard and Turrisi (2003) suggest centring predictor variables but only when the predictor variable does not have a natural 0 value. Based on this suggestion the values of the quality of performance measures variable (QPM) were centered as this was the only variable in the research that did not have a natural 0 value in its range.

Once the statistical significance of the interaction term is analysed, Cohen et al. (2003) and Jaccard and Turrisi (2003) recommend graphically representing the effect of the predictor variable on the dependent variable at different values of the moderator variable (e.g. its mean, its mean plus 1 standard deviation, and its mean minus 1 standard deviation). This is mathematically represented in Equation (4) and the plot of this function is shown in Figure 4-1.

$$(4)\ Y = (\beta_3 + \beta_5 X_4)\, X_3$$

Figure 4-1 The effect of the predictor variable (X_3) on the dependent variable (Y) at three different levels of the moderator variable (X_4)

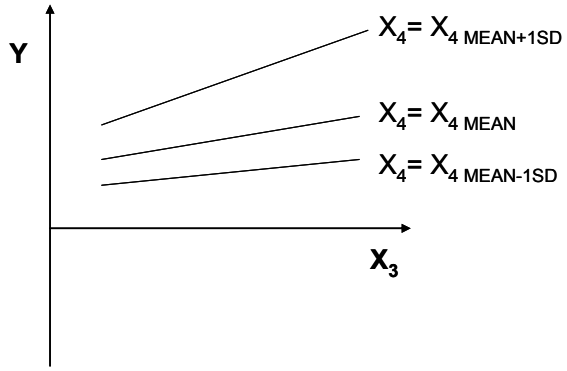


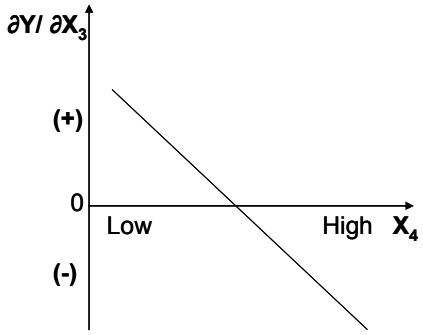
Figure 4-1 helps the interpretation of results as it indicates how the slope of Y on X_3 changes at different values of X_4. However, as stated by Schoonhoven (1981), there is another way of representing the joint effect of the main and interaction terms by rewriting Equation (4) as its partial derivative (shown in Equation 5). This way is more reliable and easier to interpret as it represents the relationship between the predictor and the dependent variable over the range of values of the moderator variable. If the joint effect of the main and interaction terms is non-monotonic, the representation suggested by Schoonhoven also indicates the point of inflection of this joint effect as Figure 4-2 shows. This point of inflection can be calculated with Equation (6), which can be rewritten as Equation (7).

(5) $\partial Y/\partial X_3 = \beta_3 + \beta_5 X_4$

(6) $\partial Y/\partial X_3 = \beta_3 + \beta_5 X_4 = 0$

(7) $X_4 = -\beta_3/\beta_5$

Figure 4-2 The effect of the predictor variable (X_3) on the dependent variable (Y) over the range of values of the moderator (X_4)



4.3.2.2. Testing mediation effects

A mediation effect is said to exist when there is "a significant intervening mechanism […] between an antecedent variable […] and the consequent variable […]. Thus while moderation specifies varying effects of an independent variable on a dependent variable as a function of the moderating variable, [mediation] specifies the existence of intervening (indirect) effects between an antecedent variable and its consequent variable" (Venkatraman, 1989, p. 429). A mediation effect can be tested by performing the two different regressions models. These models are shown in Equations (8) and (9) where two control variables have also been included. In these Equations Y is the dependent variable, X_1 and X_2 are the two control variables, X_3 is the main predictor variable, and X_4 is the mediator variable.

$$(8)\ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

(9) $X_4 = \alpha_0 + \alpha_1 X_3 + \varepsilon$

If the β_3 coefficient is not statistically significant and the β_4 and α_1 coefficients are statistically significant, this indicates that the presence of a mediator variable (X_4) is necessary for the transmission of effects of X_3 on Y and this is termed as a "complete mediational model" (Venkatraman, 1989, p. 430). If the β_3 coefficient is statistically significant and the β_4 and α_1 coefficients are also statistically significant, this indicates that a direct effect exists between Y and X_3, and an indirect effect between X_3 and Y through X_4 also exists, which implies a "partial mediational model" (Venkatraman, 1989, p. 430).

4.4. Chapter summary

This chapter has described how the research has been conducted, how each of the study variables has been operationalised and how the research data has been analysed. In summary, the research is based on survey and archival data. A sample frame of 700 firms located in the UK was surveyed. A total of 159 firms completed the research questionnaire and the financial and contextual data (e.g. ROA, Turnover, UK SIC code, Ownership structure, etc.) of those firms were downloaded from the database FAME. However, due to missing data the final sample had to be reduced to 132 firms.

The different variables used in this research are summarised in Table 4-12. This table also shows how they have been denoted in the statistical analysis, the type of measures they are (metric or non-metric/dummy), and a brief description of how these variables have been operationalised.

Table 4-12 Summary of the measurement of study variables

Variable name	Denoted as…	Type	Operationalisation	Key references
Dependent variables:				
▪ Firm's performance				
▪ Business goals achievement	BGOAL	Metric/ dummy	Based on q40 (code 1: business goals achieved, code 0: business goals not achieved)	Developed by the researcher
▪ Return on assets	ROA	Metric	ROA (2003/04)	Ittner et al.. (2003); Said et al. (2003)
▪ Sales growth	SALESG	Metric	Turnover annual percentage growth (2003/04 - 2005/06)	Ittner et al.. (2003)
Independent variables:				
▪ Measurement diversity in incentives	MDIV	Metric/ dummy	Based on q20 (code 1: financial and non-financial corporate performance measures in executives' annual incentives, code 0: financial corporate performance measures in executives' annual incentives)	Ittner and Larcker (1997)
Independent mediating variable:				
▪ Reward systems' effectiveness	RWEFF	Metric	Average of q21a, q21b, q21c, q21d, q21e and q21f	Balkin & Gomez-Mejia (1987, 1990)
Independent moderating variables:				
▪ Quality of performance measurement	QPM	Metric	Average of q20a,q20c, q20d, q20f, q20g, q20i and q20j	Developed by the researcher
▪ Ownership structure	OWN	Metric/ dummy	Code 1: MC, code 0: OC	Hambrick & Finkelstein (1995); Werner et al.. (2005)
▪ Business risk	RISK	Metric	Standard deviation of ROA (1999/00-2003/04)	Bloom & Milkovich, (1998); Miller et al.. (2002)

Variable name	Denoted as…	Type	Operationalisation	Key references
▪ Organisational culture	CULTdom	Metric/ dummy	FLEX cultural values-CONTROL cultural values	Cameron & Quinn (1999, 2005); Henri (2006)
Control variables:				
▪ Firm's size	FSIZE	Metric	Average of logASSET, log TURN and logEMP (2003/04)	Bushman et al. (1996); Ittner & Larcker (1995);
▪ Industry	IND	Metric/ dummy	EUROSTAT's classification	Ittner et al. (2003)

The data have been analysed using multivariate analysis, mainly regression analysis with moderator and mediator interaction effects. The software used for conducting the data analysis has been SPSS version 14. The next chapter presents the descriptive statistics of the data collected and the results of the correlation and regression analyses conducted.

5. RESEARCH FINDINGS

The objective of this chapter is to present the results of the analyses conducted in order to test the hypotheses formulated in Chapter 3. The chapter is structured in three sections. Section 5.1 introduces the descriptive statistics of the data collected. Section 5.2 shows the results of the correlation analyses performed. Section 5.3 presents the findings from the regression analyses carried out for testing each of the hypotheses previously proposed.

5.1. Descriptive statistics

The descriptive statistics for all variables appear in Table 5-1. The statistics presented come from raw data and centred data in the case of those variables that have been centred[34]. The data show that the sample represents large organisations in diverse industries (a table showing the industries represented in the final sample compared to the industries represented in the sample frame can be found in Chapter 4, Table 4-4). The average number of employees of the companies in the sample is 12,030, the average turnover is

[34] As suggested by Jaccard & Turrisi (2003) and by Cohen et al.. (2003) the data of those variables that did not have a natural zero value have been centred in order to avoid multicollinearity problems and to facilitate the interpretation of the interaction effects in the multiple regressions conducted.

around £3,135 million and the average value of total assets is around £11,088 million. The average ROA is 6.095 percent and the average sales percentage growth is 1.140 percent. 21 percent of the sample has failed to meet its business goals.

Table 5-1 Descriptive statistics

Codes[1]	Units of measurement	Min (%)[2]	Max (%)	Mean	Std
BGOAL	Dummy variable	.00 (21%)	1.00 (79%)	-	-
ROA	Percentage	-10.38	22.40	6.095	6.530
SALESG	Percentage	-8.93	11.43	1.140	4.298
MDIV	Dummy variable	.00 (40%)	1.00 (60%)	-	-
QPM	Survey scale	2.71	5.00	3.973	.537
QPM_cent	Survey scale (centred)	-1.22	1.06	.035	.537
RWEFF	Survey scale	2.33	5.00	3.699	.615
RISK	Standard deviation	.02	11.93	4.194	3.158
OWN	Dummy variable	.00 (75%)	1.00 (25%)	-	-
CULTdom	Survey Scale	-4.83	5.83	.755	1.549
CULT_CLAN	Survey scale	1.00	4.67	3.448	.7122
CULT_ADHO	Survey scale	1.00	5.00	2.989	.6929
CULT_MARK	Survey scale	1.33	5.00	3.708	.7389
CULT_HIER	Survey scale	1.83	4.50	3.484	.6191
FSIZE	Composite	2.64	6.57	4.733	.901
TURN03	Th. GBP	43,574	172,872,000	3,134,562	16,421,379
TASSETS03	Th. GBP	199	440,000,000	11,088,757	50,454,225
NEMP03	People	600	116,300	12,030	23,325
IND_A	Dummy variable	.00 (96%)	1.00 (4%)	-	-
IND_M	Dummy variable	.00 (74%)	1.00 (26%)	-	-
IND_E	Dummy variable	.00 (91%)	1.00 (9%)	-	-
IND_W	Dummy variable	.00 (85%)	1.00 (15%)	-	-
IND_T	Dummy variable	.00 (93%)	1.00 (7%)	-	-
IND_F	Dummy variable	.00 (59%)	1.00 (41%)	-	-

[1] **BGOAL**= Business goals achievement (code 1=Goals achieved, code 0=Goals not achieved); **ROA**=Short-term economic results (ROA2003/04); **SALESG=** Sales growth (turnover growth 2003/04-2005/06); **MDIV**= Measurement diversity (code 1=Financial and non-financial performance measures in executives' incentive pay, code 0=Financial performance measures only in executives' incentive pay); **RWEFF**= Reward system effectiveness; **QPM**= Quality of performance measures; **QPM_cent**=Quality of performance measures data after centring it (QPM-QPMmean); **RISK**= Business risk (standard deviation of ROA 1999/00-2003/4); **OWN**= Ownership (code 1=Manager-controlled, code 0=Owner-controlled); **CULT_dom**= Culture dominance (ranges from 10 representing MARKET and HIERARCHY cultures to -10 representing CLAN and ADHOCRACY cultures); **CULT_CLAN**= Clan organisational culture data from survey scale; **CULT_ADHO**= Adhocracy organisational culture data from survey scale; **CULT_HIER**= Hierarchy organisational culture data from survey scale; **CULT_MARK**= Market organisational culture data from survey scale; **FSIZE**= Firm's size (average log total assets, log turnover and log number employees 2003/04); **TURN03=** Turnover 2003/04, **TASSETS03** = Total assets 2003/04, **NEMP03=** Number of employees 2003/04; **IND_A**= Agriculture, hunting, forestry, fishing, mining and quarrying industry (code 1=Yes, code 0=No); **IND_M**= Manufacturing industry (code 1=Yes, code 0=No), **IND_E**= Electricity, gas, water, construction industry (code 1=Yes, code 0=No); **IND_W**= Wholesale and retail, hotels, restaurants industry (code 1=Yes, code 0=No); **IND_T**= Transport, storage and communications industry (code 1=Yes, code 0=No); **IND_F**= Financial intermediation, real estate, business administration industry (code 1=Yes, code 0=No).

[2] In the case of dummy variables the percentage of companies in each category (0 and 1) is included.

Regarding the type of performance measures used to determine executives' incentive pay, 60 percent of the sample used a combination of financial performance measures and at least one non-financial corporate performance measure in their executives' annual incentives. The remaining 40 percent of the companies only used financial performance measures in their executives' incentive system.

Tables 5-2 and 5-3 present the corporate performance measures that were most commonly used by sample firms in their executives' incentives systems (EIPM). These tables also show the most commonly used corporate performance measures for assessing firm performance (CPM) and the percentage of the corporate performance measures that were used for determining executives' incentive pay (EIPM/CPM). As can be seen, Net Operating Income, Revenues, and Earnings per share (EPS) are the most used corporate financial performance measures in executives' incentives. As per non-financial corporate performance measures, the most used for determining executives' incentive pay are Customer Satisfaction, Employee Satisfaction and Core Competencies and Skills.

Table 5-2 also indicates that around 50 percent of the financial performance measures used for evaluating corporate performance were used for compensation purposes. In the case of non-financial performance measures (Table 5-3) this percentage is 46.8. This finding indicates that only half of the measures used for assessing firm performance are included in the executives'

incentive system. In the subsequent section, the results of the correlation analyses conducted are illustrated.

Table 5-2 Descriptive statistics on FINANCIAL performance measures

FINANCIAL MEASURES	CPM (%)	EIPM (%)	EIPM/ CPM (%)
Net operating income	46.72	31.39	67.19
Revenues	50.36	29.20	57.98
Earning per share (EPS)	36.5	27.74	76.00
Year-over-year growth	46.72	24.09	51.56
Cash flow ratio	42.34	23.36	55.17
Gross margin	43.80	22.63	51.67
EBITDA	28.47	19.71	69.23
Profit	20.44	16.06	78.57
Return on assets	33.85	14.60	43.13
TSR	16.06	14.60	90.91
Market share	38.69	12.41	32.08
Return on equity	22.63	8.76	38.71
EVA©	8.03	5.11	63.64
Cost	10.22	5.11	50.00
R&D spend	11.68	2.92	25.00
Advert. spend vs. sales	9.49	2.19	23.08
Other financial measures	10.22	3.65	35.71
Average %EIPM/%CPM			51.43

Table 5-3 Descriptive statistics on NON-FINANCIAL performance measures

NON-FINANCIAL MEASURES	CPM (%)	EIPM (%)	EIPM/ CPM (%)
Customer satisfaction	44.53	22.63	50.82
Employee satisfaction	36.5	18.98	52
Core competencies and skills	22.63	13.87	61.29
Leadership	17.52	13.14	75
Safety incidents	31.39	11.68	37.21
Customer retention	26.28	10.22	38.89
Service quality audit	23.36	8.76	37.5
Productivity/yield	20.44	8.03	39.29
Personal scorecard	7.3	8.03	110
Employee turnover	35.77	8.03	22.45
New product development	17.52	7.3	41.67
Capacity to innovate	13.87	5.84	42.11
Customer loyalty	17.52	5.84	33.33
Internal customer satisfaction	11.68	5.11	43.75
Defects rates	14.6	4.38	30
Workforce capabilities	10.95	3.65	33.33
Idea generation rate	6.57	2.92	44.44
Competitors' measures	10.22	2.92	28.57
Other non-financial measures	24.82	16.79	67.65
Average %EIPM/%CPM			46.80

5.2. Correlation analysis

This subsection reports the results of the Pearson's correlation analysis[35]. Firstly, the correlations between measurement diversity and the firm performance proxies are reviewed. Secondly, the statistically significant correlations of measurement diversity and the rest of the research variables are presented. Thirdly, other statistically significant correlations that are relevant for the subsequent regression analysis are highlighted. The Pearson's correlation matrix is shown in Table 5-4. All statistics are based on raw data prior to centring.

5.2.1. Measurement diversity and firm performance correlation results

The correlation matrix shows that measurement diversity in executive incentives (MDIV) is negatively correlated to firm performance measured as business goals achievement (BGOALS) and as sales growth (SALESG). Nevertheless, these correlations are not significant at $p \leq .10$ (BGOALS and MDIV: r=-.015; SALESG and MDIV: r=-.136). Firm performance measured

[35] Due to the fact that some of the research variables are dummy variables, it would be more appropriate to refer to these correlations as point-biserial correlations (Field, 2005). The point-biserial correlation coefficients are equal to the Pearson's correlation coefficients so the analysis does not vary, only the conceptual meaning of the coefficients.

as Return on Assets (ROA) is also negatively correlated to measurement diversity in incentive systems and this correlation coefficient is significant (ROA and MDIV: r=-.229, p≤.05). These findings suggest that the use of measurement diversity in executives' incentives is likely to be associated with low firm performance[36].

5.2.2. Measurement diversity, moderator, mediator and control variables

Table 5-4 shows that measurement diversity in executives' incentives is positively and significantly correlated to electricity, gas, water supply and construction industries (IND_E and MDIV: r=.252, p≤.01) and to financial intermediation, real estate, renting and business administration industries (IND_F and MDIV: r=.174, p≤.10). It is negatively correlated to manufacturing industries (IND_M and MDIV: r=-.317, p≤.001). The correlations between measurement diversity and the other key research variables are not statistically significant at p≤.10. These findings indicate that firms operating in financial intermediation, real estate, renting and business administration industries or electricity, gas, water and construction industries are likely to use financial as well as non-financial corporate performance

[36] It must be noted that correlation results do not imply causation, and that this finding could also be interpreted in the opposite direction (Cohen et al., 2003).

measures in their executives' incentive schemes. These results are in line with results found by previous research in this area (e.g. Bushman et al., 1996; Ittner, Larcker and Randall, 2003). The findings also show that those firms operating in manufacturing industries are likely to use only financial performance corporate measures to determine their executives' incentive pay.

5.2.3. Other interesting correlations

It is interesting to note that the different firm performance proxies do not necessarily correlate with each other. Business goals achievement (BGOALS) does not seem to significantly correlate with any of the other firm performance measures (ROA and BGOALS: r=-0.042, p>.10, SALESG and BGOALS: r=.138, p>.10). Return on assets (ROA) and sales growth are positively associated (SALESG and ROA: r=.186, p≤.10). This evidence indicates that business goals achievement is capturing a different dimension of firm performance to the one captured by the rest of firm performance proxies as described previously in Chapter 4.

Other correlation coefficients that are worth noting are those associated with reward system effectiveness. Table 5-4 shows that reward system effectiveness (RWEFF) is positively and significantly associated with the extent to which business goals are achieved (BGOALS and RWEFF: r=.158, p≤.10); with the quality of performance measures (QPM and RWEFF: r=.440, p≤.001); with ownership structure (OWN and RWEFF: r=183, p≤.05); and

with organisational size (FSIZE and RWEFF: r=.365, p p≤.001). Reward effectiveness is negatively associated with organisational culture (CULTdom and RWEFF: r=.203, p≤.05). These correlations indicate that firms in which their reward system is perceived to be effective are more likely (1) to have high quality of performance measures; (2) to achieve their business goals; (3) to be manager-controlled; (4) to be large organisations; and (5) to have an organisational culture where control values are predominant (i.e. Market or Hierarchy culture).

In addition, it is important to review the correlations between the control variables of the study and the rest of the research variables. In Table 5-4 it can be seen that firm size (FSIZE) is correlated with most of the variables in the research. In particular, it is highly correlated to reward system effectiveness (RWEFF and FSIZE: r=.365, p≤.001), to business risk (RISK and FSIZE: r=-.250, p≤.01), and to ownership structure (OWN and FSIZE: r=.436, p≤.001). Some of the industry dummy variables are significantly correlated to the firm performance proxies (e.g. SALESG and IND_A: r=.230, p≤.05), to measurement diversity (e.g. MDIV and IND_M: r=-.317, p≤.001), to the quality of performance measures (e.g. QPM and IND_T: r=-.187, p≤.10), to ownership structure (e.g. OWN and IND_F: r=-.158, p≤.10), to organisational culture (e.g. CULTdom and IND_f: r=.157, p≤.10), and to firm size (e.g. FSIZE and IND_F: r=-.286, p≤.05). These findings support previous research (e.g. Hoque and James, 2000) and indicate that it is appropriate to include these two variables as controls in the subsequent regression analyses.

The rest of this chapter focuses on the results of the regressions used to test the hypotheses presented in Chapter 4.

Table 5-4 Pearson's correlation matrix

Codes[2]	BGOAL	ROA	SALESG	MDIV	QPM	RWEFF	RISK	OWN	CULTdom	FSIZE	IND_A	IND_M	IND_E	IND_W	IND_T
ROA	-.042														
SALESG	.138	**.186**♣													
MDIV	-.015	**-.229***	-.136												
QPM	.090	.116	.033	.129											
RWEFF	**.158**♣	.043	-.024	.112	**.440*****										
RISK	**-.377*****	**.255****	-.052	-.099	-.055	-.045									
OWN	**-.156**♣	.036	-.050	.018	.128	**.183***	.073								
CULTdom	-.065	-.095	-.013	.113	-.098	**-.203***	.064	-.042							
FSIZE	**.167**♣	-.090	.111	.075	**.168**♣	**.365*****	**-.250****	**.436*****	.101						
IND_A	.103	**.182**♣	**.230***	.056	.130	-.001	.091	.072	.028	.063					
IND_M	**-.144**♣	**.163**♣	-.133	**-.317*****	.031	.073	.001	.130	-.143	.054	-.117				
IND_E	**.148**♣	-.062	-.123	**.252****	.046	.013	-.125	.083	.059	**.198***	-.061	**-.177***			
IND_W	-.018	-.138	-.027	-.090	-.091	.130	.112	-.140	-.143	-.037	-.083	**-.241****	-.126		
IND_T	-.088	**-.144**♣	.051	.010	**-.187***	-.075	-.045	.127	.054	**.176**♣	-.055	-.159	-.083	-.113	
IND_F	.065	-.016	.122	**.174**♣	.059	-.123	-.026	**-.158**♣	**.157**♣	**-.286****	**-.166**♣	**-.484*****	**-.252****	**-.343*****	**-.226****

1 Statistical significance (2-tailed): ♣ p≤0.10; *p≤.05; **p≤.01; ***p≤.001

2 **BGOAL**= Business goals achievement (code 1=Goals achieved, code 0=Goals not achieved); **ROA**= Short-term economic results (ROA2003/04); **SALESG=** Sales growth (turnover growth 2003/04-2005/06); **MDIV**= Measurement diversity (code 1=Financial and non-financial performance measures in executives' incentive pay, code 0= Financial performance measures only in executives' incentive pay); **RWEFF**= Reward system effectiveness; **QPM**=Quality of performance measures; **RISK**= Business risk (standard deviation of ROA 1999/00-2003/4); **OWN**= Ownership (code 1= Manager-controlled, code 0=Owner-controlled); **CULT_dom**= Culture dominance (ranges from 10 representing MARKET and HIERARCHY cultures to -10 representing CLAN and ADHOCRACY cultures); **FSIZE**= Firm's size (average log total assets, log turnover and log number employees 2003/04); **IND_A**= Agriculture, hunting, forestry, fishing, mining industry (code 1=Yes, code 0=No); **IND_M**= Manufacturing industry (code 1=Yes, code 0=No), **IND_E**= Electricity, gas, water, construction industry (code 1=Yes, code 0=No); **IND_W**= Wholesale and retail, hotels, restaurants industry (code 1=Yes, code 0=No); **IND_T**= Transport, storage and communications industry (code 1=Yes, code 0=No); **IND_F**= Financial intermediation, real estate, business administration industry (code 1=Yes, code 0=No).

5.3. Regression analysis and Hypotheses testing

5.3.1. Hypothesis 1: Measurement diversity and firm performance

Hypothesis 1 predicts that there is a positive relationship between measurement diversity in executive incentive pay and firm performance. This hypothesis is tested by separately regressing measurement diversity used in executives' annual incentive systems (MDIV) on the three measures of firm performance: business goals achievement (BGOALS), return on assets of fiscal year 2003/04 (ROA), and sales annual growth (SALESG). Equation (1), where Y represents the different firm performance proxies shows how.

$$(1)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \varepsilon$$

Firm size (FSIZE) and industry (IND) were used as control variables in the regressions with return on assets and sales growth as dependent variables. In the case of business goals achievement as a dependent variable,

only firm size was used as a control variable[37]. The process followed for performing the regression analyses was hierarchical. First, the control variables were included in the regression and then measurement diversity was added. The operations resulted in six regression models that are shown in Table 5-5.

Only two out of the three multiple regression models assessing the impact of measurement diversity on firm performance are statistically significant (Model 2, GOALS: R^2= .029, χ^2= 2.685, p>.10; Model 4, ROA: R^2=.220, F-ratio=2.742, p≤.05; Model 6, SALESG: R^2=.140, F-ratio=1.677, p≤.10; and Model 8). Furthermore, Table 5-5 shows a statistically significant increase in the F-ratio of two out of the three models that include measurement diversity as a predictor (these are Models 4 and 6), compared to the two models that do not include this predictor (these are Models 3 and 5). This result indicates that the use of measurement diversity in the regression models has significantly improved the ability to predict firm performance assessed by return on assets, and sales growth.

[37] When business goals achievement was computed as the dependent firm performance variable, the industry dummy variables were included initially but, as a result, the regression coefficients had unreasonably large standard errors. Due to this issue, the industry dummy variables were excluded from the logistic regression analysis as recommended by Field (2005).

Based on the parameters (unstandardised beta coefficients)[38] of Models 2, 4, and 6 results show that, contrary to predictions, measurement diversity exhibits a negative association with firm performance. This relationship is statistically significant when firm performance is measured as return on assets (ROA: β_7= -3.135, p≤.05) and sales growth (SALESG: β_7=-1.825, p≤.10).

[38] Table 5-5 and all the subsequent tables presenting the results of the regression analyses report unstandardised beta coefficients –together with Exp(b) values in the case of logistic regressions. The rationale for this decision is based on the work of Jaccard & Turrisi (2003). They suggest that when analysing interaction effects it is best to use unstandardised beta coefficients because standardised coefficients "have the potential to lead theorists astray" due to their numerous limitations (p. 68). For a specific discussion on the limitations of standardised beta coefficients see Jaccard, Turrisi & Wan (1990).

Table 5-5 Hypothesis 1: Results of regression analyses of MDIV as predictor of the firm performance measures[1,2]

	BGOALS[3]				**ROA**		**SALESG**	
	Model 1		**Model 2**		**Model 3**	**Model 4**	**Model 5**	**Model 6**
	β (SE)[Sig.] [4]	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**B (SE)[Sig.]**
Constant (β_0)	-.634 (1.29)[.62]	.530	-.460 (1.31)[.72]	.631	**21.943*** ** (6.56)[.00]	**25.415*** ** (6.64)[.00]	6.191 (5.54)[2.68]	7.435 (5.53)[.18]
FSIZE (β_1)	.375 (.27)[.15]	1.455 [.85][2.48]	.392 (.27)[.15]	1.480 [.87][2.53]	-.396 (.93)[.67]	-.460 (.91)[.61]	.620 (.58)[.29]	.722 (.58)[.22]
IND_M (β_2)					**-11.876*** (4.58)[.01]	**-13.907**** (4.59)[.00]	**-8.850*** (4.53)[.05]	**-10.006*** (4.53)[.03]
IND_E (β_3)					**-14.290**** (5.01)[.01]	**-14.261**** (4.89)[.00]	**-10.407*** (4.67)[.02]	**-10.366*** (4.62)[.02]
IND_W (β_4)					**-14.793**** (4.76)[.00]	**-16.109***** (4.69)[.00]	**-8.487♣** (4.62)[.07]	**-9.298*** (4.59)[.04]
IND_T (β_5)					**-17.417***** (5.21)[.00]	**-18.657***** (5.13)[.00]	**-7.637♣** (4.70)[.10]	**-8.290♣** (4.66)[.08]
IND_F (β_6)					**-12.183*** (4.65)[.01]	**-13.368**** (4.58)[.01]	-6.918 (4.59)[.13]	**-7.429♣** (4.55)[.10]
MDIV (β_7)			-.449 (.52)[.39]	.638 [.23][1.77]		**-3.135*** (1.54)[.05]		**-1.825♣** (1.10)[.10]
Durbin-Watson=						2.033		1.791
R^2=	.020		.029		.173	.220	.107	.140
Adj R^2=					.101	.140	.034	.057
ΔR^2=			.009			.048		.033
Model χ^2 / F=	1.929		2.685		**2.399***	**2.742***	1.462	**1.677♣**
Block χ^2 / ΔF=			.756			**4.142***		**2.754♣**
N=	85		85		76	76	80	80

1 Statistical significance: ♣p≤.10; *p≤.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.3.2. Hypothesis 2: Measurement diversity, firm performance and quality of performance measures

Hypothesis 2 predicts that the relationship between measurement diversity and firm performance is moderated by the quality of performance measures such that measurement diversity is positively associated with firm performance when the quality of performance measures is high. This hypothesis is tested using the regression Equation (2) where Y represents each of the firm performance measures. Table 5-6 presents the results of the logistic and OLS regression analyses used to test Hypothesis 2. These analyses have been performed using a hierarchical approach resulting in Models 7, 8, 9, 10, 11 and 12 shown in Table 5-6.

$$(2)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \beta_8 QPM + \beta_9 MDIV*QPM + \varepsilon$$

As presented in Chapter 4, the data used for testing hypothesis 2 is analysed in two phases (Cohen et al. 2003; Jaccard and Turrisi, 2003; Schoonhoven, 1981). Firstly, the signs and statistical significance of the unstandardised beta coefficients of each interaction effect –that is β_9 in Models 8, 10 and 12– are reviewed. When the dependent variable is business goals achievement, the Exp(b) value of the interaction effect –that is Exp(b_9)– is contrasted with β_9 as there is evidence suggesting that under

specific circumstances this value is more reliable than the statistical significance of the β_9 coefficient[39]. Secondly, if the β_9 coefficients are statistically significant –or different from 1 in the case of the Exp(b_9)–, the joint effect of the main and interaction terms is plotted. The results of the analyses of both of these phases are presented in turn.

Table 5-6 shows the outputs of the regression analyses conducted to test Hypothesis 2. In particular, it shows the parameters of the main effects of measurement diversity (MDIV) and quality of performance measures (QPM_cent) on firm performance and the interaction effect of these two predictors (MDIV*QPM_cent). The interaction effect coefficient (β_9) is positive when the dependent variables are return on assets (ROA: β_9= 1.991), and sales growth (SALESG: β_9= .587). β_9 is negative when the dependent variable is business goals achievement (BGOALS: β_9= -.554). However, none of these coefficients is statistically significant at $p \leq .10$, which means that there is a high probability that they could be zero. These findings indicate that the data do not support Hypothesis 2. Due to the lack of significance of the interaction effect's coefficients, the graphical

[39] As suggested by Menard (1995), in logistic regression the interpretation of the beta coefficients must be done in combination with the Exp (b) value. The rationale is that the statistical significance of the Wald statistic tends to become underestimated. The Exp (b) value is an indicator of the change in odds resulting from a unit change in the predictor. If the value of Exp (b) is greater than 1, this indicates that as the predictor increases, the odds of the outcome occurring also increase. If the value of Exp (b) is less than 1, this indicates that as the predictor increases, the odds of the outcome occurring decrease.

representation of the joint effect of the main and interaction terms is not presented.

Table 5-6 Hypothesis 2: Results of regression analyses of MDIV, QPM and MDIVQPM as predictors of the firm performance measures[1,2]

	BGOALS[3]				**ROA**		**SALESG**	
	Model 7		**Model 8**		**Model 9**	**Model 10**	**Model 11**	**Model 12**
	β (SE)[Sig.] [4]	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**B (SE)[Sig.]**
Constant (β_0)	-.430 (1.32)[.65]	.650	-.203 (1.39)[.88]	.816	**24.646*** ** (6.66)[.00]	**22.782*** ** (7.29)[.00]	7.437 (5.57)[.19]	6.838 (6.06)[.26]
FSIZE (β_1)	.386 (.27)[.16]	1.471 [.86][2.53]	.349 (.28)[.22]	1.417 [.81][2.48]	-.569 (.91)[.53]	-.393 (.95)[.68]	.682 (.60)[.26]	.750 (.66)[.25]
IND_M (β_2)					**-12.609** ** (4.73)[.01]	**-11.619*** (4.99)[.02]	**-9.834*** (4.60)[.04]	**-9.547*** (4.76)[.05]
IND_E (β_3)					**-12.913** ** (5.03)[.01]	**-12.267*** (5.15)[.02]	**-10.176*** (4.69)[.03]	**-9.976*** (4.79)[.04]
IND_W (β_4)					**-14.711*** ** (4.85)[.00]	**-13.719*** ** (5.11)[.00]	**-9.092♣** (4.67)[.06]	**-8.831♣** (4.81)[.07]
IND_T (β_5)					**-16.651*** ** (5.42)[.00]	**-15.919*** ** (5.56)[.00]	**-7.947♣** (4.83)[.10]	-7.732 (4.93)[.12]
IND_F (β_6)					**-11.937** ** (4.75)[.01]	**-11.033*** (4.97)[.03]	-7.245 (4.62)[.12]	-6.985 (4.76)[.14]
MDIV (β_7)	-.474 (.53)[.37]	.623 [.22][1.78]	-.512 (.55)[.35]	.599 [.20][1.76]	**-3.333*** (1.55)[.04]	**-3.253*** (1.56)[.04]	**-1.851♣** (1.11)[.10]	**-1.849♣** (1.12)[.10]
QPM_cent (β_8)	.354 (.50)[.48]	1.424 [.53][3.85]	.680 (.80)[.39]	1.975 [.41][9.58]	1.677 (1.49)[.26]	.619 (2.22)[.78]	.325 (1.08)[.76]	.009 (1.63)[.99]
MDIV*QPM_cent (β_9)			-.554 (1.05)[.60]	.575 [.07][4.55]		1.991 (3.09)[.52]		.587 (2.25)[.76]
Durbin-Watson=						2.022		1.813
R^2=	.035		.038		.235	.239	.141	.142
Adj R^2=					.143	.136	.045	.032
ΔR^2=			.003			.005		.001
Model χ^2 / F=	3.239		3.514		**2.568** **	**2.309***	1.460	1.288
Block χ^2 / ΔF=						.415		.068
N=	85		85		76	76	80	80

1 Statistical significance: ♣p≤.10; *p≤.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.3.3. Hypothesis 3: Measurement diversity, firm performance and reward effectiveness

Hypothesis 3 predicts that the relationship between measurement diversity and firm performance was mediated by the effectiveness of the reward system. The mediation effect of reward system effectiveness is analysed using Equations (2) and (3) (Venkatraman, 1989).

$$(2)\ RWEFF = \alpha + \alpha_1 FSIZE + \alpha_2 MDIV + \varepsilon$$

$$(3)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \beta_8 RWEFF + \varepsilon$$

As explained in Chapter 4, if the α_2 coefficient in Equation (2) is statistically significant and the β_7 coefficient in Equation (3) is not statistically different from zero, then the mediating effects of reward system effectiveness will be strongly supported. As Venkatraman (1989) indicates, this would imply that the presence of RWEFF is necessary for the transmission of effects of MDIV on Y. If this occurs the relationship is referred to as a "complete mediation model" (Venkatraman, 1989, p. 430). If the α_2 coefficient in Equation (2) is statistically significant and the β_7 coefficient in Equation (3) is also statistically significant, then a direct effect between measurement diversity and firm performance exists, and an indirect effect between measurement diversity and firm performance through reward

system effectiveness exists, which implies a "partial mediational model" (Venkatraman, 1989, p. 430).

Table 5-5 presents the results of the logistic and OLS regression analyses conducted to test this hypothesis. Firstly, the signs and statistical significance of the unstandardised beta coefficients of measurement diversity and reward system effectiveness are examined in the different regression models. Data show that when firm performance is measured as business goals achievement (BGOALS), reward system effectiveness positively affects firm performance. When firm performance is measured as return on assets (ROA) and sales growth (SALESG), reward system effectiveness is negatively related to firm performance. However none of the unstandardised beta coefficients of reward system effectiveness is statistically significant. This indicates that they could be zero, which is sufficient to show that Hypothesis 3 is not supported by the data.

Table 5-7 Hypothesis 3: Results of regression analyses of MDIV and RWEFF as predictors of the firm performance measures[1,2]

	BGOALS[3]		**ROA**	**SALESG**	**RWEFF**
	Model 13		**Model 14**	**Model 15**	**Model 16**
	β (SE)[Sig.] [4]	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**B (SE)[Sig.]**
Constant (β_0)	-2.276 (1.91)[.23]	.103	**25.181***** (8.61)[.00]	10.594 (6.72)[.12]	**2.627***** (.340)[.00]
FSIZE (β_1)	.276 (.31)[.37]	1.318 [.72][2.39]	-.267 (1.03)[.80]	.866 (.65)[.19]	**.224***** (.069)[.00]
IND_M (β_2)			**-13.702***** (4.81)[.00]	**-11.062*** (4.73)[.02]	
IND_E (β_3)			**-14.458***** (5.10)[.00]	**-11.267*** (4.84)[.02]	
IND_W (β_4)			**-15.717***** (4.87)[.00]	**-9.910*** (4.78)[.04]	
IND_T (β_5)			**-18.829***** (5.41)[.00]	**-9.336**• (4.91)[.06]	
IND_F (β_6)			**-13.161***** (4.85)[.00]	**-8.326**• (4.80)[.08]	
MDIV (β_7)	-.557 (.56)[.32]	.573 [.19][1.71]	**-2.997**• (1.66)[.07]	**-1.939**• (1.16)[.09]	.095 (.129)[.46]
RWEFF (β_8)	.682 (.48)[.15]	1.978 [.77][5.05]	-.204 (1.34)[.88]	-.773 (.92)[.40]	
Durbin-Watson=			2.048	1.654	1.779
R^2=	.056		.217	.158	.123
Adj R^2=			.118	.058	.101
ΔR^2=					
Model χ^2 / F=	4.869		**2.184***	1.573	**5.685****
Block χ^2 / ΔF=					
N=	82		72	76	84

1 Statistical significance: •p≤.10; *p≤.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.3.4. Hypothesis 4: Measurement diversity, firm performance and business risk

Hypothesis 4 states that the relationship between measurement diversity and firm performance is moderated by business risk such that measurement diversity in executive incentive pay is positively associated with firm performance when business risk is high or low and negatively associated with firm performance when business risk is moderate. This Hypothesis has been tested using Equation (4) where Y represents the different firm performance proxies (Jaccard and Turrisi, 2003).

$$(4)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \beta_8 RISK + \beta_9 RISK^2 + \beta_{10} MDIV*RISK + \beta_{11} MDIV*RISK^2 + \varepsilon$$

The sample data were fitted to this Equation and Table 5-8 presents the results of the regression analyses performed. As with previous analyses, a hierarchical approach was used for computing the regressions. The data have been analysed in two phases as suggested in Chapter 4. Firstly, the sign and statistical significance of the unstandardised beta coefficient of the curvilinear interaction –that is β_{11}– and the Exp(b_{11}) in the case of the logistic regression when the dependent variable is BGOALS, are reviewed. If these coefficients are statistically significant, then the joint effect of the main and interaction terms is plotted.

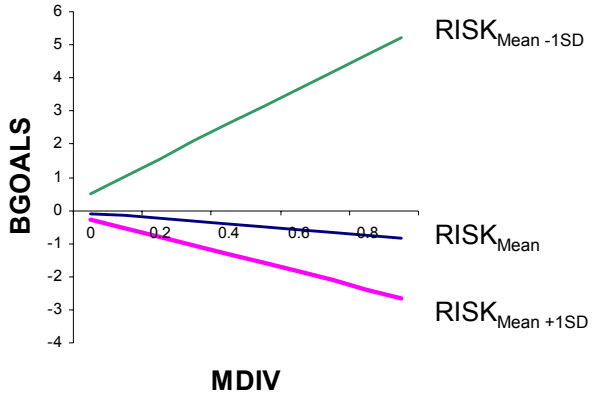
When firm performance is measured as BGOALS, β_{11} is positive and statistically significant at $p \leq .05$. $Exp(b_{11})$ is greater than 1, and its lower and upper confidence intervals are 1.03 and 1.49 respectively. This indicates that this result is fairly reliable, showing that there is only a 5 percent chance that these analyses with another sample will provide a different result to the one obtained here. When firm performance is measured as ROA, or SALESG the β_{11} obtained with these regression models is not statistically significant. These findings show that only when firm performance is measured as business goals achievement, is the effect of measurement diversity on firm performance moderated by business risk.

In order to further understand how business risk moderates the effect of measurement diversity on the extent to which business goals are achieved, the main and interaction terms from Model 24 are plotted. For interpretation purposes, it is assumed that all variables are continuous. Two approaches for plotting these terms are used that will help to illustrate the outcomes from two different perspectives. First, three different values of business risk are selected: moderate, low and high. As recommended by Cohen et al. (2003) and Jaccard and Turrisi (2003), the three values were: the mean of RISK, the RISK value that is 1 standard deviation below the mean of RISK, and the RISK value that is 1 standard deviation above the mean of RISK. The mean of RISK was 4.194 and its standard deviation was 3.158. Then, a "low" business risk corresponds to 1.036, a "high" business risk corresponds to 7.352, and a "moderate" business risk corresponds to the

mean. Three different lines were plotted, one for each of the RISK values using Equation (5) as shown in Figure 5-1.

$$(5)\ BGOALS = (\beta_7 + \beta_9 RISK + \beta_{11} RISK^2)\ MDIV$$

Figure 5-1 The effect of measurement diversity on business goals achievement at three different levels of business risk



This representation of the joint effect shows that when business risk is high or moderate the relationship between business goals achievement and measurement diversity in executives' incentive systems is negative. When business risk is low the effect of measurement diversity on business goals is positive. This graph is illustrative but it can be misleading for theory testing purposes as will be seen below.

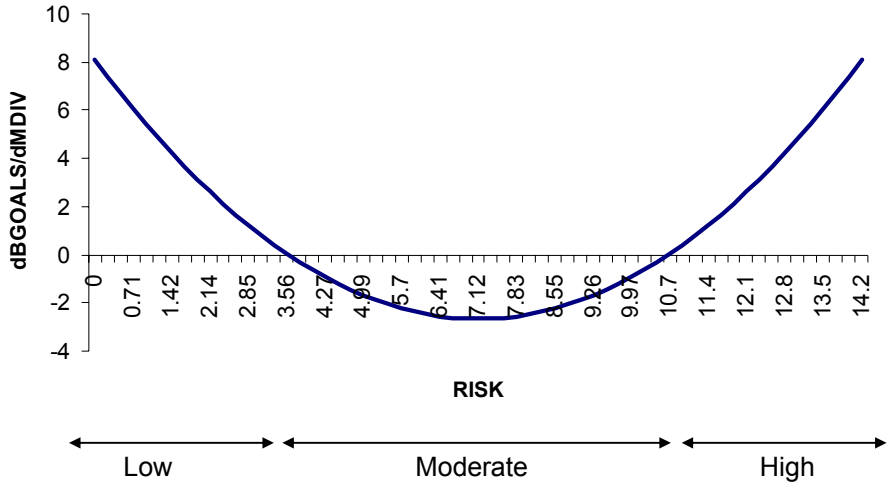
As suggested by Schoonhoven (1981), there is another way for plotting the effect of risk on the relationship between measurement diversity and business goals achievement. This method involves the rewriting of

Equation (5) as a partial derivative shown in Equation (6). Equation (6) now indicates that the effect of MDIV on BGOALS is a function of RISK.

(6) $\partial BGOALS/\partial MDIV = \beta_7 + \beta_9 RISK + \beta_{11} RISK^2$

This function can be plotted by using different values of RISK as Figure 5-2 shows. Using this graph the interpretation of the results is slightly different. Figure 5-2 indicates that when business risk is low and high the effect of measurement diversity on business goals achievement is positive; when business risk is moderate the effect of measurement diversity on business goals becomes negative. In Figure 5-1 the use of the mean + and – its standard deviation missed the true effect of measurement diversity on business goals achievement over the range of the business risk due to its specific value. Therefore, Figure 5-2 is used to test Hypothesis 4 as it is more reliable.

Figure 5-2 The effect of measurement diversity on business goals achievement over the range of values of business risk



In summary, the findings indicate that Hypothesis 4 is supported when firm performance is measured as the extent to which business goals are achieved $-\beta_{11}$ is statistically significant, and Figure 5-2 shows the expected relationship between the three variables under investigation. Hypothesis 4 is not supported when firm performance is measured as return on assets, or sales growth.

Table 5-8 Hypothesis 4: Results of regression analyses of MDIV, RISK, RISK², MDIVRISK and MDIVRISK² as predictors of the firm performance measures[1,2]

	BGOALS[3]						ROA			SALESG		
	Model 17		Model 18		Model 19		Model 20	Model 21	Model 22	Model 23	Model 24	Model 25
	β (SE)[Sig.][4]	Exp(b) [Lower][Upper]	β (SE)[Sig.]	Exp(b) [Lower][Upper]	β (SE)[Sig.]	Exp(b) [Lower][Upper]	β (SE)[Sig.]	β (SE)[Sig.]	β (SE)[Sig.]	β (SE)[Sig.]	β (SE)[Sig.]	B (SE)[Sig.]
Constant(β_0)	2.028 (1.85)[.272]	7.596	1.819 (1.84)[.32]	6.166	.400 (2.03)[.84]	1.492	**22.912***** (6.83)[.00]	**22.789***** (6.88)[.00]	**22.483***** (7.42)[.00]	7.177 (5.63)[.21]	6.520 (5.64)[.25]	5.212 (5.76)[.37]
FSIZE(β_1)	.185 (.32)[.57]	1.203 [.64][2.26]	.148 (.33)[.64]	1.160 [.61][2.20]	.038 (.35)[.91]	1.039 [.52][2.07]	-.267 (.93)[.77]	-.363 (.95)[.70]	-.357 (.99)[.72]	.720 (.60)[.23]	.666 (.60)[.27]	.528 (.62)[.40]
IND_M(β_2)							**-13.391***** (4.66)[.00]	**-13.453***** (4.69)[.00]	**-13.638***** (4.83)[.00]	**-9.239*** (4.47)[.04]	**-9.292*** (4.46)[.04]	**-8.452**♣ (4.46)[.06]
IND_E(β_3)							**-13.721***** (4.95)[.00]	**-13.928***** (5.00)[.00]	**-14.185***** (5.23)[.00]	**-9.940*** (4.57)[.03]	**-10.373*** (4.57)[.03]	**-9.266*** (4.59)[.05]
IND_W(β_4)							**-15.948***** (4.72)[.00]	**-16.040***** (4.76)[.00]	**-16.260***** (4.90)[.00]	**-9.147*** (4.53)[.05]	**-9.406*** (4.52)[.04]	**-8.657**♣ (4.52)[.06]
IND_T(β_5)							**-16.365***** (5.40)[.00]	**-16.280***** (5.44)[.00]	**-16.425***** (5.74)[.00]	-6.283 (4.87)[.20]	-6.229 (4.85)[.20]	-4.631 (4.92)[.35]
IND_F(β_6)							**-13.885***** (4.63)[.00]	**-13.752***** (4.67)[.00]	**-13.981***** (4.88)[.00]	-6.457 (4.48)[.15]	-6.183 (4.47)[.17]	-4.695 (4.53)[.30]
MDIV(β_7)	-.436 (.61)[.47]	.646 [.19][2.13]	.400 (1.29)[.75]	1.492 [.12][18.54]	**8.100*** (4.22)[.05]	3293.471 [.85][1201]	**-3.087**♣ (1.63)[.06]	-1.888 (2.98)[.53]	-.839 (5.03)[.87]	-.728 (1.17)[.53]	1.321 (2.09)[.53]	-.703 (3.43)[.83]
RISK(β_8)	**-.274***** (.10)[.00]	.760 [.62][.93]	-.208 (.13)[.11]	.812 [.63][1.05]	.696 (.61)[.25]	2.006 [.60][6.70]	.315 (.27)[.25]	.457 (.40)[.26]	.696 (1.65)[.67]	-.180 (.19)[.34]	.025 (.26)[.92]	.453 (1.05)[.67]
MDIV*RISK(β_9)			-.147 (.20)[.46]	.864 [.58][1.30]	**-3.020*** (1.36)[.03]	.049 [.00][.70]		-.268 (.56)[.63]	-.786 (2.05)[.70]		-.441 (.37)[.24]	.652 (1.36)[.63]
RISK²(β_{10})					-.071 (.05)[.14]	.931 [.85][1.02]			-.021 (.13)[.88]			-.034 (.08)[.68]
MDIV*RISK²(β_{11})					**.212*** (.09)[.03]	1.237 [1.03][1.49]			.045 (.17)[.79]			-.102 (.11)[.35]
Durbin-Watson=									2.070			1.766
R^2=	.145		.171		.273		.215	.218	.219	.167	.186	.225
Adj R^2=							.116	.105	.076	.057	.064	.078
ΔR^2=								.003	.001		.019	.039
Model χ^2 / F=	**11.260****		**11.810**♣		**18.712****		**2.160***	**1.922**♣	1.530	1.525	1.521	1.529
Block χ^2 / ΔF=			.550		**6.902***			.231	.037		1.410	1.459
N=	75		75		75		72	72	72	70	70	70

1 Statistical significance: ♣p≤.10; *p≤.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.3.5. Hypothesis 5: Measurement diversity, firm performance and ownership

Hypothesis 5 predicts that the impact of measurement diversity on firm performance is moderated by ownership structure such that measurement diversity in executives' pay is positively associated with firm performance when firms are manager-controlled. In order to test this hypothesis Equation (7) was used, where Y represents the firm performance measures proxies. Each equation was computed in SPSS using a hierarchical approach that resulted in eight models. Table 5-7 presents the results of these models.

$$(7)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \beta_8 OWN + \beta_9 MDIV*OWN + \varepsilon$$

The data are analysed using the two phases proposed in Chapter 4. Initially, the algebraic signs and statistical significance of the unstandardised beta coefficients of each interaction effect –that is β_9– are explored. In the case of the logistic regression presented in Model 27 the Exp(b) value of the interaction effect –that is Exp(b_9)– is examined in combination with the unstandardised beta coefficient due to its greater reliability (Menard, 1995). If the beta coefficients are statistically significant –and different from 1 in the case of the Exp(b)–, the joint effect of the main

and interaction terms is plotted. The findings from these phases are presented as follows.

As can be seen in Table 5-9, the unstandardised beta coefficients of the interaction effects between measurement diversity and ownership structure (MDIV*OWN: β_9) are positive when firm performance is measured as return on assets (ROA), and sales growth (SALESG). The interaction effect beta coefficient is negative when firm performance is measured as the extent to which business goals are achieved. However none of these coefficients is significant at $p \leq 10$. The $Exp(b_9)$ is less than 1 but the values of its 95 percent confidence interval contain 1, which shows that there is a high probability of $Exp(b_9)$ to be 1.

These findings show that the relationship between measurement diversity and firm performance is not moderated by ownership structure. Therefore, there is a lack of empirical support for Hypothesis 5.

Table 5-9 Hypothesis 5: Results of regression analyses of MDIV, OWN and MDIVOWN as predictors of the firm performance measures[1,2]

	BGOALS[3]				ROA		SALESG	
	Model 26		Model 27		Model 28	Model 29	Model 30	Model 31
	β (SE)[Sig.][4]	Exp(b) [Lower][Upper]	β (SE)[Sig.]	Exp(b) (Lower-Upper)	β (SE)[Sig.]	β (SE)[Sig.]	β (SE)[Sig.]	B (SE)[Sig.]
Constant (β_0)	-2.890 (1.61)[.07]	.056	-3.679 (1.73)[.03]	.025	**25.923***** (6.80)[.00]	**26.034***** (6.87)[.00]	6.937 (5.53)[.21]	6.695 (5.59)[.24]
FSIZE (β_1)	**1.124***** (.39)[.00]	3.076 [1.43][6.59]	**1.223***** (.41)[.00]	3.398 [1.53][7.55]	-.662 (.99)[.50]	-.682 (1.01)[.50]	1.152♣ (.65)[.08]	**1.155**♣ (.65)[.08]
IND_M (β_2)					**-13.666***** (4.67)[.00]	**-13.501***** (4.76)[.00]	**-10.981**** (4.57)[.01]	**-10.519*** (4.72)[.02]
IND_E (β_3)					**-14.113***** (4.96)[.00]	**-14.080***** (5.00)[.00]	**-11.359**** (4.67)[.01]	**-11.045*** (4.75)[.02]
IND_W (β_4)					**-15.805***** (4.78)[.00]	**-15.706***** (4.84)[.00]	**-10.468*** (4.66)[.02]	**-10.114*** (4.75)[.03]
IND_T (β_5)					**-18.472***** (5.20)[.00]	**-18.504***** (5.24)[.00]	**-9.327*** (4.71)[.05]	**-9.126*** (4.76)[.05]
IND_F (β_6)					**-13.250***** (4.64)[.00]	**-13.199***** (4.68)[.00]	**-8.274**♣ (4.59)[.07]	**-7.954**♣ (4.67)[.09]
MDIV (β_7)	-.708 (.59)[.23]	.493 [.15][1.56]	-.038 (.72)[.96]	.962 [.23][3.98]	**-2.991**♣ (1.58)[.06]	**-3.170**♣ (1.79)[.08]	**-2.022**♣ (1.12)[.07]	**-2.269**♣ (1.26)[.07]
OWN (β_8)	**-2.086***** (.77)[.00]	.124 [.02][.56]	-1.022 (1.06)[.34]	.360 [.04][2.89]	.821 (1.74)[.63]	.418 (2.54)[.87]	-1.749 (1.23)[.16]	-2.297 (1.76)[.19]
MDIV*OWN (β_9)			-1.937 (1.30)[.13]	.144 [.01][1.84]		.747 (3.40)[.82]		1.016 (2.32)[.66]
Durbin-Watson=						2.046		1.831
R^2=	.149		.199		.222	.222	.167	.169
Adj R^2=					.128	.115	.072	.061
ΔR^2=						.000		.002
Model χ^2 / F=	**12.814****		**15.199****		**2.352***	**2.066***	**1.752**♣	1.561
Block χ^2 / ΔF=			2.384			.048		.191
N=	83		83		75	75	79	79

1 Statistical significance: ♣p≤.10; *p≤0.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.3.6. Hypothesis 6: Measurement diversity, firm performance and organisational culture

Hypothesis 6 proposes that the impact of measurement diversity on firm performance is moderated by organisational culture. It is expected that measurement diversity will be negatively associated with firm performance when organisational culture emphasises the value of control rather than flexibility, and that measurement diversity will be positively associated with firm performance when organisational culture emphasises the value of flexibility rather than control. Similar to previous sections, this hypothesis is tested according to Equation (10) where Y represents each of the four different firm performance measures.

$$(10)\ Y = \beta_0 + \beta_1 FSIZE + \beta_2 IND\_M + \beta_3 IND\_E + \beta_4 IND\_W + \beta_5 IND\_T + \beta_6 IND\_F + \beta_7 MDIV + \beta_8 CULT + \beta_9 MDIV*CULT + \varepsilon$$

After substituting the sample data in Equation 10 using a hierarchical approach, Table 5-10 presents the results of the eight regression models obtained. Hypothesis 6 is tested using the same two phases employed for testing Hypotheses 2, 4 and 5. These are: (1) the review of the algebraic sign and statistical significance of the unstandardised beta coefficients of the interaction term (MDIV*CULTdom: β_9); and (2) the graphical representation of the joint effect of the main and interaction terms if β_9 is

statistically significant, in order to better interpret the relationships between firm performance, measurement diversity and organisational culture.

Table 5-8 shows that the unstandardised beta coefficients of the interaction effects (MDIV*CULTdom: β_9) are negative when firm performance is measured as return on assets (ROA) and sales growth (SALESG). Nevertheless, none of these beta coefficients is statistically significant at $p \leq 0.10$. When firm performance is measured as BGOALS, β_9 is positive and statistically significant. Furthermore, the Exp(b_9) value is greater than 1, and its 95 percent confidence interval is also greater than 1. This indicates that the coefficients for the interaction term are highly reliable.

In sum, the data show that organisational culture moderates the relationship between measurement diversity and firm performance when measured by business goals achievement. It does not moderate the relationship between measurement diversity and firm performance measured by ROA and sales growth. Now, in order to further understand the joint effect of measurement diversity and organisational culture on business goals achievement the following two functions (Equations 11 and 12) are plotted as suggested in previous sections. Figures 5-3 and 5-4 show the resulting plots.

(11) $BGOALS = (\beta_7 + \beta_9 CULT)\ MDIV$

(12) $\partial BGOALS/\partial MDIV = \beta_7 + \beta_9 CULT$

In Figure 5-3, as presented in Chapter 4, three values of organisational culture are used. In this case, since organisational culture ranges from -10 to 10 with a value of zero which represents that the firm does not have a dominant organisational culture, the three values selected were -10, 10 and zero. -10 represents firms characterised for having very strong control oriented values. 10 represents firms characterised for having very strong flexibility oriented values. 0 represents firms characterised by having the same emphasis on both flexibility and control.

Figure 5-3 The effect of measurement diversity on business goals achievement at three different levels of organisational culture

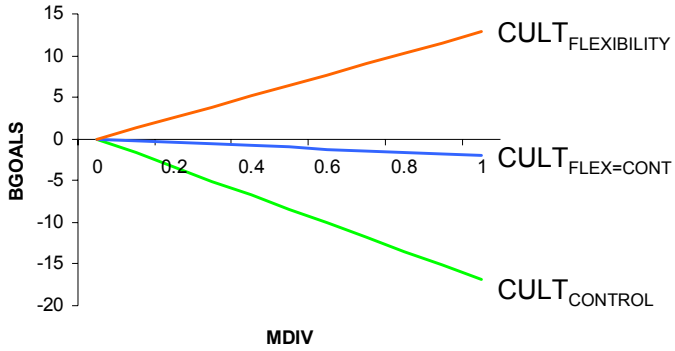
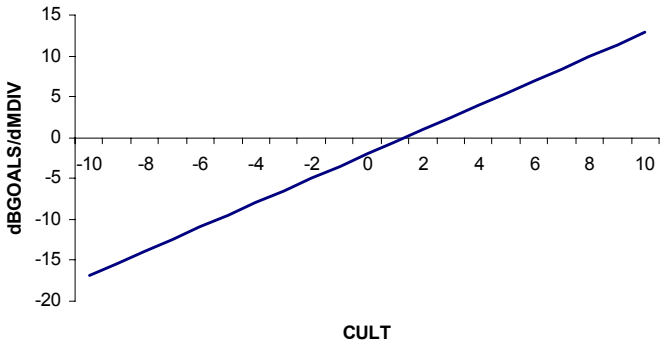


Figure 5-4 The effect of measurement diversity on business goals achievement over the range of values of organisational culture



The plotted lines in Figures 5-3 and 5-4 show that the effect of measurement diversity on firm performance is positive when organisational culture emphasises flexibility rather than control. It is negative when organisational culture emphasises control rather than flexibility or when organisational culture emphasises both control and flexibility to the same degree.

In summary, these findings support Hypothesis 6 when firm performance is measured by business goals achievement. However, when firm performance is measured by return on assets or sales growth Hypothesis 6 is refuted.

Table 5-10 Hypothesis 6: Results of regression analyses of MDIV, CULT and MDIVCULT as predictors of the firm performance measures[1,2]

	BGOALS[3]				**ROA**		**SALESG**	
	Model 32		**Model 33**		**Model 34**	**Model 35**	**Model 36**	**Model 37**
	β (SE)[Sig.] [4]	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**Exp(b) [Lower][Upper]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**β (SE)[Sig.]**	**B (SE)[Sig.]**
Constant (β_0)	-.237 (1.34)[.86]	.789	.927 (1.52)[.54]	2.526	**25.384*** ** (6.71)[.00]	**24.932*** ** (6.75)[.00]	6.937 (5.53)[.17]	6.695 (5.59)[.17]
FSIZE (β_1)	.409 (.28)[.15]	1.505 [.86][2.62]	.437 (.29)[.14]	1.548 [.86][2.77]	-.450 (.93)[.63]	-.374 (.93)[.69]	1.152 (.65)[.26]	1.155 (.65)[.27]
IND_M (β_2)					**-13.921*** ** (4.64)[.00]	**-13.849*** ** (4.65)[.00]	**-10.981*** (4.57)[.03]	**-10.519*** (4.72)[.03]
IND_E (β_3)					**-14.280*** ** (4.94)[.00]	**-14.437*** ** (4.96)[.00]	**-11.359*** (4.66)[.02]	**-11.045*** (4.74)[.02]
IND_W (β_4)					**-16.143*** ** (4.76)[.00]	**-16.234*** ** (4.78)[.00]	**-10.468*** (4.65)[.05]	**-10.114*** (4.75)[.05]
IND_T (β_5)					**-18.659*** ** (5.17)[.00]	**-18.852*** ** (5.19)[.00]	**-9.327•** (4.71)[.07]	**-9.126•** (4.76)[.08]
IND_F (β_6)					**-13.362*** ** (4.62)[.00]	**-13.497*** ** (4.63)[.00]	**-8.274•** (4.58)[.10]	**-7.954•** (4.67)[.10]
MDIV (β_7)	-.479 (.55)[.38]	.620 [.21][1.81]	**-2.007*** (1.03)[.05]	.134 [.01][1.03]	**-3.116*** (1.58)[.05]	**-2.697•** (1.68)[.10]	**-2.022•** (1.11)[.09]	**-2.269•** (1.25)[.10]
CULTdom (β_8)	-.295 (.20)[.14]	.744 [.49][1.11]	**-1.533*** (.67)[.02]	.216 [.06][.807]	-.031 (.51)[.95]	.461 (.84)[.58]	-1.749 (1.23)[.54]	-2.297 (1.76)[.82]
MDIV*CULTdom (β_9)			**1.484*** (.70)[.03]	4.411 [1.11][17.49]		-.764 (1.04)[.46]		1.016 (2.32)[.84]
Durbin-Watson=						2.000		1.811
R^2=	.052		.124		.220	.226	.145	.145
Adj R^2=					.127	.121	.048	.035
ΔR^2=						.006		.000
Model χ^2 / F=	4.809		**10.959***		**2.364***	**2.147***	1.500	1.319
Block χ^2 / ΔF=			**6.150****			.538		.039
N=	85		85		76	76	80	80

1 Statistical significance: •p≤.10; *p≤.05; **p≤.01; ***p≤.001

2 The industry dummy representing agriculture, hunting, forestry, fishing, mining and quarrying (IND_A) is used as reference category. Its beta coefficient is represented by the constant (β_0).

3 These results were obtained through a logistic regression due to the fact that BGOALS is a dummy variable. The R^2 of this regression shown in the table represents the Hosmer and Lemeshow test. The Durbin-Watson test and Adj. R^2 do not apply for logistic regressions.

4 Numbers within ( ) are the standard errors (SE). Numbers within [ ] are p-values [Sig]. In the case of Exp (b) the numbers within [ ] are the lower and upper significance values.

5.4. Chapter summary

This chapter has presented the descriptive statistics of the research, the correlation matrix with all the variables under study and the results of the regression analyses performed in order to test the six hypotheses discussed in Chapter 3.

Table 5-11 presents the results of each hypothesis. In summary, Hypothesis 1 was refuted. According to the data the use of non-financial performance measures in addition to financial performance measures in executives' incentives is associated with firm performance. However, this association does not occur in the expected direction as measurement diversity is found to affect firm performance in a negative way rather than in a positive one. Hypotheses 2, 3 and 5 were not supported as the data did not show that the quality of performance measures, reward system effectiveness or ownership structure interacts with the relationship between measurement diversity and firm performance. Hypothesis 4, which predicts that the relationship between measurement diversity in executives' annual incentives is moderated by business risk in a curvilinear form and Hypothesis 6, which predicts that the relationship between measurement diversity in executives' annual incentives is moderated by organisational culture, were both supported by the empirical evidence. However, this only occurred when

firm performance was measured by the extent to which business goals are achieved.

Table 5-11 Summary of results for each hypothesis under investigation

	Key variables: Independent	Dependent	Type of relationship	Empirical results	Hypothesis testing
H1	▪ Measurement diversity	▪ Business Goals	▪ Linear (positive)	▪ Linear (none)	Refuted
		▪ ROA	▪ Linear (positive)	▪ Linear (negative)	
		▪ Sales growth	▪ Linear (positive)	▪ Linear (negative)	
H2	▪ Measurement diversity; quality of performance measures; and interaction	▪ Business Goals	▪ Linear (positive)	▪ Linear (none)	Refuted
		▪ ROA	▪ Linear (positive)	▪ Linear (none)	
		▪ Sales growth	▪ Linear (positive)	▪ Linear (none)	
H3	▪ Measurement diversity, reward effectiveness	▪ Business Goals	▪ Linear (positive)	▪ Linear (none)	Refuted
		▪ ROA	▪ Linear (positive)	▪ Linear (none)	
		▪ Sales growth	▪ Linear (positive)	▪ Linear (none)	
H4	▪ Measurement diversity; business risk; and interaction	▪ Business Goals	▪ Curvilinear (positive/ negative)	▪ Curvilinear (positive/ negative)	Partially supported
		▪ ROA	▪ Curvilinear (positive/ negative)	▪ Curvilinear (none)	
		▪ Sales growth	▪ Curvilinear (positive/ negative)	▪ Curvilinear (none)	
H5	▪ Measurement diversity; ownership structure; and interaction	▪ Business Goals	▪ Linear (positive)	▪ Linear (none)	Refuted
		▪ ROA	▪ Linear (positive)	▪ Linear (none)	
		▪ Sales growth	▪ Linear (positive)	▪ Linear (none)	
H6	▪ Measurement diversity; organisational culture; and interaction	▪ Business Goals	▪ Linear (positive)	▪ Linear (positive)	Partially supported
		▪ ROA	▪ Linear (positive)	▪ Linear (none)	
		▪ Sales growth	▪ Linear (positive)	▪ Linear (none)	

Among the results it was also found that the use of measurement diversity is positively correlated to firms operating in financial

intermediation, real estate, renting and business administration industries or electricity, gas, water and construction industries. It is negatively correlated to firms operating in manufacturing industries. In addition to this, the most used financial corporate performance measures in executives' incentives were found to be: Net Operating Income, Revenues, and Earnings per share (EPS). As per the non-financial corporate performance measures, those most used for determining executives' incentive pay were found to be: Customer Satisfaction, Employee Satisfaction and Core Competencies and Skills. When the number of corporate performance measures used for determining executive pay was compared to the number of performance measures used to assess overall firm performance, it was found that only 50 percent of the financial performance measures and 46.8 percent of the non-financial performance measures used for assessing firm performance are also used for compensation purposes.

Other interesting findings from the data analysis were that firms in which their reward system is perceived to be effective are more likely (1) to have high quality of performance measures; (2) to achieve their business goals; (3) to be manager-controlled; (4) to be large organisations; and (5) to have an organisational culture where control values are predominant (i.e. market or hierarchy culture).

6. DISCUSSION AND CONCLUSION

This chapter discusses the findings presented in Chapter 5. It is structured in five sections. Section 6.1 reviews the research results presented in Chapter 5 and highlights the research contributions to performance measurement research, agency theory and contingency theory. Section 6.2 describes the implications that the research results may have for practitioners. Section 6.3 summarises the study limitations. Section 6.4 establishes different directions for future research in the performance measurement literature. Finally, section 6.5 presents the research conclusions.

6.1. Research implications and key contributions

The purpose of this research was twofold. Firstly, the research looked at the impact of using financial and non-financial performance measures in executives' incentives on firm performance. Secondly, the research investigated the interaction effects of two internal management control variables –quality of performance measures and reward system effectiveness– and three contextual variables –business risk, ownership structure and organisational culture. A theoretical model was developed comprising six hypotheses. These hypotheses were tested using a

combination of survey and archival data extracted from a sample of UK publicly quoted and private companies during the fiscal year 2003/04.

Hypothesis 1 argued that the use of measurement diversity in executive incentives was positively related to firm performance. This hypothesis was tested using multivariate analysis. In particular, logistic and OLS regression analysis were employed depending on the nature of the firm performance measure used. The data showed that measurement diversity was negatively related to firm performance assessed by ROA and sales annual growth. Measurement diversity was also negatively related to firm performance when this variable was assessed by business goals achievement[40]. However, in the case of business goals achievement, the relationship was not statistically significant at $p \leq .05$. Consequently, Hypothesis 1 was refuted based on the results of the data analysis.

From a performance measurement perspective, several reasons may explain the negative impact of the use of financial and non-financial information in executive incentive systems. Firstly, the impact of this type

[40] As explained in Chapter 4, firm performance was measured using three different proxies. Two of them –ROA and sales growth– capture the economic results of the organisation and as such they were correlated (see Chapter 5, Table 5-4). However, the objective of the third one –business goals achievement– is to capture the perception of respondents about how well their organisation is doing as a whole, i.e. how effective it is in reaching its goals. As seen in Table 5-4 this measure does not correlate with the previous two, which suggests that it is assessing a different dimension of firm performance.

of incentive design may have a lag effect on financial performance (e.g. Banker, Potter, and Srinivasan, 2005). Non-financial performance measures are meant to be long-term oriented so their impact on performance may take some time to emerge. Secondly, the implementation of this type of incentive design may be more complex than previously expected and this might be a reason why organisations are not finding financial benefits (e.g. Neely et al., 2000). They might be struggling with implementation issues. As an area for further research it would be interesting to examine to what extent the implementation process used to integrate financial and non-financial performance measures in executive incentive systems is a moderator factor of the relationship between the use of measurement diversity and firm performance. Finally, the findings of this hypothesis may also be explained if the relationship between the use of measurement diversity in incentives and firm performance is considered in the reverse direction[41] –after all regression analysis does not imply causation (Cohen, Cohen et al., 2003). That is organisations that are underperforming are the ones more likely to use financial and non-financial information in their executive incentive systems.

[41] I would like to thank one of the externals examiners of this thesis, Prof. David Otley, for providing me with this suggestion.

The results of hypothesis 1 are not a complete surprise as they are in line with the results of a similar study conducted by Ittner, Larcker and Randall (2003). In their study they found that greater reliance on measurement diversity was positively associated with 1-year stock returns but negatively associated with ROA and sales growth, although none of the negative associations was statistically significant at $p \leq .05$. They also found that extensive use of Balanced Scorecard systems (Kaplan and Norton, 1996; 2001; 2004), which are performance measurement systems characterised by their use of a diverse set of performance measures to assess firm performance, was associated with low ROA and this finding was significant at $p \leq .05$.

From an agency theory perspective, the finding of hypothesis 1 contradicts previous agency research conduced by researchers such as Feltham and Xie (1994) and Hemmer (1996) among others; even though, it supports the work of multi-task agency research conducted by Holmstrom and Milgrom (1991). Feltham and Xie (1994) and Hemmer (1996) based on the informativeness principle (Holmstrom, 1979), propose that financial performance measures should be supplemented or replaced by non-financial performance measures in incentive systems in order to positively affect business results. The data used in this study do not support this proposition; in fact, they show the opposite effect to the one expected.

The study results are more in line with what Holmstrom and Milgrom (1991) find when multi-criteria performance measures are used for incentive purposes. In particular, Holmstrom and Milgrom's (1991) model suggests that when multiple measures of performance are used agents will focus their efforts on those that are easier to achieve at the expense of others that are harder to reach, even if this allocation of effort is detrimental to the firm. Thus, for Holmstrom and Milgrom (1991) the positive impact of a larger number of performance measures is unclear.

This research argues that the impact of using financial and non-financial performance measures in incentives can be better understood when contingency theory research on management control systems is taken into consideration. Contingency theory research on management control systems states that the impact of management control systems on firm performance depends on organisational contingencies, and that the configuration of a management control system should be fitted to organisational contingencies in order to positively affect firm performance (Fisher, 1998; Hayes, 1977; Otley, 1980). Hypotheses 2 to 6 of this research take into consideration contingency theory premises and argue that the relationship between measurement diversity and firm performance depends on specific internal and external organisational factors.

In particular, this study looks at two internal management control factors: performance measurement quality and reward system effectiveness;

and three contextual factors: business risk, ownership structure and organisational culture. These factors have been chosen mainly because their effects on management control systems and firm performance have been critically highlighted in agency-based research (e.g. Miller et al., 2002; Werner et al., 2005) and contingency-based research (e.g. Fisher, 1995b; 1998; Hayes, 1977; Otley, 1980).

In brief, hypothesis 2 argues that the relationship between measurement diversity and firm performance will be positive when the quality of performance measures is high. Hypothesis 3 suggests that measurement diversity will be related to firm performance indirectly through its effect on reward system effectiveness. Hypothesis 4 states that measurement diversity will be positively associated with firm performance when business risk is high or low and negatively related with firm performance when business risk is moderate. Hypothesis 5 proposes that measurement diversity will be positively associated with firm performance when firms are manager-controlled –i.e. managerial discretion is high– and negatively associated with firm performance when firms are owner-controlled –i.e. managerial discretion is low. Finally, Hypothesis 6 predicts that measurement diversity will be positively associated with firm performance when organisational cultural values are clan or adhocracy values. Measurement diversity will be negatively associated with firm performance when organisational cultural values are market or hierarchy values.

These hypotheses were tested using logistic and OLS regressions with main and interaction effects. Firm performance was assessed using three different measures. Two of them were financial –i.e. ROA and sales annual growth– and one is based on perception –that is business goals achievement. The research data partially supports hypothesis 4 indicating that firms transfer financial risk to executives by using financial performance measures in executive incentive pay whenever this transfer appears to have the potential to improve the overall business performance –i.e. when there is moderate business risk. When financial performance is beyond the control of executives –i.e. when business risk is high or low–, the use of financial performance measures only in executive incentive systems is likely to be dysfunctional. This is because the observed results cannot be directly attributed to managerial decisions or actions and the use of non-financial performance measures is a method used by firms in order to balance the effects of incentives on executives' behaviour and final performance. This finding follows the same pattern found in the work of Miller et al. (2002) when looking at the effect of business risk on the relationship between CEO's incentives and firm performance.

The research data also partially supports hypothesis 6 suggesting that firms characterised by having an organisational culture which emphasises values such as flexibility, performance improvement and risk taking –i.e. clan and adhocracy cultures– will make use of non-financial performance measures in addition to financial performance measures in their executive

incentive systems and this will have a positive effect on their performance. Firms characterised by having an organisational culture which emphasises values such as control, stability and risk aversion –i.e. market and hierarchy cultures– will make greater use of financial performance only and this will have positive effects on their performance.

Hypotheses 2, 3 and 5 are not supported by the data, suggesting that neither the performance measures quality, reward system effectiveness or ownership structure seem to interact with the relationship between measurement diversity and firm performance. The results of these three hypotheses is somehow surprising as one would expect the quality of performance measures, the perceived effectiveness of the reward system and the ownership structure of the organisation to have some effect on the performance impact of measurement diversity. Some explanations could be put forward regarding these unexpected results.

In the case of hypotheses 2 –the moderating effect of the quality of performance measures–, it could be argued that the metric designed for assessing the quality of performance measures might have been deficient as it might have missed attributes of performance measures that are more important than the ones selected. For example, two of these attributes might be: the extent to which executives perceive the performance measures to be the "right ones" for measuring the true performance of the organisation and the extent to which the performance measures are accurate and reliable.

Further research including a more complete metric of the perceived quality of performance measures may find additional insights that could help to better explain the results found in this thesis.

The results of hypothesis 3 –the mediating effect of reward system effectiveness– may be better understood if the work of Ittner, Larcker and Meyer (2003) is taken into consideration. These authors have found that when measurement diversity –in particular, the non-financial measures of performance– is used for incentive purposes employees perceive the reward system to be more subjective and this subjectivity generates feelings of unfairness. The work of these authors might explain why this thesis finds reward system effectiveness to be positively associated with firm performance –assessed by business goals achievement– (see Chapter 5, Table 5-4)[42] but not associated with measurement diversity.

The findings of hypothesis 5 –the moderating effect of ownership structure– could be explained if a different argument to the one proposed in Chapter 3 is put forward[43]. That is, if the use of measurement diversity is

[42] The table showing the regression results of Hypothesis 3 (Chapter 5, Table 5-7) also presents a positive association between business goals achievement and reward system effectiveness. This relationship is not significant at $p < .05$ but it is very close to be significant at $p \leq .10$.

[43] I would like to thank one of the externals examiners of this thesis, Dr. Martin Larraza-Quintana, for providing me with this suggestion.

more common in manager-controlled firms because non-financial measures are perceived by managers as measures that can be easily manipulated. Then the use of non-financial measures in executive incentives would be a reflection of an agency cost (i.e. lack of alignment between the interest of the principal/owner and the agent/managers). In this case, measurement diversity could be detrimental for firm performance in manager-controlled firms. In other words, the moderating effect of ownership structure on the relationship between measurement diversity and firm performance could be negative. However, since managers in manager-controlled firms are also stockholders –which means that they are also interested in increasing firm performance–; then, this stock ownership may neutralise the negative effect of their decisions to include non-financial performance measures in incentives and this may explain the absence of a significant moderating effect of ownership structure (i.e. managers as stockholders will pursue firm performance maximisation regardless of the relative ownership structure of the firm).

In summary, these results indicate that the use of financial and non-financial performance measures in executives' incentives may actually be detrimental for organisational performance, in contrast to what authors such as Kaplan and Norton (1996; 2001; 2004; 2006), Banker et al. (2000), or Said et al. (2003) suggest. However, the negative relationship between the use of financial and non-financial performance measures in executives' incentives and firm performance might not apply to all organisations in all

circumstances. That is, under specific conditions, such as those of high or low business risk, and clan or adhocracy cultural values, the use of multi-criteria performance measures for determining executives' incentive pay may be beneficial for organisations. These findings suggest that when investigating the performance impact of measurement diversity in executives' incentives, a more prolific topic on which to focus is a search for those "idiosyncratic conditions" (Miller et al., 2002, p. 752) in which particular performance measures in executives' incentives produce better results, rather than concentrating on the search for links between measurement diversity and firm performance per se.

This study extends prior performance measurement research in several ways (see Table 6-1). Firstly, it contributes to the body of literature looking at the performance impact of measurement diversity (e.g. Banker et al., 2000; Hoque and James, 2000; Ittner and Larcker, 1995; Ittner, Larcker and Randall, 2003; Said et al., 2003; Van der Stede et al., 2006). In particular, it provides evidence to show that the use of measurement diversity in executives' incentives is negatively associated with firm performance (measured by return on assets and sales annual growth).

Secondly, it contributes to the body of literature looking at the moderator factors that may affect the relationship between measurement diversity and firm performance (e.g. Govindarajan and Gupta, 1985; Hoque and James, 2000). To this stream of research, the study contributes by

finding (1) that business risk –defined as environmental uncertainty– affects the relationship between measurement diversity in executives' incentives and firm performance (measured by business goals achievement) in a curvilinear way rather than in a linear way as previously proposed by Hoque (2005)[44]; (2) that organisational culture not only affects managerial decisions about the type of performance measures used to assess firm performance as suggested by Henri (2006), but also the relationship between the type of performance measures that managers use to determine executive incentive pay and firm performance; and (3) that ownership structure, the quality of performance measures and the reward system effectiveness do not influence the relationship between measurement diversity in executives' incentives and firm performance.

This study contributes to the agency theory literature by providing evidence that does not support the theoretical propositions provided by Feltham and Xie (1994) and Hemmer (1996) among others. These authors suggest that the use of measurement diversity in incentives will be beneficial for organisations but as the data have shown this may not be the case in all circumstances. This finding is more in line with the work

[44] It must be noted that Hoque (2005) measures environmental uncertainty using a survey scale and not a financial measure as the one used in this study. Thus, his results may differ from the results obtained in this thesis due to the different proxies used to assess environmental uncertainty or business risk.

conducted by agency base researchers Holmstrom and Milgrom (1991) who find that the use of measurement diversity in incentives may generate dysfunctional behaviours that may be detrimental for firm performance.

In addition, this study is the first to provide theoretical arguments associating agency theory premises with organisational culture using the Competing Values Framework (Cameron and Quinn, 1999). Most previous research has looked at the application of agency theory to national cultures (e.g. Ekanayake, 2004), but little research has focused on the application of agency theory to organisational cultures with the recent exception of Kulik (2005) or Jones et al. (2007). Furthermore, this study is based in the UK, whilst the majority of the agency-based compensation and performance measurement research has been conducted in the US (Merchant et al., 2003). Finally, this study applies a survey methodology in combination with archival data. This is important because agency-based hypotheses have been mainly tested using archival data alone, which has serious limitations for producing valuable insights (Gomez-Mejia, 1994).

This study also contributes to the contingency theory of management control systems as it supports the premise that there is no universally appropriate management control system –in this case, the executive incentive system– which applies equally to all organisations in all circumstances (Fisher, 1995b; 1998; Otley, 1980).

Table 6-1 Summary of main contributions to knowledge

Literature	Previous knowledge	Contributions to knowledge
Performance Measurement, in particular the area focused on the use of non-financial performance measures in addition to financial performance measures in management control systems	▪ **Inconclusive evidence about the impact of using measurement diversity in management control systems.** - Some researchers have found a positive relationship between measurement diversity and economic performance (Govindarajan and Gupta, 1985; Hoque, 2004; Ittner and Larcker, 2003), perceived performance (Ittner and Larcker, 1995), and future economic and stock market performance (Banker et al, 2000; Ittner, Larcker and Randall, 2003). - Other researchers have found that measurement diversity is not associated with current economic performance (Perera and Poole, 1997) or that this association is negative (Ittner, Larcker and Randall, 2003).	(1) This research finds that the use of measurement diversity in executives' annual incentives is negatively associated with economic performance (measured by ROA and Sales Growth).
	▪ **The relationship between the use of non-financial performance measures in addition to financial performance measures in management control systems is influenced by the following organisational contingencies:** - Environmental uncertainty/business risk (Hoque, 2005). - Business strategy (Govindarajan and Gupta, 1985; Gupta, 1987). - Organisational size (Hoque and James, 2000). - Industry (Schiehll, 2001). ▪ **Organisational culture is a contextual variable that affects the use of financial and non-financial performance measures in management control systems (Henri, 2006)**	(2) This research finds that the relationship between measurement diversity in executives' annual incentives and firm performance (measured by the degree to which organisations achieve their goals) is influenced by business risk in a curvilinear way, not in a linear way as previously suggested; and organisational culture. (3) This study also finds that the relationship between measurement diversity in executives' annual incentives and firm performance is not influenced by ownership structure, the quality of the performance measures or the reward system effectiveness.
Agency theory, in particular the positivist agency-based research stream	▪ **Inconclusive knowledge about the benefits of using non-financial performance measures in addition to financial performance measures in incentive systems.** - Some researchers suggest that it is beneficial for organisations (Feltham and Xie, 1994; Hemmer, 1996). - Other researchers assert that the use of measurement diversity for compensation purposes may be detrimental for organisations (Holmstrom and Milgrom, 1991).	(4) This research finds that the use of measurement diversity for compensation purposes cannot be universalistic as it can be beneficial or detrimental for organisations depending on their circumstances.
	▪ **Agency theory predictions are influenced by national culture (e.g. Ekanayake, 2004)**	(5) This research theoretically associates agency theory with organisational cultural values assessed by the Competing Values Framework (Quinn and Rohrbaugh, 1983).
	▪ **Most previous agency-based research looking at the relationship between performance measurement and compensation has been developed in the US, using archival data or survey data (Gomez-Mejia, 1994; Merchant et al, 2003).**	(6) This research presents evidence collected in the UK. (7) It also uses both archival and survey data.
Contingency theory, in particular the contingency theory of management control systems	▪ **The relationship between management control systems and firm performance is dependent on organisational contingencies (Fisher, 1995b; Otley, 1980)**	(8) This research finds evidence that supports previous research.

6.2. Implications for practice

Based on the findings extracted from this research, organisations should pay close attention to their particular organisational circumstances before embarking on the design of multi-criteria executive incentive systems in order to better influence their business results. In particular, they should pay attention to the business risk to which they are exposed and to the cultural values they emphasise. The potential effects of both of these factors are further described in turn.

- **The effect of business risk on the performance impact of measurement diversity**

In the case of business risk, the research suggests that organisations operating in high and low business risk environments will be better off by using non-financial performance measures in addition to financial performance measures in their executives' incentive systems; whereas, organisations operating in moderated business risk environments will be better off by using financial performance measures only in their executives' incentives. High levels of business risk reduce the ability of executives to influence the financial performance measures included in their incentives. This is because external contingencies may affect the results of those measures more than the executives' business decisions or actions. When business risk is high the use of financial performance measures only in executives' incentives imposes higher income and employment risk on

executives and this may have detrimental effects on shareholders' value. For example, executives may be pushed to adopt extreme risk reduction decisions such as the avoidance of high-risk projects (Hoskisson et al., 1993), reducing R&D expenditures (Baysinger and Hoskisson, 1990) or broadening diversification at the expense of profits (Amihud and Lev, 1981).

In these circumstances, previous research proposes the reduction of the incentive pay size in order to minimise the dysfunctional behaviours that the executives' inability to influence financial performance measures may produce (e.g. Bloom and Milkovich, 1998; Miller et al., 2002). However, this solution may not be feasible any longer as the size of incentives is mainly determined by industry and firm size standards (e.g. Davis and Edge, 2004). Alternatively, as this research suggests, the use of non-financial performance measures in circumstances of high business risk may help to reduce the risk supported by executives and may help to predict future performance results.

Non-financial performance measures in executives' incentives can give executives strategic information about their customers, internal processes, competitors, suppliers and employees that are difficult to capture with the use of financial performance measures only (Feltham and Xie, 1994; Kaplan and Norton, 1996; 2001; 2004; 2006). Furthermore, non-financial performance measures are less likely to be subject to the effects of

external environmental factors and are more likely to be influenced by executives' decisions and actions (Hoque, 2005).

Under conditions of low risk, the use of executive incentive systems based on financial performance measures only may not be adequate. In low-business risk environments, the results of financial performance measures are easy to predict. These results, however, are likely to be independent from executives' decisions or actions and dependent on internal or external organisational contingencies (e.g. lack of competitors in the same market). Under low-risk circumstances (e.g. lack of growth opportunities), high reliance on financial performance measures may have detrimental effects on shareholder value. For instance, executives may be driven to distort accounting data (Rajagopalan and Finkelstein, 1992) in order to affect results. Therefore, using a similar argument to the one used under circumstances of high risk, the use of non-financial performance measures in executives' incentives can be employed as a way to balance the dysfunctional behaviours created by financial measures and this will have positive effects on firm performance (e.g. Feltham and Xie, 1994; Hemmer, 1996).

Under circumstances of moderate risk, the use of financial performance measures only in executives' incentives may be an adequate practice. This is because the ability of executives to influence those measures increases and dysfunctional behaviours oriented to reduce income

risk and employment risks are less likely to occur (e.g. Miller et al., 2002). The use of non-financial performance measures in firms operating in moderate risk conditions is not required as the use of financial performance measures only is an appropriate means of evaluating and rewarding the effects of executives' decisions and actions. In fact, as this research has shown, the use of non-financial performance measures for determining executive pay in firms operating in moderate risk environments may have detrimental effects on the firm's overall performance.

- **The effect of organisational culture on the performance impact of measurement diversity**

In the case of organisational culture, this research shows that organisations which emphasise values such as flexibility, discretion or risk-taking –that is Clan and Adhocracy organisational cultures– will be better off using a combination of financial and non-financial performance measures in executive incentive systems. Alternatively, organisations which emphasise values such as control, stability or risk-aversion –that is Market and Hierarchy organisational cultures– will be better off using financial performance measures only in their executives' incentive pay.

In organisations with Clan and Adhocracy cultures, the use of measurement diversity for determining executives' incentive pay will be beneficial for firm performance as these types of organisations are more likely to emphasise long-term performance improvement, and both financial as well as non-financial business goals. In organisations with Market and

Hierarchy cultures, the use of measurement diversity for determining executives' incentive pay will be at odds with their underlying values of emphasising financial controls and therefore it will not have beneficial effects for overall organisational performance.

6.3. Limitations

The results of this research are subject to a number of limitations. Firstly, the sample size is relatively small, even though it is larger than some of the samples used in previous performance measurement research (e.g. Hoque, 2005). Secondly, the analyses conducted to determine sample biases showed that the data were biased towards very large organisations. Thirdly, in the final sample some industries were more represented than others. For instance, firms operating in financial, real estate, renting and business administration had a greater proportion compared to the population than firms operating in manufacturing or wholesale, retail, hotel and restaurant industries. Fourthly, the study focuses on corporate performance measures used in executives' annual incentive systems. Corporate performance measures are just one type of the performance measures used in executives' annual incentives (team or individual performance measures have not been considered). Finally, the study only looks at annual incentive systems. The use of non-financial performance measures in addition to financial performance measures for determining base pay increases, long-term

incentives, performance appraisals or employment status (promotions and terminations) has not been investigated.

6.4. Areas of further research

This study raises a number of issues for further research. The first issue is the understanding of why the use of measurement diversity negatively affects firm performance, contrary to the predictions of agency theory. Researchers such as Banker et al. (2004), Ittner, Larcker and Meyer (2003), Lipe and Salterio (2000; 2002) or Roberts, Albright and Hibbets (2004) have already started to look at this phenomenon by focusing on the difficulties that the use of financial and non-financial performance measures may generate for organisations. Among their results, they have found that the use of multi-criteria performance measures increases the perceived subjectivity of the incentive system, which in turn affects its perceived effectiveness. In their explanations of this phenomenon these researchers have relied on psychology-based theories rather than on economic-based theories. Future research could extend this body of research by developing a theoretical framework based on both psychology theories (e.g. procedural justice, equity theory, motivational theories) and economic theories (e.g. agency theory).

The second issue is to examine better ways for assessing the quality of performance measures. In this research, a specific metric has been designed

for evaluating the perceived quality of performance measures; however, key attributes of performance measures may have been absent in this metric as mentioned earlier in this chapter. Thus, further research could try to improve the measurement of this variable in order to fully understand its moderating effect on the relationship between measurement diversity and firm performance.

The third issue is to study in more detail the impact of measurement diversity on perceived reward system effectiveness. Questions such as "are there any other reasons apart from the one provided in this thesis that may explain why the use of measurement diversity does not have a positive effect on reward system effectiveness?" or "to what extent does the use of measurement diversity in incentives increases subjectivity and feelings of unfairness among the employees?" could be of great interest for future research.

The fourth issue is to further investigate the relationship between the use of ownership structure, measurement diversity and firm performance. As shown in this thesis two different arguments can be presented regarding this relationship. On the one hand, in Chapter 3 (hypothesis 5) it is argued that measurement diversity will improve firm performance in manager-controlled firms. On the other hand, earlier in this Chapter a counter argument is presented. That is, that measurement diversity will harm firm

performance in manager-controlled firms. Further research could shed some light about which of these two arguments is more accurate.

The fifth issue is to analyse the impact of other internal and external contingencies that may affect the relationship between measurement diversity in executives' incentives and firm performance. Some examples of these contingencies are: organisational structure (e.g. Donaldson, 2001), external economic environment (i.e. systematic risk) (e.g. Miller and Bromiley, 1990), management style (e.g. Lawler, 1985), or trust (e.g. Busco, Riccaboni and Scapens, 2006; Coletti, Sedatole and Towry, 2005).

The sixth issue is to investigate the appropriateness of using non-financial performance measures for both informational and compensation purposes. As Gjesdal (1981) suggests, performance measures that are useful for valuing the firm (i.e. informational purposes) may not be appropriate for assessing and rewarding managerial performance (i.e. compensation purposes). For instance, customer satisfaction may be an adequate measure for determining firm performance but its results may be influenced by many factors that are outside the executive's control (Ittner, Larcker and Meyer 2003). Consequently, taking into consideration the controllability principle proposed by agency theorists (Demski and Feltham, 1978), customer satisfaction may not be an appropriate measure for evaluating and rewarding executives' performance. This research has highlighted that the consequences of using the same non-financial performance measures for

informational and compensation purposes may have detrimental results for the organisation. Future research could focus on identifying potential solutions to this problem.

Finally, the seventh issue is the need to find better ways for using non-financial information for determining pay. Future research could search for different ways in which to link non-financial performance measures to the different components of a reward system. Even though performance measurement authors normally assume that performance measures are linked to incentives (Kaplan and Norton, 1996; 2001; 2004; 2006), in practice, performance measures can be linked to monetary compensation –base pay increases, annual incentives and long-term incentives[45]–; but also to related compensation –recognition, employment status (i.e. promotions and terminations), and learning opportunities. Each of these reward elements has a specific purpose (e.g. Gomez-Mejia, 1994; Pavlik et al., 1993). In particular, annual incentive systems are meant to drive short-term performance (Gomez-Mejia, 1994; Gomez-Mejia and Balkin, 1992). Financial performance measures are supposed to be short-term oriented and non-financial performance measures long-term oriented (e.g. Kaplan and

[45] Benefits or "perks" are another reward component. However, they have not been included here as they do not tend to be linked to performance. They are linked to specific jobs or management levels.

Norton, 1996). Based on these descriptions, the use of non-financial performance measures may not fit the main purpose of annual incentive pay, which is to drive short-term performance. This may be one of the reasons why the use of non-financial performance measures in annual incentives is not generating positive effects on firm performance. Consequently, the use of non-financial performance measures may be more appropriate in other reward elements. Thus, the search for the most adequate way to use non-financial performance measures for evaluating and rewarding could be an interesting avenue for further research.

6.5. Research conclusions

The purpose of this research was to address two key research questions. Firstly, what effect does the use of measurement diversity in executives' incentive systems has on firm performance? Secondly, to what extent is the relationship between measurement diversity in executives' incentive pay and firm performance influenced by business risk, ownership structure, organisational culture, the perceived quality of performance measures and the perceived reward system effectiveness?

In response to the first question this study finds that the use of measurement diversity in executives' annual incentive systems negatively affects firm performance measured by ROA and sales annual growth. The effect is also negative when firm performance is measured by the extent to

which business goals are achieved but this negative association is not statistically significant.

In response to the second question this study finds the following. On the one hand, business risk and organisational culture are both factors that moderate the relationship between the use of measurement diversity in executives' annual incentive systems and firm performance. On the other hand, ownership structure, the perceived quality of performance measures and the perceived reward system effective are factors that have no effect on this relationship.

The general conclusion that can be drawn from these results is that the use of non-financial performance measures in addition to financial performance measures in executives' annual incentives can be detrimental for organisational performance. However, the negative effect of using multi-criteria performance measures in executives' incentives is not universal –i.e. it does not affect all organisations under all circumstances. Organisations that operate in high or low business risk environments and organisations that have clan or adhocracy cultural values will find performance benefits in the use of measurement diversity in executives' annual incentives.

The results of this thesis also suggest that the investigation of the direct effect of using measurement diversity for compensation purposes on firm performance may be pointless. A more fruitful avenue to pursue when

looking at this relationship is to search for those idiosyncratic conditions in which the use of this management control mechanism appears to work best.

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APPENDICES

APPENDIX A: INTRODUCTORY LETTER FOR SURVEY INSTRUMENT

Date
«Title» «First_Name» «Surname»
«Position»
«Company_name»
«RO_Address_Line_1»
«RO_Full_Postcode»

Dear «Title» «Surname»

Linking Business Performance Measurement to reward has a positive impact on performance!

That is the theory - but to date there is insufficient evidence to support it.

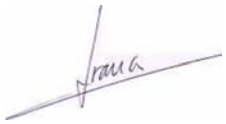
As companies seek to drive greater performance through the business and look to their people to deliver this, we believe it is important to have a better understanding of the link between performance and reward. To explore this link further we are partnering with the Human Capital Consultancy Watson Wyatt to conduct a UK study on the link between business performance measurement and reward systems. We would like to invite you to participate in this study.

By simply completing a questionnaire you will receive a full report of the findings. This report will tell how companies use business performance measurement systems, how these systems are linked to reward and where the greatest value is to be found. We believe the findings will be invaluable in helping you guide your company's evolution in this area.

The survey can be completed either on paper or online. If on paper, please return the questionnaire in the enclosed business reply envelope. If online please go to www.watsonwyatt.com/cranfield. The closing date for all responses is 12th December.

We thank you in anticipation for contributing to this important study.

Yours sincerely



Monica Franco

Research Officer
Cranfield School of Management
Cranfield, Bedford MK43 0AL
Tel. 01234751122 ext. 2926
Email: monica.franco@cranfield.ac.uk

APPENDIX B: PILOT SURVEY PARTICIPANTS

Practitioners who completed and reviewed the pilot survey instrument

Name	Position	Years of experience	Area of knowledge[46]	Company/ University	Meeting format	Date
1. David Jacques	Performance Measurement Manager	>15	Practical experience in the design, implementation and management of PM systems	Belron	Roundtable	10/12/03
2. Andy Shilten	Performance Measurement Manager	>5	Practical experience in the design of PM systems	City & Guilds	Roundtable	10/12/03
3. David Leeming	Planning Manager	>10	Practical experience in the design of PM systems	Co-operative Group	Roundtable	10/12/03
4. Susan Perry-whitehead	Performance Measurement Manager	>10	Practical experience in the implementation and management of PM systems	DHL	E-mail	03/09/03
5. Stuart Hepburn	Global Reward Director	>15	Consulting and practical experience on the implementation and management of EC	GlaxoSmithKline	E-mail/ Telephone	08/08/03

[46] Abbreviations used: Performance Measurement (PM), Executive Compensation (EC), Human Resources (HR)

Name	Position	Years of experience	Area of knowledge[46]	Company/ University	Meeting format	Date
6. Alan Pankhurst	HR Director	>20	Practical experience on the implementation and management of HR systems and EC	Guardian Media Group	In person	06/08/03
7. Mandy Devonald-Batt	HR Director	>20	Practical experience on the implementation and management of HR systems and EC	SAS	In person	23/07/03
8. Radha Startin	Compensation and Benefits Director	>10	Consulting and practical experience on the implementation and management of EC	Shell	In person	06/08/03
9. Monica Montealegre	HR Manager	>8	Practical experience on the implementation and management of HR systems and EC	Siemens	E-mail/ Telephone	07/08/03
10. Sharon Dietrich	HR Director	>15	Practical experience on the implementation and management of HR systems and EC	Smith & Nephew	In person	05/08/03
11. Judith Davidson	Director of Strategy	15	Practical experience in the design, implementation and management of PM systems	Sodexho	Roundtable	10/12/03
12. Christine Shillington	UK Reward Manager	>15	Consulting and practical experience on the implementation and management of EC	Unilever	E-mail	26/09/03
13. Tracey Kneller	UK Reward Manager	>10	Consulting and practical experience on the implementation and management of EC	Vodafone	E-mail	11/08/03
14. Stan Tennison	Performance Measurement Manager	10	Practical experience in the design of PM systems	Vodafone	Roundtable	10/12/03
15. Richard Cheeseman	Marketing Manager	5	Marketing knowledge (survey format)	Watson Wyatt Ltd.	E-mail/ Telephone	
16. Stephen Martin	Senior Consultant	>10	Consulting experience (PM and EC)	Watson Wyatt Ltd.	E-mail	
17. Beverly Keene	Marketing Director	15	Marketing knowledge (survey format)	Watson Wyatt Ltd.	E-mail/ Telephone	22/08/03
18. Russell Huntington	Partner	>20	Consulting experience (EC)	Watson Wyatt Ltd.	In person	
19. Jonathan Gardner	Research and Development Director	>12	Research and consulting experience (EC)	Watson Wyatt Ltd.	E-mail	

Academics and support staff who completed and reviewed the pilot survey instrument

Name	Position	Years of experience	Area of knowledge	Company/ University	Meeting format	Date
20. Prof. Shaun Tyson	Professor of HR	>25	Research and teaching experience (EC)	Cranfield SoM	In person	
21. Prof. Luis Gomez-Mejia	Professor of Management	>25	Research and teaching experience (EC)	Arizona State University	In person	
22. Prof. Andy Neely	Professor of PM	>15	Research and teaching experience (PM)	Cranfield SoM	E-mail and Telephone	
23. Bernard Marr	Research Fellow	5	Research and practice experience (PM)	Cranfield SoM	In person	
24. Dr. Ruth Bender	Senior Lecturer	>10	Research and teaching experience (EC)	Cranfield SoM	In person	
25. Dr. Mike Kennerley	Senior Research Fellow	15	Research (PM)	Cranfield SoM	In person	
26. Dr. Mike Bourne	Senior Research Fellow (My PhD supervisor)	10	Research and teaching experience (PM).	Cranfield SoM	In person	12/08/03
27. Richard Elliot	Visiting Fellow	>25	Consulting and practical experience in the design, implementation and management of PM systems	Cranfield SoM	Roundtable	10/12/03
28. Adrian Edelman	PhD student	15	Research and practice knowledge (PM)	Cranfield SoM	In person	
29. James Collins	PhD student	20	Research and practice knowledge (HR)	Cranfield SoM	E-mail/ in person	
30. Javier Marcos	PhD student	>10	Research and practice knowledge (HR)	Cranfield SoM	In person	
31. Pietro Micheli	PhD student	2	Research experience (PM)	Cranfield SoM	In person	
32. Dina Gray	PhD student/ Company director	>15	Business and people management in industry and research experience (PM)	Cranfield SoM	In person	
33. Angela Walters	CBP Knowledge Manager	10	Knowledge management experience	Cranfield SoM	In person	
34. Alison Isham	CBP Secretary	10	Administration experience	Cranfield SoM	In person	
35. Jacqueline Brown	CBP Secretary	>15	Administration experience	Cranfield SoM	In person	

APPENDIX C: SURVEY INSTRUMENT

Strategic performance measurement and reward systems survey

Questionnaire

Cranfield School of Management in conjunction with Watson Wyatt LLP

WWW.WATSONWYATT.COM

Cranfield UNIVERSITY
School of Management

Watson Wyatt Worldwide

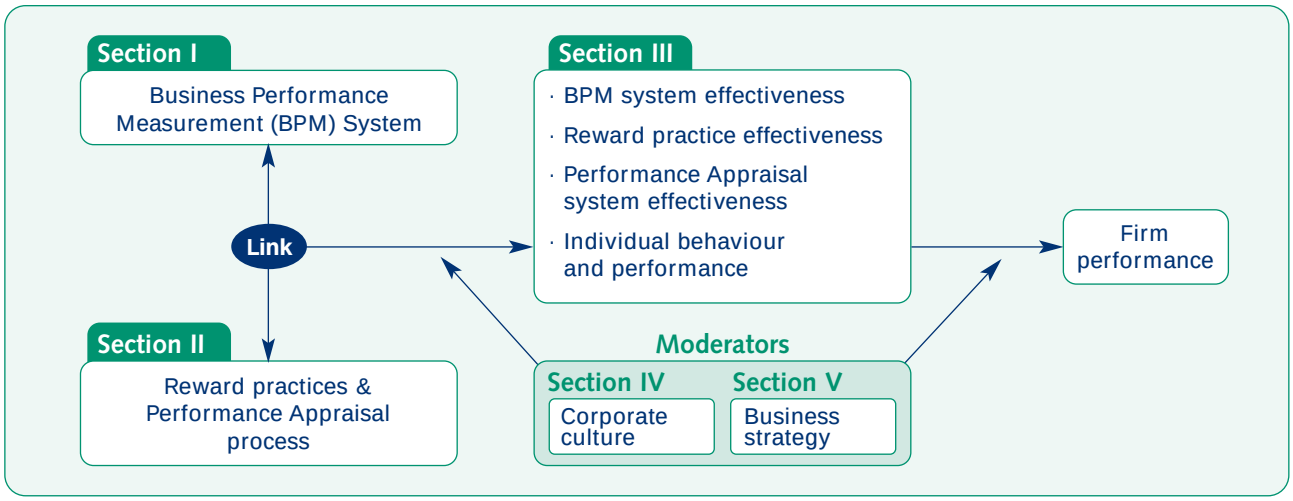
Introduction

Watson Wyatt and Cranfield School of Management would like to invite you to participate in this survey of major organisations in the UK. This study is part of a doctoral project, the focus of which is to investigate the link between strategic performance measurement, reward practices and business performance (see figure 1). There is no cost to participate and participation will entitle you to receive a free copy of the survey results, which will help to guide your company's evolution in this important area in the future.

The questionnaire is structured into five sections:

I. Business performance measurement system (e.g. Balanced Scorecards, Key Performance Indicators)
II. Reward practices (i.e. base pay, annual incentives) and Performance Appraisal process
III. The impact of the link between BPM systems and reward practices
IV. Organisational culture
V. Business strategy

Figure 1



The questionnaire is designed to be easy and quick to complete and should take no more than 20 – 30 minutes. If you prefer you can complete the survey online at www.watsonwyatt.com/cranfield

If you have any questions about the survey please contact: Paul Richards at Watson Wyatt on 020 7227 2319 or email paul.richards@eu.watsonwyatt.com, or Monica Franco at Cranfield School of Management on 01234 751122 ext. 2926 or email monica.franco@cranfield.ac.uk

Confidentiality statement

Watson Wyatt and Cranfield School of Management will use the information provided by you for research purposes. We will hold your individual responses to the survey in confidence and any distribution or publication of the information collected will not identify your contribution. Readers of the report will be interested in the types of companies that participated in the survey, therefore we plan to list a representative sample in the report.

To ensure you receive your copy of the results please complete the following:

Name of person completing the survey:		
Job title/role:	Company name:	
Address:		
City:	County:	Post code:
Email:	Phone:	Fax:

Type of company and respondent perspective

I will be responding to this questionnaire from the point of view of a… (mark only one)

- ☐ single company not affiliated to any other company
- ☐ subsidiary company
- ☐ parent company

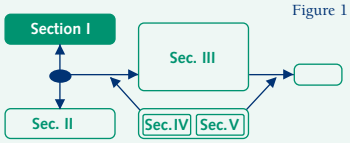
The full name of the company I am responding for is _____

NB Since the research is investigating the most common practices in the UK, please try to focus on your UK environment only

Section I. Business Performance Measurement system

A Business Performance Measurement (BPM) system does **not** refer to the **Performance Management** or **Appraisal system**. It refers to the processes managers use in order to measure their company's financial and non-financial performance, and in order to check whether their business strategy is being implemented.

Figure 1



1 Does your company use a BPM system?

- ☐ Yes
- ☐ No - please specify why _____

(Go to question 9)

2 My company uses the following Business Performance Measurement (BPM) system…

Please mark **one** response for each line.		To a great extent	To some extent	To a little extent	Not at all	Don't know
a	Balanced Scorecard	☐	☐	☐	☐	☐
b	Business Excellence model (e.g. EFQM)	☐	☐	☐	☐	☐
c	A set of Key Performance Indicators (KPIs)	☐	☐	☐	☐	☐
d	Our own BPM system based on one of the above. Which one? _____	☐	☐	☐	☐	☐
e	Our own BPM system **not** based on any of the above	☐	☐	☐	☐	☐
f	Other – please specify: _____	☐	☐	☐	☐	☐

3 My company's Business Performance Measurement system (e.g. Balanced Scorecard, set of KPIs, etc.) has the following characteristics…

Please mark **one** response for each line.		Strongly Agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	It is linked to our business strategy	☐	☐	☐	☐	☐	☐
b	It uses a strategic map with cause-and-effect relationships among objectives	☐	☐	☐	☐	☐	☐
c	It uses a balanced set of performance measures (e.g. financial, customers, people, process, etc.)	☐	☐	☐	☐	☐	☐
d	It uses a methodical target setting process. Targets are set based on a rigorous analysis of performance data	☐	☐	☐	☐	☐	☐
e	It is communicated to all employees	☐	☐	☐	☐	☐	☐
f	It is integrated with our budgeting processes	☐	☐	☐	☐	☐	☐
g	It is integrated with our appraisal processes	☐	☐	☐	☐	☐	☐
h	It is integrated with our reward system	☐	☐	☐	☐	☐	☐

4 My company's Business Performance Measurement system started to be used…

Please mark **one** response for each line.		This year	1 to 2 years ago	3 to 6 years ago	More than 6 years ago	N/A	Don't know
a	By the top executive team	☐	☐	☐	☐	☐	☐
b	By senior managers	☐	☐	☐	☐	☐	☐
c	By all other employees	☐	☐	☐	☐	☐	☐
d	To determine pay	☐	☐	☐	☐	☐	☐
e	To evaluate individuals	☐	☐	☐	☐	☐	☐
f	To determine budgets	☐	☐	☐	☐	☐	☐

5 The following people have participated in the development of our Business Performance Measurement system (e.g. Balanced Scorecard, set of KPIs, etc.)…

Please mark **one** response for each line.		To a great extent	To some extent	To a little extent	Not at all	Don't know
a	CEO	☐	☐	☐	☐	☐
b	Top executive team	☐	☐	☐	☐	☐
c	Senior managers	☐	☐	☐	☐	☐
d	Middle managers	☐	☐	☐	☐	☐
e	HR function	☐	☐	☐	☐	☐
f	IT managers	☐	☐	☐	☐	☐
g	External consultants	☐	☐	☐	☐	☐
h	Other – please specify: _____					

6 My company uses its Business Performance Measurement system to…

Please mark **one** response for each line.		To a great extent	To some extent	To a little extent	Not at all	Don't know
a	Measure business results	☐	☐	☐	☐	☐
b	Manage strategy implementation	☐	☐	☐	☐	☐
c	Assess the validity of the business strategy	☐	☐	☐	☐	☐
d	Manage the budgeting processes	☐	☐	☐	☐	☐
e	Manage operations processes	☐	☐	☐	☐	☐
f	Inform decision making	☐	☐	☐	☐	☐
g	Encourage improvement of business processes	☐	☐	☐	☐	☐
h	Conduct internal benchmarks	☐	☐	☐	☐	☐
i	Conduct external benchmarks	☐	☐	☐	☐	☐
j	Communicate strategic priorities to employees	☐	☐	☐	☐	☐
k	Communicate strategic priorities to external stakeholders	☐	☐	☐	☐	☐
l	Comply with legal requirements	☐	☐	☐	☐	☐
m	Monitor managers' productivity	☐	☐	☐	☐	☐
n	Reward managers' contribution to business performance	☐	☐	☐	☐	☐

7 Top executives and senior managers receive information about the level of achievement of…

Please mark **two** responses for each line.		Top executives						Senior managers					
		Weekly	Monthly	Quarterly	Yearly	N/A	Don't know	Weekly	Monthly	Quarterly	Yearly	N/A	Don't know
a	Strategic goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Corporate performance measures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Their business unit performance measures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Other business units' performance measures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Their individual performance measures	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

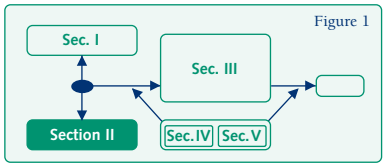
8 My company's different employee groups have the following level of awareness, use and acceptance of the Business Performance Measurement (BPM) system

Please mark **one** response for each line.		Uses, understands and is a clear supporter of the BPM system	Uses and understands the BPM system, but isn't a supporter	Uses the BPM system, but doesn't fully understand it	Aware of the BPM system, but doesn't use it	Not aware of the BPM system	Don't Know
a	CEO	☐	☐	☐	☐	☐	☐
b	Top executive team	☐	☐	☐	☐	☐	☐
c	Senior managers	☐	☐	☐	☐	☐	☐
d	Middle managers	☐	☐	☐	☐	☐	☐
e	Rest of employees	☐	☐	☐	☐	☐	☐

Section II. Reward system

Important: For the following questions please focus on the top executives' reward schemes and senior managers' reward schemes. Reward plans for specific employee groups, such as R&D or sales, are out of the scope of this study.

Figure 1



9 The following people have participated in the selection of the measures included in top executives' and senior managers' reward schemes

Please mark **two** responses for each line.		Top executives: To a great extent	Top executives: To some extent	Top executives: To a little extent	Top executives: Not at all	Top executives: Don't know	Senior managers: To a great extent	Senior managers: To some extent	Senior managers: To a little extent	Senior managers: Not at all	Senior managers: Don't know
a	CEO	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Top executive team	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Senior managers	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Remuneration committee	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	HR function	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	External consultants	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g	Other – please specify: _____	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

10 On average, top executives' and senior managers' base pay are considered to be…

Please mark **two** responses for each line.		Top executives: Yes	Top executives: No	Top executives: Don't know	Senior managers: Yes	Senior managers: No	Senior managers: Don't know
a	Above competitive market salaries (above our industry median)	☐	☐	☐	☐	☐	☐
b	Similar to competitive market salaries (our industry median)	☐	☐	☐	☐	☐	☐
c	Below competitive market salaries (below our industry median)	☐	☐	☐	☐	☐	☐

11 Top executives' and senior managers' base pay increases are based on…

Please mark **two** responses for each line.		Top executives: Yes	Top executives: No	Top executives: Don't know	Senior managers: Yes	Senior managers: No	Senior managers: Don't know
a	Performance criteria included in BPM system (e.g. Balanced Scorecard, KPIs)	☐	☐	☐	☐	☐	☐
b	Performance criteria **not** included in BPM system	☐	☐	☐	☐	☐	☐
c	Competencies included in BPM system	☐	☐	☐	☐	☐	☐
d	Competencies **not** included in BPM system	☐	☐	☐	☐	☐	☐
e	Years of service	☐	☐	☐	☐	☐	☐
f	Industry rate	☐	☐	☐	☐	☐	☐
g	Other – please specify: _____	☐	☐	☐	☐	☐	☐

12 In my company…

Please mark **two** responses for each line.		Top executives: To a great extent	To some extent	To a little extent	Not at all	Don't know	Senior managers: To a great extent	To some extent	To a little extent	Not at all	Don't know
a	Performance results **below** targets are likely to affect managers' employment status in the short-term (i.e. termination)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Performance results **above** targets are likely to affect managers' promotions in the short-term	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

13 My company uses a pay-for-performance annual incentive plan that is…

This type of incentive plan pays out when a specific performance level is achieved. This performance level can be determined based on an overall subjective basis or based on either **financial** or non **financial measures.**

Please mark **two** responses for each line. If "**yes**" include what proportion of the total annual incentive is based on that plan. Example: In company X, annual incentives are discretionary based (20%) and budget based (80%).		Top executives: Yes	No	N/A	Don't know	Senior managers: Yes	No	N/A	Don't know
a	**Discretionary based** Performance results are considered on an overall subjective basis, no specific measures are used to determine payouts	☐___%	☐	☐	☐	☐___%	☐	☐	☐
b	**A peer company comparison plan** Top management selects measures of performance and a group of peer companies to be compared against	☐___%	☐	☐	☐	☐___%	☐	☐	☐
c	**Based on Management by Objectives (MBO)** Goals for company wide, business unit, team and/or individual performance measures are set for each manager. Progress and goal attainment are measured and monitored in appraisal sessions.	☐___%	☐	☐	☐	☐___%	☐	☐	☐
d	**Based on the BPM system (e.g. Balanced Scorecard, KPIs)** Similar to Management by Objectives but goals and measures are integrated with the BPM system	☐___%	☐	☐	☐	☐___%	☐	☐	☐
e	**Based on budgets** Budget targets for company-wide team and/or individual are set for each manager	☐___%	☐	☐	☐	☐___%	☐	☐	☐
f	**Based on performance improvement** Company selects performance criteria; incentive fund is created based upon improvements over prior year's results	☐___%	☐	☐	☐	☐___%	☐	☐	☐
g	**Other – please specify:** _____	☐___%	☐	☐	☐	☐___%	☐	☐	☐
		100%				100%			

14 Top executives' and senior managers' long-term incentive plans are…

Long-term incentives refer to multiyear performance plans. Payouts can be made in cash, shares, stock options, etc.

Please mark **two** responses for each line. If "**yes**" include what proportion of the total annual incentive is based on that plan.		Top executives: Yes	No	N/A	Don't know	Senior managers: Yes	No	N/A	Don't know
a	Based on Management by Objectives (MBO)	☐___%	☐	☐	☐	☐___%	☐	☐	☐
b	Based on the BPM system (e.g. Balanced Scorecard, KPIs)	☐___%	☐	☐	☐	☐___%	☐	☐	☐
c	Based on the measures **not** included in the BPM system	☐___%	☐	☐	☐	☐___%	☐	☐	☐
d	Other – please specify: _____	☐___%	☐	☐	☐	☐___%	☐	☐	☐
		100%				100%			

15 On average, if on-target performance is achieved this year, the percentage of base pay that will be earned in incentives is… (If not known please enter D/K and if not applicable enter N/A)

Please include the corresponding % in each line.		Top executives	Senior managers
a	Annual incentives	____% over Base Pay	____% over Base Pay
b	Long-term incentives	____% over Base Pay	____% over Base Pay

16 On average, the weights of the measures my company uses to determine annual incentives are…
(If not known please enter D/K and if not applicable enter N/A)

Please include the corresponding % in each line and column.		Top executives	Senior managers
a	Corporate measures	_____%	_____%
b	Business Unit measures	_____%	_____%
c	Individual measures	_____%	_____%
d	Other – please specify: _____	_____%	_____%
	TOTAL	100 %	100 %

17 My company uses the following metrics to measure corporate performance. Please mark whether these metrics are also included in the top executives' and senior managers' corporate level incentives
(Please mark only the measures that your company uses)

	Measure of corporate performance	Measure included in top executives' corp. level incentives	Measure included in senior managers' corp. level incentives
Financial perspective			
Cash flow ratio	☐	☐	☐
Earning per share (EPS)	☐	☐	☐
EBITDA	☐	☐	☐
EVA©	☐	☐	☐
Gross margin	☐	☐	☐
Net Operating Income	☐	☐	☐
Return on assets (ROA)	☐	☐	☐
Return on equity (ROE)	☐	☐	☐
Revenues	☐	☐	☐
Year-over-year growth	☐	☐	☐
TSR	☐	☐	☐
Other – please specify:			
_____	☐	☐	☐
_____			
_____			
Customer perspective:			
Advertising spend vs. sales	☐	☐	☐
Competitors' measures	☐	☐	☐
Customer loyalty	☐	☐	☐
Customer retention	☐	☐	☐
Customer satisfaction	☐	☐	☐
Internal customer satisfaction	☐	☐	☐
Market share	☐	☐	☐
Other – please specify:			
_____	☐	☐	☐
_____			
_____			

	Measure of corporate performance	Measure included in top executives' corp. level incentives	Measure included in senior managers' corp. level incentives
Operations perspective			
Capacity to innovate	☐	☐	☐
Cost of quality	☐	☐	☐
Defects rates	☐	☐	☐
Idea generation rate	☐	☐	☐
Maintenance cost	☐	☐	☐
New product development	☐	☐	☐
Productivity/yield	☐	☐	☐
Profit from new product	☐	☐	☐
R&D spend	☐	☐	☐
Service quality audit	☐	☐	☐
Other – please specify:			
_____	☐	☐	☐
_____			
_____			
People perspective			
Personal scorecard	☐	☐	☐
Employee satisfaction	☐	☐	☐
Employee turnover	☐	☐	☐
Leadership	☐	☐	☐
Workforce capabilities	☐	☐	☐
Safety incidents	☐	☐	☐
Core competencies and skills	☐	☐	☐
Other – please specify:			
_____	☐	☐	☐
_____			
_____			

18 My company updates the…

Please mark **one** response for each line.		Less than yearly	Every year	Every 2 to 3 years	Every 4 to 6 years	Every 7 or more years	N/A	Don't know
a	Performance measures included in short-term incentives	☐	☐	☐	☐	☐	☐	☐
b	Performance measures included in long-term incentives	☐	☐	☐	☐	☐	☐	☐
c	Specific competencies included in base pay plans	☐	☐	☐	☐	☐	☐	☐

19 My company makes significant changes in our…

Please mark **one** response for each line.		Less than yearly	Every year	Every 2 to 3 years	Every 4 to 6 years	Every 7 or more years	N/A	Don't know
a	Business Performance Measurement system	☐	☐	☐	☐	☐	☐	☐
b	Performance appraisal system	☐	☐	☐	☐	☐	☐	☐
c	Base pay scheme (e.g. job grades, competencies, etc.)	☐	☐	☐	☐	☐	☐	☐
d	Base pay increase criteria	☐	☐	☐	☐	☐	☐	☐
e	Annual incentive scheme	☐	☐	☐	☐	☐	☐	☐
f	Long-term incentive scheme	☐	☐	☐	☐	☐	☐	☐

20 The following characteristics describe the type of measures top executives and senior managers have in their incentive plan:

		Top executives						Senior managers					
Please mark **two** responses for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Individuals have control over the measures they are responsible for	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Measures are few in number (on average, 7 or less)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Measures reflect strategic goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Measures reflect business unit goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Measures reflect individual goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	Measures are easy to understand	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g	Measures are easy to set (in our business)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
h	Measures are easy to manipulate	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
i	Measures are outcome oriented (avoidance of activity or task oriented measures)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
j	Measures are objective (avoidance of subjectivity)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

21 Reward system effectiveness

Please mark **two** responses for each line.		Top executives						Senior managers					
		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Our reward practices are effective	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Our reward practices contribute to retention and attraction of individuals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Individuals are happy with the way the reward system contributes to the achievement of overall organisational goals	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Individuals understand our reward practices	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Individuals accept our reward practices	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f	Individuals are motivated by our reward practices	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

22 The performance appraisal my company uses for top executives and senior management is…

Please mark **two** responses for each line. If "**yes**" include what proportion of the total annual incentive is based on that plan.		Top executives				Senior managers			
		Yes	No	N/A	Don't know	Yes	No	N/A	Don't know
a	**Competency-based** Performance is defined in terms of predetermined competencies	☐___%	☐	☐	☐	☐___%	☐	☐	☐
b	**Result-based** Performance is defined in terms of target achievement								
	▪ Based on the BPM system (e.g. Balanced Scorecard, KPIs)	☐___%	☐	☐	☐	☐___%	☐	☐	☐
	▪ Based on budget targets	☐___%	☐	☐	☐	☐___%	☐	☐	☐
	▪ Based on measures included in MBO	☐___%	☐	☐	☐	☐___%	☐	☐	☐
c	**Discretionary-based**	☐___%	☐	☐	☐	☐___%	☐	☐	☐
		100%				100%			

23 The performance appraisal of top executives and senior managers is formally conducted by…

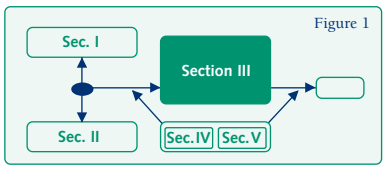
Please mark **two** responses in each **line**.		Top executives			Senior managers		
		Yes	No	Don't know	Yes	No	Don't know
a	Their superior, peers and subordinates (360 feedback)	☐	☐	☐	☐	☐	☐
b	Their superiors and peers	☐	☐	☐	☐	☐	☐
c	Their superior	☐	☐	☐	☐	☐	☐
d	Other – please specify: _____	☐	☐	☐	☐	☐	☐

24 Performance appraisal effectiveness

Please mark **two** responses for each line.		Top executives						Senior managers					
		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Our performance appraisal process is effective	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b	Managers are good at judging the information extracted from our BPM system for evaluating people	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c	Individuals understand our performance appraisal process	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d	Individuals accept our performance appraisal process	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e	Our performance appraisal process is considered to be objective	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Section III. Impact of the link between BPM systems and rewards

Figure 1



25 My company uses the BPM system's measures to determine rewards because we believe this linkage…
(if your company does not use its BPM system to determine rewards please specify why in the blank space below* and go to question 27)

Please mark **one** response for each line.		To a great extent	To some extent	To a little extent	Not at all	Don't know
a	Facilitates managers' understanding of our business strategy	☐	☐	☐	☐	☐
b	Encourages managers to focus on our financial as well as non-financial performance results	☐	☐	☐	☐	☐
c	Motivates managers to achieve better performance	☐	☐	☐	☐	☐
d	Induces the desired behaviours	☐	☐	☐	☐	☐
e	Facilitates alignment between managers' actions and strategic goals	☐	☐	☐	☐	☐
f	Encourages cooperation	☐	☐	☐	☐	☐
g	Other – please specify: _____					

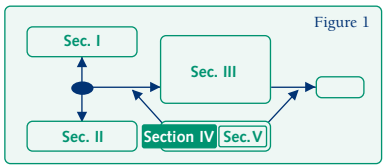
*Why has your company not linked its BPM system to its reward practices? _____

_____

26 The alignment of our reward practices with our business performance measurement system has produced the following effects…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Increased the effectiveness of our reward system	☐	☐	☐	☐	☐	☐
b	Increased the effectiveness of our BPM system	☐	☐	☐	☐	☐	☐
c	Increased the effectiveness of our performance appraisal process	☐	☐	☐	☐	☐	☐
d	Increased managers' understanding of strategic priorities	☐	☐	☐	☐	☐	☐
e	Increased managers' focus on strategic priorities	☐	☐	☐	☐	☐	☐
f	Increased number of actions that produce long-term results	☐	☐	☐	☐	☐	☐
g	Increased managers' performance (according to their appraisal)	☐	☐	☐	☐	☐	☐
h	Increased managers' focus on improvement rather than control	☐	☐	☐	☐	☐	☐
i	Increased managers' motivation	☐	☐	☐	☐	☐	☐
j	Increased managers' working hours	☐	☐	☐	☐	☐	☐
k	Induced the type of behaviours needed to achieve strategic priorities	☐	☐	☐	☐	☐	☐
l	Induced dysfunctional behaviours	☐	☐	☐	☐	☐	☐
m	Increased managers' tendency to only work for what they are being evaluated for	☐	☐	☐	☐	☐	☐
n	Increased managers' work intensity (how hard they work)	☐	☐	☐	☐	☐	☐
o	Other – please specify: _____	☐	☐	☐	☐	☐	☐

Section IV Corporate culture



27 My company is…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	People-oriented. It is like an extended family, in which people seem to share a lot of themselves	☐	☐	☐	☐	☐	☐
b	Dynamic and entrepreneurial. People are willing to take risks	☐	☐	☐	☐	☐	☐
c	Results-oriented. A major concern is reaching our targets. People are very competitive and achievement-oriented	☐	☐	☐	☐	☐	☐
d	Control and structure-oriented. Formal procedures generally govern what people do	☐	☐	☐	☐	☐	☐

28 Management style in my company is characterised by…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Teamwork, consensus, and/or participation	☐	☐	☐	☐	☐	☐
b	Individual risk-taking, innovation, freedom, and/or uniqueness	☐	☐	☐	☐	☐	☐
c	Hard-driving competitiveness, high demands, and/or achievement	☐	☐	☐	☐	☐	☐
d	Security of employment, conventionality, and/or stability in relationships	☐	☐	☐	☐	☐	☐

29 The leadership in my company is generally considered to exemplify…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Mentoring, facilitating, and/or nurturing	☐	☐	☐	☐	☐	☐
b	Entrepreneurship, innovating, and/or risk taking	☐	☐	☐	☐	☐	☐
c	A no-nonsense, aggressive, and/or results-oriented focus	☐	☐	☐	☐	☐	☐
d	Coordinating, organising, and/or smooth-running efficiency	☐	☐	☐	☐	☐	☐

30 The "glue" that holds the company together is…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Loyalty and mutual trust	☐	☐	☐	☐	☐	☐
b	Commitment to innovation and development. There is an emphasis on being on the cutting edge	☐	☐	☐	☐	☐	☐
c	Emphasis on achievement and goal accomplishment. Aggressiveness and winning are common themes	☐	☐	☐	☐	☐	☐
d	Formal rules and policies. Maintaining a smooth-running organisation is important	☐	☐	☐	☐	☐	☐

31 My company emphasises…

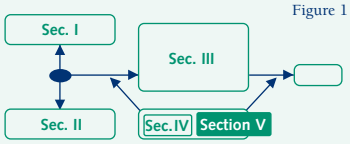
Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	Human development. High level of trust, openness, and/or participation persists	☐	☐	☐	☐	☐	☐
b	Acquiring new resources and creating new challenges. Trying new things and/or prospecting for opportunities are valued	☐	☐	☐	☐	☐	☐
c	Competitive actions and achievement. Hitting stretch targets and/or winning in the marketplace are dominant	☐	☐	☐	☐	☐	☐
d	Permanence and stability. Efficiency, control and/or smooth operations are important	☐	☐	☐	☐	☐	☐

32 My company defines success on the basis of…

Please mark **one** response for each line.		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a	The development of teamwork, employee commitment, and/or concern for people	☐	☐	☐	☐	☐	☐
b	Having the most unique or the latest products. It is a product leader and/or innovator	☐	☐	☐	☐	☐	☐
c	Winning in the market place and/or outpacing the competition. Competitive market leadership is key	☐	☐	☐	☐	☐	☐
d	Efficiency. Dependable delivery, smooth scheduling and/or low cost production are critical	☐	☐	☐	☐	☐	☐

Section V. Business strategy

Figure 1



33 My company…

- ☐ Aims to become the lowest-cost producer in our industry (i.e. cost-leadership strategy)
- ☐ Focuses on providing quality products highly valued by our customers (i.e. product-differentiation strategy)
- ☐ Focuses on providing the best total solution for our key customers' problems. The focus is on individual key customers rather than markets (i.e. customer-intimate strategy)

34 My company…

Please mark **one** response for each line.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a Responds rapidly to early signals of business opportunities in our market	☐	☐	☐	☐	☐	☐
b Has greater flexibility to respond to changes in our environment than our competitors	☐	☐	☐	☐	☐	☐
c Has the ability to adjust capacity within a short period of time	☐	☐	☐	☐	☐	☐
d Has the ability to change product or service offerings rapidly	☐	☐	☐	☐	☐	☐

35 My company…

Please mark **one** response for each line.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a Offers a larger range of products and services than our competitors	☐	☐	☐	☐	☐	☐
b Is first to market new products and services	☐	☐	☐	☐	☐	☐
c Responds rapidly to early signals of innovation opportunities in our market	☐	☐	☐	☐	☐	☐
d Expects most of our future growth in profits to come from our new product and service offerings	☐	☐	☐	☐	☐	☐

36 My company…

Please mark **one** response for each line.	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
a Is most active in developing the markets it currently serves, rather than entering new markets with our products or services	☐	☐	☐	☐	☐	☐
b Operates in markets for its products and services that are highly predictable	☐	☐	☐	☐	☐	☐
c Is more cost-efficient than its competitors	☐	☐	☐	☐	☐	☐
d Can easily forecast how actions of competitors will affect its performance	☐	☐	☐	☐	☐	☐

General information

37 **The number of people employed by my company on a full-time basis is...** (mark only one)

☐ Fewer than 500 ☐ 500 to 999 ☐ 1,000 to 2,999 ☐ 3,000 to 9,999 ☐ 10,000 or more

38 **My parent company head office is in…** (if no parent company, please mark your own)

☐ UK ☐ USA ☐ Germany ☐ France ☐ Italy ☐ Other country _____

39 **My company is a…** (mark only one)

☐ Private company
☐ Public company (quoted on the UK stock exchange)
☐ Public company (quoted on another country stock exchange)
☐ Other – please specify: _____

40 **In the last financial year reported, my company has…** (mark only one)

☐ Exceeded its financial/business performance goals
☐ Met its financial/business performance goals
☐ Fallen short of its financial/business performance goals
☐ Significantly failed to meet its financial/business performance goals

41 **Over the past year, my company has…**

☐ Downsized/restructured
☐ Grown/expanded
☐ Merged with another company
☐ Been aquired by another company
☐ Gone through other major organisational changes – please specify: _____
☐ None of the these

Any additional comments you would like to add...

_____

_____

_____

Thank you for your help.

Please return the questionnaire in the enclosed business envelope or send it directly to: Emma Harraden, Watson Wyatt LLP, 21 Tothill Street, Westminster, London SW1H 9LL. Alternatively you can fax it to Emma Harraden on 020 7222 9182.

If you would like to receive a copy of a recent article about the topic of our survey please tick here and ensure you have given us your email address ☐

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 September 2003 Ref: RWD1671

APPENDIX D: LIST OF COMPANIES INCLUDED IN FINAL SAMPLE

	Company name
1.	3I PLC
2.	3M UNITED KINGDOM PUBLIC LIMITED COMPANY
3.	AKER KVAERNER ENGINEERING SERVICES LIMITED
4.	ALFRED MCALPINE PLC
5.	ALLIANZ MARINE (UK) LIMITED
6.	ALSTEC GROUP LIMITED
7.	AMEY PLC
8.	ANDREW WEIR & COMPANY LIMITED
9.	ANTALIS LIMITED
10.	ARCADIA GROUP BRANDS LIMITED
11.	ARGOS LIMITED
12.	ASTRAZENECA PLC
13.	ATOS ORIGIN IT SERVICES UK LIMITED
14.	AUTOGLASS LIMITED
15.	AVENTIS PHARMA LIMITED
16.	AVERY BERKEL LIMITED
17.	AVERY WEIGH-TRONIX HOLDINGS LIMITED
18.	AVIVA PLC
19.	AWE PLC
20.	BAA LIMITED
21.	BAE SYSTEMS (OPERATIONS) LIMITED
22.	BAILLIE GIFFORD & CO LIMITED
23.	BG GROUP PLC
24.	BLACKROCK INTERNATIONAL, LTD.
25.	BORAX EUROPE LIMITED
26.	BPB PUBLIC LIMITED COMPANY
27.	BRIDGESTONE UK LIMITED
28.	BRISTOL & WEST PLC
29.	BRITANNIA GROUP LIMITED
30.	BRITANNIA REFINED METALS LIMITED
31.	BRITISH NUCLEAR GROUP SELLAFIELD LIMITED
32.	BT GROUP PLC
33.	CABLE AND WIRELESS PUBLIC LIMITED COMPANY
34.	CAPITAL ONE BANK (EUROPE) PLC
35.	CARILLION PLC
36.	CARLSON MARKETING GROUP (UK) LIMITED
37.	CENTRICA PLC
38.	CLIFFORD CHANCE LONDON LIMITED
39.	COATS HOLDINGS LTD
40.	COLORCON LIMITED
41.	DE LA RUE PLC

	Company name
42.	DRS DATA AND RESEARCH SERVICES PUBLIC LIMITED COMPANY
43.	DUNFERMLINE BUILDING SOCIETY
44.	EDF ENERGY PLC
45.	ELAN CORPORATION PUBLIC LIMITED COMPANY
46.	EMERALD GROUP PUBLISHING LIMITED
47.	EXEL LIMITED
48.	FIRST DATA MOBILE HOLDINGS LIMITED
49.	FOSECO HOLDING LIMITED
50.	GARTNER U.K. LIMITED
51.	GLAXOSMITHKLINE PLC
52.	GUARDIAN MEDIA GROUP PLC
53.	HALIFAX PLC
54.	HFC BANK LIMITED
55.	IMPERIAL TOBACCO GROUP PLC
56.	INSTRON LIMITED
57.	INTELLECTUAL CAPITAL SERVICES LIMITED
58.	INTENTIA (UK) LIMITED
59.	INTERCONTINENTAL HOTELS LIMITED
60.	ITNET LIMITED
61.	JOSIAH WEDGWOOD & SONS LIMITED
62.	KINGSTON COMMUNICATIONS (HULL) PLC
63.	LADBROKES BETTING & GAMING LIMITED
64.	LAND ROVER
65.	LANIER UNITED KINGDOM LIMITED
66.	LINX PRINTING TECHNOLOGIES LIMITED
67.	LLOYD'S REGISTER QUALITY ASSURANCE LIMITED
68.	LLOYDS TSB GROUP PLC
69.	LONDON STOCK EXCHANGE PLC
70.	MARS U.K. LIMITED
71.	MARSH LIMITED
72.	MARSHALL OF CAMBRIDGE (HOLDINGS) LIMITED
73.	MASTERLEASE LIMITED
74.	MCCAIN FOODS (GB) LIMITED
75.	MCCORMICK (UK) LIMITED
76.	MILLER INSURANCE SERVICES LIMITED
77.	MOTABILITY FINANCE LIMITED
78.	NACCO MATERIALS HANDLING LIMITED
79.	NATIONAL GRID PLC
80.	NATIONAL HOUSE-BUILDING COUNCIL
81.	NEWELL & BUDGE LIMITED
82.	NORWICH & PETERBOROUGH BUILDING SOCIETY
83.	NZMP (AEM) LIMITED
84.	OIL STATES INDUSTRIES (UK) LIMITED
85.	OKI EUROPE LIMITED
86.	OOCL (UK) LIMITED
87.	OXOID LIMITED
88.	PA CONSULTING SERVICES LIMITED

	Company name
89.	PREMIER FARNELL PLC
90.	QAD EUROPE LIMITED
91.	QEK GLOBAL SOLUTIONS (UK) LTD
92.	RHODIA UK LIMITED
93.	RICARDO PLC
94.	ROYAL DUTCH SHELL PLC
95.	ROYAL LIVER INSURANCE SERVICES LIMITED
96.	ROYAL LONDON MUTUAL INSURANCE SOCIETY LIMITED (THE)
97.	SAFEWAY STORES LIMITED
98.	SAITEK PLC
99.	SANOFI-SYNTHELABO LIMITED
100.	SAS SOFTWARE LIMITED
101.	SCHERING HEALTH CARE LIMITED
102.	SCHRODERS PLC
103.	SCOTT WILSON LTD
104.	SCOTTISH & NEWCASTLE PLC
105.	SCOTTISH WIDOWS PLC
106.	SERCO GROUP PLC
107.	SHELL (UK) LIMITED
108.	SIEMENS VAI METALS TECHNOLOGIES LIMITED
109.	SMG PLC
110.	SMITH & NEPHEW PLC
111.	SONY ERICSSON MOBILE COMMUNICATIONS MANAGEMENT LIMITED
112.	STAGECOACH GROUP PLC
113.	TAMDOWN REGENERATION LIMITED
114.	TELEWEST COMMUNICATIONS GROUP LIMITED
115.	THE BANK OF NEW YORK EUROPE LIMITED
116.	THE IMAGINATION GROUP LIMITED
117.	THE ROYAL BANK OF SCOTLAND PUBLIC LIMITED COMPANY
118.	THE SAGE GROUP PLC
119.	TOTAL E&P UK PLC
120.	UNUM LIMITED
121.	VISA MANAGEMENT SERVICES LIMITED
122.	VOLVO CAR UK LIMITED
123.	WATSON WYATT LIMITED
124.	WEDGE GROUP GALVANIZING LIMITED
125.	WESSEX WATER LIMITED
126.	WEST BROMWICH BUILDING SOCIETY
127.	WESTBURY LIMITED
128.	WILLIAM JACKSON & SON LIMITED
129.	WOOLWORTHS GROUP PLC
130.	WS ATKINS PLC

***** Two respondents did not disclose the names of their companies (these have been labelled ‘unknown 1’ and ‘unknown 2’ in the data set).

List of companies excluded from final sample

	Company name
1.	BELRON UK
2.	BP PLC
3.	CO-OPERATIVE GROUP (CWS) LIMITED
4.	GKN PLC
5.	GRAMPIAN COUNTRY FOOD GROUP LIMITED
6.	I.T. WORLD SERVICES LIMITED
7.	IMPERIAL CHEMICAL INDUSTRIES PLC
8.	NATIONWIDE INVESTMENT GROUP LIMITED
9.	NORTHUMBRIAN WATER LIMITED
10.	NOVO NORDISK LIMITED
11.	RWE NPOWER PLC
12.	SODEXHO LIMITED
13.	STUDENT LOANS COMPANY LIMITED
14.	VODAFONE PLC

APPENDIX E: FINAL SAMPLE CLASSIFIED BY INDUSTRY

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
(1)	Agriculture, hunting, forestry, fishing, mining and quarrying	1110	Extraction of crude petroleum and natural gas	BG GROUP PLC
(1)	Agriculture, hunting, forestry, fishing, mining and quarrying	1120	Service activities incidental to oil and gas extraction excluding surveying	OIL STATES INDUSTRIES (UK) LIMITED
(1)	Agriculture, hunting, forestry, fishing, mining and quarrying	1110	Extraction of crude petroleum and natural gas	ROYAL DUTCH SHELL PLC
(1)	Agriculture, hunting, forestry, fishing, mining and quarrying	1110	Extraction of crude petroleum and natural gas	SHELL (UK) LIMITED
(1)	Agriculture, hunting, forestry, fishing, mining and quarrying	1110	Extraction of crude petroleum and natural gas	TOTAL E&P UK PLC
(6)	Financial intermediation, real estate, renting, and business administration	6601	Life insurance	UNUM LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6523	Other financial intermediation not elsewhere classified	3I PLC
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	AKER KVAERNER ENGINEERING SERVICES LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6603	Non-life insurance	ALLIANZ MARINE (UK) LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	ALSTEC GROUP LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7415	Holding companies including head Offices	ATOS ORIGIN IT SERVICES UK LIMITED
(6)	Financial intermediation, real estate, renting,	6601	Life insurance	AVIVA PLC

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
	and business administration			
(6)	Financial intermediation, real estate, renting, and business administration	7522	Defence activities	AWE PLC
(6)	Financial intermediation, real estate, renting, and business administration	6523	Other financial intermediation not elsewhere classified	BAILLIE GIFFORD & CO LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6523	Other financial intermediation not elsewhere classified	BLACKROCK INTERNATIONAL, LTD.
(6)	Financial intermediation, real estate, renting, and business administration	6511	Central banking	BRISTOL & WEST PLC
(6)	Financial intermediation, real estate, renting, and business administration	6511	Central banking	CAPITAL ONE BANK (EUROPE) PLC
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	CARLSON MARKETING GROUP (U.K.) LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	CLIFFORD CHANCE LONDON LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	-	-	DUNFERMLINE BUILDING SOCIETY
(6)	Financial intermediation, real estate, renting, and business administration	7200	Computer and related activities	FIRST DATA MOBILE HOLDINGS LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7415	Holding companies including head offices	FOSECO HOLDING LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6512	Other monetary intermediation	HALIFAX PLC
(6)	Financial intermediation, real estate, renting, and business administration	6512	Other monetary intermediation	HFC BANK LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	9305	Other service activities not elsewhere classified	INTELLECTUAL CAPITAL SERVICES LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7222	Other software consultancy and supply	INTENTIA (UK) LIMITED
(6)	Financial intermediation, real estate, renting,	7260	Other computer related activities	ITNET LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
	and business administration			
(6)	Financial intermediation, real estate, renting, and business administration	9271	Gambling and betting activities	LADBROKES BETTING & GAMING LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	LLOYD'S REGISTER QUALITY ASSURANCE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6512	Other monetary intermediation	LLOYDS TSB GROUP PLC
(6)	Financial intermediation, real estate, renting, and business administration	6711	Administration of financial markets	LONDON STOCK EXCHANGE PLC
(6)	Financial intermediation, real estate, renting, and business administration	6603	Non-life insurance	MARSH LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6603	Non-life insurance	MILLER INSURANCE SERVICES LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6521	Financial leasing	MOTABILITY FINANCE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6603	Non-life insurance	NATIONAL HOUSE-BUILDING COUNCIL
(6)	Financial intermediation, real estate, renting, and business administration	7222	Other software consultancy and supply	NEWELL & BUDGE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	-	-	NORWICH & PETERBOROUGH BUILDING SOCIETY
(6)	Financial intermediation, real estate, renting, and business administration	7414	Business and management consultancy activities	PA CONSULTING SERVICES LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7222	Other software consultancy and supply	QAD EUROPE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7420	Architectural and engineering activities and related technical consultancy	RICARDO PLC
(6)	Financial intermediation, real estate, renting, and business administration	6603	Non-life insurance	ROYAL LIVER INSURANCE SERVICES LIMITED
(6)	Financial intermediation, real estate, renting,	6601	Life insurance	ROYAL LONDON MUTUAL INSURANCE

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
	and business administration			SOCIETY LIMITED (THE)
(6)	Financial intermediation, real estate, renting, and business administration	7222	Other software consultancy and supply	SAS SOFTWARE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	SCHERING HEALTH CARE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6712	Security broking and fund management	SCHRODERS PLC
(6)	Financial intermediation, real estate, renting, and business administration	7420	Architectural and engineering activities and related technical consultancy	SCOTT WILSON LTD
(6)	Financial intermediation, real estate, renting, and business administration	6601	Life insurance	SCOTTISH WIDOWS PLC
(6)	Financial intermediation, real estate, renting, and business administration	7414	Business and management consultancy activities	SERCO GROUP PLC
(6)	Financial intermediation, real estate, renting, and business administration	9220	Radio and television activities	SMG PLC
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	SONY ERICSSON MOBILE COMMUNICATIONS MANAGEMENT LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6523	Other financial intermediation not elsewhere classified	THE BANK OF NEW YORK EUROPE LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7414	Business and management consultancy activities	THE IMAGINATION GROUP LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	6713	Activities auxiliary to financial intermediation not elsewhere classified	THE ROYAL BANK OF SCOTLAND PUBLIC LIMITED COMPANY
(6)	Financial intermediation, real estate, renting, and business administration	7222	Other software consultancy and supply	THE SAGE GROUP PLC
(6)	Financial intermediation, real estate, renting, and business administration	-	-	VISA MANAGEMENT SERVICES LIMITED
(6)	Financial intermediation, real estate, renting, and business administration	7487	Other business activities not elsewhere classified	WATSON WYATT LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
(6)	Financial intermediation, real estate, renting, and business administration	-	-	WEST BROMWICH BUILDING SOCIETY
(6)	Financial intermediation, real estate, renting, and business administration	7420	Architectural and engineering activities and related technical consultancy	WS ATKINS PLC
(2)	Manufacturing	3663	Other manufacturing not elsewhere classified	3M UNITED KINGDOM PUBLIC LIMITED COMPANY
(2)	Manufacturing	2441	Manufacture of basic pharmaceutical products	ASTRAZENECA PLC
(2)	Manufacturing	2924	Manufacture of other general purpose machinery not elsewhere classified	AVERY BERKEL LIMITED
(2)	Manufacturing	2924	Manufacture of other general purpose machinery not elsewhere classified	AVERY WEIGH-TRONIX HOLDINGS LIMITED
(2)	Manufacturing	2960	Manufacture of weapons and ammunition	BAE SYSTEMS (OPERATIONS) LIMITED
(2)	Manufacturing	2662	Manufacture of plaster products for construction purposes	BPB PUBLIC LIMITED COMPANY
(2)	Manufacturing	2741	Precious metals production	BRITANNIA REFINED METALS LIMITED
(2)	Manufacturing	1716	Manufacturing of sewing threads	COATS HOLDINGS LTD
(2)	Manufacturing	2441	Manufacture of basic pharmaceutical products	COLORCON LIMITED
(2)	Manufacturing	2222	Printing not elsewhere classified	DE LA RUE PLC
(2)	Manufacturing	3002	Manufacture of computers and other information processing equipment	DRS DATA AND RESEARCH SERVICES PUBLIC LIMITED COMPANY
(2)	Manufacturing	2441	Manufacture of basic pharmaceutical products	ELAN CORPORATION PUBLIC LIMITED COMPANY
(2)	Manufacturing	2213	Publishing of journals and periodicals	EMERALD GROUP PUBLISHING LIMITED
(2)	Manufacturing	7222	Other software consultancy and supply	GARTNER UK LIMITED
(2)	Manufacturing	2442	Manufacture of pharmaceutical preparations	GLAXOSMITHKLINE PLC
(2)	Manufacturing	2212	Publishing of newspapers	GUARDIAN MEDIA GROUP PLC
(2)	Manufacturing	1600	Manufacture of tobacco products	IMPERIAL TOBACCO GROUP PLC
(2)	Manufacturing	3320	Manufacture of instruments and appliances for measuring, checking, testing, navigating and	INSTRON LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
			other purposes, except industrial process control equipment	
(2)	Manufacturing	2625	Manufacture of other ceramic products	JOSIAH WEDGWOOD & SONS LIMITED
(2)	Manufacturing	3410	Manufacture of motor vehicles	LAND ROVER
(2)	Manufacturing	2956	Manufacture of other special purpose machinery not elsewhere classified	LINX PRINTING TECHNOLOGIES LIMITED
(2)	Manufacturing	1584	Manufacture of cocoa; chocolate and sugar confectionery	MARS UK LIMITED
(2)	Manufacturing	3530	Manufacture of aircraft and spacecraft	MARSHALL OF CAMBRIDGE (HOLDINGS) LIMITED
(2)	Manufacturing	1533	Processing and preserving of fruit and vegetables not elsewhere classified	MCCAIN FOODS (GB) LIMITED
(2)	Manufacturing	2922	Manufacture of lifting and handling equipment	NACCO MATERIALS HANDLING LIMITED
(2)	Manufacturing	3663	Other manufacturing not elsewhere classified	OXOID LIMITED
(2)	Manufacturing	2466	Manufacture of other chemical products not elsewhere classified	RHODIA UK LIMITED
(2)	Manufacturing	2441	Manufacture of basic pharmaceutical products	SANOFI-SYNTHELABO LIMITED
(2)	Manufacturing	1596	Manufacture of beer	SCOTTISH & NEWCASTLE PLC
(2)	Manufacturing	2852	General mechanical engineering	SIEMENS VAI METALS TECHNOLOGIES LIMITED
(2)	Manufacturing	2441	Manufacture of basic pharmaceutical products	SMITH & NEPHEW PLC
(2)	Manufacturing	2875	Manufacture of other fabricated metal products not elsewhere classified	WEDGE GROUP GALVANIZING LIMITED
(2)	Manufacturing	1589	Manufacture of other food products not elsewhere classified	WILLIAM JACKSON & SON LIMITED
(5)	Transport and storage	6110	Sea and coastal water transport	ANDREW WEIR & COMPANY LIMITED
(5)	Transport and storage	6323	Other supporting air transport activities	BAA LIMITED
(5)	Transport and storage	6420	Telecommunications	BT GROUP PLC
(5)	Transport and storage	6420	Telecommunications	CABLE AND WIRELESS PUBLIC LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
				COMPANY
(5)	Transport and storage	6024	Freight transport by road	EXEL LIMITED
(5)	Transport and storage	6420	Telecommunications	KINGSTON COMMUNICATIONS (HULL) PLC
(5)	Transport and storage	6340	Activities of other transport agencies	OOCL (UK) LIMITED
(5)	Transport and storage	6021	Other scheduled passenger land transport	STAGECOACH GROUP PLC
(5)	Transport and storage	6420	Telecommunications	TELEWEST COMMUNICATIONS GROUP LIMITED
(3)	Utilities and construction	4521	General construction of buildings and civil engineering works	ALFRED MCALPINE PLC
(3)	Utilities and construction	4521	General construction of buildings and civil engineering works	AMEY PLC
(3)	Utilities and construction	4521	General construction of buildings and civil engineering works	BRITANNIA GROUP LIMITED
(3)	Utilities and construction	4011	Production of electricity	BRITISH NUCLEAR GROUP SELLAFIELD LIMITED
(3)	Utilities and construction	4521	General construction of buildings and civil engineering works	CARILLION PLC
(3)	Utilities and construction	4021	Manufacture of gas	CENTRICA PLC
(3)	Utilities and construction	4011	Production of electricity	EDF ENERGY PLC
(3)	Utilities and construction	4011	Production of electricity	NATIONAL GRID PLC
(3)	Utilities and construction	4525	Other construction work involving special trades	TAMDOWN REGENERATION LIMITED
(3)	Utilities and construction	4100	Collection, purification and distribution of water	WESSEX WATER LIMITED
(3)	Utilities and construction	4521	General construction of buildings and civil engineering works	WESTBURY LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5190	Other wholesale	ANTALIS LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5242	Retail sale of clothing	ARCADIA GROUP BRANDS LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5212	Other retail sale in non-specialised stores	ARGOS LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5020	Maintenance and repair of motor vehicles	AUTOGLASS LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5146	Wholesale of pharmaceutical goods	AVENTIS PHARMA LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5190	Other wholesale	BORAX EUROPE LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5190	Other wholesale	BRIDGESTONE UK LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5510	Hotels	INTERCONTINENTAL HOTELS LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5184	Wholesale of computers, computer peripheral equipment and software	LANIER UNITED KINGDOM LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5010	Sale of motor vehicles	MASTERLEASE LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5139	Non-specialised wholesale of food , beverages and tobacco	MCCORMICK (UK) LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5133	Wholesale of dairy produce, eggs and edible oils and fats	NZMP (AEM) LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5143	Wholesale of electrical household appliances and radio and television goods	OKI EUROPE LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5186	Wholesale of other electronic parts and equipment	PREMIER FARNELL PLC
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5020	Maintenance and repair of motor vehicles	QEK GLOBAL SOLUTIONS (UK) LTD
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5211	Retail sale in non-specialised stores with food, beverages or tobacco predominating	SAFEWAY STORES LIMITED

EUROSTAT category description		UK SIC code and description (from FAME)		Final sample of companies
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5143	Wholesale of electrical household appliances and radio and television goods	SAITEK PLC
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5010	Sale of motor vehicles	VOLVO CAR UK LIMITED
(4)	Wholesales, retail trade, repairs, hotels and restaurants	5248	Other retail sale in specialised stores	WOOLWORTHS GROUP PLC

* Two respondents did not disclose the names of their companies (these have been labelled ‘unknown 1’ and ‘unknown 2’ in the data set).