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A comparative empirical investigation of Business Excellence Models in the Kingdom of Saudi Arabia

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by

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Abstract

Business excellence theorising has produced more than 100 business excellence models (BEMs). They can be divided (according to their context of development and application) into two broad groups: a) *universal* (e.g., the Malcolm Baldrige National Quality Award – MBNQA, and the European Foundation for Quality Management – EFQM models) and b) *country-specific* (e.g., the King Abdul Aziz Quality Award – KAQA model, i.e., the Saudi Arabia BEM).

The literature is scarce and inconclusive as to the suitability/applicability of different BEMs. This is partly due to the lack of comparative and comprehensive studies (i.e., pursuing both conceptual and empirical comparisons) and robust methodological frameworks.

Therefore, the key research question of this thesis: is the MBNQA and EFQM or the KAQA BEM better suited in the Saudi Arabia context? and which of these models' criteria is critical in influencing other criteria? Moreover, given the elevated emphasis in the literature of contextual factors (like strategic orientation and industry type), the key research question is complemented with a supplementary one concerning the effects these potential moderating factors may have in the (better suited-) BEM relations.

To answer the above, the three BEMs are conceptually and comparatively investigated using a purposively developed methodological framework comprising a range of methods (e.g., structural equation modelling) and primary data from a survey of 233 firms in Saudi Arabia. The results are interpreted in light of the factors that underpin the differences between BEMs, indicating: 1) the KAQA BEM superiority and 2) the key role of leadership, strategic planning, and operations management in BEM relations. Significant differences in the KAQA relations are identified due to strategic orientation except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners, but not due to industry type except for the links between strategic planning and suppliers and partners, operations management, and focusing on beneficiary constructs.

Theoretical, methodological, policy, and practice contributions are developed on the basis of the above findings. Extant theorising concerning the suitability of the MBNQA, EFQM, KAQA BEMs is tested and extended, while the role of key criteria and moderating factors (namely, strategic orientation) are clarified. Enhancements to the studied BEMs are also suggested. The comparative and comprehensive methodological framework to test BEMs and to explain BEM-construct interrelations contributes to advancing from description to inference. Last, but not least, at the policy and practice levels, mechanisms for developing and/or reviewing BEMs are provided along with recommendations concerning considering local conditions in practising business excellence and the differentiating effects of contextual factors.

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Dedication

My Parents
Hamdan & Faidha Alanazi

My Wife
Reem Alanzey

My Children
Abdullah, Abdulrahman, Sarah, Abdulaziz & Asma

Academic works associated with the thesis

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List of Abbreviations

ADF	Asymptotically Distribution Free
AGFI	Adjusted Goodness of Fit
AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
AVISC	Average Interscale Correlation
BBNFI	Bentler–Bonett Normed Fit Index
BEM	Business Excellence Model
CBSEM	Covariance-Based Structural Equation Modelling
CCA	Canonical Correlation Analysis
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Measure
CI	Confidence Interval
CMV	Common Method Variance
COV	Cut-Off Value
CR	Composite Reliability
D^2	Mahalanobis Distance Measure
Df	Degree of Freedom
EFA	Exploratory Factor Analysis
EFQM	the European Foundation for Quality Management
EM	Expectation Maximisation
GFI	Goodness-of-Fit Index
GLS	Generalized Least Square
GOF	Goodness-of-Fit
IFI	Incremental Fit Index
KAQA	the King Abdul Aziz Quality Award
LISREL	Linear Structural Relations
MAKM	Measurement, Analysis and Knowledge Management
MAR	Missing At Random
MBNQA	the Malcolm Baldrige National Quality Award
MCAR	Missing Completely at Random
MI	Modification Indices
ML	Maximum Likelihood
MLE	Maximum Likelihood Estimation
MVA	Missing Value Analysis
N	Sample size
n.s.	not significant
NFI	Normed Fit Index
NNFI	Non-Normed Fit Index
NQA	National Quality Award
OLS	Ordinary Least Square
PCFI	Parsimony Comparative Fit Index
PLS	Partial Least Squares
PLS-SEM	Partial Least Squares-Structural Equation Modelling
PNFI	Parsimony Normal Fit Index
R^2	Squared factor loading
RMSEA	Root Mean Square Error of Approximation
S.D.	Standard Deviation
S.E.	Standard Error
SAS	Statistical Analysis System
SEM	Structural Equation Modelling
Sig.	statistical significance
SPSS	Statistical Package for Social Sciences
SRMR	Standardised Root Mean Square Residual
TQM	Total Quality Management
ULS	Unweighted Least Square
US	United States
VIF	Variance Inflation Factor
WLS	Weighted Least Square
α	Cronbach's Alpha
χ^2	Chi-square

Chapter One: Introduction

1.1 Research background

Since the establishment of the Malcolm Baldrige National Quality Award[1] (MBNQA) model and the European Foundation for Quality Management (EFQM) model in 1987 and 1994, respectively, these models have been transformed from means for identifying and promoting exemplary quality management practices, to comprehensive world-class performance frameworks; widely used as models for improvement (Badri et al., 2006; Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Talwar, 2011; Wilson & Collier, 2000). Additionally, they have often been viewed as embodiments of total quality management (TQM) principles (Bou-Llusar et al., 2009; Prajogo & Sohal, 2006). Thus, these models serve as the most appropriate for adoption as approaches in which TQM can be depicted and assessed (Bou-Llusar et al., 2005; Curkovic et al., 2000). The success of these models in developing the performance and competitiveness of companies in their originating territories has drawn much attention. As a result, they have become the most frequently adopted business excellence models (BEMs) worldwide as generic/universal models (EFQM, 2013; Karimi et al., 2013; Lee & Lee, 2013; NIST, 2015; Talwar, 2011; Tan, 2002).

These models have also influenced the development of comparable awards and models in many other countries in response to their specific local conditions (Lee & Lee, 2013; Mohammad & Mann, 2010; Talwar, 2011). In contradistinction to the aforementioned generic or universal BEMs and awards, these will be referred to hereafter as country-specific.

[1] Quality award model and business excellence model are used in this study interchangeably, following the example of previous literature (e.g., Talwar, 2011).

The National Institute of Standards and Technology (NIST), for example, reported that: "Globally, about 100 performance or business excellence programmes exist; most use the Baldrige framework or a derivative as their organisational excellence model" (2015: iv). One of the latest additions is the King Abdul Aziz Quality Award (KAQA); i.e. a country-specific BEM benchmark whose development has been influenced by both the MBNQA and EFQM models, albeit with a greater influence of the latter.

The availability of alternative BEMs necessitates difficult choices for practitioners and policy makers. As it is not always clear which BEM should be preferred or better fits a particular context (e.g., MBNQA or KAQA). This is particularly true in contexts that differ substantially from the original context of BEM development. For example, in some contexts (e.g., India, Malaysia and Sweden), more than one model is adopted (Lee & Lee, 2013; Mohammad & Mann, 2010). In a similar vein, in some European countries, the MBNQA model is adopted rather than the EFQM model (Mavroidis et al., 2007).

Although several elaborations regarding the validity and development of different BEMs can be found in the literature (e.g., Badri et al., 2006; Calvo-Mora et al., 2005; Meyer & Collier, 2001; Moon et al., 2011; Peng & Prybutok, 2015), there is a scarcity of empirical studies showing the suitability/applicability of different BEMs.

Therefore, this study aims to fill this gap by investigating the suitability/applicability of different BEMs. In particular, this research seeks to understand conceptual differences between three BEMs (MBNQA, EFQM, and KAQA) and their empirically suitability/applicability from a comparative perspective. Adopting a comparative perspective for testing BEMs is invaluable, theoretically, conceptually, methodologically, and practically.

Starting with the *theoretical* and *conceptual* aspects, a comparative perspective affords several compelling benefits. First, given the global interest in adopting the MBNQA and EFQM models (Lee & Lee, 2013; Mohammad & Mann, 2010; NIST, 2015) one may mistakenly assume that they can be readily transferred across countries. Their wide acclaim (Flynn & Saladin, 2001; La Rotta & Pérez Rave, 2016; NIST, 2015), has produced a lot of hype concerning their success in improving performance and competitiveness (Bou-Llusar et al., 2009; Karimi et al., 2013; Lee & Lee, 2013; Talwar, 2011; Tan, 2002), along with their institutionalisation as international BEMs (e.g., EFQM model). Their regular reviewing also brought a high and universal profile as best TQM practice (EFQM, 2013; NIST, 2015; Voss, 1995), along with claims of suitability in economies that differ significantly from the national characteristics associated with these models (e.g., Badri et al., 2006; He et al., 2011). Nonetheless, some studies found evidence that it is necessary to develop BEMs that are tailored to national characteristics (Flynn & Saladin, 2006), arguing that country-specific models are better suited to their intended contexts (Moon et al., 2011; Santos et al., 2016; Su et al., 2003; Xiang et al., 2010). Thus, reports concerning the suitability/applicability[2] of these different BEMs tend to be conflicting. Through comparing the MBNQA, EFQM, and KAQA models, a stronger theoretical grounding for the applicability of BEMs is provided.

Second, there are differences among these BEMs in terms of criteria, dimensions, suggested relationships and emphasis (see Tables 2.1 and 2.2 and Figures 2.5 to 2.8) that tend to be driven by local and global factors, e.g., national culture, and international standards and practices (Flynn & Saladin, 2006; Oger & Platt, 2002; Tan,

[2] Suitability, applicability, and fit are used interchangeably in this study.

2002). Although extant studies have shown the validity of different BEMs (e.g., Bou-Llusar et al., 2009; Meyer & Collier, 2001), insufficient attention has been paid to analysing the differences among BEMs empirically and/or confirming the applicability of these differences (La Rotta & Pérez Rave, 2016; Talwar, 2011). Studies tend to concentrate on a single model (e.g., Badri et al., 2006; Bou-Llusar et al., 2005; Gómez Gómez et al., 2011; Karimi et al., 2013; Meyer & Collier, 2001; Pannirselvam et al., 1998; Santos-Vijande & Alvarez-Gonzalez, 2007), or the evolution of a particular BEM (Flynn & Saladin, 2001). Some use a single theoretical framework for different measurement items (focusing on the measurement model level) while lacking in testing the overall model quality; i.e., assessing fit (Jayamaha et al., 2009). There is also a predominance of comparative studies of a descriptive, as opposed to theory testing nature (e.g., Lee & Lee, 2013; Talwar, 2011; Xie et al., 1998). Noticeably, quality practice and performance excellence may mean more to quality managers than the constructs used for modelling the specific criteria. It is possible that other relevant excellence criteria may need to be present in any survey instrument in order to embody perceptions of the excellence concept more fully (Schniederjans et al., 2006).

Third, and more specifically, some ambiguities still remain regarding internal consistency and the causal relationships between BEM criteria (Bou-Llusar et al., 2005; Karimi et al., 2013); further discussed in section 2.5. Moreover, with the exception of few studies (Calvo-Mora et al., 2005; Peng & Prybutok, 2015), indirect causal effects suggested by BEMs as a systems approach and integrated mechanism (NIST, 2015) have largely been ignored. For example, in addition to leadership, "measurement, analysis, and knowledge management" (MAKM), processes, and strategic planning are critical constructs for the MBNQA, EFQM, and KAQA models, respectively, in particular concerning their mediating role (as further discussed in section 2.3), i.e., the model emphasis (Dror, 2008; KAQA, 2011; Uygur & Sümerli, 2013). Previous research provides mixed results regarding which of these constructs have a more positive and/or significant influence among the enablers and results constructs (Gadenne & Sharma, 2009). Moreover, research comparing the role of these three critical constructs is lacking (Doeleman et al., 2014; La Rotta & Pérez Rave, 2016). Although previous studies analysed the role of strategic planning in BEMs (e.g., Heras-Saizarbitoria et al., 2012; Santos-Vijande & Alvarez-Gonzalez, 2007), they did not analyse the mediating effects of strategic planning on the association between leadership and the other enabler constructs in a simultaneous manner.

These ***theoretical and conceptual shortcomings could be remedied through empirical research that compares and contrasts MBNQA, EFQM, and KAQA models***. Such an approach could also afford a broader and deeper consideration of concept specifications and demonstrations, theory, measures, and organisational phenomena (Bagozzi & Phillips, 1982). Platt (1964) pointed out that the value of comparing multiple models is to create a form of strong inductive inference. That is, it could ***demonstrate empirically how BEMs differ regarding their applicability***. In this respect, leading BEM papers have asserted the need to analyse the differences and applicability of such models (Bou-Llusar et al., 2009; Meyer & Collier, 2001). As Talwar (2011: 24) aptly summarised: “The consistent increase in the number of BEMs has generated the need for a comparative study to validate empirically their effectiveness”.

Fourth, previous research has empirically analysed country-specific models based on the MBNQA outside the USA (e.g., Flynn & Saladin, 2006; Moon et al., 2011; Xiang et al., 2010). However, the literature appears to lack similar studies focusing on the EFQM model. This research gap led to a call for analysis of ***any differences between***

the EFQM model and its adaptations (Bou-Llusar et al., 2009). Insights gained from this research also help in filling this gap.

Considering the methodological benefits, the desire to examine BEMs, as complex models, has led several studies to embrace structural equation modelling (SEM) (e.g., Bou-Llusar et al., 2009; Moon et al., 2011; Santos-Vijande & Alvarez-Gonzalez, 2007; Su et al., 2003; Xiang et al., 2010). Concerning SEM in particular, Jöreskog (1993) distinguished among three strategies, which are: strictly confirmatory, model generating, and alternative models (further discussed in section 3.8.2.3). Although there has been a lack of attention to the alternative models approach (i.e., the comprehensive comparative approach pursued in this research) and its importance in the BEM literature, the alternative SEM strategy has been pursued in other fields as diverse as marketing (Chin et al., 2008), strategic management (Shook et al., 2004), operations management (Shah & Goldstein, 2006), and accounting (Henri, 2007). For example, Shah and Goldstein (2006) found that 20.3% of the studies they reviewed in operations management used this approach. Similarly, Henri (2007) survey of SEM in management accounting found that 43.9% of studies used this approach.

A desirable objective of the SEM technique is to demonstrate that a posited model shows a good approximation of real world phenomena, as represented by an observed set of data (Shah & Goldstein, 2006). As with any statistical technique, SEM benefits are gained only if it is appropriately applied (Shook et al., 2004). Thus the strictly confirmatory approach is highly limited and if the model does not work, then it does not leave the researcher any latitude (Shah & Goldstein, 2006). Moreover, the examined model is just one of several potential different models having acceptable model fits (Hair et al., 2010). The model generation approach is also trouble-prone due to the potential for high susceptibility to capitalisation on chance (MacCallum et al., 1992), abuse (Shah & Goldstein, 2006), and results that lack validity (MacCallum, 1986). An alternative models approach, however, may produce a substantially different interpretation of the data (MacCallum et al., 1993). That is, given the inability of SEM to guarantee that no other model has a better fit than the suggested model, the strictest examination of theory goes through comparing alternative models using a formalised process (Hair et al., 2010). In this manner, by each proposed model, acknowledging different structural models (e.g., (non)equivalent and (non)nested), the validity of results can be enhanced, thereby supporting a researcher's ability to develop knowledge and inform practice (Anderson & Gerbing, 1988; Chin et al., 2008; Hair et al., 2010; Shook et al., 2004). This is particularly relevant for deepening our understanding of BEMs, given their differences in terms of criteria, dimensions, suggested relationships, and emphasis. Anderson and Gerbing (1988), for example, advocated a two-stage procedure for identifying and assessing a series of nested models in which the relative fit is assessed to gather information on the model that best accounts for the covariance observed among exogenous and endogenous constructs. Furthermore, comparing multiple conceptual models is desirable when theoretical bases propose multiple plausible ways of assessing relationships, even when the models are not nested (Chin et al., 2008; Shah & Goldstein, 2006). This is because testing nested models does not guarantee that alternative theoretical models outside of the nested formulation would not represent the data more precisely (Chin et al., 2008). In their discussion of this topic, Shah and Goldstein (2006) recommend that authors compare alternative *a priori* models in order to discover the one that the observed data support best; instead of using specification searches. Shah and Goldstein pointed out that "Such practices may have a lower probability of identifying models with great fit, but they increase the alignment of modelling results with our existing knowledge and theories. Leading journals must show a willingness to publish poor fitting models for such advancement of knowledge and theory" (2006: 162). It seems that BEM studies did not benefit sufficiently from such developments, which are fully engaged with in this research.

Last but not least, from a practice standpoint, the approach pursued in this research is beneficial, since both the MBNQA and the EFQM BEMs are used internationally (Mohammad & Mann, 2010; Williams et al., 2006), and in many countries (e.g., India, Saudi Arabia, and UAE), more than one BEM is adopted (Lee & Lee, 2013; Mohammad & Mann, 2010; SASO, 2015). Organisations aiming to improve their performance should invest more of their resources and focus more of their efforts on improving the critical BEM criteria. Failure to acknowledge these criteria could lead to a lower level of effectiveness and/or success. Therefore, it is paramount to have accurate and reliable identification of what the relevant criteria maybe. However, the literature (introduced above and further discussed in Chapter 2) cannot be relied upon to advise practitioners as to which BEM they should select, what may be the key criteria, how to manage excellence practices, and/or which best practice to adopt. Moreover, the approach pursued in this thesis could aid a broader group of business excellence custodians (e.g., policy makers, consultants) to develop and/or review BEMs in more effective ways.

All of the aforementioned thematic, analytical, and practice-related issues point towards the importance of establishing a comparative and comprehensive approach for examining differences between BEMs.

Organisations also need to understand how to implement business excellence in order to achieve the maximum benefit. Failure to recognise the applicability limits of excellence practices may result in their application in contexts for which they are not suitable. Although the potential role played by contextual factors such as strategic orientation and industry type has been emphasised in business excellence practices (Calvo-Mora et al., 2015; Mohammad et al., 2011; NIST, 2015: 4-5; Sousa, 2003), little attention has been paid to the potential effects of these factors on BEM relationships (Doeleman et al., 2014; La Rotta & Pérez Rave, 2016). In particular the effects of strategic orientation have been neglected in the BEM literature (Escrig et al., 2016). Moreover, contradictory results are found on the effect of industry type on BEM relationships (Sadikoglu, 2004). These controversies suggest that there is a need for continuing research on this issue (Calvo-Mora et al., 2015). If moderating factors are taken into account, then a deeper understanding of BEMs could be obtained, increasing the explanatory power of these models.

The opportunity to address these deficiencies provided the motivation for the research reported in this thesis.

In short, the purpose of this research is to examine BEMs using a structured comparative approach that focuses on the theoretical level. That is, the level of the constructs (instead of sub-construct items) involved in two of the most established BEMs, namely the MBNQA and the EFQM models, vis-à-vis one of the latest BEM benchmarks, the KAQA model; the development of which has been influenced by both the MBNQA and EFQM models, albeit with a greater influence of the latter. These three BEMs are compared through an empirical examination and then their results are discussed in light of the factors that underpin their differences. In addition, the potential moderating effects of industry type and strategic orientation on the (better suited-) BEM relations are investigated. Having provided the background for this research, its main questions, aim and objectives are formally introduced in the following sections.

1.2. Research questions

The nexus of problems discussed so far, can be summarised with the following research questions:

Whether the KAQA model is better suited than the MBNQA and EFQM BEMs in the context of Saudi Arabia? and which of these models' criteria are critical in influencing BEM relations? In fewer words, to identify the key drivers among the enabler and results constructs of these models.

Moreover, going beyond the comparative and comprehensive study of the three BEMs, and given the important role of moderating factors in business excellence implementation, this key research question is complemented with a supplementary one investigating the effects of two potential moderating factors (namely: industry type and strategic orientation) in the resultant BEM relations, as expressed by the following question:

Do significant differences exist in the resultant BEM relations due to the firms' industry type and strategic orientation?

The research hypotheses are developed and reported in Chapter 2 (section 2.7) in order to facilitate the development of answers to the research questions.

1.3 Research aim and objectives

As highlighted in the previous section, the aim of this research is to make an original contribution to the advancement of knowledge concerning the comparative validity of NQAs/BEMs, and to gain a deeper understanding of the suitability/applicability of these models by focusing on the theoretical level, through an empirical comparative analysis of the KAQA, EFQM and MBNQA models. The accomplishment of this aim is operationalised via the following objectives:

(i) to delineate conceptually the distinctive differences between the MBNQA, the EFQM, and the KAQA models at the theoretical level;

(ii) to develop a comprehensive measurement instrument based on the content of the three targeted models;

(iii) to determine empirically which model, among the MBNQA, EFQM, and KAQA models is more suitable/applicable[3] (to the data of this research[4]); and

(iv) to examine the potential moderating effects of industry type and strategic orientation on the (better suited-) BEM relations.

1.4 Research context

Given the aforementioned background and objectives, it is perhaps anticipated that the data for this research were collected in the Kingdom of Saudi Arabia (KSA). The key characteristics of this research context and its appropriateness for the pursuit of the research aim and objectives are discussed in this section.

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[3] That is, the best model, among the studied models, for explaining the data. This model will provide a good reflection of the structure and interrelations of business excellence practices and results within the studied context according to multiple criteria. This was performed in multiple phases (discussed in section 5.3).

[4] A survey of manufacturing and service firms in KSA discussed in sections 3.7 and 5.2.7.

KSA is the largest economy in the Middle East and North Africa (MENA) region; which also translates into the largest industrial base, commercial sector, and market exchange in the region (SAIA, 2015). Also, its location offers easy and quick access to a diverse portfolio of markets straddling the Red Sea and the Arabian Gulf to the west and north.

In this regard, the role of the private sector (with its various industries) has been reflected in the development and improvement of a national economy that is driven by increasing investments in the private non-oil sector (CSC, 2013). In addition, the private sector has been instrumental in the rapid increase of shares being circulated in the Saudi capital markets; increasing the number of factories, capital, and workers; and a remarkable increase in commercial establishments registered in the country. The private sector has also participated in the integration of advanced production techniques and economic development, represented in diversifying the production base (CSC, 2013). Table 1.1 summarises some of the most relevant KSA characteristics.

The increased private sector activity added pressure for firms to improve their operations and was combined with pressures from a range of stakeholders to make business processes more efficient and competitive (CSC, 2013).

In response to these pressures, many Saudi organisations have adopted a range of improvement initiatives, such as quality management standards like ISO9000, total quality management (TQM), and BEMs (e.g., MBNQA or EFQM models) (SASO, 2015). In line with this trend, the King Abdul Aziz Quality Award (KAQA) model was launched in 2007 as a country-specific BEM to motivate the manufacturing and service sectors to adopt the principles of total quality, work towards raising quality standards and enhance their ability to compete globally (KAQA, 2011); further discussed in section 2.3.

Table 1.1 KSA key indicators

Area total (square kilometres)		2,250,000
Population (million)		30,770
Population density (person / sq. km)		15.3
Official language		Arabic
Major religion		Islam
Currency		Saudi Riyal (SAR)
Per capita GDP at current prices in 2014 (SAR)		91,703
Economic diversification indicators	Private sector's contribution to GDP at constant prices for 2014	39.5%
	Proportion of private sector growth for 2014 at constant prices	5.70%
	Proportion of non-oil exports to imports 2014	34.20%
	Growth of exports of non-oil goods for 2014	7.79%
Global competitiveness index (GCI)	GCI 2014-2015 rank	24
	Basic requirements rank	15
	Efficiency enhancers rank	33
	Innovation and sophistication factors rank	32
Culture (Hofstede (1980, 1991) dimensions)	Power distance	High
	Individualism	Low
	Masculinity	Medium
	Uncertainty avoidance	High

Source: Author, based on data from Alamri et al. (2014), Malshe et al. (2012), SAIA (2015), CDSI (2015), and Schwab and Sala-i-Martin (2015).

In the light of these characteristics, the KSA seems to provide an adequate research context to analyse the suitability/applicability of the three aforementioned BEMs. For instance, the experience with different approaches to improving quality, the diverse service and manufacturing sectors that adopted these, along with complex organisational practices shaped by many factors (e.g., national culture and international standards and practices; more on this in section 2.3).

In short, given the above and what was highlighted in the research background, this research context has the ability to foster both theoretical and practical implications for advancing our understanding of BEMs. For example, the emergence of a recently developed BEM (which has not previously been investigated[5]), and competing for adoption in the same context with the MBNQA and EFQM models that, together with the local conditions shaped its development, offers an unparalleled opportunity and a highly suited context for the pursuit of the research objectives. That is, this research context enables spanning the domain of the variability of the key independent and dependent variables in the three studied models, i.e., through comparing the three models, different structural models are acknowledged (e.g., (non)equivalent and/or (non)nested), and thus more valid and insightful results are provided.

1.5 Structure of the thesis

Following the brief introduction in this chapter of the research, including aspects related to background, research questions, aim and objectives, and context, Chapter 2 goes deeper into the need for the comprehensive and comparative approach developed in this thesis. It starts with a critical review of the literature discussing the limitations of the extant approaches that gave birth to the key research question of this thesis and the approach developed to answer it. More specifically, it presents the theoretical context, the evolution of the MBNQA, EFQM, and KAQA models and their underpinning aspects, and summarises the prior empirical studies on BEMs and the moderation conditions in their relationships. It is against this backdrop that the research hypotheses and models are introduced. Chapters 3 to 5 complement these by detailing the methodological intricacies (e.g., the research methodology, sampling

[5] In this specific research area, as summarised in Table A.2.5, few studies have focused on developing countries and it appears that there is no empirical study focusing on Arab countries and/or adapted EFQM models.

design and procedures, data analysis techniques, instrument design and operationalisation, and data analysis) of the comprehensive and comparative approach developed in this thesis; while preparing for the findings following next in Chapter 6. The latter, as introduced above, comprises a discussion of the three tested models comparatively. This is followed by a discussion on the moderating effects of strategic orientation and industry type on BEM relations. The thesis concludes in Chapter 7 with a summary of its main contributions, a critical appraisal of its limitations and areas for further research, rounding off with a discussion of the aforementioned implications and recommendations for theory, policy, and practice.

Chapter Two: Literature Review

2.1 Introduction

As presented in chapter 1, given the widespread adoption of business excellence models as TQM operational frameworks and self-assessment tools, it is important to obtain a deeper understanding of these models suitability/applicability on the basis of a comparative empirical view. This pursuit requires first their deeper understanding on the basis of the literature. This is undertaken in this chapter focusing on the history, evolution, importance and characteristics of the three studied models, followed by the factors affecting BEMs development. Next, a review and synthesis of the relevant studies in the literature are presented. Moderating conditions in BEM relationships are the subject of the following section. Building on this, the research hypotheses/questions and models are introduced.

2.2 Comprehensive approaches to organisational improvement

One widespread comprehensive approach for organisational improvement is total quality management (TQM) (Evans & Lindsay, 2014). A consensus among experts appears to define TQM as "an approach to management characterized by some guiding principles or core concepts that embody the way the organisation is expected to operate, which, when effectively linked together, will lead to high performance" (Bou-Llusar et al., 2009: 5)[6]. TQM puts emphasis on the concepts of customer satisfaction,

[6] There is an overall agreement, in this respect, about the assumptions in the concepts of TQM. The following three main points summarize these assumptions (Bou-Llusar et al., 2009): 1) The TQM core concepts can be categorised into two broad dimensions: social TQM (e.g., leadership, human resource management), and technical TQM (e.g., operations management and partnership suppliers and partners); 2) The holistic character of TQM initiatives is reflected by the interdependence among the TQM concepts, that is, their management cannot be achieved separately; 3) The best management of TQM core concepts will result in better organisational performance. The principal theoretical foundation for this relationship is based on the assumption that TQM provides great value to the customer by clarifying customers' expressed and expected needs, responsiveness to changing markets, also through enhancing the efficiency of the processes that make the product or service (Anderson et al., 1995).

employee involvement, continuous improvement and process management and involves benchmarking, product and service design, long-range thinking, and problem-solving tools (Curkovic et al., 2000; Isaksson, 2006). Because of this, it is seen as a comprehensive way to deal with a complex environment (Slack et al., 2010, p. 668).

Since the launch of TQM, the body of literature in this field has increased as the need for a systematic framework to facilitate putting TQM into practice emerged (Al-Tabbaa et al., 2013; Bou-Llusar et al., 2009; Curkovic et al., 2000; Moon et al., 2011). As a result, a number of approaches to total quality management have been developed (Al-Tabbaa et al., 2013; Bou-Llusar et al., 2009; Santos-Vijande & Alvarez-Gonzalez, 2007). These approaches can be classified into the following categories (Bou-Llusar et al., 2009; Curkovic et al., 2000; Santos-Vijande & Alvarez-Gonzalez, 2007):

1) consultant-based frameworks (e.g., Crosby, 1980; Deming, 1982; Juran & Gryna, 1993);

2) standardized frameworks such as the ISO 9000:2000 series (e.g., Kartha, 2004; Rao Tummala & Tang, 1996);

3) models based on the critical factors of TQM (e.g., Dow et al., 1999; Flynn et al., 1994; Saraph et al., 1989);

4) academic-based frameworks (e.g., Kanji's Excellence Framework (Kanji & Wallace, 2000); Oakland's Total Organisational Excellence Framework (Oakland, 2001) and the UMIST quality improvement framework (Dale et al., 2007)); and

5) quality awards / business excellence models (e.g., the Deming prize, the MBNQA and EFQM models).

The NQA/BEMs have often been considered as the best embodyments of TQM principles and concepts (Bou-Llusar et al., 2009; Prajogo & Sohal, 2006), and thus, the most suitable to be adopted as a way in which TQM can be depicted and, more importantly, assessed (Curkovic et al., 2000) in a clear and accessible language (Bou-Llusar et al., 2005; Eskildsen, 1998).

BEMs are broadly considered as a representative theory to improve traditional TQM by expanding and enhancing its narrow quality-oriented concept into a comprehensive management framework (Dean & Bowen, 1994; Kim et al., 2010; Pannirselvam et al., 1998) for world class performance, employed as models for improvement (Flynn & Saladin, 2001).

BEMs specify causes and effects, implying that certain practices will lead to various desired outcomes (Flynn & Saladin, 2001). In this regard, the MBNQA theory maintains that leadership drives the system (excellence practices) that causes the results (Badri et al., 2006; He et al., 2011; Meyer & Collier, 2001; Prybutok et al., 2011; Wilson & Collier, 2000). This has also been adopted by the EFQM model, which is premised on the assumption that leadership drives the remaining elements in the enablers[7] domain, which in turn influence the results through processes (Bou-Llusar et al., 2005; EFQM, 2013). Also, in the enablers domain, the constructs are not independent: they must be employed together and in a coordinated manner to achieve excellent results (Bou-Llusar et al., 2005; Calvo-Mora et al., 2005). Moreover, the structure of these BEMs emphasises the need to drive the activities in the organisation in a systematic manner with the intention of optimizing the results (Black & Crumley, 1997).

[7] Business excellence practice, system, and enabler are used interchangeably in this research as they all refer to what is being carried out in an organisation.

Besides the aforementioned organisational benefits accrued from BEMs as operational frameworks of TQM initiatives, BEMs also act as organising principles, focusing attention on key aspects, during organisational improvement and change efforts (Badri et al., 2006; Bou-Llusar et al., 2005; Flynn & Saladin, 2006; Kim et al., 2010; Safari et al., 2012; Talwar, 2011). For example, there is evidence that BEM implementations improve business performance, customer satisfaction, and competitive advantage (Rowland-Jones, 2012; Ruiz-Carrillo & Fernández-Ortiz, 2005; Talib et al., 2013). There are also reports of BEMs guiding changes in organisational conduct and strategy alignment with resources (Alidrisi & Mohamed, 2012; Suarez et al., 2016). BEMs thus provide systematic mechanisms to improve performance, encompassing quality, innovation, reliability, efficiency, and effectiveness (Bergquist et al., 2005; Mi Dahlgaard-Park, 2008).

Moreover, self-assessment is an additional key benefit in BEM implementation (Kim et al., 2010; Peter & Lars-Erik, 2002). That is, BEM implementations are based on self-assessment, which is defined as a holistic, systematic and regular evaluation of an organisation's actions and results cross-referenced against BEM criteria (EFQM, 2013; NIST, 2015; Porter & Tanner, 2004). Thus, BEMs provide an independent and systemic yardstick of organisational strengths as well as areas for improvement, while enabling the development, establishment, and implementation of action plans, integrated in business planning (Porter & Tanner, 2004). Therefore, BEMs allow an organisation to measure both internal and external performance (Al-Tabbaa et al., 2013; EFQM, 2013) and link what an organisation does with the results it achieves (Bou-Llusar et al., 2009). At the operational level, in addition to determining which key areas need to be managed, BEM outcomes also support managers in monitoring a range of activities in a coordinated manner (Kim et al., 2010).

2.3. The evolution of business excellence models

Business excellence can be considered as a set of principles and approaches that produce the best overall results and support a sustainable future for firms (EFQM, 2013; Escrig et al., 2016; Sampaio et al., 2012). Major business excellence models (BEMs), such as the Malcolm Baldrige National Quality Award (MBNQA) model and the European Foundation for Quality Management (EFQM) model, have been adopted by firms all over the world as generic BEMs. They exist alongside more recent country-specific BEMs; e.g., the Australian, Canadian, China, New Zealand, Singapore, and King Abdul Aziz NQAs that although not as widespread as MBNQA and EFQM have nonetheless strong national followings. This section presents the establishment, description, evolution, and comparison of the BEMs focusing on the three studied models, i.e., the two major (MBNQA and EFQM) models and the country specific (KAQA) model.

Among the BEMs, the MBNQA and the EFQM models are considered as generic/universal business excellence models (Al-Tabbaa et al., 2013; EFQM, 2013; MacKerron et al., 2003; Mohammad & Mann, 2010; Talwar, 2011).

The MBNQA model was introduced in the US in 1987 to stimulate quality awareness and practices, and to develop competitiveness by encouraging organisations to focus on quality and performance excellence (Karimi et al., 2013). It underwent seven evolutions since its inception to its 2105 version (Bemowski, 1996; Flynn & Saladin, 2001; Karimi et al., 2013; NIST, 2015; Pannirselvam et al., 1998), see figure 2.3 and Appendix A.2, Table A.2.1. Since then, it has advanced from a means of identifying and promoting exemplary quality management practices to a holistic framework for world class performance, broadly used as a model for improvement (Badri et al., 2006;

Flynn & Saladin, 2001; Wilson & Collier, 2000). To date, among many NQAs, the MBNQA is the major BEM in the world (Karimi et al., 2013; Lee & Lee, 2013; Moon et al., 2011).

Figure 2.1 The MBNQA framework
Source: NIST (2015)

The MBNQA model (figure 2.1) comprises seven criteria grouped under the leadership triad (leadership, strategy and customers), the system foundation (measurement, analysis and knowledge management- MAKM) and the results triad (workforce, operations and results), These seven criteria are split into 17 criteria items (sub-criteria), which are further broken down into 'areas to address' (NIST, 2015). The "measurement, analysis, and knowledge management" (MAKM) criterion is a unique criterion to the MBNQA model, see figure 2.5 and Table 2.1. Additionally, it is deemed the focal aspect of the MBNQA model (Dror, 2008), see figures 2.1. That is, "The system foundation (MAKM) is critical to effective management and to a fact-based, knowledge-driven system for improving performance and competitiveness" (NIST, 2015). This is shown by its suggested position in the MBNQA model (Flynn & Saladin, 2001; He et al., 2011; Jayamaha et al., 2009; Wilson & Collier, 2000), see figure 2.6.

The EFQM excellence model was the second major BEM to be developed in 1994 to recognize and promote sustainable success and to provide guidance to those seeking to achieve it (EFQM, 2013). It has experienced five evolutions since its launch to its 2013 version (EFQM, 2013; Thawani, 2013), see figure 2.3 and Appendix A.2, Table A.2.2. Nowadays, this model has clearly become one of the most applied models in Europe and the world (Bou-Llusar et al., 2009; Lee & Lee, 2013; Mohammad & Mann, 2010; Talwar, 2011; Tan, 2002).

The EFQM model encompasses nine criteria grouped under the enabler domain (comprising: leadership, people, strategy, partnerships & resources, and processes, products & services criteria) and the results domain (comprising: people results, customer results, society results, and business results) (Figure 2.2). The enablers (excellence practices) show how the organisation operates, and the results focus on the achievements to organisational stakeholders (those who have an interest in the organisation). Similarly to other BEMs, these nine criteria are divided into various sub-criteria and all sub-criteria are explained with several "guidance points" that exemplify what the organisation must do to advance in any of the criteria (Bou-Llusar et al., 2009; EFQM, 2013; Santos-Vijande & Alvarez-Gonzalez, 2007). In spite of this similarity and unlike other BEMs, the EFQM places additional emphasis on how a range of stakeholders can be targeted and their impacts measured (Bou-Llusar et al., 2005; EFQM, 2013).

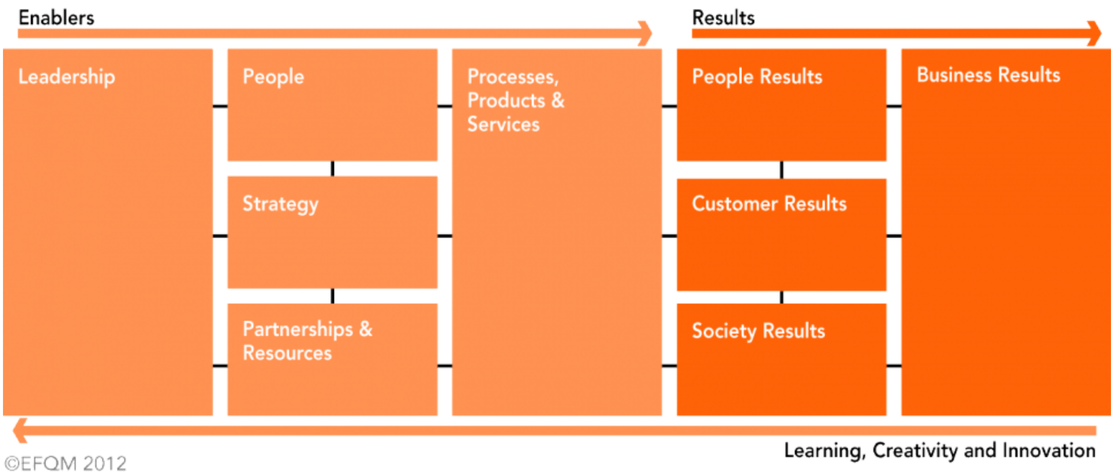

Figure 2.2 The EFQM framework
Source: EFQM (2013)

Processes is the emphasis of the EFQM framework as indicated by its position (EFQM, 2013), see figure 2.2. It is ranked the most important component among practice constructs, i.e., enabler constructs (Calvo-Mora et al., 2013; Dror, 2008; Uygur & Sümerli, 2013). Specifically, the several results constructs are conceptualised as a function of the intervening effect of processes on the association between enabler constructs and results constructs, see Figure 2.7.

The success of the MBNQA and EFQM models in developing the performance and competitiveness of companies in their respective countries has drawn much world attention. These two models have been adopted at international level (Bou-Llusar et al., 2005; Curkovic et al., 2000; Karimi et al., 2013; Xiang et al., 2010). Moreover, many countries have developed their own NQA/BEM based on these two models, i.e., country-specific BEMs (Lee & Lee, 2013; Mohammad & Mann, 2010; Talwar, 2011).

Currently, about 100 country-specific awards base their models upon the MBNQA and/or the EFQM criteria (Lee & Lee, 2013; NIST, 2015).

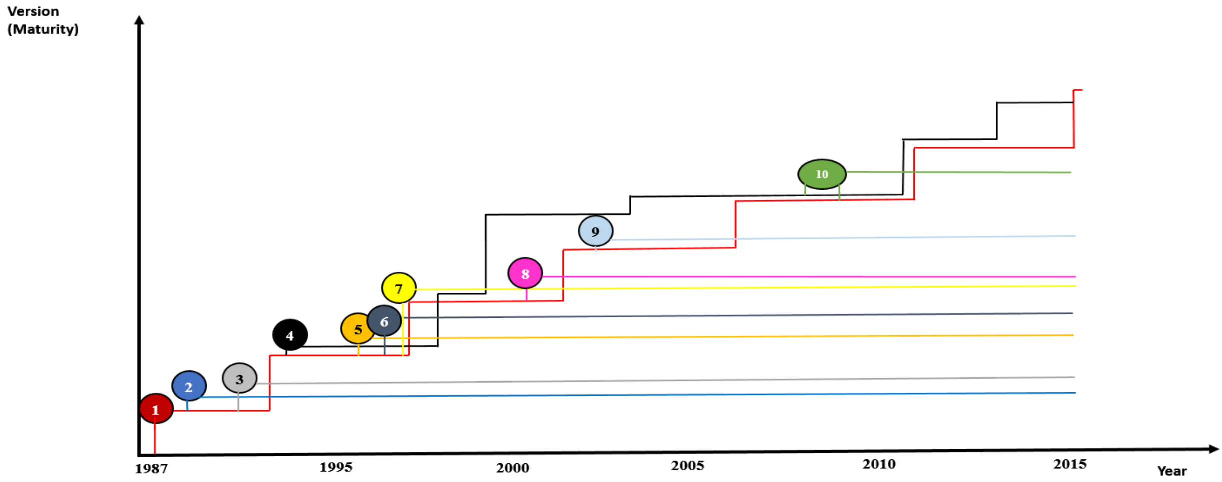

Figure 2.3 The evolution of BEMs

Source: Author creation based on (Bemowski, 1996; EFQM, 2013; Flynn & Saladin, 2001; Jayamaha et al., 2009; KAQA, 2011; Karimi et al., 2013; Moon et al., 2011; NIST, 2015; Pannirselvam et al., 1998; Su et al., 2003; Tan, 2002; Xiang et al., 2010)

Notes:
The presented BEMs are limited to the models that have been introduced and analysed in the literature. The presented evolution of each model is based on the available information. 1: (MBNQA); 2: the Australian Quality Award (AQA); 3: the Taiwan National Quality Award (TNQA) 4: (EFQM); 5: the New Zealand National Quality Award; 6: the Canadian Awards for Excellence; 7: the Korean NQA (KNQA); 8: Singapore Quality Award (SQA); 9: the China Quality Award (CQA); 10: the King Abdul Aziz Quality Award (KAQA)

In this regard, one of the most recently developed such country-specific BEMs is the King Abdul Aziz Quality Award (KAQA) model in Saudi Arabia. The KAQA model was created in 2007 to motivate the manufacturing and service sectors to adopt the principles of total quality, work to raise quality standards and keep abreast of global competition. The intention is to encourage continuous improvement in the performance of these sectors and honour the best organisations, which achieve distinctive performance and attain the highest quality levels (KAQA, 2011).

In respect of the context of the KAQA model, i.e., the Saudi Arabia cultural context, Hofstede's (1980, 1991) seminal work on national culture (four cultural dimensions) has found that Saudi culture is markedly different from those found in the USA and Western Europe cultures, partly due to the influence of Islamic traditions (Bhuian, 1998). That is, Saudi culture is a high-power distance culture, in that unequal power distribution is the essential principle on which all interactions are based and there are well-established systems wherein employees know where they stand (Bjerke & Al-Meer, 1993; Malshe et al., 2012). Further, Saudi culture is categorised by a tendency to avoid uncertainty, suggesting that this culture places emphasis on playing by the rulebook (Baker & Abu-Ismail, 1993). Additionally, Saudi culture, rather than individual gains, values the well-being and progress of the collective group (Alamri et al., 2014; Malshe et al., 2012). Taking these together, the results are that Saudi organisations emphasise using traditional systems of authority, stress common norms, and target minimisation of distinctions between organisational and individual goals (Ouchi, 1980). Further, within such a context, employees are more accepting of leaders' rules and policies (Wheeler, 2002) and an analysable environment that is under the control of the organisation is preferred (Mukherji & Hurtado, 2001). Information and learning opportunities are more likely to be restricted to high status members (Snell & Hui, 2000).

The KAQA comprises eight criteria associated with two domains: enablers and results. The enablers domain includes leadership, human resources, strategic planning, suppliers and partners, focusing on beneficiary and effect on society, whereas the results domain consists of the business results criterion (figure 2.4). These eight criteria are broken down into various sub-criteria and each sub-criterion is clarified with various "guidance points" that give requirements/ examples of what the organisations have to carry out to achieve the criteria (KAQA, 2011).

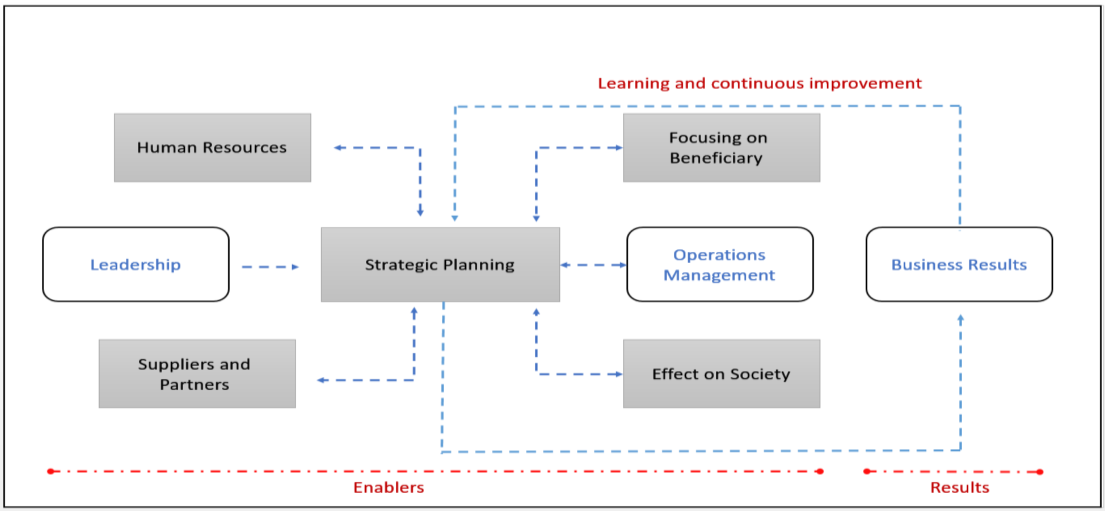

Figure 2.4 The KAQA framework
Source: KAQA (2011)

Thus, the KAQA model is built based upon the MBNQA and EFQM models bearing in mind local considerations, e.g., the cultural context and the level of experience in excellence (KAQA, 2011). For example, the model takes into account culturally desirable aspects of MBNQA and EFQM models, like the important role of leadership as a critical driver of system (excellence) practices and results (Bou-Llusar et al., 2009; Wilson & Collier, 2000). Generally, the KAQA model identifies the constructs that influence the end-results achieved by organisations, depicting the interrelations between these constructs. It is more strongly influenced by the EFQM model. For example, like the EFQM model, the KAQA model has two domains: enablers and results (EFQM, 2013; KAQA, 2011). Additionally, apart from the EFQM model's divided results criteria, its other criteria are used in the KAQA model (see Figure 2.5). However, the KAQA model has unique characteristics. It incorporates the unique constructs of the MBNQA and EFQM models (e.g., suppliers and partners, and focusing on beneficiary, respectively), and local conditions. For example, it includes the way suppliers and partners are managed by the focal organisation to attain excellence in work relations and the effective operation of processes. It focuses on the engagement of the organisation's beneficiaries in terms of its success, including determining their needs and expectations, building relationships with them, and using their information effectively. Given the local conditions (e.g., limited experience of implementing business excellence practices (see Figure 2.3) and the local culture), it has greater emphasis on the enablers domain (see its criteria weights in Table 2.1, e.g., 700 vs 550 and 500, and criterion 8 in Table 2.2). It also has a less complex/linear structure (in comparison to the MBNQA and EFQM BEMs) of interrelations between its constructs (cf. Figures 2.6, 2.7, and 2.8), relatively narrower criteria content (e.g., dimensions 4.1-4.7 in Table 2.2), and explicit consideration of local conditions (e.g., Saudization and national development – cf. dimensions 3.8 and 8.1 in Table 2.2). Moreover, it places a greater emphasis on the strategic management construct (as opposed to the MAKM and processes constructs as the focal aspects of the MBNQA and EFQM models, respectively (cf. Figures 2.6, 2.7, and 2.8). That is, as a formal part of the model process, the strategic planning and action plans guide and oversee the processes embodied in the constructs. Strategic planning improves enabler criteria and provides a company with competitive advantage over its competitors in the market (Deming, 1986; Juran, 1986; Peters, 1988). In other words, it forms a means for integrating the content of the remaining constructs and direct their management (Black & Porter, 1995; Reiner, 2002) and the choice of practices to employ should be aligned to the firm's strategy (Escrig et al., 2016). In this sense, Oakland (2011) stated that the practices and objectives of total quality management should be incorporated into the strategic plan of the firm in a systematic manner. The logic of the model is based on the fact that achieving excellent results is directly related to the leadership capacity, the strategy and its deployment through the remaining enabler criteria (Calvo-Mora et al., 2015). Although unique in how strategic planning is modelled in KAQA, its significant role in the initiation and development of change toward business excellence seems well accepted in the wider literature (Pfeifer et al., 2005); while the direct and mediating effects of strategic planning have been established empirically in a range of contexts (Calvo-Mora et al., 2005; Suarez et al., 2016).

Table 2.1 and figure 2.5 show a comparison of the criteria of the MBNQA, EFQM and KAQA models. Table 2.2 and Appendix A.2, Table A.2.3 present a comparison of the dimensions (sub-criteria) of these three models. The definition of each criterion for the three models is summarized in Table A.2.4.

Table 2.1 Criteria and their weights of the KAQA, MBNQA and EFQM models

King Abdul Aziz Quality Award	Malcolm Baldrige National Quality Award	European Quality Award
KAQA model (Saudi Arabia)	MBNQA model (U.S.A)	EFQM model (Europe)
Date of initiation: 2007	1988	1992
Version: 2011	2015	2013
Leadership (120)	Leadership (120)	Leadership (100)
Strategic planning (80)	Strategy (85)	Strategy (100)
Human resources (100)	Workforce (85)	People (100)
Suppliers and partners (80)	Not explicit	Partnerships and resources (100)
Operations management (170)	Operations (85)	Processes, products and services (100)
Focusing on beneficiary (90)	Customers (85)	Not specified
Not specified	Measurement, analysis and knowledge management (90)	Not specified
Effect on society (60)		Society results (100)
Business results (300)	Results (450)	Business results (150)
		Customer results (150)
		People results (100)

Note: Weights inside brackets use a standardized scale of 1–1000.

Source: Author creation based on EFQM (2013); KAQA (2011); NIST (2015)

Table 2.2 Comparison of the KAQA, MBNQA and EFQM dimensions (sub-criteria)*.

Criterion	Dimension (sub-criterion)	K	M	E
1. Leadership	1.1. Senior management orientation	X	X	X
	1.2. Organisational performance auditing	X	X	X
	1.3. Encouraging and promoting culture of quality	X		X
	1.4. Governance and societal responsibilities		X	
2. Strategic planning	2.1. Strategic planning management process	X	X	X
	2.2. Strategic goals & action plan	X	X	X
	2.3. Research and development	X	X	X
3. Human resources	3.1. People plans support the organisation's strategy		X	X
	3.2. People communicate effectively throughout the organisations		X	X
	3.3. Training and education	X	X	X
	3.4. Employees' participation	X	X	X
	3.5. Human resources planning and selection	X	X	X
	3.6. Employees' satisfaction & work environment	X	X	X
	3.7. Performance & appreciation	X	X	X
	3.8. Saudization	X		
4. Suppliers and partners	4.1. Selecting, assessing & improving supplier services quality	X		X
	4.2. Managing long term partnerships & agreement	X		X
	4.3. Finances are managed to secure sustain success			X
	4.4. Buildings, equipment, materials and natural resources are managed in a sustainable way			X
	4.5. Technology is managed to support the delivery of strategy			X
	4.6. Focusing on local suppliers and products	X		
	4.7. Information and knowledge are managed to support effective decision making and to build the organisation's capability.			X
5. Operations management	5.1. Systems of quality, environment, power, health and occupational safety management	X	X	X
	5.2. Continuous improvement	X	X	X
	5.3. Applying recognized Saudi or (international) standard specifications	X		
	5.4 Customer relationships are managed and enhanced			X
	5.5 Supply-Chain Management		X	
6. Focusing on beneficiary	6.1. Knowing beneficiaries and market	X	X	
	6.2. Managing relations with beneficiaries	X	X	
	6.3. Beneficiaries' satisfaction/ measurement and enhancement	X	X	
7. Measurement, analysis & KM	7.1. Measurement, analysis, and improvement of organisational performance		X	
	7.2. Knowledge management, information, and information technology		X	
8. Effect on society	8.1. Contributing to national development	X		
	8.2. Social responsibility	X		
	8.3. Participating in society training and education	X		
9. Business results	9.1. Beneficiaries' satisfaction	X	X	X
	9.2. Financial results	X	X	X
	9.3. Suppliers/partners	X		X
	9.4. Product and process results		X	X
	9.5. Human resources	X	X	X
	9.6. Investment in research and development	X		
	9.7. Exporting	X		
	9.8. Society results			X
	9.9. Leadership and governance results		X	

Notes: K: the KAQA model, M: the MBNQA model, E: the EFQM model.

* For the common elements, the author chose the wording used in the KAQA model or, if the element does not exist in the KAQA, in the EFQM model. When comparing dimensions, the author have combined some of the MBNQA and EFQM models elements into single categories in order to simplify comparison with the KAQA model. For example, the 5.2 dimension of KAQA model is reflected by 5.b, 5.c, and 5.d dimensions of the EFQM model.

Source: Author's creation based on KAQA (2011), EFQM (2013) and NIST (2015).

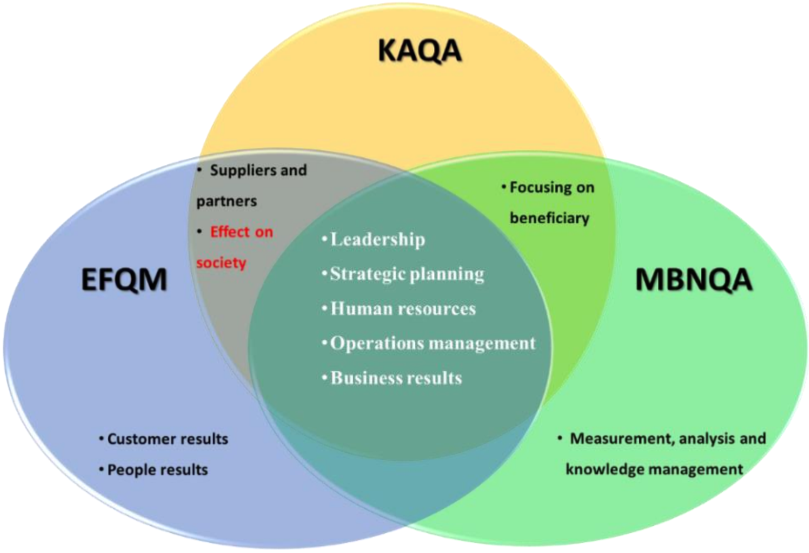

Figure 2.5 Comparison of the KAQA, EFQM and MBNQA criteria[8]
Source: Author creation based on EFQM (2013); KAQA (2011); NIST (2015)

On the basis of the above, besides their similarities, BEMs exhibit non-trivial differences in their criteria, relations, and emphasis. In this regard, the emergence and development of BEMs has been shaped by both their local context (e.g., underlying socio-economic dynamics) along with global best practices (Oger & Platt, 2002). This issue is discussed in the next section

2.4. Factors affecting the development of BEMs [9]

A considerable amount of literature has been published on factors that underpin the differences between business excellence models (e.g., Alonso-Almeida & Fuentes-Frías, 2012; Anderson et al., 1999; Conti, 2007; EFQM, 2013; Flynn & Saladin, 2006; Juran, 1993; Mavroidis et al., 2007; NIST, 2015; Oger & Platt, 2002; Talwar, 2011; Tan, 2002; Xie et al., 1998). Chief among them are: economic development, culture,

[8] Note: although the "effect on society" construct is common conceptually to the EFQM and KAQA models, it is presented as an enabler criterion in the KAQA model, and a result criterion in the EFQM model.

[9] These factors are presented as a context in which the empirical results of the three studied models may be interpreted (Moon et al., 2011; Su et al., 2003).

political status and governmental regulations ,and international standards and practices. Discussion about this is presented below.

For example, the experience level of excellence associated with economic development of a country may explain the differences in BEMs suitability/applicability (Oger & Platt, 2002; Tan, 2002). This could be identified, for instance, by the length of time taken for different sets of practices to achieve maturity (Ahire, 1996). It also needs to be taken into account that BEM emphasis and criteria-content also evolve during their lifecycles. For instance, in developing economies that have relatively short experience in excellence and then it is uncommon to adopt broad and advanced quality management systems, BEMs-criteria-content tends to be simpler, and in general, put great emphasis on enabler criteria (which cover what an organisation does), including the leadership system (Tan, 2002). This is because of the important role Leadership plays in effective implementation of quality initiatives (Escrig et al., 2016). That is, strong support of quality initiatives from top management has long been cited as the stepping-stone in companies' quest to achieve a quality-driven culture, competiveness and continuous improvement (Abdullah, 2010; Meyer & Collier, 2001). On the other hand, in developed economies with longer experience of excellence, BEM-criteria-content is more advanced and emphasis tends to shift towards the results-criteria. That is, a deeper understanding of the underlying causes of excellence variation and, then, improved control of these causes enables increasing learning that leads to achieve best results and, in this context, firms have built in routines to place top management commitment to efforts that are planned to enhance performance (Jayaram et al., 2010). Thus, initial excellence initiatives should be directed towards focusing on enabler criteria, which cover what an organisation does (i.e., an infrastructure), as this facilitates organisational improvement and learning. For example, the MBNQA model (e.g., in its 1988 vs. 2015 versions) advanced its criteria-content and reduced the emphasis placed on system-criteria in line with the evolution of quality and excellence practices in the US (Karimi et al., 2013; NIST, 2015).

In addition, national culture may lead to differences in the suitability/applicability of different BEM criteria and structures (Chuan & Soon, 2000; Flynn & Saladin, 2006; Lagrosen, 2003; Pagell et al., 2005; Ruiz-Carrillo & Fernández-Ortiz, 2005). In this vein, the literature shows that management theories are often not most successfully operated without cultural-based modification (e.g., Rosenzweig, 1994; Shenkar & Von Glinow, 1994), and the validity of a theoretical framework is limited by its national boundaries, and management practices must be tailored to fit local conditions (Hofstede, 1993). That is, national cultural maintains a unique set of characteristics that will affect decisions made within the firm (Pagell et al., 2005). Flynn and Saladin (2006), for example, employed Hofstede's dimensions of national culture to examine whether the theoretical constructs underlying the Baldrige criteria are relevant across national cultures. Their study showed evidence about the strong role that national culture plays in BEMs, and the effectiveness of the MBNQA in particular. In this context, they concluded that "practices and approaches should be adapted to the local culture, in order to have the highest probability of success. The same logic applies to the Baldrige criteria, which should not be adopted without modification by countries with national cultures that differ significantly from the national culture profile associated with the Baldrige constructs" (p. 599).

The desire to be in line with international standards and practices could, also, result in BEMs' variation (Talwar, 2011; Tan, 2002). For example, Voss (1995) pointed out that, in addition to the outstanding performance of the Japanese manufacturing industry and the growth of business process-based approaches and benchmarking, the emergence of awards such as the MBNQA and the EFQM has brought a high and universal profile to best practise in certain areas (e.g., TQM). In this vein, the European Foundation of Quality Management pointed out about its update of the 20101 EFQM model that "this decision was mainly influenced by the following key drivers for change like: feedback we obtained from our members..; information gathered through our links with other learning networks..; and proposals .. by our assessors, local partner organisations and our EFQM Faculty of trainers .. ." (Gemoets, 2009: 4). More specifically, the way in which the EFQM model presents the central role of stakeholder perceived results that is considered one of the most significant aspects resulting from TQM models (Conti, 2007; Saunders et al., 2008). As Conti pointed out, "How such results had to be interpreted and used was the main divergence point between the EFQM and the MBNQA models" (2007: 117).

In short, in BEMs' development, economic status, culture, political status and governmental regulations, and the world's best practices should be taken into account. This means that localized and global approaches towards business excellence may play role in this matter. This, in turn, may lead to differences among BEMs indicating that BEMs do not just comprise best practices but are, also, context-dependent models. Consequently, many studies have paid attention to empirically analysing these models and testing their validity. This issue will be discussed in the next section.

2.5. Review of the empirical literature on BEMs

The MBNQA and EFQM models are widely accepted in practice (Al-Tabbaa et al., 2013; Lee & Lee, 2013; Talwar, 2011). Therefore, a number of studies have focused on analysing the former (e.g., Badri et al., 2006; Meyer & Collier, 2001; Peng &

Prybutok, 2015) and the latter (e.g., Bou-Llusar et al., 2009; Calvo-Mora et al., 2005; Eskildsen & Dahlgaard, 2000; Prabhu et al., 2000; Reiner, 2002; Santos-Vijande & Alvarez-Gonzalez, 2007) models empirically. Also, other research has analysed country-specific BEMs (e.g., Moon et al., 2011; Su et al., 2003; Xiang et al., 2010), see Appendix A.2, Tables A.2.5-A.2.7. Relations among the BEM criteria according to the reviewed literature are found in table 2.3. Prior empirical BEMs research has adopted the following approaches:

1) using a factorial approach: when all the criteria of the model are intercorrelated, e.g., analysing the dimensions associated with the constructs of the BEMs, e.g., the leadership triad and results triad for the MBNQA model (e.g., Bou-Llusar et al., 2009; Karimi et al., 2013), or analysing how the BEMs capture the TQM dimensions (e.g., Bou-Llusar et al., 2009; Calvo-Mora et al., 2013; Curkovic et al., 2000);
2) a causal approach, concentrating on both developing measurement models that precisely embody the content of BEM criteria and testing the proposed relations among BEM criteria (e.g., Badri et al., 2006; Calvo-Mora et al., 2005; Meyer & Collier, 2001; Moon et al., 2011);
3) a comparative approach, examining two or more BEMs (Flynn & Saladin, 2001; Jayamaha et al., 2009).

For the pre/post-testing models of these studies, an appendix is provided (see appendix A.2.8). This section discusses prior research in three categories: factorial approach studies, causal approach studies and comparative approach studies.

2.5.1. Studies adopting a factorial approach

Within this set of studies, some previous research concentrated on analysing how the business excellence models capture the TQM dimensions (Bou-Llusar et al., 2009;

Calvo-Mora et al., 2013; Curkovic et al., 2000; Santos-Vijande & Alvarez-Gonzalez, 2007), others analysed the dimensions associated with the constructs of the BEMs (e.g., the leadership triad and results triad for the MBNQA model and enabler/results dimensions for the EFQM model) (Bou-Llusar et al., 2005; Karimi et al., 2013; Prybutok et al., 2011) (cf. Tables A.2.5 and A.2.6, in Appendix A.2, and Figures in Appendix A.2.8).

The first group employed BEMs as a method to reflect and operationalize the TQM concept. For instance, Curkovic et al. (2000) examined whether the internal structure of the1997 MBNQA model captured the definition of TQM. To this end, they proposed business excellence (BE) as a second-order construct with only four first-order constructs: 1) TQM Strategic Systems (formed from three MBNQA criteria, i.e., Leadership, Strategic Planning, and Customer and Market Focus); 2) TQM Operational Systems (formed from two MBNQA criteria, i.e., Human Resource Focus, and Process Management); 3) TQM Information Systems (formed from the MBNQA criteria Information and Analysis); and 4) TQM Results (formed from the MBNQA criterion Business Results). A single industry, the automotive industry, was chosen to test their model using confirmatory factor analysis and structural equation modelling (SEM) on data from 526 plant managers in the USA. They concluded that the relationships between the four constructs of the MBNQA formed from TQM strategic systems, TQM operational systems, TQM information systems, TQM results were captured by the second order construct: TQM.

Santos-Vijande and Alvarez-Gonzalez (2007), for example, developed an instrument to measure BEM implementation and studied the relationship between the enablers and results constructs of the 1999 EFQM model using confirmatory factor analysis

(CFA) and SEM. Survey data was gathered from 93 Spanish manufacturing and service companies. In this respect, their model suggests that there is a latent factor, labelled as TQM, which represents the five enabler constructs: leadership, people, policy and strategy, partnerships and resources, and processes. Also, the four results constructs are represented by a latent construct (Business performance). The results prove a strong correlation between the TQM practices and performance.

Bou-Llusar et al. (2009) carried out research aiming to investigate the extent to which the 2003 EFQM model reflects the main TQM assumptions. To this end, firstly, their study examined the extent to which the EFQM represents separately the social and technical dimensions of TQM. Therefore, they split the enabler criteria into three components: 1) the social aspects (leadership and people), 2) the technical aspects (processes and partnership & sources) and 3) the guidance of the management of the other criteria (policy and strategy). Secondly, under the assumption that enabler excellence during the implementation of the EFQM model is interpreted as the overall way that has to be adopted by companies, their study tested the existence of a mutual interdependence among all enabler aspects represented by the common latent factor enabler excellence. Thirdly, in the same vein, the existence of a mutual interdependence among all results aspects represented by the common latent factor results excellence was examined. Finally, the influence of enablers on results was analysed. Their study used SEM on data collected from managers of 446 Spanish companies by a structured questionnaire. Their study found that both social and technical dimensions of TQM are embedded in the EFQM model enablers, are inter-correlated and collectively influence results excellence construct, which, in turn, shows the degree of deployment gained by each result criteria.

The second group of studies analysed the dimensions associated with the constructs of the BEMs (i.e., the interrelationship among all constructs). Prybutok et al. (2011), for example, conducted a study with the aim of examining the applicability of the 2002 MBNQA model to the government sector using data collected from 214 employees within the Denton city government as multiple respondents using a single-site case study methodology. They used Partial Least Squares (PLS) and suggested that the theoretical relationships in the 2002 Baldrige framework could be developed with three hypotheses, emphasising the interrelationships among the leadership triad, the business result triad, and the information and analysis construct. The leadership triad is reflected by three first-order constructs- leadership, strategic planning, and customer market focus, whereas the business results triad is reflected by three other first-order constructs - business results, process management, and human resources. Their study differs from prior studies in how to treat the information and analysis construct (as a dependent variable) as well as in using multiple respondents at a single-site case study methodology. In the conclusion, the three research hypotheses were confirmed.

Similarly, Bou-Llusar et al. (2005) carried out a study using data from Spanish manufacturing and service firms through a questionnaire (covering criteria and sub-criteria) with canonical correlation analysis (CCA) incorporated in SEM to test the interrelationship between the five enabler constructs (conceived to synthesise a single construct) and the four results constructs (conceived to synthesise a single construct) of the 1999 EFQM model. They then reduced the two constructs, which make up the ‘‘canonical correlation pair’’, to a single latent construct following the CCA procedures specified in the literature. Their study did not examine all the relationships of the EFQM model, but how the enablers impact on results. In their work, they confirmed that the set of enablers as a whole, improve the set of results and, all the enablers and result criteria in the EFQM model, with the exception of policy and strategy criteria, made a significant contribution to this relationship. Moreover, all the enabler criteria contributed in the same direction to result improvements.

In a more recent study, Karimi et al. (2013) used canonical correlation analysis with 277 independent review scores of the Baldrige Award applicants in various sectors (manufacturing (21), service (23), small business (36), education (68), healthcare (119), and non-profit (10)) covering the period of 2003–2006 obtained from the NIST. In their study, they developed a framework, based on the 2006 MBNQA model, that merged the 'leadership triad' and 'measurement, analysis, and KM' into one group called the 'drivers', and divided the 'results triad' into two separate constructs: the 'systems' and the 'results'. Furthermore, the results construct was split into its six dimensions. Thus, they studied the links between the Baldrige constructs in three phases: 1) the relationship between the 'drivers' and the 'systems', 2) the link between the 'drivers' and the 'results' and 3) the relationship between the 'systems' and the 'results'. Their findings confirmed that these three sets are correlated.

Although these studies capture the complete group of constructs and supported the business excellence models as operational frameworks for TQM, they did not examine specific relationships between certain constructs and others. This is necessary, as the relationships between these constructs may form the full power of BEMs and there is a strong need to examine each of the BEM criteria under an integrated system (Naylor, 1999; Peng & Prybutok, 2015). Studies that addressed this issue are analysed in the next section.

2.5.2. Studies adopting a causal approach

Other studies focused on the validity of BEMs more directly. These works focused on the relationship among the constructs of the BEMs. That is, they concentrated on both developing measurement models (and their associated scales and constructs) that precisely embody the content of BEM criteria, and furnish insights into the directions of causation among the BEM criteria. These studies targeted the MBNQA model (Badri et al., 2006; Meyer & Collier, 2001), the EFQM model (Calvo-Mora et al., 2005; Gómez Gómez et al., 2011; Heras-Saizarbitoria et al., 2012), and country-specific models (Moon et al., 2011; Su et al., 2003; Xiang et al., 2010), see Tables A.2.5-A.2.7, in Appendix A.2.

For the MBNQA model, Wilson and Collier (2000), for instance, used the 1995 MBNQA model to study the theory and causal performance linkages implicit in this model with data from manufacturing firms (US automotive industry). The model was analysed in terms of driver (viz. leadership), system (viz. process management, human resource development and management, strategies planning, and information and analysis), and results (viz. customer focus and satisfaction and financial results). In their study model, leadership is the only exogenous variable, with the other six constructs as endogenous variables. That is, leadership affects each remaining construct, and system constructs in turn affect result constructs. Their conclusion supported the underlying theory of the MBNQA. Leadership, also, was the strongest driver of the system and influenced financial results indirectly through the system. Their conclusion, also, showed that the second most important criterion was information and analysis affected customer focus and satisfaction twice as important in affecting financial results.

In a similar way, Badri et al. (2006), based on the 2004 Baldrige education criteria, used regression analysis and confirmatory SEM to develop a measurement model and test the causal relationships in the Baldrige model on a sample from 15 United Arab Emirates (UAE) universities and colleges. They concluded that leadership is a driver for all constructs in the Baldrige system (comprising measurement, analysis and knowledge management, strategic planning, faculty and staff focus and process management). In addition, all Baldrige constructs are significantly related with organisational performance results, and student, stakeholder and market focus as representative of organisational outcomes.

Furthermore, on data collected by questionnaire from manufacturing and service firms in China, He et al. (2011) proposed a theoretical model with 19 hypotheses based on the 2006 Baldrige framework to validate whether the causal links derived from the data represent the theoretical model of the Baldrige framework. Empirical findings of this study suggested that the proposed theoretical model with 19 hypotheses are statistically supported and process management is the most important construct in the MBNQA model, followed by leadership on the basis of evidence from China.

In the EFQM model context, Gómez Gómez et al. (2011), for example, conducted an investigative study of the relationships in the 2003 EFQM model using data from organisations in Spain. In their study, partial least squares based structural equation modelling (PLSBSEM) was used to test the structural model. The findings showed that the set of relationships proposed in the EFQM model were not supported, as the people results and society results constructs were insufficiently correlated with the other constructs. Hence, an alternative model was suggested, in which processes appear at the same level as policy& strategy, people, and partnership & resources, and these four constructs affect people, customer and society results, which in turn affect key performance results. Their conclusion, also, showed the key role of leadership in the EFQM model relations.

In the same way, Heras-Saizarbitoria et al. (2012) investigated the relationships among the criteria of the 2003 EFQM model based on data from organisations in Spain. They hypothesised that the leadership construct affects the people, policy & strategy and partnership & resources constructs and the latter affect the processes construct. The processes construct, in turn, affects results constructs with respect to people, customer and society. These three constructs finally influence the key performance results construct. Their study used PLSB-SEM to test the model's theoretical validity, where reflective indicators were used for the enablers, while formative indicators were used for the results. Their main finding was that seven of the 12 proposed relationships among the constructs of the EFQM model were confirmed. The five rejected hypotheses concerned the relationships between: a) people and processes, b) processes and people results, c) processes and society results, d) people results and key results, and e) society results and key results.

As illustrated earlier, a number of country-specific BEMs have been developed and most of them are based on the MBNQA and EFQM models (Lee & Lee, 2013). Thus, some researchers have focused on analysing these BEMs (e.g., Moon et al., 2011; Su et al., 2003; Xiang et al., 2010) (see Table A.2.7, in Appendix A.2) to test their suitability/applicability in their own contexts and enhance understanding of evidence that there exists a theory underlying BE criteria. These studies focused on testing the causal relationships existing between the constructs of BEMs (i.e., causal approach).

For instance, in testing the theoretical causal relationships underlying the Taiwan National Quality Award (TNQA) with seven constructs, Su et al. (2003) used SEM on data from manufacturing plants in Taiwan and proposed 20 hypotheses based on the 2000 Baldrige framework. The driver (viz. leadership) was tested in terms of influence on both system (viz. innovation and strategic management, customer/market development, human resource and knowledge management, information management and process management) and results (viz. business result). Also, results were tested as one factor, differently from Wilson and Collier's (2000) study. All the proposed hypotheses were confirmed except for three links that did not hold; 1) customer/market development to process management, 2) customer/market development to business result, and 3) human resource and knowledge management to business result. In addition, their findings showed that strategic planning and leadership are the most important in the TNQA model.

Similarly, Xiang et al. (2010) developed measurement instruments to measure the contents of the China Quality Award (CQA) constructs. In addition, they identified causal relationships among the constructs of the CQA model based upon the theory of the Baldrige causal model, which are driver (leadership), direction (strategic planning), foundation (information and analysis), system (human resource focus, process management, and customer and market focus), and results (business results) ending with 18 hypotheses using SEM on data from Chinese firms. This study confirmed all but four hypotheses. The rejected hypotheses concerned the relationships between: 1) leadership to customer and market focus; 2) strategic planning to process management; 3) customer and market focus to results; 4) human resource focus to results.

Likewise, the research of Moon et al. (2011) on the Korean National Quality Award (KNQA) examined the causal relationships among seven constructs in the KNQA model. Unlike previous studies (Wilson & Collier, 2000, 2001; Flynn & Saladin, 2001; Su et al., 2003), which analysed the causal relationship between leadership, system and results, their study identified strategic planning as a direction and information & analysis as a foundation based on the 2005 MBNQA model. Thus, they classified the seven constructs of the KNQA model into five components: 1) driver (Leadership), 2) direction (Strategic Planning), 3) foundation (Information & Analysis), 4) system (Customer & Market Focus, Human Resource Focus, Process Management), and 5) results (Business Results). In an attempt to determine the extent to which internal efficiency impacts on corporate performance, the causal links between those results were verified and the causal relationship between system and result was tested. By developing a questionnaire, they collected responses from manufacturing and service companies in Korea to test their 24 hypotheses using CFA and SEM. This study found that 19 of the 24 of hypotheses were supported. The rejected hypotheses included: 1) leadership to customer & market focus; 2) leadership to product & service results; 3) leadership to customer focus results; 4) strategic planning to human resource focus; 5) strategic planning to process management. Furthermore, it was shown that leadership plays a significant role in positively affecting results through its direct and indirect relationships on direction and foundation.

One point that can be noted is that although these studies have contributed to the validation of these models (for example, there is a general consensus regarding a positive influence of systems on results (Bou-Llusar et al., 2009)), some ambiguities still remain, regarding their internal consistency and the causal relationships between their criteria (Bou-Llusar et al., 2005; Karimi et al., 2013). For example, contradictory results have been reported in relation to some proposed relationships between system constructs and the effect of such constructs on results (see Table 2.3). Furthermore, so far, there has been little discussion about the empirical analysis of country-specific models. Moreover, such studies are limited to models based on the MBNQA model. That is, outside the European context, it seems that no attention has been paid to the empirical analysis of models adapted from the EFQM model. Also, this research has tended to focus on a particular BEM rather than a comparative approach. However, as mentioned earlier, it is important to analyse competing models comparatively, since there is no guarantee that the model studied is the best model (Meyer & Collier, 2001; Shah & Goldstein, 2006). The issue of a comparative approach to BEMs studies is discussed in the next section.

2.5.3. Studies adopting a comparative approach

The need for empirical validation of the relationship of BEMs' constructs constitutes the basis for incorporating a different approach into the research on the BEMs (Bou-Llusar et al., 2005). Hence, from a more comprehensive perspective, some previous research focused on analysing business excellence models comparatively (see Tables A.2.5, and A.2.7, in Appendix A.2).

For instance, Flynn and Saladin (2001) compared and studied the 1988, 1992, and 1997 MBNQA models using path analysis to test the fit/suitability and the criteria weight of each of the three frameworks, on survey data gathered from the World Class Manufacturing (WCM) database. Their empirical study showed that all three models were a good fit with the Baldrige frameworks for those years, and that both the 1992 and 1997 models improved upon the foundation established by the 1988 model. Moreover, their results showed that leadership is the most important construct, followed by operations management and information and analysis.

In addition, to study the theoretical validity of three key Business Excellence models (BEMs) used in the Asia Pacific Region – the Australian Business Excellence Framework (ABEF), the Baldrige Criteria for Performance Excellence (MBNQA), and the Singapore Quality Award Criteria (SQAC), Jayamaha et al. (2009) conducted research based on item scores collected from the applicants of NQA/BEM for ABEF and BCPE awards. They adopted a variety of strategies to increase the size of sample, ending with 110 and 118 observations respectively. They used survey data for SQAC because only organisations with an overall score of 700 points in SQC assessments are eligible to apply for the SQA. In their study, PLSB-SEM was used with the aim of understanding how measurement items in different business excellence models are associated with their assigned constructs; evidence that there exists a theory underlying business excellence criteria; and how theoretical models can be interpreted, from a practical perspective. With this aim, they tested three separate PLS models matching each BEM, using a shared structural model based on the structural models used by Flynn and Saladin (2001) and Lee et al. (2003). This study differs from the previous studies in validating multiple BEMs within a unitary theoretical framework. Their findings showed that the level of evidence of measurement validity of the ABEF was lower, compared to the other two business excellence models. Additionally, the majority of the relationships between constructs were found to be significant. (see Appendix A.2.8.6.a-d)

Overall, while prior literature has shown that different BEMs exist, and their different validity and development, there is a scarcity of empirical literature showing the suitability/applicability for these different models from a broad view, i.e., acknowledging the variation of BEMs, and between MBNQA, EFQM, and KAQA BEMs in particular. Additionally, studies in this domain tend to be inconclusive. For example, some studies found evidence that it is necessary to develop country-specific BEMs that are tailored to the national characteristics (Flynn & Saladin, 2006), and stated that country-specific models are suitable for their intended contexts (Moon et al., 2011; Santos et al., 2016; Su et al., 2003; Xiang et al., 2010). However, other studies showed the suitability of the generic (i.e., the MBNQA) model in economies with national characteristics that differ significantly from the national characteristics profile associated with the adopted model (Badri et al., 2006; He et al., 2011).

Although the importance of the comparative approach on BEMs (as discussed earlier), early attempts to compare BEMs (e.g., Flynn & Saladin, 2001; Jayamaha et al., 2009) did not compare the MBNQA, EFQM, and KAQA models. This study provides a first step towards a direct and comprehensive comparative analysis of the suitability/applicability of these three carefully selected BEMs and opens up a promising research agenda by developing the requisite approach to be used in such endeavours.

Table 2.3 Relations among the BEM criteria according to the reviewed literature.

Dependent	Independent	Leadership MBNQA	Leadership EFQM	Strategic planning MBNQA	Strategic planning EFQM	Human resources MBNQA	Human resources EFQM	Operations managemet MBNQA	Operations managemet EFQM	Focusing on beneficiary MBNQA	M,A & KM MBNQA	Suppliers& partners EFQM	Customer results MBNQA	Customer results EFQM	People results MBNQA	People results EFQM	Society results EFQM	Product results MBNQA	Key Results MBNQA	Key Results EFQM
Leadership	MBNQA																			
	EFQM																			
Strategic planning	MBNQA	(+) 1,2,3,4,5,6,7,8,9,18									(+/-) 1,2,3,4,5,6,7,8,9									
	EFQM		(+) 10,12,13,14,15,16																	
Human resources	MBNQA	(+) 1,2,3,4,5,7,8,9,18		(+ / -) 2,4,5,6,7,8,9,18				(+) 4		(+) 4,8	(+/-) 1,2,3,4,5,6,7,8,9,18									
	EFQM		(+) 10,12,14,15,16		(+ / -) 10,12,14,15															
Operations managemet	MBNQA	(+/-) 1,2,3,4,5,7,8,9,18		(+ / -) 2,5,7,8,9,18		(+ / -) 2,4,5,6,6,7,8,18				(+ / -) 2,4,6,7,8,9	(+/-) 1,2,3,4,5,6,7,8,9,18									
	EFQM		(+) 13		(+ / -) 10,12,14,15,16		(+ / -) 10,12,14,15,16					(+ / -) 10,12,14,15,16								
Focusing on beneficiary	MBNQA	(+ / -) 1,2,3,4,5,6,7,8,9,18		(+ / -) 1,2,3,4,5,6,7,8,9		(+ / -) 1,2,2,3,5		(+) 1,2,3,5			(+ / -) 1,2,3,4,6,7,8,9								(+) 2,3,5	
M,A & KM	MBNQA	(+/-) 1,2,3,4,5,6,7,8,9,18		(+) 18						(+) 18										
Suppliers and partners	EFQM		(+) 10, 12, 14, 15, 16		(+ / -) 10,12,14,15															
Customer results	MBNQA	(-) 9								(+) 9								(+) 9		
	EFQM		(+) 11						(+ / -) 12,13,14,15,16							(+ / -) 12,14,15	(+ / -) 12,15			
People results	MBNQA	(+) 9				(+) 9														
	EFQM						(+ / -) 10,11,12,13,17		(+ / -) 10,12,14,15,16					(+) 13						
Society results	EFQM								(+ / -) 12,15,16							(+) 13				(+) 14
Product results	MBNQA	(-) 9						(+) 9							(+) 9					
Key Results	MBNQA	(+ / -) 1,2,3,4,5,7,8,9,18		(+ / -) 1,3,4,5		(+ / -) 1,2,3,4,5,6,7,8,18		(+ / -) 1,2,3,4,5,6,7,8		(+/-) 4,7,18	(+ / -) 1,2,3,4,5,8,18		(+) 9							
	EFQM								(+) 14					(+) 12,14,15,16		(+ / -) 12,14,15,16	(-) 15,16			

Notes: 1= Wilson and Collier (2000) ; 2= Flynn and Saladin (2001); 3= Meyer and Collier (2001); 4= Su et al. (2003); 5= Badri, et al. (2005); 6= Jayamaha, et al. (2009); 7= Xiang, et al. (2010); 8= He et al. (2011); 9= Moon, et al. (2011); 10= Eskildsen and Dahlgaard (2000); 11= Prabhu et al. (2000); 12= Eskildsen et al. (2000); 13= Reiner (2002); 14= Calvo-Mora et al. (2005); 15= Go´mez, et al. (2011); 16= Heras-Saizarbitoria, et al. (2012); 17= Safari, et al. (2012); 18: Peng and Prybutok (2015). Black number: positive reported relation, red number: negative reported relation. Blue box: related to MBNQA literature or unique MBNQA criterion, green box: related to EFQM literature or unique EFQM criterion. Positive (+), negative (-) relation.

2.6 Moderation conditions in BEM relationships

BEM/TQM research has suggested that a number of moderating factors drive the relationship between TQM and performance such as strategic orientation, industry type, and firm size (Calvo-Mora et al., 2015; Escrig et al., 2016; Sadikoglu, 2004; Shah & Ward, 2003; Sila, 2007). Of these, strategic orientation and industry type are the focus of this study.[10]

Generally, in BEM literature, little attention has been paid to the potential effects of these contextual factors on BEMs relationships (Doeleman et al., 2014; La Rotta & Pérez Rave, 2016). In this regard, the effects of strategic orientation is especially scarce in the BEM literature (Escrig et al., 2016). In addition, prior studies analysing the contextual effect of industry type on BEM relationships report mixed findings, although the evidence tends to lend support for the non-significant difference between service and manufacturing firms in the case of BEMs.

For example, using the EFQM model framework, Calvo-Mora et al. (2015) found no significant differences in TQM implementation based on the industry type. Likewise, Bou-Llusar et al. (2009)'s findings show that the same results are obtained from service and manufacturing companies for the EFQM model that reflects the main TQM assumptions. On the other hand, Gómez Gómez et al. (2011) analysed differences in the EFQM relationships between education and manufacturing sectors. According to their results, there are some differences in the relationships between manufacturing and service firms. There is a slightly higher achievement in the group of manufacturing companies compared with the group of educational institutions. The reason for these

[10] As outlined in demographic profile section (section 5.2.7), for the firm size, the data has only two size segments: medium and large, with the predominance of the latter one. Thus, testing the effect of this factor is not viable.

possible differences may lie in the nature of the characteristics of the operations that organisations undertake, or being (or not) early adopters of continuous improvement programmes, e.g., business excellence, (Jayaram et al., 2010; Sun & Cheng, 2002).

Strategic orientation is a relatively enduring patterns by which the managerial processes of the organisation (including its capabilities) are aligned with its environment (Miles et al., 1978). Although other strategic orientation typologies have been suggested (e.g., Hoopes et al., 2003; Treacy & Wiersema, 1995), the Miles et al. (1978) typology has been extensively used, and has generally been supported (e.g., McKee et al., 1989; Snow & Hambrick, 1980; Webster Jr, 1992) because of its correspondence with the actual strategic postures of companies across multiple countries and industries, and industry-independent nature (Hambrick, 2003). Therefore, strategic orientations were differentiated in this study using Miles et al. (1978) typology. In using this typology, strategic orientation is classified into four groups: prospectors, analysers, defenders, and reactors.[11]

Although the emphasis of the role played by the moderating factors, such as strategic orientation, in business excellence implementation (Jayaram et al., 2010; NIST, 2015: 4-5; Sousa, 2003), as mentioned earlier, too little attention has been paid to the moderating role of strategic orientation in BEM research (Escrig et al., 2016). However, in a broad sense, some TQM research analysed the moderating effects of this factor in the relationship between TQM and performance. With the exception of Hobbs (1994) and Sila (2007), although different strategic orientation

[11] Prospectors devote more resources to be technologically innovative and monitor evolving trends in the marketplace; defender organisations are engineering-oriented, place a high priority on improvements in efficiency, and focus on maintaining a secure niche in relatively stable market segments; analysers are more complex and balanced functionally, and tend to prefer a 'second-but-better' strategy ; and reactor organisations lack a stable strategy and tend to be short-term oriented and environmentally dependent (Miles et al., 1978).

typologies/variables and different research designs were used, prior research supports the existence of strategic orientation impact (e.g., Das et al., 2000; Reed et al., 1996; Sitkin et al., 1994; Sousa, 2003). For example, Das et al. (2000) examined the moderating role of strategic orientation (based on the level of international competition) in quality management practices and performance (consisting of high involvement work practices, quality practices, quality performance, and firm performance). Strategic orientation was found to moderate the relationship between quality practices and customer satisfaction performance, and the relationship between high involvement work practices and firm performance. Moreover, using the case-study method, Sousa (2003) investigated the influence of strategic orientation (based on product customization, production volume, rate of new product introduction, item variety, production run sizes, and type of production process) on customer-focused quality management practices. The study strongly indicates that customer-focused quality management practices are contingent on a plant's strategic orientation. In addition, Sila (2007) examined the moderating role of strategic orientation (Based on the Scope of operations: domestic vs. international) in total quality management practices and organisational performance. Their findings do not provide support for the influence of strategic orientation on total quality management practices and performance.

As can be shown from the summary above, in BEM literature, while the moderating impacts have been investigated by some studies, these studies have either mixed findings, or have not studied the moderating effect of strategic orientation on the relationships of BEMs. This study fills this gap by examining sparsely studied moderating variables, i.e., strategic orientation and industry type.

2.7 Research hypotheses and models

In summary, the literature review has identified scarce and inconclusive findings concerning the suitability of different BEMs across a range of national characteristics, and some uncertainties regarding BEMs internal consistency and the causal relationships between their criteria, as well as the need for comparative validation. This empirical study was thus designed to investigate this issue by examining and contrasting three models: the MBNQA, EFQM, and KAQA models.

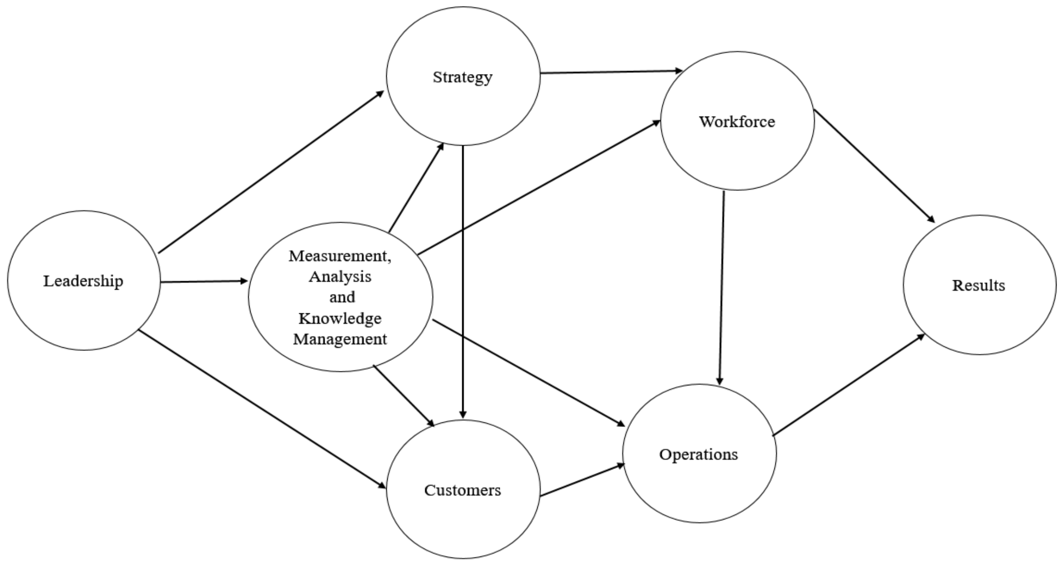

Figure 2.6 The structural model based on the MBNQA framework.
Source: Flynn and Saladin (2001), Jayamaha et al. (2009)

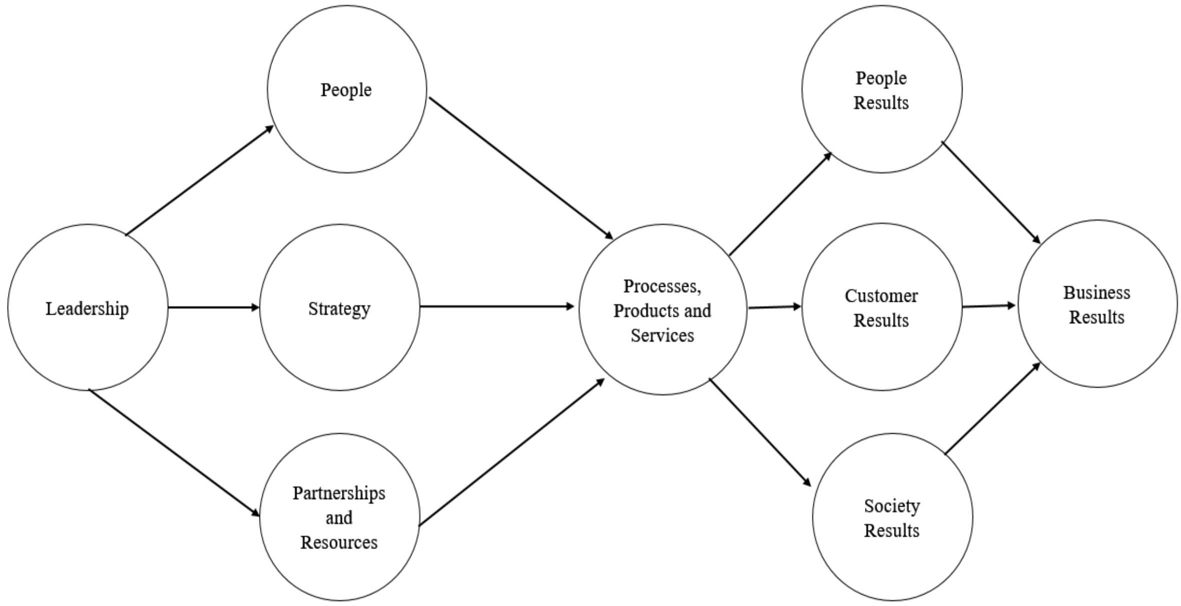

Figure 2.7 The structural model based on the EFQM framework.
Source: Gómez Gómez et al. (2011), Heras-Saizarbitoria et al. (2012).

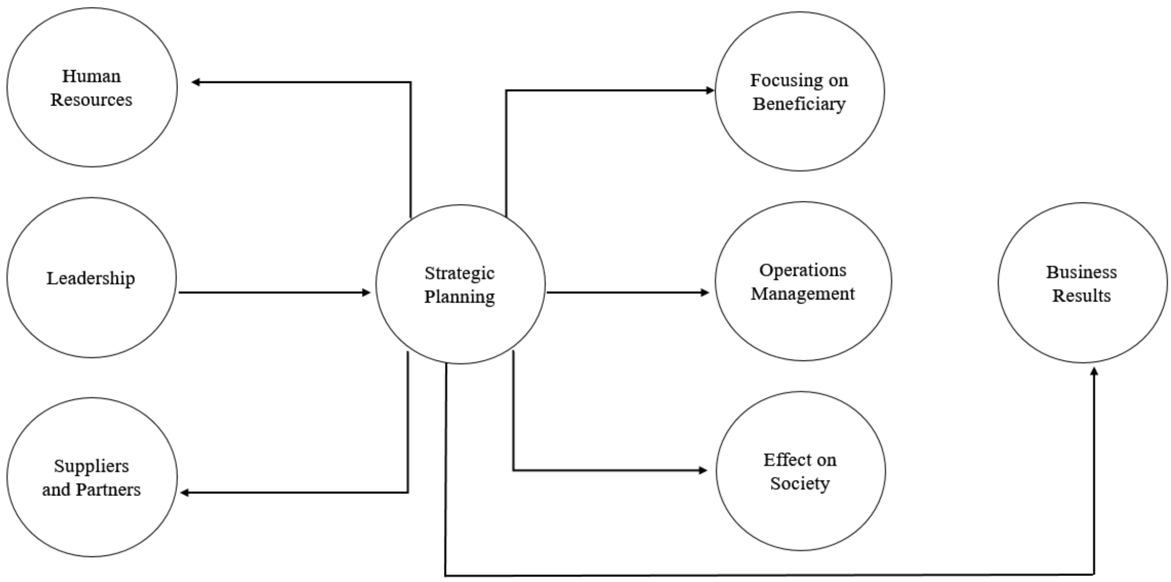

Figure 2.8 The structural model based on the KAQA framework.
Source: author elaboration based on KAQA (2011).

The structural models for the MBNQA and EFQM frameworks were adopted (Figures 2.6 and 2.7), as these models were frequently used and tested in previous studies (Flynn & Saladin, 2001; Gómez Gómez et al., 2011; He et al., 2011; Heras-Saizarbitoria et al., 2012; Jayamaha et al., 2009). Hence, by adopting these models for the current study, an attempt to replicate the earlier studies is made, responding not only to calls for multi-model investigations but also for more replication studies in the BE field, e.g., assessing the applicability of BEMs in different contexts (Bou-Llusar et al., 2009; Flynn & Saladin, 2001). The KAQA framework was redrawn (Figure 2.8) to meet the model testing needs at hand. In line with the objectives of this research, best research practice (Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Heras-Saizarbitoria et al., 2012; Jayamaha et al., 2009; Meyer & Collier, 2001; Peng & Prybutok, 2015) as well as to streamline the analysis, the KAQA structural model is recursive. That is, it comprises no reciprocal causation (two-headed arrows) or feedback (circular) loops (Hair et al., 2010; Kline, 2010).

As discussed in sections 2.3 and 2.5, relationships similar to the three studied models have been investigated previously (e.g., Badri et al., 2006; Calvo-Mora et al., 2005; Calvo-Mora et al., 2013; Flynn & Saladin, 2001; Peng & Prybutok, 2015; Suarez et al., 2016). It may thus be reminded (as introduced in section 1.3), that one of the key research questions of this study is to examine the suitability/applicability of the three targeted models comparatively. To produce the requisite information regarding the model that best accounts for the covariance observed among the (exogenous and endogenous) constructs, a sequence of nested and (non)nested structural models for the resultant superior model will be considered; ultimately yelding the best model[12].

To examine each of the three models, respective hypotheses have been developed, which provide a comprehensive assessment of the relationships between the model constructs as summarised in Tables 2.4-6.

[12] For more details, see sections 3.8.2.3 and 5.3.

Table 2.4 Summary of the MBNQA model hypotheses

Ha1-3. Within the MBNQA model, leadership has a direct positive influence on (1) MAKM, (2) strategy, and (3) customers
Ha4-8. Within the MBNQA model, leadership has an indirect positive influence on (4) strategy, (5) customers, (6) operations, (7) workforce, and (8) results
Ha9-12. Within the MBNQA model, MAKM has a direct positive influence on (9) strategy, (10) customers, (11) workforce, and (12) operations
Ha13-16. Within the MBNQA model, MAKM has an indirect positive influence on (13) customers, (14) workforce, (15) operations, and (16) results
Ha17-18. Within the MBNQA model, strategy has a direct positive influence on (17) workforce, and (18) customers
Ha19-20. Within the MBNQA model, strategy has an indirect positive influence on (19) operations, and (20) results
Ha21. Within the MBNQA model, customers has a direct positive influence on operations
Ha22. Within the MBNQA model, customers has an indirect positive influence on results
Ha23-24. Within the MBNQA model, workforce has a direct positive influence on (23) operations, and (24) results
Ha25. Within the MBNQA model, workforce has an indirect positive influence on results
Ha26. Within the MBNQA model, operations has a direct positive influence on results

Table 2.5 Summary of the EFQM model hypotheses

Hb1-3. Within the EFQM model, leadership has a direct positive influence on (1) people, (2) strategy, and (3) partnerships and resources
Hb4-8. Within the EFQM model, leadership has an indirect positive influence on (4) processes, (5) society results, (6) people results, (7) customer results, and (8) business results
Hb9. Within the EFQM model, partnerships and resources has a direct positive influence on processes
Hb10-13. Within the EFQM model, partnerships and resources has an indirect positive influence on (10) society results, (11) people results, (12) customer results, and (13) business results
Hb14. Within the EFQM model, people has a direct positive influence on processes
Hb15-18. Within the EFQM model, people has an indirect positive influence on (15) society results, (16) people results, (17) customer results, and (18) business results
Hb19. Within the EFQM model, strategy has a direct positive influence on processes
Hb20-23. Within the EFQM model, strategy has an indirect positive influence on (20) society results, (21) people results, (22) customer results, and (23) business results
Hb24-26. Within the EFQM model, processes has a direct positive influence on (24) people results, (25) customer results, and (26) society results
Hb27. Within the EFQM model, processes has an indirect positive influence on business results
Hb28. Within the EFQM model, customer results has a direct positive influence on business results
Hb29. Within the EFQM model, people results has a direct positive influence on business results
Hb30. Within the EFQM model, society results has a direct positive influence on business results

Table 2.6 Summary of the KAQA model hypotheses

Hc1. Within the KAQA model, leadership has a direct positive influence on strategic planning
Hc2-7. Within the KAQA model, leadership has an indirect positive influence on (2) human resources, (3) suppliers and partners, (4) operations management, (5) effect on society, (6) focusing on beneficiary, and (7) business results
Hc8-13. Within the KAQA model, strategic planning has a direct positive influence on (8) human resources, (9) suppliers and partners, (10) operations management, (11) effect on society, (12) focusing on beneficiary, and (13) business results

To answer the second key research question, bearing in mind the reviewed literature (in section 2.6), the moderating role played by strategic orientation in business excellence implementation has been emphasised (Jayaram et al., 2010; NIST, 2015: 4-

5) and the extant empirical evidence in general, suggests that strategic orientation has an impact on BEM relations (e.g., Das et al., 2000; Reed et al., 1996; Sitkin et al., 1994; Sousa, 2003). Therefore, it may be hypothesised that:

Hd: Strategic orientation moderates the associations between constructs in business excellence models.

The literature also suggests that business excellence, and the three focal BEMs in particular, can be applied in both service and manufacturing sectors (EFQM, 2013; KAQA, 2011; NIST, 2015). However, as reviewed in section 2.6, prior studies analysing the contextual effect of industry type on BEM relationships reported mixed findings. Nonetheless, there seems to be more evidence in support of the non-significant difference between service and manufacturing firms concerning the BEMs in question. Therefore, it may be hypothesised that:

He: The paths of business excellence models are not statistically different between service and manufacturing companies.

2.8. Summary

In this chapter, the history, description, and usefulness of BEMs (i.e., focusing on the MBNQA, EFQM, and KAQA models) have been presented. Further, universal and local aspects causing BEMs development have been explained. Next, this study addressed the fragmentation in BEMs research by reviewing and categorising the literature and integrating findings across different models and industries. From this, prior literature has shown that different BEMs exist, and their different validity and development. However, there is a scarcity of empirical literature showing the suitability/applicability of these different models within a broader view, i.e., acknowledging the differences of BEMs. Additionally, the potential role of moderating factors such as industry type and strategic orientation in business excellence implementation and results was discussed. Therefore, the research hypotheses, questions and models were introduced according to the research objectives and the reviewed literature. The next chapter will highlight the approach and methodology adopted in data collection for the research and the analysis techniques used.

Chapter Three: Research Methodology

3.1 Introduction

This chapter focuses on the methodology that was employed in this study. The study methodology adopted by a researcher is greatly influenced by his or her assumptions about reality. Consequently, this chapter starts by presenting the research philosophy and paradigm. Next, the research approach is introduced. The research strategy is discussed in the following section, followed by the research method. Then, discussion is directed to the adopted time horizon followed by sampling design and procedures comprising the research population, sampling, sampling frame, and sample size. Lastly, the data analysis techniques used in this study are highlighted, including preliminary and main analyses. Overall, these topics are presented in line with the sequence of Figure 3.1, which represents Saunders et al.'s (2012) research process "onion".

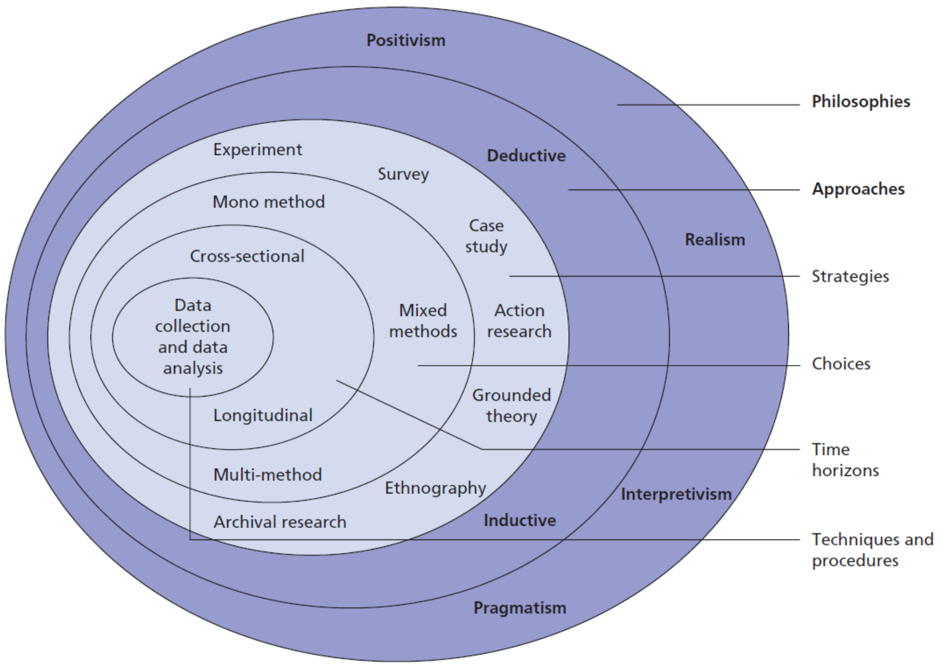

Figure 3.1 The research onion
Source: Saunders et al. (2012)

3.2 Research philosophy and paradigm

In business and management and other social science research, two types of competing mainstream research philosophies and paradigms are adopted: positivistic (or the so-called scientific approach) and interpretive (Bryman, 2012; Weber, 2004).

A paradigm can be defined as a way in which particular understandings can be obtained and explanations attempted in relation to analysing social phenomena (Saunders et al., 2012). It is a perspective or frame of reference for viewing the social world, consisting of a set of concepts and assumptions (Bailey, 2008). A research paradigm includes four aspects (assumptions): ontology, epistemology, axiology and methodology (Saunders et al., 2012; Walliman, 2006) regarding the frame in which the researcher understands reality. To illustrate, the term ontology can be defined as the researcher's view of the nature of reality or being, or a theory of the nature of social entities; the term epistemology refers to the researcher's view about what forms acceptable knowledge or knowledge; axiology—as used in research paradigms—primarily refers to the role of values in research; and the term methodology refers to the "best means" of gaining knowledge or how the research process is conducted, deductively or inductively (Bryman, 2012; Creswell & Clark, 2007; Lincoln et al., 2011; Saunders et al., 2012). These aspects (assumptions) determine and reinforce the selected research strategy and methods (Creswell, 2009; Saunders et al., 2012).

The positivist paradigm, as regards ontology, implies the idea that there is a certain "objectivity" regarding reality, which is quantifiable, divisible and fragmentable (Hudson & Ozanne, 1988; Orlikowski & Baroudi, 1991).Thus, the role of the researcher in examining a phenomenon is supposed to be discovering the phenomenon without intervention (Sobh & Perry, 2006). As with natural phenomena, social phenomena are held to be ruled by unchanging laws (Saunders et al., 2012; Willmott, 1993). In terms of positivistic epistemology, only observable phenomena can produce dependable data or facts (Saunders et al., 2012) and research is aimed at advancing knowledge using scientific theories (Straub et al., 2004). By employing existing theory to develop hypotheses, a research strategy can be generated to collect data (Saunders et al., 2012). A positivist researcher adopts a generalising approach to research, targeting general and abstract laws that can be perfectly applied to large numbers of people, settings, phenomena, and times (Hudson & Ozanne, 1988). From a methodological perspective, positivism seeks to achieve a high degree of objectivity and repeatability in order to gain insights regarding reality (Sayer, 1992). Moreover, the positivist paradigm depends on empirical evidence (Hiles, 1999) in order to examine theories developed to test and summarise knowledge (Saunders et al., 2012). Therefore, by using deduction, hypotheses can be tested (Sayer, 1992) for confirmation or falsification, in whole or part, (Saunders et al., 2012). Formalised statistical and mathematical methods are often employed by positivist researchers (Hudson & Ozanne, 1988). Accordingly, the values of the researcher are kept out of the research context (Saunders et al., 2012).

Interpretivists, in contrast, take the ontological stance that people (the researcher, and those individuals being explored) generate and associate their own subjective meanings in their everyday social interaction (Creswell, 2009; Saunders et al., 2012). For this reason, interpretivists think that knowledge is socially constructed by interaction with humans in their role as social actors (Saunders et al., 2012) and concepts develop from informants, rather than being identified *a priori* by the researcher. In other words, instead of seeking to determine law-like regularities, interpretivists study a particular phenomenon at a specific time and place to determine reasons, meanings, motives, and other subjective experiences that are context and time bound (Hudson & Ozanne, 1988). Consequently, interpretivists interact with the investigated people and, then, the results are affected by the investigator's standpoint and values (Saunders et al., 2012). Hence, inductive logic dominates in the interpretivist methodology (Henn et al., 2005). From a methodological standpoint, it can be said that unlike positivists, interpretivists believe that reality is perceived subjectively. Reality, as illustrated by Cunliffe (2003), is formed to a high degree through the way in which we understand it and react to it. Consequently, in such a research context, the focus will be on interpreting the social actions happening in specific situations (Cunliffe, 2008; Saunders et al., 2012). A summary of the comparison between the two paradigms is reported below in Table 3.1.

For the purposes of this study, the positivist paradigm is adopted, as it is deemed to be the most appropriate. First, this research's aim is to investigate the extent to which business excellence models are valid/suitable from a comparative standpoint. Consequently, the positivist paradigm is more appropriate to adopt within such a context, as it is adopted where theory is available, variables are easily specified, and the studies are highly structured (Creswell, 2009). In this vein, Onwuegbuzie and Leech (2006) point out that the research questions determine the form of data collection and play a key role in choosing the research paradigm.

Second, this study adopts a confirmatory research approach, which follows the procedure of confirming or disconfirming pre-specified causal relationships (Hair et al., 2010) and for this reason pre-validated scales were used. It is assumed that business excellence comprises a set of objectively observable and measurable criteria and that law-like generalizations can be made about relationships between variables. In other words, in accordance with the study objectives, research models are examined statistically using the SEM technique (at both levels: measurement and structural) to produce reliable results that can be generalized to the research population. This is consistent with the positivist paradigm (Saunders et al., 2012). Urbach and Ahlemann (2010) point out that study that "applies SEM usually follows a positivist epistemological belief" (p.9). Additionally, this study attempts to analyse business excellence models' inter-relations, which can be attained by employing positivist philosophy. In this context, Collis and Hussey (2003) pointed out that "according to the positivist paradigm, explanation consists of establishing causal relationships between the variables by establishing causal laws and linking them to a deductive or integrated theory"(p. 53). Similarly, Neuman (2014) stated that positivism deems social science as an organised method for combining deductive logic with accurate empirical observations of individual behaviours to discover and confirm causal laws that can be employed to predict general forms of human activity. As a result, consistent with the ontological, epistemological, and axiological assumptions, as far as possible, objective investigation apart from the researcher's perceptions and values was followed (Creswell, 2009; Saunders et al., 2012) .

Third, the previous business excellence models literature is inclined towards this approach (e.g. Badri et al., 2006; Bou-Llusar et al., 2005; Heras-Saizarbitoria et al., 2012; Karimi et al., 2013; Meyer & Collier, 2001; Pannirselvam et al., 1998).

Finally, the researcher prefers statistical methods and has good knowledge of this analytical tool. The researcher's past experience and preference are major aspects shaping the choice of philosophy (Creswell, 2009).

Table 3.1 Comparison of the positivism and interpretivism paradigms

	Positivism	**Interpretivism**
Ontology (the nature of reality)	External, objective and independent	Socially constructed, subjective, may change, multiple
Epistemology (what forms valid knowledge)	Only observable phenomena provide credible facts. Focus on causality and law (generalisations), Simplest elements of phenomena	Subjective meanings and social phenomena. Focus upon the details of situation, a reality behind these details, subjective meanings motivating actions
Axiology (the role of values)	Value-free	Value bound
Methodology (the process of research)	Process is deductive	Process is inductive
Rhetoric (the research language)	Using accepted quantitative words, the writing is formal with passive voice	With accepted qualitative words, the writing is informal with personal voice
Data collection techniques most used	Highly structured, large samples, measurement, quantitative, but can use qualitative	Small samples, in-depth investigations, qualitative

Source: adapted from Saunders et al. (2012) and Collis and Hussey (2003).

3.3 Research approach

According to Saunders et al. (2012), after determining the research paradigm to be followed, another important decision needs to be made: the research approach to be used. Two main research approaches are usually used by researchers, i.e., the deductive approach and the inductive approach (Bryman & Bell, 2015; Collis & Hussey, 2003). In the deductive approach, a theory and hypothesis (or hypotheses) are developed and a research strategy is designed to test the hypothesis, whereas in the inductive approach, data are gathered and as a consequence of the analysis of this data, a theory is developed (Saunders et al., 2012).

In the deductive research, to deduce a research hypothesis (or hypotheses), a researcher starts with information known about a particular phenomenon. Then, the operational hypothesis (or hypotheses) will need an empirical examination in the next stage of a research project (Bryman & Bell, 2015; Saunders et al., 2012).

With the positivist philosophy being followed, deductive research relies on the related literature to develop a theory and hypothesis (or hypotheses), which are subject to verification through appropriate statistical techniques, leading to a reasoned conclusion (Collis & Hussey, 2003). That is, the deductive approach progresses from the general to the specific (Collis & Hussey, 2003). Robson (2002) shows five progressive stages that are normally included in the deductive approach: (1) deducing a hypothesis, (2) operationalising the hypothesis, (3) testing, (4) the hypothesis confirmed or rejected, and (5) revision of theory if necessary.

An alternative approach to the deductive research is the inductive approach. Researchers following the inductive approach begin with observations on a specific phenomenon and by using findings, theory is generated (Bryman & Bell, 2015). In other words, inductive research uses several methods to collect data aiming at creating different views of phenomenon. In this way, collecting data is the starting point of the inductive research then, based on the analysed data, theory is formulated, which means moving from the particular to the general (Collis & Hussey, 2003). Table 3.2 presents the main differences between deduction and induction.

Table 3.2 The main differences between deduction and induction

Deduction emphasises	**Induction emphasises**
• scientific principles	• gaining an understanding of the meanings humans attach to events
• moving from theory to data	• a close understanding of the research context
• the need to explain causal relationships between variables	• the collection of qualitative data
• the collection of quantitative data	• a more flexible structure to permit changes of research emphasis as the research progresses
• the application of controls to ensure validity of data	• a realisation that the researcher is part of the research process
• the operationalisation of concepts to ensure clarity of definition	• less concern with the need to generalise
• a highly structured approach	
• researcher independence of what is being researched	
• the necessity to select samples of sufficient size in order to generalise conclusions	

Source: Saunders (2011, p.127)

On the basis of the above, Collis and Hussey (2003) point out the need for following a research approach that supports attainment of the research aim and objectives. In a similar vein, Creswell (2009) emphasises that the most important practical criteria to choose the research approach are the emphasis and the nature of the research topic. In this study, a framework (for the measurement and structural levels) for analysing BEMs comparatively has been developed based on the relevant literature, aiming at gauging and providing empirical examination of their suitability in addition to providing insights into the strength and direction of causation between the examined models' constructs, such as direct, indirect, and moderation effects. Thus, considering the focus and nature of this research topic, the deductive approach, which emphasises measurement and empirical verification of theories, models and relationships between constructs, appears more appropriate than the inductive approach (Bryman & Bell, 2015; Saunders et al., 2012). Additionally, the deductive approach owes more to the positivist philosophy (Saunders et al., 2012), which has been selected as this study's philosophy. Moreover, the collection of quantitative data from a large sample size, and the researcher's independence of what is researched fit the deductive approach (Creswell, 2009; Saunders et al., 2012). The deductive approach emphasises more the use of large samples, to improve the generalisation of results (Saunders et al., 2012). Finally, personal preference, also, could play a role in choosing a specific research approach (Saunders et al., 2012); here, working deductively is the preferred choice.

3.4 Research strategy

According to Saunders et al. (2012), research design is the overall plan of the way in which the research question(s) will be answered. In this respect, it will be affected by the research philosophy and paradigm (Bryman, 2012; Saunders et al., 2012).

Although there are many strategies that can be used in research, there is no superior research strategy, which is better than others. Rather, the most important criteria are whether a particular strategy fits with the assumptions of the selected research paradigm or not, and whether or not allows the researcher to attain the research objectives and to answer the research questions (Creswell, 2009; Saunders et al., 2012). There are many research strategies, which may be associated either with the deductive approach, the inductive approach or both approaches, including: experiment; survey; case study; action research; grounded theory; ethnography; and archival research (Bryman, 2012; Creswell, 2009; Saunders et al., 2012). Table 3.3 shows the possible related approach with each strategy.

Table 3.3 Research strategies

Strategy	Definition and possible associated approach
Experiment	".. seeks to determine if a specific treatment influences an outcome. This impact is assessed by providing a specific treatment to one group and withholding it from another and then determining how both groups scored on an outcome. Experiments include true experiments, with the random assignment of subjects to treatment conditions, and quasi-experiments that use nonrandomized designs" (Creswell, 2009: 12). It will include: defining a theoretical hypothesis; targeting samples from known populations; experimental and control groups that randomly allocated; adopting a formalised intervention to one or more variables; gauging a small number of variables while controlling the others; employing quantitative comparisons between experimental and control groups in terms of the dependent variable (Bryman, 2012; Saunders et al., 2012).
Survey	It is usually linked with the deductive approach and considered a popular and common strategy in business and management research. Also, it provides the collection of a high amount of data from a known population in a very economic manner. Often gained by employing a questionnaire (or structured interviews), the data are standardized resulting in easy comparison with the intent of generalisation. This strategy is seen as authoritative by people in general (Creswell, 2009; Saunders et al., 2012).
Case study	"An empirical inquiry that investigates a contemporary phenomenon whithin its real-life context, especially when the boundaties between phenomenon and context are not clearly evident" (Yin, 2003: 13). That is, the basic case study involves the detailed and intensive analysis of a single case (Creswell, 2009). Although there is a tendency to link case study with the inductive reasoning approach because of the 'unscientific' feel it has (Saunders et al., 2012), such a view is misguided (Bryman & Bell, 2015). This is because the case study strategy can be, regularly, used by both approaches as almost any kind of research can be built as a case study (Bryman & Bell, 2015).
Action research	A strategy usually associated with the inductive approach and entails four aspects: emphasising the purpose of the research: research in action instead of research about action; the involving of practitioners in the research; highlighting the iterative nature of the process of diagnosing, planning, taking action and assessing; and having implications beyond the immediate project (Bryman & Bell, 2015; Saunders et al., 2012).

Grounded theory	Although defining grounded theory can lead to over-simplification (Saunders et al., 2012), Creswell (2009) defined it as a strategy in which the researcher derives a general abstract theory of a process, action, or interaction grounded in the views of participants. This process includes employing multiple steps of collecting data and the refinement and categories or interrelationship of information. He added, two primary aspects of this strategy are: the theoretical sampling of different groups to maximise the similarities and the differences of information and continual comparison of data with emerging categories. That said, it often includes analysing qualitative data aiming at generating theory out of research data by achieving a close fit between the two (Bryman & Bell, 2015). Also, it is often seen as the best example of the inductive approach; however it is better to think of it as theory building through a combination of both approaches (Saunders et al., 2012).
Ethnography	Within this strategy, researchers, by collecting, mainly, observational and interview data, describe and explain an intact cultural group in a natural way over a prolonged period of time (Creswell, 2009). In this context, it is firmly rooted in the inductive approach (Saunders et al., 2012).
archival research	A strategy in which administrative records and documents are used as the principal source of data. As the ability to answer research questions will inevitably be constrained by the nature of the administrative records and documents, this strategy necessitates researcher establishing what data are available and designing research to make the most of it (Saunders et al., 2012).

Source: the author, based on: Bryman (2012); Creswell (2009); Saunders et al. (2012); and Bryman and Bell (2015).

According to Creswell (2009) and Saunders et al. (2012), the selection of a research strategy is based on the nature of the research question(s) or issue(s) being addressed, the targeted research objective(s), the philosophical underpinnings, and the researcher's personal experiences. From this, and based on what was discussed above, the survey strategy is believed to be most appropriate for addressing the research problem and questions. For instance, this strategy generally belongs to the deductive approach (Saunders et al., 2012), and is seen as a positivistic methodology (Collis & Hussey, 2003). Therefore, it fits the followed philosophy, positivism, as well as the adopted approach, the deductive approach.

Furthermore, this research aims to precisely and quantitively examine multiple models that involve a large number of variables by collecting data from a large number of firms targeting audiences (top management or quality managers) who have limited time to participate. Therefore, the survey strategy using questionnaires is most appropriate as it enables collecting a sizable amount of data from a large population in a highly economical manner (Saunders et al., 2012). Additionally, the data gathered are standardised in a quantitative form, facilitating quantitative analysis and easy comparison by applying descriptive and inferential statistics, in order, potentially, to produce results that are generalizable to the whole population (Saunders et al., 2012). Moreover, this research intends to examine concepts that are not directly observable, as well as assessing differences between respondents and groups. The survey strategy meets these needs and is easier to administer compared to other strategies and gives more control over the research process (Saunders et al., 2012).

3.5 Research method

Consistent with the research objectives and in line with the research paradigm, approach and strategy, this research used a questionnaire as the data collection method. A questionnaire can be defined as a technique of data collection in which each person from a chosen sample is asked to respond to the same set of questions that chosen after considerable testing in a predetermined order (Collis & Hussey, 2003; De Vaus, 2002) (Collis & Hussey, 2003). This data collection method is widely employed within the survey strategy, as it provides an efficient way of gathering responses from a sizable sample in order to be analysed quantitatively. This is because all respondents are asked to answer the same questions, which will be interpreted in the same manner by all participants (Saunders et al., 2012). Also, using a questionnaire in this study allowed examination and explanation of the interrelations among BEMs variables as it is used for descriptive and explanatory research. In addition, this method was chosen given its ability to accommodate a sizable sample size which is required for the statistical analysis applied in this study, structural equation modelling.

There are different types of questionnaires: self-administered questionnaires (postal or mail-questionnaires, internet-mediated questionnaires, and delivery and collection questionnaires) and interviewer-administered questionnaires (telephone questionnaires, and structured interviews).

The type of questionnaire to be chosen is guided by the research questions and objectives and especially: the importance of reaching a specific person as respondent; the characteristics of the respondents from whom data are to be collected; the required sample size bearing in mind the possible response rate; the importance of respondents' answers not being distorted; and the number and types of questions to be asked (Saunders et al., 2012). In this research, a large sample was required, which was widely dispersed. The targeted respondents were top management or quality managers (well-educated, internet-friendly, difficult to meet individually, and undoubtedly having access to email). The questions were not easily answered by telephone and needed to be answered by knowledgeable management members, so confidence that the right person responded was needed. Given these considerations, the most appropriate and effective (in saving time and money) method for this research was the web-based questionnaire method, where a questionnaire is constructed and sent via email to the targeted participants. This collection data method has been frequently used to obtain data in the literature (e.g., Leslie et al., 2012; Zhang & Bartol, 2010). Also, the potential drawbacks associated with this method, e.g., low response rate, difficulty in answering specific question (Saunders et al., 2012), were taken into account when developing and administering the questionnaires (see chapter four).

3.6 Time horizon

There are two forms of time horizon to research design; the cross-sectional and the longitudinal designs (Bryman, 2012; Saunders et al., 2012). The cross-sectional design involves collecting data on a series of variables at a single point in time, whereas with the longitudinal design, a sample is surveyed and is surveyed again on at least one further occasion to be a representation of a given period (Bryman, 2012; Saunders et al., 2012).

The choice of time horizon design should depend on the research questions, the research strategy and method, and available resources and time (Saunders et al., 2012). As this research was intended to examine the structure and interrelations of different pre-specified models at a single point in time (and not to study change or development of these models over time), followed the survey strategy (which is often associated with cross-sectional design), used a questionnaire, and was time constrained, in this study data was gathered employing a cross-sectional design.

3.7 Sampling design and procedures

Within the sampling design procedure, there are many essential aspects of the population and sample to discuss (Creswell, 2009). These points are discussed below in details.

3.7.1 Research population

A population can be defined as “the full set of cases from which a sample is taken” (Saunders et al., 2012: 212) or “the universe of units from which the sample is to be selected” (Bryman, 2012: 187). The term cases/units in these definitions may refer to people, nations, cities, firms, etc.

Given the research objectives, the Saudi Standards, Metrology and Quality Organisation (SASO) in Saudi Arabia, which is responsible for the administration of

KAQA, suggested that the questionnaires should be posted to the Saudi joint-stock companies registered with the Saudi Capital Market Authority and large Saudi industrial companies that reported to implement TQM programmes. A number of reasons may be identified for selecting these companies as the study population. First, these companies represent a wide variety of sectors (namely banks and financial services, petrochemical industries, cement, retail, energy and utilities, agriculture and food industries, telecommunication and information technology, insurance, multi-investment, industrial investment, building and construction, real estate development, transport, media and publishing, hotel and tourism, and the equity rights sector) and are distributed in the main commercial and industrial cities in Saudi Arabia (e.g., Riyadh, Jeddah, and Dammam). Second, these companies form more than 70% of the capital of the Saudi companies (SAMA, 2013). Third, these companies are complex organisations and undertake a broad range of business operations. The criteria of the three models must explain this complexity and the wide diversity of operations, human resources, suppliers and partners, and strategic planning that these organisations deal with. Fourth, KAQA is open to big and medium sized businesses in the private sector: manufacturing and service companies (KAQA, 2011), which are well represented in this list. Fifth, these companies are ISO9000 registered, ISO 9000 implementation may be viewed as a starting-stage towards business excellence / TQM (Antony et al., 2002; Santos-Vijande & Alvarez-Gonzalez, 2007). In short, this research population is appropriate for the stated research objectives and enables spanning the domain of the variability of the key exogenous and endogenous variables in the three focal models, i.e., enables analysing the studied contextual and three models variables (e.g., Table 5.3 represents a good cross-section for the research sample in terms of sectors/ strategic orientation, see section 5.2.7).

Regarding the target population, a number of previous studies asserted the importance of ensuring that the survey's respondents have the knowledge required to answer the questions suitably (Kumar et al., 1993; Podsakoff et al., 2003). Thus, these questions were specifically aimed at respondents who are more knowledgeable regarding the content of each question. Because of that and consistent with previous BEMs research (cf. Table A.3.1 in Appendix A.3), respondents were limited to top management or quality managers (e.g., Bou-Llusar et al., 2009; Santos-Vijande & Alvarez-Gonzalez, 2007; Xiang et al., 2010).

3.7.2 Research sampling

Identifying a sample of a population is an issue that is almost invariably faced in quantitative research (Bryman, 2012). A sample can be defined as the case or segment of population that is selected for analysis (Bryman, 2012). For many research objectives and questions it will be impossible either to collect or to analyse all the data available, because of limitations of money, time and often access (for example, impracticability of surveying all cases, budget constraints, and saving time). Therefore, sampling techniques provide a number of methods that enable the amount of data needed to be gathered to be reduced by considering only cases from a sub-group instead of all possible cases or elements (Bryman, 2012; Saunders et al., 2012). Then the results of this collected data will be generalised to the whole population from which the sample was drawn (Collis & Hussey, 2003). In this context, to keep sampling bias to an absolute minimum and then ensure a representative sample, preferred sample technique, the accuracy of the sampling frame, and nonresponse bias (Bryman, 2012) were taken into account and addressed.

Two techniques for sampling are available: (1) probability sampling and (2) non-probability sampling (Bryman, 2012). Probability samples are samples where the chance of each element or unit being selected from the population is known and is usually equal for all elements or cases (Saunders et al., 2012). This sampling method is often associated with survey research strategies where there is a need to make inferences regarding the population from which the sample has been drawn, to meet the research questions and objectives (Bryman, 2012; Collis & Hussey, 2003; Saunders et al., 2012). This sampling technique helps in keeping sampling bias to an absolute minimum (Bryman, 2012). Therefore, with randomization, the ability to generalize to a population is provided by a representative sample (Creswell, 2009). Many techniques can be used to select a probability sample such as simple random, systematic, stratified random, cluster and multi-stage (Saunders et al., 2012).

On the other hand, nonprobability sampling refers to all forms of sampling that are not conducted according to the canons of probability sampling (Bryman, 2012). That is, the probability of each elements being selected from the total population is not known and the selection of samples is based on subjective judgement (Saunders et al., 2012). Therefore, compared to probability samples, nonprobability samples produce results that are less generalizable to the population (Bryman, 2012) and their generalisability is not on statistical grounds (Saunders et al., 2012). Similar to probability sampling, many techniques can be used to produce a nonprobability sample, such as quota, purposive, snowball, self-selection, and convenience sampling (Saunders et al., 2012).

Given the intention of making inferences about the population by applying tests of statistical significance, probability sampling is employed in the current study. The selection of the probability sampling technique is contingent on the research objectives, the need (or not) for face-to-face contact with informants, the geographical distribution of the population, and the nature of the sampling frame (Saunders et al., 2012). Therefore, simple random sampling is the sampling technique used in this study.

3.7.3 Sampling frame

A sampling frame is a complete list of all the units in the population from which the sample will be drawn (Bryman, 2012; Saunders et al., 2012). For this study, as mentioned earlier, a list of the Saudi joint-stock companies registered with the Saudi Capital Market Authority and large Saudi industrial companies was gained from the information service at the Saudi Ministry of Commerce and Investment, which provides information on 941 firms. Since gaining an adequate and accurate sampling frame is critical in quantitative studies to produce more generalisable results and prevent sampling bias (Collis & Hussey, 2003), to ensure the accuracy and completeness of the list, it was checked by phone calls to these firms.

3.7.4 Sample size

Efforts have been made to adapt structural equation modelling methods to accommodate smaller sample sizes (e.g., Nevitt & Hancock, 2004); however it is still, in general, true that structural equation modelling is a large sample method (Kline, 2010). Sufficiency of sample size has a significant effect on the reliability of parameter estimates, model fit, and statistical power (Shah & Goldstein, 2006).

Some disagreement exists in terms of the suggested sample size for SEM (Bagozzi & Yi, 2012), and it is difficult to give a single answer on what the sample size should be in structural equation modelling, since various factors affect sample size requirements, such as estimation method, degree of multivariate normality, model complexity, and the amount of missing data (Hair et al., 2010; Kline, 2010; Shah & Goldstein, 2006). Recommended techniques for determining sample size involve specifying a minimum (e.g., 200), having a certain number of observations per parameter estimated, having a certain number of observations per measured variable, and through conducting power analysis (Shah & Goldstein, 2006).

The type of estimation technique employed in the analysis impacts sample size requirements (Kline, 2010). In this regard, for the maximum likelihood estimation (the technique used in the current study), simulation studies show that with ideal conditions it provides valid and stable results with sample sizes as small as 50 (MacCallum, 2003). Under less ideal conditions, some researchers suggest a sample size of 200 to reach a sound basis for estimation (Hair et al., 2010).

Another factor that affects sample size requirements is the distributional characteristics of the data. In general, smaller sample sizes are needed when the distributions of dependent variables are normal in shape and their associations with one another are linear (Kline, 2010). However, the Maximum Likelihood procedure has been found to be robust to departures from normality. Hence, even with a relatively small sample size, the ML technique may be satisfactory, if the distributional characteristics of variables are acceptable or are not too far out of range (Bagozzi & Yi, 2012). Hair et al. (2010) assert that non-normality has negligible effects in the large samples (>200).

In addition, the analysis of a complex model generally necessitates more cases than that of a simpler model. This is because simpler models have fewer parameters than more complex models (Kline, 2010). In this regard, Marsh et al. (1998) suggest that when the ratio of the observed variables to the factors (r) = 2 it would require a sample size of at least 400, (r) = 3 would require at least 200 sample size; and (r) = 12 would require a sample size of at least 50. Also, a rule of thumb regarding the minimum recommended ratio of sample size to number of parameters to be estimated was discussed by Bentler and Chou (1987) who pointed out that the ratio “may be able to go as low as 5:1 under normal and elliptical theory, especially when there are many indicators of latent variables and the associated factor loadings are large,” but they also suggest that “a ratio of at least 10:1 may be more appropriate for arbitrary distributions” (p. 91). In this regard, Bagozzi and Yi (2012) stated that “This conservative advice is well taken, but we have found in practice that satisfactory models have been obtained with ratios near 3:1, even close to 2:1 on occasion. Again, the distributional properties of measures are important, not sample size or ratios of sample size to free parameters, per se” (p. 16).

Moreover, regarding the recommended sample size in more absolute terms, a “typical” sample size in studies where SEM is used is about 200 cases, especially when using maximum likelihood estimation method with distributions are not non-normal (Kline, 2010; Shah & Goldstein, 2006). In the same vein, Bagozzi and Yi (2012) stated that “we would have to say that rarely (e.g., in a factor analysis of a small number of items with “well-behaved data”) would a sample size below 100 or so be meaningful, and that one should endeavour to achieve a sample size above 100, preferably above 200” (p. 29). Harrington (2009) shows that “less than 100” is a small sample but considered satisfactory for very simple models; “100 to 200” may be acceptable as a “minimum sample if the model is not too complex; and higher than 200 is possibly acceptable for most models” (p.46).

Moreover, with respect to the amount of missing data, overall, if there is a higher level of missing values (> 10%), a larger sample is required (Hair et al., 2010).

Furthermore, one problem associated with inadequate sample size is low statistical power (Kline, 2010), as statistical power[13] is essential to SEM analysis (Shook et al., 2004). MacCallum et al. (1996) define minimum sample size that results from degrees of freedom that is needed for adequate power (0.80) to detect close model fit,

On the basis of the above and given this research data distribution, the estimation method used, the ratio of the observed variables to the factors (25/7, 34/9, 29/8 for the MBNQA, EFQM, and KAQA models respectively), and the missing data amount (i.e., <2%), MacCallum's (1996) guidelines and the gained power of the research models (i.e., adequate power), the sample size for this study (233) can be deemed sufficient and satisfactory (cf. Table A.3.1 in Appendix A.3).

3.8 Data analysis techniques

Quantitative data, such as those used in this research, are required to be processed and analysed to make them useful, i.e., to be interpreted and then reach the research objectives and answering its questions (Saunders et al., 2012). In this respect, to process and analyse the research data, SPSS v23 and AMOS v23 were employed. The sub-sections below highlight the statistical techniques used in this study.

3.8.1 Preliminary analysis

Preliminary analysis addresses a set of issues that need to be assessed and overcome after collecting data and before running the main data analysis (Tabachnick & Fidell, 2007). Considering and examining these issues is necessary as an initial step in any analysis using empirical tools and graphical techniques (Hair et al., 2010). The rationale behind this stage is to uncover what is not apparent, as much as to depict the

[13] I.e., the ability to detect and reject a poor model.

actual data and to examine and resolve likely mistakes caused by research design (e.g., questionnaire design) or data collection practices (Hair et al., 2010; Tabachnick & Fidell, 2007). This analysis involves examining the effect of missing data, identifying outliers, the issue of response-set, gaining insights into the sample characteristics, and testing assumptions underlying multivariate technique used, viz. structural equation modelling (e.g., normality, linearity, homoscedasticity, and multicollinearity) (Hair et al., 2010; Kline, 2010; Levy, 2006; Tabachnick & Fidell, 2007). These issues related to preliminary analysis were assessed and resolved, if needed, using graphical techniques (e.g., P-P plot and scatterplot) and empirical tests (e.g., independent sample t-test, correlations matrix, tolerance scores, and variance inflation factor (VIF) scores). Detailed discussion about this analysis is presented in Chapter Five.

3.8.2 Main analysis

Structural equation modelling (SEM), which is a hybrid of factor and path analysis, was applied to examine the research models with maximum likelihood estimation using the Amos v23 program (Arbuckle, 2014). Overall, SEM was performed via a four-phase study (for details, see section 5.3). Issues related to this technique are presented below.

3.8.2.1 Rationales for the application of SEM

The advantages of SEM rather than other methods, such as multiple regression, come from four specific characteristics of this study design. First, SEM integrates factor analysis in the calculations. The research constructs are operationalized as multi-indicator scales and modelling them as reflective latent variables allows incorporating the measurement errors of these multi-indicators constructs in the models. This results in providing more valid parameter estimates (Anderson & Gerbing, 1988; Bentler & Bonett, 1980). In other words, SEM, specifically confirmatory factor analysis (CFA), provides a precise way of measurement as it employs the highest amount of information available when calculating latent variables (Guarino, 2004). As opposed to alternative techniques, such as multiple regression analysis, this enables the researcher to take into account how well each survey indicator gauges the respective latent variable, accounting for the measurement error that happens with most latent variables and for the smaller role that indicators of lower validity may play (Guarino, 2004). Accordingly, SEM is statistically more precise.

Second, SEM provides simultaneous tests of the fit of an integrated set of dependence relationships, as opposed to examining coefficients in individual equations. This enables testing the fit of alternative model configurations (Hair et al., 2010; Kline, 2010).

Third, SEM has the ability to assess a variety of dependence relationships (as a dependent variable acts as an independent variable in subsequent relationships within the same analysis) while also testing multiple dependent variables simultaneously (Kline, 2010). That is, it is possible to specify a structural model, which allows examining of complex structures enables single variables to attain the role of a dependent variable and independent variable simultaneously, thereby cancelling the need for separate regression analysis (Gefen et al., 2000). For example, although other multivariate analyses (e.g., multiple regression, factor analysis, multivariate analysis of variance, and discriminant analysis) provide powerful tools for dealing with range of theoretical enquiries, they can assess only a single relationship at a time (whether with multiple dependent variables, such as multivariate analysis of variance and canonical analysis, or not) (Hair et al., 2010).

Fourth, SEM allows assessment of the whole model at once and depends on bootstrapping to examine the indirect effects proposed in the research models (Preacher & Hayes, 2008).

In addition, there is a history of its application in the BEM literature (e.g., Bou-Llusar et al., 2009; Calvo-Mora et al., 2005; Flynn & Saladin, 2001; Moon et al., 2011; Su et al., 2003; Xiang et al., 2010) the results of which can act as a backdrop for this study.

However, SEM has two different approaches: covariance-based SEM (CBSEM) and partial least squares (PLS) (Hair et al., 2010). PLS is considered as a form of or an alternative to structural equation modelling (SEM) (Rönkkö, 2014). This issue is discussed in the next section.

3.8.2.2 Comparison between CBSEM and PLS

In the context of SEM, covariance-based SEM (CBSEM) methods, as exemplified by software such as LISREL, AMOS, and EQS, have been primarily applied by researchers. Another SEM technique is partial least squares (PLS), as exemplified by software such as PLS-Graph and SmartPLS (Hair et al., 2010; Peng & Lai, 2012).

One primary difference between these techniques is that CBSEM considers both common and unique variances; whereas PLS focuses only on common factor variances. The latent variables in PLS are weighted composite scores of the indicator variables and lead directly to explicit factor scores, whereas CBSEM specifies the residual structure of latent variables (Peng & Lai, 2012).

Moreover, CBSEM estimates the complete research model and provides fit statistics that clarify how well the empirical data fit the estimated model. In this sense, CBSEM is parameter-oriented because it aims to produce parameter estimates that are close to population parameters (Peng & Lai, 2012). In contrast, PLS seeks to evaluate the extent to which one part of the tested model predicts values in other parts of the tested model. As such, PLS is prediction-oriented (Fornell & Bookstein, 1982).

Additionally, PLS estimators are not as precise as the CBSEM estimation methods such as the maximum likelihood (ML) in attaining optimal predictions. As a result, PLS is deemed statistically inferior and less well grounded in statistical theory than CBSEM (Chin, 1995).

Another difference between CBSEM and PLS is that the former yields goodness of fit indices essential for theory testing, whereas the latter does not and has a piecemeal approach to estimating the overall research model. Thus, if the study objective is theory/model testing and confirmation, CBSEM is more suitable; whereas PLS is more appropriate for prediction of variance explanation in the dependent variable(s) (Hair et al., 2010; Kline, 2010; Shah & Goldstein, 2006).

Because of the limited-information estimation methods in PLS, it can handle a wider range of problems (Kline, 2010). For example, it is possible to work efficiently with a much wider range of sample sizes and model complexity while placing fewer demands on the data (e.g., it does not generally assume a particular distributional form) (Kline, 2010). Also, it is more amenable to the use of constructs with fewer items than are required for CBSEM (e.g., one or two) because the emphasis on the measurement properties of the constructs is lacking (Hair et al., 2010). Moreover, either reflective or formative measurement can be presented in PLS (Kline, 2010).

Overall, it seems that there is no strong consensus across disciplines regarding the robustness and usefulness of the PLS technique. Some authors (cf. Richter et al., 2016) (Richter et al., 2016) argued that PLS is a useful analytical approach that is capable of delivering results comparable to CBSEM and that its limitations are non-issues statistically. On the other hand, others (cf. Rönkkö et al., 2016) argue that, although the PLS technique is developed as a SEM technique, it has rather limited capabilities for handling the wide array of problems for which applied researchers use SEM.

In short, the CBSEM is recommended if its assumptions are met as it yields more precise parameters estimates (Hair et al., 2010; Kline, 2010; Peng & Lai, 2012; Shah & Goldstein, 2006). Given the above discussion, the points highlighted in the previous section, the research objectives and the data characteristics (see preliminary analysis and sample size sections), and its application in the BEM literature (e.g., Bou-Llusar et al., 2009; Moon et al., 2011; Santos-Vijande & Alvarez-Gonzalez, 2007; Su et al., 2003; Xiang et al., 2010), the CBSEM approach is adopted and applied in the current study to examine the research models.

3.8.2.3 Model strategy

In presenting the general strategic framework in the application of structural equation modelling, Jöreskog (1993) distinguished among three strategies, which are strictly confirmatory (i.e., confirmatory modelling), alternative models (i.e., competing modelling), and model generating (i.e., model development).

In the strictly confirmatory application, the researcher postulates a single model composed of a number of relationships and then tests the fit of the hypothesized model to the sample data. Then, the model is accepted or rejected based on its correspondence to the data (Byrne, 2010; Kline, 2010).

The alternative models (i.e., competing modelling) strategy concerns assessing alternative (i.e., competing) models. It relates to contexts wherein more than one *a priori* model is available based on theoretical or empirical bases. In this strategy, the researcher chooses one model as most appropriate in representing the data, based on analysing a single set of empirical data (Byrne, 2010; Hair et al., 2010; Kline, 2010). Equivalent models[14] are, also, another way to target a set of comparative models (Hair et al., 2010).

The model generation (i.e., model development) strategy is different from the previous two strategies. This is because, although an initial model is proposed, the objective of the modelling effort is to improve this model by modifying the structural or measurement models. Therefore, in addition to testing the model empirically, SEM must be used to furnish insights into its respecification (Hair et al., 2010; Kline, 2010).

In short, the researcher must use the SEM technique that best fits in the research objectives (Hair et al., 2010). Therefore, given the above, to achieve the primary objective of this research (objective 3), the alternative models (i.e., competing modelling) strategy is adopted to examine the three research models and, then, equivalent and nested[15] models for the resultant model are considered (Eddleston & Kellermanns, 2007; Kline, 2010) to gain information regarding the model that best accounts for the covariance observed among the constructs (i.e., exogenous and endogenous constructs). Among the three model strategies, the alternative models strategy is recommended instead of using specification searches as the former increases

[14] Equivalent models are SEM models involving the same predicted correlations or covariances but differ in the configuration of paths among the same observed variables (Kline, 2010).

[15] Nested models involving the same number of constructs with one with added or deleted relationship(s) (Hair et al., 2010).

the alignment of modelling results with our existing knowledge and theories (Shah & Goldstein, 2006) and leads to more insightful tests (Hair et al., 2010).

3.8.2.4 Two-stage approach and SEM steps

To examine the current study models, the two-stage approach to SEM outlined by Anderson and Gerbing (1988) was followed and individually performed for each model. The first stage involves showing the fit of a confirmatory factor analysis model with the observed data to evaluate the fit of the overall measurement model and then assessing the psychometric properties of constructs. Once an acceptable measurement model is obtained, in the second stage, the validity of the structural model is tested. This approach is recommended because with bad measures, valid structural model tests cannot be performed (Hair et al., 2010). Also, it has become a widely applied and generally accepted approach in SEM technique (Bollen, 1989) and, more specifically, it is deployed in studies in the BEM context (e.g., Bou-Llusar et al., 2009; Moon et al., 2011; Santos-Vijande & Alvarez-Gonzalez, 2007).

The application of SEM can be carried out by the following steps: model specification, model identification, model estimation, model evaluation, and model modification (Schumacker & Lomax, 2010).

a. Specification

Model specification involves presenting the research hypotheses/relationships in the form of a structural equation model (Kline, 2010). This procedure requires support from theory and empirical results from previous research (Fornell, 1983; Hair et al., 2010). Although specification can be presented by equations, it is preferred in the form of a visual diagram, containing the measurement model and the structural model, and specifying which parameters are being estimated and which are fixed (Hair et al., 2010; Shah & Goldstein, 2006). In the current study, the measurement and structural models were clearly specified (see chapter five) based on theoretical and empirical support (see sections 2.3, 2.5, and 4.2.).

b. Identification

The identification issue deals with whether there is enough information (how many data points we have to work with) to identify a solution to a set of equations (Hair et al., 2010). It determines the correspondence between the free parameters, i.e., the information to be estimated, and the observed variances and covariances, i.e., the information from which it is to be estimated (Schumacker & Lomax, 2010). Model identification has a significant effect on parameter estimates (Shah & Goldstein, 2006), so, identification problems should be addressed prior to estimating parameters (Schumacker & Lomax, 2010).

The observed variances can be calculated based on the formula [N (N+1)/2] where N is the observed variables, one degree of freedom (df) is then used/lost for each parameter estimated determining the level of identification (Hair et al., 2010; Kline, 2010). For models where degrees of freedom are one or more (unknowns are fewer than equations), the model is “over-identified” which is highly desirable as it significantly enhances the reliability of the estimate (Shah & Goldstein, 2006). Within a “just-identified” model, degrees of freedom are zero (there is an exact solution for parameters). This model, as pointed out by Hair et al. (2010), must indicate perfect fit to be accepted. In contrast, when degrees of freedom are less than zero (the number of free parameters is higher than the number of equations), the model is “under-identified” providing insufficient information to uniquely estimate the parameters and so its estimates, if it converges during model estimation, are unreliable (Shah & Goldstein, 2006).

c. Estimation

c.i Estimation technique

Several estimation techniques are available in SEM computer programs, such as maximum likelihood ratio (ML), generalized least square (GLS), and ordinary least square (OLS), weighted and unweighted least square (WLS and ULS), and asymptotically distribution free (ADF) (Hair et al., 2010; Kline, 2010). Their application is contingent upon the distributional properties of the measures variables, and each has computational advantages and disadvantages compared to the others (Shah & Goldstein, 2006). All the alternative estimation methods are more widely available and feasible for typical problems since the computational power of the personal computer has increased (Hair et al., 2010).

Among these available techniques, ML is a flexible technique for parameter estimation where the most likely parameter values to attain the best model fit are found (Hair et al., 2010). ML remains the most widely used technique and is the default in most SEM computer programs (Hair et al., 2010; Kline, 2010). Most SEMs introduced in the literature are analysed with this technique, which performs well for most types of SEMs (Kline, 2010). Indeed, it has been shown to be fairly robust to violations of the normality assumption. Empirical research compares ML with other approaches shows that it yielded reliable results under many situations (Finch et al., 1997; Hair et al., 2010; Jöreskog & Sörbom, 1985; Lei & Lomax, 2005). Jöreskog and Sörbom (1985), for example, found that ML has proven robust with self-reported research, tending to produce slight to moderate deviation from normality. Accordingly, use of an alternative estimator other than MLE needs explicit justification (Hoyle, 2000, in Kline, 2010).

However, some of the alternative techniques are needed if the assumption of multivariate normality is not tenable; others are targeted for non-continuous dependent variables (Kline, 2010).

In the light of the discussion above, and the data characteristics and distributional properties (see sections 3.7.4 (sample size) and 5.2 (preliminary analysis)), the ML estimation is used in the current study.

c.ii SEM programs (software tool)

There are several computer programs specifically constructed for performing SEM, each of which is employed by a number of researchers today (Kline, 2010). The most widely used programs are: AMOS (Analysis of Moment Structures), CALIS (available within SAS), EQS (an abbreviation for equations), LISREL (Linear Structural Relations), and Mplus (Hair et al., 2010). These SEM programs involve core techniques related to SEM. Also, most of them can examine means, models across multiple samples and have special syntax for multilevel analyses (Kline, 2010). Details and comparison of programs for SEM can be found in Kline (2010) and Tabachnick and Fidell (2007). Selection of a SEM computer tool depends on the researcher's preference and availability, as SEM programs are becoming more similar as they evolve (Hair et al., 2010). On the basis of the above, and given the accessibility for this researcher, AMOS v23 was employed in this study as the SEM program.

d. Evaluation

The model testing processes concern whether or not the hypothesised model(s) is supported by the observed sample data (Schumacker & Lomax, 2010). This involves assessment of the measurement model validity, the structural model validity, and the overall fit (Hair et al., 2010; Shah & Goldstein, 2006).

The measurement model represents relations between the observed variables and latent variables (Hair et al., 2010). Examining the measurement model involves using CFA, assessing dimensionality, reliability, construct (convergent, discriminant, and nomological) validity (Hair et al., 2010; Shah & Goldstein, 2006) (see Chapter 5, section 5.3.1).

The structural model specifies relationships between constructs. Its evaluations involve the overall goodness of fit, i.e., covariance fit, and the model validity, i.e., the hypothesised dependence relationships including examining the sign, magnitude and statistical significance of the structural path coefficients as well as coefficients of determination (Byrne, 2010; Hair et al., 2010; Shah & Goldstein, 2006) (see Chapter 5, section 5.3.3).

One common error is to concentrate only on the overall fit of the model, while ignoring important information about parameters (Shah & Goldstein, 2006) and model-data discrepancies that take sampling error into account (Kline, 2010) .Therefore, the model adequacy should be based on multiple criteria (Byrne, 2010). Consequently, following the recommendations of Bollen (1989) and Jöreskog (1993), to compare the three research models, the following criteria were used: (1) model fit; (2) significance of the standardised path estimates; (3) amount of variance explained in the endogenous variables as an indication of the substantive contribution of practical significance.

d.i Goodness of fit indices

Concerning the overall model fit, it is deemed one of the more complicated issues of SEM as it depends on nonsignificance (Shah & Goldstein, 2006).

Overall, the most basic index used to evaluate the overall fit is the chi square statistic, though its results regarding model significance are generally ignored (Shah & Goldstein, 2006).

Since the chi square test is sensitive to the violation of the multivariate normality assumption and sample size (e.g., >200) (Fan et al., 1999; Mulaik et al., 1989; Schermelleh-Engel et al., 2003), it should not serve as the only basis for evaluating model fit and additional fit indices are required (Bollen & Long, 1993; Hair et al., 2010; Kline, 2010).

For this reason, a number of alternative fit criteria have been introduced to assess model fit, which can be classified into three categories: absolute, incremental (comparative), and parsimony fit indices (Byrne, 2010; Hair et al., 2010; Kline, 2010).

Overall, absolute fit indices show the extent to which the model specified reproduces the sample data. The x^2 test is the most fundamental measure of absolute fit. Widely used indices are root mean square residual (RMR or SRMR), root mean square error of approximation (RMSEA), goodness-of-fit index (GFI), adjusted goodness of fit (AGFI), and normed chi square. RMSEA and RMR decrease as goodness of fit increases and are restricted below by zero, whereas GFI and AGFI increase as goodness of fit increases and are restricted above by 1.00 (Hair et al., 2010; Shah & Goldstein, 2006).

Incremental fit indices assess the proportional improvement in fit when the estimated model is compared with a baseline model, i.e., a null model that is restricted and nested (Hair et al., 2010). While there are several incremental fit indices, the most widely used are the comparative fit index (CFI), incremental fit index (IFI or BL89), normed fit index (NFI), and non-normed fit index (NNFI or TLI) (Shah & Goldstein, 2006).

Parsimony fit indices are developed as a criterion for choosing between alternative models, considering its fit relative to its complexity (Mulaik et al., 1989). Thus, these indices are not useful for validating a single model (Hair et al., 2010). While there are a number of parsimony measures, Parsimonious NFI and Parsimonious CFI are widely used (Hair et al., 2010; James et al., 1982), including in BEMs literature (e.g., Bou-Llusar et al., 2009).

There is an agreement that using all fit indices should be avoided; however there is disagreement on the superiority or even suitability of one measure against another (Schermelleh-Engel et al., 2003; Shah & Goldstein, 2006). Previous research shows a fairly common set of indices perform appropriately across a wide range of cases (Hair et al., 2010).

In light of this, chi square test (i.e., the ratio between χ^2 and the degree of freedom), RMSEA, and SRMR as absolute fit indices, and CFI as an incremental fit index were used to evaluate the overall model fit. To compare the research models PNFI, PCFI and normed chi square were used (Bou-Llusar et al., 2009; Hair et al., 2010; Shah & Goldstein, 2006).

This selection is consistent with Hair et al.'s (2010) recommendations to report at least one absolute index and one incremental index along with chi square value with its corresponding degrees of freedom, which collectively produce sufficient unique information to assess a model fit. In this context, Iacobucci (2010) and MacKenzie et al. (2011) point out that reporting CFI, RMSEA, and SRMR, is indicative enough for a well-fitting model. The chosen criteria, also, agree with the recommendations of Boomsma (2000); Hooper et al. (2008); and Shah and Goldstein (2006), but Boomsma (2000) suggests, also, to report the squared multiple correlations of each equation.

Additionally, it is in line with simulation studies that suggest higher probabilities of detecting misspecified models when following this recommendation (e.g., Hu & Bentler, 1999).

More specifically, although chi square test has many associated problems, it should be reported with its degrees of freedom (Hooper et al., 2008; Shah & Goldstein, 2006). SRMR and RMSEA suggest how well matrix covariance terms are predicted by the specified model and they are best suited to use in comparing multiple models (Hair et al., 2010). In particular, SRMR performs well under many circumstances (Shah & Goldstein, 2006). Moreover, in meta-studies, CFI and RMSEA are proven to be the most widely accepted measures in the field of SEM[16] (McDonald & Ho, 2002).

In short, the chosen criteria have been considered to be the most appropriate in terms of the insensitivity to sample size, identifying model misspecification, and the estimation technique used (Hooper et al., 2008; Shah & Goldstein, 2006). Additionally, they represent variant types of the evaluation of model fit and have support in the literature as important criteria to be reported. A summary of the chosen goodness-of-fit indices and their threshold criteria is presented below.

The chi square test is the most fundamental fit index. The χ^2 simultaneously assesses the degree to which the specification of the factor loadings, factor variances and covariances, and error variances for the studied model(s) is true (Byrne, 2010). The χ^2 has a p-value (statistical probability) that indicates whether or not the model and the observed sample are actually equal with a significant result signifying a lack of fit and

[16] In addition, Hu and Bentler (1998), for example, recommend against employing GFI and AGFI because they are insufficiently sensitive to model misspecification and significantly influenced by sample size. CFI is an improved version of Normed Fit Index (NFI), while NFI is outdated. Tucker-Lewis Index (TLI) is often used and recommended, but it tends to over reject model, which makes it more problematic to interpret than CFI (e.g. McDonald & Ho, 2002; Shah & Goldstein, 2006).

therefore leading to the rejection of the model. However, its sensitivity to sample size and its reliance on the central distribution have resulted in possible biased results (Hair et al., 2010). That is, its conclusions are based on sample size and degrees of freedom (both of which are large in the current study). Hair et al. (2010) state that most models have significant χ^2 results when estimated with a sample of more than 200 observations (the current study has 233 observations).

As the χ^2 test by itself is beset with problems, dividing it by the degrees of freedom in the model (χ^2/d.f., i.e., the normed chi square) is informative because it corrects for model size (Shah & Goldstein, 2006). A normed chi square value of less than 1.0 can indicate an over-fitted model, whereas greater values (>3.0-5.0) represent an underparameterized model (Jöreskog, 1969).

The root mean square error of approximation (RMSEA) is a criterion of model fit that has recently been considered as one of the most informative and widely used indices in SEM (Byrne, 2010; Hair et al., 2010). It is an absolute badness of fit index providing an assessment of how well the tested model fits the observed sample, i.e., estimating the lack of fit in the estimated model (Tabachnick & Fidell, 2007). RMSEA values range between 0 and 1, with lower values indicating better fit. An RMSEA value of .08 or less is indicative of favourable fit. Values between .08 and .10 are considered mediocre while values greater than .1 indicate poor fit (Browne & Cudeck, 1989; 1993; Hu & Bentler, 1999). RMSEA is connected to a CI to evaluate the precision of the estimate (Steiger, 1990), which permits to estimate the model's fit , in addition to the sample, to the population.

The standardised root mean residual (SRMR) is a standardised value of (RMR) that is useful for comparing fit across models. Higher SRMR values represent worse fits and lower represent better fit, meaning that this index is categorised under badness of fit indices (Hair et al., 2010). An SRMR value less than .08 is indicative of satisfactory fit (Hooper et al., 2008; Hu & Bentler, 1998; Hu & Bentler, 1999; Iacobucci, 2010). The Bentler Comparative Fit Index (CFI; Bentler, 1990) is possibly the most widely used measure (McDonald & Ho, 2002). CFI signifies the extent to which the researcher's model is better than the independent model in representing the sample data (Kline, 2010). With higher values indicating better fit than lower values, a CFI value that is higher than 0.90 usually indicates a well-fitting model (Bagozzi & Youjae, 1988; Bentler & Bonett, 1980; Hair et al., 2010).

The Parsimony fit index results from multiplying it by the ratio of the degrees of freedom in the tested model to the total number of potentially relevant degrees of freedom available in the data as an approach to compensate for high GOF index values gained at the expense of loss of degrees of freedom (Anderson & Gerbing, 1988; Mulaik et al., 1989). Similar to PNFI, PCFI values range between 0 and 1 with higher values indicating better fit and values higher than 0.50 indicate a good fit (Meyers et al., 2006; Mulaik et al., 1989).

e. Model modification

Using CFA, the model diagnostics process includes scanning the output and applying many criteria resulting in information about the tested measurement model may suggest alterations for addressing unresolved problems (Hair et al., 2010). For instance, factor loadings above +1 or less than -1 are not deemed in the feasible range, indicating a problem with the research data. Loadings should be significant and higher than 0.5, ideally 0.7. (Bagozzi, 2011; Chin, 1998; Hair et al., 2010). Moreover, Standardized residuals (residuals that are not processed divided by the standard error of the residual) higher than |4.0| indicate a potentially unacceptable degree of error that can require dropping one of the related items (Hair et al., 2010). Furthermore, modification indices (MI) are computed for each potential relationship that is not estimated in the tested model. They show important diagnostic information about the potential cross-loadings that could exist if estimated. Thus, they are considered a useful tool to identify problematic indicators if they display the potential for cross-loadings (Hair et al., 2010). More discussion related to these issues is presented in chapter 5, section 5.3.1.

3.9 Summary

This chapter has explained the study methodology, comprising the research philosophy and paradigm, research approach, research strategy, research method, time horizon, sampling design and procedures, and applied data analysis techniques. Perspectives of research methodology were highlighted to comprehend the assumptions that guide the methodology. According to the research "onion" sequence, the most appropriate choices in terms of the research methodology were highlighted and justified and the related processes were presented. The justification is based on the research objectives as well as consistency with the research philosophy. The positivistic paradigm was deemed the most appropriate paradigm to examine the three studied models. Therefore, a deductive approach was adopted to collect and analyse data using a cross-sectional questionnaire. Then, essential aspects of the sampling design and procedures were presented, in addition to the data analysis techniques employed. The following chapter highlights the research instrument design and operationalisation.

Chapter Four: Instrument Design and Operationalisation

4.1 Introduction

Having discussed the research methodology, involving research philosophy and paradigm, research approach, research strategy, research method, time horizon, sampling design and procedures, and the data analysis techniques, in the previous chapter; in this chapter the instrument design and operationalisation will be presented. In this respect, ensuring that the specific required data will be collected is important to achieve the research objectives. This issue is the focus of the following sections. More specifically, measures and variables, common method bias, questionnaire design (translating, pre-testing and piloting the questionnaire), and questionnaire administration are discussed in turn.

4.2. Measures and variables

As stated previously, the objective of this research is to examine the differences among three studied models through an empirical comparative analysis at the theoretical level, that is, to gauge the essence of the underlying theoretical construct, rather than develop substitutes for the elements in the criteria. Following Flynn and Saladin (2001), there was no effort to match the number of elements comprised in a dimension (sub-criterion) with that used in the targeted models because the focus of this research is to test the nature of a set of constructs, rather than to fully understand the structure of a set of items. Hence, following previous research (Bou-Llusar et al., 2009; Bou-Llusar et al., 2005; Calvo-Mora et al., 2005; Flynn & Saladin, 2001; Pannirselvam et al., 1998; Xiang et al., 2010), dimensions (sub-criteria)[17] were used as a guide for comparison and operationalizing constructs. The indicators measure quality practices

[17] There are several dimensions (sub-criteria) under each model construct (criterion) that describe aspects of the criterion in more detail. Constructs and dimensions are not directly measurable. Thus, there is a need to assess them by structured questionnaire design.

associated with the research models criteria (constructs) and are assigned to models' sub-criteria (dimensions) based on their content domain.

For each model, constructs were operationalized as shown in Table 2.2. Following Bou-Llusar et al. (2009), for the EFQM model results constructs (viz., the people, customer, and society results constructs), they are operationalized unidimensionally, and the indicators chosen are directly assigned to gauging each construct. This was due to the unavailability of data from customers, employees or other stakeholders, as this study's design is based on a questionnaire administered to the top management or quality management. However, for the business results construct for the EFQM model, as it is clear from the EFQM model material (EFQM, 2013), it was operationalized by the scale for dimensions 9.2 Financial Results, 9.3 Suppliers/Partners, and 9.4 Product and Process Results.

Overall, there are two different approaches to measure unobservable measured. One way is referred to as reflective measurement, and the other is a formative measurement (Hair Jr et al., 2016). For reflective measurement, the latent variable causes the observed variables (Diamantopoulos & Winklhofer, 2001) and the error results is an inability of the construct to fully explain these measured variables and, thus, indicators within a construct should be highly correlated with each other (Hair Jr et al., 2016). Reflective item models are the predominant used in the social sciences (Hair et al., 2010). On the other hand, for formative measurement, the measured variables cause the construct and, thus, formative constructs are not deemed latent and the items need not have a consistent inherent meaning (Jarvis et al., 2003). That is, each item is a potential contributing cause (Hair et al., 2010). The appropriateness of the measurement structure is determined theoretically (Gudergan et al., 2012). Therefore, reflective measurements for the studied models were used (Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Peng & Prybutok, 2015). In particular the main criteria comprise concepts such as leadership and strategy which need to be measured by a number of elements (Hair et al., 2010). In other words, the measure variables (sub-criteria) are supposedly affected and caused by the same underlying latent variable (main criteria) (Raharjo et al., 2017). Moreover, the measure variables are highly correlated and internally consistent among themselves (Chin, 1998).

All constructs are measured using multiple indicators requiring an indication of intensity on a 7-point Likert-type scale for each indicator in accordance with previous research (Bou-Llusar et al., 2005; Calvo-Mora et al., 2005; Moon et al., 2011; Santos-Vijande & Alvarez-Gonzalez, 2007), see Table A.4.1. Seven-point scales are used because research indicates they are most easily completed by respondents while providing reliable data (Meyer & Collier, 2001). All constructs are measured using multi-indicator scales ranging between 1 (strongly disagree) and 7 (strongly agree). All constructs included three indicators or more, as recommended in latent construct models (Hair et al., 2010; Kline, 2010).

Because the KAQA, EFQM and MBNQA criteria do not suggest specific practices, the questions address whether relevant management and quality issues are addressed rather than how they are addressed. That is, respondents were asked to assess how well the different statements define their companies' practices. This method enables the assessment of the companies' commitment to all constructs and dimensions to be conducted and offers a score that quantifies the consistency between organisational quality systems and results and the excellence model (Badri et al., 2006; Bou-Llusar et al., 2009; Bou-Llusar et al., 2005; Moon et al., 2011; Santos-Vijande & Alvarez-Gonzalez, 2007). With a consideration of the competitive nature of organisations' performance and consistent with BEMs (e.g., EFQM, 2013: 13; NIST, 2015: 25), respondents were asked to compare their results with those of their direct competitors or other benchmarking group within the past three years.

Given the critical impact of how to measure research variables on the reliability and validity of collected data, Bryman (2012) suggests the use of extant measures whenever possible particularly if those measures have already been piloted and their reliability and validity have been established. Additionally, since the primary objective of this study is to analyse a number of relationships rather than developing new constructs, using pre-tested measures from previous empirical research, wherever possible, was emphasised (Tata et al., 1999).

For the dimensions of the three targeted models, existing scales were used from prior empirical studies with the exception of dimensions 3.8, 4.6, 5.3, 8.1-8.3, 9.6-9.7[18] (see Table 2.2). For the extant scales, in line with best practices, when surveying audiences (in this case top management or quality managers) who have limited time to participate (Bergkvist & Rossiter, 2007; Drolet & Morrison, 2001; Kautonen et al., 2015; Pollack et al., 2015), shorter scales but reliable and reflective of models' dimensions, where available, were chosen to gauge research constructs. This entailed utilising a two-step selection process: identifying scales that represent the content domain of the models' sub-criteria (dimensions), then, selecting the shorter but reliable one of those representative scales. The rationale behind choosing shorter scales is to enhance the response rate (Kautonen et al., 2015). Comparison of these scales is presented in Appendix A.4, Table A.4.1.

[18] Namely, Saudization, Focusing on local suppliers and products, Applying recognized Saudi or (international) standard specifications, Contributing to national development, Social responsibility, Participating in society training and education, Beneficiaries' satisfaction, and Human resources dimensions.

New scales were based on a scale or set of questions based on the self-assessment philosophy for the BEM. Previous academic studies maintained that the BEM/NQAs material is an appropriate and comprehensive input for designing a questionnaire and considered as comprehensive[19] (Bou-Llusar et al., 2005; Calvo-Mora et al., 2005; Eskildsen & Dahlgaard, 2000; Santos-Vijande & Alvarez-Gonzalez, 2007).

On the basis of the above, the questionnaire was developed using 128 statements after a comprehensive check of the relevant literature and all the dimensions and guidance points of KAQA, EFQM and MBNQA models related to the constructs of the three models. The Appendix lists the research survey questions and their sources (Appendix A.4, Table A.4.5).

A self-administered survey was employed to gather data, following the main principles for reducing response errors (e.g., wording, visual format, and directional guides of instruction) (Dillman, 2000; Fowler, 2013). Also, a number of actions to rule out common method variance (CMV) were taken (Chang et al., 2010; Podsakoff et al., 2003), for instance, emphasising to the participants the anonymity and confidentiality of their responses, assuring them that there are no right or wrong responses and giving participants the researcher's contact information to deal with any comments and/or questions that they might have. In addition, before employing a survey questionnaire, its reliability was tested, since it was employed as a measurement tool for a conceptual model (Brace, 2008; Hinkin, 1995).

[19] In this case, the new scales were extracted from the 2013 KAQA Criteria Handbook as they are unique to the KAQA model.

4.2.1 Measurement of potential moderating factors

To measure industry type (service/manufacturing)[20], firms were asked to specify sector that better reflects the firm's core business activity. The firm specialisation was assigned according to the Saudi sector classification provided by the Ministry of Commence and Investment in Saudi Arabia then firms were grouped by industry type: service and manufacturing firms. Accordingly, the service sector includes Information & Communication Technology, Insurance, Banks & Financial Services, Hotel & Tourism, Media & Publishing, Multi-Investment, Real Estate Development, and Retail specialisations, whereas the manufactoring sector includes the rest (see Table 5.3 in section 5.2.7). This is similar to operationalizations in other studies (Bou-Llusar et al., 2009; Gómez Gómez et al., 2011).

Given that there is a scarcity of established measures in operations management for moderating factors such as strategic orientation (Sousa & Voss, 2008), the importance of choosing shorter measures to enhance the response rate (Kautonen et al., 2015), and the validity of the Snow and Hambrick (1980) paragraph approach (Garrigós-Simón et al., 2005; James & Hatten, 1995), this approach was used to operationalise strategic orientation.

As mentioned earlier, strategic orientations were differentiated using (Miles et al., 1978) terminology. As such, respondents were asked to indicate the type of strategic orientation used in their firms with the following possible categories: prospectors, analysers, defenders, and reactors (see Table A.4.2 in Appendix A.4). The text used in

[20] Manufacturing firms that primarily earn revenue through providing tangible (physical) products. Service firms are involved in retail, transport, distribution, and other service-dominated businesses, i.e., its output is intangible.

the paragraphs in question (e.g., Brown & Dev, 1999; Garrigós-Simón et al., 2005; James & Hatten, 1995) was slightly modified according to the research context.

4.3. Common method variance (bias)

Common method variance (CMV) refers to ‘‘variance that is attributable to the measurement method rather than to the constructs the measures represent’’ (Podsakoff et al., 2003: 879). That is, common method variance artifactually results in internal consistency or apparent correlation between variables that is created by using the same source to measure each variable (Chang et al., 2010; Spector, 1987).

Within cross- sectional research designs (i.e., self-report data), researchers collect people’s reports of their internal states at the same time as their reports of their past behaviour regarding those internal states. As a result, it is possible that method variance inflates the observed relations between these two types of variables falsely (Lindell & Whitney, 2001). As measurement is never perfect, each research is prone to measurement error which comprises two components: random error and systematic error (Bagozzi et al., 1991). The ability to precisely measure a relationship can be affected by random and systematic errors; however, the latter is a more severe problem (Podsakoff et al., 2003). Using multiple items that are specified to capture their latent construct can treat random error (Craighead et al., 2011). However, systematic error (i.e., method effects) can inflate or deflate the measured relationships between independent and dependent variables, and thus can bias the estimates of the actual relationship among theoretical factors (Podsakoff et al., 2003).

Scholarly works have different views concerning common method variance. Some argue that the effect of CMV is a major potential validity threat (Campbell, 1982; Sharma et al., 2009). Others point out that the common method variance issue may be overstated (Crampton & Wagner, 1994; Lindell & Whitney, 2001), and claim that a consideration of method effects did not seriously undermine the validity of the results of reanalysed previous published studies (Spector, 1987; 2006).

A comprehensive review of studies on common method variance in behavioural research outlined a more balanced conclusion: ‘‘common method variance is often a problem and researchers need to do whatever they can to control for it’’ (Podsakoff et al., 2003: 900). The same researchers stated, “It is important to recognize that the findings suggest that the magnitude of the bias produced by these method factors varies across research contexts …not only can the strength of the bias vary but so can the direction of its effect” (p. 880). Given this debate, previous studies highlighted the importance of identifying and evaluating the magnitude and prevalence of CMV (Bagozzi, 2011).

Academic studies have outlined some causes of common method variance within the context of self-report questionnaires. For instance, Podsakoff et al. (2003) outline four factors that may lead to common method variance: the use of a common source, effects that result from the items’ characteristics (e.g., item complexity and/or ambiguity), the context in which items on a questionnaire are placed, and the influences of the context in which the measures are obtained (time, location and media). In this vein, when using a common rater (e.g., self report questionnaires), they define several possible effects such as (1) consistency motif (consistency effects) and illusory correlations, the tendency of respondents to try to keep their responses to items consistent, searching for similarities and consistency between their cognitions and attitudes; (2) social desirability, a propensity for respondents to respond to questions more as a desire to present themselves in a favourable social way than to show their actual feelings; (3) and behaviour that results from knowledge deficiency or leniency.

MacKenzie and Podsakoff (2012) suggest a model answering the question of when method variance is likely to be a problem (see figure 4.1). In this regard, they stated,

> "Respondents will optimize when they are able to provide accurate answers and they are motivated to provide accurate answers. Both are necessary. If respondents are able to provide accurate answers, but unwilling to try to do so, then satisficing will result. Similarly, if respondents are motivated to provide accurate answers, but are unable to do so, once again, satisficing may be the result." (p. 544).

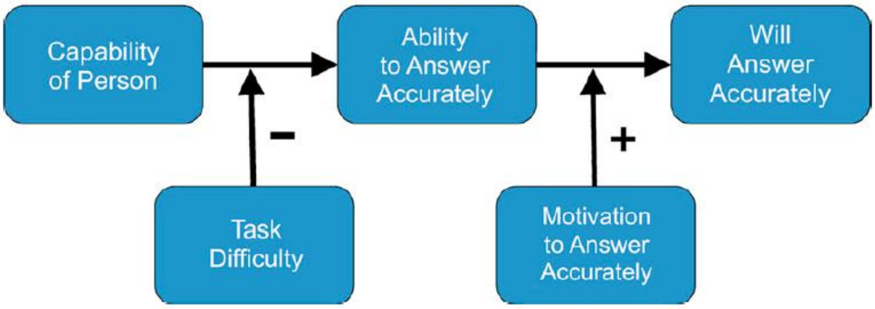

Figure 4.1 When is method bias likely to be a problem?
Source: MacKenzie and Podsakoff (2012)

Many approaches have been suggested to control or minimize common method variance (e.g., Chang et al., 2010; Craighead et al., 2011; MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003; Spector, 2006). These strategies can be classified into two fundamental approaches; ex-ante strategies fulfilled in the research design stage and ex-post statistical analyses used after the data have been gathered.

The ex-ante approaches consist of some precautionary procedures such as assuring and protecting the anonymity of participants and the confidentiality of the questionnaire, to minimise evaluation apprehension (Podsakoff et al., 2003), improving scale items by following careful development and construction of scale items, and to target respondents who have the necessary knowledge and experience about the issues of interest to ensure the validity and accuracy of the gathered data (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003; Sharma et al., 2009).

A number of ex-post statistical remedies have been noted in previous research and examined in this study to identify and control for method biases, such as a Harman one-factor test where all variables (dependent and independent) are subject to exploratory factor analysis(EFA) to be loaded into only one single factor to determine the number of factors that are necessary to account for the covariance in the variables, that is, to examine if one single factor does surface or whether one factor accounts for the majority of the variance between the variables; if not, the claim is that common method variance is not a pervasive problem (Chang et al., 2010; Craighead et al., 2011; Podsakoff et al., 2003). However, Podsakoff et al. (2003) state that Harman's analysis is insensitive and there is no useful guideline regarding what will be the satisfactory percentage of extracted variance of a single-factor model. Thus, to support the results of the Harman one-factor analysis with a more sophisticated test as suggested by Malhotra et al. (2006) and Podsakoff et al. (2003), confirmatory factor analysis can be used to compare the model fit of two models, as the first model allows all questionnaire items to load on a latent common method variance factor and the second allows all questionnaire items to load on their theoretical constructs. From this, if the latent common method variance factor model does not fit the data, therefore it can be concluded that the variables are multidimensional and common method variance is more likely not to be a pervasive problem. However, when the one factor model fits the data, then common method variance is substantial and more likely to be a threat (Malhotra et al., 2006), see for example Bou-Llusar et al. (2009) and Schleimer and Pedersen (2014). This study addressed this issue using several procedures recommended in the literature (details are discussed in section 4.4.). In addition, pretesting, pilot testing, and empirical evidence (ex-post statistical remedies) were employed for the same purpose. The results show that common method bias is not a serious problem in this study.

4.4. Questionnaire design

To a large degree, the internal validity[21] and reliability of the collected data and achieved response rate are contingent on the design and structure of the questionnaire. A reliable questionnaire implies that the data are collected consistently, and one that is valid will allow accurate data to be collected (Collis & Hussey, 2003; Saunders et al., 2012).

In the light of this, this research followed main principles and several recommendations to ensure the questionnaire used would provide a valid and reliable measurement of the research models and reduce response errors.

For example, the measurement of each of the research models' dimension, which cannot be measured directly, was operationalized, as discussed earlier, using a scale, or set of questions. Scales were mostly gleaned from empirical studies based on a thorough review and understanding of the criteria.

In addition, recommendations were followed regarding wording, visual format, and directional guides of instruction, keeping the questionnaire as short as possible, combining the questionnaire with a covering letter personally addressed to each

[21] Within the context of the validity of a questionnaire, researchers indicate content validity (the extent to which the measures provide adequate coverage of the investigative questions, which can be established by reviewing the literature and pre-test), criterion-related validity (the ability of the measures to make accurate predictions, which can be assessed by statistical analysis like correlation), and construct validity (the degree to which measures actually gauge the presence of the intended constructs, which can be assessed by statistical analysis as discussed in data analysis section) (Saunders et al., 2012).

respondent, evaluating the adequacy of the instrument (pre and pilot testing), and a number of actions to reduce the threat of common method variance (Bryman, 2012; Dillman, 2000; Fowler, 2013; MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003; Saunders et al., 2012).

The final version of the questionnaire in this research comprises two sections with questions distributed over four one-sided A4 pages. The length of the questionnaire conforms to the acceptable range of lengths provided by Saunders et al. (2012) which is between 4 to 8 A4 pages. The first section of the questionnaire involved the main questions focusing on the research models' criteria and dimensions. The second section involved questions focusing on some demographic information. The full and final version of the questionnaire is presented in Appendix A.4.2.

Furthermore, a systematic procedure for data coding and processing was conducted following the recommendation in the literature (Bernard, 2012; Groves et al., 2009; Saunders et al., 2012). For example, prior to the fieldwork, a codebook including the code of each data category was created (see Appendix A.4.3), 100% verification of entries was made, and a data cleaning process was conducted (see section 5.2).

4.4.1. Questionnaire translation

The questionnaire was translated into Arabic, the native language of the respondents, and back translated with the assistance of two Saudi scholars in the business excellence/ TQM field who resided in the UK. As they were familiar with both languages and the questionnaire questions, this guaranteed that there would be no loss of meaning after the original questions were translated and back translated (Anderson et al., 2015; Hui & Triandis, 1985). After the translation, differences were discussed (these were centred on some terms that may have more than one equivalent word and structure of expressions), and jointly solved, to ensure consistency of understanding by revising the English version and/or adjusting the translated version to precisely reflect the intended meaning and better match the two versions. To gain more clarity, the Arabic version of the questionnaire was pre-tested and then a pilot test made, as highlighted below. The final Arabic version of the questionnaire is presented in Appendix A.4.2.

4.4.2. Pre-testing and piloting the questionnaire

Prior to full operationalisation, the questionnaire should be pilot tested (Bryman, 2012). This is important to establish the content validity of an instrument and to improve questions, format, and scales (Creswell, 2009). This reduces the likelihood of problems in answering the questionnaire by respondents and in recording the data, since piloting provides assurance that questions suit the research purpose and particular research context (Collis & Hussey, 2003; Saunders et al., 2012).

Initially, an expert or group of experts should comment on the adequacy and representativeness of the measures, and to provide suggestions on the questionnaire structure. The purpose of this is to help in establishing content validity and allow necessary modifications to be made prior to pilot testing with a group as similar as possible to the research population (Saunders et al., 2012). Determining the number of people to be targeted in pretesting and piloting the questionnaire is dependent on the research objectives and questions, the research project size, and the time and money constraints (Saunders et al., 2012).

In the light of the above, the questionnaire was tested in a three-step process. Firstly, a detailed evaluation by the doctoral supervisor of this study resulted in the *alpha* version of the questionnaire.

Consequently, the questionnaire was tested on four quality managers in Saudi firms and four academic experts in business excellence in an attempt to ensure that the items were interpreted unambiguously and displayed high content validity. In addition, further short questions were given to gain further information regarding ambiguous or difficult items, repetitiveness of the items, the length of the survey, completeness/superficiality, features of the wording or formatting, and any other comments, following the suggestions of Bell (2014) and Francis et al. (2004). For example,

• Are any items ambiguous or difficult to answer?

• Does the questionnaire feel too repetitive?

• Does it feel too long?

• Does it feel too superficial?

• Are there any annoying features of the wording or formatting?

• Are there any other comments?

The questionnaire then was refined following the feedback gained. For example, the feedback suggested providing brief instructions at the beginning of each page, substituting some words for more appropriate ones (e.g., leaders instead of managers and organisation instead of companies), giving brief definitions of some terms used (e.g., empowerment, process efficiency, and key operational factors), and changing two questions for better understanding and to reflect the theoretical domain (questions 5.4.1. and 5.4.2. in Table A.4.5, Appendix A.4). These modifications led to the beta version of the questionnaire.

Based on the beta version of the questionnaire, 36 firms participated in a pilot test, that was conducted to test the reliability of the measurement scales, by randomly targeting

120 Saudi firms from the research population (response rate (RR): 30%). Cronbach's coefficient alpha is one measure employed to assess reliability, and a guideline of 0.70 was used in this study (Anderson & Gerbing, 1988). These efforts resulted in a highly reliable instrument (Cronbach's α ranging from 0.809 to 0.95) except for the Suppliers and partners construct for the KAQA model with CRA 0.621. Therefore, one item representing dimension 4.6., which had inadequate reliability, was replaced with four items based on the KAQA materials. These efforts led to the final version of the questionnaire (presented in Appendix A.4.2).). The survey questions, their sources, and modifications made are shown in Appendix A.4, Table A.4.5.

4.5. Questionnaire administration

After adjusting the beta version of the questionnaire, the final version was administered.

To maximise response rate, as mentioned earlier, several steps were taken (Dillman, 2000), for example: (1) each covering letter was personally titled to the targeted respondent explaining the importance of the research; (2) respondents were assured that their responses would be kept anonymous and confidential; (3) a report of the findings and conclusions of the study was offered to respondents; and (4) two waves of the survey were issued.

Given the gained response rate within the pilot test (RR= 30%), the response rate within BEM literature (ranging from 18% to 77%, see Table A.3.1 in Appendix A.3), the response rate for other studies conducted in the same context (i.e., Saudi context, ranging from 25% to 58%, see Table A.4.4 in Appendix A.4) and the sample size required (e.g., between 200 and 300, see section 3.7.4), the questionnaire was emailed to a random sample of 700 Saudi manufacturing and service companies, targeting the

CEO or the quality manager, with a reminder email sent almost two weeks later. With this sample, 247 questionnaires were returned, 235 of which were usable (RR: 34%). Details of the sample demographics are available in the demographic profile section (section 5.2.7). The sample size obtained is adequate (see section 3.7.4) and comparable with other rates mentioned above.

4.6. Summary

The procedures employed regarding the instrument operationalisation and design were discussed in this chapter. First, the research constructs were operationalized according to the research objectives and best practices and following the relevant literature. Second, many approaches have been suggested to control or minimize common method variance were highlighted. Third, the research questionnaire was designed following basic research principles and several recommendations to ensure the questionnaire used provides a valid and reliable measurement of the research models and reduce response errors. Fourth, the final version of the questionnaire was emailed to a random sample of 700 Saudi manufacturing and service companies, targeting the CEO or the quality manager. As a result, 247 questionnaires were returned, 235 of which were usable (RR: 34%).

Chapter Five: Data Analysis

5.1 Introduction

Chapter five focuses on the research findings by introducing the quantitative analysis of the empirical data collected in order to examine the three models comparatively and investigate moderation effects according to the research objectives and as mentioned in sections 2.7. and 3.8. In this context, the quantitative data, first, were preliminarily screened and examined against the assumption of structural equation modelling (e.g., normality and linearity). Next, the main analysis was performed and the related results were reported, involving assessing the measurement models, carrying out common method variance employing several procedural and statistical techniques, estimating the structural models, analysing the mediation effects, comparing the three models, testing alternative models for the superior model, and, finally, performing multi-group analysis and assessing moderation effects.

5.2 Preliminary data analysis

This section explicates the procedures followed for screening the empirical data collected through the questionnaire instrument. This comprises a discussion of the missing data analysis, outliers, nonresponse bias, and the known assumption of parametric tests such as normality, linearity, homogeneity of variance, and multicollinearity, as well as the demographic profile.

5.2.1 Missing data

Missing data is a common problem for research applying structural equation modelling (SEM) methods (Enders & Bandalos, 2001). Significant missing data lead to convergence failures, biased parameter estimates, and inflated fit indices (Brown, 1994). Recently, the increased use of online data collection approaches, has reduced missing data (Hair Jr et al., 2016; see for instance (Meek et al., 2011)).

The analysis of the missing values problems in this study was conducted using the SPSS missing value analysis (MVA), (see Table 5.1 and Appendix A5, Table A5.1). According to the univariate statistics, the amount of the values that were missing in all variables was below 2%. The results of the MVA also showed that a number of cases had missing values in excess 10%. For examining if the missing values were "missing completely at random", Little's MCAR test (Little & Rubin, 2002) for testing randomness was applied. The result was significant indicating the absence of complete randomness (Chi-Square = 2923.836, DF = 2789, Sig. = .037).

Prior to selecting a method for imputation of missing data, it is important to consider a simple remedy of deleting offending variables and/or cases (Hair et al., 2010; Leslie et al., 2012; Tabachnick & Fidell, 2007). This is important because deleting such cases may decrease the amount and concentration of missing data (Hair et al., 2010: 48). According to missing value analysis (MVA), the data lacked any offending variables but had two cases that can be considered as offending cases (a small subset of cases with their exclusion greatly reducing the extent of the missing data). These two cases were eliminated. The missing value analysis and Little's MCAR tests were conducted again to evaluate the pattern of missing data with the remaining cases (233). The result of Little's MCAR test showed that the data may be assumed to be MCAR, (Chi-Square = 2737.883, DF = 2626, Sig. = .063), and messiness is assumed not to matter for the analysis. Also, only few data points, about 2% or less, are missing in a random pattern, e.g., lack of concentration in some specific set of questions or attrition at the end of the questionnaire (illustrated on Table 5.2. and Table A5.2. in Appendix A5).

Table 5.1 Missing data values analysis per cases

Number of missing data per case	Number of cases	Per cent of sample
0	210	89
1	11	4.5
2	2	1
3	2	1
4	3	1.5
5	1	.5
6	2	1
7	2	1
41	1*	.5
52	1*	.5
Total	235	100

*As the survey was anonymous, following it up with these 2 respondents was unavailable.

Table 5.2 Missing data values analysis per cases for reduced sample (233 cases)

Number of missing data per case	Number of cases	Percent of sample
0	210	89.5
1	11	4.5
2	2	1
3	2	1
4	3	1.5
5	1	.5
6	2	1
7	2	1
Total	233	100

Therefore, the problems that associated with missing data are not severe. According to Hair et al (2010: 46), missing values below 10% for an individual case/observation can be ignored when the missing values do not exist in a particular fashion.

In terms of the imputation techniques for missing data, Hair et al. (2010) stated that with missing data low enough to not affect the results any of the approaches for remedying missing data may be applied even if it operates in a non-random manner. That is, when missing values are small (< 0.05), almost all methods of imputation will produce similar results (Cohen et al., 2013; Meyers et al., 2006; Tabachnick & Fidell, 2007). Nonetheless, the expectation maximisation (EM) method is recommended in cases where missing values are less than 5% and using structural equation modelling (Cohen et al. (2003: 450); Hair et al. (2010: 50) and Tabachnick and Fidell (2007: 71)). EM, which contingent on both maximum likelihood (ML) estimation and the covariance matrix, was employed for the following reasons: 1) As stated by Tabachnick and Fidell, (2007: 71), it is contingent on the covariance matrix, which makes it provide the least analysis bias when compared with the other methods of imputation, and it is a best presentation of the original distribution of values (Hair et al., 2010), 2). Under ignorable missing data conditions (missing completely at random and missing at random[22]), EM estimates were unbiased and more efficient than the other methods (Enders & Bandalos, 2001), 3) it is commonly applied alongside structural equation modelling (Hair et al., 2010; Shah & Goldstein, 2006), 4). Application of a method such as listwise deletion may result in an inadequate sample size (Hair et al., 2006). Also other techniques were explored, including listwise deletion and mean replacement (see Appendix A5, Table A5.3.), which each produced the same results.

5.2.2 Outliers

An observation that is substantially different (e.g., larger/smaller) from its nearest observation in a series of observations is refered to as an outlier (Hair et al., 2010). Tabachnick and Fidell (2007: 22) state that an outlier is a situation with such an extreme value on single variable (a univariate outlier) or such an unusual combination of scores on two or more variables (multivariate outlier) that it deforms statistics.

[22] Missing at random (MAR) refers to the case in which the missing values of Y depend on X, but not on Y, whereas within the higher level of randomness (missing completely at random (MCAR)), the observed values of Y are truly a random sample of all Y values (Hair et al., 2010).

Outliers should be retained unless evidence shows that they are truly aberrant and not representative of the population (Hair et al., 2010).

Outliers can be examined in a univariate sitting, cases with an intense value on one variable, or a multivariate sitting, cases with unusual combination of scores on two or more variables. For the univariate diagnostic method, as recommended by Hair et al. (2010); Tabachnick and Fidell (2007), this study examined the outliers by converting the data values to standard scores (z-scores). The postulation is that any case that shows a standard score (z-score) > 3.29 ($p<0.001$) is deemed as a potential outlier (Tabachnick & Fidell, 2007 :73). The results showed that 31 variables had standard Z-score values greater than 3.29 (see Appendix A5, Table A5.4.).

Even though handling these potential outliers depends on evaluating the data at a whole variate, Cohen et al. (2003: 128) suggest that potential outliers are probably best left alone if they are few (below 1% or 2% of n) and not very extreme. The highest number of outliers for one variable (BResulrts43) was four values, which representing around 2%.

Therefore, according to Cohen et al. (2013) and Kline (2010), these variables are unlikely to undermine validity. However, to obtain a more complete picture of the issue, the multivariate detection of outliers can be objectively assessed by the use of the Mahalanobis Distance measure (Hair et al., 2010). The Mahalanobis D' measure (D^2/df, where df = the number of variables) determines the distance in multidimensional space of every observation from the observations mean centre. It effectively evaluates the position of each observation contrasted with the centre of all the observations on a group of variables (Tabachnick & Fidell, 2007: 74). Hair et al. (2010) suggest that observations with D^2/df value more than 2.5 in small samples and

3 or 4 in large samples (> 200) can be selected as potential outliers. Linear regression analysis was applied to inspect Mahalanobis distance. To that effect, all observed variables were used in the multiple regression equation as independent variables and a dummy variable was employed as a dependent variable. Mahalanobis distance values, which were divided by the number of variables (128), demonstrated the nonexistence of multivariate outliers, since all values were below 2 (see Appendix A5, Table A5.5.). Furthermore, to further assess the multivariate outliers, Cook's distance (indicates how strongly each outlier case influences the entire model) should not surpass the value of 1.0 (Cook & Weisberg, 1982). Given all assessed cases are below this COV (see Appendix A5, Table A5.5.), there is no cause for concern. Depending on the previous analyses, it was decided that outliers were unlikely to be a significant concern and problems associated with outlier cases are negligible.

5.2.3 Non-response bias

The study's survey strategy aimed at avoiding nonresponse bias through implementing several methods suggested in the literature to support response, such as carefully designing the questionnaire, stating of survey importance, and length management (Yu & Cooper, 1983).

Further, wave analysis was used for evaluating possible nonresponse bias (Armstrong & Overton, 1977; Rogelberg & Stanton, 2007). Wave analysis compares early and late responses with the objective of controlling for active non-response, that is, nonresponse that arises from the recipient's mindful choice not to respond (Rogelberg & Stanton, 2007). Non-response bias refers to the bias that happens when participants to a survey are different from those who did not participate in respect of attitudinal and demographic variables (Sax et al., 2003). Therefore, specifically, one of the widespread approaches to assess for non-response bias is to contrast the demographics of the study participants with the demographics of a second wave of participants (e.g., Anderson et al., 2015; Kautonen et al., 2015; Meek et al., 2011). A wave analysis was conducted by comparing the means of sector, employee's number, and strategic orientation. These factors were also utilized in previous studies for similar reasons (Bou-Llusar et al., 2009; Calvo-Mora et al., 2013). The independent samples t-tests did not reveal significant differences in the means between late participants or those requiring a reminder email (n = 66) with the remainder of the sample (n = 169). Therefore, the probability of nonresponse bias is minimal.

5.2.4 Normality

One important assumption in structural equation modelling is normality (Hair et al., 2010; Meyers et al., 2006; Tabachnick & Fidell, 2007) that needs to be discussed particularly in terms of the choice of estimation method (Shah & Goldstein, 2006). The shape of the distribution of the data for metric variables in a multivariate technique should correspond to the normal distribution (Hair et al., 2010; Meyers et al., 2006).

Hair et al. (2010) state that the severity of non-normal distribution is based on two different aspects: the sample size and the shape of the offending distribution. Concerning the sample size, they state that significant departure from normality with a small sample size (< 50) may have a significant impact on the results, however, this significant departure from normality can be minimal with a sample size larger than 200. Regarding the shape of distribution, it can be assessed by computing skewness and kurtosis statistics. Skewness has to do with the symmetry of the distribution; a skewed variable implies that its mean is not in the centre of distribution (Tabachnick & Fidell, 2007). With respect to kurtosis, it refers to the measurement of the general peakedness of a distribution (too peaked or too flat) (Tabachnick & Fidell, 2007).

Evaluating normality can be attained on a univariate and/or multivariate sense (Hair et al., 2010). Skewness and kurtosis were employed to assess the probability that the data utilised are normally distributed. According to Lei and Lomax (2005), the cut-off values for skewness and kurtosis range between the absolute values -2.0 and +3.5. They declare that "most researchers tend to categorize the absolute values of skewness and kurtosis less than 1.0 as slight nonnormality, the values between 1.0 and about 2.3 as moderate nonnormality, and the values beyond 2.3 as severe nonnormality" (p. 2). Thus, the absolute values ±1 were used as a threshold to assess the deviation from normality (Meyers et al., 2006). The results of skewness and kurtosis statistics showed that all values were between ±1 except for the variables (Leader47, HR21, HR41, Suppliers72, Operations12, Beneficiary13, Beneficiary23, MAKM15, BResutls43, and BResults92) which revealed slight deviation from the cut-off standard (see Appendix A5, Table A5.6).

In addition, the assumption of multivariate normality applies to the distribution of the residuals of the analyses (Hair et al., 2010; Tabachnick & Fidell, 2007). Therefore, the normal probability plots of the residuals was used to examine for normality. As shown in Figure 5.1, the values fall along the diagonal with no significant departure; thus, the residuals are deemed to present a normal distribution (Hair et al., 2010)[23].

This results need to be discussed in relation to the estimation method used in this study, viz., MLE. First, for the level of non-normality characterizing the data, CB-SEM, especially when maximum likelihood (ML) estimation is used, is robust to "mild" and "slightly moderate" deviation from normality (Meyers et al., 2006). Finch et al. (1997) found that moderate non-normality has approximately negligible effects on parameter

[23] According to Tabachnick and Fidell (2007), if the residuals plot looks normal, there is no need to screen the individuals variables for normality (p. 82).

estimates for ML. Likewise, Lei and Lomax (2005), in their simulation research, showed that a slight deviation from normality has non-significant impact on the parameter estimates especially when ML is used. Lim and Melville (2009) found that non-normality alone has non-significant impacts on the power of path coefficients, unless in the presence of multicollinearity and heteroscedasticity. Second, regarding the sample size effect, Finch et al. (1997) found that using ML under non-normal data, larger sample sizes tend to produce more precise parameter estimates than smaller sample sizes. Hair et al. (2010) concur with Finch et al. by asserting that non-normality has negligible effects on large sample size (>200).

Given the above and since this study employed a sample size of 233 and ML was chosen as a preferable estimation method, non-significant deviation has minimal effects on the study results.

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: Business results

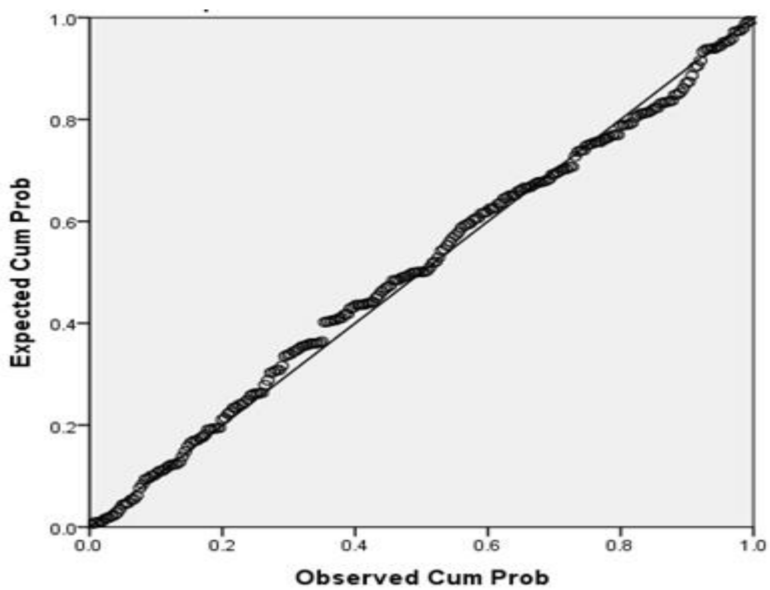

Figure 5.1 Normal Probability Plot for assessing normality

5.2.5 Linearity and homoscedasticity

Linearity can be assessed by residuals analysis. In this respect, if the relationship between the standardised residuals and dependent values displays a curved line, non-linearity is attained. Conversely, linearity is attained when the standardised residuals demonstrate a straight-line relationship with the dependent variable values (Meyers et al., 2006). The above figure shows that there is a straight-line association between the dependent variable and the independent variables. Also, the linearity assumption can be tested by residual plots as shown in figure 5.2. The residual plot shows that the assumption is met since the overall shape of the scatterplots is not curved (Tabachnick & Fidell, 2007: 127; see: Hair et al., 2010: 76).

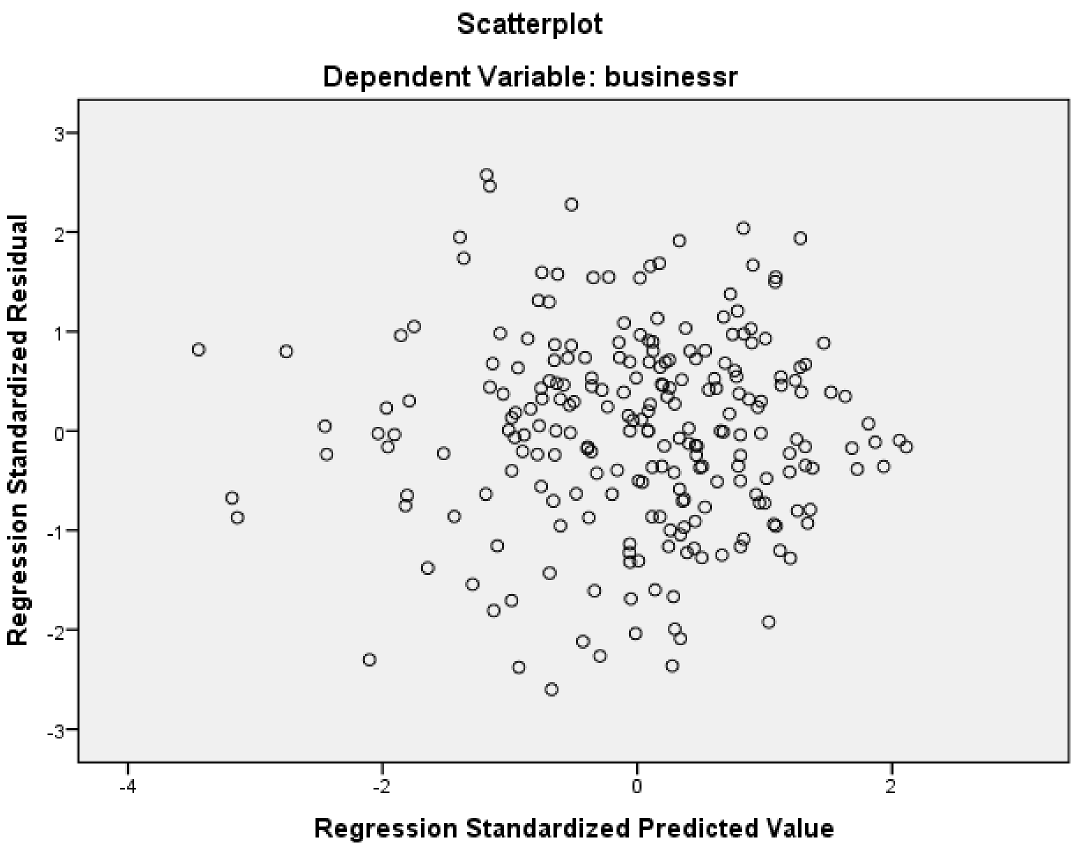

Figure 5.2 Analysis of Standardized Residuals

Concerning the homoscedasticity assumption, it indicates that the predicted variable(s) display different equal degrees of dispersion across the range of independent variable(s) (Hair et al., 2010: 74). When homoscedasticity is considered acceptable, this implies that the dependent variable's variance is approximately captured by a broad, not limited, range of the independent values. That is, the standard deviations of errors of prediction are relatively equal for predicted variables (Tabachnick & Fidell, 2007).

Testing for homoscedasticity of two metric variables is best achieved through graphical analysis, specifically an analysis of the residuals (Hair et al., 2010: 94; see: Field, 2013: 150). Using the graph of regression (see Figure 5.1) revealed that the dots tended to be equally distributed around the horizontal line of zero except for some potential outliers that did not have a major influence. In addition, the homoscedasticity assumption can be identified by residual plots as in figure 5.2, which shows that the assumption is met (Tabachnick & Fidell, 2007).

Homoscedasticity can be tested statistically, by calculating Spearman's rho correlation between the absolute value of the residuals and the independent variables (Johnston, 1997; Pivac, 2010). Thus, regression analysis was employed to produce the un-standardised residuals that were statistically tested by Spearman's rho correlation with all independent variables. The resultant correlation coefficients were non-significant ($p > 0.05$) which is to be interpreted as hetreoscedasticity not being detected in the data.

5.2.6 Multicollinearity

Multicollinearity is a problem with a correlation matrix that arise when variables are too highly correlated, i.e., 0.9 and above, (Tabachnick & Fidell, 2007). Multicollinarity problems may result in a non-positive definite sample covariance matrix which can lead to SEM relevant calculations to fail (Kline, 2010).

To check for multicollinearity, the correlations matrix between all variables indicated the nonexistence of any correlation coefficient surpassing 0.9 (see Tables 5.6, 5.9, and 5.12.), which is recommended as a cut-off value that would point out serious multicollinearity problems (Hair et al., 2010: 200; Tabachnick & Fidell, 2007: 88).

To further examine multicollinearity, the tolerance scores, and the variance inflation factor (VIF) scores were computed and checked. Tolerance is the extent of variability of the selected independent variable not captured by the other independent variables (Hair et al., 2010: 201). The variance inflation factor is the ratio of the total standardized variance over unique variance which is directly related to tolerance (Kline, 2010). The observation of VIF value greater than 10 accompanied by tolerance value less than 0.10 as the COVs may suggest a violation of the assumption of multicollinearity (Hair et al., 2010: 205; Kline, 2010: 53). As illustrated in Tables A5.9, A.5.10, and A.5.11 (see Appendix A.5), it was found that all VIF values were below 10 and no tolerance values were below 0.1. Thus, even this more stringent test failed to detect any multicollinearity in the data.

5.2.7 Demographic profile

The demographic profile of the respondents in this study consists of: sector, employee's number, and strategic orientation. According to the Ministry of Commence and Investment in Saudi Arabia (http://mci.gov.sa) three size segments were defined: small (less than 25 workers), medium-sized (25–100 workers) and large companies (more than 100 workers). The division by sectors was made according to the Saudi sector classification, including manufacturing and service sectors (http://mci.gov.sa; https://www.tadawul.com.sa).

As indicated in Table 5.3, 10% of the respondents were medium sized firms while 90% were large firms. There were no respondents from small firms because small firms usually have not created wide quality management systems. In addition, they are not expected to have a person identified by a title that represents a high-level quality management position (Meyer & Collier, 2001). These individuals use their interdisciplinary skills to work with several functional areas such as strategic planning, marketing, operation. This is consistent with other BEM works (Lee et al., 2003; Meyer & Collier, 2001). Also, KAQA is only open to large and medium sized-firms and not to small firms (KAQA, 2011). The predominance of large-sized firms is reflected in the study's population, i.e., 88% of which is large firms and 12% is medium sized firms.

The information on strategic orientation of respondents demonstrated that 31% were Defender, followed by Analyser 27%, Prospector 27%, and Reactor 15%.

In terms of firm specialisation defined, the data cover firms from different sectors: industrial investment (44.6%), Petrochemical Industries (9.9%), Insurance (9.9%), Agriculture & Food Industries (4.7%), Information & Communication Technology

(4.7%), Hotel & Tourism (4.7%) ,Retail (4.3%), Building & Construction (4.3%), Banks & Financial Services (3.4%), Cement (3%), Media & Publishing (3%), Energy & Utilities (1.3%), Real Estate Development (1.3%), and Multi-Investment (.9%). The predominance of industrial investment sector is relatively dominant of the research population (52%). From this, the sample may represents a good cross-section in terms of sectors. Given the above, it can be concluded that the data has a good representation of the population as a whole.

Table 5.3 Demographic profiles of current study respondents

Demographic variables	**Category**	**Sample (233)**	
		frequency	**(%)**
Employees number	Leass than 25	--	--
	Between 25-100	23	9.9
	More than 100	210	90.1
	Total	233	100.0
Strategic orientation	Defender	71	30.5
	Prospector	63	27.0
	Analyser	65	27.9
	Reactor	34	14.6
	Total	233	100.0
Sector	Agriculture & Food Industries	11	4.7
	Banks & Financial Services	8	3.4
	Building & Construction	10	4.3
	Cement	7	3.0
	Energy & Utilities	3	1.3
	Hotel & Tourism	11	4.7
	Industrial Investment	104	44.6
	Insurance	23	9.9
	Media & Publishing	7	3.0
	Multi-Investment	2	.9
	Petrochemical Industries	23	9.9
	Retail	10	4.3
	Real Estate Development	3	1.3
	Information & Communication Technology	11	4.7
	Total	233	100.0

5.3 Main data analysis

Structural equation modelling (SEM), a hybrid of factor and path analysis, will be applied to examine the research models with maximum likelihood estimation using Amos 23.0 software (Arbuckle, 2014). In accordance with the research objectives and following the recommendations of Bollen (1989), Jöreskog (1993) and Anderson and Gerbing (1988), see also section 3.8.2, SEM was performed via a four-phase study.

Phase One. To test the hypothesized models depicted in Figures 2.6, 2.7, and 2.8, Anderson and Gerbing's (1988) comprehensive, two-stage analytical strategy was adopted and individually applied for each model. According to this strategy, in the first stage, the measurement model is first confirmed using confirmatory factor analysis (CFA), hence specifying how latent variables are measured in terms of the observed variables[24]. This stage is performed in three main steps (Anderson & Gerbing, 1988; Bagozzi & Phillips, 1982; Fornell & Larcker, 1981; Hair et al., 2010).

First, the acceptability of the measurement model in terms of the model's fit to test for undimensionality is investigated. Four criteria will be employed to examine model fit (Browne & Cudeck, 1993; Byrne, 2010; Hu & Bentler, 1998; Lado et al., 2008; Marsh et al., 2004): (1) Comparative fit index (CFI) greater than or equal to 0.90; (2) root mean square error of approximation (RMSEA) which is a measure of the average standardized residual per degree of freedom; a favourable value is less than or equal to .08, and values less than or equal to .10 are considered "fair"; (3) the standardised root mean residual (SRMR); an SRMR value less than .08 is indicative of satisfactory fit. These indexes indicate the extent to which a research model provides an improved

[24] That is, by assessing the validity of the measurement model and the discriminant validity of the individual constructs.

overall fit relative to a null model or independence model in which the correlations among observed variables are assumed to be zero (Browne & Cudeck, 1989);

(4) Chi-square χ^2 (i.e., the ratio between χ^2 and the degree of freedom) lower than 3 (Bagozzi & Youjae, 1988). This will be reported as the index of absolute fit, which examines the extent to which the covariances estimated in the model match the covariances in the measured variables (Kline, 2010).

Second, convergent validity[25] is assessed by computing the indexes of average variance extracted (AVE), which is the level of variance in the variable not due to measurement error. An AVE of at least 0.50 (i.e., 50 per cent) shows support for convergent validity (Fornell & Larcker, 1981; Shook et al., 2004). Further, the factor loading for each indicator is calculated. Indicators with loadings less than 0.4 or 0.5 should be dropped (Hair et al., 2010), since little explanatory power can be added to the model and parameter estimates can be biased (Byrne, 2010). In addition, in this regard, the Cronbach's alphas and composite reliabilities of all constructs are computed with the recommended threshold level of .70 (Anderson & Gerbing, 1988).

Third, discriminant validity[26] is assessed, for example, by comparing the squared correlation between two variables with their respective average variance extracted. Discriminant validity can be supported if the average variance extracted of both variables is higher than the squared correlation (Fornell & Larcker, 1981).

In the second stage, SEM based on the measurement model is performed to estimate the fit of the hypothesized models to the data, hence specifying causal relations[27] (Anderson & Gerbing, 1988; Shook et al., 2004).

[25] I.e., whether measures of a construct are fairly associated with one another (Kline, 2010).
[26] I.e., the degree to which measures across constructs are distinct (Kline, 2010).
[27] In other words, considering the nomological validity. That is, assessing the entire model and the causal relations specified (Hair et al., 2010).

Also, SEM was adopted to test for mediation effects and the procedure recommended by Preacher and Hayes (2008) was followed. In this context, AMOS was used, as it allows the whole model to be assessed at once and depends on bootstrapping to examine the indirect effects in the research models. This procedure does not depend on the assumption of normality for the indirect effects, so the significance of the indirect effects was examined with a bias-corrected bootstrapping procedure with 10,000 bootstrap samples (Preacher & Hayes, 2008). This was performed for each research model (i.e., the KAQA, MBNQA, and EFQM models) separately.

Phase two. To determine the superior BEM empirically (i.e., to achieve the third objective of this study as introduced in chapter one), the three models resulting from the previous phase were compared. To this effect, the alternative models strategy (which studied three a priori models) was followed (Kline, 2010). Following the suggestions of Bollen (1989) and Jöreskog (1993) related to evaluating the models, the following criteria were employed to examine these models: (1) model fit using several fit indices; (2) significance of the standardised path estimates; (3) amount of variance explained in the endogenous variables as an indication of the substantive contribution of practical significance (Flynn & Saladin, 2001; Kollmann & Stöckmann, 2014; Lubatkin et al., 2006; Shah & Goldstein, 2006). The chosen model, in this phase, was referred to as the superior model.

Phase three. This stage involved introducing a sequence of nested and (non)nested structural models for the superior model resulting from the previous phase (Anderson & Gerbing, 1988; Eddleston & Kellermanns, 2007; Kline, 2010) to gain information regarding the model that best accounts for the covariance observed among the constructs (i.e., exogenous and endogenous constructs) (Byrne, 2010) which was referred to as the best model.

Phase Four. In accordance with the research objective, the effect of industry type (manufacturing and service) and strategic orientation (defenders, prospectors, analysers, and reactors) on the (better suited-) BEM relations were examined using the multi-group analysis technique in AMOS. Detailed discussion about these phases is presented in the following sections.

5.3.1 Measurement model assessment

Structural Equation Modelling (SEM) consists of two different models: the measurement model and the structural model (Hair et al., 2010). In this regard and as highlighted earlier, within this phase of the research analysis (i.e., the first phase), Anderson and Gerbing's (1988) comprehensive, two-stage analytical strategy was adopted. According to this strategy, in the first stage, the measurement model was first confirmed using confirmatory factor analysis, hence specifying how latent variables are measured in terms of the observed variables. Confirmatory factor analysis examines a priori measurement models in which both the number of latent constructs and their associated measured variables are explicitly defined (Kline, 2010). That is, as highlighted by Meyers et al. (2006), CFA shows the extent to which the suggested covariance matches the observed covariance. In this context, it specifies directional relations between latent constructs and their measured variables and (only) nondirectional (correlational) influences between latent variables (Long, 1983).

Employing CFA in structural equation modelling, with several associated measured variables for each construct, tends to produce a model with higher validity, more reliability, greater generalisability and stronger analyses of competing models (Bollen, 1990). Thus, CFA was seen as a more precise method to test the unidimensionality and validity of the measurement model (Anderson & Gerbing, 1988).

This stage was performed according to the following steps for each of the research models (viz. the Malcolm Baldrige National Quality Award (MBNQA) model; the European Foundation for Quality Management (EFQM) model; and the King Abdul Aziz Quality Award (KAQA) model) separately: assessing the measurement model's fit, reliability, convergent validity, discriminant validity, and nomological validity (Anderson & Gerbing, 1988; Bagozzi & Phillips, 1982; Fornell & Larcker, 1981; Hair et al., 2010).

Following best practices in the BEM (Badri et al., 2006; Bou-Llusar et al., 2009) and other research literatures (e.g., Zhang & Bartol, 2010; Zhou et al., 2010), and in accordance with the research objectives of this thesis (Little et al., 2002)[28], to gauge the sub-criteria, items sharing the same sub-criterion were averaged to create composite measures (Landis et al., 2000). In the scale validation process, composite measures are used to measure more than one item to create score aggregates that are then introduced to confirmatory factor analyses (CFA) as indicator variables (Bagozzi & Edwards, 1998). Hence, each multi-item dimension was averaged to form a composite that served as an indicator variable of the latent construct to test the measurement models. Using composite measures in confirmatory factor analysis has many advantages. It maximises the sample size to estimated parameter ratio, and facilitates model convergence (i.e., smooths out the impact of sampling error on the estimation process). That is, resulting in more parsimonious models (Bagozzi &

[28] Previous research (Bandalos & Finney, 2001; Little et al., 2002) showed that when the primary objective is to examine the relations among constructs rather than completely comprehend the relations among items, such as in this research, then parcelling is recommended.

Edwards, 1998; Bandalos & Finney, 2001; Little et al., 2002). Also, composite measures result in better meeting of the normality assumption of the resulting distributions compared to the item distributions (Bandalos & Finney, 2001). For the people results, customer results, and society results constructs of the EFQM model, as mentioned earlier (see section 4.2.), they were deemed unidimensional, and the items chosen were directly assigned to measuring each construct and introduced in the confirmatory factor analysis as indicator variables (Bou-Llusar et al., 2009).

5.3.1.1 The MBNQA measurement model

a. Goodness of fit (Dimensionality)

With reflective indicators[29] and first-order[30] structure, confirmatory factor analysis (CFA) was conducted. The Maximum likelihood (ML) method in AMOS 23 was employed to estimate coefficients. The figure below shows the MBNQA measurement model.

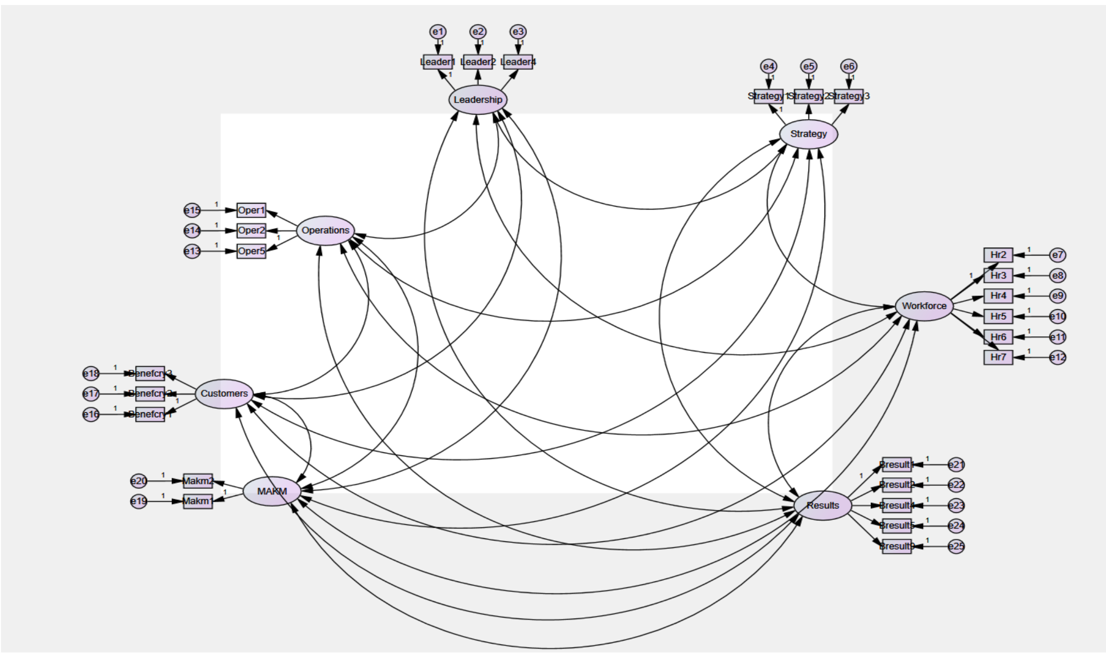

Figure 5.3 The MBNQA measurement model

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[29] For reflective (effect) indicators, the latent variable causes the observed variables (Diamantopoulos & Winklhofer, 2001).

[30] First order model refers to a model in which covariances between measured variables explained by a single latent factor layer (Hair et al., 2010).

As shown in Figure 5.6., concerning the model specification, all latent constructs were gauged by three indicators or more except for MAKM construct which was gauged by two indicators. If a standard confirmatory model (with unidimensional measurement: every variable is specified on just one factor and there are no measurement error correlations) with ≥ 2 constructs has ≥ 2 indicators per construct, the model is identified (Kline, 2010)[31]. CFA results show that no identification problems existed. The model's degrees of freedom showed an over-identified model. Over-identified models are "highly desirable because more than one equation is used to estimate at least some of the parameters, significantly enhancing reliability of the estimate" (Shah & Goldstein, 2006: 155). As mentioned earlier (see preliminary analysis section), assumptions associated with structural equation modelling application such as missing values, outliers, normality, and multicollinearity were met and, when needed, recommended remedies were followed. The CFA results revealed that all variances were positive; thus, no identification problems were detected. Also, the results show that $x^2 = 544.783$ with 254 degrees of freedom and p-value= .000, which indicate that the model should be rejected. However, following the literature recommendations of not using x^2 as a sole basis for judging model fit (Bollen & Long, 1993), the other model fit values were; x^2/df= 2.145; SRMR= 0.043; CFI= 0.933; RMSEA= .070 with a 90% confidence interval (low= .062; hi= .078). Whereas these indices showed an acceptable model fit, to reach the constructs validity, the other diagnoses from the original specification of the hypothesized measurement model (e.g., standardised regression weights, and standardised residual covariances) showed a need to eliminate

[31] That is, along with the three-indicator rule, there is a frequently mentioned two-indicator rule (e.g. O'Brien, 1994; cf. Schumacker & Lomax, 2010; Tabachnick & Fidell, 2007).

errors (see for example, Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Meyer & Collier, 2001).

b. Model diagnostics

The model diagnostics process using CFA includes scanning the output and applying many criteria resulting in information about the tested measurement model may suggest alterations for addressing unresolved problems (Hair et al., 2010). A formalised, iterative process was followed to determine which items should be eliminated from the measurement model. Using modification indices and other model diagnostics (e.g., standardised residuals), item deletion based on weak loadings, cross loadings, communalities, error residuals, and theoretical determination (Hair et al., 2010; Prahinski & Benton, 2004).

According to the CFA results of the original measurement model, all standardised regression weights (factor loadings) were greater than 0.5 except for Leader16, Leader21, Leader45, and HR42 indicators which had loading values of 0.421, 0.393, 0.483, 0.480, respectively. The Leader15, Strategy14, Strategy 24, Beneficiary13, and BResults91 indicators had relatively low loadings (0.553, 0.563, 0.570, 0.583, and 0.547 respectively) that were accompanied by relatively low squared multiple correlation values (0.305, 0.317, 0.325, 0.340, and 0.299 respectively). Also, checking the standardised residual covariance matrix showed that the indicators (Leader21, MAKM15, HR21, Bresults21, Bresults22, Bresults23, Bresults91, Bresults92, Bresults93, Beneficiary13, Leader45, and Operations21) had values greater than |4|. In addition, the Modification Indices (MI) ware used to introduce successive alterations in the scales until the fit indices and/or the construct validity reached values within the recommended limits (Hair et al., 2010; Tabachnick & Fidell, 2007). As Jöreskog and Sörbom (1996) suggest, to avoid over-modifying the model, only one parameter was altered in each iteration. In accordance with the research strategy (i.e., alterative models strategy) and previous practice in BEMs literature (Bou-Llusar et al., 2009; Flynn & Saladin, 2001) and as suggested by Hair et al. (2010), deletion is the strategy to be followed in this respect for reaching the minimum recommended values of the construct validity.

Table 5.4 Selected AMOS outputs for covariance and regression modification indices for the MBNQA model

Path			**M.I.**	**Par Change**
BResults21	<---	BResults22	61.025	0.358
BResults22	<---	BResults21	57.972	0.39
e_{72}	<-->	e_{73}	115.673	0.526
BResults22	<---	BResults23	59.803	0.383
BResults23	<---	BResults22	57.272	0.374
e_{73}	<-->	e_{74}	108.576	0.548
BResults42	<---	BResults41	38.367	0.257
BResults41	<---	BResults42	38.446	0.308
e_{75}	<-->	e_{76}	86.76	0.304
BResults92	<---	BResults91	56.922	0.369
BResults91	<---	BResults92	40.994	0.346
e_{81}	<-->	e_{82}	82.346	0.391
Leader11	<---	Leader12	20.658	0.174
e_1	<-->	e_2	71.205	0.118
e_{16}	<-->	e_{17}	34.905	0.25

Notes: M.I.: modification index, Par change: Parameter change, <---: factor loading, <-->: error covariance, 72: BResults21, 73: BResults22, 74: BREsults23, 75; BREsults41, 76: BResults42, 81: BResults91, 82: BResults92, 1: Leader11, 2: Leader12, 16: Leader46, 17: Leader47.

Reported in Table 5.4 are selected largest modification indexes computed by AMOS for error covariances and factor loadings that are fixed to zero in the original model. The table is ordered by magnitude of MIs to aid the process of starting with the largest value (Jöreskog, 1993). In this regard, when error covariances have two paths that gauge the relation between two variables, then the path with the higher regression weight value was a candidate for deletion based on the MI indices (Byrne, 2010; Kline, 2010). Given the above diagnoses, 14 items were deleted because they showed low loading and/or presented significant cross-loadings (Leader12, Leader15, Leader16, Leader21, Leeader45, Leader47, Strateg14, Strategy24, HR42, Beneficiary13, MAKM15, BResults22, BResults42, and Bresults91). Hence, 70 items from the 84 initially proposed for the MBNQA model were retained in the measurement scales. As such, minor modifications were suggested and then applied. After dropping these indicators, the remaining indicators satisfy statistical identification requirements and well represent the theoretical domain (item per factor ≥7). The removal of items calls for renewed test of the measurement model. Hence, Confirmatory factor analysis was performed. The resulting MBNQA measurement model is depicted in the following figure.

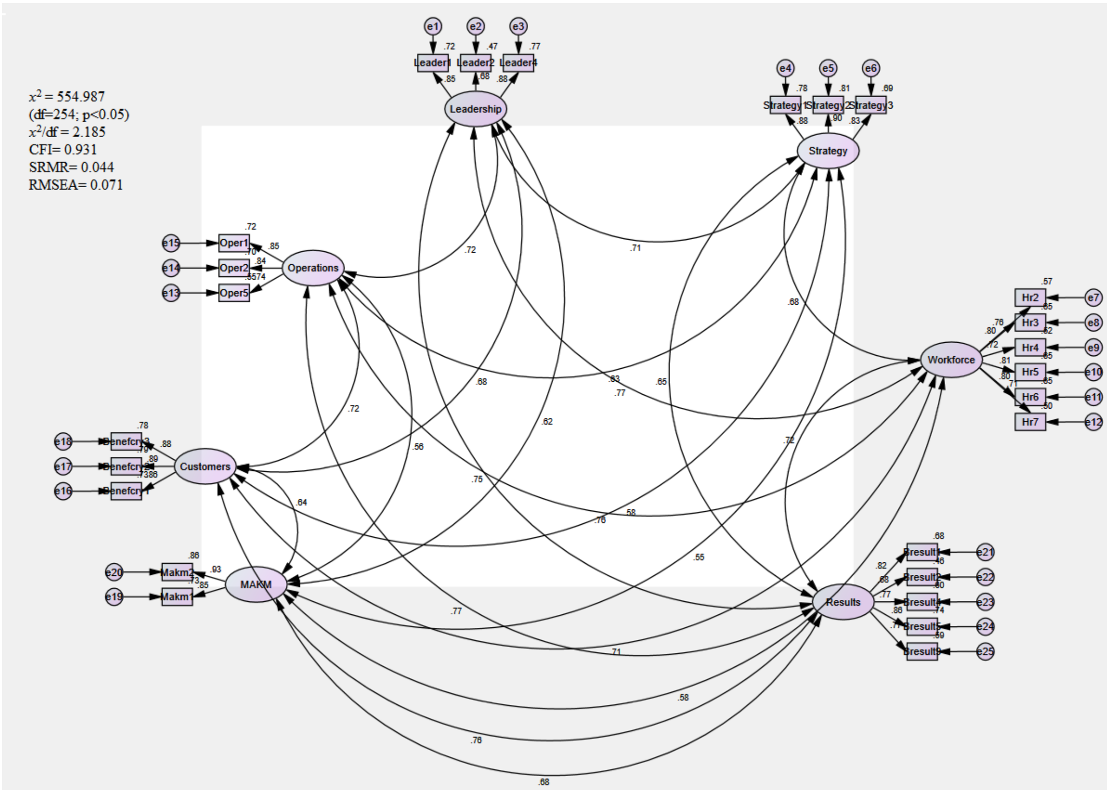

Figure 5.4 CFA results for the MBNQA model finally analysed.

The CFA results reported feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance, no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) and the absence of problems associated with identification. Also, the fit indexes fell within an acceptable

range (χ^2 [254] = 554.987, $p < 0.05$; $\chi^2/df = 2.185$; CFI = 0.931; SRMR = 0.044; RMSEA = 0.071 with a 90% confidence interval (low= .063; hi= .080)). Despite the χ^2 test was statistically significant, this test is well known to be sensitive to sample size and may be significant although the differences between model-implied and observed covariances are relatively small (Kline, 2010). Thus, multiple indices were used in evaluating model fit, as recommended in the SEM literature (e.g., Bollen, 1989; Schumacker & Lomax, 2010) and as highlighted earlier. After diagnosing the measurement model and reporting an acceptable overall model fit, the following level of analysis is to examine construct validity and reliability.

c. Construct validity and reliability

Construct validity can be defined as the extent to which a set of observations actually measure the theoretical latent construct those observations are intended to measure (Bagozzi & Phillips, 1982). Construct validity is formed by: convergent validity, reliability, discriminant validity, and nomological validity (Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Hair et al., 2010).

In terms of convergent validity, as discussed earlier, it can be assessed by computing the indexes of average variance extracted (AVE), which is the level of variance that a latent variable component captured from its indicators relative to the amount due to measurement error. All AVE values, as presented in Table 5.6, are higher than the 0.50 (i.e., 50 percent) cut-off value (Fornell & Larcker, 1981; Shook et al., 2004), which shows that the majority of the variance is accounted for by the latent variable. That is, each construct is able to explain more than half of the variance of its indicators. As further evidence of convergent validity, the factor loading for each indicator was calculated. Indicators with loadings less than 0.4 or 0.5 should be dropped (Hair et al., 2010), since little explanatory power can be added to the model and parameter estimates can be biased (Byrne, 2010). The standardized factor loadings in the CFA are all significant at the 0.001 level. Based on these results, it can be concluded that the factor loadings are strong, as they are all above 0.67 and highly significant (t-values ranging from 10.99 to 18.73). This means that each indicator shared the majority of its variance with the hypothesised latent variable. Table 5.5 lists the measurement indicators of the construct scales, standardized coefficient loadings of the confirmatory factor analysis. In short, the reported results indicate support for the MBNQA model's convergent validity.

Table 5.5 Confirmatory Factor Analysis results for the MBNQA model

Variable		**Construct**	**Std. Loading**
Leader1	<---	Leadership	0.848
Leader2	<---	Leadership	0.684
Leader4	<---	Leadership	0.875
Strategy1	<---	Strategy	0.883
Strategy2	<---	Strategy	0.902
Strategy3	<---	Strategy	0.831
Hr2	<---	Workforce	0.758
Hr3	<---	Workforce	0.804
Hr4	<---	Workforce	0.722
Hr5	<---	Workforce	0.809
Hr6	<---	Workforce	0.804
Hr7	<---	Workforce	0.71
Oper5	<---	Operations	0.742
Oper2	<---	Operations	0.839
Oper1	<---	Operations	0.849
Benefcry1	<---	Customers	0.856
Benefcry2	<---	Customers	0.889
Benefcry3	<---	Customers	0.882
Makm1	<---	MAKM	0.854
Makm2	<---	MAKM	0.928
Bresult1	<---	Results	0.823
Bresult2	<---	Results	0.678
Bresult4	<---	Results	0.772
Bresult5	<---	Results	0.862
Bresult9	<---	Results	0.765

Note: MAKM: Measurement, analysis and knowledge management

Concerning constructs' reliability, Cronbach's alpha (Cronbach, 1951) and composite reliability (Fornell & Larcker, 1981) were employed to assess the constructs' reliability. Table 5.6 shows the values of both indices. Cronbach's alphas and composite reliabilities of all constructs exceed the recommended threshold level of .7, suggesting satisfactory reliability for the individual latent variables (Anderson & Gerbing, 1988).

Discriminant validity refers to the degree to which measures across constructs are distinct (Kline, 2010). Three methods were used to evaluate discriminant validity (Bagozzi & Phillips, 1982; Fornell & Larcker, 1981; Hair et al., 2010). First, discriminant validity was assessed by testing the square root of the AVE. The square root of the AVE for each construct should be higher than its correlations with the other latent constructs (Fornell & Larcker, 1981). The square root of the AVE for each latent variable is reported in the diagonal cells in Table 5.6. The table indicates that square root of AVE for each latent variable is higher than its correlations with the other latent constructs. This shows that each latent variable shares more variance with its hypothetical indicators than with any other indicators. Second, discriminant validity was assessed by comparing Cronbach's alpha and average interscale correlation (AVISC). Cronbach's alpha should show values greater than AVISC to establish discriminant validity (Bagozzi & Phillips, 1982; Bou-Llusar et al., 2009). For all scales, Cronbach's alpha was higher than the average interscale correlation (AVISC) (see 5th column in Table 5.6). Third, discriminant validity was further supported by conducting two CFA models (Bagozzi & Phillips, 1982; Podsakoff et al., 2003). In the first model, all variables were allowed to measure only one factor, while in the second model, all the items were allowed to load on their theoretical constructs. The fit of the model was worse than in the original one where all items load on their theoretically specified factors (see for example, Kautonen et al., 2015), see common method variance section: 5.3.2.

Nomological validity is stated if correlations among constructs in a measurement model make sense in theory (Hair et al., 2010). Reported in Table 5.6 the mean, standard deviation and correlations of the seven unidimensional measurement constructs identified in the measurement model validation process. All correlations were positive and significantly different from zero, a result that was not unexpected as the constructs were part of an integrated approach to Total Quality Management (Flynn & Saladin, 2001).

In general, given the above analyses, the measurement scales used for the MBNQA model were found to be reliable and valid.

Table 5.6 Descriptive statistics, correlations, convergent and discriminant validity for the MBNQA model

Constructs	**Alpha**	**CR**	**AVE**	**AVISC**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. MAKM	0.885	0.886	0.795	0.604	*0.892*						
2. Workforce	0.892	0.896	0.591	0.720	0.578	*0.769*					
3. Results	0.885	0.887	0.612	0.722	0.684	0.717	*0.782*				
4. Strategy	0.903	0.905	0.761	0.633	0.550	0.683	0.648	*0.873*			
5. Leadership	0.840	0.847	0.651	0.708	0.615	0.768	0.753	0.714	*0.807*		
6. Operations	0.848	0.852	0.658	0.693	0.558	0.759	0.772	0.626	0.720	*0.811*	
7. Customers	0.908	0.908	0.767	0.679	0.637	0.706	0.758	0.576	0.676	0.721	*0.876*
Mean					4.772	5.249	5.453	5.618	5.572	5.436	5.534
S.D.					0.967	1.048	0.998	0.853	0.820	0.995	0.981

Notes: CR= composite reliability, AVE= average variance extracted, AVISC= average interscale correlation, S.D.= standard deviation. The square root of the average variance extracted (AVE) are reported on the diagonal in italics for each variable. MAKM: Measurement, analysis and knowledge management.

5.3.1.2 The EFQM measurement model

a. Goodness of fit (Dimensionality)

With reflective indicators and first-order structure, Confirmatory factor analysis (CFA) was conducted. The Maximum likelihood (ML) method in AMOS 23 was employed to estimate coefficients. The figure below shows the EFQM measurement model.

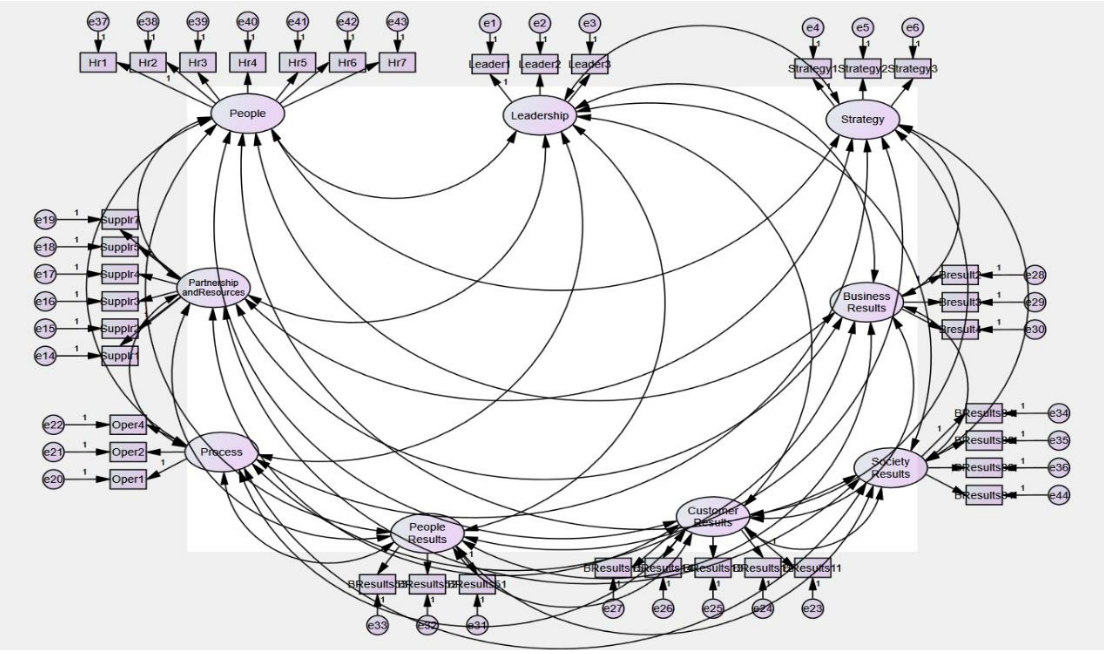

Figure 5.5 The EFQM measurement model

As shown in Figure 5.5, concerning the model specification, all latent constructs were gauged by three indicators or more. CFA results show that no identification problems existed. The model's degrees of freedom showed an over-identified model. As mentioned earlier, assumptions associated with structural equation modelling application such as missing values, outliers, normality, and multicollinearity were met and, when needed, recommended remedies were followed. The CFA results revealed that all variances were positive; thus, no identification problems were detected. Also, the results show that x^2 = 1129.645 with 593 degrees of freedom and p-value= .000, which indicate that the model should be rejected. However, following the literature recommendations of not using x^2 as a sole basis for judging model fit (Bollen & Long, 1993), the other model fit values were; x^2/df= 1.905; SRMR= 0.0486; CFI= 0.924; RMSEA= .0620 with a 90% confidence interval (low= .057; hi= .068). Whereas these indices showed an acceptable model fit, to reach the constructs' validity, the other diagnoses from the original specification of the hypothesized measurement model (e.g., standardised regression weights, and standardised residual covariances) showed a need to eliminate errors (see for example, Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Meyer & Collier, 2001).

b. Model diagnostics

The model diagnostics process using CFA includes scanning the output and applying many criteria resulting in information about the tested measurement model may suggest alterations for addressing unresolved problems (Hair et al., 2010).

According to the CFA results of the original measurement model, all standardised regression weights (factor loadings) were greater than 0.5 except for Leader16, Leader21, and HR42 indicators which had loading values of 0.404, 0.385, and 0.477, respectively. The Leader15, Strategy14, Strategy24, and BResults81 indicators had relatively low loadings (0.556, 0.562, 0.572, and 0.594, respectively) that were accompanied by relatively low squared multiple correlation values (0.309, 0.316, 0.327, and 0.353, respectively). Also, checking the standardised residual covariance matrix showed that there were two indicators (Leader21, and Operations21) that had values greater than |4|. In addition, the Modification Indices (MI) was used to introduce successive alterations in the scales until the fit indices and/or the construct validity reached values within the recommended limits (Hair et al., 2010; Tabachnick & Fidell, 2007). As Jöreskog and Sörbom (1996) suggest, to avoid over-modifying the model, only one parameter was altered in each iteration. In accordance with the research strategy (i.e., alterative models strategy) and previous practice in BEMs literature (Bou-Llusar et al., 2009; Flynn & Saladin, 2001) and as suggested by Hair et al. (2010), deletion is the strategy to be followed in this respect for reaching the minimum recommended values of the fit indices and/or the construct validity.

Table 5.7 Selected AMOS outputs for covariance and regression modification indices for the EFQM model

Path			**M.I.**	**Par Change**
BResults21	<---	BResults22	20.752	0.171
BResults22	<---	BResults21	19.77	0.185
e_{68}	<-->	e_{69}	68.413	0.268
e_{74}	<-->	e_{75}	53.558	0.185
e_{1}	<-->	e_{2}	47.458	0.082
e_{9}	<-->	e_{80}	29.523	0.346
Strategy21	<---	Strategy14	13.304	0.214
Strategy14	<---	Strategy21	12.102	0.171
e_{16}	<-->	e_{17}	19.817	0.189
e_{29}	<-->	e_{30}	14.788	0.156
e_{45}	<-->	e_{78}	13.161	0.102
Operations23	<---	Leader15	7.841	0.145
Leader15	<---	Operations23	7.491	0.125
e_{5}	<-->	e_{82}	11.521	0.138
HR12	<---	HR21	5.213	0.096
e_{25}	<-->	e_{26}	9.405	0.167
Strategy21	<---	HR22	8.153	0.161
e_{17}	<-->	e_{27}	8.118	0.099
e_{20}	<-->	e_{29}	8.177	0.122

Note: M.I.: modification index, Par change: Parameter change, <---: factor loading, <-->: error covariance, 1: Leader11, 2: Leader12, 5: Leader15, 9: Leader21, 16: Strategy14, 17: Strategy21, 20: Strategy24, 25: HR12, 26: HR21, 27: HR22, 29: HR32, 30: HR41, 45: Suppliers71, 68: BResults21, 69: BResults22, 74: BResults41, 75: BResults42, 80: Operation21, 82: Operations23.

Reported in Table 5.7 are the selected modification indexes computed by AMOS for error covariances and factor loadings that are fixed to zero in the original model. The table is ordered by magnitude of MIs to aid the process of starting with the largest value (Jöreskog, 1993). In this regard, if error covariance has two paths that gauge the relation between two variables, then the path with the higher regression weight value is a candidate for deletion based on the MI indices. Also, although other larger MIs were noted, these values do not represent cross-loading and are in essence meaningless

(Byrne, 2010). Given the above diagnoses, 14 items were deleted because they showed low loading and/or presented significant cross-loadings (Leader12, Leader15, Leader16, Leader21, Strategy14, Strategy24, HR21, HR22, HR41, HR42, Operations12, BResults22, BResults42, and BResults81). Hence, 62 items from the 76 initially proposed for the EFQM model were retained in the measurement scales. As such, minor modifications were suggested and then applied. After dropping these indicators, the remaining indicators satisfy statistical identification requirements and well represent the theoretical domain (item per factor ≥3). The removal of items calls for renewed test of the measurement model. Hence, Confirmatory Factor Analysis was performed. The resulting measurement model is depicted in the following figure.

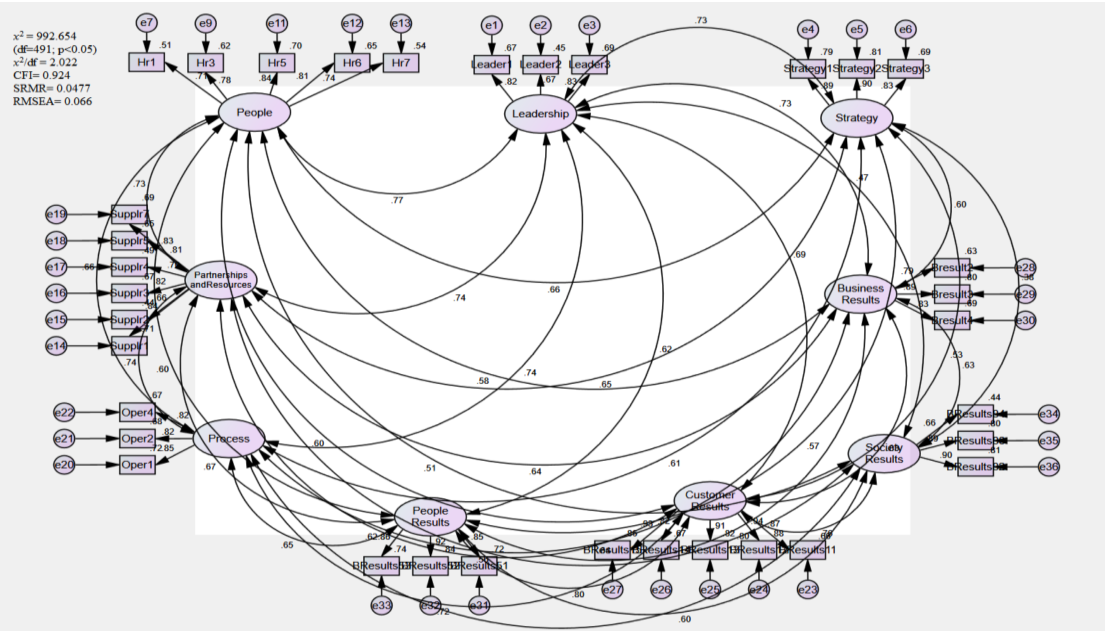

Figure 5.6 CFA results for the EFQM measurement model finally analysed.

The CFA results reported feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance, no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) and the absence of problems associated with identification. Also, the fit indexes fell within an acceptable

range (χ^2 [491] = 992.654, $p < 0.05$; χ^2/df = 2.022; CFI = 0.924; SRMR = 0.0477; RMSEA = 0.066 with a 90% confidence interval (low= .060; hi= .072)). Despite the χ^2 test was statistically significant, this test is well known to be sensitive to sample size and may be significant although the differences between model-implied and observed covariances are relatively small (Kline, 2010). Thus, multiple indices were used in evaluating model fit, as recommended in the SEM literature (e.g., Bollen, 1989; Schumacker & Lomax, 2010) and as highlighted earlier. After diagnosing the measurement model and reporting an acceptable overall model fit, the following level of analysis is to examine construct validity and reliability.

c. Construct validity and reliability

Construct validity can be defined as the extent to which a set of observations actually measure the theoretical latent construct those observations are intended to measure (Bagozzi & Phillips, 1982). Construct validity is formed by: convergent validity, reliability, discriminant validity, and nomological validity (Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Hair et al., 2010).

In terms of convergent validity, it can be assessed by computing the indexes of average variance extracted (AVE), which is the level of variance that a latent variable component captured from its indicators relative to the amount due to measurement error. All AVE values, as presented in Table 5.9, are higher than the 0.50 (i.e., 50 percent) cutoff value (Fornell & Larcker, 1981; Shook et al., 2004), which shows that the majority of the variance is accounted for by the latent variable. That is, each construct is able to explain more than half of the variance of its indicators. As a further evidence of convergent validity, the factor loading for each indicator was calculated. Indicators with loadings less than 0.4 or 0.5 should be dropped (Hair et al., 2010), since little explanatory power can be added to the model and parameter estimates can be biased (Byrne, 2010). The standardized factor loadings in the CFA are all significant at the 0.001 level. Based on these results, it can be concluded that the factor loadings are strong, as they are all above 0.66 and highly significant (t-values ranging from 10.67 to 20.71). This means that each indicator shared the majority of its variance with the hypothesised latent variable. Table 5.8 lists the measurement indicators of the construct scales, standardized coefficient loadings of the confirmatory factor analysis. In short, the reported results indicate support for the EFQM measurement model's convergent validity.

Table 5.8 Confirmatory Factor Analysis results for the EFQM model

Variable		Construct	Std. Loading
Leader1	<---	Leadership	.818
Leader2	<---	Leadership	.670
Leader3	<---	Leadership	.829
Strategy1	<---	Strategy	.888
Strategy2	<---	Strategy	.897
Strategy3	<---	Strategy	.830
Hr1	<---	People	.715
Hr3	<---	People	.785
Hr5	<---	People	.837
Hr6	<---	People	.809
Hr7	<---	People	.737
Supplr1	<---	Partnerships and Resources	.844
Supplr2	<---	Partnerships and Resources	.663
Supplr3	<---	Partnerships and Resources	.819
Supplr4	<---	Partnerships and Resources	.697
Supplr5	<---	Partnerships and Resources	.809
Supplr7	<---	Partnerships and Resources	.833
Oper1	<---	Process	.850
Oper2	<---	Process	.822
Oper4	<---	Process	.821
BResults11	<---	Customer Results	.870
BResults12	<---	Customer Results	.938
BResults13	<---	Customer Results	.906
BResults14	<---	Customer Results	.821
BResults15	<---	Customer Results	.927
Bresult2	<---	Business Results	.791
Bresult3	<---	Business Results	.892
Bresult4	<---	Business Results	.828
BResults51	<---	People Results	.848
BResults52	<---	People Results	.918
BResults53	<---	People Results	.863
BResults84	<---	Society Results	.663
BResults83	<---	Society Results	.894
BResults82	<---	Society Results	.900

Note: Process: Processes, products and services

Concerning constructs' reliability, Cronbach's alpha (Cronbach, 1951) and composite reliability (Fornell & Larcker, 1981) were employed to assess the constructs' reliability. Table 5.9 shows the values of both indices. Cronbach's alphas and composite reliabilities of all constructs exceed the recommended threshold level of .7, suggesting satisfactory reliability for the individual latent variables (Anderson & Gerbing, 1988).

Three methods were used to evaluate discriminant validity (Fornell & Larcker, 1981). First, discriminant validity was assessed by testing the square root of the AVE. The square root of the AVE for each construct should be higher than its correlations with the other latent constructs (Fornell & Larcker, 1981). The square root of the AVE for each latent variable is reported in the diagonal cells in Table 5.9. The table indicates that square root of AVE for each latent variable is higher than its correlations with the other latent constructs. This shows that each latent variable shares more variance with its hypothetical indicators than with any other indicators. Second, discriminant validity was assessed by comparing Cronbach's alpha ad average interscale correlation (AVISC). Cronbach's alpha should show values greater than AVISC to establish discriminant validity (Bagozzi & Phillips, 1982; Bou-Llusar et al., 2009). For all scales, Cronbach's alpha was higher than the average interscale correlation (AVISC) (see 5th column in Table 5.9). Third, discriminant validity was further supported by conducting two CFA models (Bagozzi & Phillips, 1982; Podsakoff et al., 2003). In the first model, all variables were allowed to measure only one factor, while in the second model, all the items were allowed to load on their theoretical constructs. The fit of the model was worse than in the original one where all items load on their theoretically specified factors (see for example, Kautonen et al., 2015)(see common method variance section: 5.3.2).

Nomological validity is stated if correlations among constructs in a measurement model make sense in theory (Hair et al., 2010). Reported in Table 5.9 the mean, standard deviation and correlations of the nine unidimensional measurement constructs identified in the measurement model validation process. All correlations were positive and significantly different from zero, a result that was not unexpected as the constructs were part of an integrated approach to Total Quality Management (Flynn & Saladin, 2001).

In general, given the above analyses, the measurement scales used for the EFQM model were found to be reliable and valid.

Table 5.9 Descriptive statistics, correlations, convergent and discriminant validity for the EFQM model

Constructs	Alpha	CR	AVE	1	2	3	4	5	6	7	8	9
1. Partnership &R	0.895	0.903	0.609	0.*781*								
2. Leadership	0.819	0.818	0.602	0.740	0.*776*							
3. Strategy	0.903	0.905	0.761	0.647	0.726	0.*872*						
4. Business-R	0.874	0.876	0.702	0.645	0.730	0.596	0.*838*					
5. Society-R	0.850	0.864	0.683	0.558	0.475	0.378	0.632	0.*826*				
6. Customer-R	0.951	0.952	0.798	0.623	0.687	0.526	0.827	0.664	0.*893*			
7. People-R	0.907	0.909	0.769	0.668	0.623	0.570	0.799	0.596	0.799	0.*877*		
8. Process	0.869	0.870	0.691	0.736	0.744	0.611	0.644	0.620	0.718	0.651	0.*831*	
9. People	0.882	0.884	0.605	0.732	0.771	0.657	0.578	0.511	0.605	0.596	0.659	0.*778*
Mean				5.510	5.584	5.618	5.495	4.991	5.621	5.323	5.591	5.261
S.D.				0.974	0.840	0.853	0.971	1.138	1.060	1.126	0.981	1.010

Notes: CR= composite reliability, AVE= average variance extracted, S.D.= standard deviation. The square root of the average variance extracted (AVE) are reported on the diagonal in italics for each variable. Partnership &R: Partnerships and resources; Business-R: Business results; Society-R: Society results; Customer-R: Customer results; People-R: People results; Process: Processes, products and services.

5.3.1.3 The KAQA measurement model

a. Goodness of fit (Dimensionality)

With reflective indicators and first-order structure, Confirmatory Factor Analysis (CFA) was conducted. The Maximum likelihood (ML) method in AMOS 23 was employed to estimate coefficients. The figure below shows the KAQA measurement model.

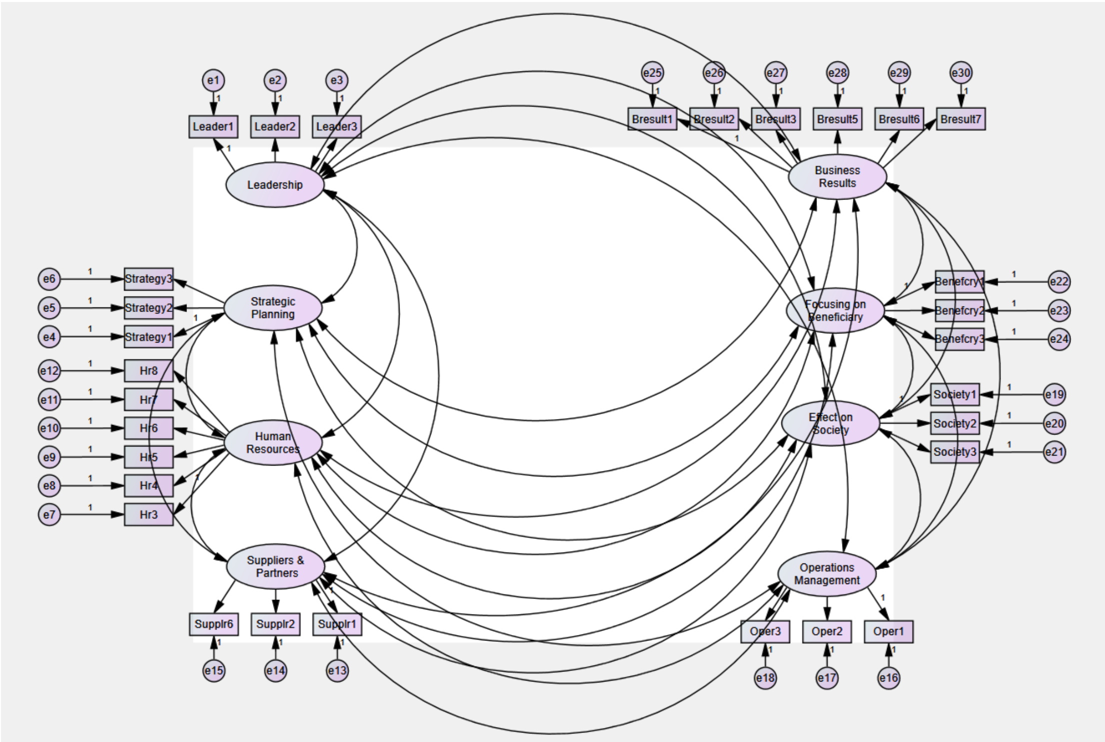

Figure 5.7 The KAQA measurement model

As shown in Figure 5.7, concerning the model specification, all latent constructs were gauged by three indicators or more. CFA results show that there are no identification problems. The model's degrees of freedom showed an over-identified model. As mentioned earlier (see section 5.2: preliminary analysis), assumptions associated with structural equation modelling application such as missing values, outliers, normality, and multicollinearity were met and, when needed, recommended remedies were followed.

The CFA results revealed that all variances were positive; thus, no identification problems were detected. Also, the results show that x^2 = 739.646 with 377 degrees of freedom and p-value= .000, which indicate that the model should be rejected. However, following the literature recommendations of not using x^2 as a sole basis for judging model fit (Bollen & Long, 1993), the other model fit values were: x^2/df= 1.962; SRMR= 0.046; CFI= 0.929; RMSEA= .0640 with a 90% confidence interval (low= .058; hi= .071). These indices showed an acceptable model fit, however to reach the constructs' validity, the other diagnoses from the original specification of the hypothesized measurement model (e.g., standardised regression weights, and standardised residual covariances) showed a need to eliminate errors (see for example, Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Meyer & Collier, 2001).

b. Model diagnostics

The model diagnostics process using CFA includes scanning the output and applying many criteria resulting in information about the tested measurement model may suggest alterations for addressing unresolved problems (Hair et al., 2010).

According to the CFA results of the original measurement model, all standardised regression weights (factor loadings) were greater than 0.5 except for Leader16, Leader21, HR42, and Supliers61 indicators which had loading values of 0.405, 0.386, 0.485, 0.485, respectively. The Leader15, Strategy14, Strategy 24, HR83, Beneficiary13, and BResults71 indicators had relatively low loadings (0.555, 0.563, 0.570, 0.542, 0.578, 0.591, respectively) that were accompanied by relatively low squared multiple correlation values (0.308, 0.317, 0.325, 0.294, 0.335, 0.349, respectively). Also, checking the standardised residual covariance matrix showed that there were seven indicators (Leader17, Leader21, Operations21, Beneficiary13, Beneficiary23, Bresults21, BResults22) that had values greater than |4|. In addition, the Modification Indices (MI) were used to introduce successive alterations in the scales until the fit indices and/or the construct validity reached values within the recommended limits (Hair et al., 2010; Tabachnick & Fidell, 2007). As Jöreskog and

Sörbom (1996) suggest, to avoid over-modifying the model, only one parameter was altered in each iteration. In accordance with the research strategy (i.e., alterative models strategy) and previous practice in BEMs literature (Bou-Llusar et al., 2009; Flynn & Saladin, 2001) and as suggested by Hair et al. (2010), deletion is the strategy to be followed in this respect for reaching the minimum recommended values of the fit indices and/or the construct validity.

Table 5.10 Selected AMOS outputs for covariance and regression modification indices for the KAQA measurement model

Path			**M.I.**	**Par Change**
BResults21	<---	BResults22	55.818	0.333
BResults22	<---	BResults21	52.347	0.362
e_{75}	<-->	e_{76}	110.719	0.49
BResults22	<---	BResults23	53.955	0.356
BResults23	<---	BResults22	52.153	0.348
e_{76}	<-->	e_{77}	103.467	0.511
BResults52	<---	BResults53	36.83	0.239
BResults53	<---	BResults52	29.262	0.267
e_{82}	<-->	e_{83}	79.237	0.338
BResults21	<---	BResults23	29.85	0.247
BResults23	<---	BResults21	27.058	0.261
e_{75}	<-->	e_{77}	57.235	0.354
BResults61	<---	BResults71	32.473	0.241
BResults71	<---	BResults61	22.384	0.27
e_{84}	<-->	e_{85}	50.678	0.275
e_{71}	<-->	e_{72}	50.445	0.132

Notes: M.I.: modification index, Par change: Parameter change, <---: factor loading, <-->: error covariance, 75: BResults21, 76: BResults22, 77: BREsults23, 82; BREsults52, 83: BResults53, 84: BResults61, 85: BResults71, 71: BResults12, 72: BResults13.

Reported in Table 5.10 are selected largest modification indexes computed by AMOS for error covariances and factor loadings that are fixed to zero in the original model. The table is ordered by the magnitude of the MIs to aid the process of starting with the largest value (Jöreskog, 1993). In this regard, all error covariances have two paths, if applicable, that gauge the relation between two variables. The path with the higher regression weight value was a candidate for deletion based on the MI indices. Given the above diagnoses, 14 items were deleted because they showed low loading and/or presented significant cross-loadings (Leader15, Leader16, Leader17, Leader21, Strategy14, Strategy24, Hr42, Hr83, Suppliers61, Beneficiary13, BResults12, BResults22, BResults53, BResults71). Hence, 71 items from the 85 initially proposed for the KAQA model were retained in the measurement scales. As such, minor modifications were suggested and then applied. After dropping these indicators, the remaining indicators satisfy statistical identification requirements and well represent the theoretical domain (item per factor ≥7). The removal of items calls for renewed test of the measurement model. Hence, Confirmatory Factor Analysis was performed. The resulting measurement model is depicted in the following figure.

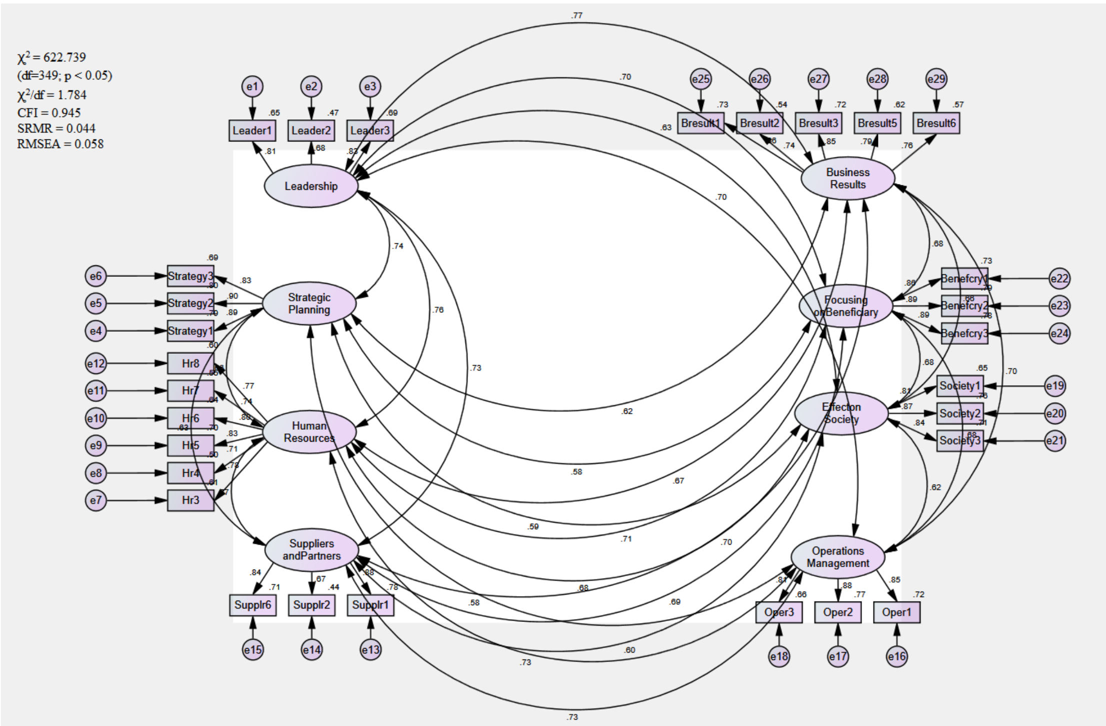

Figure 5.8 CFA results for the KAQA model finally analysed.

The CFA results reported feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance, no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) and the absence of problems associated with identification. Also, the fit indexes fell within an acceptable

range (χ^2 [349] = 622.739, $p < 0.05$; χ^2/df = 1.784; CFI = 0.945; SRMR = 0.044; RMSEA = 0.058). Although the χ^2 test was statistically significant, this test is well known to be sensitive to sample size and may be significant although the differences between model-implied and observed covariances are relatively small (Kline, 2010). Thus, multiple indices were used in evaluating model fit, as recommended in the SEM literature (e.g., Bollen, 1989; Schumacker & Lomax, 2010) and as highlighted earlier. After diagnosing the measurement model and reporting an acceptable overall model fit, the following level of analysis is to examine construct validity and reliability.

c. Construct validity and reliability

Construct validity can be defined as the extent to which a set of observations actually measure the theoretical latent construct those observations are intended to measure (Bagozzi & Phillips, 1982). Construct validity is formed by: convergent validity, reliability, discriminant validity, and nomological validity (Anderson & Gerbing, 1988; Fornell & Larcker, 1981; Hair et al., 2010).

In terms of convergent validity, it can be assessed by computing the indexes of average variance extracted (AVE), which is the level of variance that a latent variable component captured from its indicators relative to the amount due to measurement error. All AVE values, as presented in Table 5.12, are higher than the 0.50 (i.e., 50 percent) cutoff value (Fornell & Larcker, 1981; Shook et al., 2004), which shows that the majority of the variance is accounted for by the latent variable. That is, each construct is able to explain more than half of the variance of its indicators. As further evidence of convergent validity, the factor loading for each indicator was calculated. Indicators with loadings less than 0.4 or 0.5 should be dropped (Hair et al., 2010), since little explanatory power can be added to the model and parameter estimates can be biased (Byrne, 2010). The standardized factor loadings in the CFA are all significant at the 0.001 level. Based on these results, it can be concluded that the factor loadings are strong, as they are all above 0.68 and highly significant (t-values ranging from 10.78 to 18.71). This means that each indicator shared the majority of its variance with the hypothesised latent variable. Table 5.11 lists the measurement indicators of the construct scales, standardized coefficient loadings of the confirmatory factor analysis. In short, the reported results indicate support for KAQA model's convergent validity.

Table 5.11 Confirmatory Factor Analysis results for the KAQA model

Variable		Construct	Std. Loading
Leader1	<---	Leadership	.806
Leader2	<---	Leadership	.684
Leader3	<---	Leadership	.829
Strategy1	<---	Strategic Planning	.888
Strategy2	<---	Strategic Planning	.896
Strategy3	<---	Strategic Planning	.832
Hr3	<---	Human Resources	.780
Hr4	<---	Human Resources	.710
Hr5	<---	Human Resources	.835
Hr6	<---	Human Resources	.803
Hr7	<---	Human Resources	.741
Hr8	<---	Human Resources	.774
Supplr1	<---	Suppliers and Partners	.884
Supplr2	<---	Suppliers and Partners	.667
Supplr6	<---	Suppliers and Partners	.843
Oper1	<---	Operations Management	.849
Oper2	<---	Operations Management	.876
Oper3	<---	Operations Management	.810
Society1	<---	Effect on Society	.807
Society2	<---	Effect on Society	.873
Society3	<---	Effect on Society	.844
Benefcry1	<---	Focusing on Beneficiary	.856
Benefcry2	<---	Focusing on Beneficiary	.886
Benefcry3	<---	Focusing on Beneficiary	.885
Bresult1	<---	Business Results	.857
Bresult2	<---	Business Results	.737
Bresult3	<---	Business Results	.848
Bresult5	<---	Business Results	.787
Bresult6	<---	Business Results	.758

Concerning constructs' reliability, Cronbach's alpha (Cronbach, 1951) and composite reliability (Fornell & Larcker, 1981) were employed to assess the constructs' reliability. Table 5.12 shows the values of both indices. Cronbach's alphas and composite reliabilities of all constructs exceed the recommended threshold level of .7, suggesting satisfactory reliability for the individual latent variables (Anderson & Gerbing, 1988).

Discriminant validity refers to the degree to which measures across constructs are distinct (Kline, 2010). Three methods were used to evaluate discriminant validity (Bagozzi & Phillips, 1982; Fornell & Larcker, 1981). First, discriminant validity was assessed by testing the square root of the AVE. The square root of the AVE for each construct should be higher than its correlations with the other latent constructs (Fornell & Larcker, 1981). The square root of the AVE for each latent variable is reported in the diagonal cells in Table 5.12. The table indicates that square root of AVE for each latent variable is higher than its correlations with the other latent constructs. This shows that each latent variable shares more variance with its hypothetical indicators than with any other indicators. Second, discriminant validity was assessed by comparing Cronbach's alpha and average interscale correlation (AVISC). Cronbach's alpha should show values greater than AVISC to establish discriminant validity (Bagozzi & Phillips, 1982; Bou-Llusar et al., 2009). For all scales, Cronbach's alpha was higher than the average interscale correlation (AVISC) (see 5th column in Table 5.12). Third, discriminant validity was further supported by conducting two CFA models (Bagozzi & Phillips, 1982; Podsakoff et al., 2003). In the first model, all variables were allowed to measure only one factor, while in the second model, all items were allowed to load on their theoretical constructs. The fit of the model was worse than in the original one where all items load on their theoretically specified factors (see for example, Kautonen et al., 2015) (see section 5.3.2: common method variance: 5.3.2).

Nomological validity is stated if correlations among constructs in a measurement model make sense in theory (Hair et al., 2010). Reported in Table 5.12 are the mean, standard deviation and correlations of the eight unidimensional measurement constructs identified in the measurement model validation process. All correlations were positive and significantly different from zero, a result that was not unexpected as the constructs were part of an integrated approach to Total Quality Management (Flynn & Saladin, 2001).

In general, given the above analyses, the measurement scales used for the KAQA model were found to be reliable and valid.

Table 5.12 Descriptive statistics, correlations, convergent and discriminant validity for the KAQA model

Constructs	**Alpha**	**CR**	**AVE**	**AVISC**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Strategic Planning	0.903	0.905	0.761	0.627	*0.872*							
2. Leadership	0.817	0.818	0.602	0.719	0.736	*0.776*						
3. Human Resources	0.894	0.900	0.600	0.711	0.656	0.763	*0.775*					
4. Suppliers and Partners	0.820	0.844	0.646	0.693	0.627	0.726	0.773	*0.804*				
5. Business Results	0.895	0.898	0.638	0.687	0.623	0.774	0.668	0.705	*0.799*			
6. Beneficiary	0.908	0.908	0.767	0.672	0.576	0.700	0.707	0.687	0.681	*0.876*		
7. Effect on Society	0.878	0.879	0.709	0.638	0.591	0.630	0.682	0.602	0.661	0.677	*0.842*	
8. Operations	0.883	0.882	0.715	0.677	0.578	0.705	0.726	0.733	0.700	0.675	0.622	*0.845*
Mean					5.618	5.616	5.271	5.309	5.468	5.534	5.511	5.588
S.D.					0.853	0.839	1.028	0.976	0.999	0.981	0.887	1.014

Notes: CR= composite reliability, AVE= average variance extracted, AVISC= average interscale correlation, S.D.= standard deviation. The square root of the average variance extracted (AVE) are reported on the diagonal in italics for each variable. Operations: Operations Management, Beneficiary: Focusing on Beneficiary.

5.3.2 Assessing common method variance (bias)

Common method variance (CMV) is the amount of spurious correlation shared among variables due to employing the same method, often a survey, to gauge each variable (Craighead et al., 2011).

To reduce bias related to common methods, several procedures recommended in the literature (Chang et al., 2010; Podsakoff et al., 2003) were used. First, after improving the scale items[32] (Podsakoff et al., 2003), they were randomised on the questionnaire which decreases response selection bias and, subsequently, common method variance (Kline et al., 2000). Second, biases concerning both evaluation apprehension and social desirability were addressed by assuring the participants of their responses' confidentiality and anonymity, emphasising that there are no right or wrong answers, and giving participants the researcher’s contact information to deal with any comments and/or questions that they might have (Podsakoff et al., 2003). Third, complex SEMs were applied with multiple latent constructs (e.g., including mediating effects) thus respondents were “unlikely to be guided by a cognitive map that includes difficult-to-visualize interaction and non-linear effects” (Chang et al., 2010, p.179).

As the measurements were developed employing relevant items selected from a common survey, a Harman’s single-factor test (Podsakoff et al., 2003) was conducted, in which all research items (dependents and independents) were entered in SPSS for EFA and the number of factors extracted constrained to one with un-rotated solution. The basic assumption is that the existence of a common method variance is reflected by the presence of a single factor that is the common denominator across all indicators

[32] For example, by pretesting the questionnaire through groups of experts and targeted respondents which can ensure that it is written at a level the respondents can comprehend (i.e., avoiding any ambiguity and misunderstandings with the questionnaire) (MacKenzie & Podsakoff, 2012).

(Podsakoff et al., 2003). The EFA results for the KAQA model emerged with 6 factors with eigenvalues > 1.0 and accounted for 72% of the total variance. The first factor did not account for the majority of the variance (48%). For the EFQM model, EFA results emerged with 6 factors with eigenvalues > 1.0 and accounted for 71% of the total variance. The first factor did not account for the majority of the variance (47%). Regarding the MBNQA model, EFA results emerged with 5 factors with eigenvalues > 1.0 and accounted for 71% of the total variance. The first factor did not account for the majority of the variance (49%). Thus, common method variance is not a pervasive problem in this study (Bagozzi, 2011; Podsakoff et al., 2003). To support these results with a more robust analysis (Craighead et al., 2011; Malhotra et al., 2006; Podsakoff et al., 2003), the goodness-of-fit of the CFA with the indicators loading into a single factor for the KAQA, MBNQA, and EFQM models, showed a poor fit (see Table 5.13), indicating that the single-factor model does not account for all of the variance in the data and is more likely not to be a threat (see, also, Appendix A5, Figures A.5.1, A.5.2, and A.5.3).

Table 5.13 Goodness-of-fit for several specifications of CFA for the MBNQA, EFQM, and KAQA models

	Goodness-of-fit threshold [a]	**Model 1**	**Model 2**
		Measurement model	Single-factor model
χ^2		554.987/ 992.654/ 622.739	1499.771/ 2949.228/ 1800.821
(d.f.)		254/ 491/ 349	299/ 560/ 405
χ^2/df	<3	2.185/ 2.022/ 1.784	5.016/ 5.266/ 4.446
RMSEA	≤0.08	0.071(lo.063;Hi.0.080)/ 0.066(Lo. 0.060;Hi. 0.072)/ 0.058(lo.0.051;Hi. 0.065)	0.132/ 0.136/ 0.122
SRMR	<0.08	0.0439/ 0.0477/ 0.044	0.814/ 0.972/ 0.0815
CFI	>0.90	0.931/ 0.924/ 0.945	0.723/ 0.640/0.720
PNFI	>0.50	0.745/ 0.745/ 0.760	---
PCFI	>0.50	0.788/ 0.788/ 0.812	---

[a] (Bagozzi & Youjae, 1988; Browne & Cudeck, 1989; Kline, 2010; Medsker et al., 1994; Mulaik et al., 1989)

Notes: MBNQA/EFQM/KAQA model is presented before/between/after the /, respectively. RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual; CFI: comparative fit index; PNFI: parsimony normal fit index; PCFI: parsimony comparative fit index.

5.3.3 Structural model assessment

In this stage (the second stage of the first phase of the research analysis), as noted earlier, SEM based on the measurement model was performed to estimate the fit of the hypothesized models to the data, hence specifying causal relations[33] (Anderson & Gerbing, 1988; Shook et al., 2004). This will be reported for each model (i.e., MBNQA, EFQM, and KAQA models) separately.

5.3.3.1 The MBNQA structural model

Figure 5.9 depicts the MBNQA structural model indicating the relationships between the different (MBNQA categories) quality management and performance evaluation constructs. The exogenous (independent) factor in the model was leadership. The endogenous factors were Strategy, Measurement, Analysis and Knowledge Management (MAKM), Workforce, Customers, Operations, and Results. The analysis of the MBNQA structural model is discussed within the following sections: model specification and identification, and model estimation and testing.

a. Specifying the structural model (Model specification and identification)

With the acceptable MBNQA measurement model established (in section 5.3.1.1), this stage's objective was to transform the model to a structural model. This included specifying the direct effects implied in the MBNQA model and changing the covariances between the latent constructs in the MBNQA measurement model to single-headed, directional arrows. Also, endogenous constructs in the model were identified to include an error term because they are deemed to be causally explained

[33] In other words, considering the nomological validity. That is, assessing the entire model and the causal relations specified (Hair et al., 2010).

by their predictors, but not in full (Hair et al., 2010; Kline, 2010). All latent constructs (ovals) were measured by two indicators or more. A single headed arrow presents a single relationship between an exogenous latent construct and endogenous latent construct, or an endogenous construct and endogenous construct.

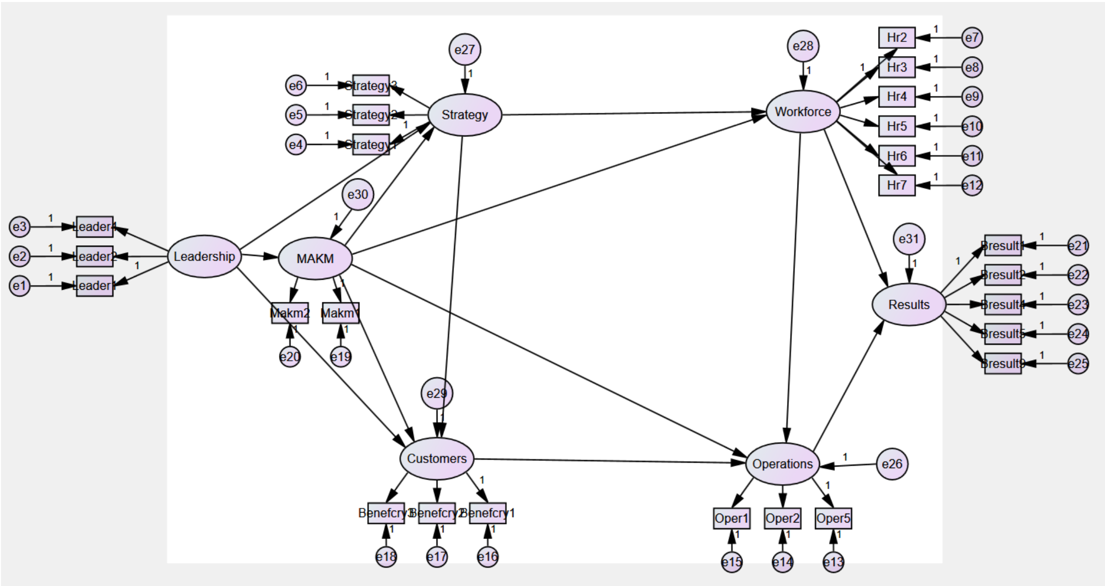

Figure 5.9 The MBNQA structural model specification (the proposed MBNQA structural model)

Note: MAKM: Measurement, analysis and knowledge management

Regarding the model identification, there are 325 distinct sample moments, or, in other words, observations (unique values) available to estimate the model parameters in the covariance matrix. This can be calculated based on the formula [N (N+1)/2] where N is the observed variables (Hair et al., 2010; Kline, 2010). Thus, there are 325 unique values in the covariance matrix [25(25+1)/2= 325]. From this, there are 63 estimated parameters, which gives (by extraction) a total of 262 free parameters (i.e., degrees of freedom) resulting in an over-identified model. As outlined earlier, in accordance with the research objective and its analytical strategy, and comparability to practice in the MBNQA model literature (see for example, Badri et al., 2006; Meyer & Collier, 2001; Peng & Prybutok, 2015), the MBNQA structural model is recursive, that is, containing no reciprocal causation (two-headed arrows) or feedback (circular) loops (Hair et al., 2010; Kline, 2010). Unidirectional flows from leadership to results (left to right) provide the researcher with the ability to examine the impacts of leadership causally through the model to the result construct (Prybutok et al., 2011). Moreover, as highlighted in section 5.2, all factors that may influence the model estimation (for example, missing data, outliers, non-normality, and multicollinearity) were tested and the recommended remedies were employed.

b. Model estimation and testing

AMOS v23 with the maximum likelihood (ML) estimation technique was used to examine the MBNQA structural model. The results showed feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance, no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) which indicates that the structural model is free of problems such as outliers, under-identification, and sampling problems (Anderson & Gerbing, 1988; Byrne, 2010). The structural model evaluation procedures involve assessing the model goodness of fit and the model validity (i.e., the hypothesised dependence relationships) (Byrne, 2010; Hair et al., 2010) which are highlighted in the next sections.

b.i Structural model goodness of fit

The MBNQA structural model results exhibited a relatively good fit to the data (χ^2 [262] = 656.786, $p<0.05$; x^2/df = 2.507; CFI= 0.905; SRMR= 0.0742; RMSEA= 0.081). The first index used to assess the model fit was x^2. Although a nonsignificant χ^2 value is desirable to show that the model is not significantly different from the underlying data, the observed chi square is significant ($p < 0.05$). Nevertheless, as outlined earlier, χ^2 is highly dependent upon sample size and should not be used with large sample sizes (Hair et al., 2010; Schumacker & Lomax, 2010). Hence, the ratio between χ^2 and the degrees of freedom, which examines the extent to which the covariances estimated in the model match the covariances in the measured variables, is used (Kline, 2010). The ratio of x^2 to the model' df was (2.507) within the acceptable range according to the criterion ≤ 3 (Bagozzi & Youjae, 1988; Kline, 2010). The comparative fit index (CFI) showed value 0.905, which is above the threshold of ≥ 0.90 (Medsker et al., 1994). The SRMR value is 0.0742, which is a standardized summary of the average covariance residuals, indicating a value below the cutoff value 0.08 (Byrne, 2010; Kline, 2010). The RMSEA (Root Mean Square Error of Approximation) value is 0.081 above the COV of 0.08 (Browne & Cudeck, 1989). Drawn from the above results, the overall fit statistics indicate a relatively good fit of the model to the data.

b.ii Examining the hypothesised dependence relationships

To assess the structural model validity, the structural parameters estimates must be examined. The structural model validity increases where the parameters estimates are statistically significant and in the predicted direction[34], and with high variance-explained estimates for the endogenous variables (Byrne, 2010; Hair et al., 2010).

Structural relations are generally examined as null hypotheses (H0) where no statistical relationship supported between the tested constructs according to the significance level (p-value). That is, H0 is either accepted or rejected according to the level of p-value of the standardised coefficient of a research parameter. From this, if the P value is higher than the significance level, no evidence is found to reject the null hypothesis. However,

[34] For example, positive effects should display a positive factor in the estimated model.

if the P value is less than the significance level, then evidence is found to reject the null hypothesis (Pallant, 2013). The MBNQA model estimated parameters, standard errors and t-tests for the significance of the paths are reported in Table 5.14 A two-tailed *t*-test is performed on each path estimate to evaluate its statistical significance. Fig. 5.10. shows the MBNQA model with the estimated path weights.

Table 5.14 Parameter estimates, standard errors and t-test for the MBNQA model

Effect (Direct causal effects)			**Parameter estimates**	**S.E**	**t-test**	**R^2**
Leadership	⟶	MAKM	0.625	0.093	8.691***	
Leadership	⟶	Strategy	0.652	0.099	7.838***	
MAKM	⟶	Strategy	0.141	0.070	1.855	
Leadership	⟶	Customers	0.345	0.128	3.457***	
Strategy	⟶	Workforce	0.548	0.070	7.500***	
Strategy	⟶	Customers	0.144	0.095	1.634	
MAKM	⟶	Customers	0.370	0.075	4.899***	
MAKM	⟶	Workforce	0.322	0.060	4.704***	
MAKM	⟶	Operations	0.089	0.068	1.101	
Customers	⟶	Operations	0.431	0.067	5.477***	
Workforce	⟶	Operations	0.440	0.075	5.647***	
Operations	⟶	Results	0.621	0.103	6.488***	
Workforce	⟶	Results	0.257	0.087	3.041**	
MAKM						0.390
Strategy						0.559
Customers						0.567
Workforce						0.567
Operations						0.693
Results						0.684

*p<0.05; **p≤0.010; ***p ≤ 0.001; standardized coefficients.
Note: MAKM: Measurement, analysis and knowledge management.

Table 5.14 shows empirical support for many of the causal relationships in the MBNQA model, while other relationships are not supported. Specifically, the relations between MAKAM and strategy (Ha9), MAKM and Operations (Ha12), and between Strategy and Costumers (Ha18) were not supported. The other causal relationships are found to be statistically significant at (p<0.001) except for the relation between Workforce and Results which was statistically significant at p<0.01. To establish the model validity, variance fit, explained variance in endogenous constructs gauged by R^2 as an indication of the substantive contribution of practical significance, is also important along with covariance fit, overall goodness of fit, (Shah & Goldstein, 2006). R^2 values represent the proportion of endogenous variables' variance that is explained by the exogenous variables. The higher the R^2 values are, the greater is the joint explanatory power of the exogenous variables (Byrne, 2010; Hair et al., 2010). The coefficients of determination for the MBNQA model are relatively moderate (ranging from $R^2 = 0.693$ for Operations to $R^2 = 0.390$ for MAKM). For example, an R^2 value of 0.693 for Operations indicates that the MAKM, Workforce, and Costumers constructs explain almost (70%) of the variation of the Operations construct. whereas, the coefficient of determination for the MAKM construct ($R^2 = 0.390$) shows that the Leadership construct explains almost 40% of variance in the MAKM construct. As stated above, these results support many of the causal relations proposed in the MBNQA model.

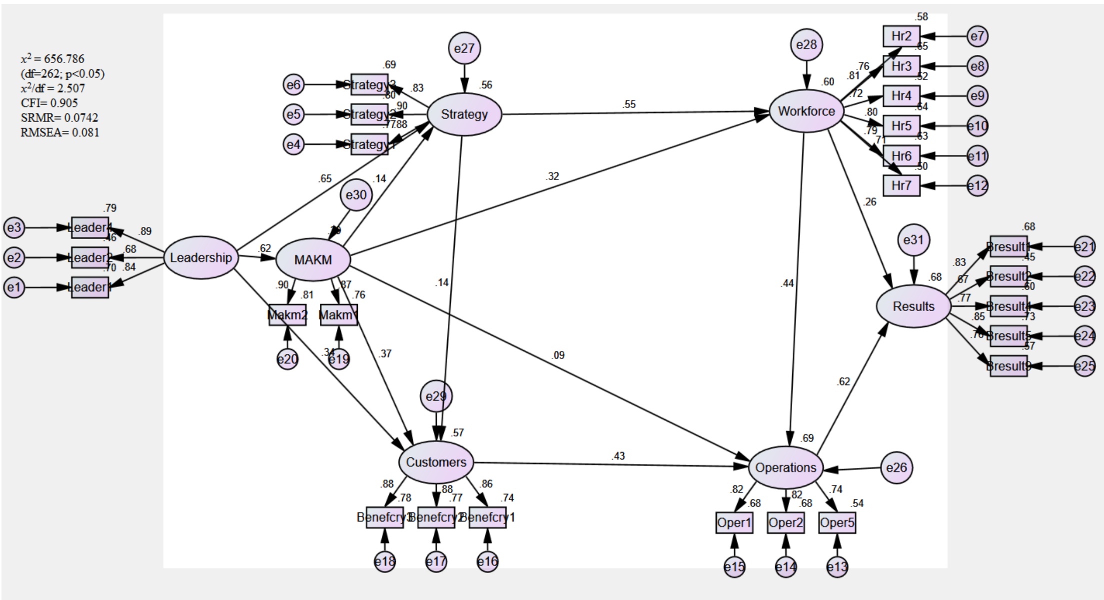

Figure 5.10 The MBNQA structural model finally analysed.

Note: MAKM: Measurement, analysis and knowledge management

5.3.3.2 The EFQM structural model

Figure 5.11 depicts the EFQM structural model, indicating the relationships between the different (EFQM categories) quality management and performance evaluation constructs. The exogenous (independent) factor in the model was Leadership. The endogenous factors were Strategy, People, Partnerships and Resources, Processes, Products and Services, People Results, Society Results, Customer Results, and Business Results. The analysis of the EFQM structural model is discussed within the following sections: model specification and identification, and model estimation and testing.

a. Specifying the structural model (Model specification and identification)

With the acceptable EFQM measurement model established (see section 5.3.1.2), this stage's objective was to transform the model to a structural model. This included specifying the direct effects implied in the EFQM model and changing the covariances between the latent constructs in the EFQM measurement model to single-headed, directional arrows. Also, endogenous constructs in the model were identified to include an error term because they are deemed to be causally explained by their predictors, but not in full (Hair et al., 2010; Kline, 2010). All latent constructs (ovals) were measured by three indicators or more. A single headed arrow presents a single relationship between an exogenous latent construct and endogenous latent construct, or an endogenous construct and endogenous construct.

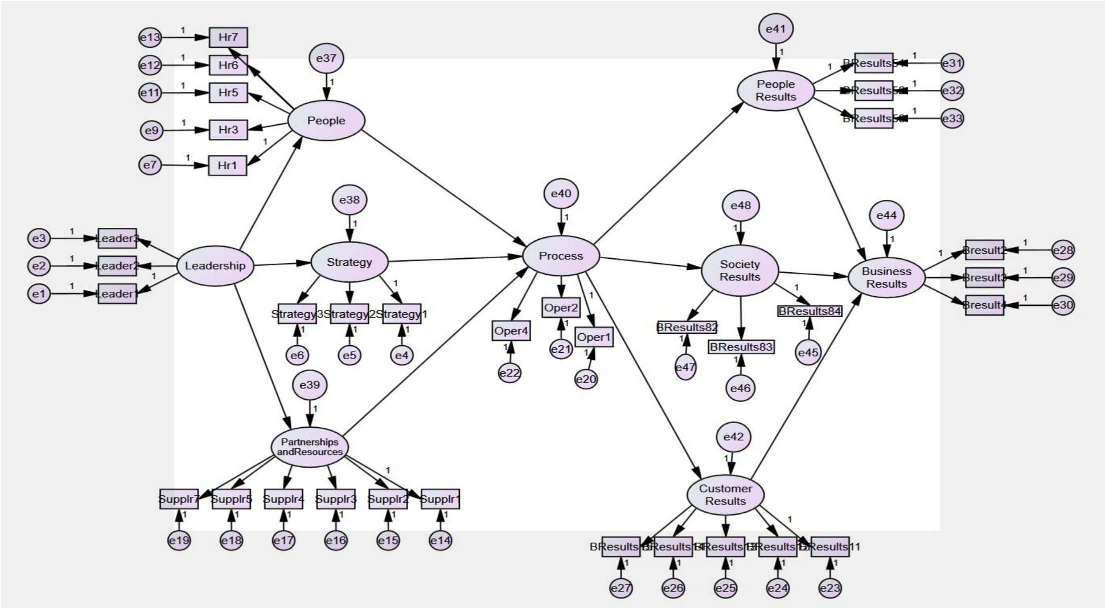

Figure 5.11 The EFQM structural model specification (the proposed EFQM structural model)

Regarding the model identification, there are 595 distinct sample moments, or, in other words, observations (unique values) available to estimate the model parameters in the covariance matrix. This can be calculated based on the formula [N (N+1)/2] where N is the observed variables (Hair et al., 2010; Kline, 2010). Thus, there are 34 unique values in the covariance matrix [34(34+1)/2= 595]. From this, there are 80 estimated parameters which gives (by extraction) a total of 515 free parameters (i.e., degrees of freedom) resulting in an over-identified model. As outlined earlier, in accordance with the research objective and its analytical strategy, and comparability to practice in the EFQM model literature (see for example, Bou-Llusar et al., 2009; Calvo-Mora et al., 2005; Heras-Saizarbitoria et al., 2012), the MBNQA structural model is recursive, that is, comprising no reciprocal causation (two-headed arrows) or feedback (circular) loops (Hair et al., 2010; Kline, 2010). Unidirectional flows from leadership to results (left to right) provide the researcher with the ability to examine the impacts of leadership causally through the model to the result construct (Prybutok et al., 2011). Moreover, as highlighted in the preliminary analysis section, all factors that may influence the model estimation (for example, missing data, outliers, non-normality, and multicollinearity) were tested and the recommended remedies were employed.

b. Model estimation and testing

AMOS v23 with the maximum likelihood (ML) estimation technique was used to examine the EFQM structural model. The results showed feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance, no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) which indicates that the structural model is free of problems such as outliers, under-identification, and sampling problems (Anderson & Gerbing, 1988; Byrne, 2010). The structural model evaluation procedures involve assessing the model goodness of fit and the model validity (i.e., the hypothesised dependence relationships) (Byrne, 2010; Hair et al., 2010) which are highlighted in the next sections.

b.i Structural model goodness of fit

The EFQM structural model results shows a good fit to the data (x^2 [515] = 1144.155, $p<0.05$; x2/df = 2.222; CFI= 0.905; SRMR= 0.0613; RMSEA= 0.073). The first index used to assess the model fit was x^2. Although a nonsignificant χ^2 value is desirable to show that the model is not significantly different from the underlying data, the observed chi square is significant ($p < 0.05$). Nevertheless, as outlined earlier, x^2 is highly dependent on sample size and should not be used with large sample sizes (Hair et al., 2010; Schumacker & Lomax, 2010). Hence, the ratio between χ^2 and the degrees of freedom, which examines the extent to which the covariances estimated in the model match the covariances in the measured variables (Kline, 2010), is used. The ratio of x^2 to the model' df was (2.222) within the acceptable range according to the criterion ≤

3 (Bagozzi & Youjae, 1988; Kline, 2010). The comparative fit index (CFI) showed a value 0.905, that is, above the threshold of ≥ 0.90 (Medsker et al., 1994). The SRMR value is 0.0613, which is a standardized summary of the average covariance residuals, indicating a value below the cutoff value 0.08 (Byrne, 2010; Kline, 2010). The RMSEA (Root Mean Square Error of Approximation) value is 0.073 below the COV of 0.08 (Browne & Cudeck, 1989). Based on the above results, the overall fit statistics exhibit a good fit of the model to the data.

b.ii Examining the hypothesised dependence relationships

To assess the structural model validity, the structural parameters estimates must be examined. The structural model validity increases where the parameters estimates are statistically significant and in the predicted direction, and with high variance-explained estimates for the endogenous variables (Byrne, 2010; Hair et al., 2010).

Structural relations are generally examined as null hypotheses (H0) where no statistical relationship supported between the tested constructs according to the significance level (p-value). That is, H0 is either accepted or rejected according to the level of p-value of the standardised coefficient of a research parameter. From this, if the P value is higher than the significance level, no evidence is found to reject the null hypothesis. However, if the P value is less than the significance level, then evidence is found to reject the null hypothesis (Pallant, 2013). The EFQM model estimated parameters, standard errors and t-tests for the significance of the paths are reported in Table 5.15 A two-tailed *t*-test is performed on each path estimate to evaluate its statistical significance. Fig. 5.12. shows the EFQM model with the estimated path weights.

Table 5.15 Parameter estimates, standard errors and t-test for the EFQM model

Effect (Direct causal effects)			Parameter estimates	S.E	t-test	R^2
Leadership	⟶	People	0.835	0.094	10.004***	
Leadership	⟶	Strategy	0.766	0.086	11.136***	
Leadership	⟶	Partnership &R	0.806	0.084	11.349***	
Partnership &R	⟶	Process	0.502	0.079	6.358***	
People	⟶	Process	0.270	0.082	3.445***	
Strategy	⟶	Process	0.163	0.065	2.363***	
Process	⟶	People-R	0.795	0.085	11.016***	
Process	⟶	Customer-R	0.828	0.081	11.968***	
Process	⟶	Society-R	0.698	0.082	8.108***	
Customer-R	⟶	Business-R	0.486	0.064	6.796***	
People-R	⟶	Business-R	0.378	0.062	5.396***	
Society-R	⟶	Business-R	0.105	0.067	1.717	
People						0.697
Strategy						0.587
Partnership &R						0.560
Process						0.691
People-R						0.632
Customer-R						0.685
Society-R						0.487
Business-R						0.734

*p<0.05; **p≤0.010; ***p ≤ 0.001; standardized coefficients.

Notes: Partnership &R: Partnerships and resources; Business-R: Business results; Society-R: Society results; Customer-R: Customer results; People-R: People results; Process: Processes, products and services.

Table 5.15 shows empirical support for the causal relationships in the EFQM model except for one suggested relation. Specifically, the relationship between Society Results and Business Results (Hb30) was not supported. The other causal relationships were found to be statistically significant at ($p<0.001$). To establish the model validity, variance fit, explained variance in endogenous constructs gauged by R^2 as an indication of the substantive contribution of practical significance, is also important along with covariance fit, overall goodness of fit, (Shah & Goldstein, 2006). R^2 values represent the proportion of endogenous variables' variance that is explained by the exogenous variables. The higher the R^2 values are, the greater is the joint explanatory power of the exogenous variables (Byrne, 2010; Hair et al., 2010). The coefficients of determination for the EFQM model (see Table 5.15 and Fig. 5.12) are relatively moderate (ranging from R^2 = 0.734 for Business Results to R^2 = 0.487 for Society Results). For example, an R^2 value of 0.734 for Business Results shows that the People Results, Customer Results, and Society Results constructs explain almost 70% of the variation of the Business Results construct. Whereas, the coefficient of determination for the Society Results construct (R^2 = 0.487) indicates that the Process construct explains almost 50% of variance in the Society Results construct. As reported above, these results support many of the causal relations proposed in the EFQM model.

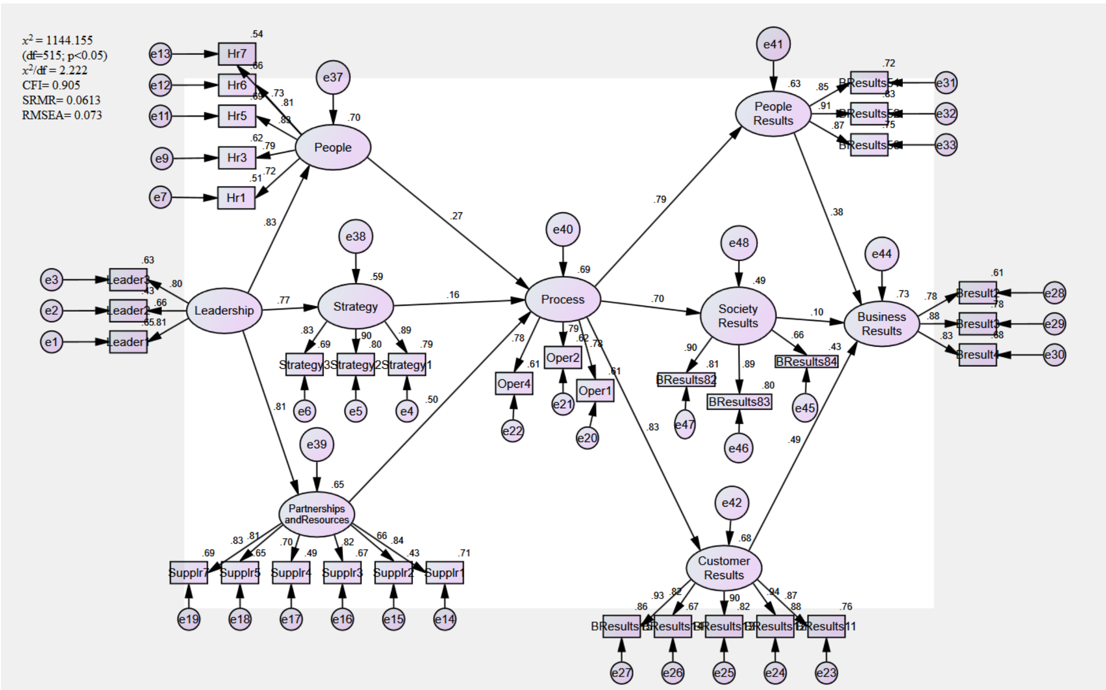

Figure 5.12 The EFQM structural model finally analysed.

5.3.3.3 The KAQA structural model

Figure 5.13 depicts the KAQA structural model indicating the relationships between the different (KAQA categories) quality management and performance evaluation constructs. The exogenous (independent) factor in the model was Leadership. The endogenous factors were Strategic Planning, Human Resources, Suppliers and

Partners, Operations Management, Focusing on Beneficiary, Effect on Society, and Business Results. The analysis of KAQA structural model is discussed within the following sections: model specification and identification, and model estimation and testing.

a. Specifying the structural model (Model specification and identification)

With the acceptable KAQA measurement model established (see section 5.3.1.3), this stage's objective was to transform the model to a structural model. This included specifying the direct effects implied in the KAQA model and changing the covariances between the latent constructs in the KAQA measurement model to single-headed, directional arrows. Also, endogenous constructs in the model were identified to include an error term because they are deemed to be causally explained by their predictors, but not in full (Hair et al., 2010; Kline, 2010). All latent constructs (ovals) were measured by three indicators or more. A single headed arrow presents a single relationship between an exogenous latent construct and endogenous latent construct, or an endogenous construct and endogenous construct.

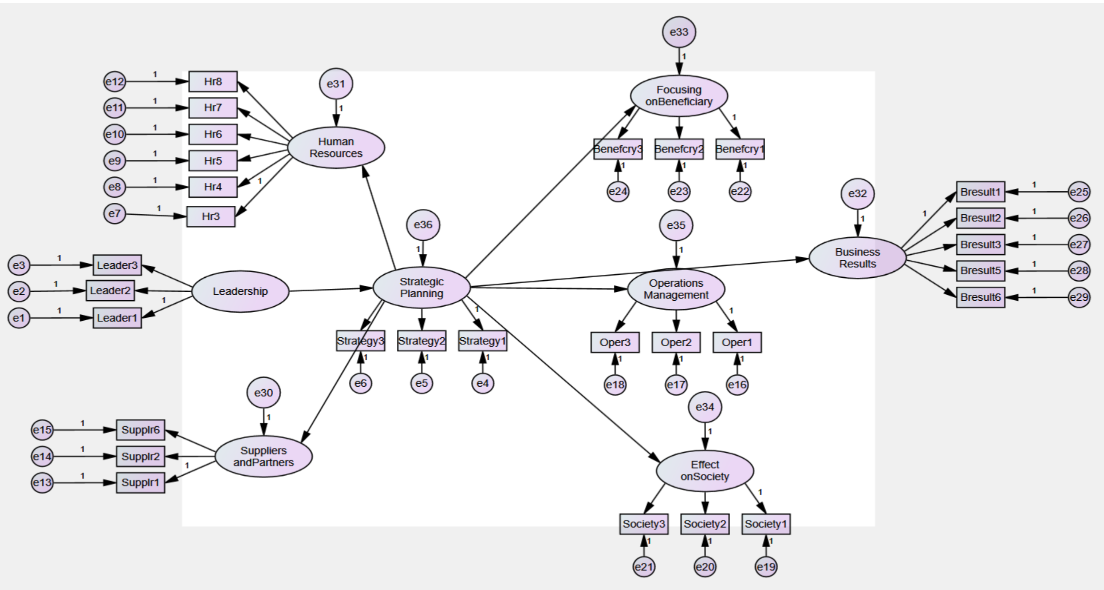

Figure 5.13 The KAQA structural model specification (the proposed KAQA structural model)

Regarding the model identification, there are 435 distinct sample moments, or, in other words, observations (unique values) available to estimate the model parameters in the covariance matrix. This can be calculated based on the formula [N (N+1)/2] where N is the observed variables (Hair et al., 2010; Kline, 2010). Thus, there are 435 unique values in the covariance matrix [29(29+1)/2= 435]. From this, there are 65 estimated parameters, which gives (by extraction) a total of 370 free parameters (i.e., degrees of freedom) resulting in an over-identified model. In accordance with the research objectives and its analytical strategy[35], and comparability to best practice in prior studies (Bou-Llusar et al., 2009; Flynn & Saladin, 2001; Heras-Saizarbitoria et al., 2012; Jayamaha et al., 2009; Meyer & Collier, 2001; Peng & Prybutok, 2015) as well as to simplify the analysis at this stage, the KAQA structural model is recursive, that is, comprising no reciprocal causation (two-headed arrows) or feedback (circular) loops (Hair et al., 2010; Kline, 2010). Unidirectional flows from leadership to results (left to right) provide the researcher with the ability to examine the impacts of leadership causally through the model to the result construct (Prybutok et al., 2011). Moreover, as highlighted in the preliminary analysis section, all factors that may influence the model estimation (for example, missing data, outliers, non-normality, and multicollinearity) were tested and the recommended remedies were employed.

b. Model estimation and testing

AMOS v23 with the maximum likelihood (ML) estimation technique was used to examine the KAQA structural model. The results showed feasible parameter estimates and appropriate standard errors (no correlations exceeding 1.00, no negative variance,

[35] That is, alternative models strategy, where multiple a priori models are studied. Of them, the MBNQA and EFQM models are adopted from previous research as recursive models.

no standardised parameter estimations that exceed the absolute value |1.0|, covariance/ correlation matrices positive definitive, and reasonable SEs for parameter estimates) which indicates that the structural model is free of problems such as outliers, under-identification, and sampling problems (Anderson & Gerbing, 1988; Byrne, 2010). The structural model evaluation procedures involve assessing the model goodness of fit and the model validity (i.e., the hypothesised dependence relationships) (Byrne, 2010; Hair et al., 2010) which are highlighted in the next sections.

b.i Structural model goodness of fit

The KAQA structural model results indicated a good fit to the data (x^2 [370] = 843.0773, p<0.05; x^2/df = 2.280; CFI= 0.905; SRMR= 0.0575; RMSEA= 0.074). The first criteria employed to assess the model fit was x^2. The obtained x^2 value with the accompanied p-value (.000) show that the model does not fit the data and should be rejected. Nevertheless, x^2 is highly dependent on sample size and should not be used with large sample sizes (Hair et al., 2010; Schumacker & Lomax, 2010). Hence, the ratio between χ^2 and the degrees of freedom, which examines the extent to which the covariances estimated in the model match the covariances in the measured variables (Kline, 2010), is used. The ratio of x^2 to the model' df was an acceptable range according to the criterion ≤ 3 (Bagozzi & Youjae, 1988; Kline, 2010). The comparative fit index (CFI) showed a value of 0.905, which is considered indicative of good fit and clearly above the threshold of ≥ 0.90 (Medsker et al., 1994). The SRMR value is 0.0575, which is a standardized summary of the average covariance residuals, indicating a value below the cutoff value 0.08 (Byrne, 2010; Kline, 2010). The RMSEA (Root Mean Square Error of Approximation) value is 0.074 below the COV of 0.08 (Browne & Cudeck, 1989). Drawn from the above results, the overall fit statistics indicate a good fit of the model to the data.

b.ii Examining the hypothesised dependence relationships

To support the structural model validity, the structural parameters estimates must be examined. The structural model validity increases where the parameters estimates are statistically significant and in the predicted direction, and with high variance-explained estimates for the endogenous variables (Byrne, 2010; Hair et al., 2010).

Structural relations are generally examined as null hypotheses (H0) where no statistical relationship is supported between the tested constructs according to the significance level (p-value). That is, H0 is either accepted or rejected according to the level of p-value of the standardised coefficient of a research parameter. From this, if the P value is higher than the significance level, no evidence is found to reject the null hypothesis. However, if the P value is less than the significance level, then evidence is found to reject the null hypothesis (Pallant, 2013). The KAQA model estimated parameters, standard errors and t-tests for the significance of the paths are reported in Table 5.16 A two-tailed *t*-test is performed on each path estimate to evaluate its statistical significance. Fig. 5.14. shows the KAQA model with the estimated path weights.

Table 5.16 Parameter estimates, standard errors and t-test for the KAQA model

Effect (Direct causal effects)			Parameter estimates	S.E	t-test	R^2
Leadership	⟶	Strategic Planning	0.886	0.086	11.018***	
Strategic Planning	⟶	Human Resources	0.850	0.087	10.907***	
Strategic Planning	⟶	Suppliers and Partners	0.825	0.082	11.737***	
Strategic Planning	⟶	Operations Management	0.798	0.088	10.921***	
Strategic Planning	⟶	Effect on Society	0.756	0.080	9.957***	
Strategic Planning	⟶	Focusing on Beneficiary	0.789	0.089	11.014***	
Strategic Planning	⟶	Business Results	0.817	0.085	11.299***	
Strategic Planning						0.786
Human Resources						0.723
Suppliers and Partners						0.680
Operations Management						0.636
Effect on Society						0.572
Focusing on Beneficiary						0.622
Business Results						0.667

*p<0.05; **p≤0.010; ***p ≤ 0.001; standardized coefficients.

Table 5.16 indicates that the KAQA model has statistically significant effects among all its relationships (Hc1, and Hc8-13). The high value of the regression parameters, ranging from 0.886 for "Leadership to Strategic Planning" to 0.756 for "Strategic Planning to Effect on Society" implies that there is a strong causal relationship between these constructs in the KAQA model. To establish the model validity, variance fit, explained variance in endogenous constructs gauged by R^2 as an indication of the substantive contribution of practical significance, is also important along with covariance fit, overall goodness of fit, (Shah & Goldstein, 2006). R^2 values represent the proportion of endogenous variables' variance that is explained by the exogenous variables. The higher the R^2 values are, the greater is the joint explanatory power of the exogenous variables (Byrne, 2010; Hair et al., 2010). The coefficients of determination are also high (ranging from $R^2 = 0.786$ for Strategic Planning to $R^2 = 0.572$ for Effect on Society), reflecting that the model explains a significant amount of variation in endogenous variables. For example, an R^2 value of 0.786 for Strategic Planning indicates that the Leadership construct explains a high percentage (almost 80%) of the variation of the Strategic Planning construct. In addition, the coefficient of determination for the Effect on Society construct ($R^2 = 0.572$) shows that the Strategic Planning construct explains almost 60% of variance in the Effect on Society construct. These results support the relationships between the different quality management and performance evaluation constructs, as the KAQA model proposes.

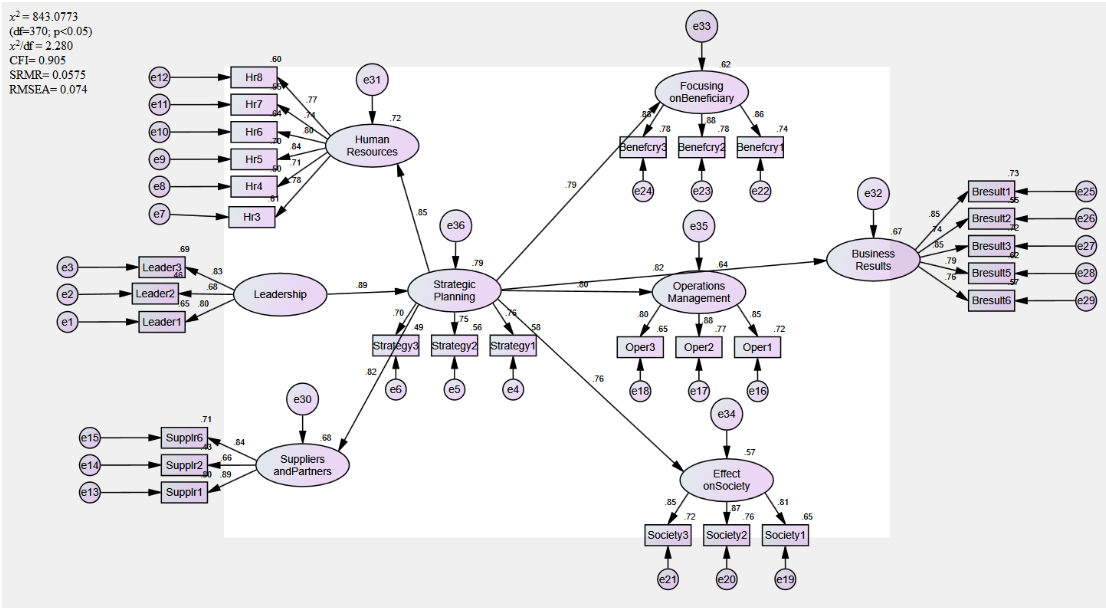

Figure 5.14 The KAQA structural model finally analysed.

5.3.4 Mediation effects

Mediation effects (indirect effects) occur when one or more variables/constructs intervenes between two related variables/constructs (independent and dependent) (Hair et al., 2010). That is, mediation effects show how, or by what means, a dependent variable (*Y*) is affected by an independent variable (*X*) through one or more intervening variables, or mediators (*M*) (Preacher & Hayes, 2008). Figure 5.16. shows a simple mediated relationship and depicts how variable K's causal effect can be apportioned into its indirect effect on E through M and its direct effect on E (path c). According to the mediation model (figure 5.15), Path A embodies the effect of K on the proposed mediator (M), while path B is the effect of M on E (dependent variable/construct) partialling out the effect of K. All of these paths would typically be quantified with unstandardized regression coefficients. The indirect effect of K on E through M can then be quantified as the product of a and b (i.e., ab) (Hair et al., 2010; Shrout & Bolger, 2002).

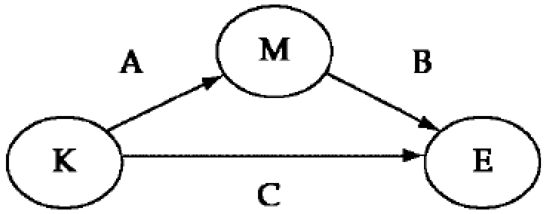

Figure 5.15 Direct and indirect effects

Many approaches have been suggested for testing mediation effects (e.g., Hayes, 2009; MacKinnon et al., 2002; Shrout & Bolger, 2002)[36].

One widely used approach is the causal steps approach, which can be traced to the seminal work of Judd and Kenny (1981) and Baron and Kenny (1986) which specifies a series of tests of links in a causal chain. In this approach, the researcher estimates the paths of the model in Figure 5.16. in addition to an initial model with only direct effect from K to E, and evaluates if various conditions are satisfied. That is, assessing mediation effects based on causal steps entails tests of different logical relations among the three variables involved. The series of causal steps requires four conclusions for mediation. Variable M is a mediator if K (independent variable) significantly affects M, K significantly accounts for variability in E (dependent variable), M significantly accounts for variability in E when controlling for K, and the effect of K on E reduces significantly when M is entered simultaneously with K as an independent variable and E as dependent variable. The latter condition will be met when the signs of the effects are consistent with the proposed mediating effect and when the first and third criteria are met. These criteria principally call for paths a and b to be significant and the path c to be smaller than a direct path from K to E (a model with only the direct effect from

[36] These diverse approaches reflect that there is no firm consensus across disciplines about the conceptual foundation and assumptions of mediation effect (MacKinnon et al., 2002).

K to E) by a nontrivial amount (Preacher & Hayes, 2008). If path c is decreased but still significant when M is included as a mediator, then partial mediation exists. Complete mediation is supported, however, if C is reduced to the extent that it is not significant (Hair et al., 2010). However, some academic studies (Shrout & Bolger, 2002; Williams et al., 2009) stated that a significant total effect of K on E is not required for establishing mediation effects, and showed evidence for significant indirect effects when total or direct effects are absent (see for example, Hayes, 2009; Rucker et al., 2011). As the general objective of the causal steps approach is to build conditions for mediation instead of a statistical test of the indirect effect of K on E through M, it has many limitations, as MacKinnon et al. (2002) and Shrout and Bolger (2002) noted. For example, this approach lacks a joint test of the conditions (mentioned above), i.e., a direct estimate of the size of the indirect effect of *K* on *E*, or standard errors to construct confidence limits, despite the standard error of the indirect effect of *K* on *E* is provided in the descriptions of the causal steps approach (Baron & Kenny, 1986). Also, the difficulty to extend this approach to models incorporating multiple mediating variables. Moreover, the condition that there has to be a significant link between the independent and dependent variables eliminates many inconsistent mediating variable models where the indirect effect and direct effect have opposite signs and may cancel each other out (MacKinnon et al., 2000).

Some other scholars introduced approaches that centred on assessing the significance of the mediating effect by dividing the estimate of the mediating effect, ab, by its standard error and contrasting this value to a standard normal distribution. That said, the focus is on the product term ab rather than on the individual paths to test the mediation model. This is due to the fact that this product is equal to the difference between the total and direct effect (MacKinnon et al., 2002; Preacher & Hayes, 2008).

With multiple mediators for a given relationship between two variables, the indirect effect is the sum of the indirect paths that independently occur for each path (Calvo-Mora et al., 2013; Flynn & Saladin, 2001; Preacher & Hayes, 2008). In this context, the residuals associated with the mediators are permitted to covary as recommended by Preacher and Hayes (2008).

The focus, then, is towards assessing the magnitude and significance of indirect effects rather than to decide whether to proceed with testing mediation and whether one proposed mediator fully or partially accounts for an effect (Rucker et al., 2011). In this context, the product-of-coefficients approach, the Sobel test (Sobel, 1982) includes calculating the ratio of ab to its estimated standard error (SE). A number of formulas have been suggested for estimating this SE (MacKinnon et al., 2002), however, with negligible differences on their test outcomes (Preacher & Hayes, 2008). In reference to the standard normal distribution, a P value for this ratio is calculated, and significance supports the mediation effects. However, as the sampling distribution of *ab* is normal only in large samples, analysts have taken issue with using the standard normal distribution for computing a *p* value for the indirect effect. Hence, the distribution of the product approach is a procedure that develops inference based on a mathematical derivation of the distribution of the product of two normally distributed variables. Therefore, it does not impose the assumption of normality of the sampling distribution, but acknowledges the skew of the distribution of products (MacKinnon et al., 2002; Preacher & Hayes, 2008).

Also, an alternative procedure developed for assessing mediation effects which, similarly, does not impose the assumption of normality, is the bootstrap framework (Shrout & Bolger, 2002). Bootstrapping is “a computationally intensive method that involves repeatedly sampling from the data set and estimating the indirect effect in each resampled data set" (Preacher & Hayes, 2008: 880). To build confidence intervals for the indirect effect, an empirical approximation of the sampling distribution of *ab* is built by repeating this procedure thousands of times (Shrout & Bolger, 2002).

In their simulations studies, MacKinnon et al. (2002) and (MacKinnon et al., 2004) examined the outcome of these approaches, discussed above, to evaluate their Type I error rates and power. They suggested the use of the distribution of the product approach or bootstrapping over the causal steps approach and Sobel test. This is because that the former have higher power while maintaining reasonable control over the Type I error rate.

Mediation models are best estimated using SEM analysis over the linear regression technique, because it affords greater flexibility in model specification and estimation options (Brown, 1997; Hayes, 2009; Iacobucci, 2009; MacKinnon et al., 2002; Preacher & Hayes, 2008). Also, both SEM and regression analysis have a similar logic for testing mediation effects (Holmbeck, 1997; MacKinnon et al., 2002).

Therefore, SEM was adopted to test for mediation effects and the procedure recommended by Preacher and Hayes (2008) was followed (see for example, Breugst et al., 2012). Also, this is in accordance with BEMs literature practice (see, Bou-Llusar et al., 2009; Calvo-Mora et al., 2005; Peng & Prybutok, 2015). In this context, AMOS was used that allowing to assess the whole model at once and depends on bootstrapping to examine the indirect effects proposed in the research models. This procedure does not depend on the assumption of normality for the indirect effects, so, the significance of the indirect effects was examined with a bias-corrected bootstrapping procedure with 10,000 bootstrap samples (Preacher & Hayes, 2008).

Table 5.17 Indirect effects proposed in the MBNQA model

Indirect effects	Bootstrap-indirect effect	SE	Lower limit 95% CI	Upper limit 95% CI
Leadership → Strategy	0.088	0.054	-0.014	0.200
Leadership → Customers	0.338***	0.091	0.167	0.528
Leadership → Operations	0.617***	0.056	0.501	0.724
Leadership → Workforce	0.606***	0.051	0.496	0.698
Leadership → Results	0.539***	0.064	0.401	0.654
MAKM → Customers	0.020	0.023	-0.005	0.093
MAKM→ Workforce	0.077	0.047	-0.013	0.175
MAKM→ Operations	0.344***	0.071	0.213	0.502
MAKM→ Results	0.371***	0.084	0.211	0.537
Strategy → Operations	0.303***	0.084	0.144	0.475
Strategy → Results	0.329***	0.076	0.184	0.479
Workforce → Results	0.273***	0.118	0.159	0.724
Customers → Results	0.268***	0.108	0.088	0.501

*p<0.05; **p≤0.010; ***p ≤ 0.001

Notes: Confidence intervals are bias-corrected based on 10,000 bootstrap samples, CI: confidence interval, SE: standard error, MAKM: Measurement, analysis and knowledge management. Results based on two-tailed tests. All path coefficients reported in standardized form.

The suggested indirect effects for the MBNQA model, their standard errors, and the 95% bias-corrected Cis are presented in Table 5.17, indicating empirical support for many of the indirect effects in the MBNQA model, while other indirect effects are not supported. Specifically, the indirect effect of Leadership on Strategy (Ha4) is not supported (indirect effect = 0.088, p > 0.05). Moreover, the indirect effect of MAKM "Measurement, analysis and knowledge management" on Customers (Ha13) is not supported (indirect effect = 0.020, p > 0.05). Also, the indirect effect of MAKM on Workforce (Ha14) is not supported (indirect effect = 0.077, p > 0.05). The other indirect relations (Ha5-8, Ha15-16, Ha19-20, Ha22, and Ha25) are found to be statistically significant at (p<0.001). As outlined earlier, the model fit was within accepted thresholds (x^2 [262] = 656.786, p<0.05; x^2/df = 2.507; CFI= 0.905; SRMR= 0.0742; RMSEA= 0.081).

Table 5.18 Indirect effects proposed in the EFQM model

Indirect effects	Bootstrap-indirect effect	SE	Lower limit 95% CI	Upper limit 95% CI
Leadership → Process	0.739***	0.042	0.642	0.811
Leadership → Society-R	0.473***	0.054	0.370	0.581
Leadership → People-R	0.525***	0.061	0.400	0.637
Leadership → Customer-R	0.556***	0.057	0.439	0.661
Leadership → Business-R	0.500***	0.058	0.385	0.612
Partnership &R → Society-R	0.320***	0.068	0.199	0.464
Partnership &R → People-R	0.354***	0.074	0.218	0.507
Partnership &R → Customer-R	0.375***	0.073	0.238	0.526
Partnership &R → Business-R	0.338***	0.071	0.208	0.484
People → Society-R	0.160*	0.067	0.030	0.290
People → People-R	0.177*	0.075	0.031	0.324
People → Customer-R	0.188*	0.080	0.033	0.349
People → Business-R	0.169*	0.071	0.031	0.308
Strategy → Society-R	0.107	0.062	-0.010	0.236
Strategy→ People-R	0.119	0.070	-0.013	0.262
Strategy→ Customer-R	0.126	0.073	-0.013	0.275
Strategy→ Business-R	0.114	0.066	-0.012	0.251
Process → Business-R	0.677***	0.051	0.567	0.768

*p<0.05; **p≤0.010; ***p ≤ 0.001

Notes: Confidence intervals are bias-corrected based on 10,000 bootstrap samples, CI: confidence interval, SE: standard error, Partnership &R: Partnerships and resources; Business-R: Business results; Society-R: Society results; Customer-R: Customer results; People-R: People results; Process: Processes, products and services. Results based on two-tailed tests. All path coefficients reported in standardized form.

The suggested indirect effects for the EFQM model, their standard errors, and the 95% bias-corrected Cis are presented in Table 5.18 indicating empirical support for many of the indirect effects in the EFQM model, while other indirect effects are not supported. Specifically, the indirect effect of Strategy on Society Results (Hb20) is not supported (indirect effect = 0.107, p > 0.05). Moreover, the indirect effect of Strategy on People Results (Hb21) is not supported (indirect effect = 0.119, p > 0.05). Also, the indirect effect of Strategy on Customer Results (Hb22) is not supported (indirect effect = 0.126, p > 0.05). Also, the indirect effect of Strategy on Business Results (Hb23) is not supported (indirect effect = 0.114, p > 0.05). The other indirect relations are found to be statistically significant at (p<0.001) except for the indirect relations between

People and results constructs (i.e., Society Results, People Results, Customers Results, and business Results constructs) which were statistically significant at $p<0.05$. As outlined earlier, the model fit was within accepted thresholds (x^2 [515] = 1144.155, $p<0.05$; x2/df = 2.222; CFI= 0.905; SRMR= 0.0613; RMSEA= 0.073).

Table 5.19 shows the indirect effects of leadership on each of the KAQA model criteria through strategic planning, their standard errors, and the 95% bias-corrected CIs. The effect of leadership is high and statistically significant for all criteria, although it differs between them, being higher for Human Resources (indirect effect = 0.753, 95% CI = 0.663-0.821) and lower for Effect on Society (indirect effect = 0.670, 95% CI = 0.575-0752). These findings support the mediation effects proposed in the KAQA model (Ha2-7). As outlined earlier, the model fit was within accepted thresholds (x^2 [370] = 843.0773, $p<0.05$; x2/df = 2.280; CFI= 0.905; SRMR= 0.0575; RMSEA= 0.074).

Table 5.19 Indirect effects proposed in the KAQA model

Indirect effects	**Bootstrap-indirect effect**	**SE**	**Lower limit 95% CI**	**Upper limit 95% CI**
Leadership → Human Resources	0.753***	0.040	0.663	0.821
Leadership → Suppliers and Partners	0.731***	0.047	0.624	0.811
Leadership → Operations	0.707***	0.045	0.606	0.783
Leadership → Effect on Society	0.670***	0.045	0.575	0.752
Leadership → Beneficiary	0.699***	0.045	0.602	0.778
Leadership → Business Results	0.724***	0.054	0.604	0.814

***$p \leq 0.001$

Notes: Confidence intervals are bias-corrected based on 10,000 bootstrap samples, CI: confidence interval, SE: standard error, Operations: Operations Management, Beneficiary: Focusing on Beneficiary. Results based on two-tailed tests. All path coefficients reported in standardized form.

5.3.5 Comparing the research models

As highlighted earlier, within this phase of the analysis (the second phase), the three models were compared (i.e., the KAQA, MBNQA, and EFQM models). Following the suggestions of Bollen (1989) and Jöreskog (1993) to evaluate the models, the criteria that will be employed to examine these models were: (1) model fit using several fit indices, (2) significance of the standardized path estimates, and (3) amount of variance explained in the endogenous variables as an indication of the substantive contribution of practical significance (Kollmann & Stöckmann, 2014; Lubatkin et al., 2006).

Various statistics were used to evaluate the goodness of fit of the KAQA model (Browne & Cudeck, 1992) (see Table 5.20 and section 5.3.3.3). All these values indicate the adequacy of the KAQA model for the data (x^2 [370] = 843.0773, p<0.05; x^2/df = 2.280; CFI= 0.905; SRMR= 0.0575; RMSEA= 0.074). Also, each of its causal direct and indirect relations (Ha1-13) were statistically significant at p<0.001 level (see Tables 5.16, 5.19 and 5.21) with high value of the regression parameters, ranging from 0.886 to 0.756. The R^2 values were strong, ranging from 0.786 to 0.572 with an average R^2 value of 0.67.

Table 5.20 Goodness-of-fit indices for the KAQA, MBNQA, and EFQM models

Model	Chi-Sq	Df	p-Value	CFI	SRMR	RMSEA
1. The KAQA model	843.773	370	0.000	0.909	0.0575	0.074
2. The MBNQA model	656.786	262	0.000	0.909	0.0742	0.081
3. The EFQM model	1144.115	515	0.000	0.905	0.0613	0.073

The causal relationships in the MBNQA model were supported except for three direct relationships and three indirect relationships (see Tables 5.14, and 5.22). Specifically, the direct links between MAKM and strategy (Ha9), MAKM and Operations (Ha12), and between Strategy and Customers (Ha18) were not supported. Also, the indirect effects between Leadership and Strategy (Ha4), MAKM "Measurement, analysis and knowledge management" and Customers (Ha13), and between MAKM and Workforce (Ha14) were not supported (see Tables 5.17, 5.22). The other causal relationships were found to be statistically significant at ($p<0.001$) except for the direct relation between Workforce and Results, which was statistically significant at $p<0.01$ with a lower value of the regression parameters, ranging from 0.625 to 0.257, compared to the KAQA model. The R^2 values were relatively moderate (ranging from $R^2= 0.693$ to $R^2 = 0.390$), with an average R^2 value of 0.58, compared with an average R^2 value of 0.67 in the KAQA model. Table 5.20 explains the goodness-of-fit of the MBNQA model, which was relatively speaking a worse fit than the KAQA model. Also, the RMSEA is slightly above the 0.08 threshold (see Table 5.20 and section 5.3.3.2). The overall fit indices for the MBNQA model were (χ^2 [262] = 656.786, $p<0.05$; x^2/df = 2.507; CFI= 0.905; SRMR= 0.0742; RMSEA= 0.081). Although a direct χ^2 comparison test is not viable since it is not a nested comparison, the PCFI and PNFI (Hair et al., 2010; James et al., 1982; Shah & Goldstein, 2006) were used for both models. The parsimony indices are operational way of trading off the increase in fit of a less restricted model obtained at the expense of degrees of freedom lost in estimating free parameters (Mulaik et al., 1989). The PCFI and the PNFI for the KAQA model were 0.769 and 0.825 respectively, and they were 0.749 and 0.794 for the MBNQA model. Overall, these multiple results show that the KAQA model serves as a better representation of the phenomenon under study. Thus, based on this comparison, it can be concluded that the KAQA model is superior to the MBNQA model.

A summary of the estimated parameter results of the EFQM model is provided in Tables 5.15 and 5.18 (see also Table 5.23). Except for one direct link and four indirect links (Hb20-23, and Hb30), the other path coefficients were supported. Specifically, the direct relation between Society Results and Business Results (Hb30) was not supported. Moreover, the indirect relationships between Strategy and Society Results (Hb20), Strategy and People Results (Hb21), Strategy and Customer Results (Hb22), and between Strategy and Business Results (Hb23) were not supported. The supported relations were found to be statistically significant at ($p<0.001$) except for the indirect relations between People and results constructs (i.e., Society Results, People Results, Customers Results, and Business Results constructs) which were statistically significant at $p<0.05$, with a lower value of the regression parameters, ranging from 0.835 to 0.163, compared to the KAQA model. The R^2 values ranged from 0.734 to 0.487, with an average R^2 value of 0.63, lower than the KAQA model (ranged from 0.786 to 0.572 with an average value of 0.67). Although Table 5.20 shows a good fit for both the EFQM and KAQA models, the latter seems to fit the data better.

When comparing the goodness-of-fit indices adjusted for parsimony in both models, the results seem to be the same, slightly higher for the EFQM model (PCFI = 0.769, 0.772, and PNFI = 0.825, 0.831 for the KQAQ and EFQM models respectively). This result is not unexpected because the KAQA model is more constrained than the EFQM model and, in general, constrained models are expected to fit the data less well (Hair et al., 2010). Also, multivariate models (the EFQM model in its results constructs) tend to have a better fit than multidimensional models (i.e., the KAQA model in its results construct). Multidimensional models involve dimensions that necessarily differ from one another, and these distinctions are expected to relate differently to other variables (Edwards, 2001). When using a parsimony index, it should not be relied upon solely to compare competing models (Hair et al., 2010). Rather, important information about parameters should also be taken into account (Shah & Goldstein, 2006), since fit indices provide no information about model plausibility (Browne & Cudeck, 1993) and parameters are not directly assessed by fit indices (Mulaik et al., 1989). Hence, consistent with the research strategy mentioned above, multiple criteria should be taken into account to compare these models. Specifically, although the first criterion (model fit) is not firm in terms of determining the better model, the other criteria (significance of the standardized path estimates, and amount of variance explained) indicate that the KAQA model is a better fit to the data. That is, the results show that the KAQA model is a parsimonious and simpler model, which represents a satisfactory alternative to the less restricted model, i.e., the EFQM model, and better explains variance in the relations suggested by BEM. Furthermore, it captures all of its hypothetical (direct and indirect) relationships with stronger coefficient values. Thus, based on these multiple results, it can be concluded that the KAQA model is a better fit than the EFQM model. The superiority of the KAQA measurement model over the MBNQA and EFQM measurement models is also indicated by comparing their measurement models (as reported in Table 5.13).

Having discussed the results of the analysis the following Tables (5.21-23) summarizes the results of the hypothesis (introduced in Tables 2.4-6) testing.

Table 5.21 Summary of the direct and indirect relations results in the KAQA model

Hypotheses	Results
Hc1. Within the KAQA model, leadership has a direct positive influence on strategic planning	Supported
Hc2. Within the KAQA model, leadership has an indirect positive influence on human resources	Supported
Hc3. Within the KAQA model, leadership has an indirect positive influence on suppliers and partners	Supported
Hc4. Within the KAQA model, leadership has an indirect positive influence on operations management	Supported
Hc5. Within the KAQA model, leadership has an indirect positive influence on effect on society	Supported
Hc6. Within the KAQA model, leadership has an indirect positive influence on focusing on beneficiary	Supported
Hc7. Within the KAQA model, leadership has an indirect positive influence on business results	Supported
Hc8. Within the KAQA model, strategic planning has a direct positive influence on human resources	Supported
Hc9. Within the KAQA model, strategic planning has a direct positive influence on suppliers and partners	Supported
Hc10. Within the KAQA model, strategic planning has a direct positive influence on operations management	Supported
Hc11. Within the KAQA model, strategic planning has a direct positive influence on effect on society	Supported
Hc12. Within the KAQA model, strategic planning has a direct positive influence on focusing on beneficiary	Supported
Hc13. Within the KAQA model, strategic planning has a direct positive influence on business results	Supported

Table 5.22 of the direct and indirect relations results in the MBNQA model

Hypotheses	Results
Ha1. Within the MBNQA model, leadership has a direct positive influence on MAKM	Supported
Ha2. Within the MBNQA model, leadership has a direct positive influence on strategy	Supported
Ha3. Within the MBNQA model, leadership has a direct positive influence on customers	Supported
Ha4. Within the MBNQA model, leadership has an indirect positive influence on strategy	Not supported
Ha5. Within the MBNQA model, leadership has an indirect positive influence on customers	Supported
Ha6. Within the MBNQA model, leadership has an indirect positive influence on operations	Supported
Ha7. Within the MBNQA model, leadership has an indirect positive influence on workforce	Supported
Ha8. Within the MBNQA model, leadership has an indirect positive influence on results	Supported
Ha9. Within the MBNQA model, MAKM has a direct positive influence on strategy	Not supported
Ha10. Within the MBNQA model, MAKM has a direct positive influence on customers	Supported
Ha11. Within the MBNQA model, MAKM has a direct positive influence on workforce	Supported
Ha12. Within the MBNQA model, MAKM has a direct positive influence on operations	Not supported
Ha13. Within the MBNQA model, MAKM has an indirect positive influence on customers	Not supported
Ha14. Within the MBNQA model, MAKM has an indirect positive influence on workforce	Not supported
Ha15. Within the MBNQA model, MAKM has an indirect positive influence on operations	Supported
Ha16. Within the MBNQA model, MAKM has an indirect positive influence on results	Supported
Ha17. Within the MBNQA model, strategy has a direct positive influence on workforce	Supported
Ha18. Within the MBNQA model, strategy has a direct positive influence on customers	Not supported
Ha19. Within the MBNQA model, strategy has an indirect positive influence on operations	Supported
Ha20. Within the MBNQA model, strategy has an indirect positive influence on results	Supported
Ha21. Within the MBNQA model, customers has a direct positive influence on operations	Supported
Ha22. Within the MBNQA model, customers has an indirect positive influence on results	Supported
Ha23. Within the MBNQA model, workforce has a direct positive influence on operations	Supported
Ha24. Within the MBNQA model, workforce has a direct positive influence on results	Supported
Ha25. Within the MBNQA model, workforce has an indirect positive influence on results	Supported
Ha26. Within the MBNQA model, operations has a direct positive influence on results	Supported

Table 5.23 Summary of the direct and indirect relations results in the EFQM model

Hypotheses	Results
Hb1. Within the EFQM model, leadership has a direct positive influence on people	Supported
Hb2. Within the EFQM model, leadership has a direct positive influence on strategy	Supported
Hb3. Within the EFQM model, leadership has a direct positive influence on partnerships and resources	Supported
Hb4. Within the EFQM model, leadership has an indirect positive influence on processes	Supported
Hb5. Within the EFQM model, leadership has an indirect positive influence on society results	Supported
Hb6. Within the EFQM model, leadership has an indirect positive influence on people results	Supported
Hb7. Within the EFQM model, leadership has an indirect positive influence on customer results	Supported
Hb8. Within the EFQM model, leadership has an indirect positive influence on business results	Supported
Hb9. Within the EFQM model, partnerships and resources has a direct positive influence on processes	Supported
Hb10. Within the EFQM model, partnerships and resources has an indirect positive influence on society results	Supported
Hb11. Within the EFQM model, partnerships and resources has an indirect positive influence on people results	Supported
Hb12. Within the EFQM model, partnerships and resources has an indirect positive influence on customer results	Supported
Hb13. Within the EFQM model, partnerships and resources has an indirect positive influence on business results	Supported
Hb14. Within the EFQM model, people has a direct positive influence on processes	Supported
Hb15. Within the EFQM model, people has an indirect positive influence on society results	Supported
Hb16. Within the EFQM model, people has an indirect positive influence on people results	Supported
Hb17. Within the EFQM model, people has an indirect positive influence on customer results	Supported
Hb18. Within the EFQM model, people has an indirect positive influence on business results	Supported
Hb19. Within the EFQM model, strategy has a direct positive influence on processes	Supported
Hb20. Within the EFQM model, strategy has an indirect positive influence on society results	Not supported
Hb21. Within the EFQM model, strategy has an indirect positive influence on people results	Not supported
Hb22. Within the EFQM model, strategy has an indirect positive influence on customer results	Not supported
Hb23. Within the EFQM model, strategy has an indirect positive influence on business results	Not supported
Hb24. Within the EFQM model, processes has a direct positive influence on people results	Supported
Hb25. Within the EFQM model, processes has a direct positive influence on customer results	Supported
Hb26. Within the EFQM model, processes has a direct positive influence on society results	Supported
Hb27. Within the EFQM model, processes has an indirect positive influence on business results	Supported
Hb28. Within the EFQM model, customer results has a direct positive influence on business results	Supported
Hb29. Within the EFQM model, people results has a direct positive influence on business results	Supported
Hb30. Within the EFQM model, society results has a direct positive influence on business results	Not supported

5.3.6 Testing alternative models for the superior model

This stage of the research analysis, as discussed earlier, involves introducing a sequence of nested structural models[37] for the superior model resulting from the previous phase (Anderson & Gerbing, 1988; Eddleston & Kellermanns, 2007), i.e., the KAQA model. Then, information is derived regarding the model that best accounts for the covariance observed among the constructs (i.e., exogenous and endogenous constructs) (Byrne, 2010), which will be referred to as the best model. That is, the aim is to consider equivalent and nested models for the resultant model after determining the superior model among the three studied models (Eddleston & Kellermanns, 2007; Kline, 2010; Shook et al., 2004). Thus, following Anderson and Gerbing's (1988) suggestions, five alternative models were examined, which were plausible on a theoretical basis.

As highlighted earlier (see Chapter two), leadership is considered a driver of human resources development and management (Badri et al., 2006; Calvo-Mora et al., 2005; Meyer & Collier, 2001). Therefore, in the first alternative model (model two in Table 5.24), a direct effect of leadership on human resources was tested by adding a direct path from Leadership to Human Resources. This model had an adequate fit to the data but was not significantly better than the superior model ($\Delta\, x^2(1) = 0.162$, n.s.), and the direct path from Leadership to Human Resources was not significant. For fit indexes and the path coefficient, see Table 5.24. Leadership is, also, defined to have a positive influence on Suppliers and Partners (Calvo-Mora et al., 2005; Gómez Gómez et al., 2011). Thus, given the above, in the second alternative model (model three in Table 5.24), two direct paths were added, the first from Leadership to Suppliers and Partners,

[37] Except for model five that was not nested.

the second from Leadership to Human Resources. This model resulted in an adequate fit to the data but was not significantly better than the superior model ($\Delta\ x^2(2) = 1.72$, n.s.), and both direct paths from Leadership to Suppliers and Partners, and from Leadership to Human Resources were not significant (Table 5.24). Also, Operations Management has a positive influence on business results (Badri et al., 2006; Calvo-Mora et al., 2005; Wilson & Collier, 2000). Thus, a direct path from Operations Management to Business Results was added (model 4 in Table 5.24). This model fit the data acceptably but was not significantly better than the superior model ($\Delta\ x^2(1) = 3.327$, n.s.), and the direct path from Operations Management to Business Results was not significant (Table 5.24). Suppliers and Partners, also, has a positive influence on operations management (Calvo-Mora et al., 2005; Eskildsen et al., 2000; Heras-Saizarbitoria et al., 2012). Thus, a direct path from Suppliers and Partners to Operations Management was added (model 5 in Table 5.24). This model fitted the data acceptably and was significantly better than the superior model ($\Delta\ x^2(1) = 6.952$, $p<0.05$), and the direct path from Suppliers and Partners to Operations Management was significant (Table 5.24).

Finally, in the fifth alternative model (model six in Table 5.24), the two direct paths to Human Resources and to Suppliers and Partners are considered to be from Leadership instead of Strategic Planning, that is, removing two direct links: from Strategic Planning to Human Resources and from Strategic Planning to Suppliers and Partners, and adding two direct paths: from Leadership to Human Resources and from Leadership to Suppliers and Partners. This alternative provides a relatively worse fit. In the computations, comparison through chi-square change test was avoided since this alternative model (model six) is non-nested and, therefore, the test was inappropriate. However, the parsimony fit indices for Model 6 were also worse (PNFI = 0.722, PCFI

= 0.821) than the superior model (PNFI = 0.769, PCFI = 0.825), designated as model 1 in Table 5.24. Overall, model five was the best model and more consistent with the data than each of the five alternative models.

Table 5.24 Comparisons of structural equation models

Model	x^2	df	CFI	SRMR	RMSEA	Δx^2	Δdf	Sig.
Model 1: the superior model (figure 5.10.)	**843.773 *****	**370**	**0.909**	**0.0575**	**.074**			
Model 2: direct path from Leadership to Human Resources (β=.061, p>0.05)	843.611***	369	0.905	0.0576	0.074	.162	1	n.s.
Model 3: direct path from Leadership to Human Recourses (β=.016, p>0.05), and from Leadership to Suppliers and Partners (β=-.155, p>0.05)	843.601***	368	0.905	0.0575	0.075	.172	2	n.s.
Model 4: direct path from Operations Management to Business Results (β=-.172, p>0.05)	840.446***	369	0.906	0.0584	0.074	3.327	1	n.s.
Model 5: direct path from Suppliers and Partners to Operations Management (β=.283, p<0.05)	836.791***	369	0.906	0.0589	0.074	6.982	1	*
Model 6: remove direct path from Strategic Planning to Human Resources and from strategic Planning to Suppliers and Partners, direct path from leadership to Human Resources (β=.793, p<0.05), and from leadership to Suppliers and Partners (β=.773, p<0.05)	863.133***	370	0.901	0.0631	0.076	--	--	Not nested

Notes: df = degree of freedom, $\Delta\ \chi^2$: difference in chi-square values between models, Δdf: difference in number of degrees of freedom between models, n.s.: not significant at $p < 0.050$, sig,: statistical significance. All models are nested except for model 5.

*p<0.05

***p ≤ 0.001

5.3.7 Multi-group analysis and moderation effects

A moderating effect occurs when the effect of one variable/construct on another related variable/construct depends on the level of a third variable/construct, usually called a moderator variable (Zedeck, 1971).

A moderator variable can be metric or nonmetric. Categorical variables are often posited to be moderators, which are classification variables of some type (e.g., respondent characteristics) or various situations/contexts. After defining respondents' groups for the categorical variable, multi-group analysis can be applied in a procedure similar to invariance testing but with a focus on structural model estimates instead of the measurement model (Hair et al., 2010). Regarding the continuous moderator variable, when it is acceptable (logically or theoretically) to be categorised then the same nonmetric variable procedures can be used after creating groups. Also, continuous moderators can be modelled by developing interaction terms (which can be created by multiplying the independent variable with the moderator). However, applying the nonmetric multi-group approach is recommended for the continuous moderator variable except if it cannot be justified. This is because the former approach is complicated by numerous factors (Hair et al., 2010) resulting in predominant use of the latter (Wilson, 2010).

To assess moderation effects, multi-group structural equation modelling is used where the moderating variable is nonmetric or transformed into a nonmetric variable. The procedure is considered as an extension of the multi-group analysis for examining measurement equivalence since moderation involves testing of structural model estimates (Kline, 2010). That is, the range of invariance hypotheses that can be tested is wider (SEM has both measurement and structural components). Within this context, some form of metric invariance needs to be established prior to testing differences in structural model estimates (Byrne, 2010; Hair et al., 2010; Kline, 2010). For this purpose, a levels/series of hierarchical structural equation models is developed, that could be assessed for invariance (Kline, 2010). These levels show whether parameter estimates are equal across the groups. First. The configural invariance hypothesis is tested by estimating the same structural equation model but with no cross-group equality constraints, that is, if the factor pattern matrix has the same form across groups. If this hypothesis is rejected, then the latent variables and the indicators are not linked in the same way in groups, i.e., equivalence does not hold at measurement or structural level. However, If configural invariance is supported, then, the conclusion is that the indicator were interpreted using the same constructs in groups (Vandenberg & Lance, 2000). Second, the construct-level metric invariance hypothesis is tested by setting constraints on each freely estimated factor loading to be equal across the groups (so to investigate if the factor loadings are equal across groups). If this hypothesis is rejected, then a less strict hypothesis can be evaluated by relaxing some of the equality constraints on factor loadings. Third, establishing evidence for at least partial measurement invariance (i.e., the initial or the less strict hypothesis, in second above, is retained), then it makes sense to test for invariance of structural model parameters (Cheung, 2008; Hair et al., 2010; Kline, 2010). As Hair et al. (2010) pointed out, “a general consensus has developed that if two parameters per construct equal (e.g., loadings in metric invariance) are found to be invariant, then partial invariance is found and the process can extend to the next stage” (p. 741). In invariance testing, in addition to the chi-square test, comparison of the parameter estimates across groups and inspecting changes in values of approximate fit indexes (i.e., the lack of degradation of CFI and Delta2 (Cheung & Rensvold, 2002), for example, (ΔCFI $\leq$ 0.01)) can be used (Kline, 2010).

Once measurement invariance has been established, then, moderation effects are tested by a comparison of group models similar to invariance testing (i.e., using the chi-square difference test). Specifically, if directions or magnitudes of path estimates in the structural model differ significantly across groups (as indicated by the chi-square difference test), then group membership moderates these direct effects (Byrne, 2010; Hair et al., 2010; Kline, 2010).

Following the above discussion, the effects of industry type (manufacturing and service) and strategic orientation (defenders, prospectors, analysers, and reactors) on the KAQA model relations were examined using the multi-group analysis technique in AMOS.

5.3.7.1 The effect of strategic orientation

To evaluate whether strategic orientation moderates the relationships depicted in the KAQA model, a multi-group analysis was conducted via the AMOS structural equation modelling software. Strategic orientations were differentiated using Miles et al.'s (1978) terminology (i.e., defenders, prospectors, analysers, and reactors). Given the research design and objectives, the configural and metric levels of invariance are required (Hair et al., 2010; Kline, 2010). To this end, both the Hu and Bentler (1999) two-index strategy and the Cheung and Rensvold (2002) change in goodness-of-fit criteria were applied,

Table 5.25 Multi-group invariance tests – for the KAQA model grouped by strategic orientation (defenders, prospectors, analysers, and reactors)

Model tested	χ^2	**df**	**CFI**	**Delta2 (IFI)**	$\Delta\chi^2$ **(Δdf)**	**Statistical significance**
Configural model[38]	3103.230	1480	0.732	0.739	--	---
Metric (Measurement weights)[39]	3177.113	1543	0.731	0.734	73.883 (63)	n.s.
Multigroup comparison Goodness-of-fit threshold			-0.01	-0.01		>0.10

Notes: $\Delta\chi^2$: difference in chi-square values between models; Δdf: difference in number of degrees of freedom between models; n.s.: not significant at $p < 0.10$.

The results indicate a relatively adequate fit of the multi-group model with the covariances provided by the data except to the CFI and IFI indices (χ^2 [1480] = 3103.230, $p<0.05$; $\chi2/df = 2.097$; CFI= 0.732; IFI= 0.739; SRMR= 0.082; RMSEA= 0.069). However, Hu and Bentler (1999) suggested a two-index strategy to evaluate model fit. That is, they proposed specific combination rules with two fit indices to minimise Type I and Type II error rates. In this context, they suggested employing a

[38] No equality constraints imposed.
[39] All factors loading constrained equal among groups, other parameters free to vary.

cut-off value close to (0.08) for SRMR supplemented by a cut-off value close to (0.06) for RMSEA to assess model fit which "resulted in the least sum of Type I and Type II error rates" (p. 27). Thus, it can be concluded that there is an adequate fit between the multi-group model and the observed data (Monsen & Wayne Boss, 2009). Therefore, the results indicate the existence of configural invariance (Vandenberg & Lance, 2000); that said, the same model could be used to each sub-sample of strategic orientations. In addition, as presented in Table 5.25, metric invariance is, also, confirmed as indicated by the lack of degradation of CFI and IFI indices (Cheung & Rensvold, 2002), and the nonsignificant change in chi square.

To test whether differences between defenders, prospectors, analysers, and reactors companies are statistically significant, the existence of structural invariance is tested. Specifically, the multiple-group model was compared with nested models. With each nested model, one relationship is constrained to be equal across groups. As reported in Table 5.26 the chi-square difference tests for the multi-group model indicate that the invariance test is statistically significant but for the relationship between leadership and strategic planning ($\Delta \chi^2 = 4.488$; Δ df = 3; $p > 0.10$), and between strategic planning and suppliers and partners ($\Delta \chi^2 = 5.739$; Δ df = 3; $p > 0.10$). These results provide support for the research hypothesis (Hd) concerning the role of an organisation's strategic orientation in the relationships between business excellence practices, and between business excellence practices and business results as depicted in the KAQA model except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners. Thus, the strategic orientation does moderate the effect of strategic planning on both business excellence practices (except for suppliers and partners) and business results.

Table 5.26 presents the standardised parameters estimates for the multi-group model results. While the tested relationships are positively significant in all groups, results indicate that some groups are superior over other groups according to their strategic behaviour. Generally, within the business excellence practices relations, defenders has the strongest results (its regression parameters range from 0.942 to 0.793), whereas analysers has the lowest results (with regression parameters, ranging from 0.703 to 0.555). Moreover, it is evident from Table 5.26 that defenders and prospectors are the highest-performing groups on the business results construct, while analysers is the lowest-performing group. The standardised estimates for the defenders and prospectors groups are (0.901, 0.898) respectively, whereas it is (0.651) for the analysers group. Hence, according to the research results, it could be concluded that strategic orientation moderates many relations among practice constructs as well as the relations between practice constructs and business results as depicted in the KAQA model. That is, strategic planning will contribute to a greater business excellence practices and results under conditions of defenders' strategic orientation.

Table 5.26 Parameter estimates, standard errors and t-test for KAQA model for multiple-group model (strategic orientation: defenders, prospectors, analysers, and reactors)

Effect (Direct causal effects)			**Defenders (71 cases)**			**Prospectors (63 cases)**			**Analysers (65 cases)**			**Reactors (34 cases)**			**Invariant test**	
			St. Parameter estimates	S.E	t-test	St. Parameter estimates	S.E	t-test	St. Parameter estimates	S.E	t-test	St. Parameter estimates	S.E	t-test	χ^2 (df)	$\Delta\chi^2$ (Δdf)
Leader	→	Strategy	0.920	0.120	6.978***	0.887	0.252	4.942***	0.710	0.137	5.467***	0.884	0.265	4.112	3107.718 (1483)	4.488 n.s. (3)
Strategy	→	HR	0.868	0.168	6.217***	0.893	0.147	5.554***	0.703	0.115	4.911***	0.869	0.227	5.292	3111.830 (1483)	8.6 ** (3)
Strategy	→	Suppliers	0.807	0.171	6.379***	0.838	0.128	6.085***	0.758	0.106	6.271***	0.805	0.210	4.844	3108.969 (1483)	5.739 n.s. (3)
Strategy	→	Operations	0.845	0.174	6.528***	0.804	0.134	6.649***	0.555	0.127	4.142***	0.851	0.229	4.251	3111.081 (1483)	7.851 ** (3)
Strategy	→	ESociety	0.942	0.147	6.338***	0.628	0.126	4.541***	0.643	0.122	4.534***	0.781	0.220	4.758	3111.020 (1483)	7.79 * (3)
Strategy	→	Beneficiary	0.793	0.190	5.906***	0.787	0.126	5.799***	0.574	0.130	4.462***	0.942	0.203	6.227	3115.456 (1483)	12.226** (3)
Strategy	→	BResults	0.901	0.170	6.996***	0.898	0.105	6.579***	0.651	0.106	4.452***	0.696	0.274	4.192	3119.604 (1483)	16.374*** (3)

Notes: *p<0.10, **p≤0.050, ***p ≤ 0.001, n.s.: not significant at p < 0.10, st. = standardized, df = degree of freedom, $\Delta\chi^2$: difference in chi-square values between models, Δdf: difference in number of degrees of freedom between models, $\Delta\chi^2$ (unconstrained $\chi^2 - \chi^2$ for each model with constrained path), unconstrained χ^2 = 3103.230, Leader: Leadership, Strategy: Strategic Planning, HR: Human Resources, Suppliers: Suppliers and Partners, Operations: Operations Management, Beneficiary: Focusing on Beneficiary, ESociety: Effect on Society, BResults: Business Results.

5.3.7.2 The effect of industry type

Given the above, a multiple-group analysis was performed to evaluate whether the same results for the KAQA model are gained across manufacturing and service firms.

Table 5.27 Multi-group invariance tests – for the KAQA model grouped by sector (manufacturing and service firms)

Model tested	χ^2	df	CFI	Delta2 (IFI)	$\Delta\chi^2$ (Δdf)	Statistical significance
Configural model[40]	1400.038	740	0.874	0.876	--	---
Metric (Measurement weights)[41]	1427.763	761	0.873	0.874	27.725 (21)	n.s.
Multigroup comparison Goodness-of-fit threshold			-0.01	-0.01		>0.10

Notes: $\Delta\chi^2$: difference in chi-square values between models; Δdf: difference in number of degrees of freedom between models; n.s.: not significant at $p < 0.10$.

The results indicate a relatively adequate fit of the multi-group model with the covariances provided by the data except to the CFI and IFI indices (χ^2 [740] = 1400.038, p<0.05; χ^2/df = 1.892; CFI= 0.874; IFI= 0.876; SRMR= 0.057; RMSEA= 0.062). However, Hu and Bentler (1999) suggested a two-index strategy to evaluate model fit. That is, they proposed specific combination rules with two fit indices to minimise Type I and Type II error rates. In this context, they suggested employing a cut-off value close to (0.08) for SRMR supplemented by a cut-off value close to (0.06) for RMSEA to assess model fit which “resulted in the least sum of Type I and Type II error rates” (p. 27). Thus, it can be concluded that there is an adequate fit between the multi-group model and the observed data. Therefore, the results indicate the existence of configural invariance (Vandenberg & Lance, 2000). That said, the same model could be used for each sub-sample of strategic orientations. In addition, as presented in Table 5.27, metric invariance is, also, confirmed as indicated by the lack of

[40] No equality constraints imposed.
[41] All factors loading constrained equal among groups, other parameters free to vary.

degradation of CFI and IFI indices (Cheung & Rensvold, 2002), and the nonsignificant change in chi square.

Table 5.28 Parameter estimates, standard errors and t-test for the KAQA model for multiple-group model (manufacturing and service firms)

Effect (Direct causal effects)			**Manufacturing firms (158 cases)**			**Service firms (75 cases)**			**Invariant test**	
			St. Parameter estimates	S.E	t-test	St. Parameter estimates	S.E	t-test	χ^2 (df)	$\Delta\chi^2$ (Δdf)
Leader	→	Strategy	0.926	0.098	9.457***	0.794	0.169	5.582***	1400.045 (741)	$0.007^{n.s.}$ (1)
Strategy	→	HR	0.859	0.106	8.910***	0.886	0.153	6.889***	1400.394 (741)	$0.356^{n.s.}$ (1)
Strategy	→	Suppliers	0.861	0.108	10.010***	0.724	0.122	6.019***	1403.824 (741)	3.786* (1)
Strategy	→	Operations	0.841	0.114	10.042***	0.737	0.128	5.112***	1406.480 (741)	6.442** (1)
Strategy	→	ESociety	0.828	0.101	9.701***	0.629	0.131	4.915***	1401.874 (741)	$1.836^{n.s.}$ (1)
Strategy	→	Beneficiary	0.815	0.120	9.642***	0.738	0.120	5.315***	1407.460 (741)	7.422** (1)
Strategy	→	BResults	0.828	0.106	9.509***	0.783	0.137	6.053***	1401.015 (741)	$0.977^{n.s.}$ (1)

Notes: *p<0.10, **p≤0.050, ***p ≤ 0.001, n.s.: not significant at p < 0.10, st. = standardized, df = degree of freedom, $\Delta\chi^2$: difference in chi-square values between models, Δdf: difference in number of degrees of freedom between models, $\Delta\chi^2$ (unconstrained $\chi^2 - \chi^2$ for each model with constrained path), unconstrained χ^2 = 1400.038, Leader: Leadership, Strategy: Strategic Planning, HR: Human Resources, Suppliers: Suppliers and Partners, Operations: Operations Management, Beneficiary: Focusing on Beneficiary, ESociety: Effect on Society, BResults: Business Results.

To test whether differences between manufacturing and service companies are statistically significant, the existence of structural invariance was tested. Specifically, the multiple-group model was compared with nested models. With each nested model, one relationship was constrained to be equal across groups. As shown in Table 5.28, support was found only for the links between strategic planning and suppliers and partners ($\Delta\chi^2 = 3.786$; Δ df = 1; $p < 0.10$), operations management ($\Delta\chi^2 = 6.442$; Δ df = 1; $p < 0.050$), and focusing on beneficiary constructs ($\Delta\chi^2 = 7.422$; Δ df = 1; $p < 0.050$), with higher results for the manufacturing companies. None of the other paths revealed any significant differences between manufacturing and service companies groups including the results construct. Generally, the results support the research hypothesis (HE) concerning the nonsignificant difference between service and manufacturing companies in BEMs relations.

5.4 Summary

This chapter has presented the data analysis comprising both the preliminary and main analyses. First, preliminary analysis indicated that assumptions associated with structural equation modelling application such as missing values, outliers, normality, linearity, homoscedasticity, and multicollinearity were met. Further, the issue of nonresponse bias was found not likely to be a threat in this study. Also, the demographic profile of the respondents in this study were highlighted. Second, using CFA, the measurement models for the three studied models were established through assessing their fit, reliability, convergent validity, discriminant validity, and nomological validity. Third, common method bias was tested using several procedures recommended in the literature, indicating that it was not found to be a significant issue. Fourth, based on the measurement model SEM was applied to assess the entire structural models as well as their direct and indirect causal relations specified. Fifth, the three structural models were compared using multiple criteria, indicating the superiority of the KAQA model. Sixth, alternative models for the superior model in addition to the potential moderation impacts of strategic orientation and industry type were analysed and discussed. The following chapter will concentrate on interpreting and discussing the research findings in more detail.

Chapter Six: Findings and Discussion

6.1 Introduction

This chapter centres on discussing the research findings (Chapter Five) in order to achieve the research objectives. Given that the similarities and differences between the MBNQA, EFQM, and KAQA models were discussed in Chapter Two (to achieve objective 1: to conceptually delineate the distinctive differences between the MBNQA, the EFQM, and the KAQA models at the theoretical level), and the measurement models for the studied models were established in chapters four and five (to achieve objective 2: to develop a comprehensive measurement model based on the content of the three targeted models), to achieve the objectives 3 (to empirically determine which model, among the MBNQA, EFQM, and KAQA models is more suitable/applicable) and 4 (to examine the potential moderating effects of industry type and strategic orientation on the (better suited-) BEM relations), the comparative analysis of the studied models and the moderating effects and multi-group analysis on the KAQA model relations will be discussed in this chapter. Toward this end, the research findings are organised according to the research objectives. Consequently, this chapter begins in section 6.2 with a discussion of the three tested models comparatively (objective 3). This is followed in section 6.3 by a discussion on the moderating effects and multi-group analysis of strategic orientation and industry type on the (better suited-) BEM relations (objective 4). Lastly, this chapter concludes with a summary, which is introduced in section 6.4.

6.2 The three models

6.2.1 The MBNQA Model

The MBNQA model was a less good fit than both the EFQM and KAQA models, despite having had a relatively overall good fit, as there were larger discrepancies between its framework and the research results (Tables 5.14, 5.17, 5.20, and 5.22).

The causal relationships in the MBNQA model were supported except for three direct relationships and three indirect relationships. Specifically, the direct links between MAKM and strategy, MAKM and Operations, and between Strategy and Customers were not supported. Also, the indirect effects between Leadership and Strategy, MAKM "Measurement, analysis and knowledge management" and Customers, and between MAKM and Workforce were not supported.

The "measurement, analysis, and knowledge management" (MAKM) criterion is a unique criterion to the MBNQA model. Additionally, it is deemed the focal aspect of the MBNQA model (Dror, 2008), see figures 2.1. and 2.6. The research findings show that the MAKM criterion does not play its proposed role as a brain centre for the alignment of system criteria. Specifically, many of its suggested direct and indirect links were either non-significant or weak, although statistically significant (see Tables 5.14 and 5.17). Also, it indicated a relatively weak coefficient of determination as compared to the other constructs (see Table 5.14). The less critical role of the MAKM criterion was conceptualised in the earlier versions of the MBNQA model, for example, the 1988 MBNQA model (see for example, Flynn & Saladin, 2001), either in its content or its position, reflecting, perhaps, the implementation level of business excellence practices, i.e., the initial efforts within business excellence duration (Peng & Prybutok, 2015). Given that the introduced MBNQA model has a complex and advanced definition for the MAKM criterion, including effective measuring, analysis, and improving of a wide range of information, as well as competitive comparisons (NIST, 2015), the research findings may indicate the narrower use of this criterion within the Saudi firms' context. This is consistent with the maturity level of adopting business excellence for these firms. This can likely be represented by tracking the evolution of business excellence models/experiences in the studied context (Ahire, 1996), see, for example, figure 2.3. Moreover, this may be indicative of the narrower use of the MAKM criterion within the Saudi context (Alamri et al., 2014). That is, it is perhaps restricted to high status members (Snell & Hui, 2000). This may, also, be interpreted as indicating the extent to which these may be out of sync with 'best/advanced' practices (Conti, 2007; Tan, 2002).

The MBNQA model has more complex relationships among its constructs, where every construct influences, or is influenced by, a number of other constructs. This is in line with a business excellence perspective as a systems approach and integrated mechanism (NIST, 2015). However, according to the research findings, as indicated by the (non)significance and magnitude of the direct and indirect proposed links (see Tables 5.14 and 5.17), a less complex interrelation among the model's components may serve as a better reflection of the business excellence practices within the context of Saudi Arabia. Simpler structures for business excellence models were used for early versions of the MBNQA model (Flynn & Saladin, 2001).

The MBNQA model indicated that the influence of practice constructs on business results was quite different, with operations and leadership having a stronger effect than any other construct, more than roughly twice as strong as the influence of workforce, MAKM, strategy, and customers constructs. While leadership does not have a direct influence on business results, it has a strong indirect effect through its influence on operations and workforce. These results are consistent with the results of Flynn and Saladin (2001), who found that leadership and operations had stronger effect on business results in the MBNQA model. Likewise, within the Chinese firms context, He et al. (2011) found operations to be the most important construct in the MBNQA model followed by leadership. Combined, these results strongly suggest that leadership and operations are critical drivers of business excellence results.

Overall, although it has overall relatively good fit, there are problems associated with the MBNQA model. The research analysis shows the need of repositioning the MAKM construct and modifying its content according to the Saudi context. Additionally, a less linear model may more accurately represent the links between constructs.

6.2.2 The EFQM model

Unsurprisingly, given its greater influence on the KAQA model, the EFQM model ranks between the MBNQA and KAQA models in terms of its superiority, according to the research analysis (Tables 5.15, 5.18, and 5.23).

Except for one direct link and four indirect links, the other path coefficients were supported within the EFQM model. Specifically, the direct relation between society results and business results was not supported. Additionally, the indirect relationships between Strategy and society results, strategy and people results, strategy and customer results, and between strategy and business results were not supported.

Processes is the emphasis of the EFQM framework as indicated by its position (EFQM, 2013). It is ranked the most important component among practice constructs, i.e., enabler constructs (Calvo-Mora et al., 2013; Dror, 2008; Uygur & Sümerli, 2013). Specifically, the several results constructs are conceptualised as a function of the intervening effect of processes on the association between enabler constructs and results constructs. The empirical tests did not confirm this critical role of processes, as many of its suggested mediating effects were either non-significant or weak, although statistically significant (see Table 5.15 and Table 5.18). Despite this, it had strong direct effects on the results constructs (see Table 5.15). These results may show the less significant role given to operations management “processes” within the context of the research sample, as well as the need to reposition it within the structure of the enabler constructs on the one hand, and within the relation between enabler constructs and results constructs on the other hand.

The partners and resources construct in the EFQM model has broader and more extended content compared to the KAQA model, including managing internal resources to secure sustained success and to support the delivery of strategy and the effective operation of processes (EFQM, 2013). The research’s empirical tests indicate better suitability for the more limited content of the partners and resources construct in the KAQA model which also incorporated local considerations, as indicated by the coefficients of determination for the construct in both models. Although there is a significant link between leadership and partners and resources constructs as shown in the EFQM model, the research findings suggest eliminating this link when a connection between strategy and partners and resources exists (see Table 5.21); that is, indicating the potential full mediation effect of strategic planning on the association between leadership and suppliers and partners “partners and resources”. This suggests a significant explanation for the process by which leadership influences suppliers and partners “partners and resources”, thus, supporting the critical role of strategic planning construct within the enabler domain, as posited in the KAQA model within the context of the sample firms. Moreover, the research results indicate the adequacy of adding a link between suppliers and partners “partners and resources” and operations management “processes” in the KAQA model, as suggested by the EFQM model (see Table 5.21). This ensures the supportive role created by suppliers and partners “partners and resources” construct in achieving the effective operation of processes (Calvo-Mora et al., 2005; Eskildsen et al., 2000); that is, the importance of working cooperatively and closely with partners and suppliers in order to commit to specific operations and internal processes (Calvo-Mora et al., 2013).

Unlike other models, the EFQM model divided the results construct into four separate constructs: costumer, people, society and business results. For BEMs such as the other models, using a composite measure of outcomes, although in a somewhat different combination, is intended to acknowledge the broadness and complexity of business excellence outcomes (EFQM, 2013; Meyer & Collier, 2001; NIST, 2015). Furthermore, it also ensures the trade-off between short and long-term practices, and that they do not lead to unsuitable balances between important stakeholders (Nabitz & Klazinga, 1999). Despite the superiority of the KAQA model (with its one combined results construct) over the EFQM model (with its divided separate results constructs), the EFQM model’s broken results constructs may provide meaningful results; for example, results beyond the level of outcome achieved as a whole, and uncovering the results on one part that may contribute to the outcomes on others. In this regard, with the exception of society results, both customer results and people results play significant roles in business results; although this aspect is less important than leadership and processes effects.

According to the EFQM model, the effect of enabler constructs on the results constructs was very different. Leadership and processes had stronger effects than any other variables, with a higher effect for processes on results criteria, consistent with the result of Calvo-Mora et al. (2013) and He et al. (2011). The partners and resources construct had a strong effect on the business results constructs. People had a relatively weak effect, whereas strategy had no significant effect on the business results constructs. These constructs influence business results constructs through their impact on processes. Collectively, these results provide evidence that the design, management and improvement of processes are critical to customer, people, society, and business results, and should be operated from the firm's stakeholders' perspective. A firm centred on enhancing its different results should invest resources and focus its efforts on improving operations management "processes". Overall, although the EFQM model was shown to have general adequacy within the Saudi context, there remains room for development, for instance, reformulating society results and its links as well as repositioning processes construct.

6.2.3 The KAQA model

The KAQA model showed a good fit, whether in itself or comparatively with the other models, as indicated by its overall fit, the strength and statistical significance of all its links, and having the highest proportion of variance explained (Tables 5.16, 5.19, 5.20, and 5.21).

Each of the KAQA causal direct and indirect relations were supported. The KAQA model places greater emphasis on the strategic planning construct, as indicated by its position: it is directly affected by leadership and affects all the remaining constructs, since it forms a means for integrating the content of the remaining constructs (Reiner, 2002); that is, it comprises elements that relate to the rest of the constructs, directing their management (Black & Porter, 1995). The empirical tests provide support to the suggested role of strategic planning in the KAQA model as shown by its strong and significant direct and mediating effects; that is, Strategic planning causes positive and strong direct changes in both business excellence practices and outcomes. Furthermore, strategic planning has significant usefulness for enhancing leadership impact on business excellence practices.

The “effect on society” construct is common to both the EFQM and KAQA models. However, it is presented as a result construct in the EFQM model and as an enabler construct in the KAQA model. That is, the focus is on how the organisation’s efforts towards society operate in the KAQA model (KAQA, 2011), and achievement concerning the society in which the organisation performs its activities for the EFQM model (EFQM, 2013). This indicates that the society results construct is of lesser importance within the Saudi private firms’ context; that is, the remaining results constructs can be viewed as core and classic objectives (Gómez Gómez et al., 2011). The less important position of the effect on the society construct was also conceived in the early stage of the EFQM model’s development (e.g., the 1999 EFQM model), where the EFQM model allocated only 60 out of 1000 total award points to the effect of society (Bou-Llusar et al., 2005). Further, achievement of results implies a considerable level of commitment and action. Taking into account these combined aspects, the research’s empirical tests in both models (i.e., the EFQM and the KAQA models) indicated that a relatively low commitment to societal practices (as indicated by its coefficient of determination) results in weak society results (as indicated by its coefficient of determination as well as a nonsignificant effect), thus, indicating the better adequacy of its position in the KAQA model. This was expected, given the evolution and level of excellence experience in the studied context.

According to the KAQA model results, although both had a strong impact, strategic planning had a stronger influence on business results, followed by leadership, which indirectly influenced business results through strategic planning. These results converge with those obtained by Su et al. (2003) for the Taiwan National Quality Award Model (TNQA), asserting the significant role played by strategic planning in causing business results in the given contexts.

Generally, the KAQA model appears to be the better presentation of the interrelations among business excellence practices and organisational performance when considering the Saudi context, bearing in mind the caveats discussed in section 5.3.6.

6.2.4 Summary and synthesis

The research findings serve as a significant contribution to the body of business excellence models literature. As detailed previously, the research findings show that comparing the MBNQA and EFQM business excellence models with the KAQA model results in generally supporting the latter, which differs from the former in terms of content, relations, and emphasis. While viewing each of the model's results in isolation may indicate its adequacy, even when to different degrees, the research's comparative approach provides a more robust, fruitful and comprehensive view.

The research findings suggest the superior fit of the KAQA model in the context of Saudi Arabia. They also highlight the importance of considering local conditions (e.g. culture and business excellence maturity level) in practicing business excellence. Suggesting that failure to take into account such local conditions in the research context of Saudi Arabia , may result in poor fitting BEMs For example, in the MBNQA model, many of the MAKM suggested direct and indirect links were either non-significant or weak (see section 6.2.1 and Tables 5.14 and 5.17), while non-significant effects were found for society results in the EFQM model (see section 6.2.3 and Table 5.15). The findings of the current study, thus, also provide support to earlier arguments (e.g., Flynn & Saladin, 2006) about the need for developing and/or adjusting BEMs to match local conditions.

In addition, the research models, consistently, assert the significant role of leadership, whether directly or indirectly, in business excellence within the system management and performance. This is consistent with the results of prior BEM studies (Badri et al., 2006; Gómez Gómez et al., 2011; Moon et al., 2011; Su et al., 2003). Taken together these insights highlight the crucial role leadership plays in the effective implementation of business excellence and corroborates the underlying BEM premise that leadership is a critical driver of system practices and performance (Wilson & Collier, 2000).

Moreover, in addition to leadership, MAKM, processes, and strategic planning are the critical constructs for the MBNQA, EFQM, and KAQA models respectively; especially concerning their mediating role, i.e., the model emphasis (Dror, 2008; KAQA, 2011; Uygur & Sümerli, 2013). As reviewed in section 2.5, previous research provides mixed results regarding which of these constructs have a more positive and significant influence among the enabler and results constructs. Moreover, research comparing the role of these three critical constructs is lacking. Furthermore, although previous studies analysed the role of strategic planning in BEMs (e.g., Heras-Saizarbitoria et al., 2012; Santos-Vijande & Alvarez-Gonzalez, 2007), they did not analyse the mediating effects of strategic planning on the association between leadership and the remaining enabler constructs in a simultaneous manner. The findings of this research indicate strong support for the direct and mediating role of strategic planning within the KAQA model; whereas partial support was found for the processes mediating role within the EFQM model. Overall, weak support was found for the significant role of the MAKM construct in the MBNQA model.

Within the KAQA model, strategic planning mediates the associations between leadership and the remaining enablers and results constructs. The research findings show strong support for this role, as suggested by its strong and significant direct and mediating effects (see Tables 5.16, 5.19 and 5.21). That is, strategic planning has a strong and significant link with human resources, suppliers and partners, operations management, effect on society, focusing on beneficiary, and business results as well as a strong and significant mediating effect on the association between these constructs and leadership. In particular, the alternative models test indicates the potential full mediation effect of strategic planning on the association between leadership and human resources, and between leadership suppliers and partners. One explanation for this may be the cultural context (Alamri et al., 2014), which could result in better acceptance of a leader's rules and policies (Wheeler, 2002) as well as a preference for an analysable environment that is under the control of the organisation (Mukherji & Hurtado, 2001). Moreover, the alternative models test suggests no mediating role for operations management in the association between strategic planning and business results as indicated by the nonsignificant link between operations management and business results.

The MAKM construct is usually portrayed as the system foundation for the MBAQA model. In this sense, it mediates the associations between leadership and the remaining system constructs (i.e., strategy, customers, operations, and workforce) and has indirect effects on many of the MBNQA constructs, including the results construct. However, the findings from this research show that the MAKM construct does not assume its archetypal role in the MBNQA model when tested in the context of Saudi Arabia. As indicated for example by the nonsignificant links between MAKM and strategy and between MAKM and operations; whereas leadership has a significant direct link with strategy and a significant indirect link with operations (see Tables 5.14, 5.17, and 5.22). In particular, the suggested mediating role for MAKM in the association between leadership and strategy was not supported. This affected its indirect links on customers and workforce constructs, as shown by the nonsignificant indirect effects between these constructs and MAKM. In addition, the suggested mediating role for MAKM in the association between leadership and operation was not supported. This may have resulted in its relatively weak indirect effects on the results construct.

In the EFQM model, processes mediate the association between the enabler constructs (i.e., people, strategy, and partnerships and resources) and the results constructs (i.e., people, customers, society, and business results). The findings from this research did not confirm this archetypal role of processes (see Tables 5.15 and 5.18, 5.23). That is, the mediating effect of processes was not supported for the association between strategy and society results, strategy and people results, strategy and customer results, and between strategy and business results. Moreover, processes has a weak mediating role in the association between people and results constructs (i.e., society results, people results, customer results, and business results), and between partnerships and resources and results constructs, compared to the mediating role of strategic planning in the KAQA model.

Overall, concerning the emphasis of the three focal models, the test results suggest a critical direct and mediating role for strategic planning within the system and results constructs, followed by a less significant role for operations management within the context of the sample firms. This finding may reinforce the critical role played by strategic planning in terms of the initiation and development of change towards business excellence initiatives (Pfeifer et al., 2005). Moreover, it also indicates the need to achieve integration of business excellence practices into the strategic planning process. The directive role of strategic planning is also consistent with previous studies that found the focus on isolated areas to be less effective for achieving excellence (e.g., Dijkstra, 1997; Eskildsen et al., 2001). In this context, (Pannirselvam & Ferguson) (2001: 22) stated that “Managers will need to plan and execute a concerted effort to improve several areas of organisational quality in order to achieve world-class quality”.

In conclusion, the findings from this research indicate the superior fit of the KAQA model in the context of Saudi Arabia while demonstrating the critical role of leadership and strategic planning in BEM relations. They also afford a comparative, rigorous, and robust explanation of how the three focal models operate in this context. .

6.3. Moderation effects

This section discusses the findings of phase four of the analysis, which assessed the potential moderating effects of industry type (manufacturing and service) and strategic orientation (defenders, prospectors, analysers, and reactors) on the KAQA model relations.[42]

6.3.1 The effect of strategic orientation

The results support the Hd hypothesis concerning the role of an organisation's strategic orientation in the association between the relationships depicted in the KAQA model except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners, although they do not confound the one/mixed sample results[43]. More specifically, strategic orientation does moderate the effect of strategic planning on both business excellence practices (except for suppliers and partners) and business results. As indicated earlier (section 2.6), little attention has been paid to the moderating role of strategic orientation within BEMs research (Escrig et al., 2016). However, in a broad sense, the study findings converge with TQM studies

[42] The primary data do not allow a broader analysis of these contextual factors. An attempt was made to investigate sectoral differences in each group of strategic orientation (defenders, prospectors, analysers, and reactors). However, the number of observations in each group/subgroup were insufficient for further analysis. Although targeting lots of suggested potential moderating variables may be insightful, this was infeasible given this research scope and constraints. In this regard, focusing on a limited group of potential moderating variables is recommended to reach an appropriate response rate given the target population (top management or quality managers), i.e., keep the questionnaire as short as possible (Kautonen et al., 2015), simplify the analysis (Hair et al., 2010), facilitate the comparison of different research results (Sousa & Voss, 2008), an approach that has also been adopted extensively by prior business excellence studies (e.g., Calvo-Mora et al., 2015; Escrig et al., 2016; Raharjo et al., 2017). Areas of further research related to other potential moderating factors are discussed in section 7.4. It is also to be kept in mind that the questionnaire used in this study is already rather extensive in comparison to single BEM-studies.

[43] It is not unexpected that the moderating effects of these factors do not confound the mixed sample results since BE practices are inherently interrelated as an integrated approach to BE (Flynn & Saladin, 2001; Peng & Prybutok, 2015) as also reported in the results of several BEM studies (e.g., Calvo-Mora et al., 2015; Escrig et al., 2016).

that support the moderating role played by strategic orientation in the relationship between TQM and performance (Reed et al., 1996; Sousa & Voss, 2008).

As detailed in Table 5.23 strategic orientation yields somewhat different results among the four groups except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners; which vary according to their strategic behaviour. For example, defenders behave better than the other groups in both the enabler and results domains; whereas analysers seem to exhibit the least consistent behaviours with business excellence initiatives and outcome. This can be interpreted as suggesting how the way in which firms cope with environmental uncertainty using their available capabilities (i.e., strategic orientation) can influence business excellence practices and results. In other words, generally, business excellence will find the greatest opportunities for internal consistence and, by extension, better performance in organisations where enabler elements are oriented toward a defenders orientation.

In short, the research results regarding the effect of strategic orientation on BEM relations can be summarised as follows. First, strategic orientation moderates several BEM relationships and, most importantly, those between the enabler and business results constructs depicted in the KAQA model (as summarised in Table 5.26). This suggests that the use of several BE practices were found to be contingent on strategic orientation. Highlighting therefore, the importance of considering the strategic orientation of a firm when pursuing business excellence.

Second, the path coefficients for strategic planning effects differed significantly among the four strategic orientations. In particular the strongest effects were observed, generally, for defenders; whereas the weakest for analysers. This may help managers:

a) to (understand how to) better configure 'lower levels of excellence' and/or in general BE implementations that may be unsatisfactory when compared to the competition, and/or b) to develop or adopt a more proactive stance towards the competition. These could involve changes in excellence implementation (e.g., specific practices) and/or strategic orientations (e.g. in ways that fit the particular organisational predicaments), vis-à-vis its competition.

Third, no role was found for strategic orientation on some BEM relations. That is, regarding the potential impact of strategic orientation on the role of leadership within BEMs and the KAQA BEM in particular. The results of this research suggest a facilitating role for leadership in creating the necessary breeding ground for business excellence practices and results in firms of different strategic orientations. Similarly, the effect of strategic planning on suppliers and partners was found to be equally important in different strategic orientations.

6.3.2 The effect of industry type

As reported in Table 5.25, the multiple-group analyses indicate that, generally, the same results are gained from both manufacturing and service groups, and they do not confound the one/mixed sample results, thus, supporting the research hypothesis (HE) concerning the nonsignificant difference between service and manufacturing companies in BEM relations. That said, there are no significant differences between manufacturing and service firms in the relations suggested in the enabler domain (but the effect of strategic planning on operations management, focusing on beneficiary, and suppliers and partners with slightly higher results for manufacturing firms) and, more importantly, in the relation between enabler and results constructs as depicted in the KAQA model. These results agree with (Bou-Llusar et al., 2009; Calvo-Mora et al., 2015) results concerning the nonsignificant difference between manufacturing and service firms in the association between enabler and results. However, manufacturing industry is considered the original focus of BEMs (Prybutok et al., 2011). Therefore, one possible explanation for the slight difference found among enabler relations is the longer experience in business excellence practices that manufacturing firms have as compared to service firms (SAIA, 2015). Overall, considering the studied sectors, the results support the argument that business excellence can be applied efficiently in any sphere or sector as suggested by BEMs (EFQM, 2013; NIST, 2015).

6.4 Summary

This research's comparative approach introduces three different business excellence models to assess their validity in order to investigate the suitability/applicability of these models. The three models are the MBNQA and EFQM models along with the KAQA model which, in addition to their similarities, have differences concerning their constructs, relations, emphasis. The empirical tests of the research models for a sample of companies in Saudi Arabia supports that: (1) the KAQA model is a better fit within the context of Saudi Arabia, (2) and the significant differences in BEM (the KAQA model) relations due to strategic orientation except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners, along with the nonsignificant difference found between manufacturing and service firms except for the links between strategic planning and suppliers and partners, operations management, and focusing on beneficiary constructs.

Chapter Seven: Contributions, Implications, Limitations and Directions for Future Research

7.1 Introduction

In the previous chapters, the suitability/applicability of the KAQA, MBNQA, and EFQM models were empirically evaluated. The potential moderating effects of strategic orientation and industry type on the BEM relations were also assessed. In this chapter, the contributions and implications of these investigations are discussed (sections 7.2 and 7.3), followed by the study's limitations and directions for future research (in 7.4).

7.2 Original contributions to the advancement of knowledge

Seeking recourse to the literature for answering the key research question (namely: whether the KAQA model rather than the MBNQA and EFQM BEMs is better suited in the Saud context), although insightful, is of limited direct benefit, as argued in this thesis; due to the paucity of empirical studies testing BEMs side-by-side. Moreover, the lack of evidence/consensus concerning the potential moderating role of strategic orientation and industry type in the case of BEMs led to establishing the supplementary research question (namely: do significant differences exist in the resultant BEM relations based on firms' industry type and strategic orientation?). These questions prompted the development of the comprehensive approach for the comparative empirical investigation of BEMs (namely, the MBNQA and the EFQM models, and the KAQA model (Saudi) BEM) using SEM techniques, in addition to using multi-group analysis techniques in order to examine the potential moderating effects of strategic orientation and industry type on the (better suited-) BEM relations.

The research findings show that comparing the MBNQA and EFQM business excellence models with the KAQA (Saudi) model results in generally supporting the latter, which differs from the former in terms of content, relations, and emphasis; bearing in mind the caveats discussed in section 5.3.6.

Moreover, the findings indicate significant differences in the (KAQA) BEM relations, due to strategic orientation, except for the relationships between leadership and strategic planning, and between strategic planning and suppliers and partners; and no significant differences due to sectoral specialisation, except for the relationships between strategic planning and suppliers and partners, operations management, and focusing on beneficiary constructs.

These findings, underpin several contributions to the advancement of theoretical, methodological, and empirical knowledge as well as contributions to the literature, which are discussed in more detail below.

7.2.1 Theoretical advancements

Talwar (2011: 24), in his review of BEMs, stated: “The consistent increase in the number of BEMs has generated the need for a comparative study to validate empirically their effectiveness”. In response to this and other calls (Bou-Llusar et al., 2009; La Rotta & Pérez Rave, 2016; Meyer & Collier, 2001), and given the scarcity of comparative empirical studies as aids to BEM theorising, this study developed a comprehensive comparative approach to contribute to BEM theorising and to formulate a superior research agenda for further investigations in this under-researched area.

Thus, in terms of theoretical advancement, this study first and foremost advances the ***extant knowledge concerning the suitability/applicability of different BEMs and in***

particular the KAQA (Saudi) model and the MBNQA and EFQM BEMs. The extant literature is inconclusive as to the suitability/ applicability of different BEMs (e.g., Badri et al., 2006; Moon et al., 2011), and comparative studies of their validity are scarce (Talwar, 2011). To remedy this, the MBNQA, EFQM, and KAQA models were subjected to an empirical examination that advances our understanding of different BEMs.

Thus, firstly, one of the theoretical contributions of this research is the better fit of the KAQA model in the context of Saudi Arabia. They also highlight the importance of considering local conditions (e.g. culture and business excellence maturity level) in practicing business excellence. Suggesting that failure to take into account such local conditions in the research context of Saudi Arabia , may result in poor fitting BEMs. For example, in the MBNQA model, many of the MAKM suggested direct and indirect links were either non-significant or weak (see section 6.2.1 and Tables 5.14 and 5.17), while non-significant effects were found for society results in the EFQM model (see section 6.2.3 and Table 5.15). The findings of the current study, thus, also provide support to earlier arguments (e.g., Flynn & Saladin, 2006) about the need for developing and/or adjusting BEMs to match local conditions.

Secondly, given the presence of alternative BEMs, a comparative perspective was deemed necessary for enhancing the theorising of the constructs that need to be considered as part of BEMs, in addition to the patterns in the interrelations of these constructs (Bagozzi & Phillips, 1982; La Rotta & Pérez Rave, 2016; Platt, 1964). However, the BEM literature appears to be dominated by single-model studies (Badri et al., 2006; Bou-Llusar et al., 2005; Gómez Gómez et al., 2011; Karimi et al., 2013; Meyer & Collier, 2001; Pannirselvam et al., 1998; Santos-Vijande & Alvarez-Gonzalez, 2007). Thus, this study also advances our understanding of the criteria and interrelations that make up these models, and the differences in emphasis placed by these models. In this regard, MAKM, processes, and strategic planning are the critical constructs for the MBNQA, EFQM, and KAQA models, respectively. Specially regarding their mediating role (as introduced in section 2.3), i.e., the model emphasis (Dror, 2008; KAQA, 2011; Uygur & Sümerli, 2013). As reviewed in section 2.5, previous research provides mixed results regarding which of these constructs have a more positive and significant influence among the enablers and results constructs. This constitutes a significant advancement of the theorizing concerning the (comparative) role of these three critical constructs; which has been lacking so far. Although previous studies analysed the role of strategic planning in BEMs (e.g., Heras-Saizarbitoria et al., 2012; Santos-Vijande & Alvarez-Gonzalez, 2007), they did not analyse the mediating effects of strategic planning on the association between leadership and the other enabler constructs in a simultaneous manner. Thus, the contribution of this research findings suggest the key (direct and mediating) role of strategic planning within the system and results constructs as suggested by the KAQA model, while a less significant role was found for the processes mediating role within the EFQM model.

Thirdly, enhancements to the studied BEMs are also suggested. For example, in the MBNQA model, the suppliers and partners construct is not part of its criteria (Karimi et al., 2013; Peng & Prybutok, 2015). The importance of the suppliers and partners construct has been widely recognised in several studies (e.g., Eskildsen et al., 2000; Heras-Saizarbitoria et al., 2012), as reviewed in section 2.5. The role of this construct is suggested and supported comparatively in this study. That is, taken together, the results relating to the EFQM and the alternative models provide empirical support for the positive influence of suppliers and partners on operations management. This ensures the supportive role created by the suppliers and partners construct in achieving the effective operation of processes (Calvo-Mora et al., 2005; Eskildsen et al., 2000). That is, the importance of working cooperatively and closely with partners and suppliers for excellent organisations in order to commit to specific operations and internal processes (Calvo-Mora et al., 2013; EFQM, 2013). Moreover, for the EFQM model, uncertainty still remains, particularly regarding the role of its emphasis, i.e., processes (Gómez Gómez et al., 2011; Heras-Saizarbitoria et al., 2012), as reviewed in section 2.5.2. This study also advances prior assessments of the EFQM model, which is necessary for the legitimisation of BEMs (Heras-Saizarbitoria et al., 2012). The results of this research indicate a less significant role for the processes criterion in the EFQM model (as discussed in sections 6.2.2 and 6.2.3). Suggesting therefore, that the processes criterion role in the EFQM model needs to be reconsidered.

In short, this study is the first one to analyse and compare three different BEMs (namely, the MBNQA EFQM, and KAQA models) using primary data and rigorous statistical analysis. This is especially pertinent for the KAQA BEM, as this study also represents its first empirical assessment; producing important insights as to how it measures up to the competition. Therefore, advancing the knowledge concerning the suitability of BEMs, the superiority of the KAQA model in the context of Saudi Arabia and a deeper theoretical understanding of business excellence and its different models. In particular, the importance of acknowledging contextual aspects as well as the importance of model criteria and their interrelations.

Fourthly, in the case of BEMs, Escrig et al. (2016) and Mohammad et al. (2011) have asserted the need for investigating the ***potential role played by moderating factors such as strategic orientation and industry type***. To the best of this researcher's knowledge, this is the first study to examine the moderating effects of strategic orientation on BEM relations. Accordingly, it contributes to BEM theorising by providing a deeper understanding of BEMs. That is, notwithstanding the non-significant differences in some relations, this study advances BEM studies by providing support for the moderating role of an organisation's strategic orientation in the association between several relationships, and most importantly, between the enablers and business results constructs, as depicted in the KAQA model. Given the significant role of strategic orientation identified in this research, it is also recommended that future empirical BEM studies include this factor, e.g., as a moderating or control variable. Concerning the ambivalent theorising/reports about the moderating role of ***industry type*** in BEM relationships (Bou-Llusar et al., 2009; Gómez Gómez et al., 2011; Sadikoglu, 2004), it is suggested that there is a need for continuing research on this issue (Calvo-Mora et al., 2015). This research thus, notwithstanding the significant differences found for some relations, contributes to the extant knowledge supporting the argument formulated initially in EFQM (2013) and NIST (2015). These can be interpreted as suggesting that, business excellence can be applied efficiently in both sectors (Bou-Llusar et al., 2009; Calvo-Mora et al., 2015). It is also to be noted that this is the first study to investigate differences based on firms' industry type and strategic orientation in the KAQA model.

Fifthly, the research results enhance the theorising of prior studies regarding ***the key role of leadership in BEMs relations***. Prior research was premised on the direct role of leadership (Moon et al., 2011; Santos et al., 2016) and/or using only one operationalisation of its role (Calvo-Mora et al., 2005; Meyer & Collier, 2001). This research demonstrated the significant role of leadership, whether directly or indirectly, in business excellence within the management system and performance, as depicted in the three studied models. The results enhance the BEM underlying theory that leadership is a critical driver of system practices and performance (Prybutok et al., 2011; Wilson & Collier, 2000), providing additional managerial insights into the dominant role leadership plays in the effective implementation of business excellence (further discussed in section 7.3).

7.2.2 Methodological advancements

Another large part of the original contribution of this thesis can be seen as a response to the ongoing calls in the BEM literature for more rigorous and alternative approaches/methodologies (Kim et al., 2010). That is, the development of the comprehensive comparative approach in this thesis for investigating different BEMs. The only study identified in the literature as explicitly investigating more than one BEM framework is that of Flynn and Saladin (2001), which considered variations of a single model. It focused on the development of one specific model using path analysis, i.e., no simultaneous examination of the measurement and structural models that integrate the specification of constructs and models with their measurement and testing. Therefore, this study contributes to the advancement of the methodologies used for researching BEMs. Firstly, this research has developed a comprehensive comparative approach that applied (non)equivalent, and (non)nested models which were plausible on a theoretical basis. As comparative BEM research has been scarce and mostly descriptive, this research developed a comparative methodology to move beyond description to inference within the BEM domain. This is especially important for the rigorous theorising of BEMs, given that there are non-trivial differences among their criteria, dimensions, suggested relationships, and emphasis. That is, as SEM based research cannot guarantee that no other model has a better fit than the 'suggested' model (Hair et al., 2010). Also, this approach extends approaches applied in prior research. For example, prior research adopted a range of approaches (e.g., causal and comparative approaches) to analyse BEMs. However, it did not consider testing nested models (e.g., Badri et al., 2006; Bou-Llusar et al., 2005; Flynn & Saladin, 2001; Moon et al., 2011; Peng & Prybutok, 2015; Xiang et al., 2010) and/or (non)equivalent models, e.g., multiple different models (e.g., Bou-Llusar et al., 2009; Meyer & Collier, 2001). As discussed above, applying the approach developed in this study sets the foundation for a superior research agenda in the pursuit of novel causal (comparative) and robust findings; enhancing the ability to theorise and inform practice (Anderson & Gerbing, 1988; Chin et al., 2008; Hair et al., 2010; Shook et al., 2004). Secondly, and breaking from the BEM research tradition centring on a single model (e.g., Badri et al., 2006; Moon et al., 2011), a comprehensive measurement model that acknowledges the variation of different BEMs was developed along with instruments for operationalising multiple BEMs simultaneously. Such development could benefit scholarly works in the domain of BEMs, e.g., for comparing and operationalising different BEMs/constructs.

7.2.3 Empirical advancements

This thesis also makes an original contribution to the advancement of empirical knowledge related to business excellence in Saudi Arabia. That has been absent so far from both comparative (Flynn & Saladin, 2006; Jayamaha et al., 2009) and non-comparative excellence studies (Bou-Llusar et al., 2005; Eskildsen et al., 2000; He et al., 2011; Meyer & Collier, 2001; Moon et al., 2011). In general, few studies have contributed to the advancement of knowledge outside developed economies (e.g., Su et al., 2003; Xiang et al., 2010), and there appears to be no empirical investigation of the Arab economies (La Rotta & Pérez Rave, 2016). That is not withstanding the many calls to investigate BEMs in different contexts, and developing economies in particular

(Bou-Llusar et al., 2009; Flynn & Saladin, 2006; Wilson & Collier, 2000). As such, this research is one of the few empirical studies that have focused on BEMs using empirical survey data from a novel context; i.e. other than those documented in prior BEM research. Thereby providing insight into business excellence patterns in the Saudi context (as discussed in sections 5.2.7 and 6.2).

7.2.4 Contributions to the literature

The research results advance BEM literature in several ways. For example, this research reinforces prior studies (e.g., Moon et al., 2011; Santos et al., 2016; Su et al., 2003; Xiang et al., 2010) that focused on analysing country-specific BEMs by supporting and extending their conclusions of showing that country-specific BEMs are better suited in their intended contexts.

Furthermore, the research findings concerning the need/suitability of country-specific BEMs and the critical role of strategic planning in (the KAQA) BEM relations extend and complement the literature that centred on analysing how BEMs capture TQM dimensions (e.g., Bou-Llusar et al., 2009; Bou-Llusar et al., 2005; Calvo-Mora et al., 2015; Curkovic et al., 2000; Santos-Vijande & Alvarez-Gonzalez, 2007; Suarez et al., 2016). As TQM models, the causal relations between BEM constructs are interpreted not only as empirical regularities within a focal model, but also as relations in the broader context of the TQM domain (Bou-Llusar et al., 2009).

Moreover, given the scarcity of literature-based studies and the fragmentation in BEM research (e.g., MBNQA vs. EFQM model studies; cf. Doeleman et al., 2014) this thesis makes an important contribution to the literature by reviewing and categorising extant studies and integrating their findings across different models. Future studies could benefit from the categorisation and synthesis of prior literature developed in section

2.5. Moreover, this research extends comparative-concept BEM literature (e.g., Mavroidis et al., 2007; Talwar, 2011; Tan, 2002). In particular, it synthesises the fragmented information concerning the evolution of both the MBNQA and EFQM models and the novel information concerning the KAQA model, and accordingly, undertakes a conceptual comparison, thereby enriching extant knowledge and facilitating further studies in this area.

7.3 Implications for policy and practice

This research has a range of implications, especially for practitioners: reviewing extant BEM implementations, pursuing BEM adaptation, being in the privileged position of having to choose between alternative BEMs, initiating excellence initiatives and/or considering the ensuing organisational changes, pursuing excellence across differing contexts, and making recommendations concerning the differentiating effects of contextual factors.

Firstly, the approach developed in this study may help custodians by presenting a more effective way to develop and/or review BEMs. That is, to carefully recognise the local context and then develop a tailored model that acknowledges both national and international considerations.

Secondly, the approach developed and the results produced, can better inform BEM suitability and choice. That is, providing a more effective way to manage excellence practices that drive excellence results, particularly in contexts where multiple BEMs are competing for adoption. Although the results of this research apply directly to Saudi Arabia, they also indicate the need for a tailored BEM. That is, managers should take into account local conditions (e.g. culture and business excellence maturity level) in practicing business excellence.

Thirdly, managers need to understand the interrelationships among BEM criteria (Evans & Lindsay, 2014), and invest more resources while focusing their efforts on improving the critical BEM criteria to fully gain advantages from the self-assessment approach, and to enhance managing the business (Reiner, 2002). In this sense, this research (via its comprehensive comparative approach) offers managers assistance in terms of understanding BEM interrelations and their critical criteria in a more in-depth and accurate manner. Also, the research results indicate leadership, strategic planning, and operations management as critical criteria of BEMs. Failure to acknowledge these criteria could lead to a lower level of effectiveness/success.

Fourthly, the study findings, as suggested by the KAQA model, show the importance of achieving integration of business excellence practices into the development, implementation, and potential modification of strategy. During such processes, resource allocation decisions should include/consider the different enabler constructs (i.e., human resources, suppliers and partners, operations management, focusing on beneficiary, and effect on society). A carefully formulated and implemented strategy; e.g., driven by stakeholder needs and strongly aligned with enabler constructs (Black & Porter, 1995; Reiner, 2002) would result in better business excellence practices and performance. This is considered to be more crucial in the initiation and development of change towards a business excellence initiative (Pfeifer et al., 2005).

Another implication of the research findings relates to international management challenges; e.g., learning about the host context of foreign operations while trying to introduce home excellence practices. Especially when differences between contexts are non-trivial. The findings from this study should raise further awareness of the importance of taking into account local conditions in practicing business excellence.

This awareness will help firms to better manage the transfer and/or adaptation of business excellence practices from the home country context to foreign country contexts.

Finally, the analysis of the effects of strategic orientation on a BEM opens up several possibilities for connecting strategic orientation, through enabler constructs, to the results construct. For example, both enabler and results domains depicted different levels of effectiveness, depending on a company's particular strategic orientation. This should aid managers in understanding how to better configure 'lower levels of excellence' and/or in general unsatisfactory implementation of business excellence in response to competition and/or aid in developing a more proactive response to competition. These could involve changes in excellence implementation (e.g., specific practices) and/or implementing strategic orientation in varying extents and in ways that fit the particular organisational predicaments, vis-à-vis its competition.

7.4 Limitations and future research directions

As in any study, the interpretation of the results and conclusions of this study are subject to limitations that need to be made explicit. These limitations can be classified into three groups: those relating to validity (e.g., single source and time), those regarding generalisation, and those concerning precision (e.g., scales/criteria).

Firstly, starting with the validity of the research results, in line with prior empirical studies (e.g., Badri et al., 2006; Bou-Llusar et al., 2009; Meyer & Collier, 2001; Peng & Prybutok, 2015), perceptual data were used to gauge BEM criteria. It is therefore important to recognise the possibility that same-source bias could exist affecting the truth and/or accuracy of the results. Thus, future research that uses multiple informants could further test this study's perceptions. Despite the fact that responses from multiple informants may be preferred (e.g., at an extra cost and/or at the expense of a much smaller sample), there are some compelling arguments as to why common method variance may not be a serious limitation for this study, as detailed previously in section 5.3.2. It should also be kept in mind that the presence of common method bias does not *necessarily* affect results or conclusions (Spector, 2006). Nonetheless, best practices were adopted and common method bias was tested using several procedures recommended in the literature (Chang et al., 2010; Podsakoff et al., 2003), which did not detect it as being of result-altering significance.

Moreover, similar to previous BEM research (e.g., Bou-Llusar et al., 2009; Heras-Saizarbitoria et al., 2012; Peng & Prybutok, 2015), this research used a cross-sectional design. The cross-sectional nature of this study prevents definitive statements about causal relationships (Hair et al., 2010; Kline, 2010). Therefore, further research following a longitudinal design would be necessary to increase confidence in the causality of the suggested relationships.

Secondly, in terms of the scope of generalisation, as the research sample consisted of private sector (manufacturing and service) companies at the larger-end of the size spectrum, caution should be exercised in generalising the findings to other company sizes and sectors (e.g., public and non-profit). Further research involving such organisations absent from the current study's sample could test the generalisation of the results. The particular reason behind targeting the non-small size and the private sector in this research, as is commonly practiced in BEM research (Bou-Llusar et al., 2009; Eskildsen et al., 2000; He et al., 2011; Moon et al., 2011), is discussed in section 3.7.1 and evolve around the fact that insufficient quantities (to sustain rigorous statistical analyses) of small size, and/or non-private/profit organisations have not implemented TQM programmes in Saudi Arabia. The latter also presents a delimitation (i.e., a choice made by this researcher) for the generalisation of the findings of this study. Although the population and sample were uniquely appropriate for the research questions being investigated and the Saudi model involved, the aforementioned choice poses some limits to the replication of its findings in other contexts. Therefore, comparative studies in other countries are suggested to test the replicability of the research findings in other contexts. Furthering this research agenda, populations and BEMs in countries at different stages of economic development could be targeted as part of the same survey to produce additional insights of BEM criteria and relations, e.g., in a bid to better understand the cross-national suitability of BEMs. Moreover, the different effects of strategic orientation on BEMs relations suggest a need for analysing other potential moderating factors in the adoption of business excellence practices within BEMs and these models' relations. Identifying factors that show the greatest variance in BEMs relations is challenge, particularly given the scarcity of relevant studies (Doeleman et al., 2014; La Rotta & Pérez Rave, 2016). In this regard, there are other potential moderating factors to be investigated, such as structure or environmental features, and the maturity level of practicing business excellence.

Thirdly, given the objective of this research (to focus on the level of the constructs instead of sub-construct items), and as commonly practiced in existing BEM research (e.g., Bou-Llusar et al., 2009; Flynn & Saladin, 2001), there was no research effort expanded towards investigating the full set of relations among the research models' items. For example, although the content of sub-criteria was represented, it was not necessarily represented in proportion to the specified weight of each sub-criterion. It could nonetheless be argued that the content of the dimensions was presented appropriately, according to the research objective. As it was also crucial for the adopted approach to reach an appropriate response rate given the target population (top management or quality managers). Future research could deepen into this, for example, by developing three completely separate instruments that match the exact number of elements in each model. Such an approach could then be used to compare models and further test the findings of this research.

Bearing in mind the evolving nature of BEMs, which involves changes in their criteria, revalidation studies are required (Gómez Gómez et al., 2011; Pannirselvam et al., 1998). In this vein, and as the KAQA is a newly developed model, future research could focus on this model, with the aim of developing a measurement model that accurately matches its content, and then offer appropriate assessment indices for the self-assessment of its context.

To conclude this thesis, it should be obvious from the above discussion that these areas of further research do not detract from the main contributions of this thesis, which can be summarised in terms of the objectives it fulfils: 1) delineate conceptually the distinctive differences between the MBNQA, the EFQM, and the KAQA models at the theoretical level; 2) develop a comprehensive measurement instrument based on the content of the three targeted models; 3) determine empirically which among the MBNQA, EFQM, and KAQA BEMs is more suitable/applicable of explaining the observed data; and 4) examine the potential moderating effects of strategic orientation and industry type on the (better suited-) BEM relations. Despite early attempts to validate BEMs, research has devoted little attention to gaining a broad/comparative view of how these models differ empirically. This thesis serves as one of the first steps towards an integrated and robust approach for understanding BEMs and enlightening the suitability/applicability of their shared and unique elements.

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Appendices Chapters 2 - 5

A.2 Appendices Chapter 2

Appendix A.2

Table A.2.1 The Baldrige criteria and point values from 1988 to 2015 versions

1988	1992	1995	1997	2001	2006	2011	2015
Leadership 150	Leadership 95	Leadership 90	Leadership 110	Leadership 120	Leadership 120	Leadership 120	Leadership 120
Strategic quality planning 75	Strategic quality planning 60	Strategic planning 55	Strategic planning 80	Strategic planning 85	Strategic planning 85	Strategic planning 85	Strategy 85
Customer satisfaction 300	Customer focus and satisfaction 300	Customer and market focus 250	Customer and market focus 80	Customer and market focus 85	Customer and market focus 85	Customer focus 85	Customers 85
Information and analysis 75	Information and analysis 80	Information and analysis 75	Information and analysis 80	Information and analysis 90	Measurement, analysis and KM 90	Measurement, analysis and KM 90	Measurement, analysis and KM 90
Human resource utilization 150	Human resources development and management 150	Human resources development and management 140	Human resources development and management 100	Human resource focus 85	Human resource focus 85	Workforce focus 85	Workforce 85
Quality assurance of products and services 150	Management of process quality 140	Process management 140	Process management 100	Process management 85	Process management 85	Operations focus 85	Operations 85
Result from quality assurance of products and services 100	Quality and operational results 180	business results 250	business results 450	business results 450	results 450	Results 450	results 450
Total points 1000	1000	1000	1000	1000	1000	1000	1000

Source: the author, based on: Bemowski (1996), NIST (2015), Pannirselvam et al. (1998), Flynn and Saladin (2001), and Karimi et al. (2013).

Table A.2.2 The EFQM criteria and point values from 1995 to 2013 versions

1995	1997	1999	2003	2010	2013
Leadership	Leadership 10%	Leadership 10%	Leadership 10%	Leadership 10%	Leadership 10%
Employee Management	People Management 9%	People Management 9%	People 8%	People 10%	People 10%
Policy & Strategy	Policy & Strategy 8%	Policy & Strategy 8%	Policy & Strategy 9%	Strategy 10%	Strategy 10%
Resources	Resources 9&	Partnerships & Resources 9%	Partnerships & Resources 9%	Partnerships & Resources 10%	Partnerships & Resources 10%
Processes	Processes 14%	Processes 14%	Processes 14%	Processes, Products and services 10%	Processes, Products and services 10%
Customer Satisfaction	Customer Satisfaction 20%	Customer Results 20%	Customer Results 20%	Customer Results 15%	Customer Results 15%
Employee Satisfaction	People Satisfaction 9%	People Results 9%	People Results 9%	People Results 10%	People Results 10%
Impact on society	Impact on society 6%	Impact on society 6%	Society Results 6%	Society Results 10%	Society Results 10%
Business Results	Business Results 15%	Key Performance Results 15%	Key Performance Results 15%	Key Results 15%	Business Results 15%
Total points 1000	1000	1000	1000	1000	1000

Source: the author, based on: Dijkstra (1997), Bou-Llusar et al. (2005), Eskildsen et al. (2001), Wiele et al. (1997), Vukomanovic et al. (2014), and Gemoets (2009)

Table A.2.3 Comparison of the MBNQA and EFQM dimensions (sub-criteria) to the KAQA dimensions (sub-criteria)

Criteria and dimensions	KAQA model	EFQM model	MBNQA model
1. Leadership	1) Leadership (120)	1) Leadership (100)	1) Leadership (120)
1.1. Senior management orientation	1.1 Senior management orientation (40)	1a. Leaders develop the mission, vision, and ethics and act as role models. 1c. Leaders engage with external stakeholders. 1e. Leaders ensure that the organisation is flexible and manages change effectively.	1.1 Senior leadership
1.2. Organisational performance auditing	1.2 Organisational performance auditing (40)	1b. Leaders define, monitor, review and drive the improvement of the organisation's management system and performance.	
1.3. Encouraging & promoting culture of quality	1.3 Encouraging & promoting culture of quality(40)	1d. Leaders reinforce a culture of excellence with the organisation's people.	
1.4 Governance and social responsibility			1.2 Governance and societal responsibilities
2. Strategic planning	2) Strategic planning (80)	2) Strategy (100)	2) Strategic planning (85)
2.1 Strategic planning management process	2.1 Strategic planning management process (40)	2a. Strategy is based on understanding the needs and expectations of both stakeholders and the external environment. 2b. Strategy is based on understanding internal performance and capacities.	2.1 Strategy development
2.2 Strategic goals & action plan	2.2 Strategic goals & action plan (20)	2d. Strategy and supporting policies are communicated, implemented and monitored	2.2 Strategy Implementation
2.3 Research and development	2.3 Research and development (20)	2c. Strategy and supporting policies are developed, reviewed and updated	
3. Human resources	3) Human resources (100)	3) People (100)	5) Workforce focus (85)
3.1. People plans support the organisation's strategy		3a. People plans support the organisation's strategy	
3.2. People communicate effectively throughout the organisations		3d. People communicate effectively throughout the organisations	5.2 Workforce Engagement

3.3. Training and education	3.2 training and education (20)	3b. People knowledge and capabilities are developed	
3.4. Employees participation	3.5 employees participation (15)		
3.5. Human resources planning and selection	3.1 Human resources planning and selection (20)	3c. People are aligned, involved and empowered	5.1 Workforce environment
3.6. Employees satisfaction & work environment	3.4 Employees satisfaction & work environment (15)	3e. People are rewarded, recognised and carded for	
3.7. Performance & appreciation	3.3 Performance & appreciation (15)		
3.8. Saudization	3.6 Saudization[44] (15)		
<u>4. Suppliers and partners</u>	<u>4) Suppliers and partners (80)</u>	<u>4) Partnerships and resources (100)</u>	
4.1. Selecting, assessing & improving supplier services quality	4.1 Selecting, assessing & improving supplier services quality (30)	4a. Partners and suppliers are managed for sustainable benefit.	
4.2. Managing long term partnerships & agreement	4.3 Managing long term partnerships & agreement (30)		
4.3. Finance are managed to secure sustain success		4b. Finance are managed to secure sustain success.	
4.4. Buildings, equipment, materials and natural resources are managed in a sustainable way		4c. Buildings, equipment, materials and natural resources are managed in a sustainable way.	
4.5. Technology is managed to support the delivery of strategy		4d. Technology is managed to support the delivery of strategy.	
4.6. Focusing on local suppliers and products	4.2 Focusing on local suppliers and products (20)		
4.7. Managing information and knowledge		4e. Information and knowledge are managed to support effective decision making and to build the organisation's capability.	
<u>5. Operations management</u>	<u>5) Operations management (170)</u>	<u>5) Processes, products and services (100)</u>	<u>6) Operations focus (85)</u>

[44] Saudization of the workforce is the replacement of foreign workers with Saudi nationals.

5.1. Systems of quality, environment, power, health and occupational safety management	5.1 Systems of quality, environment, power, health and occupational safety management (100) 5.1.1 Based on the requirements of ISO9000 (ISO14000,OHSAS18000) or their equivalent	5a. Processes are designed and managed to optimise stakeholder value.	6.1 Work Processes 6.2 Operational effectiveness
5.2. Continuous improvement	5.2 Continuous improvement (50)	5b. Products and services are developed to create optimum value for customers.	
		5c. Products and services are effectively promoted and marketed.	
		5d. Products and services are produced, delivered and managed.	
5.3. Applying recognized Saudi or (international) standard specifications	5.3 Applying recognized Saudi or (international) standard specifications (20)		
5.4. Customer relationships are managed and enhanced		5e. Customer relationships are managed and enhanced.	
5.5. Supply-chain management			-Supply-chain management
<u>6. Focusing on beneficiary</u>	<u>6) Focusing on beneficiary (90)</u>		<u>3) Customer focus (85)</u>
6.1. Knowing beneficiaries and market	6.1 Knowing beneficiaries and market (30)		3.1 Voice of the Customer
6.2. Managing relations with beneficiaries	6.2 Managing relations with beneficiaries (30)		3.2 Customer Engagement
6.3 Measuring and enhancing beneficiaries satisfaction	6.3 Measuring and Enhancing Beneficiaries Satisfaction (30)		
7. Measurement, analysis, and knowledge management			4) Measurement, analysis and knowledge management (90)
7.1 Measurement, analysis, and improvement of organisational performance			4.1 Measurement, analysis, and improvement of organisational performance
7.2 Knowledge management, information, and information technology			4.2 Knowledge management, information, and information technology
<u>8. Effect on society</u>	<u>7) Effect on society (60)</u>		

8.1. Contributing to national development	7.1 Contributing to national development (20)		
8.2. Social responsibility	7.2 social responsibility (20)		
8.3. Participating in society training and education	7.3 participating in society training and education (20)		
9.Business results	8) Business results (300)	6) Customer results (150)	7) Results (450)
9.1. Beneficiaries' satisfaction	8.1 Beneficiaries satisfaction (80)	6a. Perceptions 6b. Performance indicators	7.2 Customer-focused results
9.2. Financial results	8.2 Financial results (70)	9) Business results (150) 9a. Perceptions 9b. Performance indicators	7.5 Financial and market results
9.3. Suppliers/partners	8.4 Suppliers/partners (50)		
9.4. Product and process results			7.1 Product and process results
9.5. Human resources	8.3 Human resources (50)	7) People results (100) 7a. Perceptions 7b. Performance indicators	7.3Workforce-focused results
9.6. Investment in research & development	8.5 Investment in research & development (25)		
9.7. Exporting	8.6 Exporting (25)		
9.8. Society results		8) Society results (100) 8a. Perceptions 8b. Performance indicators	
9.9. Leadership and governance results			7.4 Leadership and governance results

Note: Given that the KAQA model is a country-specific model whose development has been influenced by both the MBNQA and EFQM models and it was intended to be compared to the other two, it was considered as the baseline model for comparison. For the common elements, the author chose the wording used in the KAQA model or, if the element does not exist in the KAQA, in the EFQM model. Following Pannirselvam et al. (1998),when comparing dimensions, the authors have combined some of the MBNQA and EFQM models elements into single categories in order to simplify comparison with the KAQA model. For example, the 5.2 dimension of KAQA model is reflected by 5.b, 5.c, and 5.d dimensions of the EFQM model. The comparison was made after a comprehensive and extinsive check of all the dimensions and guidance points of the KAQA, EFQM and MBNQA models related to the constructs of the three models, and the relevant literature.

Source: Author's creation based on KAQA (2011), EFQM (2013) and NIST (2015).

Table A.2.4 The MBNQA, EFQM, and KAQA Models criteria

Criterion	Definition		
	MBNQA	EFQM	KAQA
Leadership	The leadership category asks how senior leaders' personal actions guide and sustain organisations. It also asks about the organisation's governance system and how organisation fulfils its legal, ethical, and societal responsibilities.	Excellent organisations have leaders who shape the future and make it happen, acting as role models for their values and ethics and inspiring trust at all times. They are flexible, enabling the organisation to anticipate and react in a timely manner to ensure the on-going success of the organisation.	The leadership criterion deals with the role that senior management plays in the organisation regarding determining objectives, expectations and performance criteria. This criterion, also, pays special attention to the way in which senior management communicate with staff, audit and review organisational performance, and inspire a culture of excellence and quality within an organisation.
Strategic planning	The strategy category asks how an organisation develops strategic objectives and action plans, implements them, changes them if circumstances require, and measures progress.	Excellent organisations implement their mission and vision by developing a stakeholder focused strategy. Policies, plans, objectives and processes are developed and deployed to deliver the strategy.	The organisation describes the way used for determining its strategic objectives including improving its competitive status and its performance, as well as the way it uses in transforming its strategic and development objectives into action plans and development projects to increase profitability and productivity or improving products and services.
Focusing on beneficiary	The customers category asks how an organisation engages its customers for long-term marketplace success, including how an organisation listens to the voice of the customer, builds customer relationships, and uses customer information to improve and to identify opportunities for innovation.		This criterion depends on the extent in which an organisation concentrate on its beneficiaries in terms of determining their requirements and needs, knowing the characteristics of the markets to which an organisation belongs, building relations with beneficiaries, and determining the main success factors to ensure and improve its beneficiaries satisfaction.
Human resources	The workforce category asks how an organisation assesses workforce capability and capacity needs and builds a workforce environment conducive to high performance. The category also asks how an organisation engages, manages,	Excellence organisations value their people and create a culture that allows the mutually beneficial achievement of organisational and personal goals. They develop the capabilities of their people and promote fairness and equality. They care for, communicate, reward and recognize, in a way that motivates people, builds commitment and enables them to use	This criterion focuses on the role that an organisation plays in pursuing towards excellence in terms of its human resources such as preparing, implementing and following up the systems, plans and programmes of human resources and their ability to develop a suitable work environment for employees. This criterion is also concerned with explaining areas of developing human resources including planning,

	and develops workforce to utilize its full potential in alignment with organisation's overall business needs.	their skills and knowledge for the benefit of the organisation.	management, training, continuous education, as well as employees' participation and satisfaction, and support to the Saudization process, to gain full utilization of employees' abilities and high performance.
Suppliers and partners		Excellent organisations plan and manage external partnerships, suppliers and internal resources in order to support their strategy, policies and the effective operation of processes. They ensure that they effectively manage their environment and societal impact.	This criterion focuses on the way in which an organisation manages suppliers and partners to implement its plans and to achieve its objectives and attain distinction in its work relationships and quality of the exchanged inputs and outputs that enhance parties' ability to create value added, increase flexibility and fast response to change, and facilitate long term balanced relations between partners.
Operations management	The operations category asks how an organisation designs, manages, improves, and innovates its products and work processes and improves operational effectiveness to deliver customer value and achieve ongoing organisational success.	Excellent organisations design, manage and improve processes, products and services to generate increasing value for customers and other stakeholders.	This criterion deals with the methods an organisation uses in managing its operations and developing them in order to facilitate implementing its strategy and achieving its objectives. It focuses on the organisation efforts of applying systems of managing quality and standard specifications, managing and improving the main procedures and processes to design and deliver products and services.
Measurement, Analysis, and Knowledge Management	The measurement, analysis, and knowledge management category asks how an organisation selects, gathers, analyzes, manages, and improves its data, information, and knowledge assets; how it learns; and how it manages information technology. The category also asks how an organisation uses review findings to improve its performance.		
Customer results		Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their customers.	
People results		Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their people.	

Effect on society		Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of relevant stakeholders within society.	This criterion focuses on the role of the organisation in society and its effect on the field of its social responsibility for national development and service of country and citizen.
Business results	The results category asks about an organisation's performance and improvement in all key areas—product and process results, customer-focused results, workforce-focused results, leadership and governance results, and financial and market results. The category asks about performance levels relative to those of competitors and other organisations with similar product offerings.	Excellent organisations achieve and sustain outstanding results that meet or exceed the needs and expectations of their business stakeholders.	Results of the organisation performance show the outputs of the integrated matrix of its works. This is expressed through a number of key and secondary performance indicators which show the success in achieving strategic objectives. This criterion includes the main results in relation to beneficiaries, financial results, human resources, suppliers and investment in research, development and exporting.

Source: EFQM (2013), NIST (2015) and KAQA (2011)

Table A.2.5 Previous empirical literature on analysing the MBNQA model

Author(s)	Award	Statistical procedure	Approach			Sector(s)
			causal	comparative	factorial	
Meyer and Collier (2001)	the 1995 MBNQA Health Care Criteria	SEM	X			Health care
Curkovic et al. (2000)	The 1997 MBNQA	SEM			X	Manufacturing sector (automotive industry)
Wilson and Collier (2000)	The 1995 MBNQA	SEM	X			Manufacturing sector
Flynn and Saladin (2001)	The 1988, 1992, and 1997 MBNQA	path analysis		X		Manufacturing sector
Badri et al. (2006)	the 2004 MBNQA education criteria	regression analysis and confirmatory SEM	X			Education
Prybutok et al. (2011)	the 2002 MBNQA	PLS			X	Public sector
He et al. (2011)	the 2006 Baldrige framework	SEM	X			manufacturing and service sectors
Karimi et al. (2013)	the 2006 MBNQA	canonical correlation analysis			X	Multiple sectors (manufacturing, service, small business, education, healthcare, and non-profit)

Table A.2.6 Previous empirical literature on analysing the EFQM model

Author(s)	Award	Statistical procedure	Approach			Sector(s)
			causal	comparative	factorial	
Eskildsen and Dahlgaard (2000)	The 1999 EFQM model		X			service sector
Prabhu et al. (2000)	The 1997 EFQM model		X			N/A
Eskildsen et al. (2000)	The 1999 EFQM model		X			manufacturing and service sectors
Bou-Llusar et al. (2005)	the 1999 EFQM model	CCA incorporated in SEM			X	manufacturing and service sectors
Calvo-Mora et al. (2005)	the 1999 EFQM model	PLS	X			public education sector
Santos-Vijande and Alvarez-Gonzalez (2007)	The 1999 EFQM model	CFA and SEM			X	manufacturing and service sectors
Bou-Llusar et al. (2009)	the 2003 EFQM model	SEM			X	N/A
Gómez Gómez et al. (2011)	The 2003 EFQM model	PLS	X			public (education sector) and private (manufacturing sector)
Heras-Saizarbitoria et al. (2012)	the 2003 EFQM model	PLS	X			N/A
Safari et al. (2012)	The 2010 EFQM model	CCA	X (only 1 to 1 constructs)			Manufacturing and service sectors (electricity companies)

Table A.2.7 Previous empirical literature on analysing country-specific models

Author(s)	Award	Statistical procedure	Approach			Sector(s)
			causal	comparative	factorial	
Su et al. (2003)	the Taiwan National Quality Award (TNQA)	SEM	X			manufacturing sector
Jayamaha et al. (2009)	the Australian Business Excellence Framework (ABEF), the Baldrige Criteria for Performance Excellence (BCPE), and the Singapore Quality Award Criteria (SQAC)	PLS		X (partial: focus on the measurement level)		manufacturing and service sectors
Xiang et al. (2010)	the China Quality Award (CQA)	SEM	X			manufacturing and service sectors
Moon et al. (2011)	the Korean National Quality Award (KNQA)	CFA and SEM	X			manufacturing and service sectors

Appendix A.2.8 The reviewed studies' pre/post testing models

A.2.8.1.a,b Wilson and Collier's (2000) pre/post testing models

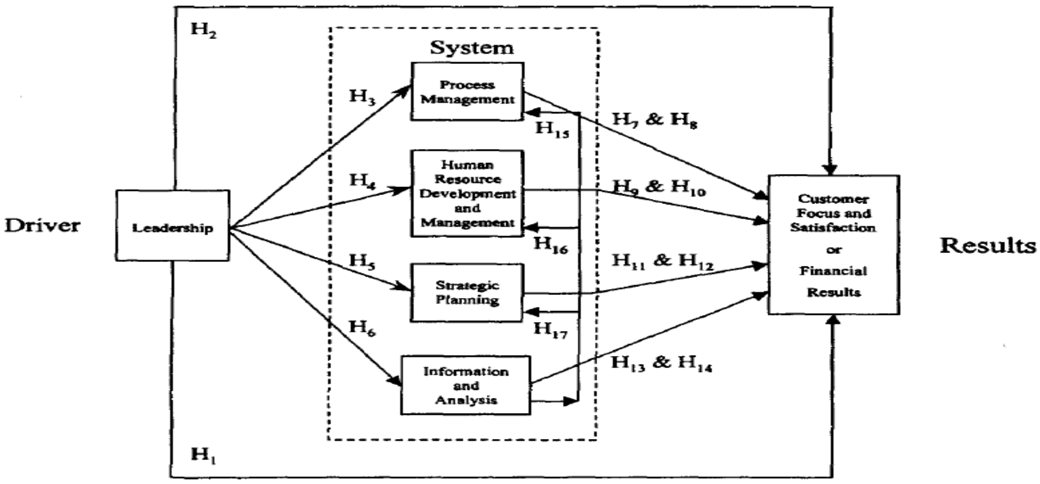


Figure A.2.8.1.a Wilson and Collier's (2000) pre testing model

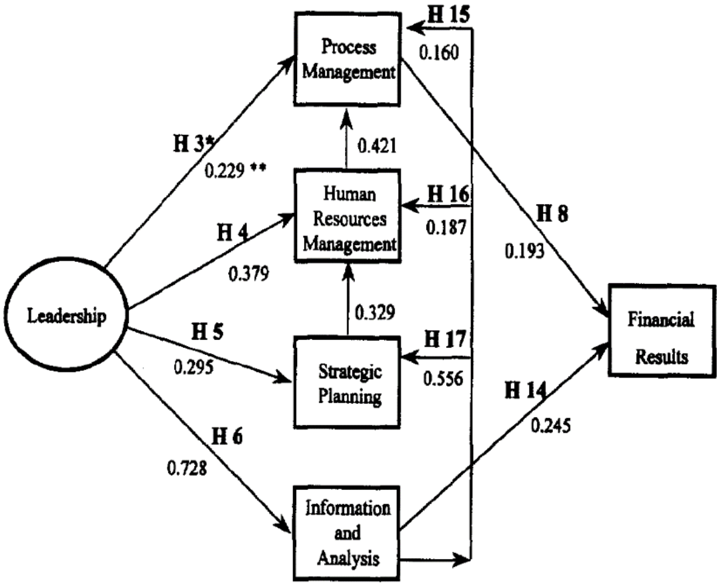


Figure A.2.8.1.b Wilson and Collier's (2000) post testing model

A.2.8.2.a-f Flynn and Saladin (2001) pre/post testing models

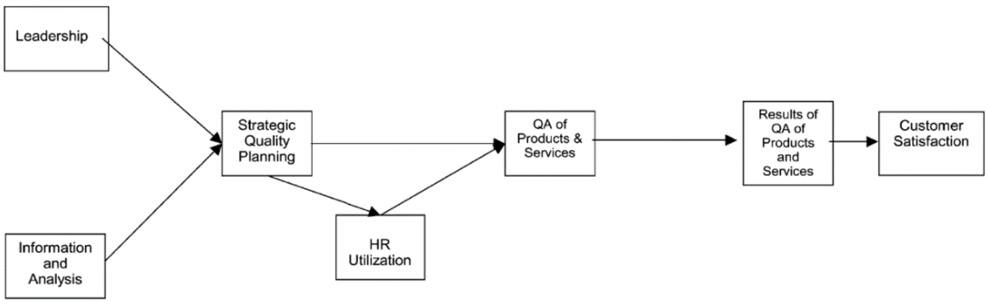


Figure A.2.8.2.a Flynn and Saladin (2001) **pre** testing model based on 1988 MBNQA framework

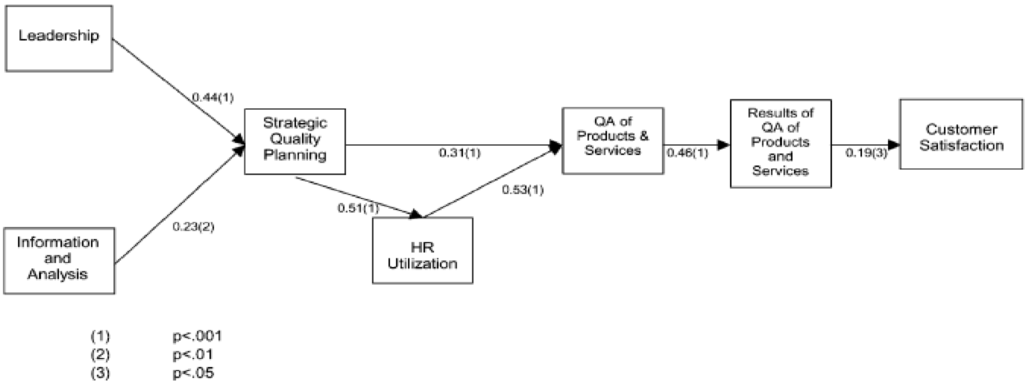


Figure A.2.8.2.b Flynn and Saladin (2001) **post** testing model based on 1988 MBNQA framework

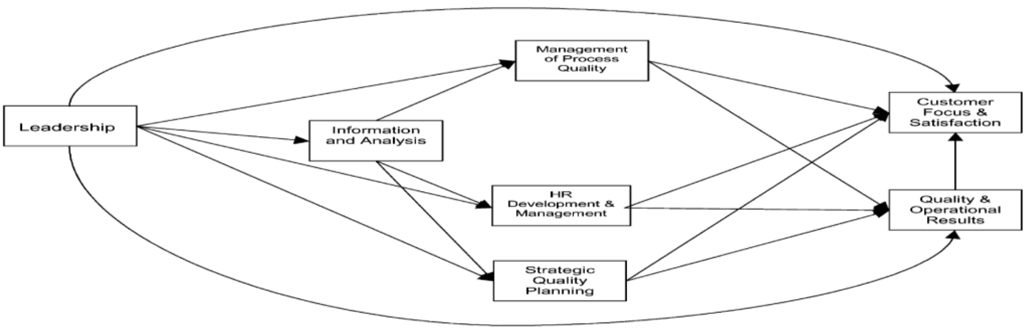


Figure A.2.8.2.c Flynn and Saladin (2001) **pre** testing model based on 1992 MBNQA framework

(Cont.) Flynn and Saladin's (2001) pre/post testing models

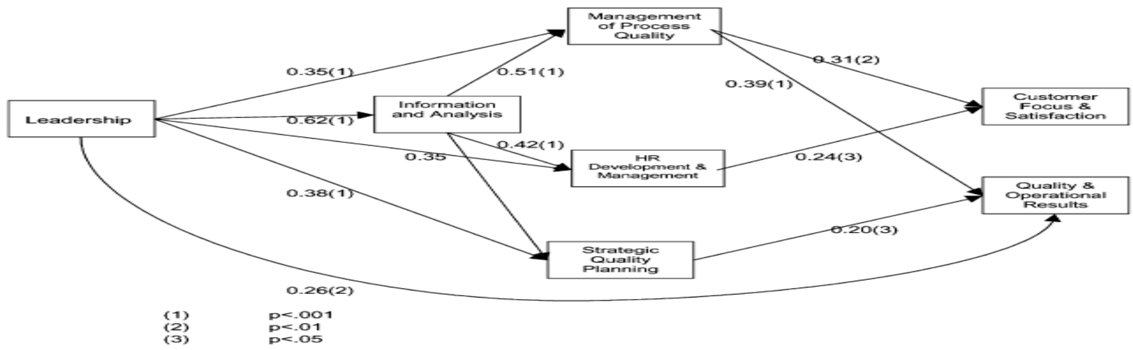


Figure A.2.8.2.d Flynn and Saladin's (2001) **post** testing model based on 1992 MBNQA framework

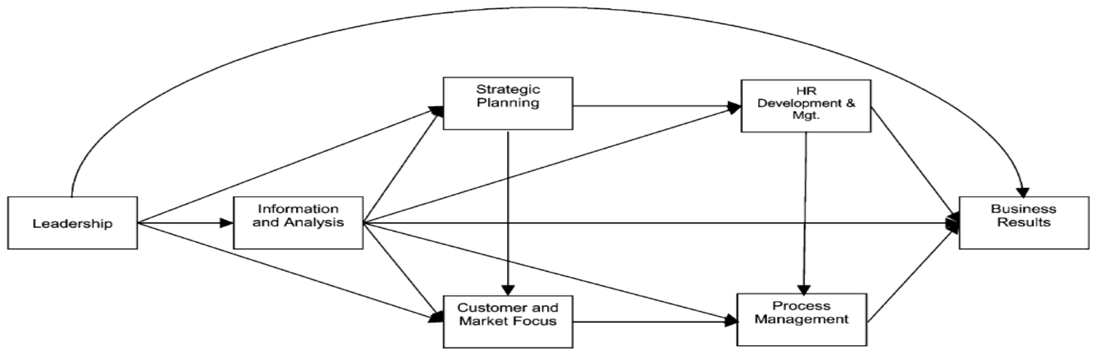


Figure A.2.8.2.e Flynn and Saladin's (2001) **pre** testing model based on 1997 MBNQA framework

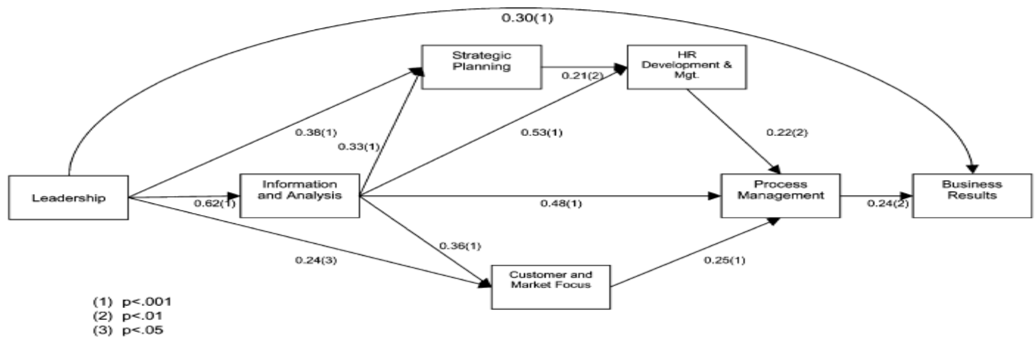


Figure A.2.8.2.f Flynn and Saladin's (2001) **post** testing model based on 1997 MBNQA framework

A.2.8.3.a, b Meyer and Collier's (2001) pre/post testing models

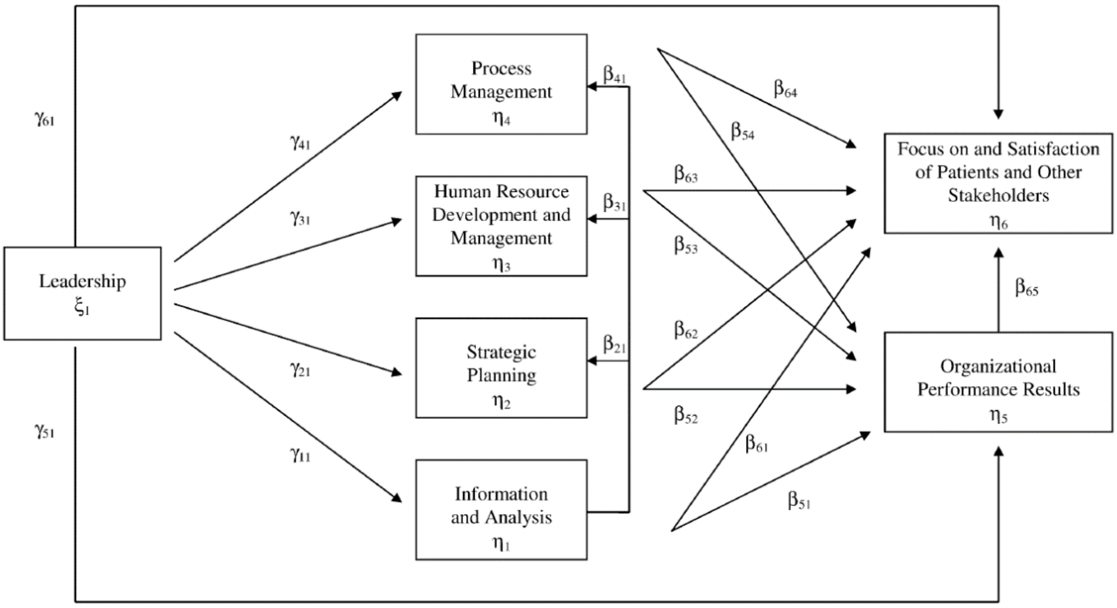
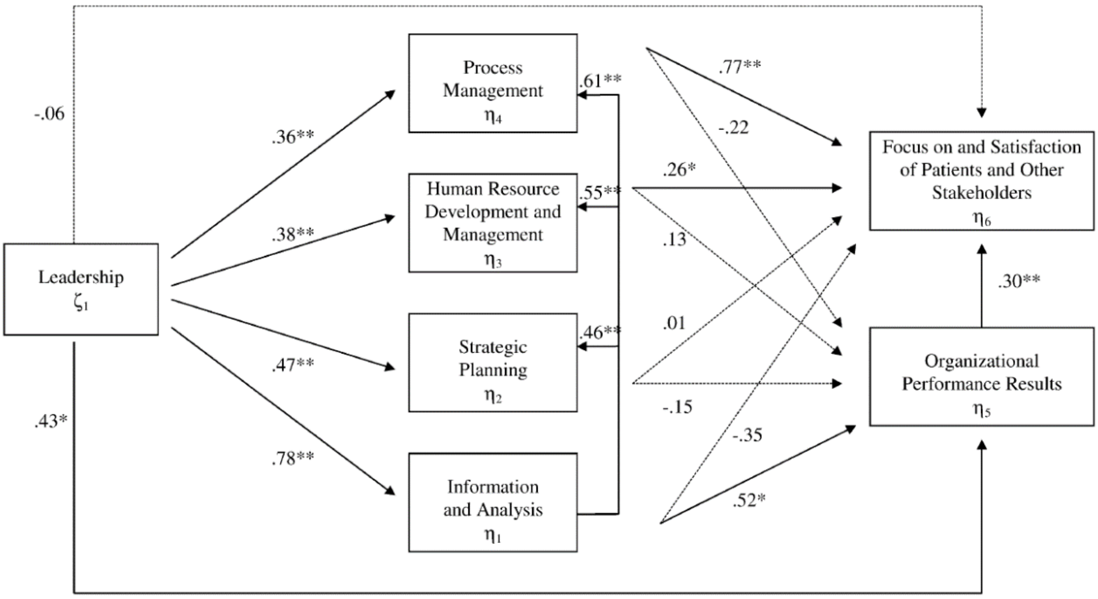


Figure A.2.8.3.a Meyer and Collier's (2001) pre testing model based on MBNQA health care framework



Notes: * path significant at P<.05
** path significant at P<.01
All path coefficients are standardized.
Solid lines indicate statistically significant paths.
Dashed lines are not statistically significant.

Figure A.2.8.3.b Meyer and Collier's (2001) post testing model based on MBNQA health care framework

A.2.8.4.a,b Su et al.'s (2003) pre/post testing models

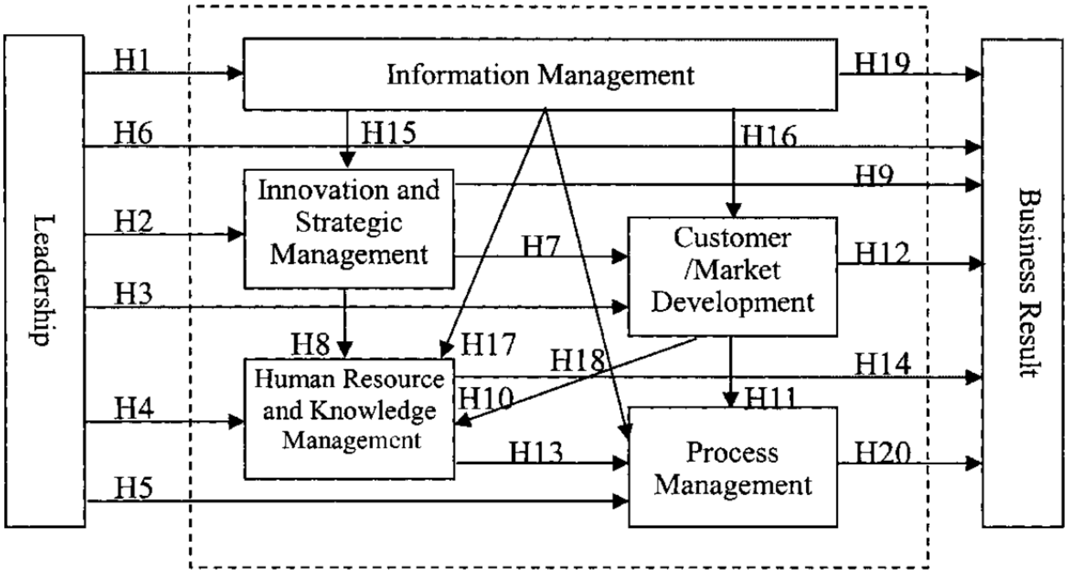


Figure A.2.8.4.a Su et al.'s (2003) pre testing model

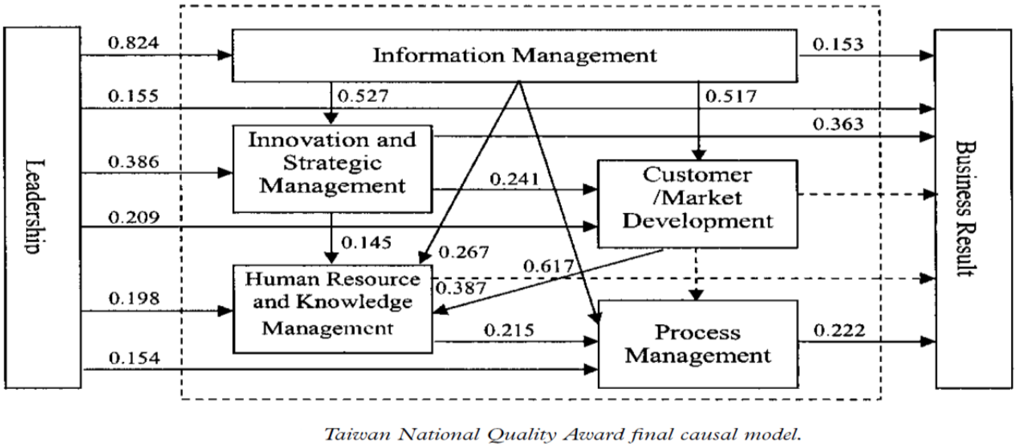


Figure A.2.8.4.b Su et al.'s (2003) post testing model

Note: In this post-testing model, three links showed non-significant relationships: 1) customer/market development to process management; 2) customer/market development to business result, and 3) human resource and knowledge management to business result. However, all the others showed significant relationships among those categories.

A.2.8.5.a Badri, et al.'s (2005) post testing model

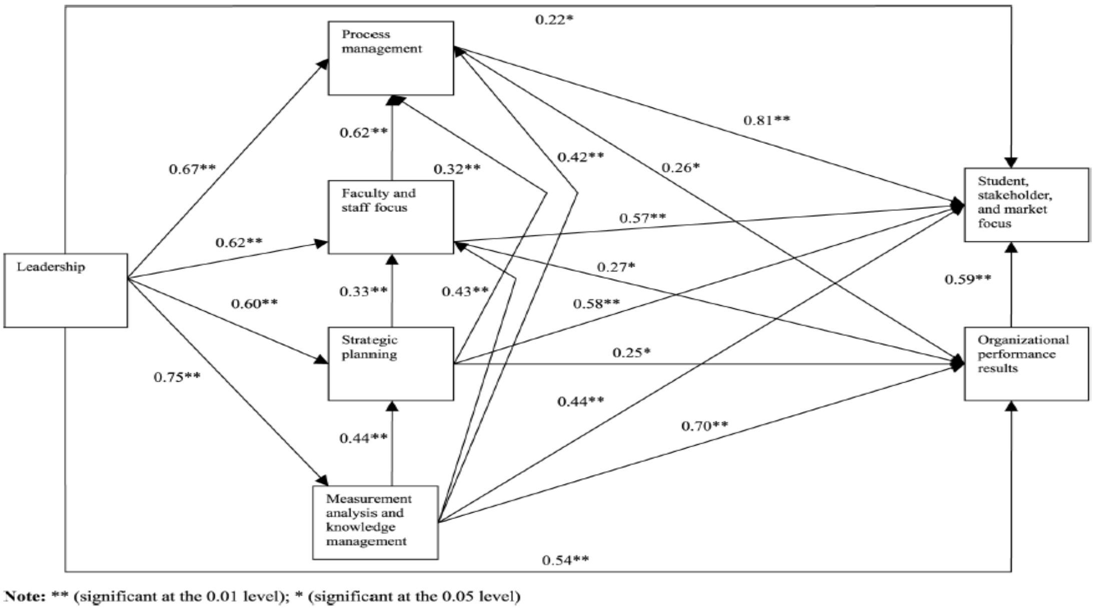


Figure A.2.8.5.a Badri, et al.'s (2005) post testing model

Note: This study did not present the pre testing model.

A.2.8.6.a-d Jayamaha, et al.'s (2009) pre/post testing models

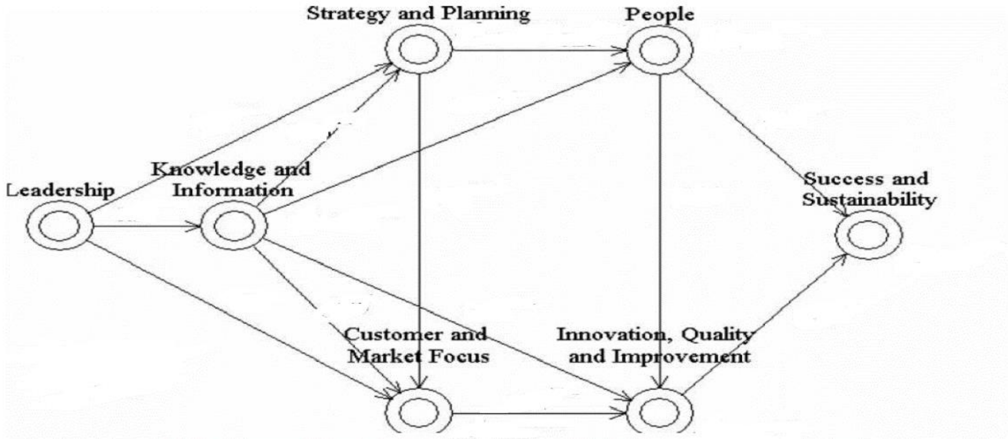


Figure A.2.8.6.a Jayamaha, et al.'s (2009) pre testing model

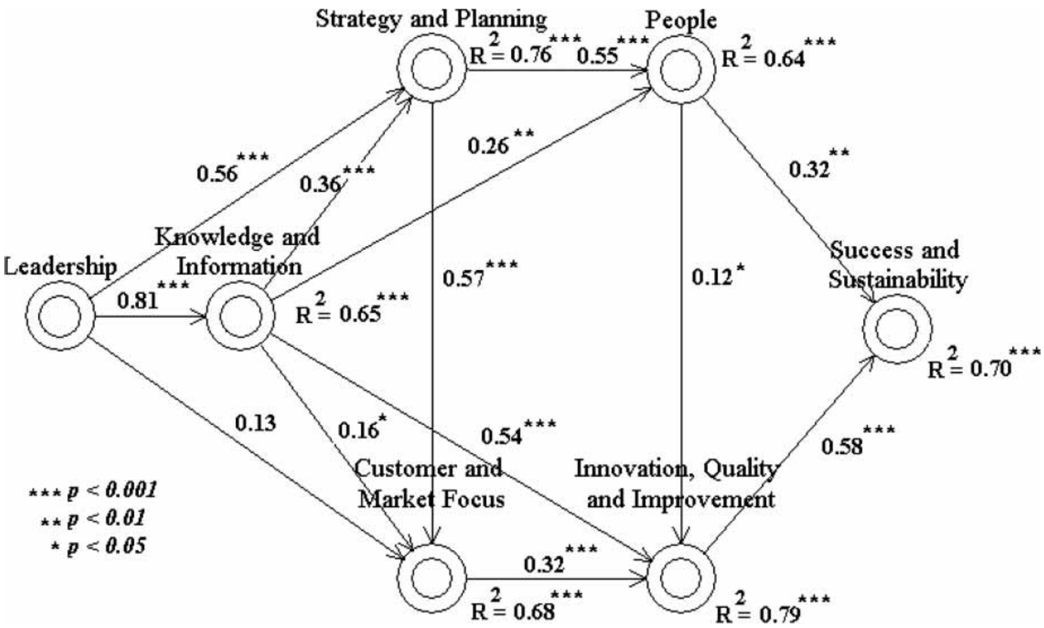


Figure A.2.8.6.b Jayamaha, et al.'s (2009) post testing model for ABEF

(Cont.) A.2.8.6.a-d Jayamaha, et al.'s (2009) pre/post testing models

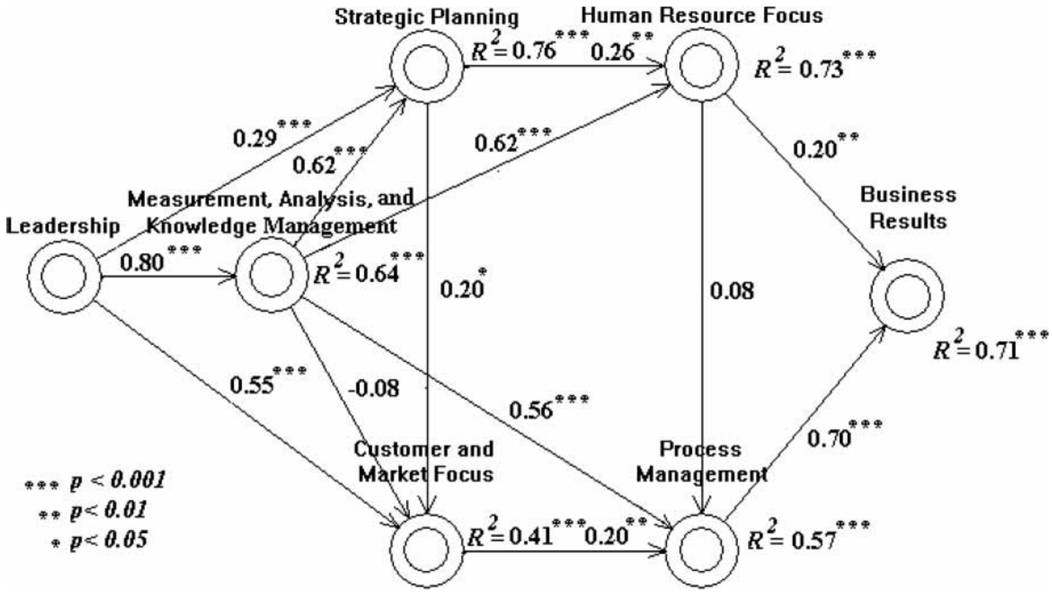


Figure A.2.8.6.c Jayamaha, et al.'s (2009) post testing model for the MBNQA

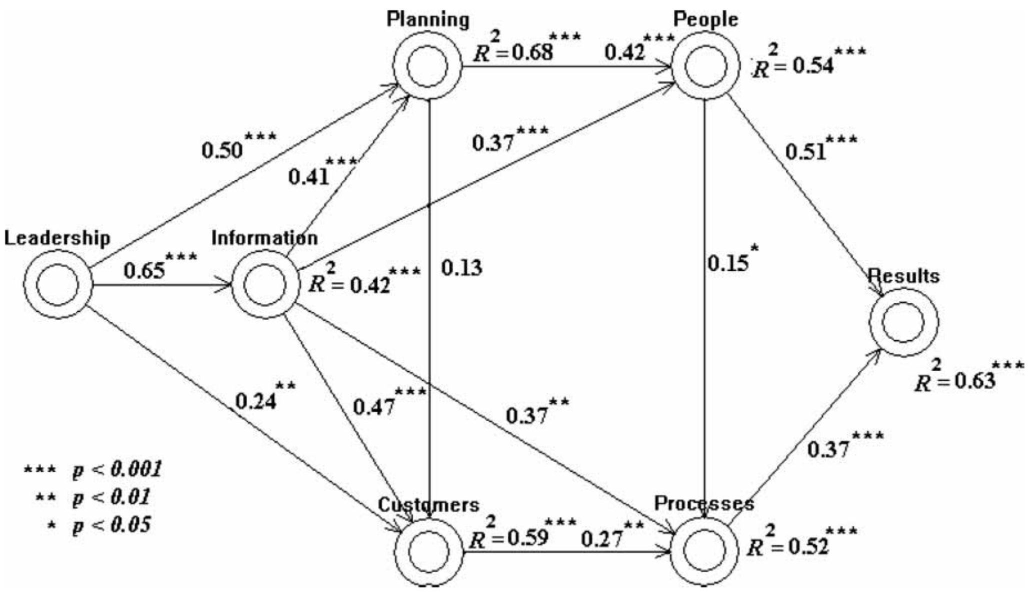


Figure A.2.8.6.d Jayamaha, et al.'s (2009) post testing model for the SQA model

A.2.8.7.a,b Xiang, et al.'s (2010) pre/post testing models

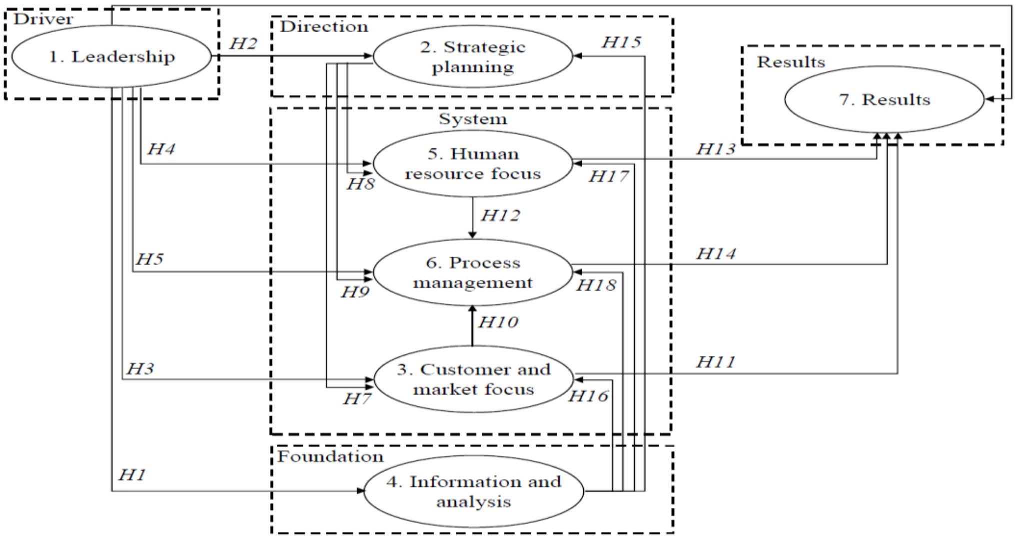


Figure A.2.8.7.a Xiang, et al.'s (2010) pre testing model

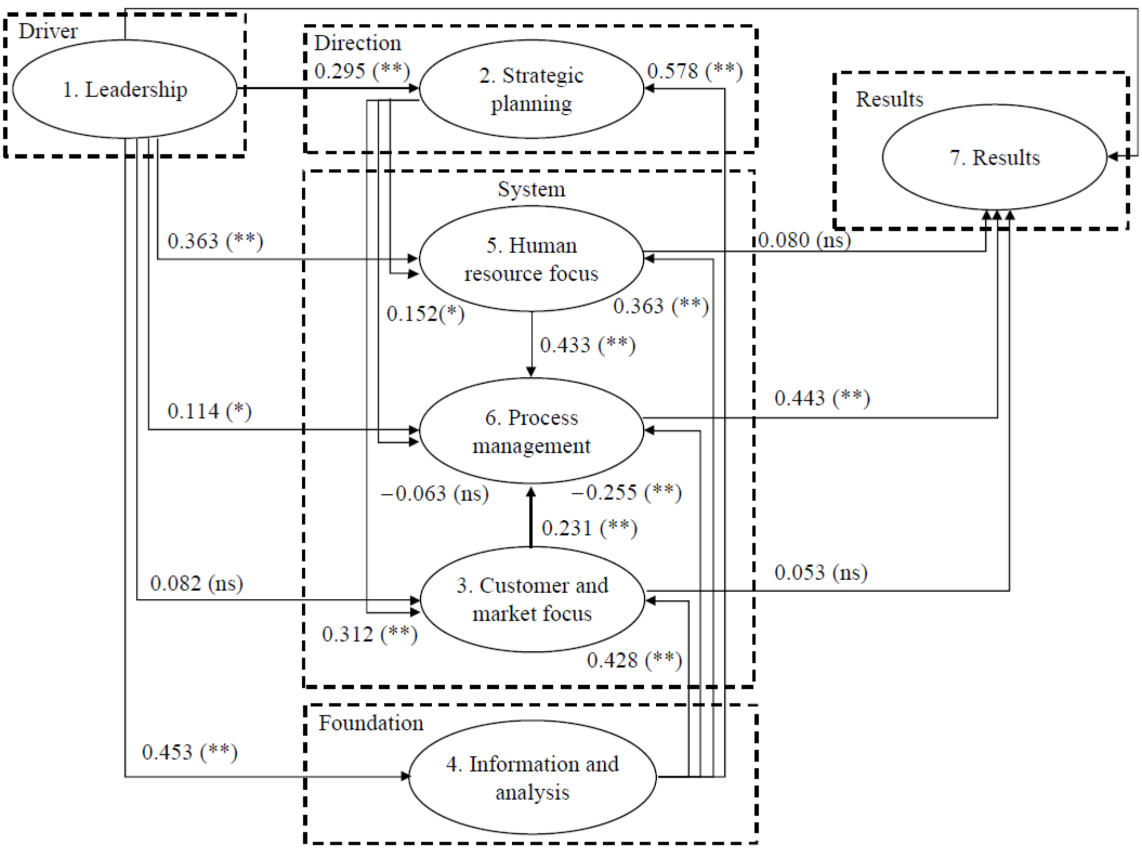


Figure A.2.8.7.b Xiang, et al.'s (2010) post testing model

A.2.8.8.a-d He et al.'s (2011) pre/post testing models

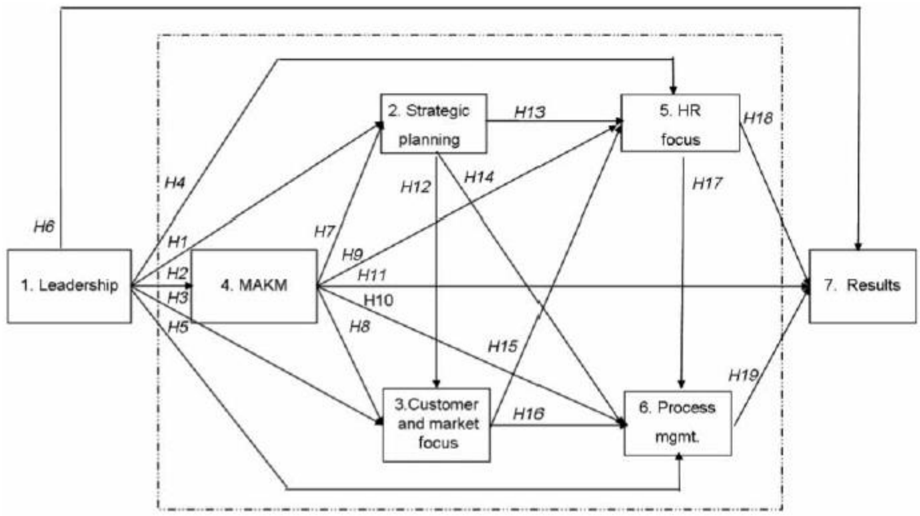


Figure A.2.8.8.a He et al.'s (2011) pre testing model

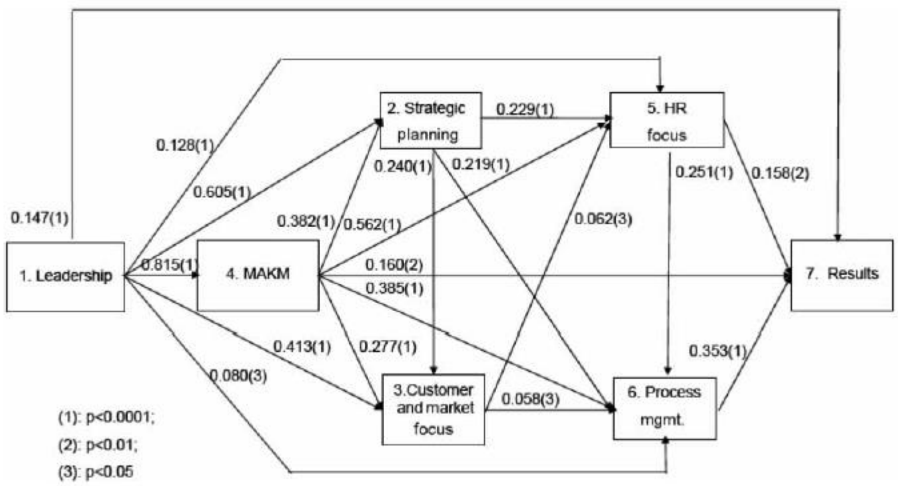


Figure A.2.8.8.b He et al.'s (2011) post testing model with standardised path coefficients

(Cont.) A.2.8.8.a-d Xiang, et al.'s (2010) pre/post testing models

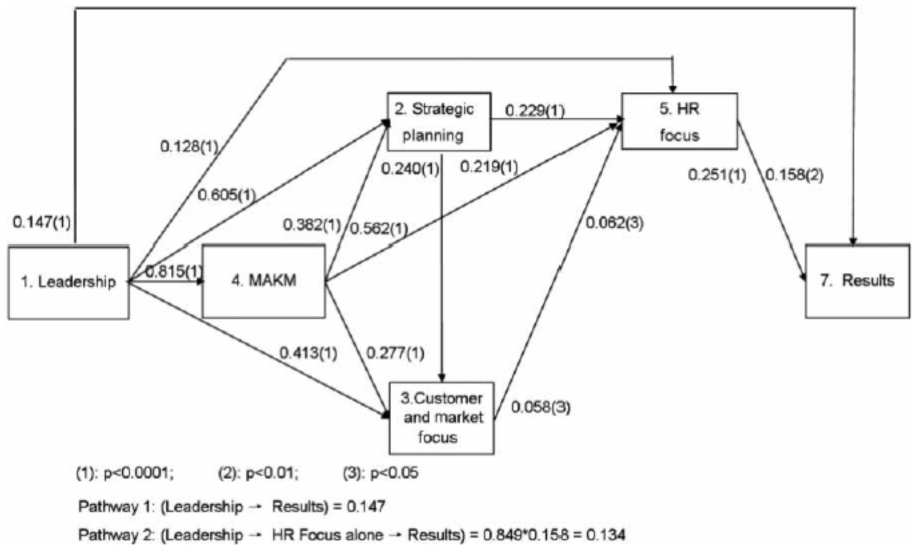


Figure A.2.8.8.c He et al.'s (2011) post testing model with pathway 1 and pathway 2

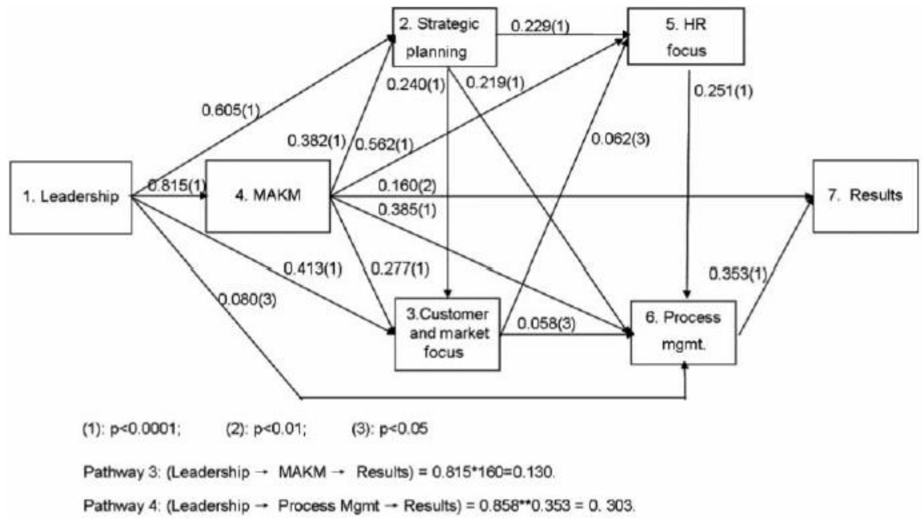


Figure A.2.8.8.d He et al.'s (2011) post testing model with pathway 3 and pathway 4

A.2.8.9.a,b Moon, et al.'s (2011) pre/post testing models

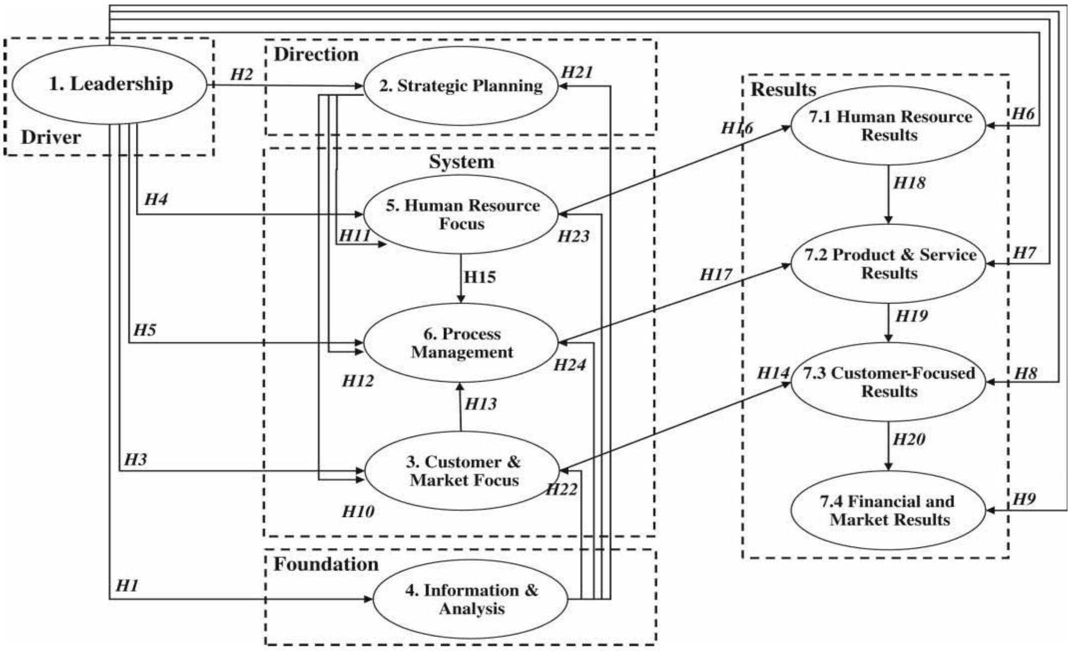
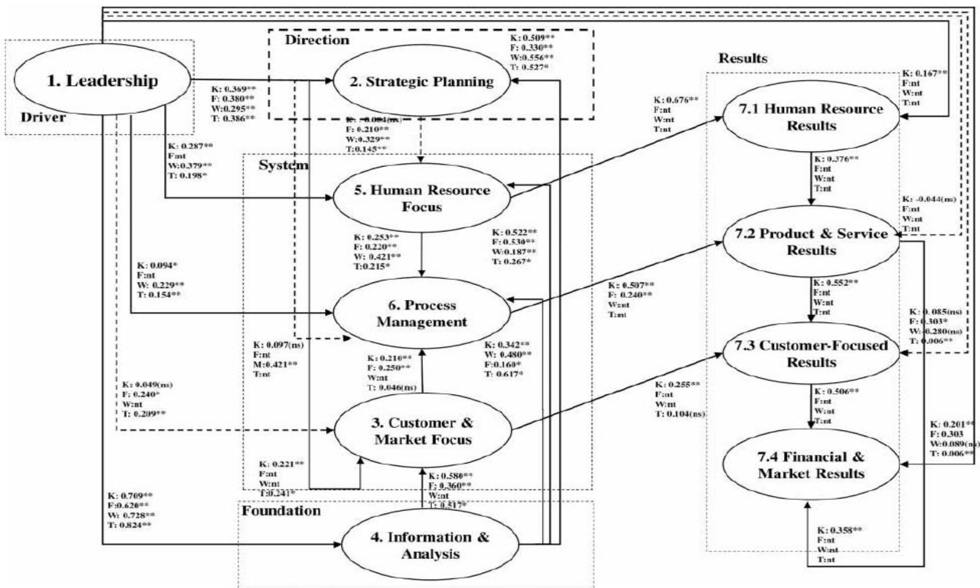


Figure A.2.8.9.a Moon et al.'s (2011) pre testing model



Results of the KNQA causal model.
Notes: K, KNQA; F, 1997MBNQA; W, 1992MBNQA; T, TNQA; ns, not significant, nt, not tested.
$^*p < 0.05$, $^{**}p < 0.01$.

Figure A.2.8.9.b Moon et al.'s (2011) post testing model

A.2.8.10.a,b Prybutok, et al.'s (2011) pre/post testing models

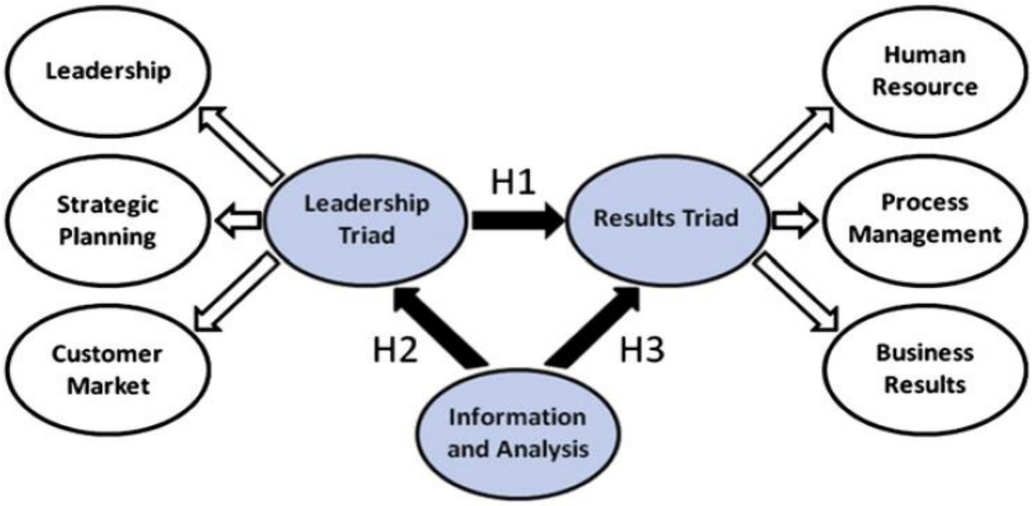


Figure A.2.8.10.a Prybutok, et al.'s (2011) pre testing model

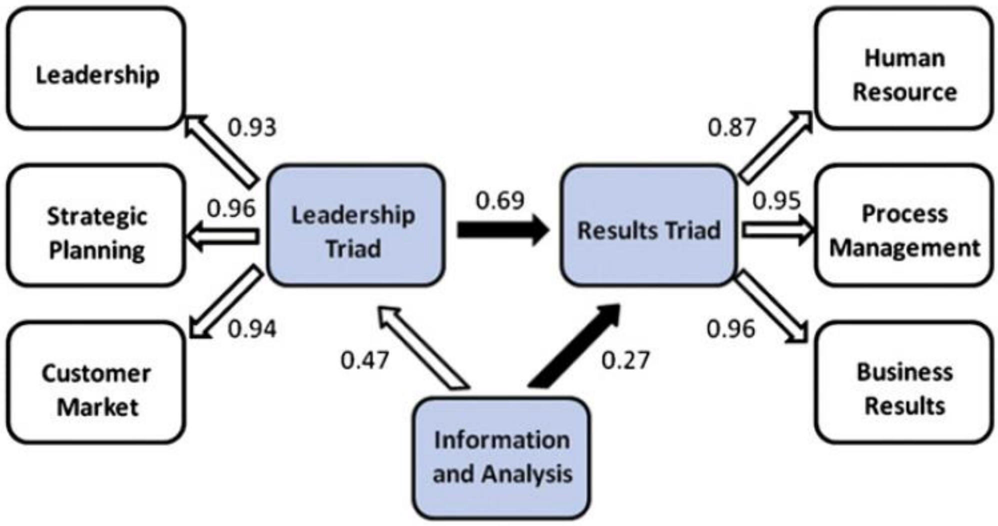


Figure A.2.8.10.b Prybutok, et al.'s (2011) post testing model

A.2.8.11.a Karimi, et al.'s (2014) pre testing model

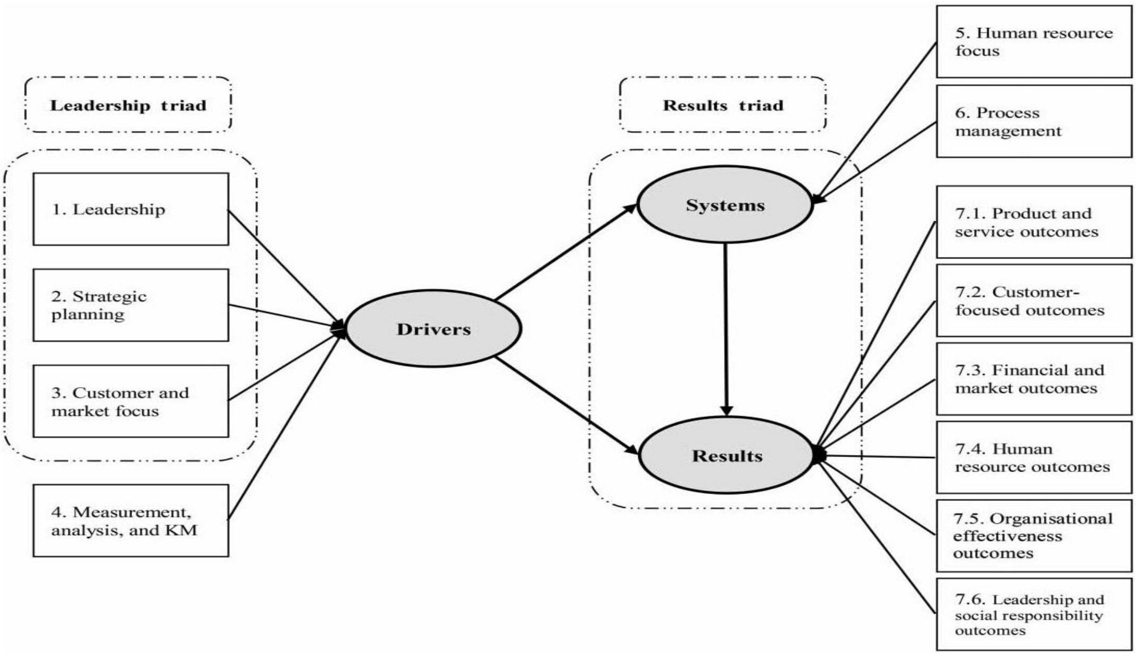
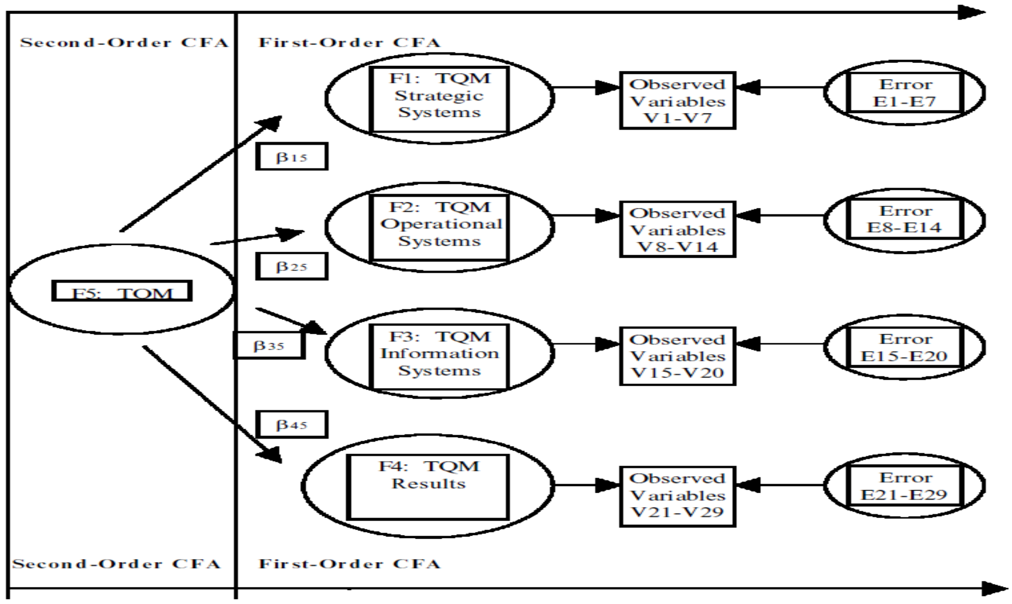


Figure A.2.8.11.a Karimi, et al.'s (2014) pre testing model

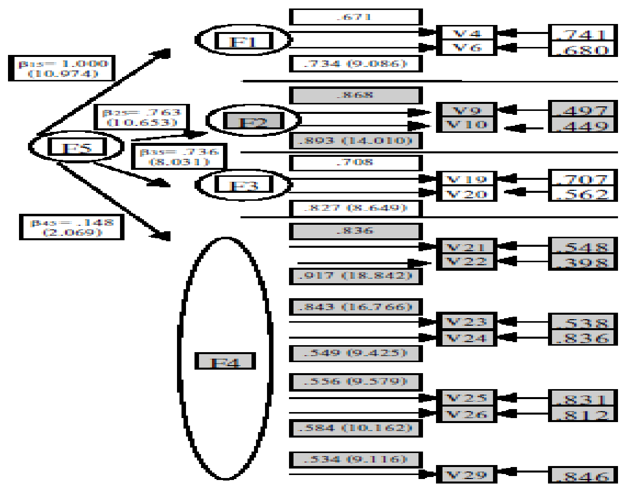
Note: This study did not present the post-testing model.

A.2.8.12.a,b Curkovic et al.'s (2000) pre/post testing models



* Each first-order factor has a disturbance term associated with it.

Figure A.2.8.12.a Curkovic et al.'s (2000) pre testing model



* Each first-order factor has a disturbance term associated with it. D1=.375, D2=.599, D3=.787, and D4=.965.

( ) t-values in parentheses

F5 = Factor 5 = TQM

F1 = Factor 1 = TQM Strategic Systems

V4: Adequate resources are provided to carry out quality improvements within your plant (2.2)
V6: Key factors for building and maintaining customer relationships are identified and used by your plant (3.1)

F2 = Factor 2 = TQM Operational Systems

V9: An adequate amount of training in quality awareness is provided to hourly/direct labor employees within your plant (5.2)
V10: An adequate amount of training in quality awareness is provided to managers and supervisors within your plant (5.2)

F3 = Factor 3 = TQM Information Systems

V19: Procedures have been developed for monitoring key indicators of plant performance (4.2)
V20: Procedures have been developed for monitoring key indicators of customer satisfaction (4.3)

F4 = Factor 4 = TQM Results

V21: After-sales customer complaints (7.1)
V22: Customer rejection of our products (e.g., manufacturing defects) (7.1)
V23: Defect rates/cost (7.2)
V24: Employee absenteeism (7.3)
V25: Cost of quality (e.g., inspection and testing) (7.2)
V26: Employee grievances (7.3)
V29: Total cost of purchased parts (7.4)

Figure A.2.8.12.b Curkovic et al.'s (2000) post testing model

A.2.8.13.a,b Eskildsen and Dahlgaard's (2000) pre/post testing models

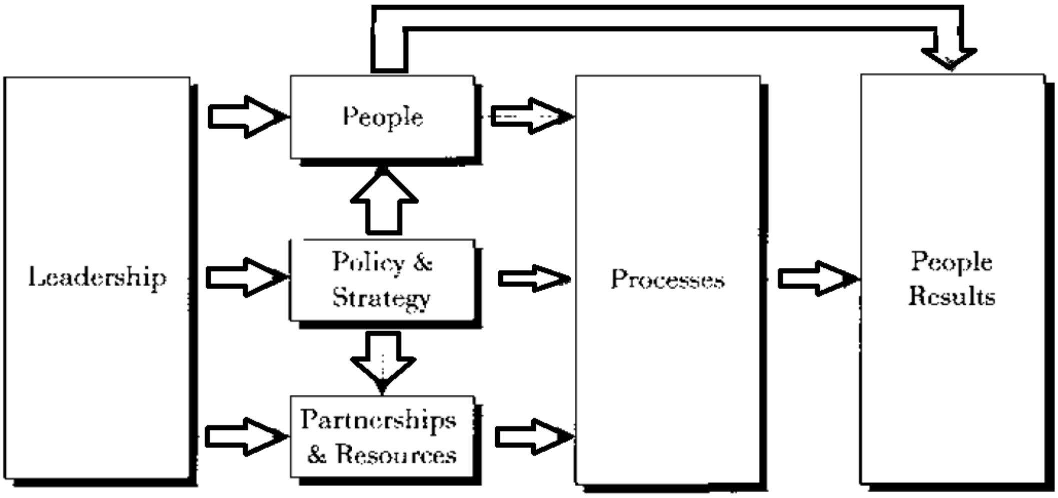


Figure A.2.8.13.a Eskildsen and Dahlgaard's (2000) pre testing model

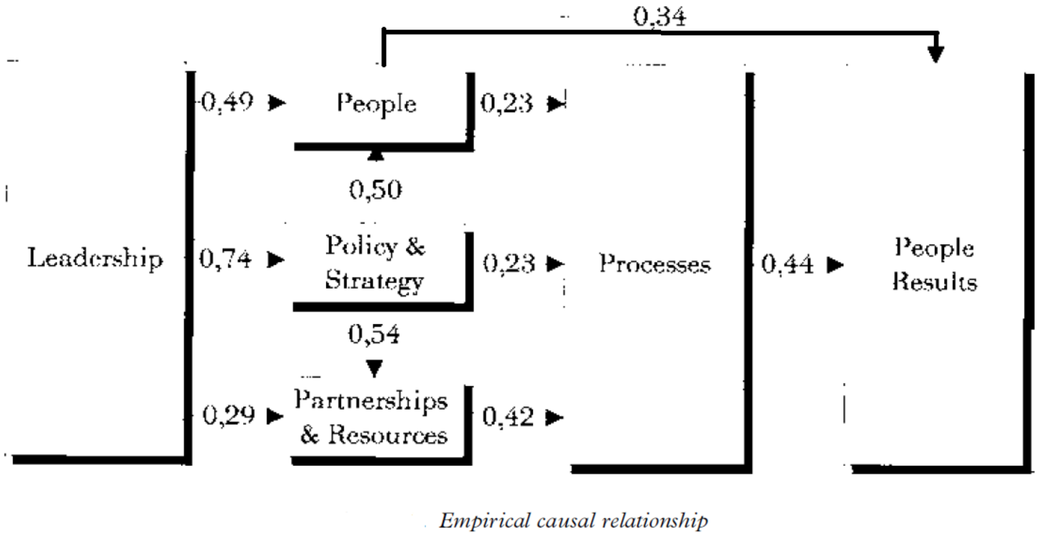


Figure A.2.8.13.b Eskildsen and Dahlgaard's (2000) post testing model

A.2.8.14.a,b Eskildsen et al.'s (2000) pre/post testing models

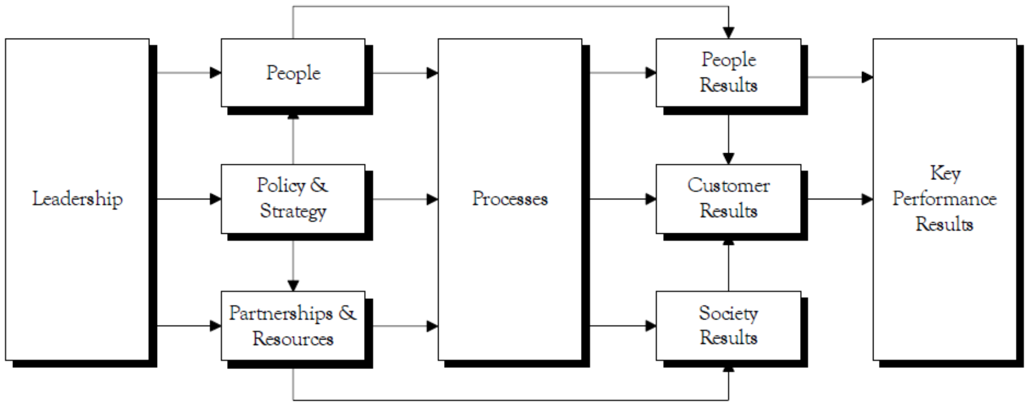


Figure A.2.8.14.a Eskildsen et al.'s (2000) pre testing model

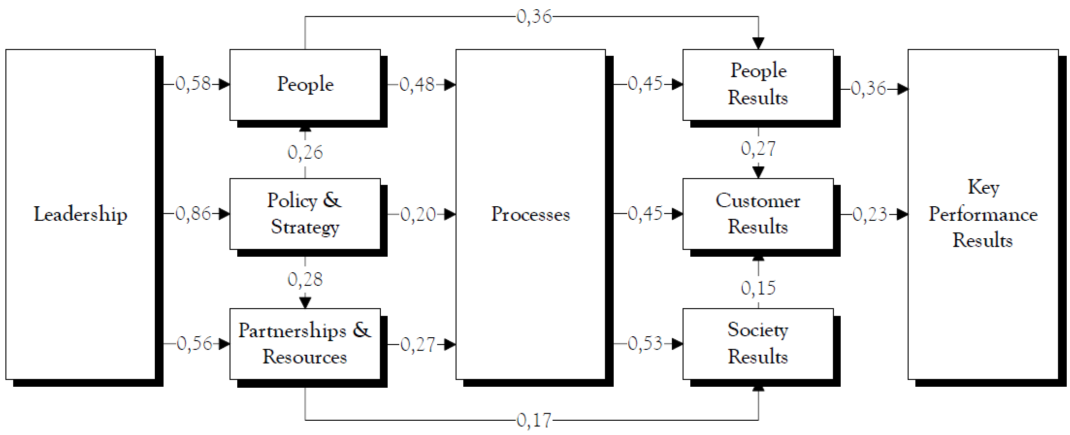


Figure A.2.8.14.b Eskildsen et al.'s (2000) post testing model

A.2.8.15.a,b Calvo-Mora et al.’s (2005) pre/post testing models

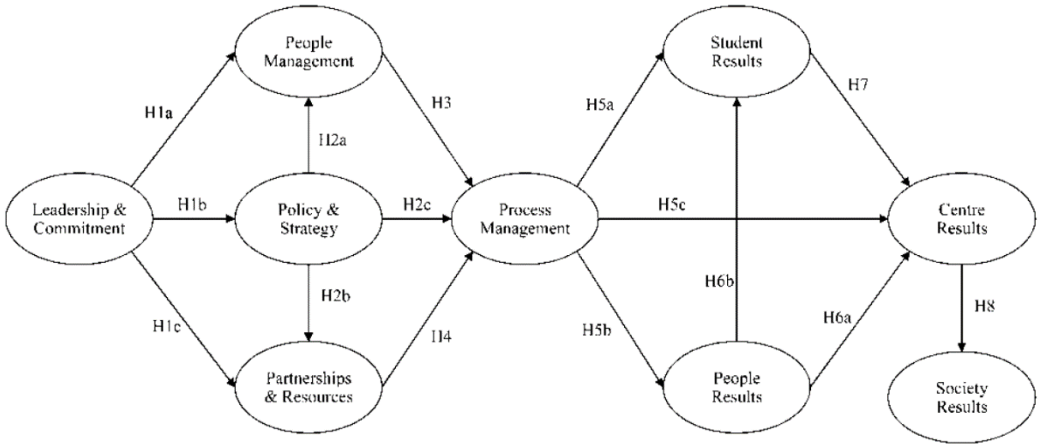


Figure A.2.8.15.a Calvo-Mora et al.’s (2005) pre testing model

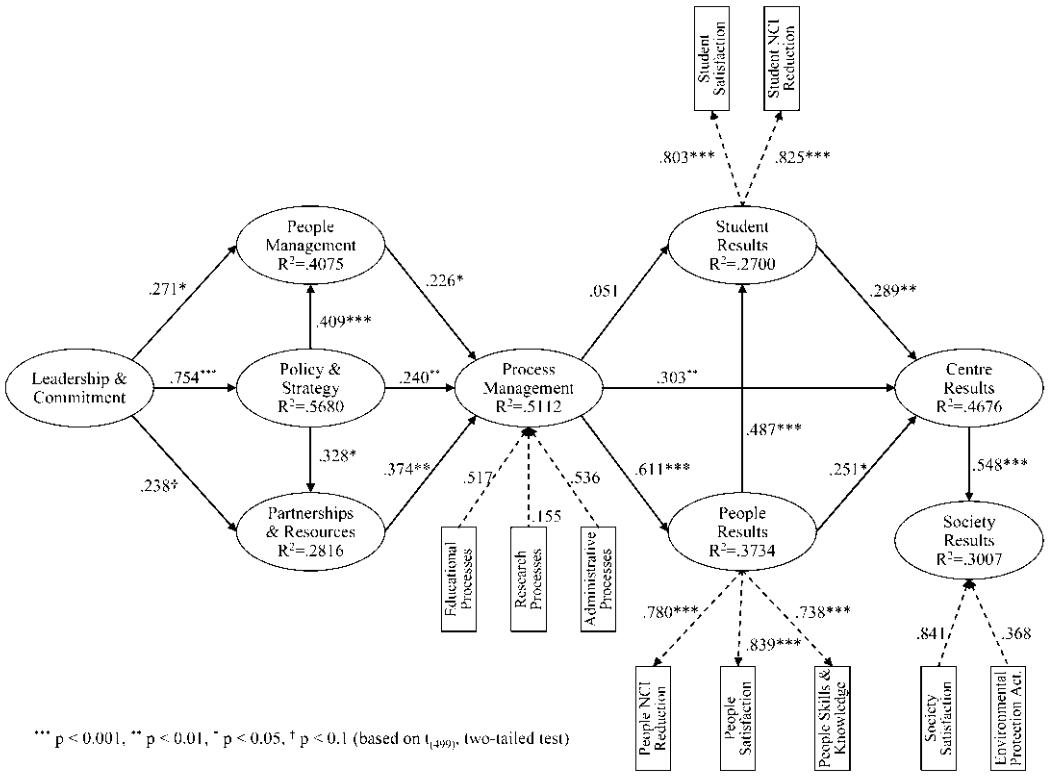


Figure A.2.8.15.b Calvo-Mora et al.’s (2005) post testing model

A.2.8.16.a,b Go´mez, et al.'s (2011) pre/post testing models

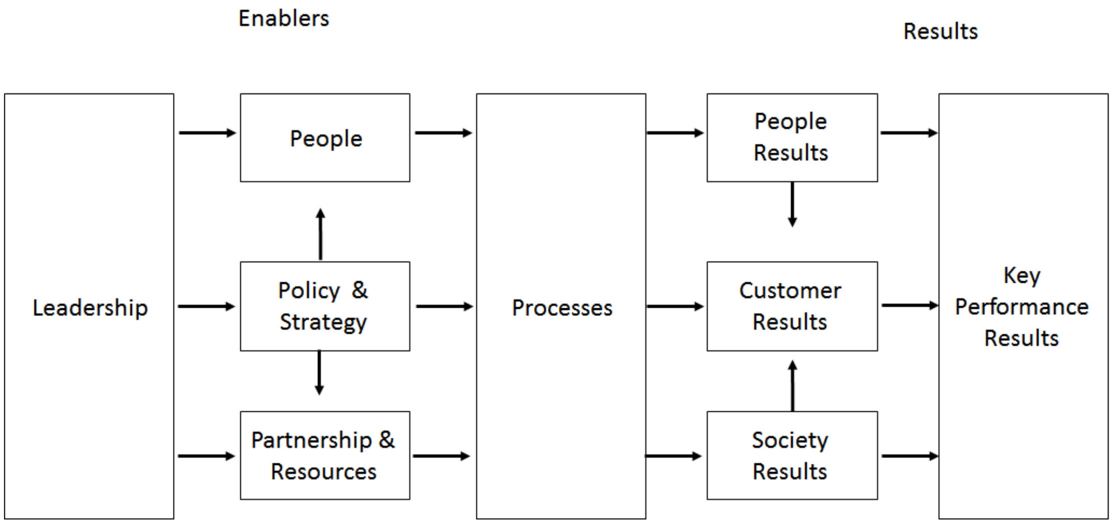


Figure A.2.8.16.a Go´mez, et al.'s (2011) pre testing model

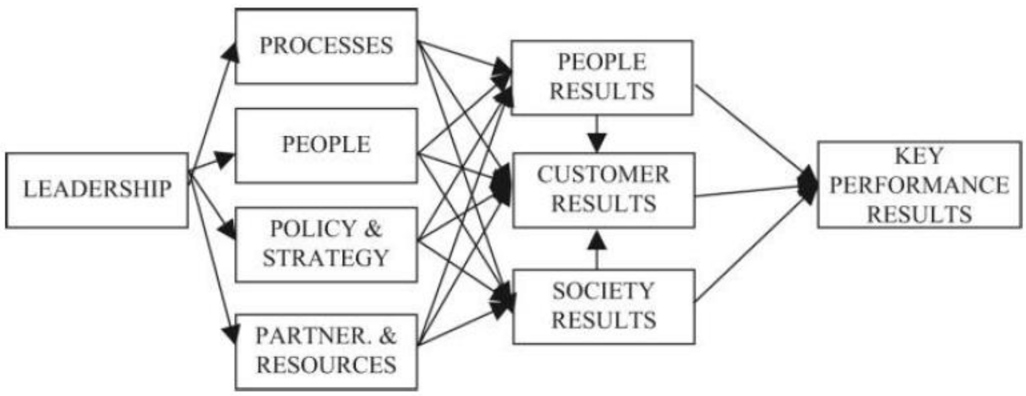


Figure A.2.8.16.b Go´mez, et al.'s (2011) pro testing/ alternative suggested model

A.2.8.17.a,b Heras-Saizarbitoria, et al.'s (2012) pre/post testing models

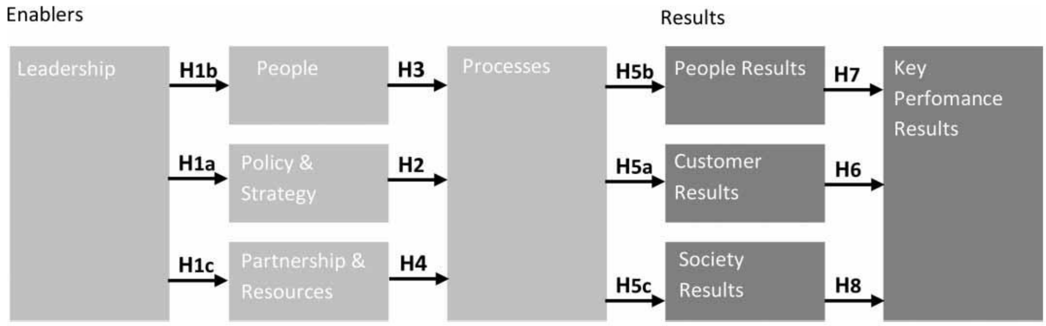


Figure A.2.8.17.a Heras-Saizarbitoria, et al.'s (2012) pre testing model

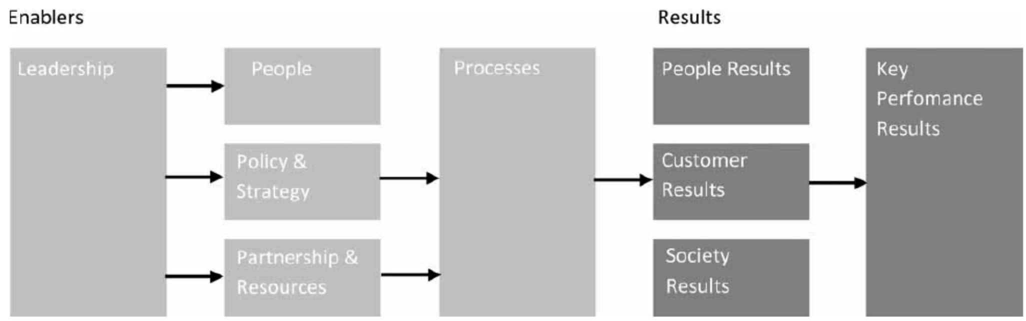


Figure A.2.8.17.b Heras-Saizarbitoria, et al.'s (2012) post testing model

A.2.8.18.a Safari, et al.'s (2012) pre testing model

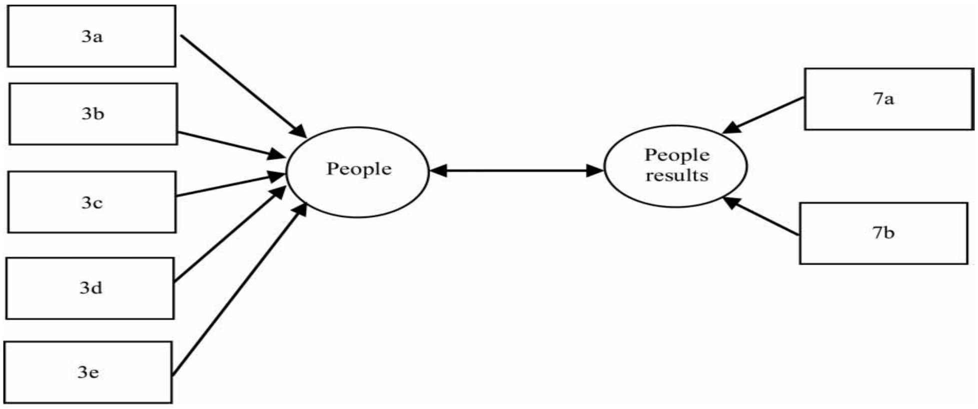


Figure A.2.8.18.a Safari, et al.'s (2012) pre testing model

Note: This study did not present the post-testing model.

A.2.8.19.a Bou-Llusar et al.'s (2005) pre testing model

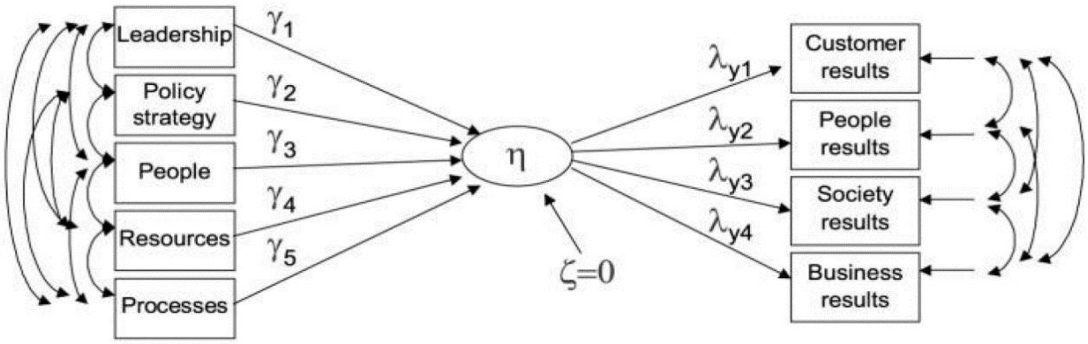


Figure A.2.8.19.a Bou-Llusar et al.'s (2005) pre testing model

Note: This study did not present the post-testing model.

A.2.8.20.a Santos-Vijande and Alvarez-Gonzalez's (2007) pre testing model

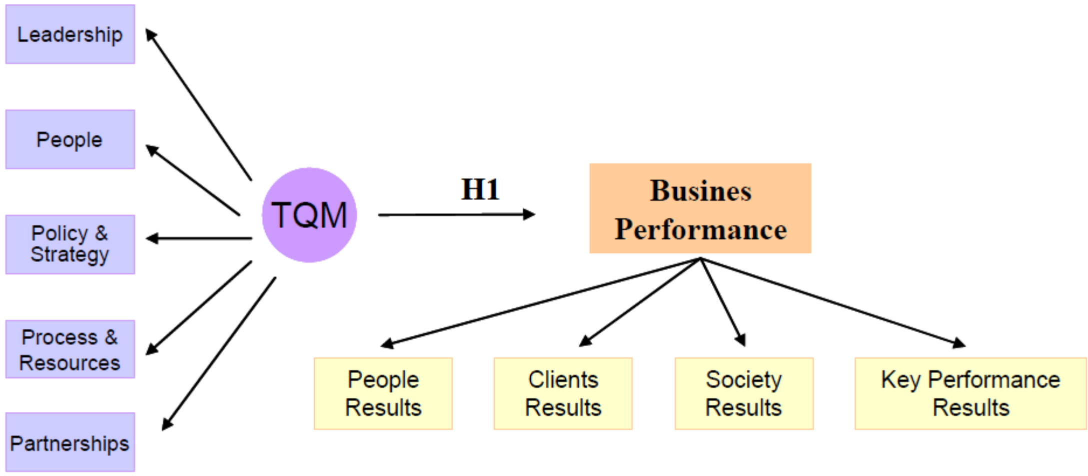


Figure A.2.8.20.a Santos-Vijande and Alvarez-Gonzalez's (2007) pre testing model

Note: This study did not present the post-testing model.

A.2.8.21.a,b Bou-Llusar et al.'s (2009) pre/post testing models

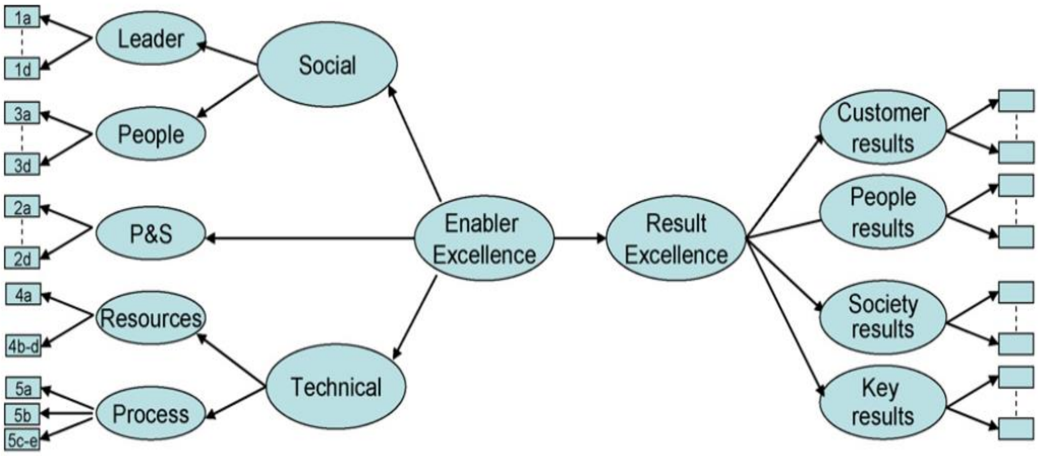


Figure A.2.8.21.a Bou-Llusar et al.'s (2009) pre testing model

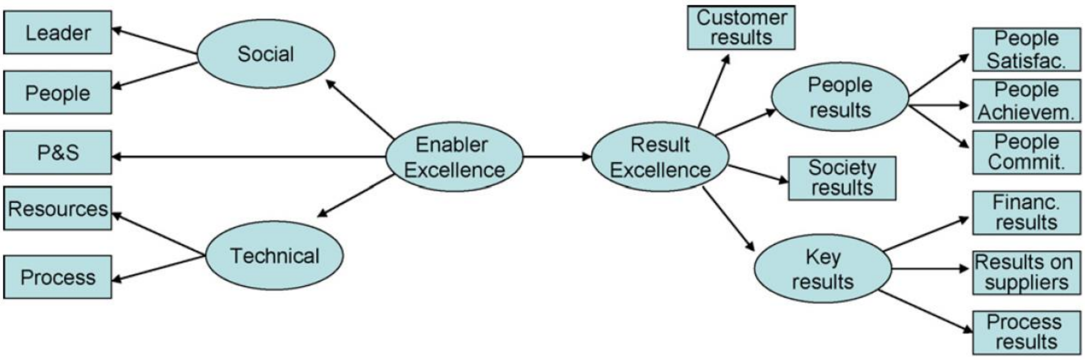


Figure A.2.8.21.b Bou-Llusar et al.'s (2009) post testing model

A.3 Appendices Chapter 3

Appendix A.3

Table A.3.1 The sample characteristics of prior studies

#	RR%	Nu	SS	RT	RS	Composition	Award	Country	References
1	77	2302	2990	senior manager, mid-level manager, and frontline employees, with 10, 8,6, and 4 years of experience in quality management on average, respectively	multiple	manufacturing and service sectors	The 2006 MBNQA framework	China	He et al. (2011)
2	54.7	220	409	vice chancellors, deputy vice chancellors, associate deputy vice chancellors, advisors, deans, vice deans, associate deans, assistant deans, academic department chairs, and unit heads	multiple	15 educational facilities	the 2004 MBNQA education criteria	U.A.E	Badri et al. (2006)
3	-nr-	164	N/A	Plant accountant 1, Human resource manager 1, Inventory/purchasing manager 1, Information systems manager 1, Production control manager 1, Process engineer 1, Plant manager 1, Plant research coordinator 1, Plant superintendent 1, Quality manager 1, Supervisors 4, Direct labour 12 Total respondents/plant 26 Total number of plants 164	multiple	Manufacturing	The 1988, 1992, and 1997 MBNQA	England, Germany, Italy, Japan, U.S.A	Flynn and Saladin (2001)
4	20	214	1100	employees	multiple	a single municipal government organisation	the 2002 MBNQA	U.S.A	Prybutok et al. (2011)
5	28	228	814	Director of Quality, Vice President of Quality, or Quality Manager	single	Health care	the 1995 MBNQA Health Care Criteria	U.S.A	Meyer and Collier (2001)

6	20	160	800	Quality manager	single	Manufacturing	The 1995 MBNQA	U.S.A	Wilson and Collier (2000)
7	17,86	269	-nr-	plant manager	single	The automotive industry	The 1997 MBNQA	U.S.A	Curkovic et al. (2000)
8	-nr-	277	-nr-	-nr-	single	Multiple sectors (manufacturing, service, small business, education, healthcare, and non-profit)	the 2006 MBNQA	U.S.A	Karimi et al. (2013)
9	24.8	248	1000	-nr-	single	Manufacturing and service sectors	the Korean National Quality Award (KNQA)	Korea	Moon et al. (2011)
10	-nr-	192	-nr-	Quality manager or senior executive in charge of quality management	single	manufacturing and service sectors	the China Quality Award (CQA)	China	Xiang et al. (2010)
11	23.9	191	800	-nr-	single	Munufacturing sector	the Taiwan National Quality Award (TNQA)	Taiwan	Su et al. (2003)
12	80	400	500	Manager	multiple	a single European service company	The 1999 EFQM model	Denmark	Eskildsen and Dahlgaard (2000)
13	-nr-	310	-nr-	CEO	single	manufacturing and service sectors	The 1999 EFQM model	Denmark	Eskildsen et al. (2000)
14	16.5	446	2695	the quality manager or general manager	single	manufacturing and service sectors	the 1999 EFQM model	Spain	Bou-Llusar et al. (2005)
15	-nr-	68	-nr-	-nr-	single	public (education sector) and private (manufacturing sector)	The 2003 EFQM model	Spain	Gómez Gómez et al. (2011)
16	16.5	446	2695	CEO or quality manager	single	manufacturing and service sectors	the 2003 EFQM model	Spain	Bou-Llusar et al. (2009)
17	-nr-	242	-nr-	-nr-	single	-nr-	the 2003 EFQM model	Spain	Heras-Saizarbitoria et al. (2012)

18	-nr-	90	-nr-	data were gathered through documents of the Quality and Efficiency Unit	-nr-	the subsets companies of a major service company (regional electricity, electricity distribution and power generation companies).	The 2010 EFQM model	Iran	Safari et al. (2012)
19	32	111	346	dean, deputy-Dean, director of university school and other positions (n/a)	multiple	public education sector	the 1999 EFQM model	Spain	Calvo-Mora et al. (2005)
20	20.6	93	451	General Manager or Managing Director	single	manufacturing and service sectors	The 1999 EFQM model	Spain	Santos-Vijande and Alvarez-Gonzalez (2007)

Note:
RR: response rate, NU: number of usable responses, SS: sample size, RT: respondents types, RS: response source, -nr-: not reported.
Source: Author creation based on the review of the 20 studies cited above

A.4 Appendices Chapter 4

Appendix A.4

Table A.4.1 BEMs scales and their reliability reported in previous studies

Study	Model	Wording, years/period and discription/ evaluation of system/performace			Similar measures in this study and in previous studies (number of scale items/reliability)																					
					1. Leadership				2. Strategic planning			3. Human resources								4. Suppliers and partners						
		Points	Range from..to	description/ comparison	1.1.	1.2.	1.3.	1.4.	2.1.	2.2.	2.3.	3.1	3.2.	3.3.	3.4.	3.5.	3.6.	3.7.	3.8.	4.1.	4.2.	4.3.	4.4.	4.5.	4.6.	4.7.
Bou-Llusar, et al. (2009)	EFQM03	7	**a.,b. system/ performance:** 1. strongly disagree 7. strongly agree	how well the different statements described their companies practices/ performance	11	2	3		9	4	5	2	7	3	5			1		3	1	1	2	1		1
					0.839* , 0.851**				0.801*, 0.818**			0.882*, 0.899**								0.714*, 0.722**						
He et al. (2011)	MBNQA06	6	**a. system:** 1. Extremely disagree 7. Extremely agree	self-evaluation guidance regarding each process description	2			8	4	5	3		1	2		2	5	1								
			b. Performance: 1. Our performance is worst 6. Our performance is excellent	Years/period -Not Specified Compare your performance with that of your competitors or benchmarkings	0.82*			0.87*	0.9*	0.87*	0.9*			0.9*		0.87*	0.9*	0.87*								
Moon, et al. (2011)	KNQA	7	-nr-					4	4	4				4		4	4									
								0.81**	0.83**	0.88**				0.9**		0.87**	0.87**									
Santos-Vijande and Alvarez-Gonzalez (2007)	EFQM99	7	**a. system:** 1. strongly disagree 7. strongly agree	how well the different statements described their companies practices	8	2	2		4	2	1	3	2	2	2		1	2		2	1	1	1	2		2
			b. performance: 1. not at all 7. a great deal	Years/period -Not Specified to what extent firm's quality practices allow to achieve the evaluated variables of performance compared to firms' main competitors	0.945*, 0.946**, 0.716***				0.936*, 0.938**, 0.685***			0.934*, 0.951**, 0.611***								0.773*, 0.807**, 0.682***						
Xiang, et al. (2010)	CQA	-nr-	-nr-					3	3	4				3		3	3									
								0.778**, 0.541***	0.729** 0.475***	0.873** 0.634***				0.779** 0.542***		0.855** 0.663***	0.85** 0.655***									
									0.951*			0.954*														

Note: * Cronbach's alpha, ** Composite reliability, ***average variance extracted (AVE), not reported (-nr-), the Korean National Quality Award (KNQA), the China Quality Award (CQA)

(continued)

Study	Similar measures in this study and in previous studies (number of scale items/reliability)																						
	5. Operations management					6. Focusing on beneficiary			7. M., a. and km		8. Effect on the society			9. Business results									
	5.1.	5.2.	5.3.	5.4.	5.5	6.1.	6.2.	6.3.	7.1.	7.2.	8.1.	8.	8.3.	9.1.	9.2.	9.3.	9.4.	9.5.	9.6.	9.7.	9.8.	9.9.
Bou-Llusar, et al. (2009)	5	5		3										5	4	4	3	12			4	
	0.733*, 0.779**													0.873*, 0.826**	0.903*, 0.905**	0.841*, 0.884**	0.878*, 0.876**	0.748*, 0.756**			0.909*, 0.910*	
He et al. (2011)	9	13				2	4	2	5	7				2	2		5	3				4
	0.88*	0.95*				0.88*	0.84*	0.83*		0.92*				0.88*	0.89*		0.91*	0.89*				0.9*
Moon, et al. (2011)	3	7		3		3	6		9	4				2	3		3	5				
	0.83**	0.905**		0.82**		0.79**	0.89**		n/a	0.86**				0.77**	0.79**		0.83**	0.9**				
Santos-Vijande and Alvarez-Gonzalez (2007)	3	3		4										5	3	3	10	7			2	
	0.951*, 0.971**, 0.615***													0.914*, 0.917**, 0.689**	0.939*, 0.939**, 0.837***	0.905*, 0.909**, 0.770***	n/a	0.905*, 0.915**, 0.687***			0.925	
Xiang, et al. (2010)	3	6			3	3	3	2	7	3				3	3		2	3				
	0.834** 0.629**	0.863** 0.682**			0.763** 0.518**	0.874** 0.699**	0.889** 0.617***		n/a	0.792** 0.560***				0.736** 0.482**	0.744** 0.493***		0.670** 0.505***	0.814** 0.594***				
	0.936*					0.947*			0.933*					0.94*								

Table A.4.2 Final questionnaire of this study (English and Arabic versions)

CEO /Quality Manager

Dear Sir,

We seek your cooperation for researching Business Excellence in Saudi Arabia. This survey is conducted by Mr. Mohammed Alanazi under the supervision of Dr. Dimitrios Tsagdis at Hull University Business School, in the United Kingdom and is supported by the Saudi Standards, Metrology and Quality Organization (SASO).

The survey aims to capture your opinion on a range of aspects relating to the practices and performance of your firm. There are no right or wrong answers we are simply seeking the extent to which you agree or disagree with a list of (randomly ordered) statements. Your participation in this survey will help us develop useful suggestions, for performance improvement and in general business excellence for all firms in Saudi Arabia.

So we kindly ask for your participation in this survey. The information that you are asked to provide is **anonymous** and **confidential**. The analysis of the survey will involve statistical aggregates, making the individual responses impossible to identify within the results. The returned questionnaires will be destroyed after the completion of this study while during this study only Mr. Alanazi will have access to them.

The attached questionnaire should take approximately **20** minutes to complete. Once completed, please email it to (**M.H.Alanazi@2014.hull.ac.uk**). Please, **answer all questions**. If you are unsure about your response to any particular question, try to answer it to your best of your knowledge. If you have any question about this study, please contact us by phone: 0553418416 or via email.
Should you have any concerns about the ethical conduct of this research, please contact the Secretary, HUBS Research Ethics Committee, University of Hull, Cottingham Road, Hull, HU6 7RX; Tel No (+44) (0)1482 463536.

We shall be pleased to **share with you the findings** of this research once it is completed. If you would like to receive a **copy** of the findings, please provide us with an e-mail address at the end of the questionnaire.

Thanks in advance for your participation in this survey and your contribution to this research.

Yours faithfully,

Mohammed Alanazi
Doctoral researcher
M.H.Alanazi@2014.hull.ac.uk

Dr. Dimirios Tsagdis
PhD Supervisor
D.Tsagdis@hull.ac.uk

☐ Please tick that you have read this cover letter and give your informed consent.

This is an anonymous questionnaire. Please ensure that you do not write your name, or anything else that could be used to identify you. By completing the questionnaire you are consenting to take part in this research. If not done so already, please read the covering letter as it explains the aim and procedures of this research..

'The organisation' in the following statements refers to the organisation this survey is addressed. Performance statements imply the organisation's **direct competitors or other benchmarking group within the past 3 years as the basis of comparison**.
Please, state your response in the **space to the right of each statement** using the following 7-point scale:

Strongly disagree	**Disagree**	**Somewhat disagree**	**Neither agree or disagree**	**Somewhat agree**	**Agree**	**Strongly agree**
1	2	3	4	5	6	7

1	Leaders interact with customers and keep in mind their contributions when designing goods and/or services	
2	The impacts and risks resulting from the organisation's products and/or services on society are well managed (e.g., waste recycling, environmental conservation, and traffic safety).	
3	Employees can feed back their opinions to strategic plans and business objectives.	
4	Customer satisfaction has improved.	
5	Leaders take on the responsibility for developing quality oriented management systems.	
6	The organisation strives to improve operational efficiency by efficient use of technology.	
7	The organisation's data and information are complete, consistent, and accurate.	
8	The organisation has good results in terms of its exporting operations.[45]	
9	The organisation's work is organised in a manner that reduces and optimizes physical, economic and financial resources.	
10	New products and/or services are designed thoroughly and meticulously before being manufactured and marketed.	
11	The organisation can quickly respond to the customer and the market's demands.	
12	Leaders create an organisational environment of empowerment[46], innovation, and learning.	
13	The different organisation departments liaise with one another during the development of new products/services.	
14	Customers' claims are settled through the customer service system as soon as possible.	
15	Organisational processes and their interrelationships are identified (e.g., by translating strategies into aligned processes, projects and organisational structures).	
16	The organisation manages and enhances day to day and long term customer relationships.	
17	Employees share or contribute their individual professional knowledge to the organisation's data and information.	
18	The organisation demonstrates its commitment to ethical business practices.	
19	Delivery deadlines from suppliers have improved.	
20	Quality-related criteria predominate over speed and cost when developing new products/ services.	
21	The organisation's data and information are actively used within the organisation.	
22	Leaders personally assess the application and progress of total quality principles.	
23	The organisation uses key performance indicators (KPIs)[47] to trace the deployment of strategic objectives, and compares its KPIs with that of competitors or other benchmarks.	
24	The organisation supports the provision of services to persons with special needs (e.g., employment and training)	
25	In developing the people strategy and plans, formal processes are used to find out employee opinions.	
26	Customer and market data are being gathered systemically.	
27	The Organisation's Customer Complaints Management System is effective in settling customer complaints quickly	
28	The organisation has a well-established policy on customer service.	
29	Employees are continuously trained in the principles of quality, team work and job-specific skills.	
30	The organisation applies recognised standard specifications (e.g., Saudi or international standards).	
31	Knowledge about efficient operation management has improved.	
32	Employees are given tailor-made preparation for their jobs and are qualified to solve quality problems.	
33	Leaders pinpoint the factors that lead to a need for change and pre-empt change needed in the organisation.	
34	Our top management participates and encourages employee involvement in quality improvement activities.	
35	The organisation creates databases and files with the information it has in order to use them and learn.	
36	The organisation tries to sustain long-term win-win relationship with its suppliers.	

45 For example: the ratio of production it plans to export, the diversity of exporting markets, volume of exports, and the contribution of exporting operations towards organisation development.
46 Empowerment refers to giving subordinates more resources (e.g. information) and control in order to better serve the interests of their employing organisations (e.g. exercise initiative to solve customer service problems).
47 Key Performance Indicators capture the performance of an organisation or part thereof (e.g. business, unit, activity).

37	The organisation has better relationships with suppliers.	
38	The senior management and its employees provide effective support for non-profit entities.	
39	Communication with customers has improved.	
40	Profit levels have improved.	
41	Sales have improved.	
42	Leaders' activities seek to provide value for the community and protect the environment.	
43	Key performance indicators capturing community support have improved (such as the number of public activities).	
44	Process efficiency[48] has improved (e.g., by streamlining a organisation's core processes and minimising unneeded resources).	
45	The organisation has effective two-way communication links with its employees.	
46	The organisation's standards of work environment (e.g., promotions, training) develop national staff.	
47	Customer complaints and grievances have decreased.	
48	Leaders create an organisational environment that follows legal and ethical requirements.	
49	The organisation regularly asks its customers what they want from its products/services now and in the future.	
50	Recorded time of the organisation's work has improved (e.g., productivity and order cycle).	
51	Leaders in our organisation analyse data by themselves for strategic planning and decision-making.	
52	There are quality circles and/or interdepartmental teams to improve quality.	
53	Key performance indicators capturing learning and development have improved (e.g., innovation, number of reasonable suggestions, and performance improvement).	
54	Noise levels have decreased.	
55	The organisation contributes to the development of the local community through training programmes.	
56	Customer perception of the organisation has improved.	
57	Long-term customer satisfaction is laid down as the organisation's mission and basic principle.	
58	The organisation has an effective recruiting process to hire employees with required capability (e.g., skills, certifications, and staffing levels).	
59	Leaders measure and review the effectiveness of organisational change and share the knowledge that is obtained.	
60	The organisation conducts employee attitude surveys regularly.	
61	Leaders proactively participate in community services, medical care, education and environmental protection.	
62	The organisation provides the results of performance data analysis to business units or departments.	
63	The organisation does well in integrating performance information with innovation.	
64	The organisation creates clear strategic plans, objectives and timetables for product/service quality improvement.	
65	Leaders explicitly recognize employees' achievements at work	
66	The organisation contributes to the national economy (e.g., through investment, exporting, technology, research and development).	
67	The organisation has long-term quality agreements with its suppliers.	
68	The organisation carefully designs the work environment and facilities in order to maximise employee benefits and well-being.	
69	Strategic objectives can balance all stakeholders' requirements.	
70	All processes, procedures and products/services are assessed regularly in an attempt to drive improvement and innovation.	
71	The organisation coordinates well its strategies and its technological equipment, machinery and know-how.	
72	There are policies in place for managing relationships with local suppliers.	
73	The organisation has good results in terms of its investment in research and development.[49]	
74	The organisation systematically communicates strategic plans and objectives in a "top-down" fashion.	
75	Leaders inform employees about the organisation's quality strategy.	
76	There are updated quality-related data available to all members of the organisation.	
77	Processes are designed and defined explicitly.	
78	Key performance indicators capturing legal compliance and regulation have improved (e.g., environment protection, energy consumption, recycling and reuse of resources).	

48 Process efficiency is a measurable quantity that refers to the extent to which the inputs (e.g., resources) to a process are well used (e.g., avoid waste, idle or down time) to produce the output of that process.
49 For example: the ratio of funds assigned to research and development, the number of new products/services, productivity and the level of added value of the products.

79	Suppliers participate willingly in developing new products/ services.	
80	The organisation has a positive impact on society.	
81	The organisation's suppliers provide technical assistance and/or in general help in some other ways to improve its products and/or services.	
82	The organisation emphasises building long-term partnerships with suppliers.	
83	The organisation emphasises employees' health, safety, and well-being.	
84	The organisation has an evaluation system for measuring performance of suppliers and alliances.	
85	Key performance indicators capturing the effectiveness and efficiency of the working environment have improved (e.g., job simplification, rotation, employee retention, internal promotion rate).	
86	Verification and selection of local suppliers is implemented across the organisation.	
87	Pollution levels have decreased.	
88	The organisation is prepared to form alliances with partners and collaborators in the market in an attempt to achieve competitive advantage.	
89	Key performance indicators capturing ethical and behavioural issues in the organisation's corporate governance have improved (e.g., the number or ratio of independent directors).	
90	The organisation communicates with partners frequently regarding design changes and key factors affecting product/service quality.	
91	Leaders always bear in mind stakeholder groups.	
92	Partnerships with local social institutions are developed in different fields (e.g., health and education).	
93	The organisation's governance mechanism warrants management's behaviours to the interests of the organisation, shareholders, and other stakeholders.	
94	Customer and market data are being processed into reliable information for rational decision-making.	
95	The present and future customers' interests in relation to products and/or services are taken into account.	
96	Customer consolidation, returning customers and loyal customers have improved.	
97	Leaders periodically evaluate organisational performance and the progress of business objectives, and transform evaluations into action plans.	
98	Standardized systems are in place to deal with customer complaints.	
99	The organisation contributes to raising the level of awareness and citizenship of society through sponsoring research and studies.	
100	Leaders provide a plan detailing the different stages of change, and secure the investment, resources and support needed to achieve change.	
101	Market share has improved.	
102	The organisation has procedures in place to make sure that local supplier outputs conform to its requirements.	
103	The organisation systematically collects data and information, in order to trace, review and improve organisational performance.	
104	Leaders predict and take actions to reduce possible impacts on the public and environment, due to questionable products, services, and operations.	
105	The organisation conducts customer loyalty and satisfaction surveys regularly.	
106	The organisation develops corporate strategic plans based upon analysing key operational factors[50] and relative data.	
107	The organisation invests sufficient resources in order to achieve strategic objectives.	
108	The organisation knows which products and services fulfil its customer expectations and needs.	
109	Every member in the organisation knows the organisational mission and objectives.	
110	Quality of suppliers' goods or services has improved.	
111	Employees are actively involved in quality-related activities and the success of the organisation.	
112	A Saudization plan is integrated in all operations undertaken by the organisation.	
113	Saudi employees are encouraged to work at jobs where the rate of Saudization is low.	
114	Key performance indicators capturing employee welfare and satisfaction have improved (e.g., numbers of emergencies, employee absence).	

50 Characteristics and measures of the key internal and external factors relevant to the operation of the organisation (e.g., value creation, resources, inputs, waste, demand fluctuations, delivery times, supplier reliability).

115	Leaders listen and support employees and encourage them to take part in deciding and managing total quality policies and plans.	
116	Leaders acknowledge and reward employees' contributions to improving quality.	
117	The organisation makes ongoing efforts to keep their facilities clean and in order.	
118	Key performance indicators capturing the financial responsibilities inside and outside the organisation have improved (e.g., the independence of auditors or the auditing department).	
119	Employees can take decisions independently in terms of quality and end results of the product/service.	
120	The organisation demonstrates its commitment to local and international standards for protecting the environment and recycling waste (e.g., ISO 14000 or equivalent).	
121	The organisation regularly sponsors social activities and events (e.g., cultural and educational events).	
122	Quality policies are translated into a set of specific and measurable objectives.	
123	Preference is given to local suppliers, products and/or services.	
124	Protection of the environment has improved.	
125	Emphasis is placed on recruiting highly skilled employees required to achieve the strategic goals.	
126	Customer complaints are being systematically analysed and discussed.	
127	Leaders allocate resources for continuous improvement of the management system.	
128	The organisation takes a number of approaches to explore employees' potential, and help employees to achieve their career goals.	

Finally, we would appreciate if you can answer the following general questions regarding your organisation:

1. Please, indicate the number of your organisation's employees: ☐ less than 25 ☐ between 25-100 ☐ more than 100

2. Please, indicate one of the following sectors that better reflects your organisation's core business activity:

☐ Agriculture & Food Industries ☐ Banks & Financial Services ☐ Building & Construction ☐ Cement
☐ Energy & Utilities ☐ Hotel & Tourism ☐ Industrial Investment ☐ Insurance
☐ Media & Publishing ☐ Multi-Investment ☐ Petrochemical Industries ☐ Retail
☐ Real Estate Development ☐ Transport ☐ Information & Communication Technology

3. Four types of orientation and behaviour relating to changes in markets, products, and services are listed below. No type is **better or worse** than any other. Please tick √ the box (**only one**) that corresponds more closely to your organisation.

☐ **Organisation A** maintains a secure market 'niche' by offering a relatively stable set of products and services. This type of firm tends to ignore industry changes that have no direct influence on its current areas of operation. Concentrating instead on doing the best possible in its existing area and protecting its market by offering higher quality, superior service, and/or prices.

☐ **Organisation B** operates within a broad product-market and makes relatively frequent changes (especially additions) to its set of products and services. This type of firm tends to be 'first in' in new products/services in the markets, even if not all of these efforts prove to be highly profitable. It responds rapidly to early signals concerning areas of market needs or opportunities, and these responses often lead to a new round of competitive actions.

☐ **Organisation C** attempts to maintain a relatively stable base of products and services while at the same time moving to meet selected and promising new market developments in the industry. This type of organisation is seldom 'first in' with new services and products. However, by carefully monitoring the actions of its major competitors (like organisation B above) in areas compatible with its stable market base, organisation C attempts to follow and frequently be 'second in' with a more cost-efficient products and/or services.

☐ **Organisation D** cannot be clearly characterised in terms of its approach to changing its services, products, or markets. Sometimes organisation D will be an early entrant into new fields of opportunity, sometimes it will move into new fields only after considerable evidence of potential success, sometimes it will not make service/product or market changes unless it is forced to by external changes.

4. If you would like to receive an electronic copy of this study's findings, please provide an email address: ________

THANK YOU FOR PARTICIPATING IN THIS SURVEY

سعادة المدير التنفيذي/ مدير الجودة **المحترم**

نتطلع لتعاونك مع هذه الدراسة الأكاديمية حول التميز المؤسسي في المملكة العربية السعودية. تنفذ هذه الدراسة من خلال الأستاذ/ محمد العنزي تحت إشراف الدكتور/ ديمتري تساقديز في مدرسة إدارة الأعمال بجامعة هال في المملكة المتحدة (the Hull University Business School)، وهي مدعومة من الهيئة السعودية للمواصفات والمقاييس والجودة.

تهدف الاستبانة لاستقصاء رأيك حول مجموعة من الجوانب المتصلة بممارسات وأداء شركتكم. ليس هناك إجابات صحيحة أو خاطئة، نحن بشكل مبسط نستقصي إلى أي مدى أنت توافق أو لا توافق حول قائمة من العبارات المرتبة عشوائياً. مشاركتك في هذا الاستبيان سوف تساعدنا في تطوير اقتراحات مفيدة لتطوير الأداء، وفي التميز المؤسسي لجميع الشركات في السعودية.

لتحقيق ذلك، نحن نتطلع لكريم مشاركتك في هذه الاستبانة. المعلومات التي نتطلع للحصول عليها هي **غير محددة للاسم/المصدر** ولا تحتاج ذلك، وهي **سرية**. تحليل الاستبانة سيتضمن تجميع إحصائي يجعل من المستحيل التعرف على الإجابات الفردية ضمن نتائج الدراسة. الاستبانات المستلمة سيتم إتلافها بعد الانتهاء من هذه الدراسة، بينما أثناء هذه الدراسة فقط الأستاذ/ محمد العنزي سيطلع عليها.

الاستبانة المرفقة قد تحتاج تقريباً 20 دقيقة لإكمالها. عند إكمالها، المرجو إرسالها إلى البريد الالكتروني **(M.H.Alanazi@2014.hull.ac.uk)**. لطفاً، **أجب جميع الأسئلة**. إذا لم تكن متأكدا من إجابتك لأي سؤال، حاول أن تجيبه وفق أفضل ما تعرف. إذا كان لديك أي سؤال حول هذا البحث، المرجو الاتصال بنا على جوال (0553418416) أو بواسطة البريد الالكتروني المشار إليه.
إذا كان لديك أي تساؤلات حول التصرف الأخلاقي لهذا المشروع البحثي، المرجو الاتصال بـ
HUBS Research Ethics Committee, University of Hull, Cottingham Rd, Hull, HU6 7RX; Tel No (+44) (0)1482 463536.

سيكون من دواعي سرورنا **مشاركتك نتائج** هذا البحث عندما تكتمل. في هذا الصدد، إذا وددت باستلام **نسخة** من النتائج، المرجو تزويدنا ببريدك الالكتروني في نهاية هذه الاستبانة.

نشكرك بشكل مسبق لموافقتك على المشاركة في هذه الاستبانة، وإضافتك الهامة لهذا البحث.

وتقبلوا أطيب تحياتنـــا،،،

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☐ يرجى وضع علامة هنا، مفيداً بقراءتك هذه الرسالة، وإعطاء موافقتك بالعلم بمحتواها.

هذه الاستبانة غير محددة للاسم/المصدر. يرجى التأكد من عدم كتابة اسمك، أو أي ملاحظات أخرى تجعلك معرّف. من خلال إكمالك هذه الاستبانة فإنك توافق على المشاركة في هذا البحث.
ينصح أولاً بقراءة الخطاب المرفق بعناية حيث إنه يفسر بشكل كامل القصد من هذا المشروع.
كلمة "المنشأة" في العبارات أدناه تشير إلى المنشأة التي يتناولها هذا الاستبيان. العبارات المتعلقة بالأداء تتطلب **المقارنة مع المنافسين المباشرين أو مجموعة مقارنة مرجعية أخرى خلال الثلاث سنوات الماضية.**

لطفاً، حدد إجابتك في الخانة المخصصة يسار كل عبارة مستخدماً أحد الخيارات الـ 7 التالية:

لا أوافق مطلقاً	لا أوافق	لا أوافق إلى حد ما	محـايــد	أوافق إلى حد ما	أوافـــق	أوافق بشدة
1	2	3	4	5	6	7

1	يتفاعل القادة مع العملاء ويأخذون بالاعتبار إسهاماتهم عند تصميم المنتجات و/أو الخدمات.		
2	الآثار والمخاطر على المجتمع الناتجة من منتجات و/أو خدمات المنشأة يتم إدارتها بشكل جيد (مثل: تدوير النفايات، والمحافظة على البيئة، والسلامة المرورية).		
3	بإمكان الموظفين تقديم آرائهم حول الخطط الاستراتيجية والأهداف.		
4	لقد تحسن رضا العملاء.		
5	يأخذ القادة على عاتقهم مسؤولية تطوير نظم إدارة ذات توجه للجودة.		
6	تسعى المنشأة جاهدة لتحسين الكفاءة التشغيلية من خلال استخدام كفء للتقنية.		
7	بيانات ومعلومات المنشأة كاملة، ومتسقة، ودقيقة.		
8	المنشأة لديها نتائج جيدة بشأن عمليات التصدير.[51]		
9	يتم تنظيم عمل المنشأة على نحو يرشد ويستخدم استخداماً أمثل الموارد المادية والاقتصادية والمالية.		
10	يتم تصميم المنتجات و/أو الخدمات الجديدة بشكل شامل ودقيق قبل إنتاجها وتسويقها.		
11	يمكن للمنشأة الاستجابة بشكل سريع لطلبات العميل والسوق.		
12	يوجِد القادة بيئة تنظيمية تتضمن التمكين[52] والابتكار والتعلم.		
13	إدارات المنشأة المختلفة تتواصل مع بعضها البعض أثناء تطوير منتجات/ خدمات جديدة.		
14	مطالبات العملاء يتم تسويتها من خلال نظام خدمة العملاء بأقرب وقت ممكن.		
15	يتم تحديد العمليات التنظيمية وترابطها (على سبيل المثال: من خلال ترجمة الاستراتيجيات إلى إجراءات متسقة، ومشاريع، وهياكل تنظيمية).		
16	تدير المنشأة وتعزز علاقات العملاء اليومية وبعيدة المدى.		
17	يتشارك الموظفون أو يساهمون بمعلوماتهم المهنية الشخصية إلى بيانات ومعلومات المنشأة.		
18	تبين المنشأة التزامها بممارسات الأعمال (التجارية) الأخلاقية.		
19	لقد تحسنت مواعيد التسليم من الموردين.		
20	تعد المعايير ذات العلاقة بالجودة أكثر أهمية من السرعة والتكلفة عند تطوير منتجات/ خدمات جديدة.		
21	يتم استخدام بيانات ومعلومات المنشأة بفاعلية داخل االمنشأة.		
22	يقيّم القادة بشكل شخصي تطبيق مبادئ الجودة الشاملة والتقدم المرتبط بها.		
23	تستخدم المنشأة مؤشرات الأداء الرئيسية (KPIs)[53] لمتابعة تحقيق الأهداف الاستراتيجية، وتقارن مؤشرات أدائها الرئيسية مع المنافسين أو المقارنات المرجعية الأخرى.		
24	تدعم المنشأة توفير خدمات لذوي الاحتياجات الخاصة (مثل: التوظيف، التدريب).		
25	عند تطوير استراتيجية وخطط العاملين، يتم استخدام إجراءات رسمية لمعرفة آراء الموظفين.		
26	يتم جمع بيانات العملاء والسوق بشكل منتظم.		
27	نظام إدارة شكاوى العملاء في المنشأة هو فعال في تسوية شكاوى العملاء بشكل سريع.		
28	للمنشأة سياسة راسخة بشأن خدمة العملاء.		
29	يتم تدريب الموظفين بشكل مستمر على مبادئ الجودة، وفرق العمل، والمهارات المرتبطة بوظائفهم.		
30	تطبق المنشأة مواصفات قياسية معتمدة (مثل: المواصفات القياسية السعودية أو الدولية).		
31	لقد تطورت المعرفة حول إدارة العمليات بكفاءة.		
32	يتم تهيئة (تدريب) الموظفين بشكل مصمم لوظائفهم، وهم مؤهلون لحل مشاكل الجودة.		
33	يحدد القادة العوامل التي تقود لحاجة التغيير، ويستبقون التغيير المطلوب في المنشأة.		
34	تشارك الإدارة العليا لدينا وتشجع على إشراك الموظف في أنشطة تحسين الجودة.		
35	تنشيء المنشأة قواعد بيانات وملفات مع المعلومات المتوفرة لديها، بهدف استخدامها والتعلم منها.		

51 على سبيل المثال: نسبة الإنتاج المخططة للتصدير، وتنوع أسواق التصدير، وحجم الصادرات، ومساهمة عمليات التصدير في تطوير المنشأة.

52 يشير التمكين لإعطاء المرؤوسين المزيد من الموارد (مثل المعلومات) والسلطة لتحقيق أفضل لأهداف المنشأة التي يعملون فيها (على سبيل المثال المبادرة بحل مشاكل خدمة العملاء).

53 مؤشرات الأداء الرئيسية (KPIs) ترصد وتقيس أداء المنشأة أو جزء منها (عمل، وحدة إدارية، نشاط) في سياق تحقيق أهدافها.

36	تحاول المنشأة الحفاظ على علاقة طويلة المدى مربحة للجانبين مع مورديها.		
37	المنشأة لديها علاقات أفضل مع الموردين.		
38	تقدم الإدارة العليا والموظفون دعم فعال للجهات غير الربحية.		
39	لقد تحسن التواصل/الاتصال مع العملاء.		
40	مستويات الربحية زادت.		
41	لقد تحسنت المبيعات.		
42	تسعى أنشطة القادة لتأمين قيمة للمجتمع وحماية البيئة.		
43	لقد تطورت مؤشرات الأداء الرئيسية الخاصة بدعم المجتمع (مثل عدد الأنشطة المجتمعية).		
44	لقد تحسنت كفاءة العمليات[54] (على سبيل المثال عن طريق تبسيط العمليات الأساسية للمنشأة وتقليل الموارد غير الضرورية).		
45	المنشأة لديها خطوط تواصل فعالة وثنائية الاتجاه مع موظفيها.		
46	تساهم معايير المنشأة الخاصة ببيئة العمل (على سبيل المثال: الترقيات، التدريب) في تطوير الموظفين المواطنين.		
47	لقد انخفضت شكاوى وتظلمات العملاء.		
48	يوجِد القادة بيئة تنظيمية تراعي المتطلبات القانونية والأخلاقية.		
49	تسأل المنشأة عملاءها بانتظام عما يريدونه من منتجاتها/خدماتها الآن وفي المستقبل.		
50	لقد تحسن الوقت المسجل لإجراءات عمل المنشأة (مثل: الإنتاجية ودورة طلب العميل).		
51	يقوم القادة في المنشأة بتحليل البيانات بأنفسهم لغرض التخطيط الاستراتيجي واتخاذ القرارات.		
52	لدى المنشأة حلقات الجودة و/أو فرق مشتركة بين الإدارات لتحسين الجودة.		
53	لقد تطورت مؤشرات الأداء الرئيسية (KPIs) الخاصة بالتعلم والتطوير (مثل: الابتكار، وعدد الاقتراحات المناسبة، وتطور الأداء)		
54	لقد انخفضت مستويات الضوضاء.		
55	تساهم المنشأة في تطوير المجتمع المحلي من خلال برامج تدريبية.		
56	لقد تحسنت مرئيات/انطباعات العملاء حول المنشأة.		
57	تنص رسالة الشركة على أن أحد مبادئها الأساسية هو رضا العملاء على المدى الطويل.		
58	لدى المنشأة آلية توظيف فعالة لتعيين موظفين وفق القدرات المطلوبة (مثل: المهارات، الشهادات، مستويات التوظيف).		
59	القادة يقيسون ويراجعون فعالية التغيير التنظيمي، ويشاركون المعلومات التي يحصلون عليها.		
60	تجري المنشأة استطلاعات حول آراء الموظفين بانتظام.		
61	القادة يشاركون بفاعلية في خدمة المجتمع، والرعاية الصحية، والتعليم وحماية البيئة.		
62	توفر المنشأة نتائج تحليل بيانات الأداء للإدارات والأقسام.		
63	تعمل المنشأة بشكل جيد في دمج المعلومات الخاصة بأدائها مع مبادرات الابتكار.		
64	تنشيء المنشأة خطط استراتيجية وأهداف وجداول زمنية واضحة لتحسين جودة المنتج/الخدمة.		
65	يقر القادة بإنجازات الموظفين في العمل بشكل صريح.		
66	تساهم المنشأة في دعم الاقتصاد الوطني (مثل: من خلال الاستثمار، التصدير، التقنية، الأبحاث والتطوير).		
67	لدى المنشأة اتفاقات جودة بعيدة المدى مع مورديها.		
68	تصمم المنشأة بعناية بيئة العمل والمرافق بهدف تعظيم مزايا ورفاهية الموظفين.		
69	بإمكان الأهداف الاستراتيجية موازنة متطلبات جميع أصحاب المصلحة.		
70	يتم تقييم جميع الإجراءات والعمليات والمنتجات/الخدمات بشكل منتظم في محاولة لدفع التحسين والابتكار.		
71	تنسق المنشأة بشكل جيد لانسجام استراتيجياتها مع معداتها التكنولوجية والآلات والمعرفة العملية (الخبرة الفنية للعاملين).		
72	لدى المنشأة سياسات لإدارة العلاقات مع الموردين المحليين.		
73	للمنشأة نتائج جيدة فيما يتعلق باستثمارها في الأبحاث والتطوير.[55]		
74	تقوم المنشأة بإبلاغ الخطط الاستراتيجية والأهداف بشكل منتظم بأسلوب "من أعلى لأسفل".		
75	يقوم القادة بإعلام الموظفين حول استراتيجية المنشأة للجودة.		
76	لدى المنشأة بيانات محدثة ذات علاقة بالجودة متاحة لجميع منسوبي المنشأة.		
77	يتم تصميم الإجراءات وتحديدها بشكل صريح.		
78	لقد تحسنت مؤشرات الأداء الرئيسية ذات الصلة بالالتزام بالأنظمة واللوائح (مثل: حماية البيئة، استهلاك الطاقة، تدوير وإعادة استخدام الموارد).		
79	يشارك الموردون برغبة في تطوير منتجات/خدمات جديدة.		
80	للمنشأة تأثير إيجابي على المجتمع.		
81	يوفر موردو المنشأة مساعدة تقنية و/أو بشكل عام يساعدون في بعض الطرق الأخرى لتحسين منتجات/خدمات المنشأة.		

[54] كفاءة الإجراءات هي كمية قابلة للقياس تشير إلى أي مدى المدخلات (مثل الموارد) تستخدم بشكل جيد بالنسبة للإجراءات (مثل تجنب هدر الموارد والوقت الضائع) لإنتاج المنتج/الخدمة من خلال هذه الإجراءات.

[55] على سبيل المثال: نسبة الأموال المخصصة للبحث والتطوير، وعدد المنتجات/الخدمات الجديدة، والإنتاجية ومستوى القيمة المضافة للمنتجات.

			تؤكد المنشأة على بناء شراكات بعيدة المدى مع الموردين.	82
			تؤكد المنشأة على أهمية صحة الموظفين وسلامتهم ورفاهيتهم.	83
			لدى المنشأة نظام تقييم لقياس أداء الموردين والتحالفات.	84
			لقد تحسنت مؤشرات الأداء الرئيسية (KPIs) الخاصة بفاعلية وكفاءة بيئة العمل (مثل: تبسيط العمل، التدوير، المحافظة على الموظفين، معدل الترقية الداخلية، .. الخ).	85
			يتم تطبيق إجراءات في المنشأة لتقييم واختيار الموردين المحليين.	86
			لقد انخفضت مستويات التلوث.	87
			يتم تهيئة المنشأة لتشكيل تحالفات مع الشركاء والمتعاونين في السوق سعياً لتحقيق ميزة تنافسية.	88
			لقد تطورت مؤشرات الأداء الرئيسية (KPIs) الخاصة بالقضايا الأخلاقية والسلوكية في حوكمة المنشأة (مثل: عدد أو نسبة المدراء المستقلين).	89
			تتواصل المنشأة مع الشركاء بشكل متكرر بشأن تغييرات التصميم و العوامل الرئيسية المؤثرة على جودة المنتج/الخدمة.	90
			القادة دائماً يأخذون بالاعتبار مجموعات أصحاب المصلحة.	91
			يتم تطوير الشراكات مع مؤسسات المجتمع المحلي في مختلف المجالات (مثل: الصحة والتعليم).	92
			تضمن آلية حوكمة المنشأة سلوكيات الإدارة لصالح المنشأة والمساهمين وباقي أصحاب المصلحة.	93
			يتم معالجة بيانات العملاء والسوق إلى معلومات موثوقة لاتخاذ قرارات رشيدة.	94
			يتم الأخذ بالاعتبار اهتمامات العملاء الحالية والمستقبلية المرتبطة بالمنتجات و/أو الخدمات.	95
			لقد زاد توطيد العملاء، والعملاء العائدون، والعملاء الموالون.	96
			القادة بشكل دوري يقيّمون الأداء التنظيمي والتقدم في تحقيق الأهداف، ويحولون التقييم إلى خطط عمل.	97
			يتم تهيئة أنظمة موحدة (معيارية) للتعامل مع شكاوى العملاء.	98
			تساهم المنشأة في رفع درجة الوعي والمواطنة في المجتمع من خلال رعاية الأبحاث والدراسات.	99
			يوفر القادة خطة تفصل المراحل المختلفة للتغيير، وتضمن الاستثمار والموارد والدعم المطلوب لتحقيق التغيير.	100
			لقد زادت الحصة السوقية.	101
			لدينا إجراءات للتأكد من أن مخرجات الموردين المحليين تتوافق مع متطلبات المنشأة.	102
			تجمع المنشأة بشكل منتظم بيانات ومعلومات بهدف تتبع ومراجعة وتحسين الأداء.	103
			يساهم القادة في اتخاذ إجراءات للحد من آثار محتملة على المجتمع والبيئة بسبب منتجات أو خدمات أو عمليات محل جدل.	104
			تجري المنشأة استطلاعات حول ولاء ورضا العملاء بانتظام.	105
			تطور المنشأة خطط استراتيجية بناء على تحليل عوامل التشغيل الرئيسية[56] والبيانات ذات العلاقة.	106
			تستثمر المنشأة موارد كافية لتحقيق الأهداف الاستراتيجية.	107
			تعرف المنشأة أي من المنتجات/الخدمات يفي بتوقعات واحتياجات عملائها.	108
			كل فرد في المنشأة يعلم رسالة وأهداف المنشأة.	109
			لقد تحسنت جودة منتجات أو خدمات الموردين.	110
			يتم إشراك الموظفين بشكل فعال بالأنشطة المرتبطة بالجودة وبنجاح المنشأة.	111
			تم دمج خطة التوطين (السعودة) بجميع العمليات التي تقوم بها المنشأة.	112
			يتم تشجيع الموظفين السعوديين للعمل في وظائف ذات معدلات سعودة منخفضة.	113
			لقد تحسنت مؤشرات الأداء الرئيسية (KPIs) الخاصة بالرفاهية ورضا الموظفين (مثل: عدد حالات الطوارئ، الغياب الوظيفي).	114
			القادة ينصتون ويدعمون الموظفين، ويشجعونهم للمشاركة في إدارة وصياغة خطط وسياسات الجودة الشاملة.	115
			القادة يقرون ويكافئون مساهمات الموظفين لتحسين الجودة.	116
			تقوم المنشأة بجهود مستمرة للمحافظة على مرافقها نظيفة ومرتبة.	117
			لقد تحسنت مؤشرات الأداء الرئيسية الخاصة بالمسؤوليات المالية داخل وخارج المنشأة (مثل استقلالية المراجعين أو إدارة المراجعة).	118
			يمكن للموظفين اتخاذ قرارات بشكل مستقل فيما يتعلق بالجودة والنتائج النهائية الخاصة بالمنتج/الخدمة.	119
			تبين المنشأة التزامها بالمعايير المحلية والدولية لحماية البيئة وتدوير النفايات (مثل: ISO 14000 أو ما يماثلها).	120
			ترعى المنشأة بشكل منتظم فعاليات وأنشطة اجتماعية (مثل: فعاليات تعليمية وثقافية).	121
			يتم تحويل سياسات الجودة إلى مجموعة من الأهداف المحددة والقابلة للقياس.	122
			هناك أفضلية للمورد المحلي والمنتج/الخدمة المحلية.	123
			لقد تحسنت الحماية للبيئة.	124
			يتم التركيز على تعيين موظفين ذوي مهارات عالية لازمة لتحقيق الأهداف الاستراتيجية.	125

[56] خصائص وترتيبات للعوامل الداخلية والخارجية الرئيسية ذات الصلة بعمل المنشأة (مثل خلق القيمة والموارد والمدخلات، وتقلبات الطلب ومواعيد التسليم، وموثوقية المورد).

126	يتم تحليل شكاوى العملاء ومناقشتها بشكل منتظم.	
127	يخصص القادة موارد للتحسين المستمر لنظام الإدارة.	
128	تتبنى المنشأة عدداً من الأساليب لاستكشاف إمكانات الموظفين، ومساعدتهم لتحقيق أهدافهم المهنية.	

أخيراً، سيكون محل تقديرنا لو أمكن أن تجيب على هذه الأسئلة العامة فيما يتعلق بمنشأتكم:

1. لطفاً، حدد عدد موظفي منشأتكم: ☐ أقل من 25 ☐ بين 25 - 100 ☐ أكثر من 100

2. لطفاً، حدد **واحداً** من القطاعات التالية التي تمثل أنشطة أعمالكم التجارية بشكل أفضل:

☐ الزراعة والصناعات الغذائية	☐ المصارف والخدمات المالية	☐ التشييد والبناء	☐ الإسمنت
☐ الطاقة والمرافق الخدمية	☐ الفنادق والسياحة	☐ الاستثمار الصناعي	☐ التأمين
☐ الإعلام والنشر	☐ الاستثمار المتعدد	☐ الصناعات البتروكيماوية	☐ التجزئة
☐ التطوير العقاري	☐ النقل	☐ الاتصالات وتقنية المعلومات	

3. أربعة أنواع من التوجه والسلوك المتعلقة بالتغيرات في الأسواق والمنتجات والخدمات هي مدرجة أدناه.
ليس هناك نوع هو **الأفضل أو الأسوأ** من الأنواع الأخرى. لطفاً، ضع إشارة (√) في الخانة **(فقط واحدة)** التي تتوافق بشكل أقرب مع منظمتكم.

☐ **المنشأة A** تحافظ على سوق آمن من خلال تقديم مجموعة مستقرة نسبيا من المنتجات /الخدمات. هذا النوع من الشركات يميل لتجاهل تغيرات مجال نشاطها التي ليس لها تأثير مباشر على المجالات الحالية من عملها. مركزة بدلاً من ذلك على فعل أفضل ما يمكن في مجالها الحالي، مع حماية سوقها من خلال توفير جودة أعلى، وخدمة متفوقة و/أو الأسعار.

☐ **المنشأة B** تعمل ضمن سوق منتجات واسع وتجري تغيرات متكررة نسبياً (خاصة إضافات) لمجموعة منتجاتها وخدماتها. هذا النوع من الشركات يميل ليكون الأول في المنتجات/الخدمات الجديدة في السوق، حتى لو لم تكن كل هذه الجهود تثبت لأن تكون عالية الربحية. هي تستجيب بشكل سريع للمؤشرات المبكرة المتعلقة بمجالات احتياجات السوق أو الفرص، وهذه الاستجابات عادة تؤدي لجولة جديدة من أعمال تنافسية.

☐ **المنشأة C** تحاول أن تحافظ على قاعدة مستقرة نسبياً من المنتجات والخدمات بينما في نفس الوقت تتحرك لمواجهة تطورات سوقية جديدة مختارة وواعدة في مجال نشاطها. هذا النوع من الشركات نادراً ما يكون الأول في منتجات وخدمات جديدة. ومع ذلك، من خلال رصد دقيق لأعمال منافسيها الرئيسيين (مثل المنشأة B في الأعلى) في مجالات متوافقة مع قاعدتها السوقية المستقرة، تحاول المنشأة C أن تتبع وبشكل متكرر تكون الثانية في الدخول في منتجات و/أو خدمات ذات كفاءة تكلفة أعلى.

☐ **المنشأة D** لا يمكن وصفها بشكل واضح فيما يتعلق بمنهجها لتغيير خدماتها ومنتجاتها أو أسواقها. في بعض الأحيان، المنشأة D تكون الداخل المبكر في مجالات جديدة من الفرص. وفي بعض الأحيان، سوف تتحرك لمجالات جديدة فقط بعد أدلة معتبرة لإمكانية النجاح. وفي بعض الأحيان، هي لن تفعل تغيرات في الخدمة/المنتج أو السوق ما لم تضطر لذلك بتغيرات خارجية.

4. في حال رغبتك بتلقي نسخة الكترونية من نتائج هذه الدراسة،
يرجى تزويدنا ببريدك الالكتروني: ☐

شكـــــــــــــــراً لمشـــاركتـــــك في هـذا الاستبيـــــــــــــان

Table A.4.3 Codebook

Construct	Dimension	SPSSN	QN	Question's wording	Variable name	Description	Type	Range
Part1: business excellence questions								
1. Leadership	1.1. Senior Management Orientation	1	57	Long-term customer satisfaction is laid down as the organisation's mission and basic principle.	Leader11		Interval (scale)	1= Strongly disagree 2= Disagree 3= Somewhat disagree 4= Neither agree or disagree 5= Somewhat agree 6= Agree 7= Strongly agree
		2	33	leaders pinpoint the factors that lead to a need for change and pre-empt change needed in the organisation.	Leader12			
		3	100	leaders provide a plan detailing the different stages of change, and secure the investment, resources and support needed to achieve change.	Leader13			
		4	127	leaders allocate resources for continuous improvement of the management system.	Leader14			
		5	1	leaders interact with customers and keep in mind their contributions when designing goods and/or services	Leader15			
		6	91	leaders always bear in mind stakeholder groups.	Leader16			
		7	42	leaders' activities seek to provide value for the community and protect the environment.	Leader17			
		8	115	leaders listen and support employees and encourage them to take part in deciding and managing total quality policies and plans.	Leader18			

1.2. Organisational Performance Auditing	9	22	leaders personally assess the application and progress of total quality principles.	Leader21
	10	59	leaders measure and review the effectiveness of organisational change and share the knowledge that is obtained.	Leader22
1.3. Encouraging & Promoting Culture of Quality	11	5	leaders take on the responsibility for developing quality oriented management systems.	Leader31
	12	116	leaders acknowledge and reward employees' contributions to improving quality.	Leader32
1.4. Governance and social responsibility	13	48	leaders create an organisational environment that follows legal and ethical requirements.	Leader41
	14	12	leaders create an organisational environment of empowerment, innovation, and learning.	Leader42
	15	97	leaders periodically evaluate organisational performance and the progress of business objectives, and transform evaluations into action plans.	Leader43
	16	93	The organisation's governance mechanism warrants management's behaviours to the interests of the organisation, shareholders, and other stakeholders.	Leader44
	17	34	Our top management participates and encourages employee involvement in quality improvement activities.	Leader45
	18	104	leaders predict and take actions to reduce possible impacts on the public and environment, due to questionable products, services, and operations.	Leader46
	19	61	leaders proactively participate in community services, medical care, education and environmental protection.	Leader47
	20	82	The organisation emphasises building long-term partnerships with suppliers.	Leader48

2. Strategic planning	2.1. Strategic planning management process	21	106	The organisation develops corporate strategic plans based upon analysing key operational factors and relative data.	Strategy11
		22	64	The organisation creates clear strategic plans, objectives and timetables for product/service quality improvement.	Strategy12
		23	3	Employees can feed back their opinions to strategic plans and business objectives.	Strategy13
		24	69	Strategic objectives can balance all stakeholders' requirements.	Strategy14
	2.2. Strategic goals & action plan	25	15	Organisational processes and their interrelationships are identified (e.g., by translating strategies into aligned processes, projects and organisational structures).	Strategy21
		26	122	Quality policies are translated into a set of specific and measurable objectives.	Strategy22
		27	75	leaders inform employees about the organisation's quality strategy.	Strategy23
		28	109	Every member in the organisation knows the organisational mission and objectives.	Strategy24
	2.3. Research and development	29	23	The organisation uses key performance indicators (KPIs)[2] to trace the deployment of strategic objectives, and compares its KPIs with that of competitors or other benchmarks.	Strategy31
		30	107	The organisation invests sufficient resources in order to achieve strategic objectives.	Strategy32
		31	74	The organisation systematically communicates strategic plans and objectives in a "top-down" fashion.	Strategy33

3. Human resources	3.1. People plans support the organisation's strategy	32	25	In developing the people strategy and plans, formal processes are used to find out employee opinions.	HR11
		33	125	Emphasis is placed on recruiting highly skilled employees required to achieve the strategic goals.	HR12
	3.2. People communicate effectively throughout the organisations	34	52	There are quality circles and/or interdepartmental teams to improve quality.	HR21
		35	45	The organisation has effective two-way communication links with its employees.	HR22
	3.3. training and education	36	32	Employees are given tailor-made preparation for their jobs and are qualified to solve quality problems.	HR31
		37	29	Employees are continuously trained in the principles of quality, team work and job-specific skills.	HR32
	3.4. employees participation	38	111	Employees are actively involved in quality-related activities and the success of the organisation.	HR41
		39	119	Employees can take decisions independently in terms of quality and end results of the product/service.	HR42
	3.5. Human resources planning and selection	40	58	The organisation has an effective recruiting process to hire employees with required capability (e.g., skills, certifications, and staffing levels).	HR51
		41	128	The organisation takes a number of approaches to explore employees' potential, and help employees to achieve their career goals.	HR52

	3.6. Employees satisfaction & work environment	42	68	The organisation carefully designs the work environment and facilities in order to maximise employee benefits and well-being.	HR61
		43	83	The organisation emphasises employees' health, safety, and well-being.	HR62
		44	60	The organisation conducts employee attitude surveys regularly.	HR63
	3.7. Performance & appreciation	45	65	leaders explicitly recognize employees' achievements at work	HR71
	3.8. Saudization	46	112	A Saudization plan is integrated in all operations undertaken by the organisation.	HR81
		47	46	The organisation's standards of work environment (e.g., promotions, training) develop national staff.	HR82
		48	113	Saudi employees are encouraged to work at jobs where the rate of Saudization is low.	HR83
4. Suppliers and partners	4.1. Selecting, assessing & improving supplier services quality	49	81	The organisation's suppliers provide technical assistance and/or in general help in some other ways to improve its products and/or services.	Suppliers11
		50	88	The organisation is prepared to form alliances with partners and collaborators in the market in an attempt to achieve competitive advantage.	Supliers12
	4.2. Managing long term partnerships & agreement	51	67	The organisation has long-term quality agreements with its suppliers.	Supliers21
	4.3. Finance are managed to secure sustain success	52	9	The organisation's work is organised in a manner that reduces and optimizes physical, economic and financial resources.	Supliers31

	4.4. Buildings, equipment, materials and natural resources are managed in a sustainable way	53	117	The organisation makes ongoing efforts to keep their facilities clean and in order.	Supliers41
	4.5. Technology is managed to support the delivery of strategy	54	71	The organisation coordinates well its strategies and its technological equipment, machinery and know-how.	Supliers51
		55	6	The organisation strives to improve operational efficiency by efficient use of technology.	Supliers52
	4.6. Focusing on local suppliers and products	56	72	There are policies in place for managing relationships with local suppliers.	Supliers61
		57	86	Verification and selection of local suppliers is implemented across the organisation.	Supliers62
		58	102	The organisation has procedures in place to make sure that local supplier outputs conform to its requirements.	Supliers63
		59	123	Preference is given to local suppliers, products and/or services.	Supliers64
	4.7. Managing Information and knowledge	60	35	The organisation creates databases and files with the information it has in order to use them and learn.	Supliers71
		61	76	There are updated quality-related data available to all members of the organisation.	Supliers72
5. Operations management	5.1. Systems of quality, environment, power, health and occupational safety management	62	77	Processes are designed and defined explicitly.	Operstions11

	63	70	All processes, procedures and products/services are assessed regularly in an attempt to drive improvement and innovation.	Operstions12
	64	10	New products and/or services are designed thoroughly and meticulously before being manufactured and marketed.	Operations13
5.2. Continuous improvement	65	20	Quality-related criteria predominate over speed and cost when developing new products/ services.	Operations21
	66	13	The different organisation departments liaise with one another during the development of new products/services.	Operstions22
	67	49	The organisation regularly asks its customers what they want from its products/services now and in the future.	Operations23
5.3. Applying recognized Saudi or (international) standard specifications	68	30	The organisation applies recognised standard specifications (e.g., Saudi or international standards).	Operations31
5.4. Customer relationships are managed and enhanced	69	108	The organisation knows which products and services fulfil its customer expectations and needs.	Operations41
	70	16	The organisation manages and enhances day to day and long term customer relationships.	Operstons42
	71	98	Standardized systems are in place to deal with customer complaints.	Operations43
5.5. Supply-Chain Management	72	36	The organisation tries to sustain long-term win-win relationship with its suppliers.	Operations51
	73	79	Suppliers participate willingly in developing new products/ services.	Operations52
	74	84	The organisation has an evaluation system for measuring performance of suppliers and alliances.	Opreations53

6. Focusing on beneficiary	6.1. Knowing beneficiaries and market	75	26	Customer and market data are being gathered systemically.	Beneficiary11
		76	94	Customer and market data are being processed into reliable information for rational decision-making.	Beneficiary12
		77	11	The organisation can quickly respond to the customer and the market's demands.	Beneficiary13
	6.2. Managing relations with beneficiaries	78	28	The organisation has a well-established policy on customer service.	Beneficiary21
		79	14	Customers' claims are settled through the customer service system as soon as possible.	Beneficiary22
		80	27	The organisation's Customer Complaints Management System is effective in settling customer complaints quickly	Beneficiary23
	6.3 Measuring and Enhancing Beneficiaries Satisfaction	81	126	Customer complaints are being systematically analysed and discussed.	Beneficiary31
		82	105	The organisation conducts customer loyalty and satisfaction surveys regularly.	Beneficiary32
7. Measurement, analysis, and knowledge management	7.1 Measurement, analysis, and improvement of organisational performance	83	103	The organisation systematically collects data and information, in order to trace, review and improve organisational performance.	MAKM11
		84	90	The organisation communicates with partners frequently regarding design changes and key factors affecting product/service quality.	MAKM12
		85	63	The organisation does well in integrating performance information with innovation.	MAKM13
		86	51	leaders in our organisation analyse data by themselves for strategic planning and decision-making.	MAKM14

		87	62	The organisation provides the results of performance data analysis to business units or departments.	MAKM15
	7.2 Knowledge management, information, and information technology	88	7	The organisation's data and information are complete, consistent, and accurate.	MAKM21
		89	17	Employees share or contribute their individual professional knowledge to the organisation's data and information.	MAKM22
		90	21	The organisation's data and information are actively used within the organisation.	MAKM23
8. Effect on society	8.1. Contributing to national development	91	66	The organisation contributes to the national economy (e.g., through investment, exporting, technology, research and development).	ESociety11
		92	92	Partnerships with local social institutions are developed in different fields (e.g., health and education).	ESociety12
	8.2. Social responsibility	93	2	The impacts and risks resulting from the organisation's products and/or services on society are well managed (e.g., waste recycling, environmental conservation, and traffic safety).	ESociety21
		94	95	The present and future customers' interests in relation to products and/or services are taken into account.	ESociety22
		95	18	The organisation demonstrates its commitment to ethical business practices.	ESociety23
		96	120	The organisation demonstrates its commitment to local and international standards for protecting the environment and recycling waste (e.g., ISO 14000 or equivalent).	ESociety24

		97	38	The senior management and its employees provide effective support for non-profit entities.	ESociety25
	8.3. Participating in society training and education	98	121	The organisation regularly sponsors social activities and events (e.g., cultural and educational events).	ESociety31
		99	55	The organisation contributes to the development of the local community through training programmes.	ESociety32
		100	99	The organisation contributes to raising the level of awareness and citizenship of society through sponsoring research and studies.	ESociety33
		101	24	The organisation supports the provision of services to persons with special needs (e.g., employment and training)	ESociety34
9. Business results	9.1. Beneficiaries' satisfaction	102	4	Customer satisfaction has improved.	BResults11
		103	96	Customer consolidation, returning customers and loyal customers have improved.	BResults12
		104	39	Communication with customers has improved.	BResults13
		105	47	Customer complaints and grievances have decreased.	BResults14
		106	56	Customer perception of the organisation has improved.	BResults15
	9.2. Financial results	107	101	Market share has improved.	BResults21
		108	41	Sales have improved.	BResults22
		109	40	Profit levels have improved.	BResults23
	9.3. Suppliers/partners	110	110	Quality of suppliers' goods or services has improved.	BResults31
		111	37	The organisation has better relationships with suppliers.	BResults32
		112	19	Delivery deadlines from suppliers have improved.	BResults33

9.4. Product and process results	113	44	Process efficiency has improved (e.g., by streamlining a organisation's core processes and minimising unneeded resources).	BResults41
	114	31	Knowledge about efficient operation management has improved.	BResults42
	115	50	Recorded time of the organisation's work has improved (e.g., productivity and order cycle).	BResults43
9.5. Human resources	116	85	Key performance indicators capturing the effectiveness and efficiency of the working environment have improved (e.g., job simplification, rotation, employee retention, internal promotion rate).	BResults51
	117	53	Key performance indicators capturing learning and development have improved (e.g., innovation, number of reasonable suggestions, and performance improvement).	BResults52
	118	114	Key performance indicators capturing employee welfare and satisfaction have improved (e.g., numbers of emergencies, employee absence).	BResults53
9.6. Investment in research & development	119	73	The organisation has good results in terms of its investment in research and development.[3]	BResults61
9.7. Exporting	120	8	The organisation has good results in terms of its exporting operations.[1]	BResults71
9.8. Society results	121	124	Protection of the environment has improved.	BResults81
	122	54	Noise levels have decreased.	BResults82
	123	87	Pollution levels have decreased.	BResults83
	124	80	The organisation has a positive impact on society.	BResults84
9.9. Leadership and governance results	125	89	Key performance indicators capturing ethical and behavioural issues in the organisation's corporate governance have improved (e.g., the number or ratio of independent directors).	BResults91

126	118	Key performance indicators capturing the financial responsibilities inside and outside the organisation have improved (e.g., the independence of auditors or the auditing department).	BResults92		
127	78	Key performance indicators capturing legal compliance and regulation have improved (e.g., environment protection, energy consumption, recycling and reuse of resources).	BResults93		
128	43	Key performance indicators capturing community support have improved (such as the number of public activities).	BResults94		

Part 2: demographic and strategy orientation questions

129	1	Please, indicate the number of your organisation's employees:	Employeesno	Ordinal	1= less than25 2= between 25-100 3= more than 100
130	2	Please, indicate one of the following sectors that better reflects your organisation's core business activity:	Sector	Nominal/ Categorical	1= Agriculture & Food Industries 2= Banks & Financial Services 3= Building & Construction 4= Cement 5= Energy & Utilities 6= Hotel & Tourism 7= Industrial Investment 8= Insurance 9= Media & Publishing 10= Multi-Investment 11= Petrochemical Industries 12= Retail

						13= Real Estate Development 14= Transport 15= Information & Communication Technology
131	3	Four types of orientation and behaviour relating to changes in markets, products, and services are listed below. No type is **better or worse** than any other. Please tick √ the box (**only one**) that corresponds more closely to your organisation.	Sorientation	Firm strategic orientation types: A: Defender B: Prospector C: Analyser D: Reactor	Nominal/ Categorical	999=missing data 1= Defender (A) 2=Prospector(B) 3=Analyser(C) 4=Reactor(D)

Table A.4.4 Reported response rate (RR) for Saudi studies.

RR (%)	Source
50	Al-Faraj, T.N. and Alidi, A.S., 1992. The practice of quality control techniques in the Saudi Arabian manufacturing sectors. *International Journal of Quality & Reliability Management*, 9(7). Available online: https://doi.org/10.1108/02656719210020441 [Accessed 13/3/2016].
25	Jannadi, O.A. and Al-Saggaf, H., 2000. Measurement of quality in Saudi Arabian service industry. *International Journal of Quality & Reliability Management*, 17(9), 949-966.
43	Al-Shetwi, M., Ramadili, S.M., Chowdury, T.H.S. and Sori, Z.M., 2011. Impact of internal audit function (IAF) on financial reporting quality (FRQ): Evidence from Saudi Arabia. *African Journal of Business Management*, 5(27), 11189-11198.
58	Magd, H.A., 2006. An investigation of ISO 9000 adoption in Saudi Arabia. *Managerial Auditing Journal*, 21(2), 132-147.

Table A.4.5 Survey Constructs - Dimensions - Indicators – References

Construct	Dimension	Indicator	Comment		Reference(s)
1. Leadership	1.1. Senior Management Orientation	1.1.1.	Long-term customer satisfaction is laid down as the organisation's mission and basic principle.		Santos-Vijande and Alvarez-Gonzalez (2007)
		1.1.2.	Leaders pinpoint the factors that lead to a need for change and pre-empt change needed in the organisation.	Original: "Leaders pre-empt change needed in the organisation and pinpoint the factors that lead to a need for change."	
		1.1.3.	Leaders provide a plan detailing the different stages of change, and secure the investment, resources and support needed to achieve change.		
		1.1.4.	Leaders allocate resources for continuous improvement of the management system.		
		1.1.5.	Leaders interact with customers and keep in mind their contributions when designing goods and/or services.		
		1.1.6.	Leaders always bear in mind stakeholder groups.		
		1.1.7	Leaders activities seek to provide value for the community and protect the environment.		
		1.1.8.	Leaders listen and support employees and encourage them to take part in deciding and managing total quality policies and plans.		
	1.2. Organisational Performance Auditing	1.2.1	Leaders personally assess the application and progress of total quality principles.		
		1.2.2.	Leaders measure and review the effectiveness of organisational change and share the knowledge that is obtained.		
	1.3. Encouraging & Promoting Culture of Quality	1.3.1.	Leaders take on the responsibility for developing quality oriented management systems.	Deleted: organisational	
		1.3.2.	Leaders acknowledge and reward employees' contributions to improving quality.	Replaced bettering with improving	
	1.4 Governance and social responsibility	1.4.1.	Leaders create an organisational environment that follows the legal and ethical requirements.	Replaced Senior executives with leaders	He et al. (2011)
		1.4.2.	Leaders create an organisational environment of empowerment, innovation, and learning.		
		1.4.3.	Leaders periodically evaluate organisational performance and the progress of business objectives, and transform evaluations into action plans.		

		1.4.4.	The organisation's governance mechanism warrants management's behaviours to the interests of the organisation, shareholders, and other stakeholders.	Replaced our with the replaced company with organisation	
		1.4.5.	Our top management participates and encourages employee involvement in quality improvement activities.		
		1.4.6.	Leaders predict and take actions to reduce possible impacts on the public and environment, due to questionable products, services, and operations.	Replaced Senior executives with leaders	
		1.4.7.	Leaders proactively participate in community services, medical care, education and environmental protection.		
		1.4.8.	The organisation emphasises building long-term partnerships with suppliers.	Replaced our with the replaced company with organisation	
2. Strategic planning	2.1. Strategic planning management process	2.1.1.	The organisation develops corporate strategic plans based upon analysing key operational factors and relative data.	Replaced our company with the organisation	He et al. (2011)
		2.1.2	The organisation creates clear strategic plans, objectives and timetables for product/service quality improvement.	Replaced our company with the organisation	
		2.1.3.	Employees can feed back their opinions to strategic plans and business objectives.		
		2.1.4.	Strategic objectives can balance all stakeholders' requirements.	Deleted: face challenges	
	2.2. Strategic goals & action plan	2.2.1.	Organisational processes and their interrelationships are identified.	Added: (e.g., by translating strategies into aligned processes, projects and organisational structures).	Bou-Llusar, et al. (2009)
		2.2.2.	Quality policies are translated into a set of specific and measurable objectives.		
		2.2.3.	Leaders inform employees about the organisation's quality strategy.	Added: organisation	
		2.2.4.	Every member in the organisation knows the organisational mission and objectives.		

	2.3. Research and development	2.3.1.	The organisation uses key performance indicators (KPIs) to trace the deployment of strategic objectives, and compares its KPIs with that of competitors or other benchmarks.	Replaced our company with the organisation Replaced our KPIs with its KPIs Added: other	He et al. (2011)
		2.3.2.	The organisation invests sufficient resources in order to achieve strategic objectives.	Replaced our company with the organisation	
		2.3.3.	The organisation systematically communicates strategic plans and objectives in a "top-down" fashion.	Replaced our company with the organisation	
3. Human resources	3.1. People plans support the organisation's strategy	3.1.1.	In developing the people strategy and plans, formal processes are used to find out employee opinions.	Added: In developing the people strategy and plans Deleted: such as attitude surveys or employee briefing	Bou-Llusar, et al. (2009)
		3.1.2.	Emphasis is placed on recruiting highly skilled employees required to achieve the strategic goals.	Added: required to achieve the strategic goals.	
	3.2. People communicate effectively throughout the organisations	3.2.1.	There are quality circles and/or interdepartmental teams to improve quality.		Santos-Vijande and Alvarez-Gonzalez (2007
		3.2.2.	The organisation has effective two-way communication links with its employees.	Replaced company with organisation	
	3.3. training and education	3.3.1.	Employees are given tailor-made preparation for their jobs and are qualified to solve quality problems.		Santos-Vijande and Alvarez-Gonzalez (2007
		3.3.2.	Employees are continuously trained in the principles of quality, team work and job-specific skills.	Replaced staff with employees	
	3.4. employees participation	3.4.1.	Employees are actively involved in quality-related activities and the success of the organisation.	Deleted: and many of their suggestions are implemented Replaced company with organisation	Santos-Vijande and Alvarez-Gonzalez (2007

		3.4.2.	Employees can take decisions independently in terms of quality and end results of the product/service.	Original: Employees are responsible for quality and end results of the product/service. They can take decisions independently	
	3.5. Human resources planning and selection	3.5.1.	The organisation has an effective recruiting process to hire employees with required capability (e.g., skills, certifications, and staffing levels).	Replaced we with the organisation Replaced techniques with capability Added: (e.g., skills, certifications, and staffing levels).	He et al. (2011)
		3.5.2.	The organisation takes a number of approaches to explore employees' potential, and help employees to achieve their career goals.	Replaced we with the organisation	
	3.6. Employees satisfaction & work environment*	3.6.1.	The organisation carefully designs the work environment and facilities in order to maximise employee benefits and well-being.	Replaced company with organisation	Xiang, et al. (2010)
		3.6.2.	The organisation emphasises employees' health, safety, and well-being.		
		3.6.3.	The organisation conducts employee attitude surveys regularly.		
	3.7. Performance & appreciation	3.7.1.	Leaders explicitly recognize employees' achievements at work.		Bou-Llusar, et al. (2009)
	3.8. Saudization	3.8.1.	A Saudization plan is integrated in all operations undertaken by my the organisation.		KAQA (2011)
		3.8.2.	The organisation's standards of work environment (e.g., promotions, training) develop national staff.		
		3.8.3.	Saudi employees are encouraged to work at jobs where the rate of Saudization is low.		

4. Suppliers and partners	4.1. Selecting, assessing & improving supplier services quality	4.1.1.	The organisation's suppliers provide technical assistance and/or in general help in some other ways to improve its products and/or services.	Original: "Our suppliers help to improve our products and/or services and also provide technical assistance"	Santos-Vijande and Alvarez-Gonzalez (2007)
		4.1.2.	The organisation is prepared to form alliances with partners and collaborators in the market in an attempt to achieve competitive advantage.	Replaced company with organisation	
	4.2. Managing long term partnerships & agreement	4.2.1.	The organisation has long-term quality agreements with its suppliers.	Original: "We have close, long-term relationships with our supplies designed to resolve quality-related problems."	
	4.3. Finance are managed to secure sustain success	4.3.1.	The organisation's work is organised in a manner that reduces and optimizes physical, economic and financial resources.	Added: the organisation Replaced around with in a manner that	
	4.4. Buildings, equipment, materials and natural resources are managed in a sustainable way	4.4.1.	The organisation makes ongoing efforts to keep their facilities clean and in order.	Replaced our company with the organisation	
	4.5. Technology is managed to support the delivery of strategy	4.5.1.	The organisation coordinates well its strategies and its technological equipment, machinery and know-how.	Added: well Replaced our company with the organisation	
		4.5.2.	The organisation strives to improve operational efficiency by efficient use of technology.	Replaced our company with the organisation	
	4.6. Focusing on local suppliers and products	4.6.1.	There are policies in place for managing relationships with local suppliers.	Original: "The organisation focuses on local suppliers and local products through	KAQA (2011)
		4.6.2.	Verification and selection of local suppliers is implemented across the organisation.		

		4.6.3.	The organisation has procedures in place to make sure that local supplier outputs conform to its requirements.	effective selecting and assessing procedures." due to the inadequate reliability of this item, it was replaced with these items	
		4.6.4.	Preference is given to local suppliers, products and/or services.		
	4.7. Managing Information and knowledge	4.7.1.	The organisation creates databases and files with the information it has in order to use them and learn.	Replaced analyze with use them Replaced our company with the organisation	Santos-Vijande and Alvarez-Gonzalez (2007)
		4.7.2.	There are updated quality-related data available to all members of the organisation.		
5. Operations management	5.1. Systems of quality, environment, power, health and occupational safety management	5.1.1.	Processes are designed and defined explicitly.	Deleted: ensuring that skills and capacities are right for company needs.	Santos-Vijande and Alvarez-Gonzalez (2007)
		5.1.2.	All processes, procedures and products/services are assessed regularly in an attempt to drive improvement and innovation.	Replaced bring in change and improvement with drive improvement Added: services	
		5.1.3.	New products and/or services are designed thoroughly and meticulously before being manufactured and marketed.	Deleted: so as to ensure that customers' present and future expectations are met.	
	5.2. Continuous improvement	5.2.1.	Quality-related criteria predominate over speed and cost when developing new products/ services.	Added: services	
		5.2.2.	The different company departments liaise with one another during the development of new products/services.	Added: with one another	
		5.2.3.	The organisation regularly asks its customers what they want from its products/services now and in the future.	Replaced we, client with the organisation, customer, respectively	
	5.3. Applying recognized Saudi or (international) standard specifications	5.3.1	The company applies recognised standard specifications (e.g., Saudi or international standards).		KAQA (2011)

	5.4. Customer relationships are managed and enhanced	5.4.1.	The organisation knows which products and services fulfil its customer expectations and needs.	Original: "The organisation knows which products/ services its customers' need".	Bou-Llusar, et al. (2009)
		5.4.2.	The organisation manages and enhances day to day and long term customer relationships.	Original: "The organisation is oriented towards the fulfilment of customer expectations and needs".	
		5.4.3.	Standardized systems are in place to deal with customer complaints.		
	5.5. Supply-Chain Management	5.5.1.	The organisation tries to sustain the long-term win-win relationship with its suppliers.	Added: its Replaced our company with the organisation	Xiang, et al. (2010)
		5.5.2.	Suppliers participate willingly in developing new products/ services.		
		5.5.3	The organisation has an evaluation system for measuring performance of suppliers and alliances.	Replaced our company with the organisation Added: measuring	
6. Focusing on beneficiary	6.1. Knowing beneficiaries and market	6.1.1.	Customer and market data are being gathered systemically.		Xiang, et al. (2010)
		6.1.2.	Customer and market data are being processed into reliable information for rational decision-making.		
		6.1.3.	The organisation can quickly respond to the customer and the market's demands.	Replaced our company with the organisation	
	6.2. Managing relations with beneficiaries	6.2.1.	The organisation has a well-established policy on customer service.	Replaced our company with the organisation	
		6.2.2.	Customers' claims are settled through the customer service system as soon as possible.		
		6.2.3.	The organisation's Customer Complaints Management System is effective in settling customer complaints quickly	Replaced company with organisation	

	6.3 Measuring and Enhancing Beneficiaries Satisfaction	6.3.1.	Customer complaints are being systematically analysed and discussed.		
		6.3.2.	The organisation conducts customer' loyalty and satisfaction surveys regularly.	Replaced our company with the organisation	
7. Measurement, analysis, and knowledge management	7.1 Measurement, analysis, and improvement of organisational performance	7.1.1.	The organisation systematically collects data and information, in order to trace, review and improve organisational performance.	Replaced our company with the organisation	He et al. (2011)
		7.1.2.	The organisation communicates with partners frequently regarding design changes and key factors affecting product/service quality.		
		7.1.3.	The organisation does well in integrating performance information with innovation.		
		7.1.4.	Leaders in our company analyse data by themselves for strategic planning and decision-making.	Replaced Senior executives with leaders	
		7.1.5.	The organisation provides the results of performance data analysis to business units or departments.	Replaced our company with the organisation	
	7.2 Knowledge management, information, and information technology	7.2.1.	The company's data and information are complete, consistent, and accurate.	Original: "The information systems' congestion and redundancy is excluded by integrated information system implementation".	Xiang, et al. (2010)
		7.2.2.	Employees share or contribute their individual professional knowledge to the organisation's data and information.	Replaced save their personal with share or contribute their individual Replaced the knowledge management system with the organisation's data and information	
		7.2.3.	The organisation's data and information are actively used within the organisation.	Replaced the knowledge management system with the organisation's data and information	

8. Effect on the society	8.1. Contributing to national development	8.1.1.	The company contributes to the national economy (e.g., through investment, exporting, technology, research and development).		
		8.1.2.	Partnerships with local social institutions are developed in different fields (e.g., health and education).		
	8.2. Social responsibility	8.2.1.	The impacts and risks resulting from the organisation's products and/or services on society are well managed (e.g., waste recycling, environmental conservation and traffic safety).		
		8.2.2.	The present and future costumer’s interests in relation to products and/or services are taken into account.		
		8.2.3.	The organisation demonstrates its commitment to ethical business practices.		
		8.2.4.	The organisation demonstrates its commitment to local and international standards for protecting the environment and recycling waste (e.g., ISO 14000 or equivalent).		
		8.2.5.	The senior management and its employees provide effective support for non-profit entities.		
	8.3. Participating in society training and education	8.3.1.	The organisation regularly sponsors social activities and events (e.g., cultural and educational events).		
		8.3.2.	The organisation contributes to the development of the local community through training programmes.		
		8.3.3.	The organisation contributes to raising the level of awareness and citizenship of society through sponsoring research and studies.		
		8.3.4.	The organisation supports the provision of services to persons with special needs (e.g., employment and training).		

9. Business results	9.1. Beneficiaries' satisfaction	9.1.1.	Customer satisfaction has improved.	Replaced client with customer	Santos-Vijande and Alvarez-Gonzalez (2007)
		9.1.2.	Customer consolidation, returning customers and loyal customers have improved.		
		9.1.3.	Communication with customers has improved.		
		9.1.4.	Customer complaints and grievances have decreased.		
		9.1.5.	Customer perception of the organisation has improved.		
	9.2. Financial results	9.2.1.	Market share has improved.		
		9.2.2.	Sales have improved.		
		9.2.3.	Profit levels have improved.	Added: levels	
	9.3. Suppliers/partners	9.3.1.	Quality of suppliers' goods or services has improved.	Added: or services	
		9.3.2.	The organisation has better relationships with suppliers.	Replaced our company with the organisation	
		9.3.3.	Delivery deadlines from suppliers have improved.		
	9.4. Product and process results	9.4.1.	Process efficiency has improved (e.g., by streamlining a company's core processes and minimising unneeded resources).	Added: (e.g., by streamlining a company's core processes and minimising unneeded resources)	Bou-Llusar, et al. (2009)
		9.4.2.	Knowledge about efficient operation management has improved.		
		9.4.3.	Recorded time of the organisation's work has improved (e.g., productivity and order cycle).	Added: of the organisation's work, (e.g., productivity and order cycle).	

9.5. Human resources	9.5.1.	Key performance indicators capturing the effectiveness and efficiency of working environment have improved (e.g.,, job simplification, rotation, employee retention, inside promotion rate).	Replaced (relevant to, position, position changeover, inside) with (capturing, job, rotation, internal) respectively In footnote: Key Performance Indicators capture the success of an organisation or of a particular activity in which it engages.	He et al. (2011)
	9.5.2.	Key performance indicators capturing learning and development have improved (such as innovation rate, number of reasonable suggestions, and performance improvement).	Replaced relevant to with capturing	
	9.5.3.	Key performance indicators capturing employee welfare and satisfaction have improved (such as numbers of emergencies, employee absence).	Replaced relevant to with capturing Deleted: employee	
9.6. Investment in research & development	9.6.1.	The organisation has good results in terms of its investment in research and development.	In footnote: For example: the ratio of funds assigned to research and development, the number of new products/services, productivity and the level of added value of the products.	KAQA (2011)
9.7. Exporting	9.7.1.	The organisation has good results in terms of its exporting operations.	Footnote: For example: the ratio of production it plans to export, the diversity of exporting markets, volume of exports, and the contribution of exporting operations towards organisation development.	

	9.8. Society results	9.8.1.	Protection of the environment has improved		Bou-Llusar, et al. (2009)
		9.8.2.	Noise levels have decreased.		
		9.8.3.	Pollution levels have decreased.		
		9.8.4.	The organisation has a positive impact on society.		
	9.9. Leadership and governance results	9.9.1.	Key performance indicators capturing ethical and behavioural issues in the organisation's corporate governance have improved (such as the number of ratio of independent directors).	Added: organisation Replaced the rate with the number of ratio Replaced relevant to with capturing	He et al. (2011)
		9.9.2.	Key performance indicators capturing the financial responsibilities inside and outside the organisation have improved (e.g.,, the independence of auditors or the auditing department).	Added: organisation Replaced relevant to with capturing	
		9.9.3.	Key performance indicators capturing legal compliance and regulations have improved (e.g.,, environment protection, energy consumption, recycling and reuse of resources).	Added: compliance Replaced relevant to with capturing	
		9.9.4.	Key performance indicators capturing community support have improved (such as the number of public activities).	Replaced relevant to with capturing	

A.5 Appendices Chapter 5

Appendix A.5

Table A.5.1 Missing data values analysis (Univariate descriptive statistics)

Variable	Number of cases	Missing Data	
		Number	Percent
Leader11	233	2	.9
Leader12	234	1	.4
Leader13	233	2	.9
Leader14	233	2	.9
Leader15	231	4	1.7
Leader16	233	2	.9
Leader17	233	2	.9
Leader18	234	1	.4
Leader21	234	1	.4
Leader22	234	1	.4
Leader31	234	1	.4
Leader32	233	2	.9
Leader41	234	1	.4
Leader42	234	1	.4
Leader43	235	0	0.0
Leader44	234	1	.4
Leader45	234	1	.4
Leader46	234	1	.4
Leader47	231	4	1.7
Leader48	234	1	.4
Strategy11	233	2	.9
Strategy12	235	0	0.0
Strategy13	232	3	1.3
Strategy14	234	1	.4
Strategy21	233	2	.9
Strategy22	234	1	.4
Strategy23	232	3	1.3
Strategy24	233	2	.9
Strategy31	233	2	.9
Strategy32	234	1	.4
Strategy33	233	2	.9
HR11	234	1	.4
HR12	233	2	.9
HR21	235	0	0.0
HR22	233	2	.9
HR31	232	3	1.3
HR32	233	2	.9
HR41	233	2	.9
HR42	234	1	.4
HR51	235	0	0.0
HR52	232	3	1.3
HR61	235	0	0.0
HR62	235	0	0.0
HR63	233	2	.9
HR71	235	0	0.0
HR81	235	0	0.0
HR82	234	1	.4
HR83	235	0	0.0
Suppliers11	234	1	.4
Supliers12	234	1	.4
Supliers21	234	1	.4
Supliers31	235	0	0.0

Supliers41	233	2	.9
Supliers51	234	1	.4
Supliers52	234	1	.4
Supliers61	233	2	.9
Supliers62	234	1	.4
Supliers63	234	1	.4
Supliers64	234	1	.4
Supliers71	233	2	.9
Supliers72	232	3	1.3
Operstions11	233	2	.9
Operstions12	235	0	0.0
Operations13	234	1	.4
Operations21	235	0	0.0
Operstions22	232	3	1.3
Operations23	235	0	0.0
Operations31	233	2	.9
Operations41	234	1	.4
Operstons42	235	0	0.0
Operations43	234	1	.4
Operations51	235	0	0.0
Operations52	233	2	.9
Opreations53	234	1	.4
Beneficiary11	235	0	0.0
Beneficiary12	235	0	0.0
Beneficiary13	234	1	.4
Beneficiary21	235	0	0.0
Beneficiary22	233	2	.9
Beneficiary23	235	0	0.0
Beneficiary31	233	2	.9
Beneficiary32	234	1	.4
MAKM11	232	3	1.3
MAKM12	234	1	.4
MAKM13	235	0	0.0
MAKM14	235	0	0.0
MAKM15	234	1	.4
MAKM21	235	0	0.0
MAKM22	235	0	0.0
MAKM23	233	2	.9
ESociety11	235	0	0.0
ESociety12	234	1	.4
ESociety21	234	1	.4
ESociety22	234	1	.4
ESociety23	235	0	0.0
ESociety24	233	2	.9
ESociety25	234	1	.4
ESociety31	233	2	.9
ESociety32	234	1	.4
ESociety33	234	1	.4
ESociety34	233	2	.9
BResults11	234	1	.4
BResults12	234	1	.4
BResults13	234	1	.4
BResults14	234	1	.4
BResults15	234	1	.4
BResults21	233	2	.9
BResults22	233	2	.9
BResults23	234	1	.4
BResults31	233	2	.9
BResults32	235	0	0.0
BResults33	235	0	0.0

BResults41	234	1	.4
BResults42	233	2	.9
BResults43	235	0	0.0
BResults51	234	1	.4
BResults52	235	0	0.0
BResults53	233	2	.9
BResults61	233	2	.9
BResults71	234	1	.4
BResults81	233	2	.9
BResults82	234	1	.4
BResults83	234	1	.4
BResults84	234	1	.4
BResults91	235	0	0.0
BResults92	233	2	.9
BResults93	233	2	.9
BResults94	232	3	1.3
Employees no	235	0	.0
Sector	235	0	.0
Strategic orientation	235	0	.0

Table A.5.2 Missing data values analysis (Univariate descriptive statistics) for reduced sample (233 cases)

Variable	Number of cases	Missing Data	
		Number	Per cent
Leader11	231	2	.9
Leader12	232	1	.4
Leader13	232	1	.4
Leader14	232	1	.4
Leader15	231	2	.9
Leader16	231	2	.9
Leader17	232	1	.4
Leader18	233	0	0.0
Leader21	233	0	0.0
Leader22	232	1	.4
Leader31	233	0	0.0
Leader32	232	1	.4
Leader41	233	0	0.0
Leader42	233	0	0.0
Leader43	233	0	0.0
Leader44	232	1	.4
Leader45	232	1	.4
Leader46	233	0	0.0
Leader47	230	3	1.3
Leader48	233	0	0.0
Strategy11	233	0	0.0
Strategy12	233	0	0.0
Strategy13	231	2	.9
Strategy14	232	1	.4
Strategy21	232	1	.4
Strategy22	232	1	.4
Strategy23	232	1	.4
Strategy24	233	0	0.0
Strategy31	233	0	0.0
Strategy32	233	0	0.0
Strategy33	233	0	0.0
HR11	233	0	0.0
HR12	232	1	.4
HR21	233	0	0.0

HR22	233	0	0.0
HR31	231	2	.9
HR32	231	2	.9
HR41	233	0	0.0
HR42	232	1	.4
HR51	233	0	0.0
HR52	231	2	.9
HR61	233	0	0.0
HR62	233	0	0.0
HR63	232	1	.4
HR71	233	0	0.0
HR81	233	0	0.0
HR82	233	0	0.0
HR83	233	0	0.0
Suppliers11	233	0	0.0
Supliers12	232	1	.4
Supliers21	232	1	.4
Supliers31	233	0	0.0
Supliers41	232	1	.4
Supliers51	233	0	0.0
Supliers52	233	0	0.0
Supliers61	233	0	0.0
Supliers62	233	0	0.0
Supliers63	233	0	0.0
Supliers64	233	0	0.0
Supliers71	232	1	.4
Supliers72	231	2	.9
Operstions11	232	1	.4
Operstions12	233	0	0.0
Operations13	233	0	0.0
Operations21	233	0	0.0
Operstions22	231	2	.9
Operations23	233	0	0.0
Operations31	232	1	.4
Operations41	233	0	0.0
Operstons42	233	0	0.0
Operations43	233	0	0.0
Operations51	233	0	0.0
Operations52	232	1	.4
Opreations53	233	0	0.0
Beneficiary11	233	0	0.0
Beneficiary12	233	0	0.0
Beneficiary13	233	0	0.0
Beneficiary21	233	0	0.0
Beneficiary22	232	1	.4
Beneficiary23	233	0	0.0
Beneficiary31	232	1	.4
Beneficiary32	233	0	0.0
MAKM11	231	2	.9
MAKM12	232	1	.4
MAKM13	233	0	0.0
MAKM14	233	0	0.0
MAKM15	233	0	0.0
MAKM21	233	0	0.0
MAKM22	233	0	0.0
MAKM23	231	2	.9
ESociety11	233	0	0.0
ESociety12	233	0	0.0
ESociety21	233	0	0.0
ESociety22	233	0	0.0

ESociety23	233	0	0.0
ESociety24	232	1	.4
ESociety25	233	0	0.0
ESociety31	232	1	.4
ESociety32	233	0	0.0
ESociety33	232	1	.4
ESociety34	233	0	0.0
BResults11	232	1	.4
BResults12	233	0	0.0
BResults13	233	0	0.0
BResults14	233	0	0.0
BResults15	232	1	.4
BResults21	232	1	.4
BResults22	233	0	0.0
BResults23	233	0	0.0
BResults31	233	0	0.0
BResults32	233	0	0.0
BResults33	233	0	0.0
BResults41	233	0	0.0
BResults42	232	1	.4
BResults43	233	0	0.0
BResults51	233	0	0.0
BResults52	233	0	0.0
BResults53	232	1	.4
BResults61	233	0	0.0
BResults71	232	1	.4
BResults81	232	1	.4
BResults82	233	0	0.0
BResults83	233	0	0.0
BResults84	233	0	0.0
BResults91	233	0	0.0
BResults92	232	1	.4
BResults93	232	1	.4
BResults94	231	2	.9
Employees no	233	0	0.0
Sector	233	0	0.0
Strategic orientation	233	0	0.0

Table A.5.3 Comparing the estimates of the mean across different imputation method

Question	Listwise	All available	EM	Mean replacement
Leader11	5.85	5.85	5.84	5.85
Leader12	5.81	5.81	5.81	5.81
Leader13	5.79	5.78	5.78	5.78
Leader14	5.68	5.69	5.68	5.69
Leader15	5.73	5.73	5.72	5.73
Leader16	5.77	5.76	5.76	5.76
Leader17	5.35	5.34	5.34	5.34
Leader18	5.53	5.52	5.52	5.52
Leader21	5.21	5.19	5.19	5.19
Leader22	5.53	5.51	5.50	5.51
Leader31	5.60	5.58	5.58	5.58
Leader32	5.63	5.64	5.64	5.64
Leader41	5.85	5.87	5.87	5.87
Leader42	5.48	5.47	5.47	5.47
Leader43	5.59	5.57	5.57	5.57
Leader44	5.53	5.53	5.53	5.53
Leader45	5.31	5.36	5.36	5.36
Leader46	5.39	5.41	5.41	5.41
Leader47	5.22	5.21	5.21	5.21
Leader48	5.60	5.60	5.60	5.60
Strategy11	5.70	5.70	5.70	5.70
Strategy12	5.68	5.69	5.69	5.69
Strategy13	5.54	5.55	5.56	5.55
Strategy14	5.39	5.37	5.37	5.37
Strategy21	5.34	5.35	5.35	5.35
Strategy22	5.65	5.65	5.65	5.65
Strategy23	5.64	5.63	5.64	5.63
Strategy24	5.37	5.33	5.33	5.33
Strategy31	5.81	5.78	5.78	5.78
Strategy32	5.70	5.68	5.68	5.68
Strategy33	5.53	5.52	5.52	5.52
HR11	5.10	5.06	5.06	5.06
HR12	5.34	5.34	5.33	5.34
HR21	5.14	5.18	5.18	5.18
HR22	5.30	5.28	5.28	5.28
HR31	5.21	5.17	5.18	5.17
HR32	5.26	5.21	5.23	5.21
HR41	5.17	5.16	5.16	5.16
HR42	4.76	4.72	4.73	4.72
HR51	5.40	5.39	5.39	5.39
HR52	5.15	5.13	5.14	5.13
HR61	5.18	5.15	5.15	5.15
HR62	5.46	5.45	5.45	5.45

HR63	5.03	5.03	5.02	5.03
HR71	5.45	5.44	5.44	5.44
HR81	5.39	5.36	5.36	5.36
HR82	5.36	5.35	5.35	5.35
HR83	5.30	5.31	5.31	5.31
Suppliers11	5.53	5.53	5.53	5.53
Supliers12	5.36	5.36	5.35	5.36
Supliers21	5.29	5.25	5.25	5.25
Supliers31	5.54	5.56	5.56	5.56
Supliers41	5.76	5.77	5.78	5.77
Supliers51	5.60	5.59	5.59	5.59
Supliers52	5.72	5.71	5.71	5.71
Supliers61	4.39	4.39	4.39	4.39
Supliers62	5.56	5.54	5.54	5.54
Supliers63	5.47	5.46	5.46	5.46
Supliers64	5.56	5.55	5.55	5.55
Supliers71	5.59	5.58	5.58	5.58
Supliers72	5.17	5.19	5.18	5.19
Operstions11	5.53	5.50	5.50	5.50
Operstions12	5.50	5.50	5.50	5.50
Operations13	5.70	5.72	5.72	5.72
Operations21	5.33	5.32	5.32	5.32
Operstions22	5.55	5.57	5.56	5.57
Operations23	5.41	5.43	5.43	5.43
Operations31	5.80	5.75	5.76	5.75
Operations41	5.76	5.71	5.71	5.71
Operstons42	5.69	5.70	5.70	5.70
Operations43	5.79	5.76	5.76	5.76
Operations51	5.62	5.61	5.61	5.61
Operations52	5.18	5.18	5.17	5.18
Opreations53	5.15	5.10	5.10	5.10
Beneficiary11	5.54	5.51	5.51	5.51
Beneficiary12	5.41	5.44	5.44	5.44
Beneficiary13	5.39	5.39	5.39	5.39
Beneficiary21	5.63	5.63	5.63	5.63
Beneficiary22	5.65	5.66	5.67	5.66
Beneficiary23	5.57	5.56	5.56	5.56
Beneficiary31	5.55	5.56	5.56	5.56
Beneficiary32	5.46	5.45	5.45	5.45
MAKM11	4.88	4.86	4.87	4.86
MAKM12	4.70	4.69	4.69	4.69
MAKM13	4.70	4.66	4.66	4.66
MAKM14	4.90	4.88	4.88	4.88
MAKM15	5.42	5.42	5.42	5.42
MAKM21	4.80	4.79	4.79	4.79

MAKM22	4.58	4.58	4.58	4.58
MAKM23	4.95	4.94	4.94	4.94
ESociety11	5.63	5.63	5.63	5.63
ESociety12	5.50	5.49	5.49	5.49
ESociety21	5.41	5.42	5.42	5.42
ESociety22	5.75	5.75	5.75	5.75
ESociety23	5.86	5.88	5.88	5.88
ESociety24	5.53	5.56	5.57	5.56
ESociety25	5.38	5.38	5.38	5.38
ESociety31	5.56	5.56	5.56	5.56
ESociety32	5.35	5.35	5.35	5.35
ESociety33	5.20	5.20	5.20	5.20
ESociety34	5.39	5.39	5.39	5.39
BResults11	5.59	5.60	5.61	5.60
BResults12	5.60	5.60	5.60	5.60
BResults13	5.68	5.68	5.68	5.68
BResults14	5.61	5.60	5.60	5.60
BResults15	5.62	5.63	5.63	5.63
BResults21	5.60	5.61	5.62	5.61
BResults22	5.58	5.58	5.58	5.58
BResults23	5.43	5.44	5.44	5.44
BResults31	5.58	5.58	5.58	5.58
BResults32	5.52	5.53	5.53	5.53
BResults33	5.46	5.45	5.45	5.45
BResults41	5.45	5.46	5.46	5.46
BResults42	5.54	5.53	5.53	5.53
BResults43	5.46	5.42	5.42	5.42
BResults51	5.42	5.39	5.39	5.39
BResults52	5.26	5.27	5.27	5.27
BResults53	5.30	5.31	5.31	5.31
BResults61	5.32	5.34	5.34	5.34
BResults71	5.11	5.13	5.12	5.13
BResults81	4.54	4.57	4.56	4.57
BResults82	4.81	4.80	4.80	4.80
BResults83	4.89	4.89	4.89	4.89
BResults84	5.25	5.29	5.29	5.29
BResults91	5.46	5.47	5.47	5.47
BResults92	5.60	5.61	5.62	5.61
BResults93	5.33	5.34	5.35	5.34
BResults94	5.09	5.10	5.10	5.10

Table A.5.4 Univariate outlier detection results

Question	Cases with standardized values exceeding -/+3.29		
Leader11	33	122	167
Leader12	122		
Leader13	33		
Leader14	--		
Leader15	34		
Leader16	--		
Leader17	--		
Leader18	--		
Leader21	--		
Leader22	--		
Leader31	221		
Leader32	204		
Leader41	--		
Leader42	--		
Leader43	--		
Leader44	167	221	
Leader45	--		
Leader46	202	221	
Leader47	--		
Leader48	--		
Strategy11	221		
Strategy12	138	221	
Strategy13	--		
Strategy14	--		
Strategy21	--		
Strategy22	--		
Strategy23	--		
Strategy24	--		
Strategy31	--		
Strategy32	--		
Strategy33	--		
HR11	17	122	221
HR12	--		
HR21	--		
HR22	--		
HR31	--		
HR32	--		
HR41	14	162	221
HR42	--		
HR51	--		
HR52	122		
HR61	--		
HR62	--		
HR63	--		
HR71	--		

HR81	--		
HR82	--		
HR83	--		
Suppliers11	--		
Supliers12	--		
Supliers21	--		
Supliers31	16		
Supliers41	--		
Supliers51	--		
Supliers52	--		
Supliers61	--		
Supliers62	--		
Supliers63	122	176	221
Supliers64	77	122	
Supliers71	--		
Supliers72	33	122	221
Operstions11	--		
Operstions12	121		
Operations13	202		
Operations21	--		
Operstions22	--		
Operations23	--		
Operations31	--		
Operations41	--		
Operstons42	--		
Operations43	--		
Operations51	202		
Operations52	--		
Opreations53	--		
Beneficiary11	--		
Beneficiary12	--		
Beneficiary13	202		
Beneficiary21	176		
Beneficiary22	--		
Beneficiary23	--		
Beneficiary31	--		
Beneficiary32	--		
MAKM11	--		
MAKM12	132		
MAKM13			
MAKM14	--		
MAKM15	34	117	122
MAKM21	--		
MAKM22	--		
MAKM23	--		
ESociety11	118		
ESociety12	221		

ESociety21	--			
ESociety22	--			
ESociety23	--			
ESociety24	--			
ESociety25	--			
ESociety31	--			
ESociety32	--			
ESociety33	--			
ESociety34	--			
BResults11	--			
BResults12	64			
BResults13	--			
BResults14	--			
BResults15	--			
BResults21	--			
BResults22	--			
BResults23	--			
BResults31	--			
BResults32	--			
BResults33	--			
BResults41	--			
BResults42	--			
BResults43	16	102	105	176
BResults51	--			
BResults52	--			
BResults53	--			
BResults61	--			
BResults71	--			
BResults81	--			
BResults82	164	202		
BResults83	--			
BResults84	--			
BResults91	16	159		
BResults92	16	176	221	
BResults93	--			
BResults94	--			

Table A.5.5 Multivariate outlier detection results

Case No.	Mahalanobis Distance		Cooks Distance
	D^2	D^2/df	
1	128.5407	1.004224	0.00728
2	91.22565	0.7127	0.00137
3	144.055	1.12543	0.03251
4	154.0992	1.2039	0.00093
5	98.24981	0.767577	0.00426
6	139.071	1.086492	0.02173
7	148.419	1.159523	0.00325
8	111.2555	0.869184	0.00043
9	124.7853	0.974885	0.0002
10	113.7158	0.888405	0.00126
11	114.6979	0.896077	0.00188
12	130.3279	1.018187	0.00838
13	121.7655	0.951293	0.03006
14	146.7357	1.146373	0.00188
15	102.4167	0.80013	0.00013
16	155.9258	1.21817	0.03709
17	146.5285	1.144754	0.02059
18	111.2116	0.868841	0.00794
19	131.6591	1.028587	0.00804
20	139.5472	1.090213	0.00638
21	153.5502	1.199611	0.03492
22	88.21729	0.689198	0.01018
23	110.7113	0.864932	0.00078
24	116.5832	0.910806	0.00627
25	93.39711	0.729665	0.00078
26	101.086	0.789735	0.00169
27	135.0783	1.055299	0.00287
28	95.19117	0.743681	0.00957
29	118.0636	0.922372	0.01298
30	150.8856	1.178794	0
31	128.6917	1.005404	0.00024
32	117.8963	0.921064	0.00496
33	187.2906	1.463208	0.12345
34	140.7572	1.099666	0.00228
35	105.319	0.822804	0.0017
36	142.2233	1.111119	0.06867
37	127.7823	0.998299	0.0005
38	99.18573	0.774889	0.00109
39	104.8748	0.819334	0.00092
40	115.4084	0.901628	0.00065
41	131.8893	1.030385	0.00002
42	145.8382	1.139361	0.0237
43	102.6645	0.802066	0.00044
44	131.3693	1.026323	0.00804
45	121.0043	0.945346	0.01444
46	106.9352	0.835431	0.00967
47	123.7239	0.966593	0.01154
48	135.4803	1.05844	0.01079
49	126.6007	0.989068	0.00141
50	130.8028	1.021897	0.00032
51	111.8099	0.873515	0.00616
52	112.7676	0.880997	0.00059
53	96.59602	0.754656	0.01123
54	117.1879	0.91553	0.00613
55	109.9574	0.859043	0.00066
56	115.55	0.902735	0.01646

57	132.1155	1.032153	0.00565
58	110.0436	0.859715	0.0005
59	124.4236	0.97206	0.00497
60	121.9396	0.952653	0.03965
61	99.71662	0.779036	0.00144
62	113.4652	0.886447	0.0118
63	154.6111	1.2079	0.06967
64	164.7554	1.287152	0.03968
65	128.8289	1.006476	0.0002
66	140.8265	1.100207	0.00276
67	112.3387	0.877646	0.00126
68	105.375	0.823242	0.00002
69	166.9971	1.304665	0.02418
70	133.7238	1.044717	0.0007
71	80.97431	0.632612	0.00229
72	95.80746	0.748496	0.02842
73	146.9203	1.147815	0.00133
74	109.5277	0.855685	0.01089
75	110.4685	0.863035	0.00007
76	125.5489	0.98085	0.01607
77	141.8321	1.108064	0.00868
78	99.87451	0.78027	0.00025
79	110.7123	0.86494	0.00155
80	138.6477	1.083185	0.02729
81	133.4131	1.042289	0.00726
82	123.4863	0.964736	0.01134
83	119.887	0.936617	0.00216
84	129.4175	1.011074	0.00099
85	117.9555	0.921527	0.00033
86	126.1388	0.985459	0.01629
87	108.5783	0.848268	0.00005
88	138.1846	1.079567	0.10358
89	149.3715	1.166965	0.00027
90	94.2537	0.736357	0.00174
91	127.2649	0.994257	0.00227
92	79.11289	0.618069	0.02433
93	126.9157	0.991529	0.00365
94	92.82453	0.725192	0.01019
95	125.6936	0.981981	0.00415
96	98.2111	0.767274	0.00336
97	111.104	0.868	0.00032
98	130.8863	1.022549	0.00484
99	143.2218	1.11892	0.00055
100	112.8103	0.881331	0.00059
101	99.52871	0.777568	0.02403
102	202.4614	1.58173	0.00829
103	107.9361	0.843251	0.02752
104	144.1836	1.126435	0.01661
105	142.0309	1.109616	0.00013
106	92.4407	0.722193	0.00942
107	133.0833	1.039713	0.00846
108	119.8725	0.936504	0.00614
109	109.1489	0.852726	0.00298
110	108.0428	0.844085	0.00007
111	134.7785	1.052957	0.00922
112	96.6426	0.75502	0.00371
113	134.3679	1.049749	0.00574
114	133.875	1.045898	0.0164
115	129.0915	1.008528	0.00592
116	114.2813	0.892823	0.00104

117	177.9849	1.390507	0.03489
118	133.5179	1.043109	0.00271
119	126.1769	0.985757	0
120	115.5792	0.902963	0.00021
121	199.2815	1.556886	0.02894
122	155.2115	1.21259	0.00053
123	141.3752	1.104494	0.02575
124	167.7225	1.310332	0.06757
125	126.8462	0.990986	0.00018
126	146.7464	1.146456	0.02049
127	171.4703	1.339612	0.01107
128	142.9233	1.116588	0.00379
129	123.3586	0.963739	0.00097
130	119.0713	0.930245	0.00358
131	163.8217	1.279857	0.06485
132	174.7121	1.364938	0.11855
133	116.3734	0.909167	0.00511
134	148.2838	1.158467	0.00783
135	128.8092	1.006322	0.01585
136	129.5348	1.01199	0.00308
137	109.371	0.854461	0.05977
138	160.5481	1.254282	0.01263
139	140.0957	1.094498	0.00581
140	147.7475	1.154278	0.00998
141	155.9317	1.218216	0.03222
142	110.3937	0.86245	0.07568
143	116.1632	0.907525	0.00032
144	127.7581	0.99811	0.00011
145	116.5008	0.910163	0.00029
146	121.4789	0.949054	0.00092
147	103.3713	0.807588	0.00088
148	126.5629	0.988773	0.01016
149	138.963	1.085648	0.00018
150	110.4053	0.862541	0.00217
151	102.1543	0.798081	0.01567
152	100.8705	0.78805	0.00017
153	143.8194	1.123589	0.00466
154	116.6464	0.9113	0.0011
155	110.8413	0.865948	0.00096
156	108.2678	0.845842	0.00082
157	122.3791	0.956087	0.00123
158	83.89744	0.655449	0.00311
159	175.7905	1.373364	0.00522
160	125.0787	0.977177	0.01582
161	133.4674	1.042714	0.00172
162	156.992	1.2265	0.00509
163	120.1531	0.938696	0.0015
164	167.7498	1.310545	0.06849
165	126.6578	0.989514	0.00802
166	119.9954	0.937464	0.00725
167	150.0641	1.172376	0.01025
168	122.6333	0.958073	0.00566
169	142.0592	1.109837	0.00696
170	134.0167	1.047005	0.01076
171	106.9509	0.835554	0.01509
172	100.6201	0.786095	0.00339
173	118.5102	0.925861	0.00002
174	136.3442	1.065189	0.00004
175	116.43	0.909609	0.00392
176	152.432	1.190875	0.00113

177	130.2778	1.017795	0.0012
178	147.3188	1.150928	0.01583
179	144.8199	1.131405	0.0407
180	139.7774	1.092011	0.00285
181	103.552	0.809	0.00881
182	109.3478	0.85428	0.00111
183	111.2739	0.869327	0.02723
184	116.8252	0.912696	0.00091
185	146.5635	1.145028	0.00463
186	140.0322	1.094002	0.02447
187	119.3909	0.932741	0.00019
188	123.2549	0.962929	0.00023
189	140.4612	1.097353	0.00018
190	83.92591	0.655671	0.00005
191	111.823	0.873617	0.0021
192	122.1016	0.953918	0.00186
193	128.668	1.005219	0.00434
194	102.1876	0.798341	0.00271
195	118.3354	0.924495	0.00001
196	122.8004	0.959378	0.00182
197	158.9507	1.241802	0.00636
198	152.8035	1.193778	0.00067
199	107.8642	0.842689	0.00026
200	134.2631	1.04893	0.01653
201	88.45073	0.691021	0.02391
202	193.2224	1.50955	0.02974
203	126.3145	0.986832	0.00094
204	191.22	1.493906	0.10435
205	122.0412	0.953447	0.00129
206	133.1489	1.040226	0.0154
207	102.9664	0.804425	0.00253
208	160.0509	1.250398	0.02406
209	91.61976	0.715779	0.00255
210	118.4752	0.925588	0.0013
211	110.7159	0.864968	0.01455
212	123.3035	0.963309	0.05422
213	117.5948	0.918709	0.0127
214	95.47455	0.745895	0.00115
215	130.7134	1.021199	0.0074
216	150.4038	1.17503	0.00917
217	101.0698	0.789608	0
218	123.2848	0.963162	0.01517
219	139.8309	1.092429	0.00342
220	157.4096	1.229762	0.01552
221	182.0749	1.42246	0.00003
222	162.8636	1.272372	0.00541
223	106.3063	0.830518	0.00438
224	193.8663	1.514581	0.03518
225	119.4516	0.933216	0.00154
226	123.4409	0.964382	0.001
227	125.9208	0.983756	0.00041
228	162.5475	1.269903	0.02557
229	100.9795	0.788903	0.0132
230	134.4237	1.050185	0
231	130.2456	1.017544	0.00962
232	121.0526	0.945723	0.00001
233	183.4089	1.432882	0.00764

Table A.5.6 Distributional characteristics of the survey variables

Construct	Variable	Mean	Std. Deviation	Skewness		Kurtosis	
				Stat.	S. E.	Stat.	S. E.
Leadership	Leader11	5.85	.835	-.563	.159	.599	.318
	Leader12	5.81	.794	-.317	.159	.005	.318
	Leader13	5.78	.776	-.211	.159	-.040	.318
	Leader14	5.69	.974	-.465	.159	-.037	.318
	Leader15	5.73	.969	-.724	.159	.740	.318
	Leader16	5.76	1.084	-.656	.159	-.251	.318
	Leader17	5.34	1.083	-.585	.159	.289	.318
	Leader18	5.52	.956	-.160	.159	-.407	.318
	Leader21	5.19	1.178	-.772	.159	.687	.318
	Leader22	5.51	.906	-.406	.159	.186	.318
	Leader31	5.58	.939	-.686	.159	.848	.318
	Leader32	5.64	.946	-.577	.159	.569	.318
	Leader41	5.87	.768	-.401	.159	-.038	.318
	Leader42	5.47	1.079	-.592	.159	.082	.318
	Leader43	5.57	.912	-.521	.159	.119	.318
	Leader44	5.53	.938	-.603	.159	.982	.318
	Leader45	5.36	1.155	-.543	.159	.068	.318
	Leader46	5.41	1.130	-.574	.159	.227	.318
	Leader47	5.21	1.138	-.633	.159	1.078	.318
	Leader48	5.60	.938	-.409	.159	-.186	.318
Strategic planning	Strategy11	5.70	1.002	-.690	.159	.409	.318
	Strategy12	5.69	1.005	-.831	.159	1.000	.318
	Strategy13	5.56	.932	-.460	.159	.095	.318
	Strategy14	5.37	.934	-.351	.159	-.145	.318
	Strategy21	5.35	1.040	-.538	.159	.169	.318
	Strategy22	5.65	.893	-.600	.159	.256	.318
	Strategy23	5.64	.933	-.592	.159	.264	.318
	Strategy24	5.33	1.136	-.783	.159	.833	.318
	Strategy31	5.78	1.068	-.745	.159	.020	.318
	Strategy32	5.68	.847	-.328	.159	-.217	.318
	Strategy33	5.52	1.071	-.496	.159	-.402	.318
Human resources	HR11	5.06	1.196	-.719	.159	.955	.318
	HR12	5.33	1.087	-.515	.159	.364	.318
	HR21	5.18	1.300	-1.020	.159	1.081	.318
	HR22	5.28	.967	-.440	.159	-.091	.318
	HR31	5.17	1.076	-.464	.159	.392	.318
	HR32	5.21	1.116	-.593	.159	.278	.318
	HR41	5.16	1.231	-.859	.159	1.075	.318

	HR42	4.72	1.226	-.401	.159	-.408	.318
	HR51	5.39	.942	-.364	.159	-.009	.318
	HR52	5.13	1.124	-.651	.159	.577	.318
	HR61	5.15	1.201	-.678	.159	.108	.318
	HR62	5.45	1.094	-.719	.159	.698	.318
	HR63	5.03	1.337	-.579	.159	-.024	.318
	HR71	5.44	.999	-.428	.159	-.097	.318
	HR81	5.36	1.004	-.334	.159	-.172	.318
	HR82	5.35	.976	-.419	.159	-.156	.318
	HR83	5.31	1.231	-.845	.159	.299	.318
Suppliers and partners	Suppliers11	5.53	.929	-.392	.159	.058	.318
	Supliers12	5.36	1.070	-.611	.159	.472	.318
	Supliers21	5.24	1.105	-.536	.159	.161	.318
	Supliers31	5.56	1.020	-.785	.159	.740	.318
	Supliers41	5.77	.954	-.704	.159	.392	.318
	Supliers51	5.59	.877	-.562	.159	.594	.318
	Supliers52	5.71	.830	-.332	.159	-.352	.318
	Supliers61	4.39	1.221	-.090	.159	-.735	.318
	Supliers62	5.54	.974	-.485	.159	.036	.318
	Supliers63	5.46	.982	-.571	.159	.956	.318
	Supliers64	5.55	1.029	-.672	.159	.516	.318
	Supliers71	5.58	.953	-.485	.159	-.005	.318
	Supliers72	5.19	1.170	-1.041	.159	1.621	.318
Operations management	Operstions11	5.50	1.215	-.820	.159	.342	.318
	Operstions12	5.50	1.126	-1.054	.159	1.585	.318
	Operations13	5.72	1.037	-.768	.159	.529	.318
	Operations21	5.32	1.172	-.657	.159	.198	.318
	Operstions22	5.57	1.053	-.658	.159	.004	.318
	Operations23	5.43	1.173	-.703	.159	.362	.318
	Operations31	5.75	1.037	-.585	.159	-.253	.318
	Operations41	5.71	1.021	-.650	.159	-.136	.318
	Operstons42	5.70	1.052	-.662	.159	-.035	.318
	Operations43	5.76	.989	-.893	.159	.673	.318
	Operations51	5.61	1.058	-.776	.159	.350	.318
	Operations52	5.18	1.181	-.536	.159	-.138	.318
	Opreations53	5.10	1.278	-.599	.159	.234	.318
Focusing on beneficiary	Beneficiary11	5.51	1.051	-.399	.159	-.218	.318
	Beneficiary12	5.44	1.045	-.793	.159	.755	.318
	Beneficiary13	5.39	1.163	-.995	.159	1.102	.318
	Beneficiary21	5.63	1.091	-.751	.159	.288	.318
	Beneficiary22	5.67	1.042	-.585	.159	-.076	.318
	Beneficiary23	5.56	1.241	-1.034	.159	.938	.318
	Beneficiary31	5.56	1.101	-.687	.159	.127	.318
	Beneficiary32	5.45	1.042	-.514	.159	-.003	.318

Measurement, analysis, and knowledge management	MAKM11	4.86	1.099	-.089	.159	-.325	.318
	MAKM12	4.70	1.105	-.262	.159	-.128	.318
	MAKM13	4.66	1.179	-.102	.159	-.252	.318
	MAKM14	4.88	1.129	-.277	.159	-.187	.318
	MAKM15	5.42	1.311	-1.026	.159	.921	.318
	MAKM21	4.79	1.095	-.398	.159	.094	.318
	MAKM22	4.58	1.089	.099	.159	-.200	.318
	MAKM23	4.94	1.039	-.400	.159	.181	.318
Effect on society	ESociety11	5.63	1.030	-.571	.159	.134	.318
	ESociety12	5.49	1.039	-.623	.159	.275	.318
	ESociety21	5.42	1.108	-.335	.159	-.677	.318
	ESociety22	5.75	.927	-.694	.159	.548	.318
	ESociety23	5.88	.964	-.681	.159	-.036	.318
	ESociety24	5.57	1.143	-.872	.159	.703	.318
	ESociety25	5.38	1.080	-.612	.159	.271	.318
	ESociety31	5.56	.932	-.377	.159	.081	.318
	ESociety32	5.35	1.108	-.319	.159	-.463	.318
	ESociety33	5.20	1.086	-.226	.159	-.158	.318
	ESociety34	5.39	1.093	-.535	.159	.142	.318
Business results	BResults11	5.61	1.062	-.768	.159	.136	.318
	BResults12	5.60	1.075	-.862	.159	.461	.318
	BResults13	5.68	1.084	-.742	.159	.032	.318
	BResults14	5.60	1.042	-.674	.159	.042	.318
	BResults15	5.63	1.043	-.847	.159	.370	.318
	BResults21	5.61	1.147	-.688	.159	-.145	.318
	BResults22	5.58	1.198	-.756	.159	.189	.318
	BResults23	5.44	1.184	-.589	.159	-.077	.318
	BResults31	5.58	1.019	-.575	.159	.030	.318
	BResults32	5.53	.974	-.460	.159	-.102	.318
	BResults33	5.45	.964	-.327	.159	-.297	.318
	BResults41	5.46	1.070	-.616	.159	.193	.318
	BResults42	5.53	.978	-.453	.159	-.123	.318
	BResults43	5.42	.998	-.723	.159	1.175	.318
	BResults51	5.39	1.101	-.812	.159	.827	.318
	BResults52	5.27	1.102	-.611	.159	.284	.318
	BResults53	5.31	1.175	-.679	.159	.365	.318
	BResults61	5.34	.992	-.359	.159	-.149	.318
	BResults71	5.12	1.061	-.229	.159	-.210	.318
	BResults81	4.57	1.198	.135	.159	-.345	.318
	BResults82	4.80	1.105	-.481	.159	.890	.318
	BResults83	4.89	1.101	-.129	.159	-.131	.318
	BResults84	5.29	1.152	-.512	.159	.088	.318
	BResults91	5.47	1.026	-.541	.159	.252	.318
	BResults92	5.61	1.049	-.983	.159	1.834	.318
	BResults93	5.34	1.060	-.481	.159	.263	.318
	BResults94	5.10	1.151	-.511	.159	.234	.318

Table A.5.7 Comparisons between early and late respondents (Independent samples T-Tests)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Sector	Equal variances assumed	.002	.966	-.401	231	.689	-.184	.458	-1.086	.718
	Equal variances not assumed			-.402	119.763	.688	-.184	.457	-1.088	.721
Employees no	Equal variances assumed	6.504	.011	-1.225	231	.222	-.053	.043	-.139	.032
	Equal variances not assumed			-1.380	156.870	.169	-.053	.039	-.129	.023
Strategic Orientation	Equal variances assumed	.007	.931	-.061	231	.952	-.009	.153	-.311	.292
	Equal variances not assumed			-.060	118.009	.952	-.009	.154	-.314	.295

Table A.5.8 Early and late respondents groups statistics

Wave		N	Mean	Std. Deviation	Std. Error Mean
Sector	1	167	7.41	3.153	.244
	2	66	7.59	3.138	.386
Employees no	1	167	2.89	.318	.025
	2	66	2.94	.240	.030
Strategic Orientation	1	167	2.26	1.048	.081
	2	66	2.27	1.060	.131

Notes: 1: early group, 2: late group.

Table A.5.9 The tolerance and VIF values for the KAQA model

variable	tolerance	VIF
Leader11	0.208	4.808
Leader12	0.263	3.802
Leader13	0.28	3.571
Leader14	0.263	3.802
Leader15	0.692	1.445
Leader16	0.836	1.196
Leader17	0.597	1.675
Leader18	0.487	2.053
Leader21	0.851	1.175
Leader22	0.582	1.718
Leader31	0.515	1.942
Leader32	0.543	1.842
Strategy11	0.376	2.660
Strategy12	0.354	2.825
Strategy13	0.295	3.390
Strategy14	0.683	1.464
Strategy21	0.626	1.597
Strategy22	0.169	5.917
Strategy23	0.188	5.319
Strategy24	0.675	1.481
Strategy31	0.517	1.934
Strategy32	0.195	5.128
Strategy33	0.49	2.041
HR31	0.52	1.923
HR32	0.389	2.571
HR41	0.509	1.965
HR42	0.765	1.307
HR51	0.375	2.667
HR52	0.313	3.195
HR61	0.398	2.513
HR62	0.464	2.155
HR63	0.52	1.923
HR71	0.46	2.174
HR81	0.516	1.938
HR82	0.438	2.283
HR83	0.706	1.416
Suppliers11	0.314	3.185
Supliers12	0.286	3.497
Supliers21	0.596	1.678
Supliers61	0.765	1.307
Supliers62	0.23	4.348
Supliers63	0.235	4.255
Supliers64	0.307	3.257
Operstions11	0.417	2.398
Operstions12	0.348	2.874
Operations13	0.351	2.849
Operations21	0.499	2.004

Operstions22	0.314	3.185
Operations23	0.346	2.890
Operations31	0.364	2.747
Beneficiary11	0.283	3.534
Beneficiary12	0.283	3.534
Beneficiary13	0.665	1.504
Beneficiary21	0.387	2.584
Beneficiary22	0.334	2.994
Beneficiary23	0.502	1.992
Beneficiary31	0.269	3.717
Beneficiary32	0.327	3.058
ESociety11	0.411	2.433
ESociety12	0.367	2.725
ESociety21	0.506	1.976
ESociety22	0.383	2.611
ESociety23	0.473	2.114
ESociety24	0.481	2.079
ESociety25	0.424	2.358
ESociety31	0.46	2.174
ESociety32	0.51	1.961
ESociety33	0.512	1.953
ESociety34	0.468	2.137
BResults11	0.296	3.378
BResults12	0.199	5.025
BResults13	0.24	4.167
BResults14	0.361	2.770
BResults15	0.15	6.667
BResults21	0.488	2.049
BResults22	0.518	1.931
BResults23	0.535	1.869
BResults31	0.459	2.179
BResults32	0.354	2.825
BResults33	0.455	2.198
BResults51	0.416	2.404
BResults52	0.387	2.584
BResults53	0.48	2.083
BResults61	0.458	2.183
BResults71	0.651	1.536

Table A.5.10 The tolerance and VIF values for the MBNQA model

variable	tolerance	VIF
Leader11	0.274	3.650
Leader12	0.314	3.185
Leader13	0.33	3.030
Leader14	0.31	3.226
Leader15	0.695	1.439
Leader16	0.822	1.217
Leader17	0.555	1.802
Leader18	0.47	2.128
Leader21	0.846	1.182
Leader22	0.555	1.802
Leader41	0.495	2.020
Leader42	0.386	2.591
Leader43	0.332	3.012
Leader44	0.501	1.996
Leader45	0.767	1.304
Leader46	0.454	2.203
Leader47	0.51	1.961
Leader48	0.531	1.883
Strategy11	0.377	2.653
Strategy12	0.354	2.825
Strategy13	0.296	3.378
Strategy14	0.683	1.464
Strategy21	0.624	1.603
Strategy22	0.17	5.882
Strategy23	0.188	5.319
Strategy24	0.675	1.481
Strategy31	0.517	1.934
Strategy32	0.196	5.102
Strategy33	0.487	2.053
HR21	0.602	1.661
HR22	0.425	2.353
HR31	0.483	2.070
HR32	0.36	2.778
HR41	0.488	2.049
HR42	0.769	1.300
HR51	0.386	2.591
HR52	0.352	2.841
HR61	0.403	2.481
HR62	0.462	2.165
HR63	0.512	1.953
HR71	0.494	2.024
Operstions11	0.405	2.469
Operstions12	0.373	2.681
Operations13	0.389	2.571
Operations21	0.546	1.832
Operstions22	0.335	2.985
Operations23	0.342	2.924

Operations52	0.59	1.695
Opreations53	0.547	1.828
Operations51	0.496	2.016
Beneficiary11	0.282	3.546
Beneficiary12	0.282	3.546
Beneficiary13	0.66	1.515
Beneficiary21	0.385	2.597
Beneficiary22	0.338	2.959
Beneficiary23	0.499	2.004
Beneficiary31	0.273	3.663
Beneficiary32	0.329	3.040
MAKM11	0.238	4.202
MAKM12	0.325	3.077
MAKM13	0.371	2.695
MAKM14	0.433	2.309
MAKM15	0.584	1.712
MAKM21	0.241	4.149
MAKM22	0.449	2.227
MAKM23	0.323	3.096
BResults11	0.308	3.247
BResults12	0.235	4.255
BResults13	0.284	3.521
BResults14	0.379	2.639
BResults15	0.19	5.263
BResults21	0.516	1.938
BResults22	0.542	1.845
BResults23	0.564	1.773
BResults41	0.459	2.179
BResults42	0.46	2.174
BResults43	0.479	2.088
BResults51	0.354	2.825
BResults52	0.33	3.030
BResults53	0.413	2.421
BResults91	0.701	1.427
BResults92	0.513	1.949
BResults93	0.618	1.618
BResults94	0.557	1.795

Table A.5.11 The tolerance and VIF values for the EFQM model

variable	tolerance	VIF
Leader11	0.208	4.808
Leader12	0.266	3.759
Leader13	0.283	3.534
Leader14	0.263	3.802
Leader15	0.691	1.447
Leader16	0.837	1.195
Leader17	0.595	1.681
Leader18	0.487	2.053
Leader21	0.852	1.174
Leader22	0.584	1.712
Leader31	0.513	1.949
Leader32	0.538	1.859
Strategy11	0.378	2.646
Strategy12	0.354	2.825
Strategy13	0.297	3.367
Strategy14	0.684	1.462
Strategy21	0.625	1.600
Strategy22	0.169	5.917
Strategy23	0.186	5.376
Strategy24	0.673	1.486
Strategy31	0.516	1.938
Strategy32	0.196	5.102
Strategy33	0.49	2.041
HR11	0.45	2.222
HR12	0.562	1.779
HR21	0.575	1.739
HR22	0.4	2.500
HR31	0.474	2.110
HR32	0.35	2.857
HR41	0.499	2.004
HR42	0.772	1.295
HR51	0.397	2.519
HR52	0.368	2.717
HR61	0.418	2.392
HR62	0.485	2.062
HR63	0.519	1.927
HR71	0.5	2.000
Suppliers11	0.342	2.924
Supliers12	0.314	3.185
Supliers21	0.559	1.789
Supliers31	0.349	2.865
Supliers41	0.523	1.912
Supliers51	0.192	5.208
Supliers52	0.501	1.996
Supliers71	0.35	2.857
Supliers72	0.482	2.075
Operstions11	0.384	2.604
Operstions12	0.37	2.703
Operations13	0.358	2.793
Operations21	0.554	1.805
Operstions22	0.34	2.941
Operations23	0.385	2.597
Operstons42	0.466	2.146

Operations43	0.34	2.941
Operations41	0.412	2.427
BResults11	0.243	4.115
BResults12	0.118	8.475
BResults13	0.18	5.556
BResults14	0.328	3.049
BResults15	0.142	7.042
BResults51	0.278	3.597
BResults52	0.162	6.173
BResults53	0.255	3.922
BResults81	0.647	1.546
BResults82	0.202	4.950
BResults83	0.197	5.076
BResults84	0.557	1.795
BResults21	0.319	3.135
BResults22	0.333	3.003
BResults23	0.386	2.591
BResults31	0.347	2.882
BResults32	0.381	2.625
BResults33	0.321	3.115
BResults41	0.329	3.040
BResults42	0.34	2.941
BResults43	0.453	2.208

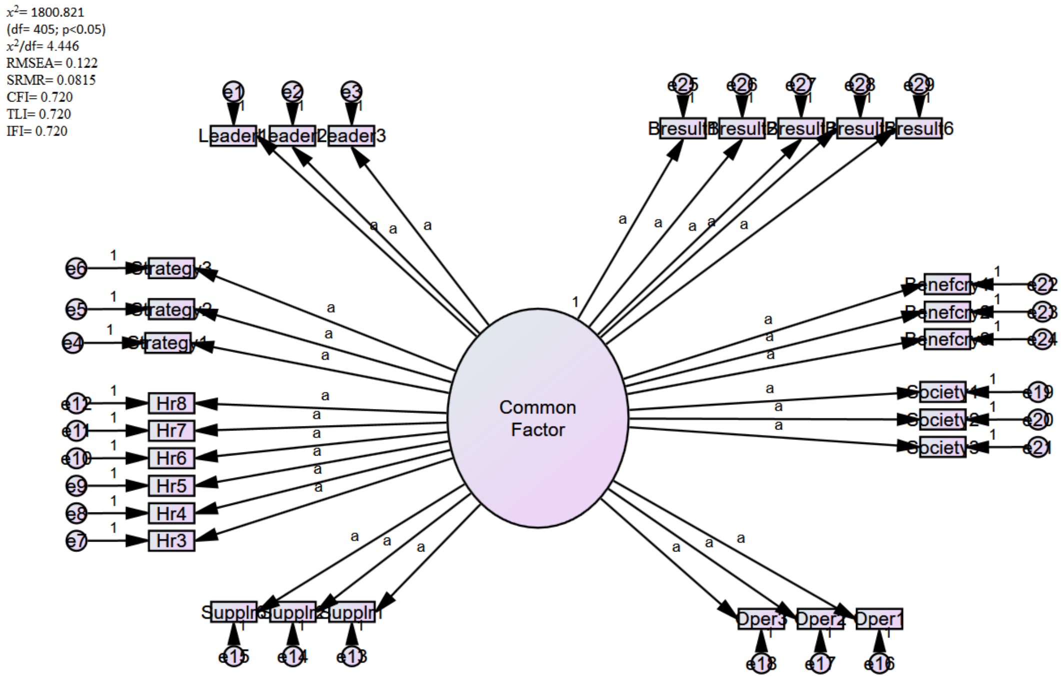

Figure A.5.1 One factor CFA for the KAQA model

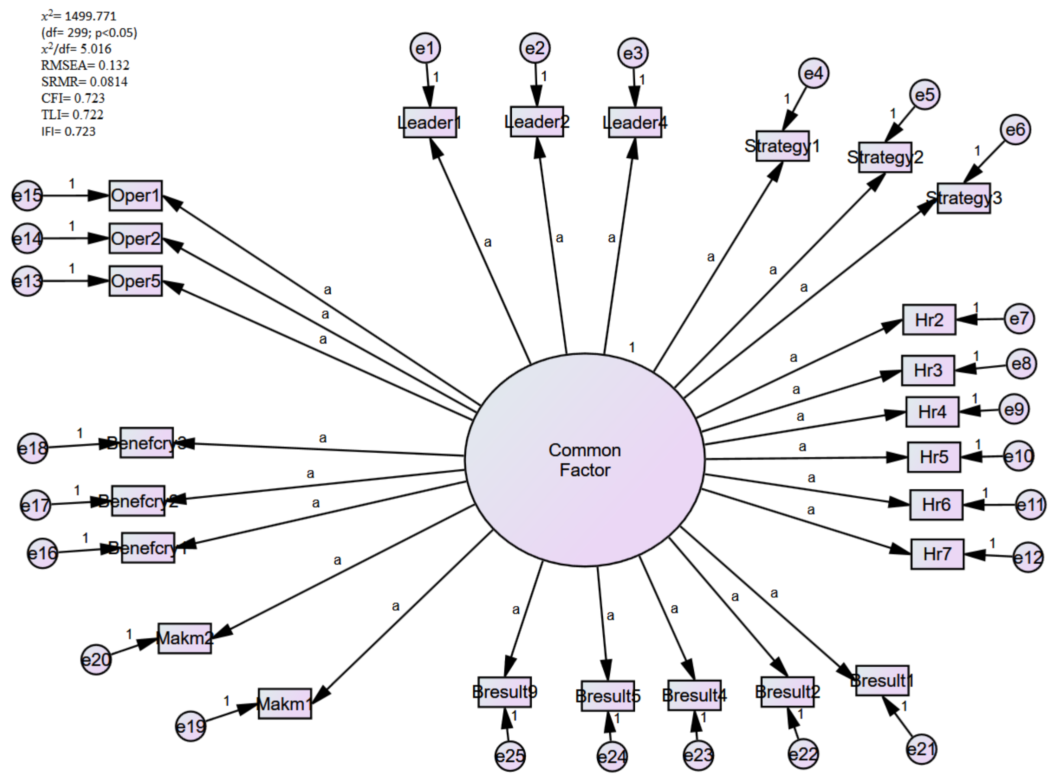

Figure A.5.2 One factor CFA for the MBNQA model

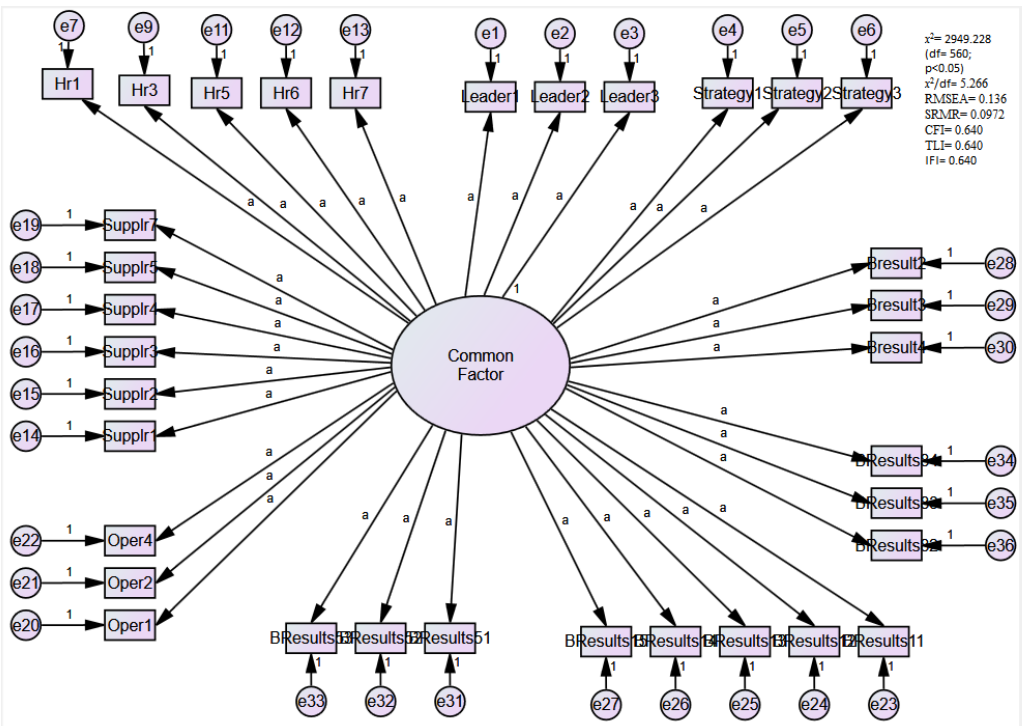

Figure A.5.3 One factor CFA for the EFQM model