MODERATING EFFECT OF FORECASTING METHODS BETWEEN FORECASTING CRITERIA AND EXPORT SALES FORECASTING EFFECTIVENESS: AN EMPIRICAL MODEL FOR UK ORGANIZATIONS

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by

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ABSTRACT

Over the last three decades important advances have been made in developing sales forecasting methods that more accurately reflect market place conditions. However, surveys of sales forecasting practice continue to report only marginal gains in sales forecasting effectiveness. This gap between theory and practice has been identified as a significant issue for sales forecasting research. The literature suggests that this gap should be addressed by examining new factors in sales forecasting. Accuracy, bias, timeliness, cost and environmental turbulence are the most studied forecasting criteria in sales forecasting effectiveness. There are some literatures which address how these factors are affected by the forecast methods the firm uses. Empirical evidence on such a role of the forecasting method is lacking, and existing literature does not take into account whether forecasting criteria's influence on export sales forecasting effectiveness vary depending on the forecasting methods used by the firm. This is the first research gap identified during the literature review.

Furthermore, the role of export sales forecasting effectiveness on export market performance have received only limited attention to date. Linking the forecasting effectiveness to the business performance was reported to be critical in evaluating and improving the firm's sales forecasting capability and sales forecasting climate. However, empirical evidence of this linkage is missing and this is the second gap this study addresses.

A conceptual model is proposed and multivariate analysis technique is used to investigate the relationship between dependent (forecasting effectiveness and export performance) and independent variables (forecasting criteria, forecasting methods, managerial characteristics, organizational characteristics and export market orientation). Our finding revealed the impact of bias, timeliness and cost on forecasting effectiveness varies depending on the forecasting methods used by the firm. But no moderating impact of forecasting methods has been found for accuracy and environmental turbulence. Moreover, this study reported the linkage between forecasting effectiveness and export performance when composite forecasting method is used.

Identifying the relative importance of all the factors (i.e. accuracy, bias, cost, timeliness, forecasting methods, etc) it becomes possible to set priorities directly reflecting managerial preferences for different forecast criteria. If implementation of such priorities is seen to contradict principles of good forecasting practice, action can be taken to inform managers of the potential negative consequences.

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To Suat, Sude and Arda

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CHAPTER 1. INTRODUCTION

This chapter presents an overview of the subject matter. The background to the research is explained. The research aim and objectives are depicted followed with the contributions of the research to academia and management. Brief description of adopted research methodology is provided with the structure of thesis.

1.1 Background to the Research

Researchers have long recognised the significant role of forecasting in business practice, and forecasting journals have emphasized the need to investigate the factors that influence forecasting effectiveness (Fildes, 2006; Makridakis, 1996; Winklhofer and Diamantopoulos, 1996a). Since its establishment in 1985, the *International Journal of Forecasting* has published two editorials calling for more research into forecasting practice (Lawrence, 2000; Schultz, 1992) but the volume of such research has remained limited (Fildes, 2006).

Over the last three decades important advances have been made in developing sales forecasting methods that more accurately reflect market place conditions (Fildes and Hastings, 1994; Winklhofer et al., 1996b; McCarthy et al, 2006; Davis and Mentzer, 2007). However, surveys of sales forecasting practice continue to report only marginal gains in export sales forecasting effectiveness (ESFE). This gap between theory and practice has been identified as a significant issue for sales forecasting research (Davis and Mentzer, 2007). The literature suggests that this gap should be addressed by examining new factors in sales forecasting (Winkhofer et al., 1996a; Fildes et al., 2003; Davis and Mentzer, 2007). Accuracy, bias, timeliness, cost and environmental turbulence are the most studied forecast critera in ESFE (Winklhofer and Diamantopoulos, 2002). There are some literatures which address how these forecast

criteria are affected by the forecast methods the firm uses. For example, conflicting evidence is found when the relationship between the types of forecasting method used and accuracy achieved are compared (Peterson, 1990; Kahn and Mentzer, 1995). Uncertainty and environmental turbulence are also considered (Zotteri and Kalchschmidt, 2007). Sanders and Mandrodt (1994) show that environmental turbulence is correlated to the judgmental adjustment of quantitative techniques compared to other forecasting methods. This indicates that for example, if judgmental forecasting methods are used, the impact of environmental turbulence on ESFE may be higher than formal statistical forecasting methods. Thus, the forecasting methods play a moderating role in the relationships between ESFE and the different forecast criteria rather than a direct influence. Empirical evidence on such a role of the forecasting method is lacking and existing literature does not take into account whether forecasting criteria's influence on ESFE changes depending on the forecasting methods used by the firm. This is the first gap identified during the literature review.

Furthermore, while a large number of empirical studies have focused on forecasting in general or sales forecasting in particular (for a review, see Winklhofer et al., 1996b), the role of ESFE on export market performance (EMP) have received only limited attention to date (Peterson, 1990; Kahn and Mentzer, 1995; Davis and Mentzer, 2007; Zotteri and Kalchschmidt, 2007). When sales forecasting is used effectively, improved ESFE helps organizations and supply chains to adapt in changing market conditions and improve EMP (Fildes and Beard, 1992; Gardner, 1990; Wacker and Lummus, 2002 and Smith and Mentzer, 2010). When ESFE degrades, companies frequently rely on inventory assets, expedited services and other expensive actions to support operations and maintenance services (Armstrong, 1988; Winklhofer et al., 1996b, Smith and Mentzer, 2010). In the worst cases, poor ESFE can contribute to major financial losses.

Forecasting missteps at Cisco Systems were believed to have contributed to a multi-billion-dollar write off of products and components during the dot-com bust in 2000 (Berinato, 2001).

More recently Davis and Mentzer (2007) conducted a qualitative study to explore whether ESFE had any influence on EMP. Linking ESFE to EMP was reported to be critical in evaluating and improving the firm's sales forecasting capability and sales forecasting climate. However, their research did not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages. Zotteri and Kalchschmidt (2007) also investigated the relationship between EMP and ESFE and they found that forecasting plays a significant role in improving a companies' performance, thus justifying the attention paid to this linkage (see further details in Section 2.7). This is the second gap identified through the literature review.

1.2 Aim and Objectives of the Research

The aim of this research is to determine whether forecast criteria's effect on ESFE varies depending on the forecasting methods used by the firm and to test the linkage between ESFE and EMP.

In order to achieve the above aim, the following objectives have been defined:

Objective 1: Developing, through an extensive literature review, a theoretically grounded model to examine the forecasting criteria's influence on ESFE in relation to the forecasting method used by the firm and also test the link between ESFE and EMP with other important control variables. Most studies on EMP have failed to control potentially important confounding influences relating particularly to managerial characteristics, export market orientation and organizational characteristics (see Section

2.8). Therefore these variables are only included in this research to fully examine the impact of ESFE on EMP.

Objective 2: Operationalization (including acquisition and purification) of the model constructs.

Objective 3: Collection of data.

Objective 4: Analysing the acquired data and testing the hypothesised pathways using suitable analytical tools.

Objective 5: Putting forward theoretical and managerial suggestions based on the empirical results.

1.3 Research Contribution

This research aims to contribute to the body of knowledge in export sales forecasting at two key levels:

Contribution to Research

Develops a comprehensive model to address two identified gaps depicted in Section 1.1; (1) the existing literatures do not take into account whether forecasting criteria's effect on ESFE vary depending on the forecasting methods used by the firm. This study addresses this gap and tests forecasting methods' moderating influence on forecast criteria. This is considered to represent advancement to the current knowledge and challenges some of the results in the literature, and (2) only two studies have been found in the literature review supporting the linkage between ESFE and EMP. Within the first study, ESFE is evaluated as average percentage error only, which is not a direct comparison with this study. Data within the second study did not lend itself to statistical

testing of the validity of constructs or the significance and strength of conceptual linkages. Therefore there is a gap in the literature to explore this important linkage and this study addresses this gap.

Managerial Implications

The studies on ESFE and the forecasting methods offer empirically based insights as to the relative importance criteria used by managers to judge ESFE in their firm. Such information is clearly of relevance to forecast preparers when designing/operating forecasting systems, as well as to consultants providing forecasting advice and training. Moreover, by identifying the importance of all the factors (i.e. accuracy, bias, cost, timeliness, forecasting methods, etc.) it becomes possible to set priorities directly reflecting managerial preferences for different forecast performance criteria (Winklhofer and Diamantopoulos, 2002). If implementation of such priorities is seen to contradict principles of good forecasting practice, action can be taken to inform managers of the potential negative consequences.

1.4 Research Methodology and Structure of the Thesis

This research study has followed a systematic methodological approach, which ensures the minimisation of errors arising from measurement, collection and analysis (Simon, 1969). Adopting the research design of Sekaran (2003), the author discusses each of the sections of the design in relation to the thesis (see Chapter 4 for details). The adoption of a research design ensures that the study will be relevant to the research problem, and it will use economic procedures in fulfilling its aim and objectives (Churchill, 1979). Although the various cells of the research design are presented in a sequential order, it must be emphasised that the decisions taken are highly interlinked.

Performance measurements are developed through an extensive and intensive literature

review (Chapter 2). A conceptual research model is developed and related hypotheses are formulated (Chapter 3). The research-instrument/questionnaire is designed (Section 4.3), an electronic survey is employed as the data collection method (Section 4.3). Appropriate measurements and measures are developed (Section 4.3). The accuracy of the measurement is assessed for reliability and validity, along with the evaluation of the proposed structural model (Chapter 5). The final part of the thesis provides overall conclusions and evaluations of the contribution of this study to both academia and normative guidelines for management given. Finally, suggestions for future research are offered (Chapter 6).

1.5 Limitations of this Study

Although considerable effort is made to ensure the robustness of the study, there are a number of limitations that should/need to be highlighted.

1. The target population for the empirical data is the UK exporters, exporting to EU countries. It is possible that the results for other countries outside of the EU might reveal different outcomes and implications.
2. The fact that only accuracy, bias, timeliness, cost and environmental turbulence are studied as forecasting criteria is acknowledged as a limitation. In the forecasting literature other constructs such as export strategy and ease of use are identified as other forecasting criteria. As a result, this stream of research is still in its exploratory phase of the development, lacking well defined theoretical framework that would link all the explored variables to export sales forecasting effectiveness.
3. Non probability snowballing approach is used as sampling method. The author is aware of all the disadvantages of this method (see Section 4.3.7).

4. This research is conducted using a cross-sectional design versus longitudinal. The author understands the limitations of cross sectional studies and details this in Section 4.3.6

5. The objective of this research is to investigate ESFE's effect on EMP. Therefore the organizational level of unit analysis is adopted versus venture or individual levels. Therefore the findings of this study only apply to the organizational level and cannot be generalized for other levels such as export venture and individuals.

6. The items used in operationalization of the performance measures are largely borrowed. Even though they are carefully adapted as well as being checked for reliability and validity, there is still a danger that they may contain inherent shortcomings, especially when applied in a new environment and in a different context.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews past research related to sales forecasting in export context. Gaps in the literature are identified and support for the relevancy of this thesis is provided.

This chapter covers four important areas; firstly the definition and importance of sales forecasting. Secondly, the identification of sales forecasting criteria which have an influence on ESFE. Thirdly, sales forecasting methods and how they interact with sales forecasting criteria and lastly the influence of ESFE on EMP.

2.2 Definition and Importance of Sales Forecasting

Forecasting is formally defined as the process for predicting the future by extrapolating information from the past (Morton, 1999). It transforms past time-series data and/or qualitative assessments into a prediction of future events. The forecasting process could also include combining quantitative, analytical data with qualitative, subjective inputs. As a result of this process, forecasts are generated. Each forecast represents an estimate of an actual value in a future period. Makridakis and Winkler (1983) reports a need for forecasting to determine when an event will occur or a need will rise, so that appropriate actions can be taken.

The critical nature of sales forecasting for a business success is recognized by both practitioners and academics (Remus and Simkin, 1987; Makridakis, 1996; Winklhofer and Diamantopoulos, 2002).

McLaughlin (1979) defines the role of forecasting is to reduce uncertainty and provide inputs into almost all decisions affecting the future of the organization. The importance of sales forecasting is expressed by Fildes and Hastings (1994, p.1) as "Without a sales

forecast, in the short term, operations can only respond retroactively, leading to lost orders, inadequate service and poorly utilized production resources. In the long term, financial and market decision making misallocate resources so that the organization's continuing existence may be brought into question". Given that forecasts are used for a number of purposes in the firm, including production planning, budgeting, sales quote setting, and personnel planning (Mentzer and Cox, 1984a; White, 1986), the factors that contribute to forecasting performance are a concern in the literature (Dalrymple, 1987; Fildes and Hastings, 1994; Drury, 1990).

Another important function of forecasting is its role in planning. Planning is an integral part of decision making but uncertainties make it difficult to plan effectively. Therefore firms rely heavily on forecasts to drive planning. Forecasts can help reduce some of the uncertainty, which enables managers to develop more accurate plans. Most operations are designed on an anticipatory basis, and most activities are initiated before demand occurs. By planning in advance, firms can allocate resources and design operations in a cost efficient way, achieving economies of scale. In recent years the role of forecasting has become particularly important as competitive market pressures increasingly create the need for improved forecast accuracy (Sanders and Manrodt, 2003). As customers increasingly demand shorter response times with improved quality, effective forecasting becomes critical in helping organizations identify new market opportunities, anticipate future demands, schedule production more effectively, and reduce inventories (Sanders and Manrodt, 2003).

Lawrence et al. (2000) describe sales forecasting as pivotal function in decision making in relation to manufacturing scheduling and inventory replenishment. Mentzer and Moon (2005) defines sales forecasting as a crucial linking function between internal

decision making and uncontrollable external factors that have the potential to affect the demand for a company's products. Research by Lapide (2010) offers a managerial perspective on sales forecasting and supports the importance of sales forecasting for firms' success. Shoesmith and Pinder (2001) provide empirical evidence that improvement in sales forecasting lead to cost reductions. Bala (2010) provides a number of examples on how improved forecasting and inventory management can yield substantial supply chain performance improvements.

In summary, literature review reveals that sales forecasting is an important part of business success. In order to understand the export sales forecasting concept and its issues clearly, a critical review of sales forecasting literature will reveal some important insights.

2.3 Research on Sales Forecasting

This section reviews the relevant literature on sales forecasting. One of the first reviews of forecasting literature is produced by Armstrong (1984). He analyses twenty five years of research. Within this period, the research is highly focused in the comparison of alternative methods for short term forecasting omitting the other important forecasting criteria and their impact on forecast effectiveness.

Another comprehensive review is developed by Makridakis (1986) and he assesses forecasting performance, evaluates accomplishments and suggests directions for future research. According to the author, the bases of forecasting is laid in the late 1930's when the first forecasting models are proposed. Five parallel and independent subfields are developed between 1950 and 1960, in the field of quantitative forecasting. As a conclusion of his review, Makridakis (1986) recommends the development of new methods and the modification of the existing ones as the primary focus for new research

efforts. The main focus of these researches is forecasting methods similar to the reviews by Armstrong (1984).

Armstrong (1988) develops a comprehensive review of forecasting research and identifies research needs of practitioners and academics using a survey instrument. Results of this survey are presented on Table 2.1 - Research Needs in Forecasting.

Table 2.1 - Research Needs in Forecasting

Field	Practitioners	Academics
Economics	Casual models; survey research	Casual models; uncertainty
Finance& Accounting	Environmental forecasting; seasonal variations	Expert system; uncertainty
Marketing	Implementation; computerisation; combine methods; competitive actions; evaluation	Incorporate judgment in models; competitive actions; combine forecasts; compare alternative methods; implementation
Planning	Impact on decision-making; expert systems; judgmental forecasting; computerisation; compare alternative models; implementation; scenarios; uncertainty	Compare alternative methods; monitor forecast
Production	New product forecasting; combine methods; quality of data vs. method; seasonality	Combine alternative methods; uncertainty; combine forecasts; compare alternative methods
Research& Development	New Product Forecasting; outliers; casual models; computerisation	Combine alternative methods; compare alternative methods; impact on decision making; scenarios
Other Areas	Expert system; compare alternative methods; impact on decision-making; implementation; monitor forecasts	Compare alternative methods; quality of data versus method; impact on decision making; scenarios; uncertainty

Armstrong, J.S. (1988). Research needs in forecasting. *International Journal of Forecasting*, 4(3), 449-465.

Armstrong (1988) compares the identified research needs with the literature published up to that year. Potential areas recommended for further research for academics are mainly on identification of best methods for estimating uncertainty associated with forecasts dismissing all other important forecasting criteria such as bias, cost,

environmental turbulence and others.

Dawes et al. (1994) conduct a review to assess the past and provide recommendations for the future forecasting research. Their finding show that the future does not appear to lie in bigger or smarter models. Instead, it lies in the implementation of the models, in the development of a better understanding of the practical forecasting process, and by the better use of the data resources made available by increasing automation. This is an important distinction in comparison to the results published by Armstrong (1984), Makridakis (1986) and Armstrong (1988). Their focus is more on developing and improving forecasting methods than its implementation.

Table 2.2 - Major Published Studies on Sales Forecasting until 1996 shows the major published studies and their main findings on sales forecasting.

Table 2.2 - Major Published Studies on Sales Forecasting until 1996

Authors	Year	Sample	Main findings
Dalrymple	1975	175 mid-western businessmen	Accuracy improved when more people were involved and large number of departments used predictions
Wheelwright and Clarke	1976	Preparers and users in 127 companies	Role needed more careful definition and better communication between the two groups
Rothe	1978	52 companies in Texas	Management systems should be improved. The marketing department was primarily responsible for forecasting in corporation.
Giroux and Kratchman	1980	234 banks	Sophisticated methods associated with specialist staff (economists and planners).
Ortman and Blackman	1981	275 companies	Planning was the responsibility of planning departments and finance.
Lawrence	1983	3 Australian companies	Management gave planning low priority. Quantitative forecasting systems used not just for accuracy but also to reduce costs, increase speed, assist processing of data and improve consistency.
Mentzer and Cox	1984	160 top corporations	Accuracy was most important factor, but ease of use, credibility, and cost played a role. Increased use of computers in forecasting.
Miller	1985	Xerox Corporations	Ease of understanding, expediency, and perceived forecast accuracy were important variables to the sustained use of Xerox's forecasting system.
Dalrymple	1987	134 companies	Companies that used computers produce more accurate forecasts.
Mahmoud et al.	1988	67 top companies	Accuracy was most important factor, but ease of use and data requirements played a significant

			role.
Drury	1990	234 Canadian companies	Many companies did not have adequate management systems to undertake sophisticated forecasts.
Walker and McClelland	1991	Member of Fortune 500	Qualitative considerations and political maneuvering a primary source of prediction error by managers.
Winklhofer and Diamantopoulos	1996a	41 empirical research review covering the period 1970-1995	Their aim of the review was to develop a framework within which to organize the diverse findings of prior research. This framework was employed to categorise and discuss the substantive findings of the various empirical studies.

Forecasting literature reviewed until 1996 (1) identifies accuracy as most important factor (2) suggests other factors such as ease of use, credibility, and cost as other important factors (3) shows that quantitative forecasting methods as dominant methods used (4) with the exception of Winklhofer and Diamantopoulos (1996a), no other studies develops a framework to organize the findings of prior research (5) there are only a few empirical studies reported within this period (namely those by Dalrymple, 1975; Wheelwright and Clarke, 1976; Pan et al., 1977; Mentzer and Cox, 1984a; Dalrymple, 1987) (6) with the exception of Armstrong (1988), none of the previous reviews are explicitly concerned with devising a research agenda for studying forecasting (7) furthermore the links between the particular forecasting methods utilized and its influence of various forecasting criteria such as accuracy and timeliness are missing (8) the previous studies fail to capture the results from different forecasting methods (9) empirical studies examining forecast effectiveness focus almost exclusively on accuracy as effectiveness criteria with the exception of Mahmoud et al. (1988) (10) broader multi-dimensional conceptualization of forecasting is missing from the previous

studies (11) finally, none of the research published until this time explicitly distinguishes between export and domestic sales forecasting.

Literature review in the last 15 years

Winklhofer et al. (1996b) conducted a review of empirical studies on forecasting. Although questions relating to the deployment of forecasting methods have attracted a lot of study within this review, issues such as the role of forecasting have been relatively neglected. Winklhofer et al. (1996b) identified three main directions for future research: (1) to relate organizational and environmental variables known to affect forecasting to a wider range of issues; (2) to explore the impact of additional firm specific and environmental variables on forecasting; and (3) to examine neglected linkages between different aspects of organizational forecasting.

Winklhofer et al. (1996a) conducted an exploratory investigation to discover significant variables for export sales forecasting. They observed several similarities and differences between export and domestic sales forecasting. This distinction was missing in the previous studies. Their exploratory study identified accuracy, bias and cost as important criteria for forecast evaluation and encountered several difficulties in the area of export sales forecasting effectiveness. First, the majority of firms could not provide precise information regarding the accuracy of their forecasts. Secondly, as only perceived accuracy levels were reported, there were of limited value when used for comparisons across firms. Thirdly, firms did not keep records of the costs involved in export sales forecasting preparation, probably due to fact that these costs were too difficult to isolate. Lastly, the findings suggest that large firms and organisations with subsidiaries have to deal with biased (i.e overly optimistic or pessimistic) initial export forecasts. Although these conclusions provide valuable input for further research, an empirical research

needs to be conducted in order to confirm (or otherwise) the insights reported in their study. Their study depicts groundwork for later, more systematic and rigorous testing of hypothesis for developing forecasting models.

How managers evaluated their firm's forecasting effectiveness was not addressed by academics with exception of Winklhofer et al. (2002 and 2003). These authors have only considered forecast accuracy (short and medium term), bias (underestimate and overestimate), timeliness (prepared and received), cost and environmental turbulence as forecast effectiveness criteria (MIMIC model: Multiple Indicators and Multiple Causes Model) (Please refer Appendix C Figure C.4). While these are indisputably important dimensions of forecast effectiveness, there are other key dimensions such as information technology (Davis and Mentzer, 2007) forecasting task-technology fit (Smith and Mentzer, 2010), forecasting commitment (Winklhofer and Diamantopoulos, 2003) that are also considered in empirical studies as forecast criteria. Winkhlofer and Diamantopoulos, (2002) study did not provide any literature justification of the choice of forecast effectiveness criteria which was a limitation of their research. Furthermore, their variables only explained about 27% of the variance in forecasting effectiveness, a substantial proportion of variation still has to be accounted for. This result implies that additional influences need to be considered which would be an obvious area for future research.

Their finding showed that forecast accuracy was not the only criterion affecting the evaluation of overall forecasting effectiveness by managers. They found out that bias (over-estimation) and timeliness also influenced evaluations of forecasting effectiveness. Only short-term accuracy seemed to considerably influence evaluation of effectiveness. The firms could be only concerned with short-term performance and

therefore place particular emphasis on short-term performance. Or it could be that managers simply consider medium-term forecast errors as an unreliable criterion when judging forecasting effectiveness. Both these explanations are in need of empirical confirmation in future studies. The data collection of this study could have captured this information if it was formulated accordingly. This is also the weakness of their study. The cost was not found to impact on evaluations of forecasting effectiveness. This could be the rather narrow measure of cost (data collection costs) used in the study. A more comprehensive cost measure, ideally capturing development, maintenance and operating costs (Armstrong, 1985) may change the results. These limitations are the subject for further research. Although the export environment was found to be linked to evaluations of forecasting effectiveness, it did not play a moderating role on the impact of accuracy, bias and timeliness; neither was any interactions established among the forecasting criteria themselves.

Winklhofer and Diamantopoulos (2003) conducted another study (1) to develop a conceptual model of export sales forecasting behavior and performance, (2) to empirically identify the factors that impact on overall forecast effectiveness by estimating the proposed model and (3) to approach forecast effectiveness from a broader perspective than previous studies which have concentrated only on accuracy (e.g., Diamantopoulos and Winklhofer, 1999). On the methodological front, this was the first time that properly tested multi-item measures have been used to capture the constructs of forecasting risks, commitment, resources, and performance in either a domestic or an export context. Although their previous research (Winklhofer and Diamantopoulos, 2002) recommended other researcher to use their MIMIC model as a starting point in modeling forecasting effectiveness and future studies can build on it by adding appropriate antecedents, improving on its measurement and expanding its explanatory

power, they did not follow this recommendation and proposed an entire new model. Overall, some of the obvious problems within these studies are the multiplicity of factors proposed by researchers to influence export forecast effectiveness and the lack of a consistent theoretical framework to guide the choice of independent factors.

More recently, a research by Danese and Kalchschmidt (2011) investigates the impact of forecasting process on forecast accuracy and operational performances (i.e. cost and delivery performances). Their research analyses not only the impact of using forecasting methods on forecast accuracy and cost and delivery performance, but also the impact of how the forecasting process should be analysed in a comprehensive way and forecasting methods are not the only relevant variables to be studied (Mentzer and Bienstock, 1998). A detailed debate on this research is provided in Section 2.6. One of the limitations of this research is that it does not support the opinion that adopting forecasting methods always lead to improved forecast accuracy. This assumption cannot be considered generally valid. However, their findings are in-line with the previous research for considering accuracy only as one objective among several performance measures such as timeliness (Herbig et al., 1994) should be taken into account for an exhaustive evaluation.

Danese and Kalchschmidt (2011a) conduct another research and empirically analyses, how, in a multivariate setting, different forecasting variables (i.e. forecasting methods adopted, information combine to elaborate a forecast, and role of forecasting in supporting decision making) can contribute to improve companies' performance. Their study also examines how these forecasting variables can interact, thus influencing companies' performance through interaction effect. The authors did not find a statistically powerful model to explain how the forecasting variables and their

interaction effects could influence forecast error. This could be linked to the fact that forecast error is not always adequate to measure forecasting performance (Mentzer and Bienstock, 1998). The use of composite forecasting methods should be also taken into account, given the importance role that combination has in improving forecast accuracy (Armstrong, 1989). In addition, the impact of specific forecasting methods through forecasting criteria should be analysed, since the literature does not provide conclusive evidence on how they can contribute to forecasting performance. Table 2.3 summarizes the major published studies and main findings on sales forecasting last 15 years.

Table 2.3 - Major Published Studies on Sales Forecasting after 1996

Authors	Year	Sample	Main findings
Winklhofer and Diamantopoulos	1996a	A qualitative study. 13 in depth personal interviews in 11 firm	Identified accuracy, bias and cost as important criterion for forecast evaluation. Furthermore, observed similarities and differences between domestic and export sales forecasting.
Lawrence and O'Conner	2000	Field study. 10 large Australian national and international manufacturing based organisations.	They examined the accuracy, bias and efficiency of the forecast performance as a function of lead time. They assumed that the forecast revision process would incorporate the new information in the last few periods before the forecast was produced. They proposed some hypotheses that the forecast revision would have improved forecast accuracy, reduce bias but would have created some inefficiency. However the data did not support it.
Lawrence et al.	2000	Field study. 13 large Australian national and international manufacturing based organisations	Reports a finding of judgmental sales forecasting over number of organisations to investigate whether these forecasts were accurate, unbiased and efficient, and whether better ex ante forecast could have been deployed using a computer-based model. The findings revealed that for the companies studied, the company forecasts were not uniformly more accurate than the simple naïve value.
Winklhofer and Diamantopoulos	2002a	Empirical study. 180 companies	Identified whether firms adapt their export sales forecasting activities according to organizational and environmental context involved. Their findings indicate that forecasting resources were perceived to be equally available for all organizational and environmental context involved.

Winklhofer and Diamantopoulos	2002	Empirical study. 180 companies	Accuracy, bias, timeliness and environmental turbulence had an influence of forecast performance. Cost did not. Environmental Turbulence did not moderate with other variables and no interaction affect have been found between the variables under this study.
Winklhofer and Diamantopoulos	2003	Empirical study. 180 companies	Identified the factors that impact on overall forecast performance. Forecast commitment and forecast resources were shown in their model as direct link. Firm size, export experience, export dependence, risk and environmental turbulence as indirect link. Firms size and export experience did not have any impact when it comes to allocating resources for export sales forecasting purpose. Moreover, it did not indirectly affect forecast performance. Export experience effect was only indirect and mediated by the commitment variable.
Lawrence et al.	2006	25 years of research into judgmental forecasting	Some contradictory results reported. Judgmental and combined forecasting methods gained substantial interest and usage in the recent years. In the early years (before 1981), quantitative methods outperformed judgmental forecasts. The studies after this period concluded that judgmental forecast to be at least as accurate as statistical methods with an exception of the research done by Carbone and Gorr (1985).
Zotteri and Kalchschmidt	2007	Empirical. 60 Companies in Italy	Identified forecasting performance impact on company performance. However this impact depended on what forecasting was used for.

Davis and Mentzer	2007	Qualitative study	Managers coupled sales forecasting performance with business performance.
Danese and Kalchschmidt	2011a	Empirical. 343 companies.	Analysed how, in a multivariate setting, different forecasting variables could contribute to improve companies' performance (i.e. forecast accuracy, cost and delivery performance) and contributes to the understanding of the impact of forecasting on companies' performance.
Danese and Kalchschmidt	2011	Empirical. 343 companies.	Analysed the impact of how forecasting was conducted (i.e the extent of use of forecasting methods, information and decision-making) on forecast accuracy. It also explored the possible direct relationship between these forecasting variables and companies' performance.

Forecasting literature review so far (1) identifies the most cited forecasting criteria that impact on overall export sales forecast effectiveness (ESFE). These are accuracy, bias, timeliness, cost and environmental turbulence (2) provides support for the need to understand the forecasting methods' influence on various forecasting criteria. Empirical evidence on such a role of the forecasting method is lacking and no study examines the forecasting method as a moderating influence and they do not take into account how these forecast criteria's' influence on ESFE vary depending on the forecasting methods used by the firm. (3) reveals some empirical evidence of the role of ESFE on export market performance (EMP) which receive only limited attention to date (namely those by Davis and Mentzer, 2007; Zotteri and Kalchschmidt, 2007). This relationship is confounded and omitted to take into account other characteristics which are found in the literature review to have an impact on EMP. Each of these areas are covered in detail in

the below sections.

2.4 Export Sales Forecasting Effectiveness and Its Antecedents

Although ESFE is the main driver behind the effort put into forecasting by academics, business and consultants, the majority of the empirical forecasting literature focus, almost exclusively, on accuracy as a measure of forecast success (Dalrymple, 1975, 1987; Mentzer and Cox, 1984a; Small, 1980; Watson, 1996), with a few studies also examining the presence/absence of bias (McHugh and Sparkes, 1983; Peterson, 1989, 1990).

A 20 year longitudinal study of forecasting practice reports that U.S. based firms consistently rank accuracy as a top criterion for evaluating sales forecasting effectiveness (McCarthy et al., 2006). Sales forecasting research also recommends including error statistics (i.e. bias and uncertainty) as a factor in evaluations of forecasting effectiveness, as well as assessment of sales forecasting process management, such as timeliness and opportunity cost (Fildes and Hastings, 1994; Winklhofer et al., 1996a).

Therefore, based on the literature review findings, we can conclude that an assessment of ESFE not only in terms of accuracy but also other criteria of importance for practitioners would provide a more comprehensive picture of ESFE (Erickson, 1987 and Winklhofer, and Diamantopoulos, 2002). We now explore the relevant forecasting criteria.

2.4.1 Forecasting Accuracy

As stated above, empirical studies examining ESFE focus almost exclusively on accuracy as performance criterion (see Dalrymple, 1975, 1987; Mentzer and Cox, 1984;

Watson, 1996) with the exception of Mahmoud et al. (1988). This preoccupation on accuracy is also reflected in the methodological forecasting literature where a large number of accuracy measures are proposed as indicators of forecast effectiveness such as MAPE (Mean Absolute Percentage Error), MdAPE (Median Absolute Percentage Error), sMAPE (Symmetric Mean Absolute Percentage Error), sMdAPE (Symmetric Median Absolute Percentage Error), MdRAE (Median Relative Absolute Error), GMRAE (Geometric Mean Relative Absolute Error), and MASE (Mean Absolute Scaled Error) (Armstrong, 1985; Mahmoud, 1984; Makridakis, 1993).

In the early studies, accuracy is often used synonymously with ESFE. Mentzer and Cox (1984a, p.144) point out that in order 'to understand the concept of accuracy, it should be divided into the components of potential accuracy and achieved accuracy. Potential accuracy is the maximum obtainable accuracy for a given forecast situation'. The particular forecasting situation places constraints on the potential accuracy of a forecast; for example 10 per cent accuracy might be a very accurate result for a company operating in a volatile market versus stable market and similarly for products that are difficult to forecast, the same forecast error represents a better quality forecast than for products that are easy to forecast (Hagdorn-van der Meijden et al., 1994; Winklhofer et al., 1996b). Mentzer and Cox (1984b), Mahmoud et al. (1988) and Winklhofer and Diamantopoulos, (2002) find accuracy as most important factor of ESFE. The table below shows the studies on accuracy in relation with ESFE.

Table 2.4 - Literature on Forecast Accuracy in Relation with ESFE

Authors	Year	Sample	Main findings
Mentzer and Cox	1984b	160 companies	Accuracy was most important factor, but ease of use, credibility, and cost played a role. Increased use of computers in forecasting.
Mahmoud et al.	1988	67 companies	Accuracy was most important factor, but ease of use and data requirements played a significant role.
Winklhofer and Diamantopoulos	1996b	41 empirical research review covering the period 1970-1995	92% of companies stated accuracy was the most important factor.
Lawrence and O'Conner	2000	Field study. 10 companies	Examined the accuracy, bias and efficiency of the ESFE.
Winklhofer and Diamantopoulos	2002	Empirical. 180 companies	Accuracy, bias, timeliness and environmental turbulence have an influence of ESFE.
Danese and Kalchschmidt	2011a	Empirical. 343 companies	Analyse how, in a multivariate setting, different forecasting variables can contribute to improve companies' performance (i.e. forecast accuracy, cost and delivery performance)

Mentzer and Kahn (1995) report that the majority of firms use Mean Absolute Percentage Error (MAPE) to measure forecast accuracy. This is defined as the absolute difference between actual and forecasted sales as a percentage of actual sales and shows to what extent actual sales are under or over estimated by the forecast. According to Makridakis (1993, p.528) 'MAPE is a relative measure that incorporates the best characteristics among the various accuracy criteria. Moreover, it is the only measure that means something to decision makers.' The suitability of the MAPE as a forecast

accuracy measure in a forecasting survey are studied by many researchers (Small, 1980; McHugh and Sparks, 1983; Dalrymple, 1987; West, 1994).

2.4.2 Forecast Bias

A forecast is defined as biased when, over several time periods, the forecast is consistently too optimistic or too pessimistic. In statistical terms, the forecast is biased if a non-random difference between an estimate and its true value can be observed. While some studies examine bias in the forecasting context, little is known about how bias influences ESFE (Lawrence and O'Conner, 2000; Winklhofer and Diamantopoulos, 2002). Erickson (1987, p.453) argues that to 'managers who are interested in planning as well as forecasting, lack of bias is more important than accuracy', but he fails to provide any empirical evidence supporting this claim. Winklhofer and Diamantopoulos, (2002) study empirically finds out that bias (over-estimation) influences evaluations of ESFE.

Table 2.5 - Literature on Forecast Bias in Relation with shows the studies on bias in relation with ESFE.

Table 2.5 - Literature on Forecast Bias in Relation with ESFE

Authors	Year	Sample	Main findings
Winklhofer and Diamantopoulos	1996a	Qualitative study. 13 in depth personal interviews	Bias has been identified as a factor influencing ESFE.
Lawrence and O'Conner	2000	Field study. 10 companies	Examined the accuracy, bias and efficiency of ESFE.
Winklhofer and Diamantopoulos	2002	Empirical. 180 companies	Accuracy, bias, timeliness and environmental turbulence have an influence of ESFE.

In the context of forecasting, a few studies have examine bias as criterion for selecting between forecasting methods (e.g. Peterson, 1990; Sanders and Manrodt, 1994). Sanders (1992) and Lawrence et al. (2000) find that judgment creates biased forecasts. This is not true for all the cases, Lawrence et al. (2000) review and they find that some companies has no bias but they do not address which forecasting method is used in these companies. If the forecasts are used as 'targets' to encourage superior performance, it is possible that there may be a systematic bias in the forecasts (Goodwin, 1996). The direction of bias depends on the forecasters' position (i.e. sales person) in the company (Cyert and March, 1961). Steward (2001) investigates how reward structures of the organization create a bias in the forecasting. Fildes and Hastings (1994) and Galbraith and Merrill (1996) describe an 'idealised' forecasting system which has a number of attributes applicable to the forecast process which would help address bias due to personal benefits. The current literature does not cover how other factors can moderate bias's impact on ESFE.

2.4.3 Forecast Timeliness

Timeliness refers to the forecast being available to a decision maker in advance of having to make a decision based on the forecast (Winklhofer and Diamantopoulos, 2002). Timeliness is, therefore, a necessary condition for a forecast to be used. Despite the obvious importance of timeliness, only limited empirical investigations include it as a ESFE indicator. (e.g. Herbig et al., 1994; Yokum and Armstrong, 1995; Winklhofer and Diamantopoulos, 2002). Herbig et al., (1994) study include timeliness as ESFE factor however they do not report its influence and how it is measured. Timeliness in Yokum and Armstrong (1995) study come as the second most important criteria after accuracy.

Winklhofer and Diamantopoulos', (2002) study expects a positive impact of timeliness on ESFE and their results shows that the timeliness that is relevant is the one that refers to the point in time at which the forecasts are received by the decision maker, not the time at which they are produced. Unless forecasts become available to decision makers at the time they are needed, their value is practically lost. This implies that forecast preparers and forecast users must collaborate to ensure that the forecasting system is in tune with firm's decision cycle.

Given the influence of timeliness considerations on ESFE, the factors that facilitate (or hinder) timely receipt of forecasts by decision makers need further investigation. Furthermore they also report that timeliness has the least impact on managerial evaluations of ESFE. However the authors cannot provide enough literature support and only reference provided is by Remus and Simkin (1987), which claims that timeliness is a necessary condition for a forecast to be used and they put timeliness first for forecasts to be useful for decision making. Further theoretical background is required. In our knowledge, no other studies are conducted to find out timeliness's impact on ESFE.

2.4.4 Forecast Cost

Mentzer and Cox (1984a,b) and Mentzer and Kahn (1995) show that 41% of respondent see cost as a criteria for evaluating sales forecasting effectiveness. There are only a few literatures (Craig and Douglas, 2000; Armstrong, 2001, Winklhofer and Diamantopoulos, 2002) addressing cost in forecasting. Winklhofer and Diamantopoulos (2002) state that generating accurate, unbiased, and timely forecasts are costly activity. Armstrong (2001a) defines these cost as initial development costs, maintenance costs (to keep the model up-to-date) and operating costs (time and money to dollars the forecasts).

However most of the studies like Craig and Douglas (2000), Winklhofer and Diamantopoulos, (2002) and Gonul et al. (2009) address only the cost of obtaining appropriate data in exporting context omitting operating costs as recommended by Armstrong (2001a). Winklhofer et al. (2002) report that cost has no effect on effectiveness, which is contrary to literature support provided in their article. One reason for this could be that as stated by Cerullo and Avila (1975), Rothe, (1978), Dalrymple (1987) and Winklhofer and Diamantopoulos, (1996a), the firms do not keep records on forecasting expenditures and, thus, do not know their costs. Another possible reason could be their measurement or lack of it. Only data collection cost is used in Winklhofer and Diamantopoulos, (2002) study. There is no theoretical justification and literature support given in the Winkhlofer and Diamantopoulos, (2002) study for this measure.

A more comprehensive cost measure such as initial development cost, maintenance cost, operating cost may well change the test results they obtained (Armstrong, 1985) and may reveal associations with evaluation of ESFE. There is no empirical study is found capturing more comprehensive cost measure. Most recently research conducted by Gonul et al. (2009) also shows that the cost of forecasts appears to be less important than aspects like timeliness and accuracy. They also only measure data collection cost. This is a limitation captured within the literature review.

2.4.5 Environmental Turbulence

Export sales forecasting situations are described as complex and turbulent since a large number of variables influence sales in export markets (Diamantopoulos et al., 1994 and 2003). These can be new foreign competitors, changes in foreign market regulations, exchange rate fluctuations and economic crisis. Early research indicates that unexpected

events and unstable customer demands have adverse effects on performance (Dalrymple, 1975, White, 1986 and Beckenstein, 1987) but they are not categorized as environmental turbulence within these researches.

Winklhofer and Diamantopoulos, (2002) conduct a research and environmental turbulence is found to be positively correlated to forecast effectiveness; this suggest that firms facing dynamic export environments are more satisfied with their overall forecasting capability than firms operating in more stable environments. Environmental turbulence is measured capturing the dimension of technological, customer and competitor turbulence. These scales are developed by Jaworski and Kohli (1993).

Studies by McHugh and Sparkes (1983), Sanders and Manrodt (1994) also address direct links between environment and forecast criteria such as accuracy but no other studies are found to address its direct influence on forecast effectiveness with the exception of study by Winklhofer and Diamantopoulos, (2002). They report that the way each forecast criterion (i.e accuracy, bias, timeliness, cost and environmental turbulence) affects evaluations of export sales forecasting effectiveness is not conditional on the influence of the other criteria or the influence of the environment.

The author finds only one study investigating environmental turbulence direct impact on forecast effectiveness (Winklhofer and Diamantopoulos, 2002) therefore this needs to be verified with further empirical studies.

2.5 Sales Forecasting Methods

Researchers develop and disseminate increasingly sophisticated forecasting methods, in order to more accurately model the complexities of marketplace conditions (Fildes and Hastings, 1994). Below we briefly describe the methods of forecasting taken from

Waddell and Sohal (1994) which are still adopted in todays' research (Lawrence et al, 2000; Diamantopoulos and Winklhofer., 2003, Konstantinos, 2010).

Quantitative forecasting methods rely on mathematical models and assume that past data and other relevant factors can be combined into reliable predictions of the future. In general, three methods are in use; time series (patterns of past demand are projected into the future), exponential smoothing method (a special form of the weighted average that focuses on the most recent period in a weighted combination with the average from immediately preceding periods) and casual methods (they develop cause and effect relationships between demand and other variables. They predict turning points in time series data and therefore are most useful in medium-to-long range forecasts) and each method is suited to different circumstances. When there is a large reference class of data, quantitative forecasting has the advantage that this data can be handled completely and efficiently, thereby precluding the cognitive biases associated with human judgment (Goodwin and Wright, 2010).

Qualitative forecasting methods rely on managerial judgment and experience. Different individuals can obtain different results from the same information. Examples for qualitative methods are executive opinion, sales force composite, Delphi method (a structured communication technique, originally developed as a systematic, interactive forecasting method which relies on a panel of experts) Harold et al. (1975) and scenario building. Scenario analysis is a process of analyzing possible future events by considering alternative possible outcomes (sometimes called "alternative worlds"). Thus, the scenario analysis, which is a main method of projections, does not try to show one exact picture of the future. Instead, it presents consciously several alternative future developments Aaker (2001).

Combinations of statistical and judgmental forecasting methods rely on using more than one forecasting method and combining their predictions.

Surveys of sales forecasting practice have consistently shown that qualitative and combined methods are more widely used than quantitative forecasting methods even though there is an extensive body of research supporting the superiority of quantitative forecasting methods in most situations (Dalrymple, 1987; McCarthy et al., 2006; Mentzer and Cox, 1984a; Mentzer and Kahn, 1994; Sparkes and McHugh, 1984; Sanders and Manrodt, 1994; Sanders, 1997 and Lawrence et al., 2000).

Early studies reviewed by Hogarth and Makridakis (1981) conclude that quantitative models outperform judgmental forecasts. Furthermore, judgment is characterized as being associated with systematic bias and large errors. However, almost none of the cited studies involve judgment applied to time series forecasting. Most are psychological laboratory experiments.

However, the empirical evidence indicates that qualitative methods are popular for forecasting situations (i.e. across all time horizons and forecasting levels); among the statistical approaches, exponential smoothing has been gaining in popularity (Mentzer and Kahn, 1995). Sanders and Manrodt (1994) show that larger firms are more likely to employ statistical methods than smaller firms while the use of judgmental forecasting methods is more widespread among managers with great experience (Watson, 1996). This finding is also supported through an exploratory investigation by Winklhofer and Diamantopoulos (1996a) and Diamantopoulos and Winklhofers' (1999) and they also uncover reliance by decision makers on judgmental methods rather than statistical methods.

The another empirical study by Diamantopoulos and Winklhofer (2003) reveals that the most popular methods are sales force opinion (85%), personal judgment (56%), jury of executive opinion (51%), time series models (20%) and casual models (4%). Thus, confirming that judgmental approaches are overwhelmingly used in export sales forecasting and these results are also supported in the previous studies conducted by Mentzer and Cox (1984a), Dalrymple (1987), West (1994) and Mentzer and Kahn (1995).

In the same year, 2003, Sanders and Manrodts' study investigate the efficacy of using judgmental versus quantitative forecasting methods in practice. Their findings show a significant greater number of judgment focused firms which are dissatisfied with current forecasting software, managerially adjust software output, and have lower software integration with other organizational systems. Also, these firms do not appear to place great importance on software accuracy or the ability to generate forecasts without user intervention. This finding suggests that these firms have little reliance on automatically generated forecasts and that accuracy is of lesser concern as output is managerially adjusted. In addition, judgment focused firms are found to be equally prevalent regardless of industry, firm size, or product positioning strategy.

More recently, Lawrence et al. (2006) review of the past 25 years of research into judgmental forecasting and their finding show that early comparison of judgmental forecasting with statistical methods mostly use artificial data and reach varying conclusions about the relative accuracy of the two methods (Adam and Ebert, 1976; Eggleton, 1982; Lawrence, 1983).

Please see early studies in Appendix C Table C.1 for usage of different forecasting methods across forecast level (percentage of respondents), Table C.2 for studies

indicating that qualitative methods outperform quantitative methods and Table C.3 for studies indicating that quantitative methods outperform qualitative methods.

In summary, although some contradictory results are reported in the literature, judgmental and combined forecasting methods gain substantial interest and usage in the recent years. We now look at how forecasting methods interact with the forecasting criteria.

2.6 Forecasting Methods Moderating Impact

This section reviews the specific literature on forecasting methods' moderating impact on forecasting criteria.

2.6.1 Accuracy

The first large-scale comparison of the accuracy of judgmental and quantitative forecasting using real life data is performed by Lawrence et al. (1985, 1986) which compare the accuracy of most of the widely available forecasting models on a set of 1001 real-life time series comprising annual, quarterly and monthly series drawn from a variety of domains including stock market, sales, demographic and financial. Lawrence et al., (1985) study using the same sample conclude that it demonstrates judgmental methods to be at least as accurate as statistical methods. In addition, the standard deviation of the judgmental forecast errors is uniformly less than for the statistically methods suggesting a greater consistency in their accuracy. They also later on find greater gains by combining a judgmental with a statistical forecast (Lawrence et al., 1986). A later research by Makridakis (1993) shows further support to these conclusions. However the research by Carbone and Gorr (1985) conclude that judgmental forecast is less accurate than the statistical forecast.

There is literature support (Mentzer and Kahn, 1995) for the adoption of particular forecasting method has implications for forecast accuracy. However Mentzer and Kahn (1995) findings also suggest that forecasting method alone does not necessarily improve accuracy. They recommend that managers should consider other issues associated with forecasting, including, the forecast environment, cost, timeliness, bias and others. Dalrymple (1975) find differences in forecast errors across forecasting methods, but he does not test the observed differences statistically. Rice (1997) report low levels of statistical method usage for nondomestic forecasting in her study of large US multinationals. The key implication of her findings is that the use of a particular forecasting procedure and the combination of forecasting methods do not automatically lead to better forecasts for export sales.

Diamantopoulos and Winklhofer (2003) test the relationship between forecasting methods and forecast accuracy and conclude that neither the use of certain types of forecasting methods nor the use of particular method influence export sales forecast accuracy. A possible explanation could be that all forecasting methods used are based on information of questionable quality and consequently none can be expected to outperform the others. Forecast accuracy is also not improved via a combination of forecasting methods. Their finding is consistent with Dalrymple's (1987) findings, which also do not detect any relationship between the combination of forecasts and forecast accuracy.

This contradicts findings of the experimental literature (see Clemen, (1989) and Sanders and Manrodt (2003)). The significant differences in forecast accuracy are found between judgment and quantitative focused firms. According to Sanders and Manrodt (2003), a significantly greater number of quantitative focused firms experience lower

error rates. Their findings show that judgment focused firms believe in the value of subjective information and they also find an evidence that these firms operate in environments with greater uncertainty where information may have significant bearing. Therefore further research should be taken to evaluate benefits of specific types of information in contributing to forecast accuracy and better structuring the forecasting process to minimize the undesirable effects of judgment.

Research by Zotteri and Kalchschmidt (2007) also investigate the link between forecast methods and accuracy and their results show that the use of quantitative methods seems to reduce forecast errors, thus claiming that companies that use at least some sort of structured forecasting approach tend to perform better. However they also acknowledge that qualitative methods tend to be used for less structured forecasting problems with a more variable and uncertain demand that is *per se* more difficult to foresee. One should not draw the conclusion that a company would improve accuracy by simply switching from qualitative to quantitative methods. However, understanding differences in accuracy is sometimes tricky. Accuracy is the main output of forecasting practices, but it is an intermediate output and companies invest in the forecasting process to improve operational performance that forecasting influences. In other words, if a company is very flexible, with short lead times, probably forecasting accuracy is not so important and thus forecasting accuracy might not be high.

More recently Danese and Kalchschmidt (2011) empirically investigate the link between forecasting methods and accuracy and they do not find a clear relationship between forecasting methods and accuracy. This result is consisted with previous findings (Diamantopoulos and Winklhofer, 2003) demonstrating that this relationship is not always verified. A possible explanation is that the efficacy of forecasting methods in

improving forecast accuracy can vary in different contexts.

Moreover, simply adopting forecasting methods is usually not sufficient to guarantee good forecast accuracy, as other actions are needed to be linked to how the forecasting process should be organized and managed. Further explanation for the lack of significant relation between forecasting methods and forecast accuracy can be linked to the way forecast accuracy is measured in their study. They chose MAPE to measure the forecast accuracy and ask the respondents to indicate (1) for an individual product, what percent would be the forecast error two months in the future, and (2) for the total sales, what percent would be the forecast error 24 months in the future. First of all, respondents may not have a precise idea of what would be the forecast error for the 2 or 24 months in the future, since they may not measure the percentage forecast error. As a consequence, the risk is that the level of performance reported does not reflect the real situation or response rate is very low. In their sample, for instance, they received 63 incomplete responses on forecast error. As a consequence, a further research is necessary in order to understand the link between the forecasting method and forecast error.

2.6.2 Bias

Literature reviewed by Hogarth and Makridakis (1981), judgment is characterized as being associated with systematic bias. This is echoed by Sanders (1992) and they find judgment to produce forecast what are biased and less accurate than statistical methods. While studies by Peterson (1989 and 1990) and Sanders and Manrodt (1994) examine bias as forecast criterion selecting between forecasting methods, there is no literature review found on how forecasting method used by firms varies influence of bias on ESFE.

2.6.3 Environmental Turbulence

Environmental turbulence refers to the amount of change and complexity in the environment of a company. The greater the amount of change in environmental factors, such as technology and governmental regulations, and/or the greater the number of environmental factors that must be considered, the higher the level of environmental turbulence. Sanders and Mandrodt (1994) research findings show that environmental turbulence is correlated to the judgmental adjustment of quantitative methods compared to other forecasting methods. The same authors' research in 2003 reveal similar findings and show that judgment focused firms are found to operate in environments characterized by higher uncertainty, which may be a factor contributing to greater reliance on subjective information. This indicates that for example, if a judgmental forecasting method is used, the impact of environmental turbulence on ESFE may be higher than formal statistical forecasting methods. Thus, the forecasting methods can play a moderating role in the relationships between ESFE and the different forecast criteria.

Empirical evidence on such a role of the forecasting method is lacking and in our knowledge only Diamantopoulos and Winklhofer (2003) put forward an exploratory hypothesis and their finding show that usage of statistical methods is found to be unrelated to the firm's dependence on exporting, and the turbulence of its export environment. These findings suggest that the type of forecasting methods utilized for export sales forecasting is likely to be governed by more organization-specific variables. This is an area in which further empirical research is needed.

2.6.4 Cost and Timeliness

The author has not found any study investigating how forecasting methods used by firm could change the influence of cost and timeliness on ESFE. This is a limitation within the literature which needs further investigation.

In conclusion, the literature review shows a need to further investigate whether the use of particular forecasting method nor the combination of forecasting methods change the influence of forecasting criteria on ESFE.

2.7 Impact of Export Sales Forecasting Effectiveness on Export Market Performance

Existing research suggests that ESFE should be judged on the extent to which sales forecasting supports improved business performance that affects the bottom line, such as inventory costs, profitability, supply chain costs and customer service levels (Mahmoud et al., 1992; Mentzer, 1999, 1999a; Moon et al., 2003). Mahmoud et al. (1988) advise firms to keep records of decision outcomes associated with sales forecast in order to evaluate the impact of sales forecasting effectiveness on decision making. McCarthy et al. (2006) report that firms which associated sales forecasting performance with business performance indicated that it is linked to inventory levels (48%), customer service (30%) and supply chain costs (19%).

While a large number of empirical studies focus on forecasting in general or sales forecasting in particular (for a review, see Winklhofer, et al, 1996b), the role of ESFE's role on EMP receive only scant attention to date. Only two studies are found in the literature review supporting the linkage between ESFE and EMP. This is rather surprising since the purpose of sales forecasting is to reduce uncertainty "by predicting

what will be sold and when" (McHughes, 1987; pp.17-18). This is particularly prevalent in the global market economy. Given that planning for export operations takes places in an environment characterized typically by high degree of uncertainty, preparation of accurate sales forecasts becomes essential for firm's export performance.

The first study undertaken by Zotteri and Kalchschmidt (2007) and in their model, ESFE is evaluated as average percentage error only; omitting bias, cost, timeliness and others from their measurement which is conflicting with some of the studies reviewed so far such as Winklhofer and Diamantopoulos, (2002), Diamantopoulos and Winklhofer (2003). In order to evaluate performance, they collected data regarding how companies in the sample perform compared to their competitors. Their conclusions confirm that forecasting has an impact on company performance but they also established that this impact depends on what forecasting is used for. This suggests that companies should carefully consider how to use their forecasts according to their competitive priorities. Moreover, this claims that forecasting plays a significant role also in improving companies' performance, thus justifying the attention paid to this issue.

Second study is conducted by Davis and Mentzer (2007) and their study investigates a positive link between ESFE and EMP. Their findings show that managers couple ESFE with several areas of EMP, including inventory costs, customer service levels, plant efficiency and capital investments. Therefore linking the ESFE to the EMP is reported to be critical to evaluating and improving the firm's sales forecasting capability and sales forecasting climate. They state that developing useful measures that link the ESFE with the EMP requires an organization-wide effort. However, in the absence of such measures, managers do not have the information that is needed to effectively diagnose problems and motivate behavioral changes, which are necessary for achieving different

performance outcomes. The content analysis the authors used provided preliminary evidence of the link between ESFE and EMP; however, the data did not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages.

In summary, the existing literature support linking the ESFE to the EMP but recommends further research to verify this link empirically. Furthermore, in the existing literature, this link has been limited with only one factor omitting other important factors which also have an influence on EMP. We now investigate these additional influences in the literature.

2.8 Control Variables

This part of the literature review on EMP seek to illustrate the current position with regard to those variables – managerial characteristics, export market orientation and organization characteristics – as control variables which have been amongst the most frequently studied in this area. These variables are only included in this research to fully examine the impact of export sales forecasting effectiveness on EMP. We now briefly look at the current literature of each of these variables;

2.8.1 Managerial Characteristics

Table 2.6 - Managerial Characteristics Influence over summaries the principle findings of some published studies.

Table 2.6 - Managerial Characteristics Influence over EMP

Authors	Type of Research	Dependent Variable	Independent Variable	Conclusion
Schlegelmilch and Ross (1987)	Empirical analysis-longitudinal study from 1982 to 1984	EMP	Managerial Characteristics	Positive impact
Abby and Slater (1988)	Literature review from 1978 to 1988	EMP	Management commitment and perception	Positive impact
Leonidou et al., (1998)	Literature review from 1960 to 1995	EMP	Identified 26 managerial factors	Positive impact
Entrialgo (2002)	Empirical Review	EMP	Managerial Characteristics	Mixed results
William and Chaston (2004)	Qualitative Research	EMP	Managerial Characteristics	Positive impact

These studies have number of limitations which need to be highlighted. Firstly, an investigation of management characteristics as isolated determinants of EMP has the disadvantage of ignoring a whole host of other company's internal and external factors. The presented results therefore can play a small part in an overall attempt to provide an explanation of EMP. A further limitations lie in the focus of the sectors and countries which inevitably raises the question of transferability of results to other industries and countries. Therefore it would be desirable to see a follow-up study in alternative empirical settings, for example comprising companies in different industries and or smaller companies.

2.8.2 Organizational Characteristics

Three variables represent organizational characteristics, namely, firm size, firms' exporting experience and firm status (independent firms versus subsidiaries).

Table 2.7 - Organizational Characteristics Influence over summaries the principle

findings of the major published studies concerning organizational characteristics influence on EMP.

Table 2.7 - Organizational Characteristics Influence over EMP

Authors	Type of Research	Dependent Variable	Independent Variable	Conclusion
Czinkota and Johnston (1983)	Empirical	EMP	Organization Size	No impact
Cavusgil (1984)	Empirical	EMP	Export Experience	Inconsistent results
Abby and Slater (1988)	Reviewed the literature between 1978 and 1988	EMP	Organization Size	No impact
Diamantopoulos and Inglis (1988)	Empirical	EMP	Export Experience	No impact
Madsen (1989)	Empirical	EMP	Export Experience	Positive Impact
Moon and Lee (1990)	Empirical	EMP	Export Experience	No impact
Erramilli (1991)	Empirical	EMP	Export Experience	Positive Impact
Agarwal and Ramaswami (1992)	Empirical	EMP	Export Experience	Positive Impact
Bonaccorsi (1992)	Empirical	EMP	Organization Size	No impact
Cheety and Hamilton (1993)	A meta analysis	EMP	Organization size	Positive Impact
Ito and Pucik (1993)	Empirical	EMP	Organization Size	Positive Impact
Zou and Stan (1998)	Literature Review between 1987 and 1997	EMP	Organization Size	Mixed findings

One area of dispute concerns the association between the size of an organization and performance as an exporter. Different studies publish in the 1980s and 1990s in which this association is assessed as positive, negative and non-existent. It is also found that some studies are in favor of positive influence of firm's exporting experience while other empirical evidence such as Bonaccorsi (19920 and Ito and Pucik (1993) are

inconsistent with these findings.

For all the attention that this variable is received, there is still little agreement regarding to its impact on export performance which is in need to be researched further.

2.8.3 Export Market Orientation

Table 2.8 - Export Market Orientation Influence over summaries the principle findings of the major published studies.

Table 2.8 - Export Market Orientation Influence over EMP

Authors	Type of Research	Dependent Varibale	Independent Variable	Conclusion
Narver and Slater (1990)	Exploratory	EMP	Market Orientation	Positive
Jaworski and Kohli (1993)	Empirical	EMP	Market Orientation	Positive
Greenley (1995)	Empirical	EMP	Market Orientation	No impact
Cadogan, et al. (1999)	Empirical	EMP	Market Orientation	Positive
Shoham and Rose (2001)	Empirical	EMP	Market Orientation	Positive
Rose and Shoham (2002)	Empirical	EMP	Market Orientation	Positive
Shoham, et al. (2005)	Meta analysis	EMP	Market Orientation	Positive
Ho et al. (2007)	Empirical	EMP	Market Orientation	No impact

Studies using samples of US companies (e.g. Jaworski and Kohli, 1993; Kumar et al., 1998; Narver and Slater, 1990; Pelham, 1997; Pelham and Wilson, 1996; Slater and Narver, 1994; Van Egeren and O'Connor, 1998) find unequivocal support for a positive association between market orientation and performance. However, mixed findings are found in non-US samples (Bhuian, 1997; Deng and Dart, 1994; Diamatopoulos and Hart, 1993). Given the inconsistency of the findings among the non-US studies, there is

a need to assess the hypothesized relationship between market orientation and EMP in other, particularly non-US, business environments.

2.9 Conclusions and Limitations of the Literature Review

The aim of this chapter is to review and summarise existing knowledge in the three areas that underlie the topic of inquiry. An analysis of the findings from these three lines of inquiry allows the researcher to identify gaps in the literature, where the study can make a contribution.

Firstly, the examination of the sales forecasting literature shows a scarcity of forecasting criteria's influence on ESFE; much of the research focuses on measuring the accuracy only as a main influence on ESFE (see Section 2.4.1). There is shortcoming including other forecasting criteria such as bias (see Section 2.4.2), timeliness (see Section 2.4.3), cost (see Section 2.4.4) and environmental turbulence (see Section 2.4.5).

Secondly, the literature review reveal that the existing research models do not address potentially important moderators of the proposed relationships. Depending on the forecasting methods used by the organization, the influence of various forecasting criteria on ESFE could also vary (see Section 2.6). For example, if the firm uses judgmental forecasting, the impact of bias on ESFE may be different than a statistical or composite sales forecasting.

Lastly, ESFE's effect on EMP receive only limited attention to date and literature review shows that the linking the ESFE to the EMP is reported to be critical to evaluating and improving the firm's sales forecasting capability. Hence the need for future research to operationalize the constructs and test the conceptual linkages proposed by Davis and Mentzer (2007) (see Section 2.7).

Several limitations of past research are identified that are likely to account for many of the inconsistencies in the literature; (1) much of the knowledge about export sales forecasting activity is fragmented, and the tradition of building on previous findings is not well-established (see Section 2.3) (2) many studies are conducted in isolation by focusing mainly on single factors affecting forecast effectiveness such as accuracy's or bias's impact (see Section 2.4). There are a few efforts to develop and test models that incorporate a relatively wide range of relevant factors (see Winklhofer and Diamantopoulos, 2002). As a result, this stream of research is still in its exploratory phase of the development, lacking well defined theoretical framework that would link all the explored variables to ESFE. This can be attributed to the lack of consensus among researchers as to what constitutes all the factors determining ESFE. (3) the relationship between the firm's forecasting activities and performance in its domestic versus export markets needs to be further researched (see Section 2.3) (4) only data collection cost is used within the existing studies. A more comprehensive cost measure such as initial development cost, maintenance cost, and operating cost may well change the test results (5) we need to know more about the performance of experts in forecasting since different studies yield contradictory findings about the value of expertise (Bolger and Wight, 1994; Griffin and Brenner, 2004). Therefore further research is required to understand the characteristics of the forecasters (i.e. education, training, previous experience, management style) (6) further research is required to understand how people acquire and use information when they make forecasts and the effects of differences in the availability of information (Camerer et al., 1989; Yaniv and Hogarth, 1993; Stewart, 2001) (7) there is still scope for further research on the influence of bias on forecast accuracy and performance. The role of biases like illusory, correlation and hindsight bias (the 'knew-it-all' effect) are largely neglected (Wilkie et

al., 1993) (8) forecasting implications of export strategies (e.g., market share versus profit or emphasizing standardisation versus adaption) need to be investigated.; currently, both the forecasting and the exporting literature are practically silent on how a firm's strategic choices in the export arena affect the organization, management and the sales forecasting effectiveness (Winklhofer and Diamantopoulos, 2003). (9) Empirical evidence on ESFE's impact on EMP is missing (see Section 2.7). (10) further research is recommended to understand the link between forecasting criteria such as accuracy, bias, cost, timeliness, environmental turbulence, forecasting methods and forecasting effectiveness (see Section 2.4, 2.5 and 2.6) (11) another major avenue for study concerns the measurement of ESFE. A major methodological challenge is the construction of appropriate measures of ESFE, going beyond accuracy criteria (see Section 4.3.9.1).

CHAPTER 3. RESEARCH MODEL AND HYPOTHESES

3.1 Introduction

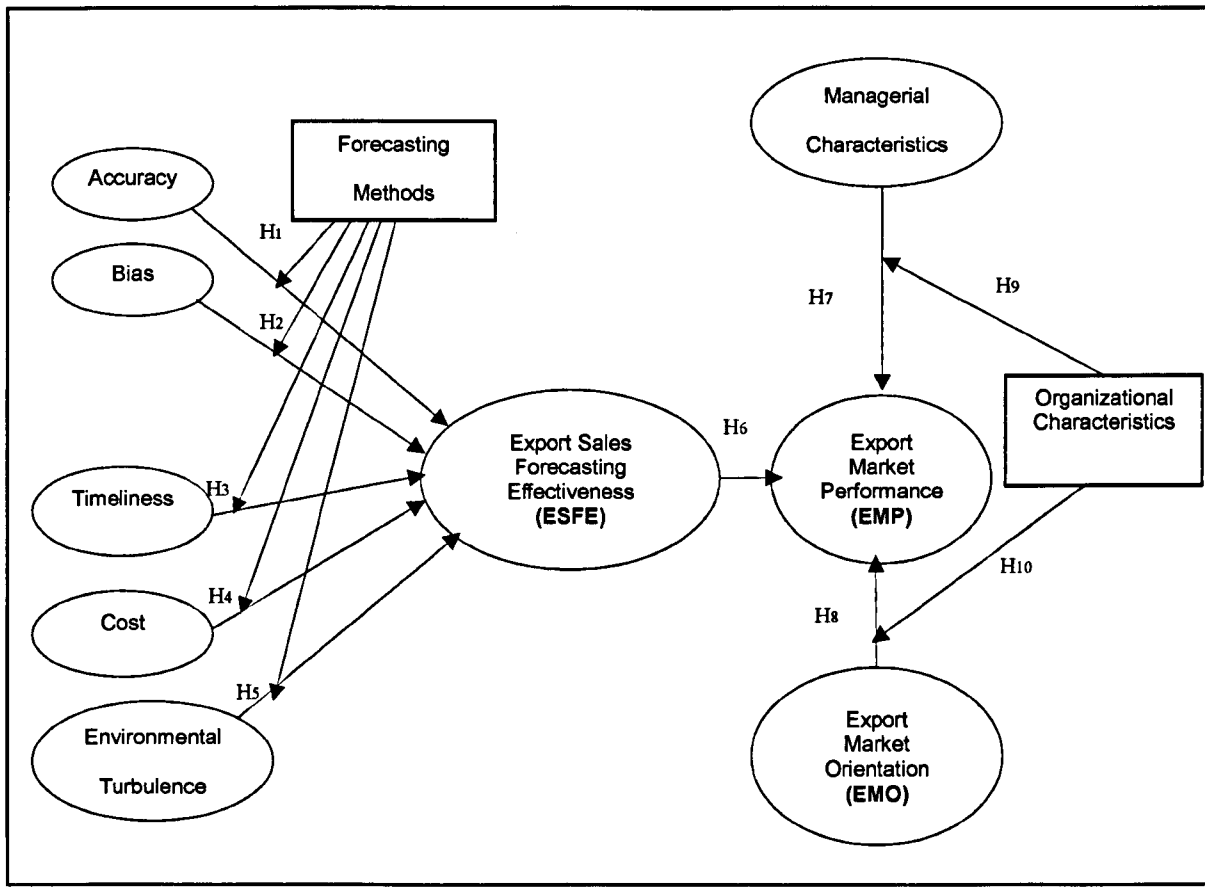
The synthesis of literature review from the preceding chapter led to the research questions investigated in this study. Forecasting literature so far identified accuracy, bias, cost, timeliness and environmental turbulence as the most studied constructs in forecasting effectiveness (see Section 2.4). It also provided support for the need to understand the forecasting methods' influence on various forecasting criteria. There are some literatures on forecast methods' moderating influence (see Section 2.6), however empirical evidence on such a role of the forecasting method is lacking and existing literature does not address whether forecasting criteria's influence on forecasting effectiveness varies depending on the forecasting methods the firm uses. This is the first gap identified within the literature review.

Furthermore, the role of ESFE on EMP receives only limited attention to date. Linking the ESFE to the EMP is reported to be critical in evaluating and improving the firm's sales forecasting capability and sales forecasting climate. Only two studies empirically test ESFE's influence on EMP (see Section 2.7). Within the first study (Zotteri and Kalchschmidt, 2007), ESFE is evaluated as average percentage error only, which is not a direct comparison with this study (see Section 4.3.9.2). And data does not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages in the second study (Davis and Mentzer, 2007) (see Section 2.7). This is the second gap identified. Most studies on EMP have failed to control for potentially important confounding influences relating particularly to managerial characteristics, export market orientation and organizational characteristics (see Section 2.8). Therefore these variables are only included in this research to fully examine the

impact of ESFE on EMP.

To address these research gaps, the author uses the literature review findings to develop the proposed research model and the hypotheses. A detailed discussion is provided to explain the presence of each construct and hypothesised relationship within the model (see Section 3.2.1) that is depicted in Figure 3.1 - The Research Model

Figure 3.1 - The Research Model



3.2 Development of the Research Hypotheses

In this section, the constructs and hypothesized relationships included in the research model are explained and the hypotheses are formulated.

3.2.1 Forecasting Methods' Moderating Role

In order to test forecasting methods' moderating impact on the relationship between forecasting criteria and ESFE, the hypotheses below are put forward from H_1 to H_5 and each hypothesis is tested separately for statistical forecasting method, judgmental forecasting method and composite forecasting method (see Section 2.5 and 2.6).

3.2.1.1 Accuracy

Diamantopoulos and Winklhofer (2003) and Danese and Kalchschmidt (2011) do not find a clear relationship between forecasting methods and forecasting accuracy. Their findings are also consistent with Dalrymple's (1987) study, which do not detect any relationships between the combinations of forecasts and forecast accuracy either. However, it contradicts findings of the experimental literature (see Clemen, 1989 and Sanders and Mandrodt, 2003). According to their result, the significant differences in forecast accuracy are found between judgment and quantitative focused firms (see section 2.6). But the existing literatures does not address whether accuracy's impact on ESFE varies depending on the forecasting methods used hence the purpose of the hypothesis below.

H_1: The positive impact of accuracy on ESFE depends on the forecasting methods applied by the companies.

3.2.1.2 Bias

While studies examine bias as criterion for selecting forecasting methods (e.g. Peterson, 1989, 1990; Sanders and Manrodt, 1994), literature evidence is missing whether biases' influences on ESFE varies depending on the forecasting methods used. For example, if the firm uses judgmental forecasting, the impact of bias on ESFE may be different than a statistical or composite sales forecasting. Lawrence et al. (2000) find that judgement creates a bias forecast, which is echoed by Steward (2001) who reports that reward structures of the organization create bias in the forecasting. Empirical evidence on such a role of the forecasting method is lacking, and to our knowledge, no study up to date examines the forecasting method's moderating influence between bias and ESFE, hence the hypothesis below is put forward.

H_2: The negative impact of bias on ESFE depends on the forecasting methods applied by the companies.

3.2.1.3 Timeliness

Timeliness refers to the forecast being available to a decision maker in advance of having to make a decision based on the forecast (Diamantopoulos and Winklhofer, 2003). However, despite the obvious importance of timeliness, only a few empirical investigations include it as a ESFE indicator (e.g. Herbig, et al.,, 1994; Yokum and Armstrong, 1995, Winklhofer and Diamantopoulos, 2003) and they find a direct impact of timeliness on ESFE (see Section 2.4.3). But these studies do not report which forecasting methods are used by the firm and whether its influence on forecasting effectiveness varies depending on the forecasting methods used. For example, if the firm uses statistical forecasting which assumes past pattern will continue in the future and therefore, timely forecasting input might not be as important compared to

judgmental forecasting. However, the author does not find any study empirically testing this moderating effect of forecasting methods between timeliness and ESFE and hence the hypothesis below is proposed.

H_3: The positive impact of timeliness on ESFE depends on the forecasting methods applied by the companies

3.2.1.4 Cost

Generating accurate, unbiased, and timely forecasts is a cost-incurring activity; such costs include data obtaining costs, initial development costs, maintenance costs (to keep the model up-to-date) and operating costs (time and dollars to make the forecasts) (Armstrong, 2001a). The literature suggests a negative link between cost and ESFE (Winklhofer and Diamantopoulos, 2002) however it does not explore whether this negative impact would vary depending on the forecasting method used by the firm. For example data obtaining costs for statistical forecasting would be cheaper (past pattern will continue) compare to judgmental forecasting methods (requires salesforce input), therefore the influence of cost on ESFE is expected to be different depending on the forecast methods they use. Hence the following hypothesis is put forward.

H_4: The negative impact of cost on ESFE depends on the forecasting methods applied by the companies.

3.2.1.5 Environmental Turbulence

Export sales forecasting situations are described as complex and turbulent in export markets (see section 2.4.5). Winklhofer, and Diamantopoulos, (2002) studies find a direct link between environmental turbulence and ESFE. Sanders and Manrodt's (1994) research findings show that environmental turbulence is correlated to the judgmental

adjustment of quantitative methods compare to other forecasting methods. The same authors' research in 2003 revealed similar findings (see Section 2.6). This indicates that forecasting methods might play a moderating role in the relationship between ESFE and the different forecast criteria rather than a direct influence. However the current literature fails to demonstrate whether environmental turbulences' impact on ESFE varies depending on the forecasting methods used. With the following hypothesis we test whether the different forecasting method interact with environmental turbulence, which would as a consequence have a different impact on ESFE.

H_5: The positive impact of environmental turbulence on ESFE depends on the forecasting methods applied by the companies.

3.2.2 Impact of Export Sales Forecasting Effectiveness on Export Market Performance

While a large number of empirical studies focus on forecasting in general or sales forecasting in particular (for a review see Winklhofer, et al., 1996b), the role of ESFE on EMP receive only scant attention to date. As depicted in the literature review, only two studies empirically test ESFE's influence on EMP (see Section 2.7). Within the first study (Zotteri and Kalchschmidt, 2007), ESFE is evaluated as average percentage error only, which is not a direct comparison with this study (see Section 4.3.9.2). And data does not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages in the second study (Davis and Mentzer, 2007). Hence there is a need to test the link between ESFE and EMP empirically.

H_6: Export sales forecasting effectiveness has a positive impact on export market performance

Managerial Characteristics

Most studies on export performance fail to control for potentially important confounding influences relating particularly to managerial characteristics, export market orientation and organizational characteristics (see Section 2.8). Therefore these variables are only included in this research to fully examine the impact ESFE on EMP.

The impact of managers on organizational performance is recognised as a critical issue for many years (Hambrick and Mason, 1984; Gupta and Govindarajan, 1984; Gunz and Jalland, 1996). In the literature, two streams of managerial characteristics are addressed. First, subjective managerial characteristics, which include indicators of risk preference, rigidity, willingness to change and future perspective (Dichtl et al. 1984). Second, objective managerial characteristics, notably formal education, language ability and experiential background, comprise directly observable socio-demographic data (Schlegelmilch and Ross, 1987). Subjective managerial characteristics rest on psychological/attitudinal measures, whereas the latter is based on 'hard facts'. This research addresses both the impact of objective and subjective managerial characteristics on EMP. Section 2.8 summarizes the principle findings of the major published studies concerning managerial characteristics influence on EMP.

The literature review suggests a link between managerial characteristics and EMP (Chapter 2 Section 2.8), which is empirically tested within this study. In this study, managerial characteristics are included as a control variable and the hypothesis below is proposed;

H_7: Managerial characteristics have an impact on export market performance

Export Market Orientation

A number of empirical studies are conducted to assess the impact of export market orientation on EMP (see Table 2.8). Studies using samples of US companies (e.g. Jaworski and Kohli, 1993; Kumar et al., 1998; Narver and Slater, 1990; Pelham, 1997; Pelham and Wilson, 1996; Slater and Narver, 1994; Van Egeren and O'Connor, 1998) find unequivocal support for a positive association between export market orientation and EMP. Section 2.8 summarizes the principle findings of the major published studies concerning export market orientation influence on EMP. Hence the hypothesis below is put forward.

H8: Export market orientation positively impacts export market performance

Organizational Characteristics

Section 2.8 summarizes the principle findings of the major published studies concerning organizational characteristics' direct influence on EMP.

In the UK, Liu (1995) reports that large firms are more market oriented than medium-sized firms and similarly, large firms show better profit performance than medium-sized firms. These findings are supported by Gaur et al. (2008) and they find that the interaction between market orientation and firm resources is positive and significant, providing support for the moderating effect of firm resources on the competitor orientation and manufacturing performance relationship. These results suggest that as the level of market orientation increases in an organization, firm resources play a more important role in affecting a firm's performance. This suggests that organizational characteristics play a moderating role in the relationships between EMP and export market orientation.

In terms of organizational characteristics' moderating impact on managerial characteristics, Sanyal and Guvenli's (2004) study shows that in the US, the results show no significant relationship between firm size and managerial characteristics. In Slovenia, the respondents from the small firms rated education as more important than those from larger firms, while those from larger companies valued the ability of managers to choose the right persons for key positions and the gender of the manager as important characteristics. The respondents from small Israeli firms rated decision making ability, commitment to organizational goals and ability to work with people as more important characteristics of managers than large firms do. Those from large firms, however, value professional membership more.

Therefore organizational characteristics are included in this research as a moderating variable.

H_9: Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm.

H_{10}: Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm.

3.3 Conclusions of the Research Model and Hypotheses

This chapter presents the research model and the hypotheses that are empirically tested in order to answer the research questions. The proposed research model integrates key findings from the literature review chapter, specifically literature related to forecasting methods' moderating relationship between the forecast criteria (accuracy, bias, timeliness, cost and environmental turbulence) and export sales forecasting effectiveness. Hypotheses presented above bring additional understanding about this moderating impact and also ESFE's impact on EMP. In the following chapter, the author provides a discussion of the research methodology followed in conducting the study.

CHAPTER 4. RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the overall structure for the procedures that the author followed to collect data. In particular, a discussion of the rationale for many research methodology decisions and precautions taken to ensure that the study was undertaken in a rigorous and effective manner is provided.

4.2 Framework for Research Methodology

Researchers can adopt a number of methodologies in designing their studies. Research methodology refers to the combination of techniques used to examine a specific situation and the procedural framework within which the research is conducted (Sekaran, 2003). It describes an approach to a problem that can be put into practice in a research programme, and can be defined as 'a framework within which the facts are placed so that their meaning can be seen more clearly' (Leedy and Ormrod, 2001). Each methodology involves different philosophical underpinnings as well as different data collection and analytical procedures. The two dominant philosophical orientation approaches in determining the research methodology used in social sciences can be termed as *positivism* (also called the scientific method) and *social constructionism* (or interpretivism) (Easterby-Smith, et al., 2002).

In order to understand the philosophical paradigm in which this research is set, it is first necessary to explain the difference between empirical and theoretical studies. 'Empirical' is defined in The Oxford Companion to Philosophy (1995; p.226, p.870) as 'based on experience'. That is *'an idea or concept is empirical if it is derived ultimately from the five senses, to which introspection is sometimes added'*. In the same publication, 'Theory' is defined as *'an attempt to bind together [in] a systematic fashion*

the knowledge that one has of some particular aspect of the world of experience'. An empirical study implies an *'understanding of the material under investigation and therefore some kind of theoretical position'* (Remenyi et al., 2005; p.31).

This study draws it conclusions from studying the observations and collecting related evidence, and then adds its claim to the body of knowledge on the subject. Therefore it falls within empirical study. The theorist however, study the subject from writings of others and discussion with learned persons on the subject without observing the subject or collecting any evidence.

It is also important to identify the difference between positivism and phenomenology because, although empirical research is frequently associated with positivism, it can be in fact either positivist or phenomenological in nature (Remenyi et al., 2005; p.104). Phenomenology is defined as *'a theoretical point of view that advocates the study of direct experience taken at face value; and one which sees behaviour as determined by the phenomena of experience rather than by external, objective and physically described reality'* (Remenyi et al., 2005; p.286). On the other hand, researchers adhering to (logical) positivism are considered to be objective analysts, interpreters of a tangible social reality. This position is predicated on the underlying assumption that the social world exists externally and that its properties should be measured through objective methods (Easterby-Smith et al., 2002). It is necessary to observe, produce evidence, and to generalise or to model mathematically the object of the study. Parsimony is important and the principle of parsimony (also termed 'Ockham's razor') is described in The Oxford Companion to Philosophy (1995) as: *'a methodological principle dictating a bias towards a simplicity in theory construction, where the parameters of simplicity vary from kinds of entity to the number of presupposed axioms to characteristics of*

curves drawn between data points' is an important consideration in such studies. The key features of the positivists and phenomenological paradigms are illustrated in Table 4.1 - Key Features of Positivists and Phenomenological Paradigms.

Table 4.1 - Key Features of Positivists and Phenomenological Paradigms

	Positivist Paradigm	**Phenomenological Paradigm**
Basic beliefs:	World is external and objective Observer is independent Science is value-free	World is socially constructed and subjective Observer is part of what is observed Science is driven by human interest
Researchers should:	Focus on facts Look for causality and fundamental laws Reduce phenomena to simplest the elements Formulate and test hypotheses	Focus on meanings Try to understand what is happening Look at totality of each situation Develop ideas through induction from evidence
Preferred methods:	Operationalise concepts so they can be measured Take large samples Use multiple methods to establish different views of phenomena	Small samples investigated in depth or over time

Source: Remenyi, D., Williams, B., Money, A. & Swartz, E. (2005) *Doing Research in Business Management. An introduction to Process and Method.* London: Sage Publications Limited (p.104).

The process of formulating and testing the proposed research model places this study firmly within the positivist tradition of enquiry. Although the positivist approach allows efficient, convenient and relatively rapid collection of data and stands up to scrutiny through replication by other researchers provided that similar methods are followed; it has its disadvantages (Easterby-Smith et al., 2002). The disadvantages are that the understanding of processes or the significance people attach to actions can be limited. And the overall contribution to knowledge can just be confirming what is already known.

The theoretically grounded formal research model and associated hypotheses are operationalised through a quantitative methodology and the collected data are analysed through the application of advanced analytical techniques that produce results suitable for logical deductions.

Table 4.2 - Comparison of Quantitative and Qualitative Approaches provides an overview of the key differences between quantitative and qualitative approaches. This orientation stems from the author's conviction that data can be classified and measured and, consequently, should be collected through quantitative methods (Easternby-Smith et al., 2002). Consequently a hypothetico-deductive method of research is followed (Sekaran, 2003). Furthermore, the foundations of the operationalisations of the research constructs are grounded in logical empiricism (i.e., formative measures) and scientific realism (i.e., reflective measures; see Hunt, 2002 for detailed discussion).

Table 4.2 - Comparison of Quantitative and Qualitative Approaches

	Quantitative Approaches	**Qualitative Approaches**
Philosophical assumptions	Positivism	Constructionism/Interpretivism
Strategies of inquiry	Surveys and experiments	Case studies, phenomenology, grounded theory, ethnography, and narrative
Methods	Close-ended questions Predetermined approaches Numeric data	Open-ended questions, text or image data, observation Emerging approaches
The researcher	Identifies variables to study Formulate hypotheses Tests or verifies theories Uses tests of validity and reliability	Collects participant meanings Focuses on a single concept Studies the setting of the participants Collaborates with the participants Brings personal values to the study

	Uses unbiased procedures Uses statistical analysis	Interprets the data Creates an agenda for change

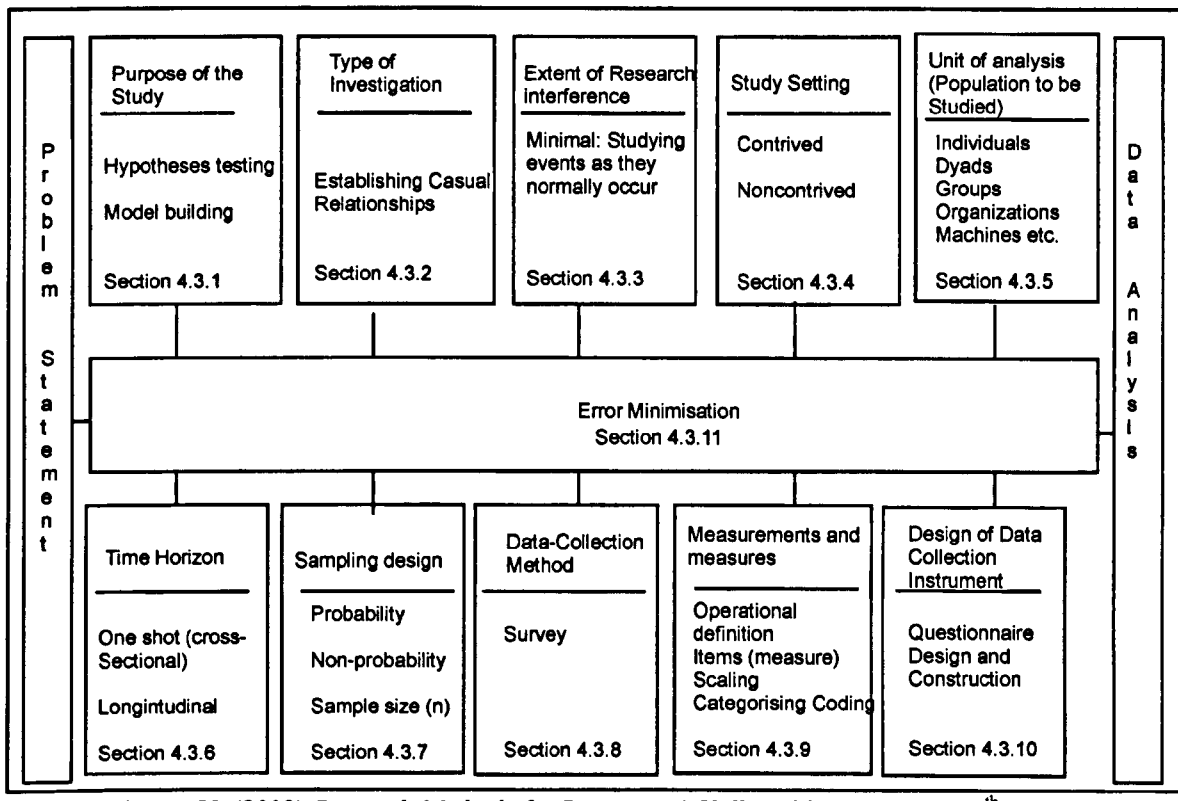
Source: Creswell, J.W. (2003) *Research Design: Qualitative, Quantitative and Mixed Methods Approaches,* London, Sage Publications, Inc.

Given these two different approaches, the choice of one approach over another for the design of the study mainly depends on the purpose of the research and the nature of the problem or research question(s) (Creswell, 2003; Easterby-Smith et al., 2002). For example, the purpose of this study is to identify different forecasting methods' moderating impact on various forecasting criteria using an established theoretical framework. If the purpose of research is to explain and predict, confirm and validate, to test a hypothesis and if the research is outcome oriented, a quantitative approach is more suitable than a qualitative approach (Leedy and Ormrod, 2001). As discussed earlier, the purpose of this study in great part conforms to a positivist, quantitative approach, which is also the dominant methodology used in similar studies. However, an initial qualitative inquiry was conducted in the form of *focus groups* and *interviews* (see Section 4.3.1 Initial Stage). The focus groups were conducted to gather insights and increase the author's familiarity with the topic of inquiry as well as to clarify the concepts and terminology used. Interviews were specifically conducted to gather insights into the constructs contained in the proposed research model and to inform the generation of questionnaire items.

4.3 The Research Design

The various issues involved in the research design discussed in this chapter are shown in Figure 4.1 (Sekaran, 2003; p.118). This particular structure is followed to ensure that all relevant aspects of research design are taken into account and to provide a clear and concise road map. In the following sections each element of the research design is discussed as depicted in Figure 4.1 – The Research Design.

Figure 4.1 – The Research Design



Source: Sekaran, U. (2003) *Research Methods for Business: A Skill Building Approach*, 4th edition, New York: John Wiley and Sons, Inc. (p.118).

4.3.1 Purpose of the Study

Using the findings of the literature review, a research model is developed showing the linkages between variables of forecasting criteria, forecasting methods, export sales forecasting effectiveness, export market performance, managerial characteristics, export market orientation and organizational characteristics.

This research utilises exploration (initial stage), hypothesis testing and model building (Kinnear and Taylor, 1996; Malhotra, and Birks, 2003; Churchill and Iacobucci, 2005). Each of these and their role within this study is debated in this chapter and is linked to the philosophical stance of the researcher (see Section 4.2).

Initial Stage

The initial research is conducted in the form of focus groups. Before carrying out a quantitative analysis of the model, it is important to obtain an additional evidence to support the assumptions and hypotheses included in the research model (Churchill and Iacobucci, 2005).

The decision to seek information from experts is in line with Dalebout and Wierenga's (1997) assertions on the importance of soliciting expert opinions and perceptions about complex business and management phenomena. Using experts during the initial research stage is recognised by scholars as a valid way of obtaining consensus and developing a holistic appreciation of the relevant issues (Winkler, 1981).

Focus Groups

Following review of the related literature, and prior to the commencement of the field research/data collection phase, focus group discussions are conducted with 'expert informants' who according to Collins English Dictionary (2000) are persons who have extensive skill(s) or knowledge in particular field. The aim is to get participants express their views on export sales forecasting and delve deeper into responses to extract as much information as possible (Hair, Babin, Money and Samouel, 2003).

When carrying out the focus groups, the author take into account the following

guidelines suggested by Churchill and Iacobucci (2005):

Size of the groups: Focus group of ten sales people are formed from the sales division of NEC who have an extensive knowledge of export sales forecasting.

Length of the focus group session and the setting: Two subsequent one hour sessions are organized with this focus group. Both sessions are held at the participants' work place.

Recording of the discussion: On both sessions, the detailed notes are taken to make sure that the important feedback is not lost.

The first session is conducted to gather insights and increase the author's familiarity with the topic of inquiry as well as to clarify the concepts and terminology used. (see Section 4.3.1 Initial Stage). Discussions focus to gather insights into the constructs contained in the proposed research model and to inform the generation of questionnaire items.

Questionnaire content is thoroughly verified at the second session which is conducted during the initial stage. Discussions are held to evaluate the original pool of questions and ascertain any suggested additions and modifications. The draft version of the research instrument is distributed to the focus group and comments received resulted in a small number of structural and wording changes (See Section 4.3.9.5, Section 4.3.9.6, and Section 4.3.9.8).

This initial research provided strong supporting evidence for the proposed research model. The author was able to gather insights into the main constructs (forecasting methods, forecasting effectiveness criteria and company performance in export setting). The discussions helped to purify questionnaire items for each construct and also

confirmed the proposed model.

Hypothesis Testing and Model Building

Hypotheses are statements that specify how two or more measurable variables are related, being tested through quantitative techniques (Churchill and Iacobucci, 2005). Testing the significance of the hypothesised relationships depicted in the research model and the predictive powers of the research model are at the core of this investigation. In short, this study involves, *hypotheses testing* to explain the complex relationships among the variables that are posited to be antecedents of export sales forecasting effectiveness and export market performance.

4.3.2 Type of Investigation

The main objective of this research is to test the research hypotheses contained within the research model and specifically to test the causal relationships between the stated constructs. Given the objective of developing and testing a model that would enable to predict different forecasting methods' moderating influence between forecast criteria and ESFE and also ESFE's impact on EMP, the author follows a positivist, hypothetico-deductive method to test the causal relationships within the model. This investigation is classified as an *ex post* factor research (Churchill and Iacobucci, 2005; Sekaran, 2003).

4.3.3 Extent of the Research Interference

The author adopts the *online survey* approach and takes precautions to eliminate any possible interference during the collection of data. Therefore this study take place within non contrived setting that involves no manipulation (i.e., events are tested as they normally occur). There is no interference.

4.3.4 Study Setting

As previously discussed, this study aims to find causal relationships between the variables proposed. There are three basic forms of evidence required to test causality. These are:

1. Concomitant variation.
2. Time order occurrence of variables.
3. Elimination of other causal factors (Churchill and Iacobucci, 2005).

The scientific concept of causality is rather complex and different from the common sense, everyday notion of causality. If we take two variables, X and Y, the scientific notion of X causes Y, would imply (Churchill and Iacobucci, 2005). Considering the statement 'X is a cause of Y', evidence of *concomitant variation* for its validity would refer to the degree that X and Y occur or vary together in the way predicted by the hypotheses. The *time order of variables'* occurrence as evidence of a causal relationship is conceptually simple, as one event cannot be considered the cause of another if it occurs after the other event (Churchill and Iacobucci, 2005). However the application of this type of evidence requires a precise understanding of the time sequence governing the phenomenon. The *elimination of other possible causal factors* are very much like Sherlock Holmes' approach to inquiry where the focus is on elimination of possible explanations other than the one being studied (Churchill and Iacobucci, 2005). This may mean holding other factors constant, or adjusting the results to remove the effects of factors that do vary.

All three types of evidence of causality are best provided through the use of a *controlled experiment*. The advantage of this approach is that the study setting (either in the laboratory or in a natural situation), is tightly controlled by the researcher. The

researcher, to a certain extent, is able to control and manipulate the interaction between the respondent and the variable(s) under study. This way, it is possible to ensure that the conditions required for evidence or causality are met (Churchill, 1999).

The nature of this study does not easily lend itself to experimental manipulation. Like most similar studies (i.e. Winklhofer and Diamantopoulos, 2002), the lack of control prohibits the execution of an experiment and therefore cannot be certain that statistically significant relationships are 'true' relationships. Instead the independent variables are viewed as affording plausible explanations of the dependent variables (Churchill and Iacobucci, 2005; Sekaran, 2003).

This research is carried out in the natural environment as a non-contrived study (done in the natural environment where work proceeds normally) and it is carried out with the UK based companies exporting to European Countries. As the researcher could not influence information transfer and management decisions and could not manipulate events, this shows that the events were tested as they normally occur.

4.3.5 Unit of Analysis

The unit of analysis refers to 'the level of aggregation of the data collected during the subsequent data analysis stage' (Sekaran, 2003, p. 132). The unit of analysis can be at many levels, such as individuals, paired individuals (dyads), groups of individuals, organizations or even countries. The researcher decides on the unit of analysis early in the research process. This decision is mainly driven by the research question and guides the choice of data collection method, sample size, and data analysis (Sekaran, 2003). The correct level of analysis depends on the objective of the study. If the objective of the study revolves around predicting the profitability of the firm, the appropriate level of analysis is the firm, not the export venture and vice versa. For example, Prasad et al.

(2004) decided to use a firm level approach because the objectives of their study was to focus on broad macro relationships between the selected research constructs, and the tradition of conceptualising some constructs, such as market orientation, as firm-wide characteristics. However, if a researcher is interested in firms' export success and in knowing whether this success is due, in part, to different strategies adopted in different ventures, the researchers should factor this into the research design. Therefore, the researcher choice of analysis must depend on the research question that is under investigation. The objective of this research is to investigate export sales forecasting effectiveness' impact on the overall export market performance, therefore, the author is also adopted the *organizational level* unit of analysis.

4.3.6 Time Horizon

The time period during which the study takes place must be considered within the research design. This research is conducted using a *cross-sectional* design. Data are gathered once only (over a limited period of time, such as in a couple of weeks or months). Cross-sectional studies provide a snapshot of a situation in time and do not attempt to comment on changes or on how situations develop over a time period (Remenyi et al., 2005). Another distinguishing feature of cross-sectional studies is that the sample is typically selected using a probability sampling plan to be representative of some known universe so that the researcher is able to investigate the variation found between respondents within the sample in terms of variables under inquiry. Cross-sectional studies have two limitations. First, they do not explain why the observed phenomenon and the related relationship exist. Second, they have difficulty eliminating all the external factors which might have caused the observed relationships (Easterby-Smith et al., 1999). Longitudinal studies can overcome those limitations at the cost of generalizability, time, money and the simplicity of data and analytical techniques used

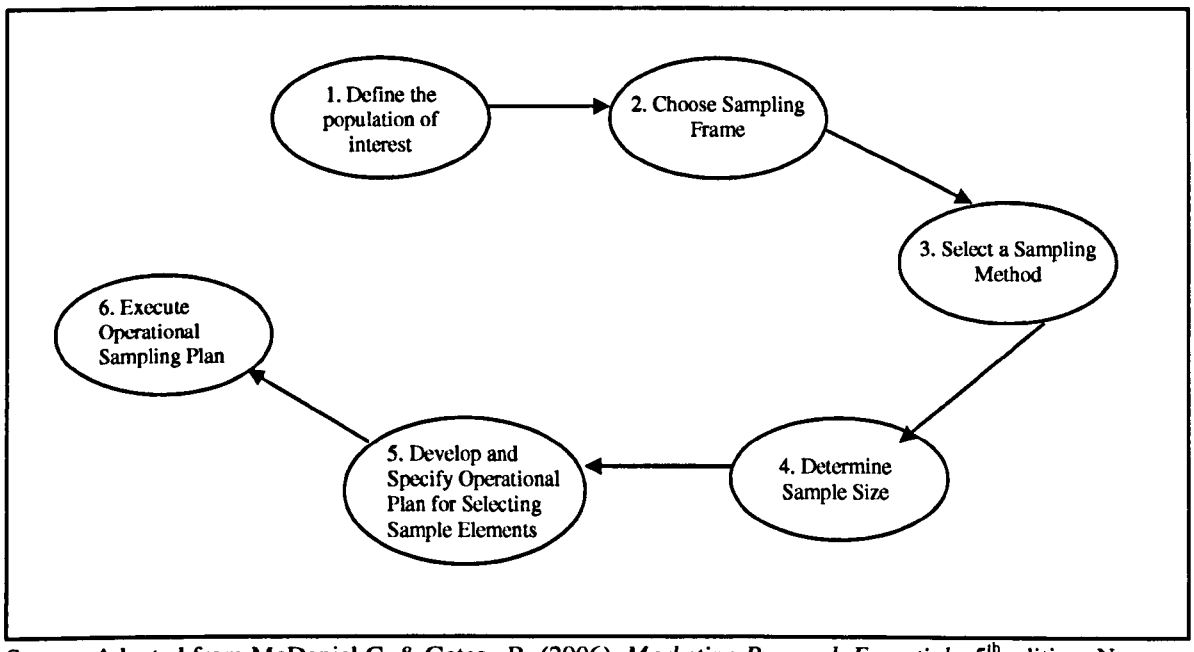
(Pettigrew, 1985).

Considering the type of information sought in this study (obtaining the forecast effectiveness and export performance and related information happened during 2009), the authors' access to export managers over time is limited and conducting a longitudinal study on a DBA programme is not practical, therefore decision is taken to adopt a cross-sectional design.

4.3.7 Sampling Design

The six step process for developing an operational sampling procedure suggested by McDaniel and Gates (2006) and shown in Figure 4.2 – Developing a Sampling Plan, is adopted. Although each of the steps is dealt with in turn, it must be appreciated that, like most other methodological considerations, decisions are taken at each stage, are contingent on other aspects of the research process and determine subsequent decisions.

Figure 4.2 – Developing a Sampling Plan



Source: Adapted from McDaniel C. & Gates, R. (2006), *Marketing Research Essentials.* 5th edition, New York: John Wiley and Sons Inc. (p.298)

Step 1: Defining the Population of Interest

The initial step involves the definition of the population from which information is to be collected in order to meet the objectives of the research. The target population for the empirical data is the UK exporters, exporting to the EU countries. Given the importance of exporting to the UK economy, this study will contribute to the understanding of export performance determinants within the UK market. In terms of target markets for exporting, the European Union countries are chosen. The reason for this is that UK based companies are more likely to be involved in exporting their goods into the European Union countries and that the identification of these companies is easier than approaching ones that export to other nations.

Therefore, export managers of UK based companies have been chosen to provide answers.

The target population is defined as follows:

Element: Export managers

Sampling Unit: Companies exporting to European Union (EU) countries.

Extent: Based in the UK

Time: Between May 2010 and October 2010

Step 2: Choose Sampling Frame

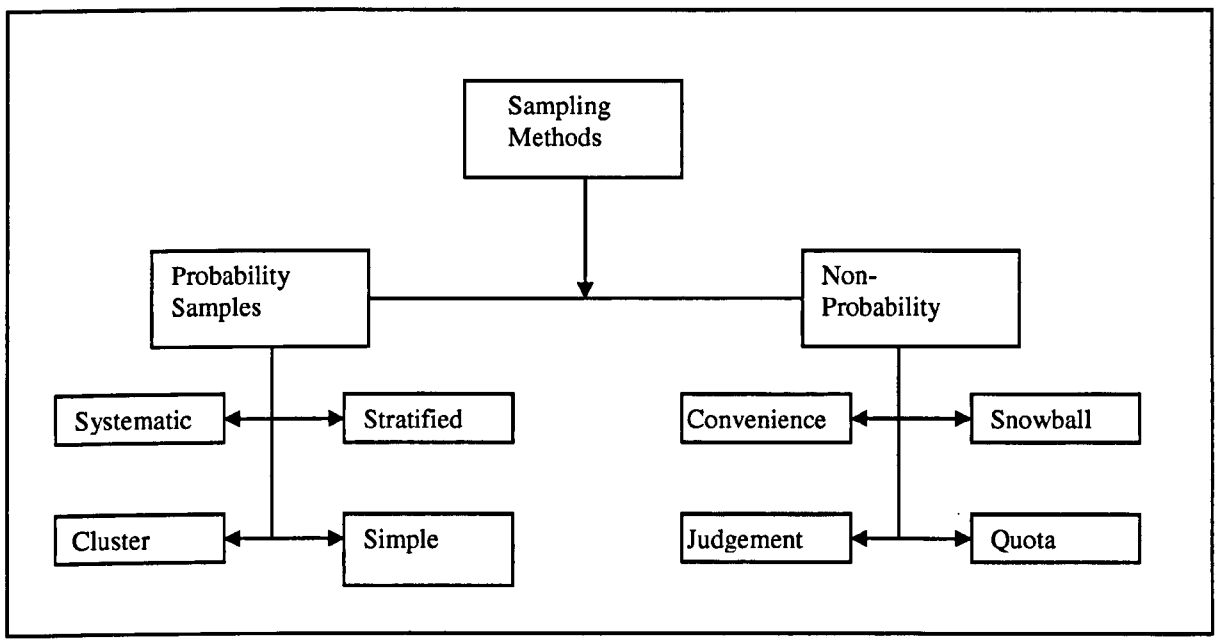
The sampling frame is a list of the population elements from which the sample is selected (de Vaus, 2002). The UK based companies exporting their business to European Union countries are chosen as target population. Initial searchers at the Business Link and the Internet do not result in the identification of an appropriate sample frame (i.e., a list that, in addition to company information, contained accurate details of company executives). As a result, it is decided to prepare a list of companies

using the author's professional colleagues connected either through LinkedIn or their personal mobile numbers and their professional associates whom are the employees of the UK based exporting companies.

Step 3: Select a Sampling Method

The selection of the sampling method is dependent upon the objectives of the study, the resources available, time limitations, and the nature of the problem under investigation (McDaniel and Gates, 2006). As illustrated in Figure 4.3 - Classification of Sampling Methods, the two main types of sampling are probability and non-probability. The relative merits and disadvantages of these sampling methods can be found, in amongst others, de Vaus (2002), Malhotra and Birks (2003) and McDaniel and Gates (2006).

Figure 4.3 - Classification of Sampling Methods



Source: Adapted from McDaniel, C. Jr. & Gates, R. (2006), *Marketing Research Essentials*, 5th edition, New York: John Wiley and Sons Inc. (p. 305)

The author realises the difficulty of getting the list of the companies and their responses at the early stage and therefore in this research the non-probability snowball approach is used. Snowball sampling is a method used to obtain research and knowledge, from

extended associations, through previous acquaintances.

Snowball sampling is inexact, and can produce varied and inaccurate results. The snowball method is heavily reliant on the skill of the individual conducting the actual sampling, and that individual's ability to vertically network and find an appropriate sample. LinkedIn provided this vertical network and helped the author to find an appropriate sample. To be successful, it requires previous contacts within the target areas, and the ability to keep the information flow going throughout the target group. Another disadvantage of snowball sampling is the lack of definite knowledge as to whether or not the sample is an accurate reading of the target population. Targeting only a few selected people is not always indicative of the actual trends within the result group.

To help mitigate these risks, it is imperative that the correct personnel is used to execute the actual sampling (Salganik and Heckathorn, 2004). The author is aware of these disadvantages of this method (Heckathorn, 2002) and uses the following method to mitigate the sampling error;

1. Draft up a participation program (subject to change, and indicative).
2. Approach stakeholders and ask for contacts.
3. Gain contacts and ask them to participate.
4. Continue the snowballing with contacts to gain more stakeholders if necessary.
5. Ensure a diversity of contacts by widening the profile of persons involved in the snowballing exercise.

The author made an initial list of business acquaintances who all worked within the UK based exporting companies. She used LinkedIn connections which are made over 10

years. This list also included the extended associations of these business colleagues and friends. The list got updated regularly until the targeted sample number was reached. The author called each member in the list and asked for their participation. A follow up email sent to each of them with a cover letter and a link to the survey page. Once their participation was obtained, the author called them thanking for their contribution and also capturing more contact names and details from them for further participation. The author continued the snowballing approach until 111 usable responses were obtained.

Step 4: Determine Sample Size

Once the sampling method is chosen, the next step includes the determination of the appropriate sample size. When determining the total sample size, the author considered: (a) the efficient sample size given the population, and (b) the appropriate sample size for the analytical technique used. The sample used in the analysis is made up of 111 responses. In PLS analysis, either simple or multiple regressions are performed depending on the mode for each set of indicators and the inner weighting scheme. Due to the partial nature of the estimation procedure where only a part of the model is included, only those part with the largest multiple regressions is needed. Therefore, the larger of two possibilities need to be identified:

- The block with the largest number of formative indicators (i.e., largest measurement equation) or,
- The dependent latent variable with the largest number of independent latent variables impacting it (i.e., largest structural equation)

Using a regression heuristic of 10 cases per indicator, the sample size requirement would be 10 times either (a) or (b), whichever is greater. Regarding the first possibility, the formative variable *managerial characteristics* is the largest measurement equation

in the model with six latent independent indicators impacting it; when the number of indicators 6 is multiplied by 10, required minimum samples size comes out to be 60, well below the actual sample size of 111.

Step 5: Develop and Specify Operational Plan for Selecting Sample Elements

This step involved self-selection, i.e., voluntary participation by potential respondents. The author first made an initial participant list from her business acquaintances and all individuals from the sampling frame were contacted to request their participation in the study and asked them further participants names from their professional networking. Consequently the author updated the list. These steps were repeated until the desired sample size was obtained.

Step 6: Execute Operational Sampling Plan

Once the above actions and decisions were completed, the researcher implemented the resulting sampling plan.

4.3.8 Data Collection Method

The data collection methods used in quantitative studies are surveys, observations and experimentation (Sekaran, 2003). Briefly, surveys include the distribution of questionnaires to a sample of the chosen population. Observations involve recording the behavioural patterns of people, objects or occurrences without direct interaction. Finally, experimentation involves the manipulation of one or more independent factors or treatments by the researcher who then measures their effects on one or more dependent factors. The merits and drawbacks of these methods are extensively described in literature, see for example, Churchill and Iacobucci (2005) and McDaniel and Gates (2006). Observation research is considered to be too time consuming, expensive and would not provide the required information for this research while

experimental research is appropriate to a controlled and manipulated experiment rather than studying attitudes, opinions and behaviours. Therefore this study rejected observation and experimental research in favour of survey research because the latter was considered the most appropriate method for this study. The reasons for adopting the survey method are:

- **Scope** – a great deal of information can be collected from a large population economically (Hart, 1987). This study obtains responses from the export managers and executives in the UK.
- **Convenience** – with regard to the export managers, the entire survey was administered from a single location (McDaniel and Gates, 2006). Regarding convenience to the respondent, the data were collected involving respondent's work experience. The use of a survey was considered to represent an appropriate means of obtaining such information without the use of a field force (de Vaus, 2002; McDaniel and Gates, 2006).
- **Fit for purpose** – survey research confirms to the specification of scientific research in that it is logical, deterministic, general, parsimonious and specific (Hart, 1987; de Vaus, 2002).
- **Inexpensive** – the data were collected relatively inexpensively as suggested by McDaniel and Gates (2006) over a period over of six months during 2010.
- **Diversity** – A wide variety of questions could be designed in order to elicit respondents' underlying thinking processes (Churchill and Iacobucci, 2005; Malhotra, and Birks, 2003; McDaniel and Gates, 2006).

Choice of Method of Administering a Survey

The main methods of administering a survey are face to face, telephone, postal self-administered and electronic (de Vaus, 2002; McDaniel and Gates, 2006). The choice of method is dependent upon the nature of the survey, the sample, time and cost constraints, the importance of response rates and the types of questions (de Vaus, 2002). The author used the electronic survey to obtain the data. Suitability of electronic survey for the collection of sensitive information such as accuracy of the forecasting and avoiding interviewer bias are strong contributors to this decision. In line with reasons for adopting surveys outlined above, the relative cost advantage of electronic survey over personal and telephone administration represents the second reason for its adoption.

Response Rate

The activities presented above were designed to elicit responses that provided an appropriate basis on which the research model was evaluated and the hypotheses were tested. Consequently, response rate, quality of data and analytical approach employed are important issues that are debated in this section.

As stated in Section 4.3.7, data were collected between May 2010 and October 2010. Snowball method was used and the author contacted over 300 people. The total number of 111 usable replies were received which complies with the desired sample size and represents a 37% effective response rate.

Communication Method

The survey was administered using a structured undisguised communication approach with the following characteristics:

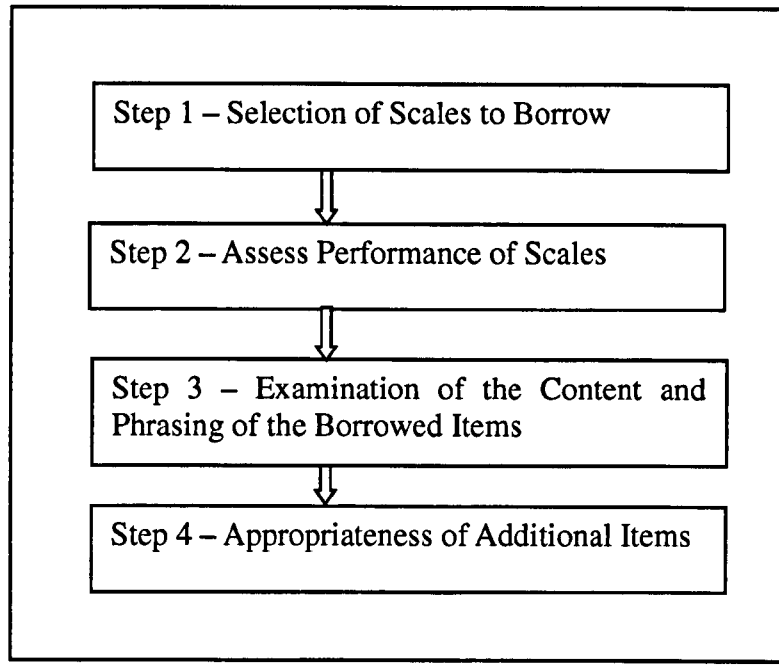
- **Degree of structure** – This refers to the degree of standardisation imposed on the questionnaire (McDaniel and Gates, 2006). It refers to the extent to which the questionnaire follows a set sequence or order, and whether questions have set wordings and whether permitted responses are strictly predefined. The questionnaire followed a strict sequence and relied primarily on closed-ended, scaled response questions.
- **Respondent targeting** – The name of each of the respondents was included in the cover letter (which was attached to the email). Directing the questionnaire to a named respondent helps increase/improve response rate and the likelihood the questionnaire will reach person in the best position to complete it (Dillman, 2006).
- **Letterhead and cover letter** – Following recommendations by Cavusgil and Elvey-Kirk (1998) and Dillman (2006), Kingston Business Scholl letterhead soft logo was used for the electronic cover letter. Adhering to good practices outlined by the above authors, the electronic cover letter was restricted to one page, contained explanation about the purpose of the survey, provided completion instructions and emphasised the importance of the respondent's reply. Please refer to Appendix A for cover letter.
- **Anonymity** – Anonymity was promised in the accompanying letter in an attempt to obtain a higher response rate. Cavusgil and Elvey-Kirk (1998) suggest that, when anonymity is promised, this reinforces the notion that a request for the information is intended to be utilised to benefit society as a whole.

- **Incentives –** Lack of consensus about the use of incentives in business surveys is acknowledged. Nevertheless, following suggestions by Cavusgil and Elvey-Kirk (1998) and Dillman (2006) and evidence by other researchers at Kingston Business School of their effectiveness, incentives were introduced. In order to motivate the participants, five pound donation to the charity of participants' choice was offered.
- **Emailing of the electronic survey link –** Given the target audience, the link for electronic survey were emailed to the each participants to their preferred email address.
- **Follow up calls –** A follow up calls were made to the participants either remind them or to thank for their contribution and asked for further participants names.

4.3.9 Measures and Measurement

Before a research instrument can be formulated, a set of robust measures (and associated measurements) need to be constructed. The measures comprise scale items of the variables using multi-item scales to measure the respondents' attitudes, opinions or behaviour to the construct under investigation. Although the review of the relevant literature reveals the existence of validated measures/scales for the research constructs, the need for contextualisation is evident. Being cognisant of potential problem in 'borrowing' existing scale, the framework proposed by Engelland et al. (2001) and illustrated in Figure 4.4, is applied in order to ensure the appropriateness of the adopted scales for this study.

Figure 4.4 - Framework for Selecting and Adopting Scales



Source: Engellend B.T., Alsford, B.L. and Taylor, R.D. (2001), *Caution and Precaution on the Use of 'Borrowed' Scales in Marketing Research,* In: T.A. Slater (ed.) Marketing Advances in Pedagogy and Philosophy, pp. 152-153. Society of Marketing Advances, New Orleans

The application of the above framework to this study is as follows:

Step 1 – Selection of Scales to Borrow: Review of academic papers, textbooks and discussions with expert informants provide a sound base for the specification of measurement scale related to research construct.

Step 2 – Assess Performance of Scales: Following from above, the scales are borrowed from papers published in the last decade. Consequently, the borrowed scales are up-to-date and representative of current thinking on the subject matter.

Step 3 – Examination of the Content and Phrasing of Borrowed Items: The effectiveness of measurement scales in conveying the meaning of the intended variable in a clear and succinct manner is tested at meetings with expert informants (see Section 4.3.1). Suggested changes relating to the use of jargon, similarity or duplication of

items, rephrasing of items and other relevant feedback are implemented.

Step 4 – Appropriateness of Additional Items: Focus group discussion is carried to establish the adequacy and appropriateness of scales in measuring the proposed constructs. Although some changes are suggested, feedback indicated that the deployed scales are explicit in their meaning and are clearly understood. As an example, export market orientation in Section 4.3.9.5 originally proposed by Cadogan et al. (2002) comprises thirteen items. However discussions with experts resulted in a reduced set of ten items.

4.3.9.1 Export Market Performance

Based on work by Diamantopoulos (1999) and Prasad et al. (2001), this construct comprises the following three dimensions: management satisfaction, the economic and financial outcome and strategic performance. These authors provide detailed information of development and testing of the dimensions and their measures.

Management Satisfaction

Management satisfaction refers to executives' satisfaction with a company's overall sales performance. We ask respondents in the exporting firms to evaluate their export performance in relation to their executives' satisfaction on a seven-point Likert scale anchors at strongly agree and strongly disagree.

- Our management was satisfied with our company's overall sales performance to EU countries

The Economic and Financial Outcome

The economic and financial items included sales growth and profitability. The following three items are employed and a seven-point Likert scale anchors at strongly

agree and strongly disagree.

- Our company generated a high volume of export sales to EU countries
- Our company generated a high volume of export revenue to EU countries
- Our company was profitable in exporting to EU countries

Strategic Performance

Strategic performance items included building brand awareness and image overseas, entering new markets abroad, improving market share position, and gaining new technology experience and market expertise. The following five items are employed and a seven-point Likert scale anchors at strongly agree and strongly disagree.

- Our company was successful in building brand awareness and image to EU countries
- Our company was successful in entering new markets to EU countries
- Our company was successful in improving its market share to EU countries
- Our company was successful in gaining new technology experience to EU countries
- Our company was successful in gaining market expertise to EU countries

4.3.9.2 Export Sales Forecasting Effectiveness

The scale represents the confidence that decision makers have in the forecasts produced and their assessment of their firm's overall export forecasting capability relative to the industry and competition. The following three items are employed from Winkhlofer and Diamantopoluos (2002) and a seven-point Likert scale anchors at strongly agree and strongly disagree.

- Our company was as good in forecasting export sales as any firm in our industry to EU countries.

- Our export decision-makers were very confident in our export sales forecasts to EU countries.
- Compared to our competitors, our company was better in forecasting export sales than any firm in the industry to EU countries.

4.3.9.3 Managerial Characteristics

This construct comprises the following six dimensions: demographic characteristics, language skills, lived/worked overseas, risk taking, openness in decision making and rewarding. It is based on work by Entrialgo (2002), William and Chaston (2004), Turnbull and Cunningham (1981) and Kendall (1992).

Demographic Characteristics

The five item scale below represents an extension to the original operationalisation of three items proposed by Entrialgo (2002) and the respondents are asked to tick one correct answer from the multiple choices questions below;

- During 2009, most of the executive managers in our company were male or female.
- During 2009, average age of the executive managers in our company was 31-40 years, 41-50 years, 51-60 years and over 60.
- During 2009, the average number of years that executive managers in our company held the position was 1-3years, 4-6 years, 7-9 years, over 9 years, do not want to disclose.
- During 2009, the average number of years that executive managers worked for our company was 1-3years, 4-6 years, 7-9 years, over 9 years, do not want to disclose.
- The highest level of educational qualification held by the majority of the executive managers in our company during 2009 was undergraduate degree or

equivalent level, postgraduate diploma or equivalent level, master degree or equivalent level, research degree or equivalent level.

Language Skills

The two item scale below is borrowed from William and Chaston (2004). The respondents are asked to select one of the multiple choices;

- The percentage of the executive managers working for their company during 2009 were bilingual in at least one language of European countries: 0-25%, 25-50%, 50-75%, over 75% and had little or no command of any language.
- The percentage of the executive managers working for their company during 2009 had social fluency in at least one language of European countries: 0-25%, 25-50%, 50-75%, over 75%

Lived/Worked Overseas

The item scale below is borrowed from Turnbull and Cunningham (1981). The respondents are asked to select one of the multiple choices;

- The number of years their executive managers worked in EU countries: Less than 1 year, 1-5 years, 6-10 years, over 11 years.

Risk Taking

The item scale below is borrowed from Kendall (1992) and a seven-point Likert scale anchors at strongly agree and strongly disagree.

- During 2009, our company's executive managers were innovative in their decision making
- During 2009, our company's executive managers took chances on good ideas
- During 2009, our company's executive managers allowed employee autonomy in decision making and held employees accountable for end results

Openness in decision making

The item scale below is borrowed from Kendall (1992) and a seven-point Likert scale anchors at strongly agree and strongly disagree.

- During 2009, our company's executive managers shared information with employees
- During 2009, our company's executive managers maintained and developed good relationships with employees across the company
- During 2009, our company's executive managers made an effort to understand other employees' problems
- During 2009, our company's executive managers created and maintained good communications and cooperation with their peers

Rewarding

The use of single-item measures has been encouraged by several authors asserting that single-item measures are appropriate and can substitute multiple-item measures in many cases (Rossiter, 2005).

According to Rossiter (2005), if a scale has a precise definition, there is no need to examine other types of validities. The item scale below is borrowed from Kendall's (1992) study and a seven-point Likert scale anchored at strongly agree and strongly disagree.

- During 2009, our company's executive managers rewarded individual achievements

4.3.9.4 Organisational Characteristics

An organisation is a social group which distributes tasks for a collective goal. Characteristics of the organizations are measured using categorical scales to determine

the total number of full time employees (open ended question), the length of the time the firm has been exporting (one answer from multiple choice questions) and whether they use any sales agents or subsidiary companies within the countries they export to (one answer from multiple choice questions). These organizational factors are used in previous exporting literature (Berrin, 2007; Yeoh, 2000; Erramilli, 1991):

- The total number of full time employees
- The length of the time the firm has been exporting : 1-5 years, 6-10 years, 7-15 years, 16-20 years, over 20 years.
- Whether they use any sales agents companies within EU countries they export to: all of EU countries, up to 75% of EU countries, up to 50% of EU countries, up to 25% of EU countries and they did not use any subsidiary companies within EU countries.
- Whether they use any subsidiary companies within EU countries they export to: all of EU countries, up to 75% of EU countries, up to 50% of EU countries, up to 25% of EU countries and they did not use any subsidiary companies within EU countries.

4.3.9.5 Export Market Orientation

Export market orientation is considered to be the activities involved in the implementation of the marketing concept. With this definition Kohli and Jaworski (1990) identify three sets of activities – intelligence generation, intelligence dissemination and responsiveness to market intelligence – which represent the operationalisation of export market orientation. The scale proposed by Kohli and Jaworski (1990), Cadogan et al. (2002) and Cadogan et al. (1999) comprised thirteen items. However discussions with focus group results in a reduced set of ten following items. They are all measured with a seven-point Likert scale anchors at strongly agree

and strongly disagree.

Intelligence Generation

Intelligence generation refers to the organization wide generation of market information about current and future customer needs;

- Timely collected a lot of information in trends and environmental changes (e.g regulations, technological developments, political, economic, etc)
- Continuously reviewed the likely effects of changes
- Constantly monitored employee level of commitment and orientation to serving the needs of our customer
- Was quick to deliver important information about the activities of our competitors to be of use to our managers
- Generated a lot of information to help us understand the forces which influenced the desires and preferences of our customers

Intelligence Dissemination

Intelligence dissemination refers to the dissemination of such information across departments and individuals within the market-oriented firm. The scale proposed by Kohli and Jaworski (1990), Cadogan et al. (1999) and Cadogan et al. (2002) comprised five items. However discussions with focus group result in a reduced set of the following three items;

- Discarded considerable amounts of information concerning our export competitors before it reached decision makers
- Had in place appropriate mechanisms so that important information about customers was not 'lost in the system'

- Often lost important information concerning market trends because of inefficiencies in its communication processes.

Responsiveness

This refers to the organizations' responsiveness to market intelligence. In the original scale it is comprised by three items but as a result of focus group discussion it is reduced to two items;

- Was quick to respond to significant changes in our competitors' price structures
- Rapidly responded to competitive actions that threatened our competitive position

4.3.9.6 Forecasting Method

The choices of forecasting methods are drawn from Diamantopoulos and Winklhofer (2003) study. Their study uses six forecasting methods. However, discussions with the focus group results in a reduced set of questions as below:

- During 2009, Please indicate only one in the below forecasting methods that best describes the method used by your company for estimating export to EU countries
    - Formal statistical techniques such as time series which assume that the past pattern will continue into the future
    - Judgmental techniques such as managerial opinion, sales force composite, panel consensus and market surveys
    - Combination of statistical and judgmental techniques

4.3.9.7 Accuracy

This construct refers to the magnitude of forecast error within the certain period. The measurement is taken from the Winklhofer and Diamantopoulos (2002) study. Thus, in the present study, the respondents are asked to select one of the multiple choices;

- During 2009, respondents were asked to provide information about their range of forecast errors. Errors are recorded in one of the following ranges: 0–5%, 6–10%, 11–15%, 16–20%, > 20%

4.3.9.8 Bias

With regard to forecast bias, underestimation and overestimation are unlikely to be perceived as being equally harmful. On balance, it could be argued that a conservative forecast is preferable to an overoptimistic forecast, because "there are several serious consequences of . . . over optimism, the most obvious being that businesses plan according to sales expectations that cannot be met" (Wheeler and Shelley, 1987, p. 57). This is captured by two items in Winklhofer and Diamantopoulos (2002) requesting respondents to indicate the extent to which export sales forecasts tended to overestimate or underestimate export sales. However, discussions with experts and results from the focus group discussion of this study resulted in a reduced number from two to one and a seven-point Likert scale anchored at strongly agree and strongly disagree.

- During 2009 our company over estimated export sales to EU countries.

4.3.9.9 Timeliness

The emphasis on the timeliness serves to highlight the importance of providing timely forecasts to management (Remus and Simkin, 1987). Unless forecasts become available to decision makers at the time they are needed, their value is practically lost (Winklhofer and Diamantopoulos, 2002). This construct is conceptualized based on

work by Winklhofer and Diamantopoulos (2002). The two item scale presented below is borrowed from Winklhofer and Dimantopoulos (2002) and is measured with a seven-point Likert scale anchored at strongly agree and strongly disagree.

- By the time our export sales forecast was prepared, important export decisions been had already been made.
- Executives in our company received export sales forecast in time for the information to be of real use.

4.3.9.10 Cost

Generating accurate, unbiased, and timely forecasts is a cost incurring activity; such costs include "initial development costs, maintenance costs (to keep the model up-to-date) and operating costs (time and dollars to make the forecasts)" (Armstrong, 2001a, p. 464). This construct is measured in Winkhlofer and Diamantopoluos (2002) study by an item indicating the extent to which data for export forecasting purposes is considered to be expensive. This study also captures development and maintenance of sales forecasting cost and is measured with a seven-point Likert scale anchored at strongly agree and strongly disagree.

- The cost of obtaining data for the purpose of forecasting exports was considered to be high
- The cost for the development and maintenance of sales forecasts were considered to be high

4.3.9.11 Environmental Turbulence

Environmental turbulence refers to the amount of change and complexity in the environment of a company. These scales are borrowed from Jaworski and Kohli (1993) and Dwyer and Welsh (1985). The following nine item scales below are employed and

measured with a seven-point Likert scale anchored at strongly agree and strongly disagree.

- There was considerable change in the product preferences of our customers in EU countries
- Potential customers for our products and/or services sold to EU countries tended to look for benefits that were different from those of our existing customers
- Competition was cut throat in terms of promotion and pricing
- The technology in our industry changed rapidly which provided big opportunities
- Transportation and handling regulations had a noticeable impact in operations
- Governmental pricing regulation considerably affected our operations
- Environmental protection laws had a perceptible impact on our EU operations
- Trade association regulations of business practices visibly changed the way we operated
- Government product standards clearly affected the way we did business in EU countries

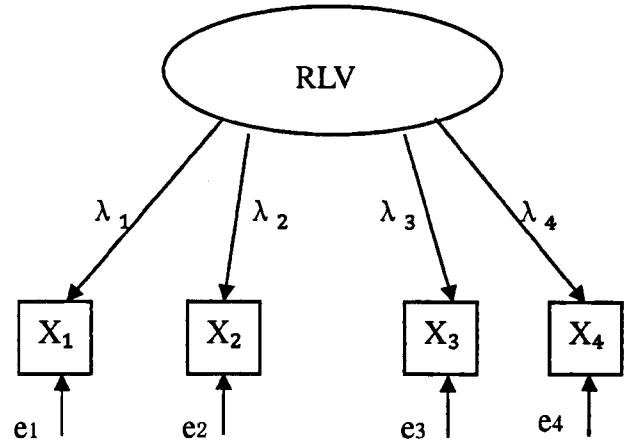
Structure of the LVs

Given emerging interest in the potential effects that misspecification in the conceptualisation of latent variables has in theory development and testing, decisions regarding the structure of the constructs had to be made. More specifically, the debate revolves around issues related to reflective and/versus formative conceptualisation of LV and associated problems of misspecification (Diamantopoulos and Winkhofer, 2001; Jarvis et al., 2003; MacKenzie et al., 2005; Diamantopoulos and Siguaw, 2006).

Reflective, or according to Bagozzi (2007) molecular, are those LVs whose indicators are influenced or affected by the underlying LV. The key feature of such LVs is that '..... a change in the latent variable will be reflected in a change in all indicators' (Diamantopoulos, 1999, p.445). The above imply that there is a one-to-one correspondence between the LV and its indicators (i.e., the indicators are seen as empirical surrogates of a LV). The underlying assumption is that the LV exists, rather than being constructed, as is measured by its indicators or by lower/first order LVs. Such LVs have their origins in the classical domain-sampling model (Nunnally and Bernstein, 1994) that assumes that the indicators are partially or entirely inter-correlated because of their underlying common LV. It consequently follows that, under such a perspective, a comparison of the loadings (λ_i) provides information of the relationship between an indicator and the LV and it is considered to measure or represent. The following are characteristics present in Reflective Latent Variables (RLV) and an illustration is provided in Figure 4.5 below:

- Direction of causality is from the construct to the measure
- Measures are expected to be correlated
- Removing an indicator from the measurement model does not alter the meaning of the construct
- Measurement error is taken into account at the item level

Figure 4.5 – Illustration of a Reflective Latent Variable (RLV)



Formative, or according to Bagozzi (2007) molar, are variables whose indicators are causing rather than being caused by the underlying LV. Under such conditions '..... a change in the latent variable is not necessarily accompanied by a change in all its indicators; rather if any one of the indicators changes, then the latent variable would also change.' (Diamantopoulos, 1999 p.446). In other words FLVs represent emergent constructs formed from a set of indicators or lower/first order factors. Unlike RLVs, there is no theoretical reason except significant interdependencies (i.e., correlations) among the indicators. It follows that, since the indicators are not necessarily correlated but they can occur independently, it is their relative weights (γ_i) that are used to construct the FLV and these indicate the relative strength of their relationship to the intended LV. It is clear from the above that FLVs do not conform to the classical test theory of factor analysis models that treat indicators as effects of a construct (Bollen and Lennox, 1991). The following are characteristics present in FLVs and an illustrative example is provided in Figure 4.6 - Illustration of a Formative Latent Variable (FLV):

- Direction of causality is from the measure to the construct;
- There is no reason to expect that the measures are correlated

- Removing an indicator from the measurement model may alter the meaning of the construct
- Measurement error is taken into account at the construct level.

Figure 4.6 - Illustration of a Formative Latent Variable (FLV)

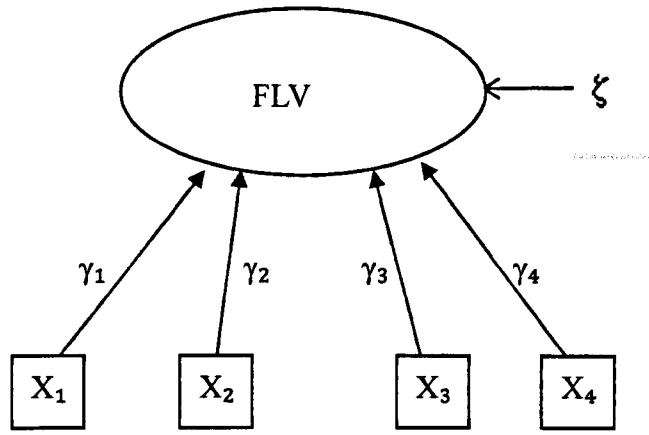


Table 4.3- Research Constructs as FLV or RLV shows how each constructs are conceptualised using the guidelines from Jarvis et al. (2003).

Table 4.3- Research Constructs as FLV or RLV

Constructs	Conceptualised As	Based on Literature
Export Market Performance	Second Order FLV	Diamantopoulos (1999)
Management Satisfaction	N/A	
The Economic and Financial Outcome	FLV	
Strategic Performance	FLV	
Export Sales Forecasting Effectiveness	RLV	Winklhofer and Diamantopoulus (2002)
Managerial Characteristics	Second Order FLV	
Demographic Characteristics	FLV	Entrialgo (2002)
Language Skills	FLV	William and Chaston (2004)
Lived/Worked Overseas	N/A	Turnbull and Cunningham (1981)
Risk Taking	FLV	Kendall (1992)
Openness in Decision Making	FLV	Kendall (1992)
Rewarding	N/A	Rossiter (2005)

Organizational Characteristics	FLV	Berrin (2007), Yeoh (2000). Erromilli (1991)
Export Market Orientation	Second Order FLV	
Intelligence Generation	RLV	Cadogan et al., (2002)
Intelligence Dissemination	RLV	Cadogan et al., (2002)
Responsiveness	RLV	Cadogan et al., (2002)
Forecasting Methods	N/A	Diamantopoulos et al.(2003)
Accuracy	N/A	Winklhofer and Diamantopoulos (2002)
Forecast Bias	N/A	Winklhofer and Diamantopoulos (2002)
Timeliness	FLV	Winklhofer and Diamantopoulos (2002)
Cost	FLV	Winklhofer and Diamantopoulos (2002)
Environmental Turbulence	FLV	Jaworski and Kohli (1993), Dwyer and Welsh (1985)

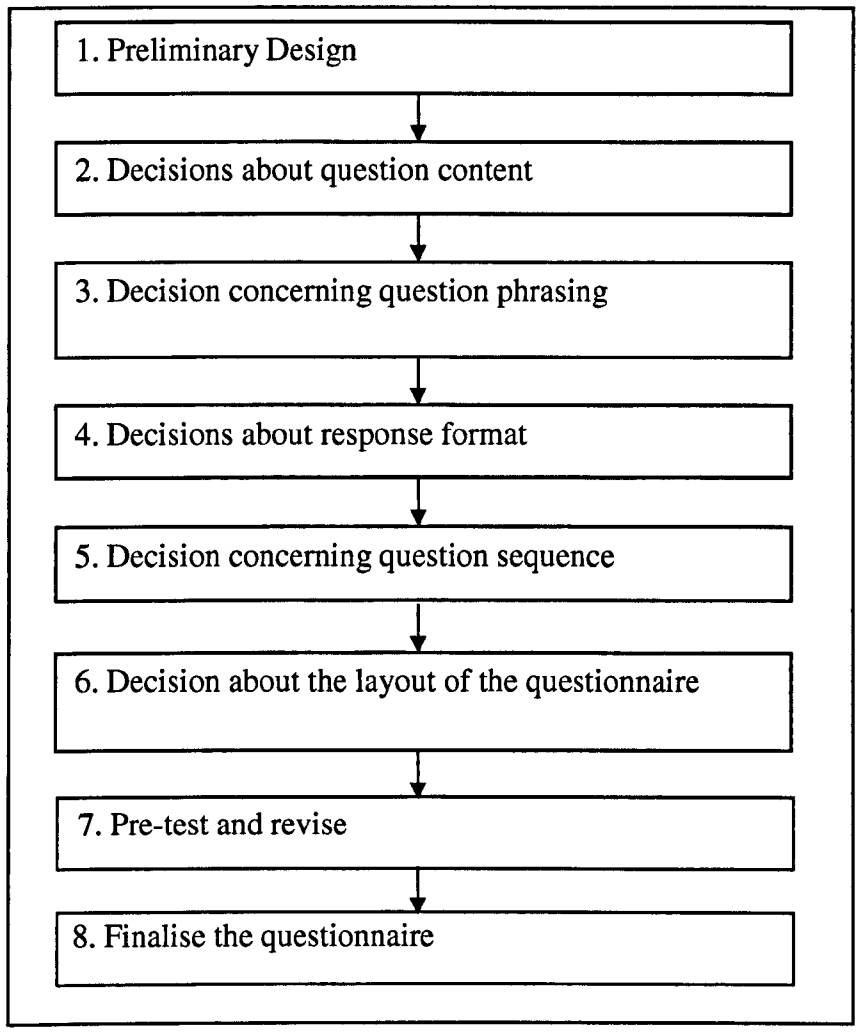
Most of the existing measures of export performance are based –implicitly or explicitly – reflective (effect) indicators (Lages and Lages, 2004; Gaur and Kumar, 2008). This perspective is characteristics of the 'conventional wisdom' on measurement (see Bollen and Lennow, 1991). An alternative and in the export marketing literature, practically ignored measurement perspective is based on the use of formative (cause, causal) indicator. Diamantopoulos (1999) explores this alternative measurement approach and examines the implications of constructing an index rather than a scale of export performance and argues that a formative approach to constructing multi-item measures is also potentially attractive for modelling complex constructs such as export performance.

The next section provides detailed information about the question design employed in this study as a result of above defined actions and deliberations.

4.3.10 Design of the Data Collection Instrument (Questionnaire)

In the design of the research instrument, good practices as outlined by, among others, Tull and Hawkins (1993), Churchill and Iacobucci (2005), are followed. Figure 4.7 – Research Instrument Construction Decisions illustrates the various issues under consideration which, although depicted as sequential, are interrelated and should be viewed as a guide or checklist.

Figure 4.7 – Research Instrument Construction Decisions



Source: Churchill, G. A., Jr. and Iacobucci, D. (2005): *Marketing Research: Methodological Foundations*, 9th ed., Mason, Ohio: Holt Rinehart and Winston

Each of the decisions is discussed in turn.

1) *Preliminary design*: Prior to the construction of the research instrument, decisions regarding the exact type of information sought from the respondents has to be considered in conjunction with the employed data collection method. Given the intended target population, emphasis is placed on professional appearance and ease of completion.

2) *Decisions about question content*: Once the topics are decided, due consideration is given to the question content, i.e. the general nature of the research instrument and the information it is designed to obtain. Question content is thoroughly verified during focus groups discussions at the initial stage.

3) *Decisions concerning question phrasing*: Due consideration is given to ensuring that the questions are phrased in a clearly understood way. Particular attention is placed on issues such as avoiding the use of jargon; ensuring the clarity of meaning; avoiding leading, double, or bias questions and ensuring clearly defined research context.

4) *Decisions about response format*: With the exception of the organizational characteristics, managerial characteristics (demographic characteristics, language skills and lived/worked overseas), forecasting methods and accuracy, a seven point Likert scale is employed.

5) *Decisions concerning the sequence of questions*: The questions are logically sequenced to make it easy/comfortable for the respondents to complete the questionnaire. Relatively sensitive questions (e.g. accuracy of forecasting exports) are placed towards the end of the questionnaire. Questionnaire started with simple 'tick-the-box' questions which allowed time for the respondents to 'settle down' and feel 'at ease' with the questions. Furthermore, to assist comprehension, the questionnaire is divided into seven sections each labelled with a title that indicates the general issues dealt with in the specific section.

6) *Decisions on the layout of the research instruments*: The physical characteristics of the research instruments affect not only the accuracy of the replies, but also the manner in which respondents react and the ease with which the replies can be processed. Therefore, particular attention is placed on issues of questionnaire layout during the pilot stage.

7) *Pre-test and revision:* Despite the exploratory work conducted during the construction of the research instrument, the adequacy of the research instrument is an issue that merits attention. There is consensus that pre-testing is an integral part of the research instrument development process (e.g. Zelnio and Gagnon, 1981; Tull and Hawkins, 1993; Churchill and Iacobucci, 2005). In highlighting the importance of pre-testing in the research development process, Churchill and Iacobucci (2001, p.147) state that '... the researcher who avoids a questionnaire pre-test .... is either naïve or fool. The pre-test is the most inexpensive insurance the researcher can buy to ensure the success of the questionnaire and the research project.' Pre-testing is defined as the 'activity to the development of the questionnaire to be used in a survey or experiment' (Green et al., 1988, p.296). The purpose of pre-testing is '... to ensure that the expectations of the researcher in terms of the information that will be obtained from the questionnaire are met' (Aaker et al., 2001, p.268). Furthermore, as language is basically ambiguous and words can have different meanings to different people (Bradburn et al., 2004), it is important to ensure that the words used in survey questions have the meaning to the respondents that the researcher intends them to have (Kinnear and Taylor, 1971).

The literature on pre-testing (reviewed by Reynolds et al., 1993) identified the following two main issues that should be addressed by pre-test: a) respondents' understanding of the instrument and of individual questions; and b) the physical

characteristics such as size and layout of the research instruments. To ensure that potential problems associated with the research instrument and their administration were fully dealt with; the researcher undertook the following pre-test. Initially, meetings and discussion were held with a focus group to evaluate the original pool of questions and ascertain any suggested additions and modifications. The draft version of the research instrument was distributed to the focus group and comments received resulted in a small number of structural and wording changes.

8) *Finalise questionnaire:* The final version of research instrument reflects the improvement made during the initial stage and is presented in Appendix D. The location of the scale items for each construct is presented in Table 4.4.

Table 4.4 - Location of Scale Items in Questionnaire

Construct	Dimension	Section and Questions
Organisational Characteristics		Section A-Q1-4
Export Market Performance	Management Satisfaction	Section B-Q1
	Economical and Financial Outcome	Section B-Q2-4
	Strategic Performance	Section B-Q5-9
Export Market Orientation	Intelligence Generation	Section C-Q1-5
	Intelligence Dissemination	Section C-Q6-8
	Responsiveness	Section C-Q9-10
Managerial Characteristics	Demographic Characteristics	Section D-Q1-5
	Language Skills	Section D-Q6-7
	Lived/Worked Overseas	Section D-Q8
	Risk Taking	Section D-Q9-11
	Openness in Decision Making	SectionD-Q12-15
	Rewarding	Section D-Q16
Forecasting Method		Section EQ1
Forecast Accuracy		Section F-Q1
Export Sales Forecasting Effectiveness		Section F-Q2-4
Forecast Bias		Section F-Q5
Forecast Timeliness		Section F-Q6-7
Forecasting Cost		Section F-Q8-9
Environmental Turbulence		Section E-Q1-9

4.3.11 Error Minimisation

In a research endeavour, the researcher strives to get as close as possible to the underlying truths of the phenomenon under question, i.e. the researcher tries to minimise the error often inherent in the research process. Therefore, being aware of sources of error and an examination for their presence is a pre-requisite for all studies involving data analysis (Bagozzi, 1994). The total error consists of the difference between the true and observed values and poses a threat to the reliability and validity of the measurement instrument. The observed measure X_O represents the sum of a number of values (Churchill and Iacobucci, 2005, p.291)

$$X_O = X_T + \text{Total Error}$$

$$\text{Total Error} = (X_R + X_S)$$

Where,

X_T represents the true mean value of the characteristic being measured

X_R represents the random error

X_S represents systematic error or bias

The distinction between systematic error and random error is very important because of the validity of a measure is evaluated. Validity of a measuring instrument can be described as 'the extent to which scores reflect true individual characteristics, not systematic biases or random errors' (Churchill and Iacobucci, 2005, p.291). The aim of the researcher is to use measures in which the score observed actually represents the true score of the object on the characteristics that is being measured.

Types of error relevant in this study are discussed in detail and explanations are provided as to how the researcher endeavoured to minimise them.

Measuring Instrument Bias

The instrument structure was tested on 10 respondents within focus groups, resulting to some change of wording and elimination of some items to a number of questions. A seven point Likert scale range was used for most of the questions. An issue of concern was whether offering a neutral position on a Likert type of scale, would cause respondents to have a tendency to opt for the middle of the road reply, leading to bias (Lockhart and Russo, 1996; Presser and Schuman, 1996). In this study, a neutral option was offered on 44 items that used a 1 to 7 Likert scale with clear explanations which were all tested during the exploratory phase. The distribution of the data was tested with respect to the mid-point. The results revealed no indication of significant differences in the percentage of neutral responses and therefore unlikely to have caused any major bias.

Non-response Bias

Non-response bias occurs when certain members of the sample do not respond to the survey instrument. The main causes of non-response bias are inability to access or reach respondents to their failure/refusal to complete the survey. Non-response bias can be a cause for concern with a survey as the respondents who did not respond maybe in some way different from those who did respond. Baruch (1999) provides a useful discussion about the norm for response rates in academic research. Although the paper examines mainly organisational research and quotes response rates among organisational populations (such as high and mid-level managers), his findings which range from 36% to 60% can be regarded as guidelines. It is important to bear in mind the method of administration as well. Referring to online surveys, Faught, et al., (2004) state that response rates vary dramatically and may be as low as 5% to 18%. The author used a snowball approach and contacted business associates for online survey participation

until the desired number of responses collected which are 111 participants with a response rate of 37%. Furthermore author locked answers so respondents cannot move to the next question. Overall 190 participants responded to the online survey with 111 usable responses. Therefore non-response bias is expected to be relatively low.

Sampling Frame Bias

Potential bias resulting from an unrepresentative sampling was not considered to be an issue for this research. Although the study was confined to the participants of the author business associates, the sample size was satisfactory. In addition, the survey was filled by the right people (i.e export managers, executives) within the export organisations, therefore the author felt that the sample was representative of the wider export sector participant.

4.3.12 Data Analysis

The section presents the decisions taken at the research design stage regarding data analysis. Data analysis is depicted in the Chapter 5, but it is beneficial to identify the intended techniques at the earlier stage.

The Data Analysis Chapter (Chapter 5) presents the hypotheses in the form of a path diagram that depicts both the dependent and independent relationships between variables as well as the relationships between variables and their reflective and formative indicators. Multivariate analysis techniques enable 'analysis of multiple variables in a single relationship or a set of relationships' (Hair et al., 1998). Structural Equation Modelling (SEM) is a multivariate technique that enables the researcher to investigate a series of dependent relationships simultaneously. This is especially useful when one dependent variable in a subsequent relationship (Bagozzi, 1994; Hair et al., 2006).

There are three key characteristics of Structural Equation Modelling (SEM). First, as already mentioned, the technique allows the estimation of multiple and interrelated dependence relationships. Second, it accommodates the inclusion of latent constructs. Constructs such as export sales forecasting effectiveness which cannot be measured directly, but are measured indirectly via observed variables – called manifest variables or indicators. Finally, SEM has the ability to account for measurement error and to assess goodness-of-fit and the explanatory fit of the model (Hair et al., 1998). During the data analysis process, SEM also enables relationships to be investigated from 'exploratory through a confirmatory stage' which allows a 'systematic and holistic view of problems' (Hair et al., 1998, p.278).

As the proposed research model requires assessment of multiple and interrelated causal relationships, it was clear that SEM was an appropriate technique to use. Furthermore, a particular technique of SEM called Partial Least Square (PLS) was used. PLS was first developed by Wold (1985, 1975) and made available as a software programme by Chin (2001). PLS is one of the several methods that can be used to estimate the relationships within an SEM framework and it is particularly useful under certain conditions. These conditions and justification to adopt it for this study can be briefly summarised as follows:

- When the model contains both reflective and formative indicators. This study contains both indicators (please see Table 4.3 above)
- When flexibility is required about measurement scales (e.g. when using different types of scales; nominal, interval and/or ratio). This study adopts Likert scale, open ended and closed questions as measurement scales (Please see Section 4.3.9)

- When the sample size is small. The recommended sample size is between 100 and 200. The obtained sample size for this study is 111 (see Chin (1998) for min sample size recommendation)
- When the data are not distributed normally (i.e. when the data are skewed) (Chin, 1998).

PLS is a prediction-oriented and uses a correlational, principal-component based approach to estimation. In contrast to covariance based techniques, PLS is not based on the maximum likelihood estimated, but combines ordinary least squares, path analysis, and principal component factor analysis (Chin, 1998b; Fornell and Cha, 1994). Latent variables are defined as the sum of their respective indicators. An algorithm aims to obtain the optimum weight estimates for each block of indicators corresponding to each latent variable (Chin and Newsted, 1999). The resulting component score for each latent variable based on the estimated indicator weights maximizes variance explained for dependent variables.

PLS has some advantages over covariance-based SEM. PLS estimates latent variables as linear combinations of the indicators in order to avoid inadmissible solutions and factor indeterminacy, which can be problematic in covariance structure analysis. Other constraints of covariance-based techniques include parametric assumptions, sample size, model complexity, and identification (Chin and Newsted, 1999). Although PLS does not rely on these assumptions, parameter estimates will improve under the conditions of larger sample size, more normally distributed data and a larger number of indicators per latent variable (Chin, 1997). In the case of PLS, standard errors need to be estimated using re-sampling procedures such as bootstrapping (Chin, 1997). Our research model has both formative and reflective indicators (see Table 4.3), the sample size is small (see

Section 4.3.7) and uses different types of measurement scales (see Section 4.3.9). Therefore PLS was an appropriate method to use. The application of PLS in analysing the data is discussed further in Chapter 5.

4.4 Conclusions of the Research Methodology

In this section, the researcher elaborates on the research design decisions that she makes. The research is based on a positivist perspective and applies quantitative multivariate analysis techniques to the data obtained from an online survey. The purpose of the chapter was to set out principles and practices that were followed during the research process. The following Chapter 5 presents the data analysis and provides the outputs obtained from testing of the research model.

CHAPTER 5. DATA ANALYSIS

5.1 Introduction

This chapter is structured under the following main sections. In Section 5.2; the measurement model is tested, formative constructs are examined, and the collinearity diagnostics is run to decide whether the scale items are kept in the model. Reflective constructs are also examined and their reliability and validity are reported. In Section 5.3; the structural model is tested, the proposed higher order structures are examined to confirm that the constructs are comprised by their lower order constructs (i.e. Export market orientation is comprised of intelligence generation, intelligence dissemination and responsiveness). In Section 5.4; the proposed research model is assessed by applying the structural equation modeling technique Partial Least Squares (PLS) and the outcome of the analysis is explained. In the final section, a summary of the findings is provided.

5.2 Testing the Measurement Model

In this section the quality of the adopted measures is assessed. The evaluation, and if needed refinement of the measures, is important in order to ensure that subsequent analysis of functional relationships is based on accurate measurements of the constructs. While the conceptualization and operationalization of export performance studies are receiving increased attention in the literature, practically all multi-item measures of export performance research available are based on reflective (effect) indicators (Diamantopoulos, 1999). This study combines formative and reflective in the measurement model (refer to Research Methodology Section 4.3.9 Table 4.3).

5.2.1 Formative Constructs

As stated in Section 4.3.9 Table 4.3- Research Constructs as FLV or RLV, the constructs treated as FLVs are cost, environmental turbulence, timeliness, export market performance, organizational characteristics and managerial characteristics. Unlike RLVs (see Section 5.2.2), in the case of FLVs there is no need to eliminate/omit non-significant indicators. According to Mathieson et al. (2001) and Diamantopoulos et al. (2008), under conditions of excessive collinearity amongst scale indicators, estimates of FLVs are highly unstable. The above is clearly articulated in the following passage from Mathieson et al. (2001, p.107):

> 'The inclusion of non-significant formative measures should not affect the estimates and any re-analyses after dropping non-significant items is not required. Because PLS is based on standard ordinary least squares regression, mis-specification due to the inclusion of 'irrelevant' items will not bias the estimates of significant items. The only potential problem is if the degree of correlation for the 'irrelevant item' and the other items is high, whereupon standard error estimates can increase.'

Testing multicollinearity is achieved by regressing the indicators of these LVs against an appropriate dependent variable, which in this case is management satisfaction (MS) (Chapter 4 Section 4.3.9.1). When assessing collinearity the author employs two tests (Hair et al., 1998):

- The variance inflation factor (VIF) denotes the amount of variance in the dependent variable not explained by the other independent variables. The benchmark of 10 has been adopted.
- The two-part process that involves first identifying conditional indices exceeding a value of 30 followed by identifying variables with variance proportions above 0.9.

The assessments result for cost, environmental turbulence, timeliness, organizational characteristics, managerial characteristics dimensions (demographic characteristics, language skills, risk taking, openness in decision making) and export market performance dimensions (the economic and financial outcome, strategic performance) indicate that VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of these constructs are retained.

In order to avoid repetition in the presentation, only environmental turbulence assessment is presented in Table 5.1 - Environmental Turbulence – Collinearity Analysis but others can be found in Appendix B.

Environmental Turbulence

Table 5.1 - Environmental Turbulence – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.281	.464		2.757	.007		
ET1	.174	.144	.157	1.212	.229	.517	1.935
ET2	.170	.144	.147	1.180	.241	.555	1.801
ET3	.027	.115	.025	.234	.815	.787	1.271
ET4	.048	.116	.047	.417	.678	.693	1.444
ET5	.084	.134	.086	.631	.529	.468	2.137
ET6	-.052	.153	-.059	-.342	.733	.288	3.473
ET7	-.068	.170	-.074	-.402	.688	.255	3.928
ET8	.233	.166	.256	1.405	.163	.260	3.845
ET9	-.110	.164	-.113	-.670	.504	.304	3.289

a. Dependent Variable: EMP-MS

Collinearity Diagnostics[a]

Model	Dimension	Statistics											
				Variance Proportions									
		Eigenvalue	Condition Index	(Constant)	ET1	ET2	ET3	ET4	ET5	ET6	ET7	ET8	ET9
1	1	9.148	1.000	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
	2	.277	5.745	.01	.03	.03	.13	.01	.02	.03	.02	.01	.02
	3	.140	8.080	.00	.01	.01	.38	.48	.02	.01	.00	.00	.00
	4	.114	8.957	.02	.10	.12	.32	.29	.04	.01	.00	.01	.01
	5	.087	10.229	.30	.14	.01	.01	.08	.22	.00	.05	.03	.02
	6	.065	11.900	.50	.07	.00	.04	.07	.48	.00	.04	.00	.02
	7	.058	12.547	.02	.00	.00	.05	.04	.04	.32	.09	.05	.34
	8	.048	13.783	.12	.60	.80	.00	.00	.00	.00	.00	.00	.01
	9	.033	16.538	.00	.00	.02	.07	.00	.05	.06	.30	.74	.21
	10	.029	17.742	.03	.03	.00	.00	.02	.13	.56	.51	.15	.36

a. Dependent Variable: EMP-MS

5.2.2 Reflective Constructs

This section presents investigations related to the accuracy of the RLVs and includes reliability and validity tests. Churchill (1979) states that if a measure is valid, it is reliable. However, Gronlünd (1982) points out that reliability is necessary to obtain validity, and, similarly, it has been suggested by Spector (1992) that one should first establish the essential property of reliability before conducting validity tests. Therefore, by following Spector (1992) and Gronlünd (1982), reliability is assessed first, followed by evaluation of validity.

5.2.2.1 Reliability

Reliability concerns the degree of stability and consistency when a scale is used repeatedly (Malhotra and Birks, 2003; Chisnall, 1997).

Cronbach alpha and internal consistency are applied in this study which are debated below.

- ***Cronbach alpha:*** is used to assess the degree of consistency amongst the multiple measurements of a variable. In assessing the reliability of the constructs two indices are examined:
    a) The overall scale alpha value provides an overall measure of reliability; suggestions for appropriate benchmarks vary with Nunnally (1978) recommending 0.5, while Malhotra et al., 2003 and Tull and Hawkins (1993) suggesting 0.6 and Churchill et al. (1997) 0.7. In this study, a mid-point benchmarking of 0.6 is adopted. For constructs with values less than 0.6, a sequential approach of removing those item(s) whose deletion resulted in a higher Cronbach's alpha value is performed until the scale reached the adopted benchmark.

b) Item-to-total correlations indicate the correlation between a specific scale item and the overall (or total) test score; the widely adopted benchmark of 0.3 is employed here (see Spector, 1992). Failure to meet this benchmark resulted in a similar iterative procedure as described above.

- ***Internal Consistency:*** A deficiency of Cronbach's alpha is that it presumes *a priori* that each indicator of a construct contributes equally, is sensitive to the number of items in a scale and fails to account for the indicator to construct relationship. To overcome this Fornell and Larcker (1981) propose a measure that utilises the item to construct loadings and is invariant to the number of items. Their proposed 0.7 benchmark is adopted in this study (denoted as composite reliability – CR). In addition for an item to be retained it should be associated with a loading that is significant and greater than 0.7. In assessing the statistical significance of loadings (given as standard values), a bootstrapping analysis is employed (Chin, 1998b for justification as to preference of bootstrapping over jack-knife) with estimates based on 500 samples (Mathieson et al., 2001).

When testing for reliability, Cronbach's alpha is examined first before testing for internal consistency, consequently changes made after the Cronbach test are incorporated into subsequent analysis. Presentation and debate of the related results for each RLV follow.

5.2.2.1.1 Export Sales Forecasting Effectiveness

The information presented in Table 5.2 - Reliability of the Export Sales Forecasting Effectiveness indicates that, the Cronbach's alpha is above 0.6 and all item to total correlations are above 0.3. In addition, all loadings are significant and the CR value of 0.911 is also above the acceptable benchmark of 0.7. Consequently, no purification is deemed necessary for this construct.

Table 5.2 - Reliability of the Export Sales Forecasting Effectiveness

Construct	Cronbach's alpha Item-to-total Correlation	α value	Loadings (t values)	CR
Export Sales Forecasting Effectiveness		0.850		0.911
ESFE1(SectionFQ2)	0.755		0.901(42.01)	
ESFE2(SectionFQ3)	0.714		0.873(39.43)	
ESFE3(SectionFQ4)	0.708		0.863(40.73)	

5.2.2.1.2 Export Market Orientation Dimensions

The information presented in Table 5.3 – Reliability of Export Market Orienttion Dimensions indicates that, the Cronbach's alpha is above 0.6 for intelligence generation and responsiveness and all item to total correlations are above 0.3 except intelligence dissemination. In addition, all loadings are significant and the CR values are also above the acceptable benchmark of 0.7 for intelligence generation and responsiveness. Consequently, no purification is deemed necessary for intelligence generation and responsiveness but purification is necessary for intelligence dissemination.

Table 5.3 – Reliability of Export Market Orientation Dimensions

Construct	Cronbach's alpha Item-to-total Correlation	α value	Loadings (t values)	CR
Intelligence Generation		0.858		0.895
EMOIG1 (Section C-Q1)	0.644		0.815(34.81)	
EMOIG2 (Section C-Q2)	0.644		0.764(30.47)	
EMOIG3 (Section C-Q3)	0.749		0.835(46.29)	
EMOIG4 (Section C-Q4)	0.676		0.783(27.39)	
EMOIG5 (Section C-Q5)	0.664		0.751(26.27)	
Intelligence Dissemination		0.403		0.510
EMOID1 (Section C-Q6)	0.407		0.422(5.42)	
EMOID2 (Section C-Q7)	0.110		0.965(79.29)	
EMOID3 (Section C-Q8)	0.224		-0.008(0.096)	
Responsiveness		0.872		0.935
EMOR1 (Section C-Q9)	0.776		0.930(47.93)	
EMOR2 (Section C-Q10)	0.776		0.945(66.28)	

Assessing Intelligence Dissemination reliability further;

Cronbach alpha for all the variations are below 0.6 and CR is below 0.7 benchmark. Therefore the effort to reach benchmark failed and intelligence dissemination is measured only with EMOID2 which has the highest loading value on the intelligence dissemination construct. EMOID2 represents that the companies had in place appropriate mechanism so that important information about customer was not lost in the system.

5.2.2.2 Validity

Validity is the process by which we can determine whether a construct measures what it is intended to measure (Churchill, 1979). There are three classes of validity tests, content (content and face), criterion (predictive and concurrent) and construct (convergent, discriminant and nomological). Unfortunately due to time limitations predictive and concurrent validity are not examined and nomological is assessed in model testing. The remaining validity tests are debated below.

5.2.2.2.1 Content and Face Validity

Content validity refers to whether the domain of the characteristics of the constructs are captured by the measure while face validity denotes the extent to which the scale items appear to sample that which are to be measured (Churchill, 1979; Hardesty and Bearden, 2004; Lee and Hooley, 2005). In order to develop measures capable of capturing the content of the research constructs/dimensions and are face valid, the procedure proposed by Churchill (1979) is followed during the operationalisation of the measurements. The procedure started with an exhaustive study of the subject matter in order to gain a thorough understanding and grounding of the issues involved. An extensive examination of previous studies and theoretical literature is carried out (see Chapter 2 – Literature Review and Chapter 4 – Research Methodology). Following this, the measurements of the research constructs/dimensions are operationalised from previous studies that provides the empirical definitions of the constructs/dimensions. The next stage is to interview professionals and practitioners from the target population. At this stage, suggestions are incorporated in order to enrich the content of the measurements, and inappropriate or unclear items measuring the research constructs/dimensions are eliminated or modified. This has provided sufficient evidence of both face and content validity for all RLVs and FLVs.

5.2.2.2.2 Convergent Validity

Convergent validity of a construct represents the ratio of the amount of variance of its indicators captured by the construct, relative to the amount of total variance, including the variance due to measurement error (Lee and Hooley, 2005). In other words, convergent validity requires that a measure (or indicator) should correlate highly with other measures of the same constructs (Malhotra and Birks, 2003). The following three approaches are utilised for the purpose of this research.

- **Average Variance Extracted (AVE)** represents shared or common variance in a LV, the amount of variance that is captured by the LV in relation to the amount of variance due to its measurement error. Consequently, AVE is a measure of the error-free variance of a set of items. As suggested by Fornell and Larcker (1981), AVE provides a measure of convergent validity. In this study their recommendation that AVE should be greater than 0.50, i.e. that 50% or more variance of the indicators should be accounted for.
- **Theta matrix** provides estimates of the loadings of each scale item on its intended as well as on the remaining (cross loadings) constructs. For convergent validity to be confirmed, indicators should be associated with high loadings with their hypothesised LV and low with other LVs in the model.
- **Exploratory Factor Analysis (EFA)** is an alternative to cross-loadings method for assessing convergent validity. According to Hair et al. (1998), EFA is designed to extract a set of latent factors that aggregate a number of variables. These latent factors can be seen as a set of common underlying dimensions of the research constructs. Items within the same common underlying dimensions show high correlation, while showing low correlation with other items loaded on different sets of common underlying dimensions. Two approaches have been employed to assess convergent

validity when utilising EFA (see amongst others Simpson and Kujawa, 1974; Mehta, 1993). The first is to pull all multiple-item scales, within the same perceptual constructs, into a pool and then to proceed with factor analysis. Items loading on conceptually unjustifiable dimensions are removed in order to purify the measurement. In contrast, in the second approach, all research multiple-items scales (not only those within a particular construct) are factor-analysed together. Due to the large number of multiple-item scales and constructs in this study, the first approach is adopted. This approach is considered to simplify the complexity of extraction of the EFA. In applying EFA, the following, as recommended by Hair et al. (1998), are considered.

Objectives of EFA - As already stated, the purpose of testing for convergent validity is to examine the correlation between the scale items and the latent constructs they are expected to measure. This is considered to be consistent with the application of EFA.

Designing an EFA – Given that we are interested in correlation between items, R-type factor analysis is employed. All items are metric and, for the sample size, the observations to scale items exceed the suggested 5:1 ratio. The total number of respondents (i.e., 111) is also within the recommended limits.

Assumptions in EFA – A visual examination of the correlations between the scale items are carried out and tested for the associated probability of the Bartlett test of sphericity (at a 5% level of significance). The Kaiser-Mayer Olkin (KMO) statistic is used to examine sampling adequacy and its adopted benchmark is 0.50. In addition the anti-image matrix is examined with a benchmark value of 0.30.

Deriving Factors and Assessing Overall Fit – The principal component analysis are

used because the aim is to identify the minimum number of factors that would account for the maximum portion of the variance of the original items. In order to determine the number of factors to be extracted the criterion adopted is Eigenvalues greater than 1, given the priori expectation of obtaining a single factor.

Interpreting the Factors – In cases where, contrary to expectations, more than a single factor is derived, the initial solution is rotated. Since no compelling theoretical reason exists in favour of a specific rotation method, varimax (according to Kinnear and Gray (1997) the most commonly used methods), is applied. Using guidelines found in Hair et al. (1998), loading above 0.40 are considered to be significant. Possible removal of scale items is examined by reference to commonality (i.e., amount of variance of each item is accounted for by the solution) with a benchmark of 0.50.

We now proceed to examine each of the research constructs on the basis of the above criteria and indices.

5.2.2.2.2.1 Export Sales Forecasting Effectiveness

The AVE value 0.773 is above the adopted benchmark. In addition, we can see from Table 5.4 that, the loadings are in line with the hypothesised structure. In terms of EFA, the KMO is 0.728, the significance associated with the Bartlett test is 0.00 and all loadings are above 0.40. Collectively, the information presented in Table 5.4 - Validity of Export Sales Forecasting Effectiveness Dimensions confirms the stability of the proposed structure of all the export sales forecasting effectiveness dimensions and confirms the convergent validity of this construct.

Table 5.4 - Validity of Export Sales Forecasting Effectiveness Dimensions

	Export Sales Forecasting Effectiveness		Derived Common Factors Factor 1
Export Sales Forecasting Effectiveness			
ESFE1(SectionFQ2)	0.901		
ESFE2(SectionFQ3)	0.872		
ESFE3(SectionFQ4)	0.863		
		Eigenvalue	2.319
		Perc.Var.	77.136
		Cum. Var.	77.136

5.2.2.2.2.2 Export Market Orientation Dimension

The AVE value 0.631 for intelligence generation and 0.876 for responsiveness are above the adopted benchmark. In addition, we can see from Table 5.5 - Validity of Export Market Orientation Dimensions that, the loadings are in line with the hypothesised structure. In terms of EFA, the KMO is 0.815 (Intelligence Generation), 0.5 (Responsiveness), the significance associated with the Bartlett test is 0.00. Collectively, the information presented in Table 5.5 confirms the stability of the proposed structure of all the export market orientation dimensions and confirms the convergent validity of this construct.

Table 5.5 - Validity of Export Market Orientation Dimensions

			Derived Common Factors Factor 1
Intelligence Generation			
EMOIG1 (Section C-Q1)	0.810		
EMOIG2 (Section C-Q2)	0.761		
EMOIG3 (Section C-Q3)	0.836		
EMOIG4 (Section C-Q4)	0.785		
EMOIG5 (Section C-Q5)	0.751		
		Eigenvalue Perc.Var. Cum. Var.	3.194 63.873 63.873
Responsiveness			
EMOR1 (Section C-Q9)	0.927		
EMOR2 (Section C-Q10)	0.945		
		Eigenvalue Perc.Var. Cum. Var.	1.776 88.806 88.806

5.2.2.2.3 Discriminant Validity

Discriminant validity implies that a measure should correlate poorly with other dimensions/items that are supposed to be different (Churchill and Iacobucci, 2001). In this respect, an indication of adequate discriminant validity is that a LV shares more variance with its measures than it does with other constructs in the model. It is recommended that, for a construct to exhibit adequate discriminant validity the square root of the construct's AVE should be noticeably greater than its bivariate correlation with the other constructs in the model. The square root of AVE's for the measures can be found in the diagonal of the matrix. Discriminant validity is established when the diagonal elements are larger (ideally >0.7) than off-diagonal elements (Hulland, 1999). As seen in Table 5.6 this holds true for all RLV constructs which are shaded in grey.

Table 5.6 - Correlation Matrix for the Dimensions of the RLV Constructs

	Accuracy	Bias	Timeliness	Cost	Env. Turb	MC	ESFE	MC-D	MC-Lang	MC-LW	MC-R	MC-O	MC-RW	EMP-MS	EMP-F	EMP-S	EMO-IG	EMO-ID	EMO-R	OC	EMP	EMO
Accuracy	1																					
Bias	0.013	1																				
Timeliness	0.343	0.478	0.799																			
Cost	0.195	0.44	0.625	1																		
Env. Turb	0.258	0.442	0.53	0.551	1																	
MC	0.35	0.172	0.511	0.407	0.455	1																
ESFE	0.534	0.244	0.621	0.488	0.607	0.683	0.902															
MC-D	0.016	0.092	0.197	0.099	0.163	0.315	0.241	0.548														
MC-Lang	0.21	0.164	0.355	0.283	0.128	0.348	0.196	0.002	0.908													
MC-LW	0.046	0.016	-0.045	0.018	0.076	0.137	0.047	-0.042	0.11	1												
MC-R	0.279	0.159	0.43	0.283	0.364	0.893	0.624	0.267	0.256	0.126	0.896											
MC-O	0.319	0.158	0.467	0.409	0.446	0.934	0.634	0.207	0.224	0.03	0.723	0.882										
MC-RW	0.313	0.034	0.399	0.354	0.411	0.795	0.546	0.245	0.169	0.145	0.595	0.747	1									
EMP-MS	0.348	0.177	0.332	0.351	0.24	0.442	0.497	0.125	0.065	0.232	0.432	0.359	0.454	1								
EMP-F	0.364	0.089	0.249	0.212	0.198	0.371	0.433	0.09	0.194	0.32	0.391	0.254	0.333	0.708	0.902							
EMP-S	0.338	0.104	0.45	0.334	0.438	0.66	0.595	0.167	0.343	0.226	0.589	0.587	0.52	0.421	0.613	0.952						
EMO-IG	0.298	0.18	0.416	0.322	0.445	0.649	0.616	0.087	0.294	0.235	0.528	0.621	0.566	0.274	0.262	0.632	0.796					
EMO-ID	0.29	0.357	0.449	0.466	0.478	0.417	0.628	0	0.197	0.116	0.341	0.431	0.285	0.277	0.244	0.458	0.602	0.62				
EMO-R	0.367	0.263	0.419	0.325	0.507	0.567	0.602	0.104	0.17	0.099	0.513	0.529	0.482	0.353	0.307	0.522	0.6	0.581	0.938			
OC	-0.248	-0.12	-0.2	-0.201	-0.259	-0.035	-0.203	0.057	-0.178	-0.254	0.002	-0.003	-0.054	-0.209	-0.349	-0.417	-0.259	-0.281	-0.257	1		
EMP	0.415	0.123	0.415	0.334	0.374	0.606	0.601	0.153	0.293	0.3	0.571	0.502	0.509	0.684	0.881	0.906	0.52	0.411	0.485	-0.422	1	
EMO	0.355	0.269	0.485	0.4	0.535	0.672	0.702	0.089	0.279	0.204	0.564	0.644	0.569	0.341	0.314	0.657	0.943	0.756	0.806	-0.304	0.566	1

5.3 Testing the Structural Model

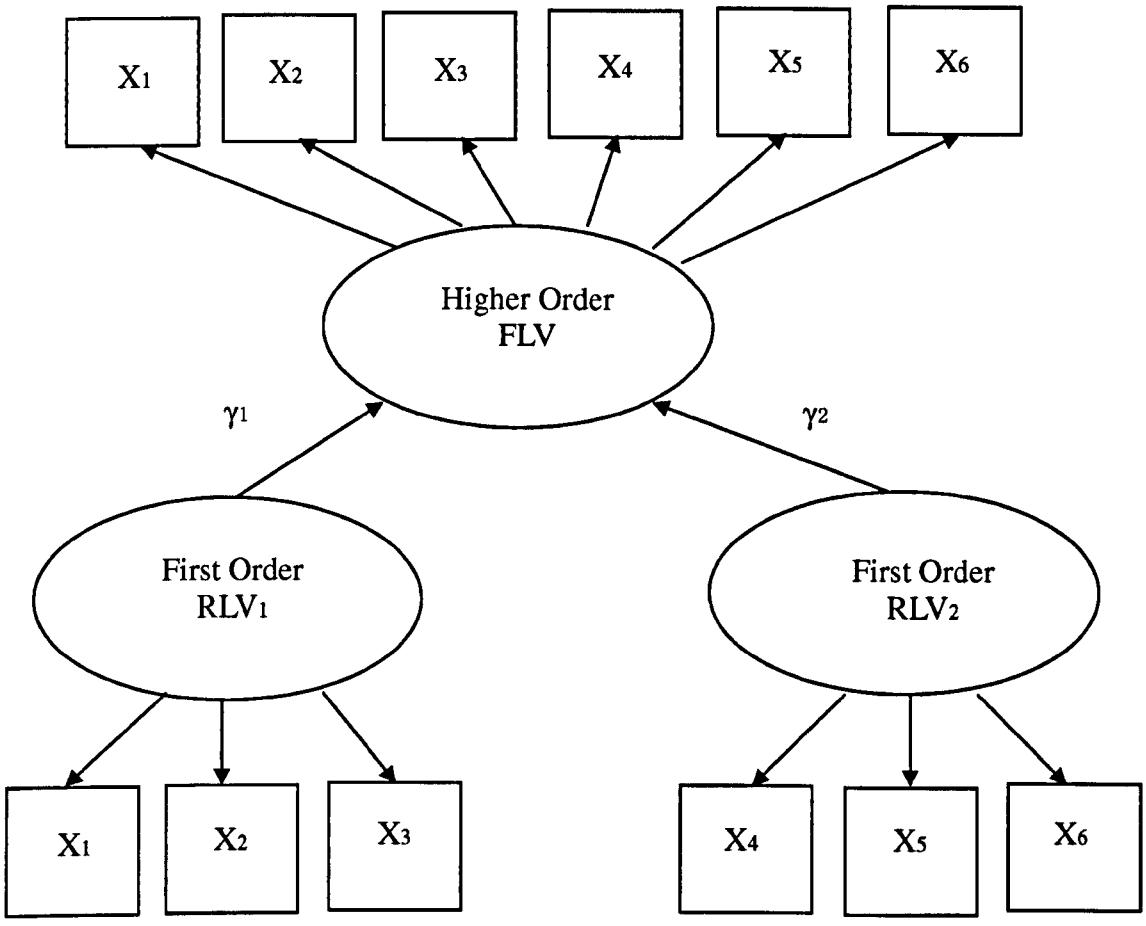
The focus of this chapter is the analysis of the research model. However, before proceeding to test the hypothesised functional relationships the proposed higher order structures of export market performance, export market orientation and managerial characteristics are examined.

5.3.1 Higher Order Structures

When testing for second order structures, Chin under the FAQ heading of his PLS webpage (http://disc-nt.cba.uh.edu/chin/plsfaq/plsfaq.htm), suggests that the method of repeated manifest variables is an acceptable approach. Quoting from a reply provided by Chin on his website 'If the number of indicators for each of our two constructs are approximately equal, we can use the method of repeated manifest variables' and 'Essentially, our overall factor that represents the two first order constructs is created by using all the indicators used for the first two order constructs'. Please also refer to Wetzels et al. (2009) for further information on using PLS path modelling for assessing hierarchical construct models.

An illustrative example is presented in Figure 5.1 - Example of Testing Higher Order Structures Using Repeated Measures. The structure depicts one higher order FLV that comprises two first order RLVs each operationalised through three indicators. Unlike covariance based SEM, when using PLS, indicators must be assigned to the higher order construct (irrespective of whether a RLV or a FLV). The repeat manifest variables method implies that the indicators of the first order constructs are also assigned to the higher order construct. Consequently, in the below example, the higher order FLV is operationalised as a composite of X_1 to X_6 which are the indicators of the two first order RLVs. For the structure to be supported, the regression coefficients γ_1 and γ_2 should be statistically significant.

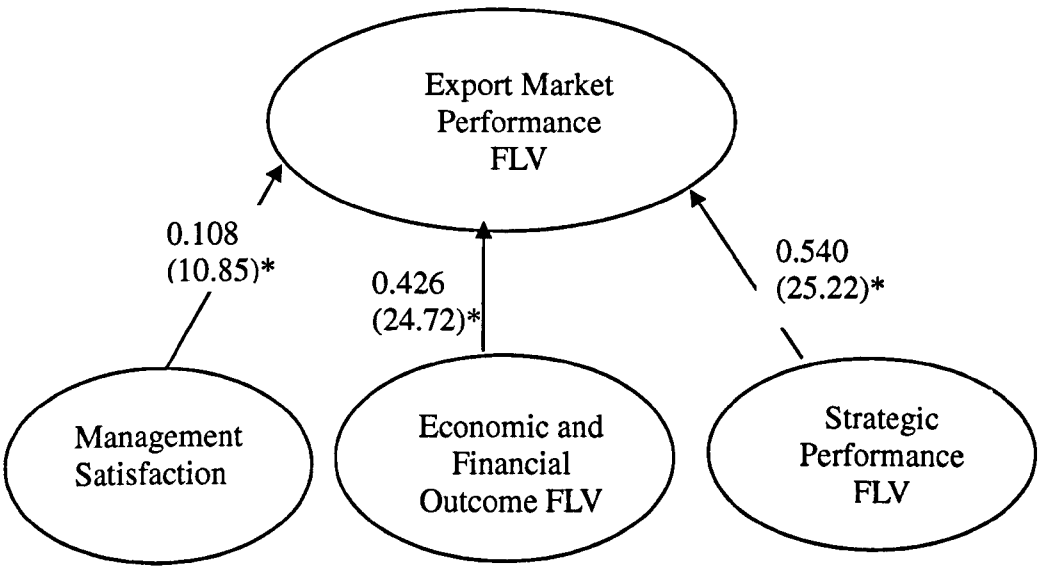
Figure 5.1 - Example of Testing Higher Order Structures Using Repeated Measures



5.3.1.1 Second Order Structure of Export Market Performance

Export Market Performance is hypothesised to represent a second order FLV that comprises of three lower order constructs (i.e., Management Satisfaction of overall outcome, economic and financial outcome and strategic performance). The solution presented in Figure 5.2 - Second Order Structure of Export Market Performance indicates that all regression coefficients are significant thus confirming the proposed structure.

Figure 5.2 - Second Order Structure of Export Market Performance

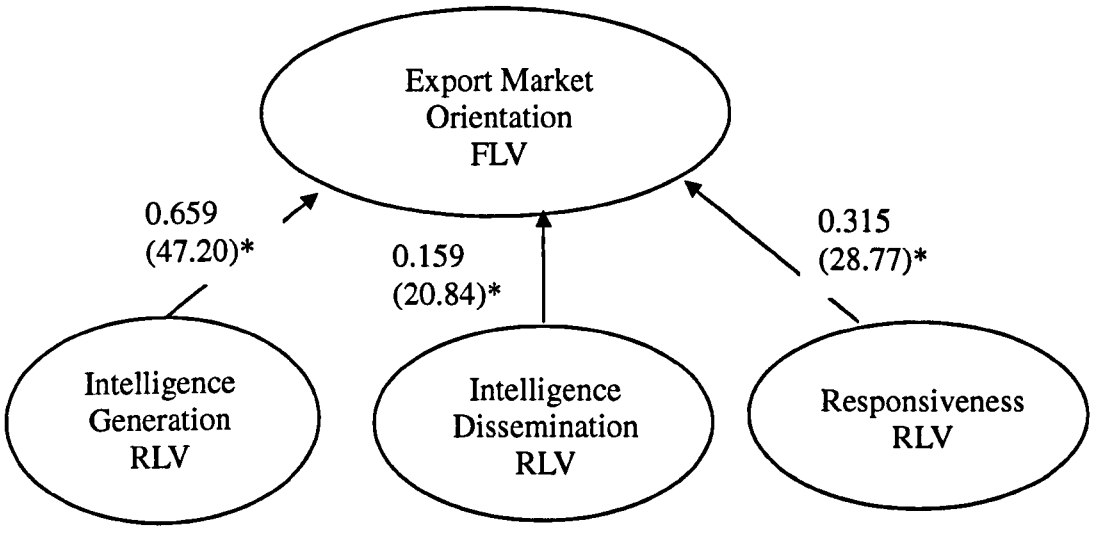


Note: * p<.001; values in parentheses are t-statistics

5.3.1.2 Second Order Structure of Export Market Orientation

Export Market Orientation is hypothesised to represent a second order FLV that comprises of three lower order constructs (i.e., Intelligence Generation, Intelligence Dissemination and Responsiveness). From Figure 5.3 – Second Order Structure of Export Market Orientation shows that all pathways are significant thus confirming the proposed higher order structure of export market orientation.

Figure 5.3 - Second Order Structure of Export Market Orientation

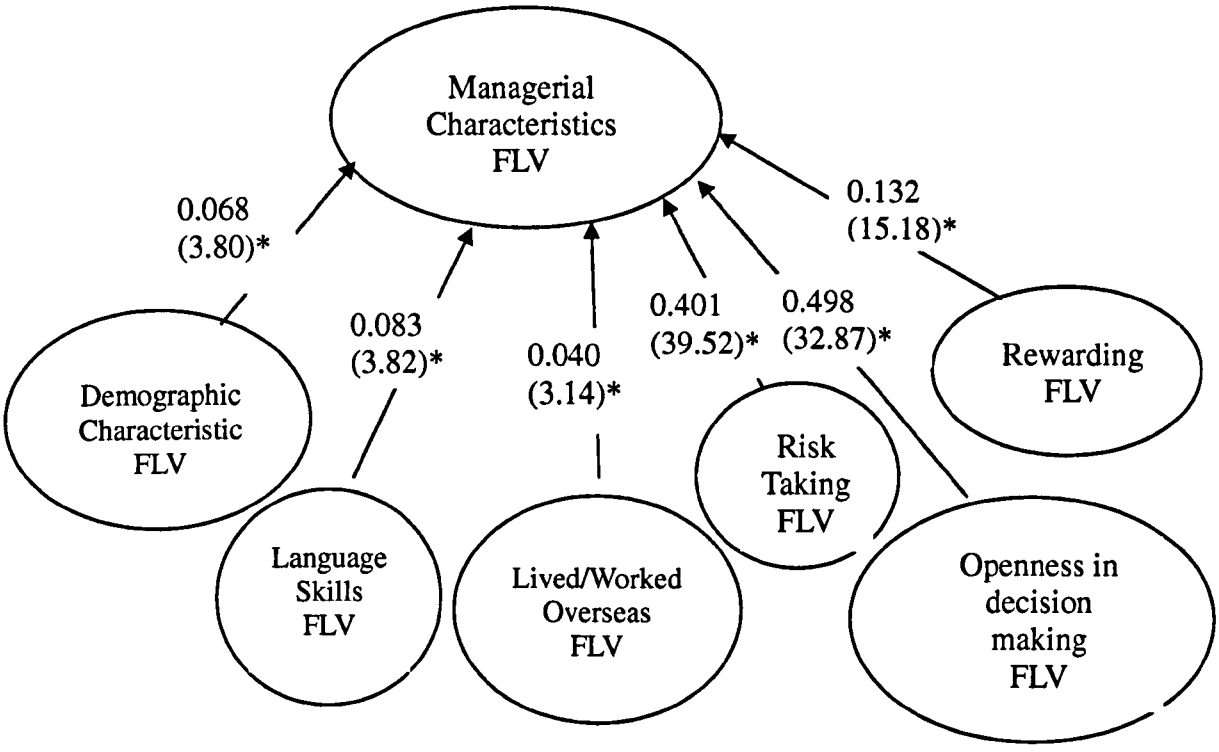


Note:* p<.001, values in parentheses are t-statistic

5.3.1.3 Second Order Structure of Managerial Characteristics

Managerial characteristics is conceptualised as a second order FLV of demographic characteristics, language skills, lived/worked overseas, risk taking, openness in decision making and rewarding. From Figure 5.4 – Second Order Structure of Managerial Characteristics, it can be seen that all pathways are significant thus confirming the proposed higher order structure of managerial characteristics.

Figure 5.4 – Second Order Structure of Managerial Characteristics



Note: * p<.001; values in parentheses are t-statistics

All the proposed structures are confirmed that our overall constructs (export market performance, export market orientation and managerial characteristics) represents their indicators.

5.4 Testing the Research Model

As discussed in the Section 4.3.1 the purpose of this study is to develop a research model showing the linkages between variables of forecasting criteria, forecasting methods, export sales forecasting effectiveness and export market performance. All relevant constructs have been brought together in a causal research model as outline in Chapter 3 Research Model and Hypotheses. A total of 10 hypotheses are formulated within the research model. This section aims to assess the research model with the structural equation modelling technique Partial Least Squares and to draw conclusions regarding the research hypothesis.

The use of structural equation modelling and particularly the use of Partial Least Squares (PLS) as a suitable technique for analysis are discussed in the Research Methodology Chapter 4 in Section 4.3.12. Structural equation modelling techniques enable the researcher to 'simultaneously examine a series of interrelated dependence relationships among the measured variables and latent constructs (variates) as well as between several latent constructs' (Hair et al., 2006, p. 710). One of the distinctions between variance based PLS and other covariance based structural equation modelling technique is that PLS is 'prediction' oriented rather than 'theory' oriented. PLS, like multiple regression, uses variances to predict the dependent variable(s). Covariance based SEM techniques use correlations; they are confirmatory in nature guided by theory rather than empirical results. Therefore the author used the PLS modelling technique as implemented in PLS-Graph Version 3.0 for the data analysis.

Statistical significance: In assessing the statistical significance of loadings, weights and pathway coefficients (given as standardised values) a bootstrapping analysis is employed (Chin, 1998b for justification as to preference of bootstrapping over jack-knife) with

estimates based on 500 samples (Mathieson et al., 2001). Because PLS makes no distributional assumptions, traditional parametric methods of significance testing (e.g. confidence intervals, χ^2) are not appropriate. Therefore a bootstrapping method is used to ascertain the stability and significance of parameter estimates. Bootstrapping technique validates a multivariate model by obtaining a large number of sub-samples with replacement from the original data set, estimating models for each sub-sample, and then identifying the values for the parameter estimates from the set of models by computing the mean of each estimated coefficient across all sub-sample model (Hair et al., 2006). This enable us to rely on the Central Limit Theorem for subsequent significance test on the weight and loadings using Student t-value tables with n-1 degrees of freedom (where n is the number of samples) resulted in one-tail critical values of, 1.65, 2.33 and 3.09 (i.e., 1-tail test), for respectively 0.05, 0.01 and 0.001 level of significance. In addition to statistical significance, Chin (1998b) suggests examining whether the structural paths are of substantial strength, stating "standardized paths should be at least 0.2 and ideally above 0.3 in order to be considered meaningful." However, given the exploratory nature of this research, the author has adopted a very liberal 0.10 benchmark.

R^2: The interpretation is similar to that employed under traditional multiple regression analysis, i.e. R^2 is the proportion of variance in either of the two variables which may be predicted (or attributed to) the variance of the other variable (Cohen, 1988).

Contribution to R^2: According to Tenenhaus et al. (2005, p.178-179) 'The value of multiple R^2 in the case of standardized variables, may be decomposed in terms of the multiple regression coefficients and correlations between the dependent variable and the explanatory ones'.

Q^2 Predictive Relevance: This relates to the predictive sample reuse technique that

represents a synthesis of cross-validation and function fitting and applies only to RLVs. In PLS this can be achieved through a blindfolding procedure that omits part of the data for the particular block of indicators during parameter estimations and then attempts to estimate the omitted part using the estimated parameters. In terms of interpretation a $Q^2>0$ implies that the model has predictive relevance while $Q^2<0$ indicates a lack of predictive relevance.

In the sections below, we test the direct impact of each forecasting criteria on export sales forecasting effectiveness and we establish the moderating impact of forecasting method in the conclusion chapter. Out of 111 respondents, 15 of them used formal statistical forecasting methods, 31 of them used judgmental forecasting methods and 65 of them used composite sales forecasting methods in their firms.

5.4.1 Research Model with Formal Statistical Forecasting Method

Fifteen respondent indicated that during 2009, formal statistical techniques such as time series which assume that the past pattern will continue into the future best describes the method used by their company for exporting to EU countries. For studies with small sample sizes such as this one, external validity and generality can be questioned (Souse et al., 2008). Therefore specific findings for this forecasting method are attenuated and should be interpreted cautiously. This is the limitation of this research (Chin, 1998).

The estimated path model with path coefficients and R^2 values are shown in Table 5.7, R^2 values provide evidence for the explanatory power of the proposed research model. The table also shows the corresponding t-values in brackets and their significance.

Table 5.7 - Research Model with Statistical Forecasting Method Data

Direct Impact of Constructs When Statistical Forecasting Method is Used.	**Standardised regressions coefficients (t-values)**
Accuracy has a positive impact on export sales forecasting effectiveness	0.111 (3.438)***
Bias has a negative impact on export sales forecasting effectiveness	0.168 (2.686)**
Timeliness has a positive impact on export sales forecasting effectiveness	-0.080 (0.798)
Cost has a negative impact on export sales forecasting effectiveness	0.311 (3.700)***
Environmental Turbulence has a positive impact on export sales forecasting effectiveness	0.540 (3.809)***
Export sales forecasting effectiveness has a positive impact export market performance	-0.021 (3.236)***§
Managerial characteristics have impact on export market performance	0.690 (3.659)***
Export market orientation positively impact export market performance	0.145 (0.992)
Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm.	0.642 (3.541)***
Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm	0.672 (3.529)***
	R^2 Q^2
Export Sales Forecasting Effectiveness	0.955 0.729
Export Market Performance	0.548

Note: *p<.05; **p<.01; ***p<.001; Regression coefficients § less than <0.10 benchmark but statistically significant

Two structural pathways (timeliness and export market orientation) out of 10 above are statistically insignificant. Export sales forecasting effectiveness is statistically significant but its standardized path is below 0.10 benchmark and therefore the structural pathway is not supported.

The positive impact of accuracy and environmental turbulence on export sales forecasting effectiveness when statistical forecasting method used are supported. Bias and cost are

statistically significant but have a positive impact. Managerial characteristics have a positive impact on export market performance when statistical methods are used.

The model contains substantial explanatory powers in terms of export sales forecasting effectiveness (95.5%) and export market performance (54.8%). Q^2 value is 0.729 which is greater than zero thus confirming the predictive relevance of the model.

5.4.2 Research Model with Judgmental Forecasting Method

Thirty one respondents indicated that during 2009, judgmental methods such as managerial opinion, sales force composite, panel consensus and market surveys used by their company for exporting to EU countries. The result related to the solution of the research model is presented in Table 5.8 below and presents the path coefficient for each of the hypothesized path linkages of the proposed model. The table also shows the corresponding t-values in brackets and their significance.

Table 5.8 - Research Model with Judgmental Forecasting Method Data

Direct Impact of Constructs When Judgmental Forecasting Method is Used.	**Standardised regressions coefficients (t-values)**	
Accuracy has a positive impact on export sales forecasting effectiveness	0.389 (10.202)***	
Bias has a negative impact on export sales forecasting effectiveness	-0.160 (6.135)***	
Timeliness has a positive impact on export sales forecasting effectiveness	0.138 (4.224)***	
Cost has a negative impact on export sales forecasting effectiveness	0.074 (1.832)*§	
Environmental Turbulence has a positive impact on export sales forecasting effectiveness	0.536 (18.035)***	
Export sales forecasting effectiveness has a positive impact export market performance	-0.043 (1.776)*§	
Managerial characteristics have impact on export market performance	0.577 (25.004)***	
Export market orientation positively impact export market performance	0.357 (10.735)***	
Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm.	-0.217 (12.681)***	
Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm	0.334 (14.644)***	
	R^2	Q^2
ESFE	0.771	0.538
EP	0.675	

Note: *p<.05; **p<.01; ***p<.001; Regression coefficients § less than <0.10 benchmark but statistically significant

The impact of each forecasting criteria on export sales forecasting effectiveness when judgmental forecasting method used are all supported with the exception of cost. Cost and export sales forecasting effectiveness are statistically significant but their pathway strength are lower than benchmark. Organization characteristics' moderating effect on managerial characteristics is found to have a significant but a negative impact on export market performance. The model contains substantial explanatory powers in terms of export sales forecasting effectiveness 77% and export market performance over 67%. Q^2 value is 0.538

which is greater than zero thus confirming the predictive relevance of the model.

5.4.3 Research Model with Composite Forecasting Method

Sixty five respondents indicated that during 2009, combination of statistical and judgmental techniques used by their company for exporting to EU countries.

Table 5.9 - Research Model with Composite Forecasting Method Data presents the path coefficients for each of the hypothesized path linkages of the proposed model. The table also shows the corresponding t-values in brackets and their significance.

Table 5.9 - Research Model with Composite Forecasting Method Data

Direct Impact of Constructs When Composite Forecasting Method is Used.	**Standardised regressions coefficients (t-values)**	
Accuracy has a positive impact on export sales forecasting effectiveness	0.222 (10.732)***	
Bias has a negative impact on export sales forecasting effectiveness	-0.039 (1.862)*§	
Timeliness has a positive impact on export sales forecasting effectiveness	0.429 (16.426)***	
Cost has a negative impact on export sales forecasting effectiveness	0.073 (2.196)* §	
Environmental Turbulence has a positive impact on export sales forecasting effectiveness	0.326 (9.462)***	
Export sales forecasting effectiveness has a positive impact export market performance	0.258 (8.883)***	
Managerial characteristics have impact on export market performance	0.284 (6.327)***	
Export market orientation positively impact export market performance	0.373 (8.109)***	
Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm.	-0.011 (0.177)* §	
Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm	0.119 (2.230)*	
	R^2	**Q^2**
ESFE	0.702	0.496
EP	0.559	

Note: *p<.05; **p<.01; ***p<.001; Regression coefficients § less than <0.10 benchmark but statistically significant

Accuracy, timeliness and environmental turbulence have a positive impact on export sales forecasting effectiveness when the composite forecasting method is used. Bias, cost and organization characteristics' moderating effect through managerial characteristics structural pathways strength are lower than the benchmark therefore they are not supported. Export sales forecasting effectiveness' positive impact on export market performance is also supported.

The model contains substantial explanatory powers in terms of export sales forecasting effectiveness 70% and export market performance over 55%. Q^2 value is 0.496 which is greater than zero thus confirming the predictive relevance of the model.

5.5 Conclusion of the Data Analysis

In this chapter the author presents the results of the data analysis that is conducted using the structural equation modelling technique PLS (Partial Least Squares). Out of 5 forecasting criteria, forecasting methods' impact remain the same for accuracy and environmental turbulence. Bias has a positive impact for statistical methods, negative one for judgmental methods but its impact for composite method is insignificant. Timeliness has a positive impact for judgmental and composite forecasting but an insignificant impact for statistical methods. Cost has a positive impact when statistical method is used but has an insignificant impact for judgmental and composite methods are used. Export sales forecasting effectiveness' impact is insignificant when statistical and judgmental methods are used but positive when composite method is used.

Managerial characteristics have a positive impact on export market performance for all the forecasting methods used by the firm. Export market orientation's impact on export market performance is insignificant for judgmental forecasting but positive for judgmental and composite methods. Organisational characteristics' moderating impact on managerial

characteristics and export market orientation also changes depending on the forecasting methods used by the firm.

For statistical forecasting methods, the model contains substantial explanatory powers in terms of export sales forecasting effectiveness (95.5%) and export market performance (54.8%). R^2 values on export sales forecasting effectiveness decrease to 77.1% for judgmental forecasting method and 70.2% for composite forecasting methods. This suggests that another proportion of the variation has still to be accounted for.

Overall, the findings suggest good explanatory power and predictive relevance of the model.

The next and final Chapter 6 discusses the conclusions of the study and the contributions made by the study to our understanding of forecasting methods' moderating influence and the linkages between export market performance and export sales forecasting effectiveness.

CHAPTER 6. CONCLUSION AND DEBATE

The literature review in Chapter 2 leads to the identification of two major gaps in the extant body of research relating to the forecasting criteria (accuracy, bias, timeliness, cost and environmental turbulence), forecast methods and export sales forecasting effectiveness.

Firstly, forecasting research has focused on forecasting criteria's direct influence on export sales forecasting effectiveness. There are some literatures which address how forecasting criteria are affected by the forecast methods the organization uses. However, the existing literature does not take into account whether forecasting criteria's influence on export sales forecast effectiveness vary depending on the forecasting methods used by the firm (see Section 2.6).

Secondly, linking the export sales forecast effectiveness to the export market performance was reported to be critical in evaluating and improving the firm's sales forecasting capability and its performance. Only two studies have been found in the literature review supporting this linkage (see Section 2.7). Furthermore, in the existing literature, this link has been limited to only one factor, omitting other important factors which also have an influence on export market performance. Managerial characteristics, export market orientation and organization characteristics are included in our research model as control variables which have been amongst the most frequently studied in this area. These variables are only included in this research to fully examine the impact of export sales forecasting effectiveness on export market performance (see Section 2.8).

Grounded on the above rationale, this study provides an empirical examination of the relationship between forecasting methods, forecasting criteria, export sales forecast

effectiveness and export market performance.

6.1 Research Objectives

In order to achieve the stated aim (see Section 1.2), five objectives are identified. Objectives 1 to 4 are debated below while Objective 5 (putting forward theoretical and managerial suggestions based on empirical results) is dealt with in Section 6.4.

Objective 1: Building a theoretically grounded model

Objective 1 is to construct a theoretically grounded model that depicts the functional relationships identified in the research aim. The first step towards this objective is to conduct an extensive review of the sales forecasting literature (see Section 2.3 to Section 2.8). Guided by extant literature, a research model is developed comprising the constructs accuracy, bias, timeliness, cost and environmental turbulence as forecast criteria, forecasting method as moderating construct, export sales forecasting effectiveness, export market performance as dependent variables and managerial characteristics, organisational characteristics and export market orientation as control variables (see Section 3.1).

Objective 2: Operationalisation of the model constructs

Once the research model is formulated, it is necessary to identify scales from the extant literature that would represent the conceptualisation of research constructs (identification of these scales is depicted in Section 4.3.9). Review of academic papers and discussions with expert informants within the focus groups provide a sound base for the specification of measurement scale related to research constructs (see Section 4.3.1). Extensive reliability and validity tests are undertaken to ensure the stability of the borrowed scales (see Section 5.2).

Objective 3: Data collection

The author uses the electronic survey to collect the data. Export managers of UK based companies exporting to European Union countries are the target population. Author makes an initial list of business acquaintances who all work within the UK based exporting companies. Database LinkedIn connections are used which also includes the extended associations of these business colleagues and friends. This list gets updated regularly until the targeted sample quantity is reached. Data is collected between May 2010 and October 2010. See Section 4.3.7 and 4.3.8 for a detailed discussion of sampling design and data collection process.

Objective 4: Analysing the acquired data and testing the hypothesised pathways using suitable analytical tools.

The collected data is analysed using the PLS approach to structural equation modelling, as reported in Chapter 5. The psychometric properties of the proposed higher-order structures are confirmed and final solution is obtained for the research model. The findings of the research model are presented in Section 5.4. Section 6.2 provides the focus of this chapter in which the results of the analysis are discussed in relation to extant literature.

Objective 5: Putting forward theoretical and managerial suggestions based on the empirical results.

Having debated the study's findings in relation to extant literature (see Section 6.2), the theoretical contributions and managerial implications are presented in Sections 6.3.1 and Section 6.3.2.

6.2 Discussions of the Research Findings

The results related to testing the research model and the hypotheses (see Section 5.4) are debated in this section. Hypothesis 1 to Hypothesis 5 are put forward to test forecasting methods' moderating effect on the relationship between forecasting criteria and export sales forecasting effectiveness. Hypothesis 6 is put forward to test export sales forecasting effectiveness' impact on export market performance. Most studies on export market performance fail to control potentially important confounding influences relating particularly to managerial characteristics, export market orientation and organizational characteristics (see Section 2.8). Therefore Hypothesis 7 to Hypothesis 10 are only included in this research to fully examine the impact of export sales forecasting effectiveness on export market performance.

Table 6.1 below shows the supported and not supported pathways for the research model for statistical, judgmental and composite sales forecasting methods. Data analysis results indicate that of the 10 pathways, only 4 are common across the three forecasting methods (accuracy, environmental turbulence, managerial characteristics and organisational characteristics' moderating impact on export market orientation). The table shows that forecasting methods used by the firm change the impact of bias, timeliness and cost on ESFE. Export sales forecasting effectiveness' impact on export market performance is only significant and positive when composite forecasting methods are used.

Table 6.1Summary of Pathways When Different Forecasting Methods are Used

Direct Impact of Research Constructs When Different Forecasting Methods are Used	**Statistical**	**Judgmental**	**Composite**
Accuracy has a positive impact on export sales forecasting effectiveness	Supported	Supported	Supported
Bias has a negative impact on export sales forecasting effectiveness	Not Supported	Supported	Not Significant
Timeliness has a positive impact on export sales forecasting effectiveness	Not Significant	Supported	Supported
Cost has a negative impact on export sales forecasting effectiveness	Not Supported	Not Significant	Not Significant
Environmental Turbulence has a positive impact on export sales forecasting effectiveness	Supported	Supported	Supported
Export sales forecasting effectiveness has a positive impact export market performance	Not Significant	Not Significant	Supported
Managerial characteristics have impact on export market performance	Supported	Supported	Supported
Export market orientation positively impact export market performance	Not Significant	Supported	Supported
Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm.	Supported	Not Supported	Not Significant
Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm	Supported	Supported	Supported

Table 6.2 below is organised according to the numbering of the hypotheses in the research model. If the same results (Supported, Not Supported or Not Significant) are reported for all the forecasting methods that mean that forecasting criteria's impact on forecasting effectiveness (ESFE) do not vary depending on the forecasting methods used by the firms.

Table 6.2 – Summary of Results of the Research Model

Research Hypotheses	**Results**
H_1: The positive impact of accuracy on ESFE depends on the forecasting methods applied by the companies	Not Supported
H2: The negative impact of bias on ESFE depends on the forecasting methods applied by the companies	Supported
H3: The positive impact of timeliness on ESFE depends on the forecasting methods applied by the companies	Supported
H4: The negative impact of cost on ESFE depends on the forecasting methods applied by the companies.	Supported
H5: The positive impact of environmental turbulence on ESFE depends on the forecasting methods applied by the companies	Not supported
H6: Export sales forecasting effectiveness has a positive impact on export market performance	Tentatively Supported
H7: Managerial characteristics have an impact on export market performance	Supported
H8: Export market orientation positively impacts export market performance	Tentatively Supported
H9: Impact of managerial characteristics on export market performance depends on the organizational characteristics of the firm	Tentatively Supported
H10: Positive impact of export market orientation on export market performance depends on the organisational characteristics of the firm.	Supported

All the above results are discussed in detail within the next sections. In summary, forecasting methods do not change accuracy's and environmental turbulence's positive impact on ESFE. Bias, timeliness and cost have a different impact on ESFE depending on the forecasting methods used by the firm hence it provides a support for Hypothesis 2, 3 and 4. ESFE's impact on EMP is only significant when composite sales forecasting is used. Managerial characteristics has a positive impact on EMP across all the forecasting methods are used. Export market orientation has a positive impact on EMP for only judgmental and composite methods. Organizational characteristics' positive

moderating impact on export market orientation remains same across all forecasting methods used by the firm but its moderating impact on managerial characteristics varies depending on the forecasting methods used by the firm.

The results related to testing the research model and hypotheses are debated in the following sections.

6.2.1 Moderating Impact of Forecasting Methods on Accuracy

Theoretical justification of including accuracy as forecasting criterion is given in Mentzer and Cox (1984a), Winklhofer and Diamantopoulos (1996a), Hagdorn-van der Meijden, et al, (1994) and Winkhlofer and Diamantopoluos's (2002) study. In light of these studies, Winkhlofer and Diamantopoluos (2002) findings show that accuracy positively relates to ESFE (see Section 2.4.1). Our findings are also in line with their results and accuracy shows a positive association with ESFE.

As shown in Table 6.1, positive impact of accuracy on ESFE does not vary depending on the forecasting methods used by the firm. Therefore this result does not support Hypothesis 1, which suggests that forecast methods moderate the relationship between accuracy and ESFE. This is in line with Diamantopoulos and Winklhofer (2003) and Danese and Kalchschmidt's (2011) findings. They do not find a clear relationship between forecasting methods and forecasting accuracy. This study's finding is also consisted with Dalrymple's (1987) study, which does not detect any relationships between the combinations of forecasts and forecast accuracy either. However, it contradicts findings of the experimental literature (see Clemen, 1989 and Sanders and Mandrodt, 2003). According to their result, the significant differences in forecast accuracy are found between judgment and quantitative focused firms.

However the existing literature does not address whether accuracy's impact on ESFE varies depending on the forecasting methods used hence the purpose of Hypothesis 1 (see Section 3.2.1.1). And our finding reveals that forecasting methods do not change the positive effect of accuracy on ESFE.

6.2.2 Moderating Impact of Forecasting Methods on Bias

In a literature review by Hogarth and Makridakis (1981), judgemental forecasting is characterised as being associated with systematic bias. This is also echoed by Sanders (1992) and they find judgment to produce forecast that are biased. Our finding is also in line with their findings and our result shows that bias has a negative impact on ESFE when judgmental forecasting is used. However biases impact is found positive when statistical methods are used and not significant when composite forecasting is used. These findings support our Hypothesis 2, which is 'the negative impact of bias on ESFE depends on the forecasting methods applied by the companies'.

Biases positive impact on ESFE when statistical methods are used, can be explained by the fact that statistical methods assume that past data can be used for reliable predictions of the future and do not include forecasters' bias. The other explanation could be that the user of statistical forecaster methods see some management/sales people input into forecasting as a positive input to increase ESFE. However biases insignificant impact on ESFE for composite forecasting raises questions. Lawrence et al. (2000) review 10 companies and conclude that some companies has no bias, but they do not address what forecasting methods those firms use. This could be the case for the composite sales forecasting, which combines the past data with the managerial judgment, therefore it would contain a lot less bias compared to judgmental forecasting, hence its insignificant effect. However, there is no literature found supporting this outcome.

However, the existing literature does not address whether impact of bias on ESFE varies depending on the forecasting methods used, hence the purpose of Hypothesis 2 (see Section 3.2.1.2). And our findings revealed that forecasting methods do change the effect of bias on ESFE.

6.2.3 Moderating Impact of Forecasting Methods on Timeliness

Timeliness refers to the forecast being available to a decision maker in advance of having to make a decision based on the forecast (see Section 2.4.3). Winklhofer et al. (2002) studies report an effect of timeliness on ESFE. But their study does not reveal whether this outcome holds true for all the forecasting methods the firm uses.

The hypothesised pathway between timeliness and ESFE is supported for judgmental forecasting and composite forecasting but it has an insignificant effect when statistical forecasting method is used. The reason for this insignificant effect could be that firms using statistical forecasting already know their past performance and assume that the past pattern will continue into the future. Therefore timeliness of forecasting input might not be relevant. However, judgemental and composite forecasting methods use managerial opinion, sales force composite and panel consensus and timeliness of the recent changes in the market situation become important.

In summary, our findings support Hypothesis 3 and the impact of timeliness on ESFE changes depending on the forecasting methods used. The author has not found any other studies confirming the same outcome (or otherwise).

6.2.4 Moderating Impact of Forecasting Methods on Cost

Although survey results show that 41% of respondents see cost as criteria for evaluating ESFE, there are only a few studies addressing cost in forecasting (see Section 2.4.4).

Winklhofer and Diamantopoulos (2002) study hypothesises that cost would be negatively related to ESFE, but their result show that cost has no effect on ESFE. Only data collection cost is used in Winklhofer and Diamantopoulos (2002) study. A more comprehensive cost measure, such as including maintenance costs and operating costs are included within this research to assess whether it would change the outcome. The hypothesised pathway between cost and ESFE is insignificant when judgmental and composite forecasting methods are used which is in line with the findings of Winklhofer and Diamantopoulos (2002). A possible explanation for this finding could be that firms using judgemental and composite forecasting might not keep records on forecasting expenditures and therefore they might not know their forecasting costs which is also stated by Dalrymple (1987) and Winklhofer et al. (1999b).

However, there is a significant positive impact between cost and ESFE when statistical methods are used. The reason for this positive impact could be that the cost of obtaining data for the purpose of forecasting exports might not be considered to be high for statistical forecasting (assumes that the past pattern will continue into the future).

Our result confirms Hypothesis 4, that forecasting methods do have a moderating impact on cost. However, none of the studies reviewed reports the impact of cost on ESFE in relation to forecasting methods.

6.2.5 Moderating Impact of Forecasting Methods on Environmental Turbulence

Research on environmental turbulence's effect on ESFE is conducted by Winklhofer and Diamantopoulos (2002) and it is found to be positively correlated to ESFE. This suggests that firms facing dynamic export environments are more satisfied with their

overall forecasting capability than firms operating in more stable environments (see Section 2.4.5). Sanders and Manrodt (1994) research findings report that environmental turbulence is correlated to the judgmental adjustment of quantitative methods compared to other forecasting methods. The same author's research in 2003 reveals similar findings (see Section 2.6). However they do not reveal the type of other forecasting methods.

The current study offers support for environmental turbulence's impact across all forecasting methods used by the firm, but it does not support that forecasting methods moderating influence would have a varying effect on environmental turbulence. The possible explanation of this result could be that environmental turbulence does not vary depending on the forecasting methods; therefore its impact on ESFE would remain similar.

The author does not find any literature addressing forecasting methods moderating influence on environmental turbulence's effect on ESFE. Our findings suggest that its positive impact on ESFE does not vary; hence our overall Hypothesis 5 is not supported.

6.2.6 Impact of Export Sales Forecasting Effectiveness on Export Market Performance

Existing research suggests that ESFE should be judged on the extent to which sales forecasting supports improved EMP that affects the bottom line, such as inventory costs, profitability, supply chain costs and customer service levels. While large numbers of empirical studies focus on forecasting in general, the impact of ESFE on EMP receive limited attention to date (see Section 2.7). Only two studies are found supporting the

linkage between ESFE and EMP. As discussed in Section 2.7, the first study is conducted by Zotteri and Kalchschmidt (2007) and ESFE is evaluated as average percentage error only, which is not a direct comparison with this study (see Section 4.3.9.2). The second study is conducted by Davis and Mentzer (2007) and their data do not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages.

Our data for statistical and judgemental forecasting methods shows an insignificant effect of ESFE on EMP, but significant and positive effect for composite forecasting methods.

For statistical forecasting methods, timeliness also has an insignificant effect. The reason for this result could be that decision makers do not value having forecasting information for statistical forecasting methods and work on the assumptions that the past performance will be repeated in the future. For judgmental forecasting methods, as Lawrence et al. (2000) studies suggest that judgment creates biased forecast, which is in line with our finding that biases negative impact for judgmental forecasting is supported. Steward's (2001) findings suggest that reward structures of the organization create a bias in the forecasting. Therefore, it can be interpreted that decision makers would not trust the forecasting input if it comes from sales people without any past performance hence they might not see the link between ESFE and EMP so its impact is insignificant.

The author does not find any literature addressing ESFE influence on EMP in relation to forecasting methods, the pathway between ESFE and EMP is only supported for composite forecasting methods. Hence Hypothesis 6 is tentatively supported.

6.2.7 Impact of Control Variables on Export Market Performance

These additional hypotheses are only included in this research to fully examine the impact of ESFE on EMP. Therefore the outcomes of these hypotheses are only debated briefly.

Managerial characteristics have an influence on EMP and our hypothesis is supported for all the forecasting methods used by the firm and it is in line with the literature findings (see Table 2.6).

Export market orientation positively impacts EMP. This hypothesis is supported for judgmental and composite forecasting methods, which are in line with the literature findings (see Table 2.8). But its effect is insignificant for statistical methods. The reason could be that the firms do not depend on the intelligence generation/dissemination and responsiveness for their target market if they are solely depending on the past sales performance.

Impact of managerial characteristics on EMP depends on the organizational characteristics of the firm. This hypothesis is only supported when statistical methods are used. Its effect is negative when judgmental forecasting method is used and insignificant when composite forecasting is used.

Positive impact of export market orientation on EMP depends on the organizational characteristics of the firm. This hypothesis is supported for all the forecasting methods used by the firm and it is in line with Liu's (1995) findings that large firms are more market oriented than medium sized firms and similarly, large firms show better profit performance than medium sized firms. This indicates that organizational characteristics can play moderating roles on export market orientation. However, it is not a focal point

of our research and therefore further research is recommended to explore this hypothesis further.

6.3 Contributions of the Research

The results debated in Section 6.2 are considered to make a number of theoretical and managerial contributions. These are centred on two key considerations related to the nature and structure of the three focal constructs of this study (i.e., forecast criteria, forecasting methods and ESFE): (1) the existing literatures do not take into account whether forecasting criteria's effect on ESFE vary depending on the forecasting methods used by the firm. This study addresses this gap and tests forecasting methods' moderating influence on forecast criteria. This is considered to represent advancement to the current knowledge and challenges some of the results in the literature, and (2) only two studies are found in the literature review supporting the linkage between ESFE and EMP. Within the first study, ESFE is evaluated as average percentage error only, which is not a direct comparison with this study. Data within the second study does not lend itself to statistical testing of the validity of constructs or the significance and strength of conceptual linkages. Therefore there is a gap in the literature to explore this important linkage and this study addresses this gap.

6.3.1 Theoretical Contributions

Examining two key considerations described above, the following contributions to the study of the subject matter are made:

1. Forecasting methods' moderating influence are supported for bias, timeliness and cost. This is the first documented evidence of examining whether forecasting criteria's influence on ESFE varies depending on the forecasting methods used by the firm.

2. Forecast accuracy's effects on ESFE do not vary depending on the forecasting methods used by the firms. This is in line with the current empirical research (see Section 2.6) but contradicts experimental literature (see Clemen, 1989 and Sanders and Mandrodt, 2003). According to their result, the significant differences in forecast accuracy are found between judgment and quantitative focused firms.

3. Biases impact is found positive when statistical methods are used and not significant when composite forecasting is used. The author does not find any other research supporting this and it is believed that this is the first documented empirical evidence of differential of the functional relationship between bias and ESFE depending on the forecasting methods used.

4. Timeliness has a greater effect on ESFE when composite forecasting method is used, which is contrary to the literature findings (see Section 2.4.3). However, it does have a minimum effect when judgemental forecasting is used, and the current literature does not address this distinction.

5. Cost has the second highest positive effect on ESFE in comparison to accuracy and bias, which is in contrary to Winklhofer and Diamantopoulos (2002) and Gonul et al. (2009) findings. The author does not find any other literature supporting this outcome and therefore it is the first documented evidence of cost's positive and high effect on ESFE when statistical forecasting method is used. The reason could be that firms using judgemental and composite forecasting might not keep records on forecasting expenditures and therefore they might not know their forecasting costs. This needs to be verified with further research.

6. The author does not find any literature addressing forecasting methods' moderating influence on environmental turbulence. Our findings suggest that although the effect of environmental turbulence on ESFE changes for composite forecasting

methods compared to statistical and judgmental forecasting methods, overall it does not change its positive impact on ESFE, hence our overall hypothesis is not supported. This is a new insight this study offers in relation with environmental turbulence.

7. ESFE's positive effect on EMP is only supported for composite forecasting methods. There is no literature conducted to test the same linkage for various forecasting methods, therefore this is the first documented evidence which needs to be verified by further studies.

8. In the existing literature, the link between ESFE and EMP is limited with only one factor, omitting other important factors which also have an influence on EMP. Managerial characteristics, export market orientation and organization characteristics are included in our research model as control variables. These variables are only included in this research to fully examine the impact of ESFE on EMP. There are other variables such as export strategies which should be included to further enhance exploratory power of EMP construct.

6.3.2 Managerial Contributions

This stream of research has helped practitioners to set priorities directly reflecting managerial preferences for different forecast criteria that would be conducive to a formidable and successful engagement in exporting.

Firms rely heavily on forecasts to drive planning. Most operations are designed on an anticipatory basis, and most activities are initiated before demand occurred. By planning in advance, firms can allocate resources and design operations in a cost efficient way, achieving economies of scale (see Section 2.2). This strategy operates well when demand is somewhat predictable. IBM, throughout the 1980s, could not predict the personal computer market and maintained its focus on mainframes, which cost it a large

part of market share before it modified its strategy.

By examining the forecasting methods moderating influence on forecast criteria and also the linkages between ESFE and export market performance, the following contributions to practice are made.

The studies on forecasting and the forecasting methods (i.e. judgmental forecasting) offer empirically based insights as to the relative importance criteria used by managers to judge forecasting effectiveness in their firm. Such information is clearly of relevance to forecast preparers when designing/operating forecasting systems, as well as to consultants providing forecasting advice and training. For example, knowing that, forecasting method is a major influence shaping managerial perception of effectiveness, it could be used to justify the introduction of new alternative forecasting methods and/or training of the forecasters on the forecasting methods.

Moreover, by identifying the relative importance of all the factors (i.e. accuracy, bias, cost, timeliness, forecasting methods, etc) it becomes possible to set priorities directly reflecting managerial preferences for different forecast criteria (Winklhofer and Diamantopoulos, 2002). Again, if implementation of such priorities is seen to contradict principles of good forecasting practice, action can be taken to inform managers of the potential negative consequences.

For example, knowing biases' impact on ESFE is negative when judgmental forecasting method is used, then sales rewarding scheme can be changed to minimize sales person's bias on their sales forecast.

Importance of environmental turbulence on ESFE is supported across all forecasting methods used by the firm. Negative consequences could be vital for the firms and even

countries. For example, in the 1960 and 1970s, the U.Ss automotive industry underestimated the competitive threat of imported cars, which were smaller, more fuel efficient, highly reliable and inexpensive.

Timeliness of forecast is reported to be one of the most important forecasting criteria by Xerox Corporation Miller (1985). This study confirms the importance of timeliness for judgmental and composite forecasting methods. This implies that forecast preparers and forecast users must collaborate to ensure that the forecasting system is in tune with the firm's decision cycle. This would also encourage organizations to use the correct tools to enhance the timely communications for forecasting purposes. For this reason companies are investing in tools such as 'Sales Force' to get regular updates from their sales people.

Cost has an insignificant impact for judgmental and composite forecasting methods but significant and positive impact for statistical forecasting methods. As debated above, the reason could be that firms using judgemental and composite forecasting might not keep records on forecasting expenditures and therefore they might not know their forecasting costs. Therefore consultants providing forecasting advice and training should encourage organisations to track their forecasting costs for judgmental and composite forecasting methods.

Existing research suggests that ESFE should be judged on the extent to which sales forecasting supports improved business performance that affects the bottom line, such as inventory costs, profitability, supply chain cost and customer service levels (see Section 2.7). In order to evaluate the impact of ESFE on decision making, firms are advised to keep records of decision outcomes with sales forecast. Our findings show that ESFE's impact on EMP is significant for composite forecasting methods only. This

outcome would encourage companies to combine their forecasting methods in order to improve their bottom line.

Managerial Implications for Control Variables

Knowledge of organizational characteristics' impact, such as firms size and export experience on export market performance, can give an important message to top management that they should not consider their size or the length of experience to be in dissonance with their ability not only to establish, develop and sustain regular export activity, but also to attain satisfactory performance levels in overseas markets.

In terms of market orientation, there is an implicit acknowledgement that becoming market-oriented and maintaining market orientation levels is expensive and involves huge amounts of company resources in terms of real investment in a set of capital-intensive processes and activities (Asmat-Nizam, et al., 2006; Steinman, et al, 2000). Kohli and Jaworski (1990) stated that being market oriented requires the commitment of resources and is only useful if the benefits outweigh the cost. Slater and Narver (1994) also put forward that increasing and maintaining market orientation is complex, expensive and time consuming.

Furthermore, knowing the importance of degree level education could surge companies to adapt their recruitment objectives accordingly. The results could show the importance of language capability, thus applying appropriate recruitment criteria for new staff by actively fostering the language abilities of existing export staff.

To conclude, and given the importance of the issues discussed in this paper for export managers and researchers, it is hoped that this investigation will contribute toward reducing the gap between research and practice, as well as stimulate future research.

6.4 Suggestions for Future Research

As with any empirical research, the results cannot be interpreted without taking into account the study's limitations (see Section 1.5). Although the current study makes a number of contributions (see Section 6.3), further research is needed to enhance our understanding of the subject matter. Some of the more urgent research needs are discussed below.

1. The results presented here are based on the analysis of a casual model with cross-sectional data. Because the model is not tested using experimental design, strong evidence of casual effects cannot be inferred. A study focusing on the effect of forecasting criteria on ESFE in relation to forecasting methods would represent an important research opportunity.

2. Only accuracy, bias, timeliness, cost and environmental turbulence are studied as forecasting criteria. Although these are the most important criteria mentioned in the literature, other criteria such as export strategy and ease of use could be added. A broader multi-dimensional conceptualization of forecasting is missing from the previous studies. Action in this regard could further enhance our understanding of the constructs affecting ESFE.

3. Given the influence of timeliness consideration on ESFE, the factors that facilitate (or hinder) timely receipt of forecasts by decision makers need further investigation.

4. There are conflicting results of forecasting methods' effect on accuracy, more specifically whether forecast accuracy can be improved via a combination of forecasting methods. This needs to be investigated further.

5. The current study findings show that biases' effect on ESFE changes depending on the forecasting methods used (positive for statistical methods, negative for

judgemental methods and not significant for composite methods). There is no other literature supporting these findings. Therefore further research is necessary in order to verify forecasting methods' moderating influence on bias.

6. Further research is required to understand how people acquire and use information when they make forecasts and the effects of differences in the availability of information (Camerer, et al., 1989; Yaniv and Hogarth, 1993; Steward, 2001).

7. The effect of ESFE on EMP is not widely researched empirically and only two studies are found (see Section 2.7). As depicted in Section 6.2.6, the author can only speculate the reasons for the current study findings. This is an area in which further empirical research is recommended.

8. Although the research sample for the current study included UK based exporting companies of all sizes, these were confided to those exporting towards EU countries. A research sample of other countries outside of the EU could result in different findings.

9. Finally, the usefulness/practicality of the proposed managerial contributions should be tested through a case study approach. Such a methodology will offer additional evidence as to the stability and relevance of the results on which these inferences are based.

APPENDIX A COVER LETTER

Dear XX,
I hope you are well. I am doing a doctorate research at Kingston University and I would appreciate if you could fill the online survey (surveymonkey.co.uk/s/FORECASTING SALES). As an incentive, £5 donation will be given to a charity of your chose in the UK.

As a senior leader and a highly respected expert, your views and opinions regarding our research effort would be unique, highly informative and of the utmost importance. Please be assured that the answers you provide will be treated in the strictest confidence. Only the research team at Kingston University Business School will be able to view the responses to the questions. The questionnaire has an identification number in order to remove your name from our list once we have received your reply.

Should you have any queries about any aspect of this research project prior to the return of the questionnaire then please contact me on 077 32 656 000 or my supervisor Professor Stavros Kalafatis on 020 8547 7121. Alternatively you could contact us through our email addresses dfyenilmez@yahoo.co.uk or kalafatis@kingston.ac.uk.

Research Background:
Rapid growth in global exporting draw the attention of marketing researchers on the factors associated with export performance and more specifically forecasting export. Whilst prior research has enhanced the understanding of the determinants of export market performance and the impact of forecasting through focusing on many factors, our knowledge is far from complete. This research will extend the existing knowledge and provide further insights in our understanding.

In closing we would like to sincerely thank you for your time and effort. Should you wish to receive a summary of the research results than simply tick the appropriate box located at the end of the questionnaire document and enclose your name and address.

Yours Sincerely
Demet Yenilmez-Dramali

APPENDIX B DATA ANALYSIS RESULTS

B.1.1 Cost

The results presented in Table B1 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations, it is concluded that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.1 - Cost – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.522	.394		3.858	.000		
FC1	.439	.174	.374	2.524	.013	.379	2.636
FC2	-.034	.171	-.029	-.198	.844	.379	2.636

a. Dependent Variable: EMP-MS

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	FC1	FC2
1	1	2.902	1.000	.01	.01	.01
	2	.073	6.296	.98	.08	.12
	3	.025	10.750	.01	.91	.87

a. Dependent Variable: EMP-MS

B.1.2 Timeliness

The results presented in Table B.2 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this constructs are retained.

Table B.2 - Timeliness – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.313	.455		2.883	.005		
FT1	.178	.104	.165	1.719	.088	.916	1.092
FT2	.315	.124	.244	2.534	.013	.916	1.092

a. Dependent Variable: EMP-MS

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	Forecasting Timeliness	Forecasting Timeliness
1	1	2.859	1.000	.01	.01	.01
	2	.087	5.732	.01	.79	.49
	3	.054	7.266	.98	.20	.50

a. Dependent Variable: EMP-MS

B.1.3 Organizational Characteristics

The results presented in Table B.3 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we

conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.3 - Organizational Characteristics – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	3.158	.370		8.529	.000		
OC1	3.142E-6	.000	.075	.728	.468	.816	1.226
OC2	.054	.105	.053	.514	.608	.836	1.196
OC3	-.184	.115	-.185	-1.606	.111	.661	1.513
OC4	-.150	.116	-.148	-1.292	.199	.662	1.511

a. Dependent Variable: EMP-MS

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	OC1	OC2	OC3	OC4
1	1	3.662	1.000	.01	.02	.01	.02	.02
	2	.751	2.209	.01	.84	.00	.00	.00
	3	.337	3.298	.07	.03	.08	.23	.23
	4	.189	4.407	.00	.00	.00	.74	.72
	5	.063	7.651	.90	.10	.91	.01	.03

a. Dependent Variable: EMP-MS

B.1.4 Managerial Characteristics Dimensions

This constructs is comprised of demographic characteristics, language skills, risk taking and openness in decision making.

B.1.4.1 Demographic Characteristics

The results presented in Table B.4 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.4 - Demographic Characteristics – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	2.533	.762		3.324	.001		
MC-Gender	-.181	.480	-.037	-.378	.707	.958	1.043
MC-Age	.096	.216	.047	.444	.658	.820	1.219
MC-Job tenure	-.052	.163	-.041	-.319	.750	.560	1.787
MC-Org tenure	.209	.157	.178	1.333	.185	.517	1.935
MC-Education	-.029	.165	-.017	-.174	.862	.929	1.076

a. Dependent Variable: EMP-MS

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				Constant	MC-Gender	MC-Age	MC-Age tenure	MC-Org tenure	MC-Education
1	1	5.530	1.000	.00	.00	.00	.00	.00	.00
	2	.221	5.002	.01	.03	.00	.15	.11	.10
	3	.094	7.682	.00	.13	.71	.10	.00	.00
	4	.079	8.357	.01	.17	.01	.33	.15	.44
	5	.053	10.260	.01	.09	.12	.41	.73	.38
	6	.023	15.432	.97	.57	.15	.01	.00	.09

a. Dependent Variable: EMP-MS

B.1.4.2 Language Skills

The results presented in Table B.5 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.5 - Language Skills – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	3.117	.329		9.460	.000		
MC- Bilingual	.029	.162	.023	.177	.860	.535	1.871
MC-Social fluency	-.149	.195	-.100	-.763	.447	.535	1.871

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	MC-Bilingual	MC-Social Fluency
1	1	2.818	1.000	.02	.01	.01
	2	.121	4.822	.87	.31	.04
	3	.060	6.836	.11	.68	.95

a. Dependent Variable: EMP-MS

B.1.4.3 Risk Taking

The results presented in Table B.6 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of

the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.6 - Risk Taking – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.321	.328		4.023	.000		
MC-Innovative [1]	.312	.180	.268	1.732	.086	.302	3.313
MC-Took changes[2]	-.198	.187	-.165	-1.060	.292	.300	3.335
MC-Allowed employee[3]	.437	.128	.387	3.426	.001	.568	1.761

a. Dependent Variable: EMP-MS

1: Our executive managers were innovative in their decision making

2: Our executive managers took changes on good ideas

3: Our executive managers allowed employee autonomy in decision making and held employees accountable for end results

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	MC-Innovative	MC-Took Changes	MC-Allowed Employee
1	1	3.798	1.000	.01	.00	.00	.01
	2	.105	6.001	.87	.08	.06	.00
	3	.068	7.492	.11	.08	.06	.99
	4	.029	11.438	.00	.83	.87	.00

a. Dependent Variable: EMP-MS

B.1.4.4 Openness in Decision Making

The results presented in Table B.7 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.7 - Openness in Decision Making – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.648	.332		4.958	.000		
MC-Shared Info 1	.372	.146	.341	2.552	.012	.448	2.231
MC-Good relation 2	.123	.153	.113	.800	.425	.402	2.490
MC-Understand 3	-.014	.193	-.013	-.073	.942	.257	3.885
MC-Communication 4	-.039	.178	-.035	-.221	.825	.325	3.075

a. Dependent Variable: EMP-MS

1: Our executive managers shared information with employees
2: Our executive managers maintained and developed good relationships with employees across the company
3: Our executive managers made an effort to understand other employees' problems
4: Our executive managers created and maintained good communications and cooperation with their peers.

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	MC-Shared info	MC-Good relations	MC-Understand	MC-Communication
1	1	4.722	1.000	.01	.00	.00	.00	.00
	2	.117	6.354	.98	.01	.03	.03	.03
	3	.072	8.099	.00	.35	.54	.02	.10
	4	.059	8.979	.02	.61	.12	.08	.34
	5	.030	12.523	.00	.02	.31	.88	.53

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	MC-Shared info	MC-Good relations	MC-Understand	MC-Communication
1	1	4.722	1.000	.01	.00	.00	.00	.00
	2	.117	6.354	.98	.01	.03	.03	.03
	3	.072	8.099	.00	.35	.54	.02	.10
	4	.059	8.979	.02	.61	.12	.08	.34
	5	.030	12.523	.00	.02	.31	.88	.53

a. Dependent Variable: EMP-MS

B.1.5 Export Market Performance Dimensions

This construct is comprised of the management satisfaction, the economic and financial outcome and the strategic performance. Management satisfaction is measured with only one indicator hence it is not included in the following assessment.

B.1.5.1 The Economic and Financial Outcome

The results presented in Table B.8 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this constructs are retained.

Table B.8 - The Economic and Financial Outcome – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.747	.287		6.088	.000		
EMP-Sales [1]	.247	.187	.279	1.321	.190	.179	5.587
EMP-Revenue [2]	-.092	.186	-.106	-.497	.620	.173	5.767
EMP-Profit [3]	.256	.107	.279	2.397	.018	.588	1.700

a. Dependent Variable: Export Sales Forecasting Effectiveness
1: Our company generated a high volume of export sales
2: Our company generated a high volume of export revenue
3: Our company was profitable in exporting to EU countries

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	EMP-Salesl	EMP-Revenue	EMP-Profit
1	1	3.776	1.000	.01	.00	.00	.01
	2	.120	5.602	.93	.04	.02	.02
	3	.087	6.585	.05	.05	.03	.97
	4	.017	14.881	.02	.90	.94	.00

a. Dependent Variable: Export Sales Forecasting Effectiveness

B.1.5.2 Strategic Performance

The results presented in Table B.9 indicate that all VIF values are below the adopted benchmark and from the collinearity diagnostics we observe that none of the conditional indices are above 30. On the strength of these observations we conclude that there is no evidence of collinearity and consequently all indicators of this construct are retained.

Table B.9 - The Strategic Performance – Collinearity Analysis

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.086	.272		3.988	.000		
EMP-Brand 1	.076	.100	.082	.756	.451	.534	1.871
EMP-New Market 2	.055	.100	.069	.548	.585	.396	2.528
EMP-Market Share 3	.359	.097	.415	3.718	.000	.502	1.994
EMP-New Tech 4	.164	.110	.176	1.490	.139	.446	2.243
EMP-Mrkt Expertise 5	-.052	.113	-.055	-.462	.645	.448	2.233

a. Dependent Variable: Export Sales Forecasting Effectiveness
1: Our company was successful in building brand awareness and image
2: Our company was successful in entering new markets
3: Our company was successful in improving its market share
4: Our company was successful in gaining new technology experience
5: Our company was successful in gaining market expertise

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	EMP-Brand	EMP-New Market	EMP-Market Share	EMP-New Tech	EMP-Mrkt Expertise
1	1	5.551	1.000	.00	.00	.00	.00	.00	.00
	2	.124	6.692	.69	.13	.13	.01	.00	.01
	3	.109	7.122	.16	.41	.00	.04	.26	.06
	4	.103	7.324	.00	.05	.12	.38	.04	.27
	5	.061	9.566	.08	.39	.44	.10	.27	.25
	6	.051	10.404	.07	.01	.30	.48	.43	.42

a. Dependent Variable: Export Sales Forecasting Effectiveness

APPENDIX C. LITERATURE REVIEW

Table C.1 - Usage across forecast level (percentage of respondents)

Technique	Indust. M&C	Indust. PS	Corp. M&C	Corp. PS	Prd Grp M&C	Prdct Line M&C	Prdct Line PS	Product M&C	Product PS	SKU /Loc PS
Qualitative										
Jury of executive	26		41	47	32	32	37	22	17	11
opinion	26		20	31	25	27	29	24	22	18
Sales force composite	5		12	15	18	18	16	12		10
Customer expectations	5									
Quantitative			9	12	18	19	17	20	20	15
Moving Average	3		10	11	11	10	12	11	12	9
Straight-line projection	6	5	6	23	14	14	28	23	34	25
Exponential smoothing	8		26		21	19	24	22		16
Regression	18	17	19		20	21		22	20	14
Trend line analysis	13	9	5		7	5		3		2
Simulation	7	4	12		4	4	14	6	6	3
Life cycle analysis	4	8	12		8	7	12	9	14	13
Decomposition	2	4	9		3	7		6	5	4
Box-Jenkins time series	2	3	4			2			3	2
Expert systems		4		5			5		6	5
Neural networks		3								

Indust. = Industry level forecast
Corp. = corporate level forecast
Prd Grp. = Product Group Forecast
Prdct Line = Product Line Forecast
Product = Product item /SKU forecast
M&C = Mentzer and Cox (1984)
PS = Mentzer and Kahn (1995)
M&C Sample Size = 160
PS sample size = 186
Source: Mentzer and Kahn (1995)

Table C.2 - Studies indicating that qualitative methods outperform quantitative methods

Area of Application	Main results	Literature sources
Performance of Analysts	Analysts can do better than quantitative methods provided that they have accurate economic and industrial information.	Johnston and Schmitt (1974), Critchfield et al. (1978), Brandon and Jarrett (1979)
Financial application	Concluded that anticipatory surveys of investment spending in the U.S. were at least as successful as econometric models and sometimes did better. (a) Ruland (1976) was concerned with the evaluation of accuracy and information content of one-year duration earnings forecasts by firms. The study indicated that judgemental forecasts were superior to those of the quantitative methods. Forecast reports of larger firms tended to be more accurate than those of smaller firms. (b) Brown and Rozeff (1979) reanalysed data from Green and Segall (1967) and found that judgemental methods using interim reports, do better than quantitative methods.	Liebling and Russell (1969), Jorgenson et al. (1970), Gray (1974), Ruland (1976), Armstrong (1978), Brown and Rozeff (1979)

Mahmoud, E. (1984). *Accuracy in forecasting: a survey.* Journal of Forecasting, 3, 139-159

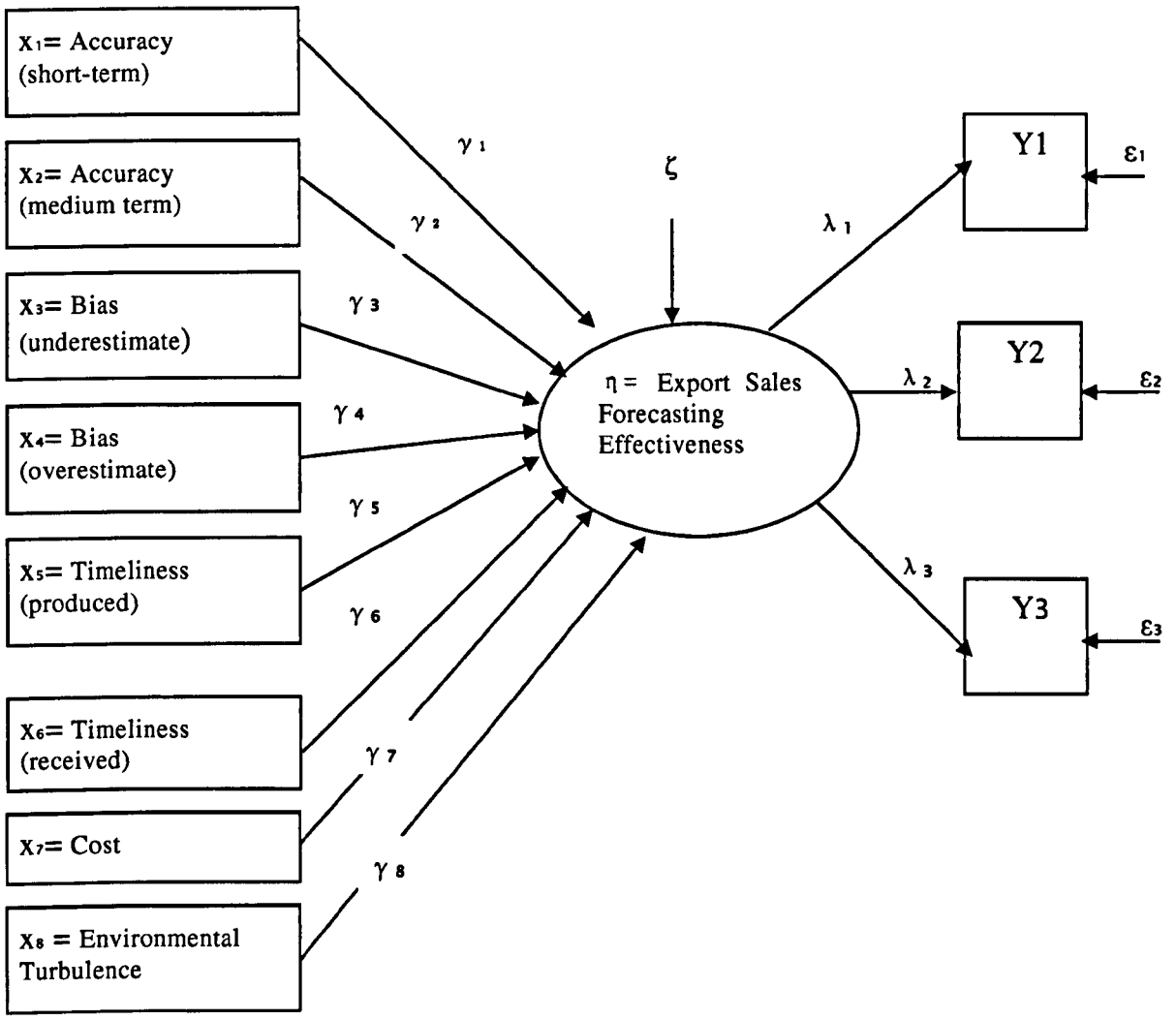
Table C.3 - Studies indicating that quantitative methods outperform qualitative methods

Area of Application	Main results	Literature sources
Winters' method versus judgemental forecasts	Winters' method produced forecasts, which were more accurate than those of human forecasters.	Adam and Ebert (1976)
Sales opinions and corporate executives versus exponential smoothing, harmonic smoothing and Box-Jenkins	The study indicated that forecasts based on opinions of the sales force and corporate executives gave less accurate results than did the other methods. It was also found that quantitative techniques cost less and took less time.	Mabert (1975)
Quantitative methods versus judgemental methods	These studies found that quantitative methods provided better forecasts than judgemental methods. Specifically, Meehl (1975) had the same findings, except the found only one case in which clinical judgement was superior to a statistical model.	Sarbin (1943), Meehl (1965), Sawyer (1966), Goldberg (1970), Armstrong and Grohman (1972), Slovic (1972), Hogarth (1975), Dalrymple (1975), Cerullo and Avila (1975), Libby (1976), Cleveland and Tiao (1976), Lorek et al. (1976), Dawes (1977), Armstrong (1978), Fildes and Fitzgerald (1981)
Finance area	These studies compared the forecasts of earnings per share made by the analysts and the results obtained from qualitative methods. It was concluded that analysts do not perform as well as do quantitative techniques.	Green and Segall (1967), Gragg and Malkiel (1968), Elton and Gruber (1972), Niederhoffer and Regan (1972)
Inability of qualitative methods	Investigated the causes behind the inability of clinical judgement to outperform quantitative methods. It was found that the lack of	Slovic (1972), Kahneman and Tversky (1973), Tversky (1974), Tversky and Kahneman (1974), Dawes (1977).

	application of valid principles, anchoring effects, regression biases, lack of reliability and the basing of predictions on irrelevant information contributed towards poorer performance of clinical judgement.	

Mahmoud, E. (1984). *Accuracy in forecasting: a survey.* Journal of Forecasting, 3, 139-159

Figure C.1 - Path Diagram for MIMIC model of sales forecasting effectiveness



ζ = Random disturbance term, ε_1, ε_2, ε_3 = Errors in measurement

y = Indicate the impact of x-variables on forecasting effectiveness

λ = Reflect the loadings of the y variables on the latent construct (forecasting effectiveness)

y_1 = Overall, we are as good in forecasting export sales as any firm in our industry.

y_2 = Our export decision makers have a lot of confidence in our export sales forecasts

y_3 = Compared to our competitors in export markets, our export sales forecasting capability is superior.

Source: Winklhofer, H. and Diamantopoulos, A. (2002). *Managerial evaluation of sales forecasting effectiveness: A MIMIC modeling approach.* International Journal of Research in Marketing19151-166.

APPENDIX D. QUESTIONNAIRE

FORECASTING SALES

This questionnaire deals with issues related to forecasting sales to European Union (EU) countries during 2009.

When completing the questionnaire please bear in mind that the questions relate to your company as a whole rather than to individual export ventures or activities.

SECTION A – ABOUT YOUR COMPANY				
Please indicate the firms' total number full time employees in the year of 2009				
The total number of years that our company have been exporting to EU countries	1-5	☐	6-10	☐
	11-15	☐	16-20	☐
	Over 20	☐		
During 2009 we had a subsidiary company in .... that we export to	☐	All of the EU countries		
	☐	Up to 75% of the EU countries		
		Up to 50% of the EU countries		
	☐	Up to 25% of the EU countries		
	☐	We did not use subsidiary companies in any of the EU countries		
During 2009 we used sales agent in ... that we exported to	☐	All of the EU countries		
	☐	Up to 75% of the EU countries		
	☐	Up to 50% of the EU countries		
	☐	Up to 25% of the EU countries		
	☐	We did not use sales agents in any of the EU countries		

SECTION B – SALES ACTIVITIES

	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
During 2009, our management was satisfied with our company's overall sales performance to EU countries	1	2	3	4	5	6	7
During 2009, our company ..... to EU countries	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
Generated a high volume of export sales	1	2	3	4	5	6	7
Generated a high volume of export revenue	1	2	3	4	5	6	7
Was profitable in exporting	1	2	3	4	5	6	7
Was successful in building brand awareness and image	1	2	3	4	5	6	7
Was successful in entering new markets	1	2	3	4	5	6	7
Was successful in improving its market share	1	2	3	4	5	6	7
Was successful in gaining new technology experience	1	2	3	4	5	6	7
Was successful in gaining market expertise	1	2	3	4	5	6	7

SECTION C – MARKET INFORMATION

During 2009, our company...in the EU countries to which we exported	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
Timely collected a lot of information in trends and environmental changes (e.g regulations, technological developments, political, economic,etc)	1	2	3	4	5	6	7
Continuously reviewed the likely effects of changes.	1	2	3	4	5	6	7
Constantly monitored employee level of commitment and orientation to serving the needs of our customers	1	2	3	4	5	6	7
Was quick to deliver important information about the activities of our competitors to be of use to our managers	1	2	3	4	5	6	7
Generated a lot of information to help us understand the forces which influenced the desires and preferences of our customers	1	2	3	4	5	6	7
Discarded considerable amounts of information concerning our export competitors before it reached decision makers	1	2	3	4	5	6	7
Had in place appropriate mechanisms so that important information about customers was not 'lost in the system'	1	2	3	4	5	6	7
Often lost important information concerning market trends because of inefficiencies in its communication processes	1	2	3	4	5	6	7
Was quick to respond to significant changes in our competitors' price structures	1	2	3	4	5	6	7
Rapidly responded to competitive actions that threatened our competitive position	1	2	3	4	5	6	7

SECTION D – EXECUTIVE MANAGERS DURING 2009

	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
During 2009, 0ur company's executive managers.....							
Were innovative in their decision making	1	2	3	4	5	6	7
Took chances on good ideas	1	2	3	4	5	6	7
Allowed employee autonomy in decision making and held employees accountable for end results	1	2	3	4	5	6	7
Shared information with employees	1	2	3	4	5	6	7
Maintained and developed good relationships with employees across the company	1	2	3	4	5	6	7
Made an effort to understand other employees' problems	1	2	3	4	5	6	7
Created and maintained good communications and cooperation with their peers	1	2	3	4	5	6	7
Rewarded individual achievements	1	2	3	4	5	6	7

During 2009, most of the executive managers in our company were	Male	☐		Female	☐		
During 2009, average age of the executive managers in our company was	31-40	☐	41-50	☐	Do not want to disclose	☐	
	51-60	☐	Over 60	☐			
During 2009, the average number of years that executive managers in our company held the position was	1 to 3 years	☐	7 to 9 years	☐	Do not want to disclose	☐	
	4 to 6 years	☐	Over 9 years	☐			

During 2009, the average number of years that executive managers worked for our company was	1 to 3 years ☐ 7 to 9 years ☐ Do not want to ☐ 4 to 6 years ☐ Over 9 Years ☐
The highest level of educational qualification held by the majority of the executive managers in our company during 2009 was	☐ Undergraduate Degree or equivalent level ☐ Postgraduate Diploma or equivalent level ☐ Masters Degree or equivalent level ☐ Research Degree or equivalent level ☐ Other (please specify) _____
Please indicate the percentage of the executive managers working for our company during 2009 that...	☐ 0 to 25% were bilingual in at least one language of the EU countries to which your country exports to ☐ 25 to 50% were bilingual in at least one language of the EU countries to which your country exports to ☐ 50% to 75% were bilingual in at least one language of the EU countries to which your country exports to ☐ Over 75% were bilingual in at least one language of the EU countries to which your country exports to
Please indicate the percentage of the executive managers working for our company during 2009 that...	☐ 0 to 25% had social fluency in at least one language of the EU countries to which your country exports to ☐ 25 to 50% had social fluency in at least one language of the EU countries to which your country exports to ☐ 50% to 75% had social fluency in at least one language of the EU countries to which your country exports to ☐ Over 75% had social fluency in at least one language of the EU countries to which your country exports to
Please tick the box that best reflects the number of years your executive managers worked in EU countries	Less than 1 year ☐ 6 to 10 years ☐ 1 to 5 years ☐ Over 11 years ☐

SECTION E – FORECASTING METHOD FOR 2009

During 2009, Please indicate the forecasting methods that best describes the method used by your company for exporting to EU countries	☐ Formal statistical techniques such as time series which assume that the past pattern will continue into the future. ☐ Judgmental techniques such as managerial opinion, sales force composite, panel consensus and market surveys. ☐ Combination of statistical and judgmental techniques

SECTION F – ACCURACY OF FORECASTING SALES IN 2009

The error margin of our sales forecast to EU countries for 2009 was	0-5% ☐		6-10% ☐		Over 20% ☐		
	16-20% ☐		11-15% ☐				
During 2009, ...to EU countries	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
Our company was as good in forecasting export sales as any firm in our industry	1	2	3	4	5	6	7
Our export decision-makers were very confident in our export sales forecasts	1	2	3	4	5	6	7
Compared to our competitors, our company was better in forecasting export sales than any firm in the industry	1	2	3	4	5	6	7
We over estimated export sales	1	2	3	4	5	6	7
By the time our export sales forecast was prepared, important export decision had already been made	1	2	3	4	5	6	7
Executives in our company received export sales forecast in time for the information to be of real	1	2	3	4	5	6	7

use							
The cost of obtaining data for the purpose of forecasting exports was considered to be high	1	2	3	4	5	6	7
The costs for the development and maintenance of sales forecasts were considered to be high	1	2	3	4	5	6	7

SECTION G – MARKET (IN) STABILITY IN EU MARKET DURING 2009

During 2009, ...	Strongly agree	Agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Disagree	Strongly disagree
There was considerable change in the product preferences of our customers in EU countries	1	2	3	4	5	6	7
Potential customers for our products and/or services sold to EU countries tended to look for benefits that were different from those of our existing customers	1	2	3	4	5	6	7
Competition was cut throat in terms of promotion and pricing	1	2	3	4	5	6	7
The technology in our industry changed rapidly which provided big opportunities	1	2	3	4	5	6	7
Transportation and handling regulations had a noticeable impact in operations	1	2	3	4	5	6	7
Governmental pricing regulation considerably affected our operations	1	2	3	4	5	6	7
Environmental protection laws had a perceptible impact on our EU operations	1	2	3	4	5	6	7
Trade association regulations of business practices visibly changed the way we operated	1	2	3	4	5	6	7
Government product standards clearly affected the way we did business in EU countries	1	2	3	4	5	6	7

THANK YOU FOR TAKING PART IN THIS RESEARCH

Please feel free to add comments about your experiences with forecasting of export sales

1. Your comments

Your comments

2. Do you wish to receive a summary of the research results

☐ Do you wish to receive a summary of the research results Yes

☐ No

3. Your name

Your name

4. Company Name and Business Title

Company Name and Business Title

5. The address you would like the research results to be emailed or posted

The address you would like the research results to be emailed or posted

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