

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES FACULTY OF TECHNOLOGY
DEPARTMENT OF MECHANICAL ENGINEERING
INDUSTRIAL ENGINEERING STREAM



**Enhancing Competitiveness Ethiopian Fashion Industry through Color
Forecasting Techniques**

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A Thesis Submitted to Addis Ababa University, Faculty of Technology, Department of
Mechanical Engineering, in Partial Fulfillment for the Award of the Degree of Master of Science
in Mechanical Engineering (Industrial Engineering)

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ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
POSTGRADUATE PROGRAM IN INDUSTRIAL ENGINEERING

ENHANCING COMPETITIVENESS ETHIOPIAN FASHION INDUSTRIES
THROUGH COLOUR FORECASTING

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DECLARATION

I hereby declare that the work which is being presented in this thesis proposal entitled, **“Enhancing Competitiveness Ethiopian Fashion Industries Through Colour Forecasting”** is original work of my own, has not been presented for a degree of any other university and all the resource of materials uses for this thesis have been duly acknowledged.

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This is to certify that the above declaration made by the candidate is correct to the best of my knowledge.

Advisor: Dr. Netsanet Jote

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ABSTRACT

The aim of this research is to explore the enhancing competitiveness Ethiopian fashion industry through colour forecasting techniques. This thesis developed a model of colour forecasting and competitiveness factors based on a review of the literature to empirically investigate in one single model: the effect of colour forecasting factors on fashion industry practices; the effect of competitiveness factors on fashion industry practices; and the effect of competitiveness of colour forecasting techniques on fashion industry practices. The sampling method which will be applied in this study is the simple random sampling method. The researcher designed a questionnaire to investigate attitudes of members towards fashion industry within their industry, and their concerns about colour forecasting practice. One hundred questionnaires were distributed to member's fashion industry.

The data collected for the purpose of this study is analyzed. The analysis includes two parts: First, descriptive analysis is presented. Second, factor analysis is conducted using the Structural Equation Model (SEM), applying Exploratory Factor Analysis in the first stage to identify the model that contains the factors that have the most significant impact on competitiveness of colour forecasting techniques using SPSS -20, then in the second stage the fitness of the model is tested through Confirmatory Factor Analysis using AMOS. Before implementing the SEM, the data is tested for reliability and consistency, in order to ensure its validity for the analysis.

The finding of this thesis largely support hypothesis relationship proposed in the theoretical model. The model suggests some correlation to compliment these factors and work together to influence of competitiveness through colour forecasting, correlation are suggested to be implemented regarding the dimension of market, technology, market demand on competitiveness, social, environmental, psychological, market demand, as interaction those factors could be considered as new dimension. Those results also provide strong evidence relationship between colour forecasting and competitiveness dimensions. This thesis contributes to theoretical and practical knowledge about relationship colour forecasting techniques and competitiveness dimensions.

Key word: Color forecasting techniques, Fashion Competitiveness, Competitiveness

Contents

DECLARATION	Error! Bookmark not defined.
ACKNOWLEDGMENT.....	vi
ABSTRACT.....	viii
List of Tables	xii
List of Figures	xiv
List of Abbreviations	xv
Chapter One	1
Back Ground	1
1.1 Introduction	1
1.2 Problem Statements.....	3
1.3 Research Question.....	4
1.4 Objectives the study	4
1.4.1 General Objective	4
1.4.2 Specific Objective.....	4
1.5 Significance of the Study	4
Literature Review.....	5
2.1 Introduction of Color Forecasting	5
2.1 Challenges in the Fashion Industry	6
2.3 Color Forecasting and Supple Chain Management.....	7
2.4 Competitiveness	11
2.5 Fashion Competitiveness.....	14
2.6 Fast Fashion.....	21
2.7 Role of Colour Forecasting on Fashion Competitiveness	21
2.7.1 Culture On the Fashion Industry	21
2.7.2 Cultural Values	22
2.7.3 Culture and color preferences.....	22
2.7.4 Market and Color Forecasting	23

2.7.5 Sustainability on Social Contract	23
2.7.6 Sustainable Clothing Behaviour	24
2.7.7 Colours and Sustainable Product.....	24
2.7.8 Consumer Perception.....	25
2.7.9 Colour to ward Brand market	25
2.7.10 Brand Logo	26
2.7.11 Personality and Consumers Perception of Colours	26
3.8 Art Sequence of Colour.....	28
2.9 Research Gaps on Competitive Advantage.....	30
Chapter Three	31
Research Methodology	31
3.1 Introduction	31
3.2 Research methods.....	31
3.2.1 Quantitative approach.....	31
3.2.2 Qualitative approach.....	31
3.3 Research design.....	32
3.3.1 Sampling Design.....	32
3.3.2 Sampling Technique	32
3.4 Data Collection Methods.....	33
3.4.1 Secondary Data.....	33
3.4.2 Primary Data Collection	33
3.5 Data Analysis Methods	34
3.6 The SEM Model and Hypotheses	37
3.6.1 The SEM Model	37
3.6.2 Model Specification.....	38
3.7 Surveyed Data for Competitiveness and color forecasting	38

Chapter Four	42
Result and Discussion	42
4.1 Introduction	42
4.2 Reliability Test and Cronbach Alpha	42
4.3 Descriptive analysis.....	43
4.3.1 Technology Measures	43
4.3.2 Marketing force measures	45
4.3.3 Market Demand On Competitiveness	46
4.3.4 Social measures	47
4.3.5 Factors Affecting Environments	48
4.3.6 Accuracy of CFT Measures.....	48
4.3.7 Psychology Measures	49
4.3.8 Market Demand Measures	50
4.4 Factor analysis	51
4.4.1 KMO- Bartlett's test	51
4.4.2 Factor rotation analysis of all variables	52
4.4.3 Rotated Component Matrix.....	54
4.4.4 The Underlying Dimensions for the colour forecasting and competitive Model.....	55
Principal component one	55
Principal component two	57
Principal component two on market demand perspective	57
Principal component two on psychology perspective	58
Principal component three	58
Principal component five.....	59
Principal component six	60
4.6 SEM Analysis of the CFT and Competitiveness Model	61
4.6.1 Colour Forecasting CFT Model.....	61
4.6.2 SEM Analysis of the competitiveness Factors Model.....	64

4.7 The Regression Weights of color forecasting and competitiveness Models	65
4.7.1 Regression Weights of Color Forecasting Model.....	65
4.7. Regression Weights of Competitiveness Model	68
4.7.2 Market Demand On Competitiveness(MDC)Perspectives	68
4.8 CFA Over All Competitiveness Through Colour Forecasting Techniques	69
4.8.1 Model Interpretation	71
4.9 Findings and Discussion	71
Chapter Five.....	73
Conclusion and recommendation.....	73
5.1 Conclusion.....	73
5.2 Recommendation.....	75
Reference	76
Appendix 1.....	89
Questionnaires Questions.....	89
Addis Ababa University; Institute of Technology	89

List of Tables

Table 2.1 Summer of Colour Forecasting Techniques	8
Table 2.2 Literature Review Summary on the Fashion Competitiveness.....	16
Table 2.4 Factor of Fashion Competitiveness and Colour Forecasting	27
Table 3.1 Factors of colour forecasting and competitiveness.....	40
Table 4.1 Cronbach's Alpha-Reliability Test.....	43
Table 4.2 Factors Affecting Technology Measuring	44
Table 4.3 Factors Affecting Marketing force measures.....	45
Table 4.4 Factors Affecting Market Demand On Competitiveness.....	46
Table. 4.5 Factors Affecting Socials Measures	47

Table. 4.6 Factors Affecting Environments Measures.....	48
Table. 4.7 Factors Affecting Accuracy CFT.....	49
Table 4.8 Factors Affecting Psychology Measures	50
Table 4.9 Factors Affecting Market Demand Measures	51
Table 4.10: KMO and Bartlett's Test result	52
Table 4.11: Rotated Correlation Matrix for The First Model	53
Table 4.12: Total Variance Explained	54
Table 4.14 Loading Factoring for Competitiveness and Colour Forecasting Variables.....	54
Table 4.15: ANOVA Results for the social perspective	56
Table 4.16: ANOVA Results for The Environment Perspective	56
Table 4.17: ANOVA Results for The Market Demand Perspective.....	57
Table 4.18: ANOVA Results for The market demand on competitiveness perspective	58
Table 4.20: ANOVA Results for Accuracy of CFT perspective	59
Table 4.21: ANOVA Results for Market perspective.....	60
Table 4.22: ANOVA Results for Technology Perspective	60
Table 4.23 Model Fit Summary	61
Table 2.24: Baseline Comparisons	62
Table 4.25: RMSEA.....	62
Table 4.26: Model Fit Summary CMIN	65
Table 4.27: Baseline Comparisons	65
Table 4.28: RMSEA.....	65
Table 4.29: Regression Weights for Social Perspectives.....	66
Table 4.30: Regression Weights for Environment Perspectives.....	66
Table 4.31: Regression Weights for Accuracy of CFT Perspectives.....	66
Table 4.32: Regression Weights for Psychology Perspectives.....	67
Table 4.33: Regression Weights for Market Demand Perspectives	67
Table 4.34: Regression Weights for Market Demand On Competitiveness Perspectives	68
Table 4.35: Regression Weights for Market Perspectives	68
Table 4.36: Regression Weights for Technology Perspectives	69

List of Figures

Figure 3.2 Over All Competitiveness of Colour Forecasting Conceptual Model.....	37
Figure 4.1: The Scree Plot of the Competitiveness and colour forecasting Model	53
Figure 4.2: CFA Results for Colour Forecasting Factors Model.....	63
Figure 4.3: CFA Results for Competitiveness Factors Model.....	64
Figure 4.4 Over All Competitiveness Through Colour Forecasting Techniques	70

List of Abbreviations

CFT	Colour Forecasting Techniques
AMOS	Analysis of Moment Structure
CFI	Comparative Fit Index
CFA	Confirmatory Factor Analysis
EFA	Education for All
EFA	Exploratory Factor Analysis
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Model
SEN	Special Education Needs
SPSS	Statistical Package for Social Science
TLI	Tucker Lewis Index
FACFT	Factor Affecting Color Forecasting
FAM	Factor Affecting Market
FAC	Factor Affecting Competitiveness
FAMD	Factor Affecting Market Demand
FAS	Factor Affecting Social
FAPS	Factor Affecting Psychology
FAE	Factor Affecting Environment
FAT	Factor Affecting Technology

Chapter One

Back Ground

1.1 Introduction

The competitiveness of the fashion industry is shaded by a numbers of factors. The industry has a three trillion-dollar annual sale value worldwide. At the same time, it is also a highly competitive industry in the global market. Competitive strategy is therefore at the core of competitive advantage, and it deals entirely with a company's business plans to compete successfully. It also refers to specific assists to please customers, offensive and defensive moves to counter challengers, responses to dominating market conditions and initiatives to strengthen its market position (Arthur et al., 2005). Zahra (2000) explained that or a society, improved competitiveness translates into new jobs and better living conditions.

Colour forecasting is fundamental part of a collective process known as fashion forecasting or trend prediction. Individuals or team to accurate forecast the colour, fabrics and style of fashion product that consumer will purchase in the near future approximately two year a head(Mcluckie ,2003).A small number of companies have remained with a focus on colour only and have extended their services to other industry sectors including the home-ware and interiors industries, cosmetics and even to car manufacturers, in fact any industry that can harness colour trends to create sales of consumer products are targeted by colour forecast companies(Diane and Cassidy,2005).

Colour forecasting is significant techniques before launching new product in the global market (Aslam, 2006; Jacobs, et al., 1991, Akcay, et al., 2011). This means for fashion company, it strongly influences the clothes we wear, the car we drive, the backpack or hand bag we choose to use, the shoes or sneakers we wear and the furnishings in our homes. The product's color may play a significant role in the consumer's purchasing decisions for certain products (Ogden et al., 2010; Akcay et al., 2011).

According to the Color Marketing Group (CMG) color increases brand recognition by up to 80%. It has also been determined that up to 85% of the reasons people may buy something are based on the use of color application. The first International Color Authority (ICA) forecast was

launched in September 1968. A panel consisting of 30 of the world's most experienced colorists and designers gather every six months to discuss color information for the ICA forecasts. According a British Color Council (BCC) and ICA believes that color forecasting that was multi-national and therefore extremely marketable. A Survey of International Color Marketing Linton H. (1994), the forecasting way, the mystery and technology of color forecasting were described, which undo the puzzles that troubled the customers and the businessmen for a long time.

Yet it has been argued that up to 62-90 % of consumer's product assessment is based on solely on color (Singh,2006), and that color can make or break the success of a product (Trent,1993). According to the study Borgogno, *et al.* (2015), in their study on meat, have identified color as one of the intrinsic quality cues strongly associated with customers' expectations while shopping. It is very important to explore the meanings and perceptions of chosen colors in every target market before launching new products in the global marketplace (Aslam, 2006; Jacobs, *et al.*, 1991; Akcay, *et al.*, 2011).

The fashion industry is a product of the modern age. Prior to the mid-19th century, most clothing was custom made. It was handmade for individuals, either as home production or on order from dressmakers and tailors. By the beginning of the 20th century with the rise of new technologies such as the sewing machine, the rise of global capitalism and the development of the factory system of production, and the proliferation of retail outlets such as department stores clothing had increasingly come to be mass-produced in standard sizes and sold at fixed prices.

In China, color forecasting researches could be dated back to the end of 1980's. China fashion color association (CFCA) contributes mostly to this research. Experienced color experts and pioneers like chief secretary of Jiangsu Textile and Fashion Color Association, colour consultant of (CFCA), and Wu Zhengbao etc., firstly delivered the newly international trends and fashion color forecasting mythologies to Chinese. The relevant information and achievements could be seen in their latter works on color science and color application (Wu Y.,1986 and Song J.,1999). Meanwhile with the development of color marketing and customers' emphasis on fashion color, color forecasting enterprises are gradually booming under the efforts of enormous color researchers and experts. Finally, Chinese textile industries' competitive capacity and status in the international textile markets. Today, there is an intensive and unprecedented international

competition in textile and fashion industry. This poses new challenges for an emerging textile and fashion industry in Ethiopia. Achieving this goal means to adapt to the requirements of the international market while at the same time the gap between the existing basic capabilities of the Ethiopian industry and the increasingly sophisticated demand of the international market is widening.

1.2 Problem Statements

The existing theories of competitiveness relate to the experience of firms in developed countries; theories that relate specifically to experience of firms in least and developing countries remain undeveloped. Porter (2008), who challenges that much is known about competitive advantage, also notes this gap in knowledge but less is known about interrelations and linkages that are necessary to attain high competitiveness.

Currently, in Ethiopia 50 medium and large sized textile and garment firms employ roughly 22,500 workers. With exports of about 12 million USD, that is only making about 1% of Ethiopia's total export volume, and comparably small amounts of foreign direct investment, Ethiopia is not present yet on the global map of textiles, Ministry of trade and industry (MOTI and ECPB, 2008). Today, there is an intensive and unprecedented international competition in textile and fashion industry. This poses new challenges for an emerging textile and fashion industry in Ethiopia. Achieving this goal means to adapt to the requirements of the international market while at the same time the gap between the existing basic capabilities of the Ethiopian industry and the increasingly sophisticated demand of the international market is widening.

The need to develop a competitive advantage model in Ethiopia fashion industry has long been recognized an important consideration. More ironically, there is inadequate knowledge on how Ethiopia fashion industry can adopt contemporary competitiveness attributes to become more innovative and produce unique products that can penetrate both local and foreign markets. Therefore, given the low competitiveness of the fashion industry, lack of design skill, lack of adequate knowledge about different techniques of production, product longevity in the market and high cost, there is a need to develop a relevant competitiveness framework to better understand how firms in the industry could create and sustain competitive advantage. The purpose of this work is therefore to develop a competitive advantage framework based on colour

forecasting and competitiveness factors models and assess their relevancy and linkage towards enhancing firm and industry's competitiveness.

1.3 Research Question

1. What are the underlying latent factors on the colour forecasting and competitiveness?
2. How to color forecasting techniques enhancing needs of customers?
3. How to color forecasting techniques improve of competitiveness?
4. Are the standard regression weights of fitted colour forecasting and competitive? models reliable?

1.4 Objectives the study

1.4.1 General Objective

The general objective of the study is investigating color forecasting techniques for Ethiopian fashion industry to competitive in global market.

1.4.2 Specific Objective

1. To identify the underlying dimension of color forecasting techniques and competitiveness;
2. To explore the colour forecasting enhancing needs of customer;
3. To explore colour forecasting techniques improve competitiveness;
4. To examine whether the regression weights of the parameters of the fitted Colour forecasting and competitive model are statistically significant.

1.5 Significance of the Study

This work contribution to better understanding the competitiveness through colour forecasting techniques in Ethiopian fashion industry. The result of this study insight into growth and the competitiveness Ethiopian fashion industry, which information can be used by fashion designers, decision makers in the planning, forecaster, manufacturers and integrating activities of competitiveness through colour forecasting techniques over all competitiveness strategy and policy. Since, the gap between the actual and the target values of the export market of the sector has been increased over periods. Identifying the problems and suggesting appropriate improvement strategies. Moreover, the improvement strategies bring tangible changes in balancing the trade between Ethiopian fashion industry and other countries.

Chapter two

Literature Review

2.1 Introduction of Color Forecasting

Forecasting is a tool used by designers, manufacturers, retailers, marketers, CEOs to give their brands creative dynamism in an increasingly competitive marketplace (McKelvey, *et al.*, 2008). Fashion colour is the colors that the most people prefer in a given period of time. It is very important to accurate forecast the future colour, fabrics and styles that will be popular in 24 months later during the fashion selling seasons and offer the trend colour for fashion company (T D Chuckie, 2003; Diane, 2005 and Diane, 2007). according to the study Brannon (2000), Many fashion industries such as clothing, beauty and cosmetics depend heavily upon our constantly shifting colour tastes for their existence. Indeed, their survival in the marketplace hinges upon the accurate forecasting of tomorrow's trend setting colors.

'Fashion forecasting is not unlike forecasting the weather, the Stock Market, or the success of a Broadway show. It aims to take all contingencies into account and come out with a responsible score. The forecaster must be flexible enough to shift gears when the unexpected occurs'. (Pena 1987:91)

Additionally, Keiser and Garner (2007) offered a wide scope of information regarding the apparel product development process in terms of the fashion cycle, creative planning and colour forecasting but, mainly concentrated on mass production and distribution as did Waddle (2004) and Rousse (2012). Forecasting Trend create emotion consumer behavior and influence of celebrity events (Frings and Stevens, 2002).

The colour forecasting will guiding the industries useful information and in marketing and manufacturing (Nena et al., 2013). And it has long been factored as the most powerful driving forces. Therefore, accurate forecast of fashion colour is not only a marketing strategy of garment industry, but also a hot issue in international fashion market. If the market products do not meet exact elements, it would be useless or have to be withdrawn from the market (Nenni et al., 2013; Na Liu et al., 2013).

" Currently, many authoritative associations on colors release fashion colour palettes every year such as INTERCOLOUR, JAFCA CFCA, PANTONE®, and so on, but little detailed information is known about the forecasting methodologies dealing with this complex and uncertain process "(Lin et al., 2010).The last decades, several theories and methodologies have been applied into colour forecasting field by using statistical analysis (Chang et al., 2010 ; Stansfield and Whitfield, 2005), grey theory (Lin et al., 2010 ; Chang et al., 2010), artificial neural network (Suzuki, 2011 and Bhambure et al.,2013) and hybrid models (Wu y z et al., 2011 and Hui et al.,2012). Although some achievements obtained, fashion colour prediction is still in exploring stage on the whole and few convincing forecasting systems had been established. Deficiencies and controversies are still existed and the validity of prediction has yet been a pressing problem of the day in the textile and clothing industries (Adyta and Collopy, 1998).

Diane and Cassidy (2005) and Eundeok et al. (2011) colour forecasting and the process involving the development of colour palettes by the colour forecasters, which contributed to background information into the colour forecasting process for current research. However, they did not address how the fashion industry managers use colour forecasting with different techniques to enhance competitiveness fashion in global market.

2.1 Challenges in the Fashion Industry

The fashion industry has challenges to handle various desires behavior on different levels in order to avoid overstocked and stock-out inventories. "External factors such as changing weather conditions, holidays or (sports) events have an impact on short-term customers' purchasing decisions and buying behaviors " (Thomassey, 2010). The availability of a product is vital for fashion items, since customer buying decisions are always creating at the point of sale (Nenni et al.,2013). Demand uncertainty mostly fashion products related influenced by highly size and colour intensity (Christopher et al.,2004). Buying decisions are always creating sale, since product vital for fashion items (Nenni et al.,2013).

Consumer, retailer and manufacturer believe that Change is accepted and expected. Two types of change (Chen, 2005) have profound effects on the textile business, fashion and seasonal change. According to fashion theory (Rocha, Hammond, & Hawkins, 2005; Sun, 2005),

consumers quickly become bored with specific time whatever is widely accepted thus, they constantly seek new and different products and activities.

Another studies Mustard et al. (2011) and Teucke et al. (2011) described that focus on pre-order information and include them into their forecasting models. choosing the accurate colour selection are very important factors for fashion industry (King, 2012). provided a complex approach including external information such as weather conditions or information on promotions and events (Thomassey, 2010). Including these additional information, the accuracy of forecast results will increase, since the consumer demand is impacted by exactly these diverse factors. Fashion colour forecasting involves various factors such as sales psychology, geographical, social psychology, political situation, climate, season, skin colour, education level (Diane, 2005 and Diane, 2007).

2.3 Color Forecasting and Supple Chain Management

Meeting the customer's desire for high quality and quick service has added pressures not historically present. Also, advanced hardware and software technology have increased manufacturing flexibility, transportation speed, and information availability, along with increased management complexity " (Asli, 2007). Firms in a textile and apparel agglomeration also benefit from a network of suppliers, customers, and competitors, which result into knowledge of supply chain management (Chapple, 1999; Deringer&Crean, 2006; Inogushi, 2011; Ross, 2004). Companies in textile and apparel agglomerations accumulate knowledge about business management, coordinating "the scattered abilities and resources" (Inogushi, 2011, p. 208).

According to, King (2011) analyzed that how colour forecasting information is compiled, its use and accuracy within the fashion industry. And, the influence and impact on the supply chain were only analyzed from tracking colour trends and a model for research into colour choice was developed. However, they were not related to the colour forecasting techniques and he wasn't mention how that information can use through color forecasting techniques and enhance fashion competitiveness.

Table 2.1 Summery of Colour Forecasting Techniques

No	Author(Year)	Research Area	Color Forecasting Techniques	Consideration/ Factors	Finding
1	ShuyunRen and Tsan-Ming Choi, Na Liu	Sales quantity and color trend prediction	Panel data based particle-filter	Time series trend, price of product, Sale quantities and color trend	Enhancing the operational management of fashion
2	V I Averchenkov, S V Kondratenko and et al (2016)	A Mathematical Model of the Color Preference Scale Construction in Quality Management	Color preferences individual scale and algorithm	Social, quality, and psychological	improve the quality of the consumer quality products.
3	Xiao Hong et al, 2014	Fashion color forecasting	BP Neural Network algorithm	sales psychology, geographical, social psychology, political situation, climate, season, skin colour, education level	This BPNN algorithm can forecast the fashion color very close. it can adjust the forecasting performance. Especially, multi factors model of the color data has considered much information and done better work
4	Deng,1989	Statistical theory of fashionable colours.	Fokker-Planck equation,	The color is popular or not in the future	Finally, numerically calculated results and explanation on whether color is popular or not in the future was given.
5	Linlong,1991	FPV method to forecast fashion color	Fashion preference value	culture, economic condition, social life	FPV method focused greatly on the psychological

				style, psychology, local folk, customs and social status.	factors of individuals and the customers.
6	Zhang et al.,2008	Rough Set Based Forecasting System for Product Color	Rough Set Theory Method/ fuzzy set methods	Interaction of Consumers' Requirement Social Culture Marketing Economy etc.	it can be seen that customers' emotion and color preference were the most decisive factors in the systematic researches.
7	CFCA,1980s	analyze and explain fashion colors changing direction	Comparison Method	Comparison of two years' fashion colors in terms of hue, value and saturation.	Finally predict future trend according to the characters of color distributions
8	Lin,2008	predicting trend of textile fashion colors	Applying gray model	economy, culture, and custom, all of which crucially affect the consumer's demand and the choice of the color,	Through GM model products can be more precise to meet the demand of the consumer and be more acceptable to the public. Furthermore, it is believed that market share effectively increased and the goal enhancing the competition achieved as well.
9	Choi et al.,2014	Fast fashion	3F algorithm	sales forecasting with limited data and time	This helps the company to achieve quick response inventory management practice because the inventory flow is driven by the fast forecasting result.
10	Yan Hong et	Garment, furniture	An open case-based	Consumer color image	The result of this work could

	al.2018	and architectures	color recommendation system(CBCRS)	perception,Emotional Color Image Words, color range,further retained in a Successful Cases Database (SCD)	also be extended to support the area of personalized industrial product design such as fashion design, furniture design and advertisement design. Through a series of real applications, the proposed color recommendation
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From the table the result suggested that colour forecasting techniques are support enhancing the operational management and improve the quality of consumer product.in addition to, measuring the colour is popular or not in the future and to increase forecasting performance. in the same way colour forecasting is to measure the forecasting performance and the colour is popular or not in the future. Some other authors state that it is a factors of individual and customer emotion and colour preference were decisive factored on predicting characters of colour distribution. Again, help the company to achieve quick response on inventory management practice. Furthermore, this method to precise meet demand of customer and increase market share and enhance competitiveness. They did not address how to enhancing competitiveness through colour forecasting techniques. This is the literature gap.

2.4 Competitiveness

Fashion industry have many challenges due to globalization, economical, market share, technological, customer, social and environment problems strives for competitiveness. In recent years, sustainable process the main issue for continuous innovation and cluster based traditional industry (Mytelka and Farinelli,2000). Again, rapid competitiveness porter five force model affect the organization performance (Indiatsy, et al.,2014). In addition to, Role of power customer to create sale lost (Awade,2014). In the same way, Quality based regional competitiveness to compose international standards goods and services (Jansson and Waxell ,2011).

Furthermore, effeteness of competitiveness on the performance achievement (kinyuira, 2014). Influence of regional competitiveness to ward competitive environment (Huggins et al., 2014). The loss of competitiveness and the intense entry of products from abroad, worsening international crisis and shrinking markets (Abit, 2015; Keller, 2006 and leach 2007). In the same study, implementation of hybrid strategy for competitive environments (Baroto et al.,2012). Selecting appropriate competitiveness strategy tool for strategic performance (Sahn et al.,2013) According to, Tanwar (2013), state that Role of porter generic competitiveness strategy to form sustainable environment. determinant of regional competitiveness to create focusing on market and resources (kitson, etal.,2004). Similarly, Competitiveness can measure through competitive outcome (Cetindamar and Kilitcioglu, 2013). For example, measuring growth rate, profit, customer and society.

However, some time there is no competitiveness through implementing of competitiveness advantage nation (Davies and Ellis,2000). In addition to, business strategy gaps on porter typology (summer, 2012). Porter competitiveness advantage strategy gap on small actors (Aktouf, 2005). Also, some industry pursues misleading concept on the competitiveness (Vogel, 2015).

Michael Porter firstly announce the concept of competitive advantage in the late 1970s (Porter 1979, 1980). The concept of competitive advantage is creating on the ideas that firms can built a differential benefit over their competitors. Thus, competitive advantage is explained from a competitive point of view in the literature (Barney 1991; Dierickx and Cool 1989; Hunt and Morgan 1995).

Achieving competitive advantage should be the objective of a firm's strategy with the outcome manifesting as above-average returns for the firm (Barney 1991; Grant 1991; Porter 1985). It is assumed that the desired outcomes of a firm's efforts in seeking a competitive advantage, such as superior performance, is sustainable and will not be easily eroded (Peteraf,1993).

In spite of these efforts, the notion that law may be a source of competitive advantage remains largely unexplored (Downes, 2004). technology Some studies support Porter's assertion pursuing low-cost and differentiation strategies is superior (Kim & Lim, 1988; O'Farrell et al., 1993; Powers & Hahn, 2004). Porter (1980) suggests that Differentiation consists of offering unique products and services in various forms, such as design, brand image, customer service. "competitive advantage" and capabilities generated by innovation (Aiginger, 2006).

Several models have been composed to explain ways to achieve competitive advantage. The dominant paradigm in this field during 1980s was the competitive forces model developed by Porter (1980). In this model, five industry-level forces determine the profit potential of an industry, namely entry barriers, threat of substitution, bargaining power of buyers, bargaining power of suppliers, and rivalry among industry incumbents (Porter 1980). Porter's model is more realistic in that it focuses on the reality of large businesses that dominate industries (Brandenburger, 2002). Nevertheless, when a more thorough and in-depth analysis of the environment is desired then Porter's model lacks on decisive information (Grundy, 2006).

According some authors Huggins et al. (2014), concluded that competitiveness is key factors to generate knowledge, entrepreneurs, innovation, developing sector, market and &ultimate new job. In addition to, kitson, et al. (2004) regional competitiveness focus better to competing over share of market and resources. Also, Cetindamar and Kilitcioglu (2013), concludes that firm competitiveness have three major pillars: competitive performance, firm resources and managerial process. In addition to, Jansson, and Waxell (2011), argue that integration of quality and competitiveness to compatible in global economy, differentiating products, regions and labor.

Davies and Ellis (2000), finally state that nation 's prosperity does not dependent on the activities of the firms for whom it is home base. in addition to, ktouf (2005), in the final, Porter offers no help to small actors in a given industry, or to companies that want to draw more on their employee's knowledge and field experience in formulating their strategies.

Sahn, et al. (2013), concludes that understanding customer needs better to need-satisfying product. Additionally, Indiatsy, et al. (2014), porter five model and performance have positive relationship, power of buyer for repeat sales, power of sales for increase cost of service. as well as, Vogel (2015) analyzed that, compete successfully by means of sophisticated capabilities rather than low costs, and that success can be measured by broader goals than narrowly economic ones.

Kinyuira (2014), argue that cost leadership can help pursuing differentiation or focus strategy. also, Furthermore, Aware (2014), combination of strategy better than single strategy model to new customer and retain business. according to, Tanwar (2013), conclude that pursue more than one strategy successful in time. but, cost leadership and differentiation at the time they may fail to achieve either. Again, Thompson et. al. (2012); Gopalakrishna and Subramanian (2001);Proff, (2000), argue that hybrid strategy for differentiation and low-cost in a unique way (Thompson et. al, 2012). competitiveness advantage to competing in global market (Barney et al.,2008; Hitt et al.,2008; Begnis et al.,2008; Yoshino et al.,2007; Barney etal.,2008; Porter,2002; Nalebuff et al.,1996; Lorgnier et al.,2014; Osarenkhoe,2010; Tomski,2011& Chin et al.,2008; Gereffietal 2011; Palpeceur,2002; Ellis 2000).

2.5 Fashion Competitiveness

In recent studies indicated that most of firms have low tech builds competitiveness in their environment (Marques et al.,2017). Government strategy assists to creates determinant of nation competitiveness (Watchravesringkan et al.,2010). Doyran (2013), state that governmental structure, underlying dynamics and shaping of fashion industry make difficult on globalization. also perception of managerial makes challenges of competitiveness (Gockeln, 2014).

most studies of fashion industry indicate that fast fashion problems composed buyer power (Bruce and Lucy Daly 2006). fast fashion industries practice construes value of and sustainable market strategy (Caro and Albeniz, 2014). fashion industries studies stated that problem of understanding customer driving approach develop fast fashion and marketable (Bhardwaj and Fairhurst 2010).

It believes that business strategy creates brand and market (Culpan et al.,2007).in the same way competitiveness can form through measuring brand strategy (Bridson, etal.,2004). In addition to, another studies Butkus and Masullo (2016), customer point of view builds determinant of brand competitiveness. Navarro, et al. (2004), customer loyalty makes organization price effectiveness, market and competitiveness. also, costume perception compose branding. fashion industry focusses on business strategy to create their own branding and market share (Yang, et al.,2017).

Little (2006), CSR can pave sustainability driver and innovation. Visualization tools like the Business Model Canvas by (Osterwalder and Pigneur, 2010). however, most business models cannot remain static (Demil and Lecocq, 2010; Ferreira, et al., 2013) and need to change over time. Johnson (1987), argues that retailers have essentially two bases upon which competitive advantage can be sought, namely, cost-focused and market focused. Porter's (1985), framework of generic strategies for achieving competitive advantage.Ghosh (1994), proposes that the creation of an advantage based on differentiation. cluster for innovation and creative competitiveness (porter, 1998). strategy fit is adaptation to its external environment and alignment of organization components (Ginsberg and Venkatraman, 1985; Grant1998; Miles and Snow 1994; Venkatraman and Camillus, 1984; Venkatraman 1989).

However according to Coates et al. (2002) and Hoskisson at al. (1999), brand competitiveness should be measured and affect competitive performance. sustainable practice for balancing

environment, social and business need (Caniato, et al., 2012 and Joy, et al., 2012). “apparent labour productivity” (Fisher, Schornberg 2007). Moreover, when the brand image is consistent with the consumers ‘self-concept, the consumers would give a preference to it (Martineau, 1957). Antón and Rodríguez (2000), loyalty of customer for a sustainable competitiveness advantage. However, fast fashion does not apply to the whole range in stores, and as much as 80 per cent of goods may be core and basic lines, with fast fashion accounting for up to 20 per cent (Mintel, 2002a, b). For Osarenkhoe (2010) and Tomski (2011), such concept encompasses both the economic and social factors and implies different behaviors in the same environment.

In addition to speed to market, design, and capital investment have also been identified as the driving forces of competitiveness in fashion industry (Sinha 2006). Indeed, quick response was conceived as a competitive strategy expected to change “the rules of the game”, Hammond and Kelly (1990). Scholars view competitiveness as an ability to meet the demands of rivalry (Porter, 1990). However, a clearer definition of the term remains elusive (Murray, 1995; Nordas, 2004; Siggle, 2001). market outcome of CSR is still inconclusive (Margolis, et al., 2003; Valor, 2008 and Vogel 2005), strategic adoption of CSR could lead to financial rewards (Lee 2008), Moreover, the elimination of the Multi-Fiber Agreement in 2005 may result in changing competitiveness for many national industries (Appelbaum, 2008; Curran, 2007)

Table Summary on the Fashion Competitiveness 2.2 Literature Review

No	Author	Research Area/Title	Problem	Finding/Solution	Methodology	Citation
1	Battaglia et al. (2014)	CSR and competitiveness Fashion Industry	Effectives CSR strategy	role of CSR in market, quality and innovation throughout the supplier and customer	Correlation analysis	little, 2006; Dummy et al.,2010; Christensen et al., 2013; Schultz et al 2013
2	Marco Lau et al.,2013	Firm competitiveness fashion	determinant competitiveness	cooperation, clustering, employee, social responsibility little role for improving competitiveness	Explanatory factor analysis	Fisher, Schornberg 2007; Krugman 1991; romer 1986; porter 1990; krugman and Obstfeld 1999;
3	Gockeln (2014),	Fashion business model	business model adjustment	fast fashion, sustainable competitiveness advantage develops customer need.	PESTLE analysis	Demil&Lecocq, 2010, Ferreira, Proença, Spencer &Cova, 2013; Osterwalder and Pigneur (2010)
4	Bridson et al. 2004	Branding in fashion	measuring brand orientation and variation in its retail offer advantage over competitors.	fashion retailers in driving greater differentiation and competitive advantage	Simple regression analysis	Johnson,1987; Ghosh,1994; liet al., 2013; Kotler and Keller,1967; Mizik and Jacobson,2008; Geller,2012;
5	Marques et al. (2017)	Competitiveness in fashion	competitive with low tech industry	high competitive performance	Maxqda software	porter, 1998; Hunt and Morgan, 1996; oppewal and Timmermans,1997
6	Culpan, et al. (2007),	Critical assessment in apparel	business strategy developing	fit model affect strategy decision, and market	Strategic fit model framework	Ginsberg and Venkatraman, 1985; Grant1998; Miles and Snow 1994; Venkatraman

			branding, and market			and Camillus, 1984; Venkatraman 1989
7	Butkus and Masullo (2016),	Brand competitiveness fashion	brand competitiveness from customer point of view and determinant of brand competitiveness.	level of brand competitiveness is affect price	Regression analysis	Coates et al. (2002) and Hoskisson et al. (1999
8	Yang, et al. (2017),	Sustainable, luxury fashion	sustainable value, luxury market and appropriate model	benefits of brands, stakeholders, customer, & environment.	Exploratory techniques and inductive analysis	Caniato et al., 2012; Joy et al., 2012; Emberley, 1998; Aspers and Skov, 2006; Seidman 2007; Moisander and Personen, 2002
9	Wang and Shen (2017),	Eco design, brand and sustainable in fashion	impact of eco design on product line development	eco material affected by color choice, product weight, gender and pattern design.	Descriptive, factor and correlation analysis	Faulkner, 1972, Holtzsch, 2006; Diane, 2007; Nenni, 2013; Grossman & Wisenblit, 1999; Hynes, 2009; Bottomley & Doyle, 2006;
10	Doyran, 2013	Global market in garment industry	Impact of globalization	Enhancing the vitality garment district	Market line analysis	Bonancich et al, 1994; abernathy, et al 1999; gerraffi, 1999:2001; gerraffi, fernandez and stark, 2001; porter, 1990:1985; yilmaz et al., 2007; appendelur and gerraffi, 1994
11	Zhang, Y. (2015)	Branding and consumer behaviour	consumer perception to ward branding	perspective of customer equity has impact on brand image	Literature Review	Martineau, 1957, bird et al., 1970; gronhildt et al., 2000; keller, 1993; kunkel and berry, 1968; koo, 2003; da silva and

						alwi ,2006
12	Navarro, et al. (2004),	Market, consumer and fashion retailer	customer loyalty on competitiveness, price and market	loyalty of organization affects customer satisfaction		Anto'n and Rodri'guez, 2000
13	Bruce, Lucy Daly,2006	Buyer behaviour fast fashion	buyer for fast fashion	Reveals the buying practices for fast fashion	Reveal the	Mintel, 2002a, b; Solomon et al.,2002; Kotler et al.,2009; Anon,2011
14	Caldeira, et al. (2017)	Cooperate strategy Competitiveness in fashion	competitiveness challenges in business environment	cooperation to carry out innovation, support service and competitiveness in global market.	Documentary analysis and statically data	Osarenkhoe (2010) and Towski (2011)
15	Bhardwaj and Fairhurst (2010)	Fast fashion	understanding a consumer-driven approach	developing effective marketing strategy and effectively in market		Sinha 2006, shen et al.,2017; arrigo,2013; gereffi,1999
16	Caro and Albeniz (2014),	Fast fashion and business model	fast fashion practices.	a business model is the perception of fashionable clothes affordable prices	Business analysis	Hammond and Kelly (1990),
17	Juyoung (2013)	Competitiveness in apparel industry	competitiveness related to trade and productivity	trade and productivity they are positively related to competitiveness.	Granger causality test	Murray, 1995; Nordas, 2004; Siggie, 2001; porter,1990
18	Battaglia, et al. (2014)	CSR & Competitiveness	competitiveness advantage through environment & social responsibility.	significant correlation with, innovation, macro competitiveness, market performance, market- oriented CSR	Correlation analysis	Margolis, et al.,2003; Valor,2008 and Vogel 2005; lee, 2008
19	Watchravesrin	competitiveness	determinant of	porter theory is new	Porter (1990)	Appelbaum, 2008; Curran,

	gkan, et al (2010)	and globalization in fashion industry	nation competitiveness.	source of global competitiveness	theory of competitiveness advantage	2007; Porter 1990;
20	Jucevičius and Rybakovas (2010),	Competitiveness in textile and apparel industry	quantitative analyzes, revealed comparative advantage and market share.	RCA use full tool to detect comparative advantage and offer information on the competitiveness	Market share analysis	Fisher, Schornberg 2007

According to Battaglia, et al. (2014), conclude that role of CSR in market, quality and innovation throughout the supplier and customer. significant correlation with, innovation, macro competitiveness, market performance, market- oriented CSR. in the same way Marco Lau, et al. (2013), argue that cooperation, clustering, employee, social responsibility little role for improving competitiveness. Yang, et al. (2017) to sum up to create sustainable value that benefits of brands, stakeholders, customer, environment and social.

Gockeln (2014), conclude that business of model dynamics for fast fashion, sustainable competitiveness advantage develops customer need. in addition to fashion retailers in driving greater differentiation and competitive advantage (Bridson, et al., 2004). in the same way, Marques et al. (2017) argue that strategy of cluster and innovation organization achieved high competitive performance. Lucy Daly (2006), conclude that Reveals the buying practices for fast fashion, namely, a combination of global and local suppliers, a leagile approach. Culpan, et al. (2007) this studies helps managers affect strategy decision to identify the market company force and related emerge problems. Caldeira, et al. (2017), finalized that promote cooperation strategy to carry out innovation, support service and competitiveness in global market. developing effective marketing strategy and effectively in the market (Bhardwaj and Fairhurst, 2010),

Butkus and Masullo (2016), argue that level of brand competitiveness is affect price fashion product. In addition to, the same studies Caro and Albeniz (2014), concluded that a business model for the perception of fashionable clothes affordable prices. Zhang, Y. (2015) perspective strategy of customer equity have impact on brand image. Also loyalty of organization enforces customer satisfaction (Navarro, et al. (2004). Wang and Shen (2017) eco material strategy affected by color choice, product weight, gender and pattern design.

Jucevičius and Rybakovas (2010), argue that(RCA) index use full tool to detect comparative advantage and offer information on the competitiveness and world market share. also four determinants competitiveness supporting the fashion industry specialized factors, sophisticated and demanding consumer market, the presence of interdependent economic agents , strategies of the companies and domestic rivals (Watchravesringkan, et al 2010). Again, Juyoung (2013), argue that high value added function are innovation ,product and market strategy and SCM created global brand should focus on increase trade balance and productivity because they are positively related to competitiveness.

2.6 Fast Fashion

According to, Tokatli (2008), Bruce & Daly (2006), quick response of trends forecasting and the output of fast fashion, to essentially produce of perfect designer catwalk trends and launch them in store as quickly as possible. 'In the early twenty-first century, as fast fashion has become a commonplace on the high street, global brands such as Zara and H&M clamor for greater shares of the market. Technology has facilitated "just in time" manufacturing and has enabled faster retail turnover. Styles, and moreover clothes themselves are being produced with shorter life spans than ever before. '(Clark, 2008).

Fast fashion it is about demand representing a move away from supply chains driven by the brand owner and designer "push" to demand chains driven by consumer "pull" (Doyle et al., 2006, Sull and Turconi, 2008). 'Fast fashion is a business strategy which aims to reduce the processes involved in the buying cycle and lead times for getting new fashion product into stores, in order to satisfy consumer demand at its peak'. (Barnes and Lea-Greenwood 2006:259)

2.7 Role of Colour Forecasting on Fashion Competitiveness

2.7.1 Culture On the Fashion Industry

This challenges designers to gain a deeper understanding of users' culture but embodying of cultural factors in new products development is not a straight forward subject and it is still an under researched area (Taylor et al. 1999). However, Lee (2004) observes that in the design field, major topics in cultural design are still only limited to identifying aesthetic stereotypes such as the national shape or color. It is culture that gives products meaning and provides the rituals within which artifacts are used and the values that are often reflected in their form and function (Press and Cooper 2003).

Verhelst (1990, p. 17) defined culture as "every aspect of life: knowhow, technical knowledge, customs of food and dress, mentality, values, language, symbols, socio-political and economic behavior, indigenous methods of making decisions and exercising power, methods of production and economic relations, and so on". The use of a society's cultural factors in design not only makes technologies more appropriate for their social context, but makes better use of culture itself as a resource for innovation (Moalosi et al.2005a). It is acknowledged that consideration of cultural factors may pave the way to the diversification of design concepts and facilitate product innovation.

Popovic (2002), observes that the following criteria could be applied to assist designers in this transformation:

- the interface and human interaction should support the user culture;
- the artefact form or shape should correspond to the culture and life cycle which conforms to the appropriate aesthetics;
- the artefact form or shape should convey humour or joy of that particular cultural set up;
- appropriate colors should be used to evoke desirable feelings within the same cultural context and;
- flexibility and adaptability of interaction should be related to culture.

2.7.2 Cultural Values

Cultural variables result from unique shared values amongst people belonging to different nations. Most of the differences between cultures arise from underlying value systems, which cause people to behave differently under similar circumstances (Cateora, et al., 2011; Deresky, 2003). Values are a society's ideas about what is good or bad, right or wrong (Deresky, 2003; Mead, 1994); the importance of things and ideas (Cateora, et al., 2011); and hold the key to understanding a culture (Kluckhohn, 1969). Values in general than determine how individuals respond in any given circumstance (Deresky, 2003; Hofstede, 1997). Values are enduring beliefs that modes of conduct or end-states of existence are preferred to opposing modes of conduct, or end states of existence (Rokeach, 1973).

2.7.3 Culture and color preferences

Fernandez (1995) provides nine general principles in designing interfaces for international users. One guide line is to present information with culturally appropriate aesthetics such as colors. As cultural backgrounds can influence learned responses to colors (Eiseman, 2000), color preferences are probably considered culturally dependent. Berating separately or by comparing between each pair of colors on a subjective scale, several factors influencing human preferences of unique colors or color combinations have been investigated such as age, gender, emotion, personality, and nationality (Kreitler and Kreitler, 1972).

Kreitler and Kreitler (1972) emphasize that an investigation on color preferences of people from different cultural backgrounds is important to arts because aesthetic experience, which is

culturally dependent, is greatly concerned in Arts. However, evidence of color preferences from culture to culture varies (e.g., Silver, 1988; Birren,1992), therefore, more studies are needed to explore the sevariation preferences.

2.7.4 Market and Color Forecasting

Marketers know color has a strong power to create brand image, affect the buyer's decision making process and change the mood of consumers. Color can contribute to differentiating products from competitors and creating positive or negative feelings about products (Grossman and Wisenblit, 1999; Singh, 2006).

In general, color has the potential to affect a consumer's overall perception of a product and the persuasiveness of purchase decisions (Sable and Akcay, 2010). Color has different meanings and perceptions in different cultures (Aslam, 2006; Madden, et al.2000). The knowledge of consumers' color choices enables marketers to identify and offer the right product color. Color is also used to attract, draw attention, create a purchase intention, and desired atmosphere in retail stores (Belize, et al., 1983; Kerfoot, et al., 2003). The importance of color is a function of the average life and price level of a product. Consumers are more likely to be focused on color in their choice of high priced, high involvement and long life products. In contrast, for low involvement products consumer s are more flexible in their choice (Grossman and Wisenblit, 1999). In general, understanding color choice and responses of consumers for various products has become very complicated because consumers have developed a wide range of color associations for various products. Marketers should be aware that color is more important for value expressive products as opposed to utilitarian type products (Ogden, et al., 2010; Akcay, et al., 2011).

2.7.5 Sustainability on Social Contract

“Sustainability” has many definitions, with the three most common being an activity that can be continued indefinitely without causing harm; doing unto others as you would have them do unto you; and meeting a current generation's needs without compromising those of future generations (Fletcher 2008; Partridge 2011; Report of the World Commission on Environment and Development 1987).

The conversion of raw textile fiber to finished fabric and final products draws on labor, energy, water, and other environmental resources. Because these resources take the same amount of time to grow and regenerate regardless of the product's speed to market and disposal, the increased rate of production and consumption of fast fashion is exacerbating the clothing industry's negative impacts (Fletcher 2010).

2.7.6 Sustainable Clothing Behaviour

While clothing has been classified as a basic human need (Maslow, 1943), for many people clothing choices are motivated by their need for identity (Max-Neef, 1992) and esteem (Maslow, 1943). Consumers construct their social definition through the meanings encoded in their clothing choices (Dodd et al., 2000). This has been reported across different age groups. For teenagers, clothing is “an essential social tool” that provides a means of self-expression, source of confidence and a key to judging other people they encounter (Piacentini and Mailer, 2004: 251). Among a broader age spectrum of consumers, clothing plays a key role in self-expression and is an important lifestyle product (Michaelidou and Dibb, 2006).

Changes in technology have fuelled ‘fast fashion’ – the feeding of trend data into production to enable rapid and frequent turnover of affordable fashion, with refreshed styles and shelf-life reduced in some cases to only a few weeks (Sull and Turconi, 2008). The short availability of clothing items elicits a loss aversion reaction in consumers and stimulates buying (Byun and Sternquist, 2012). Fast fashion has also shifted the ‘quality versus quantity’ trade-off. Young consumers prefer making multiple cheaper purchases to buying one more expensive item (Morgan and Birtwistle, 2009).

2.7.7 Colours and Sustainable Product

Product image is constructed in such a way that it is clear to a large number people, and its colors, whether they are dynamic, warm, multi-coloured, peaceful or cold describe the company's attitude to the product itself (Tourism and Hospitality Industry, 2014).

Brands have had to establish stronger marketing strategies to maintain and increase sales as a result, and the key to successful products today is in the market and trend analyses carried out during the early stages of the fashion development cycle (Bruce & Daly, 2006; Le Choux, et al., 2002). Fashion, by its very nature, has always been subject to change and the literature review

supported the response to a demand for change from an increasingly innovative society over recent decades (Sproles ,1979; Lowe & Lowe 1984; Bruce & Daly, 2006).

2.7.8 Consumer Perception

Consumers do not always know what they want. They have unconscious needs therefore the advertisers are trying to make them want something they don't necessarily need (Graves 2010). Consumer behavior studies the processes when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires. Consumers vary from different age groups; therefore, it is important to have a wide range of products or services to satisfy various needs of consumers (Solomon et al. 2002). Things such as store music and mood have impact on buying behavior. The price is also seen to demonstrate the value of products; the belief of price-quality relationship states that high price means better quality. Consumers might consider price as the only determining factor influencing their buying decision (Solomon at al. 2002). Studies show that consumer buying behaviour is emotional or even irrational; however, people seem to think that what we possess shows our personalities (Anon.2011). Consumer behaviour seems to be affected by three different kinds of factors: social, cultural and personal. There are many factors that work under these three categories which will be discussed in this section (Kotler et al. 2009, p.160).

2.7.9 Colour to ward Brand market

Both the design (shape) and the colour of corporate logos therefore demand a strategic approach (Balmer and Gray, 2000; Gray and Balmer, 1998). Visual equity is the value derived from 'visual form', that is the 'look and feel' of the brand. Visual equity contributes towards brand recognition, enabling a brand to stand out on the supermarket shelf. It also helps to communicate a brand's desired image (Keller, 1998). The intrinsic meaning of colour, if appropriately selected may bring inherent and immediate value to the brand (Kohli and LaBahn, 1997), like a carefully chosen name.

Colour is sometimes referred to as the 'silent salesperson' as it exerts persuasive power at a subliminal level (Eisenman, 2000). Therefore, it is necessary to address the need to examine how people perceive the colour, design and meaning of logos to examine how these interlink to and affect the identity of the organization (Henderson and Cote, 1998; Seifert, 1992; Van Riel and Balmer, 1997).

2.7.10 Brand Logo

Logos should be recognisable, familiar, elicit a consensually held meaning in the target market, and evoke positive affect (Cohen, 1986; Peter, 1989; Robertson, 1989; Vartorella, 1990). Brand and company simply known by their logos (Peter, 1989). Logo perceptions can follow more intense aesthetic responses (Bloch, 1995). A logo can serve as a competitive advantage and be a way to enhancing a company's more recognized (Baker and Balmer, 1997; Olins, 1989). Accurate colour and shape (Good logos) are recognisable, meaningful, and affectively positive emotion (Henderson and Cote, 1998). A logo is crucial factor in recognizing a branding (Berry, 1989; Morrow, 1992). "An important advantage of a logo is its visual character, which may make it less vulnerable to international barriers. The importance of logos may differ per product category. The identity and values of a brand are the starting point for planning the brand elements, the marketing instruments and secondary associations" (Keller, 2002). Therefore, logo is the most significant element toward brand's image.

2.7.11 Personality and Consumers Perception of Colours

"Personality is an important segment for sellers because it helps them understand the consumer and successfully segment and market their product to the one who will positively respond to it" (Schiffman, *et al.*, 2004, pp.94-95). According to the study Fox all, *et al.* (2007), Personality is defined as all characteristics that can explain consistent behaviour patterns, i.e. differences in behaviour between people and they depend on: age, gender, race, income, level of education, marital status, number of children, etc. Personality includes innate instincts, learned motives and acquired experiences.

Mullingar and Tsurenko in 2009 examined the effect of consumers' personality and values on brand preferences. It was suggested that values personality had stronger influence than brand preference. However, most of fashion designers and managers are apply this personality as promotion strategy to attract the market (Mullingar and Tsurenko in 2009).

Brand personality deals with the importance of relations in social activities and gives the brand higher positions in the mind of consumers and makes the brand something akin to being a friend or something which they feel belongs to them, something that they own (Rajagopal, 2006). Brands can speak like human beings, they speak through the style tone of their advertising and like humans speaking, the audiences who are eager will listen (Rajagopal, 2006).

Goldsmith et al. in 2012 examined three relatively high-level personality variables (namely materialism, brand engagement in self-concept BESC, and status consumption). They concluded that consumers involved with fashion clothing would suspect sales approaches that bundle clothing into collections or outfits. Brand managers should emphasize status and brand through these outlets (Goldsmith et al., 2012).

The ultimate goal of SCM is to meet customers' demand more efficiently by providing the right product, in the right quantity, at the right location, on the right time, and in the right condition (Asli, 2007).

Table 2.4 Factor of Fashion Competitiveness and Colour Forecasting

NO	FACTORS	CITATION
1	purchasing self-expressive products (market)	Elliot & Maier, 2004; Singh, 2006; Wagner, 1988; Akcay and Sun, 2013; Ogden, et al., 2011; Akcay, et al., 2011; Clarke and Honeycutt, 2000; Eiseman, 2000;
2	Personality (Age, gender culture), ethnic, geography, economic, political and education level	Brodly et al., 1981; Funk and Ndubisi, 2006; Akcay, et al., 2012; Fischer and Arnold, 1994; Boyatzis and Varghese, 1994; Silver, 1988, Paul, 2002; Krishna, 1972; Choungourian, 1968; Yang, 2001; Boyatzis and Varghese, 1994; Silver, 1988, Paul, 2002; Krishna, 1972; Berthold & Hand, 1999; Geman & Geman, 1984; Wiegersma and Vander Elst, 1988; Schiffman, et al., 2004; Diane, 2007; Nenni, 2013; Foxall, et al., 2007;
3	Consumer's perception Behavior and Customer buying preference	(Grossman, and Wisenblit 1999; Aslam, 2006). sargant, 1964; Elliot et al., 2007; Henphill, 1996; Birren, 1978; Folmar and Klausbernd, 2011; Helios, 2013; Jonhson, David, 2013; Sable and Akcay, 2010; Funk & Ndubisi, 2006; Singh, 2006); Skorinko, Kemmer, Hebl, and Lane (2006)
4	Psychological effects	Kotler, 1973; Bellizzi et al., 1983; Cimbalo et al., 1978; Diane, 2007; Nenni, 2013; Zelanski and Fisher, 2010; Birren, 1961; Bellizzi et al., 1983; Lee & Rao, 2010; Babin et al. 2003; Bellizzi & Hite, 1992;
5	Brand market, company logo and brand personality	Divard, 2001; Labrecque & Milne, 2012; Skorinko et al., 2006; Basera et al., 2013; Mulyanegara and Tsarenko, 2009; Rajagopal, 2006; Goldsmith et al., 2012; Balmer and Gray, 2000; Gray and Balmer, 1998; Keller, 1998; Kohli and LaBahn, 1997; Henderson and Cote, 1998; Seifert, 1992; Van Riel and Balmer, 1997; tuber and jeremy, 2013; Keller, 2005; Fournier, 1998; Sheth & Parvatiyar, 1995; Aaker J. L., 1997; Batra, Lehmann, & Singh, 1993; Blythe, 2007; Keller & Richey, 2006; Pittard, 2007; Tractinsky & Lowengart, 2007;
6	Environment, seasons, climate	Smith, 2003; Reyes, 1986; Meeberrie and Zagon, 1995, Mankel, 1996; Faulkner, 1972, Holtzsche, 2006; Diane, 2007; Nenni, 2013; Grossman & Wisenblit, 1999; Hynes, 2009; Bottomley

		& Doyle, 2006;
7	Sustainability	Fletcher 2008; Partridge 2011; Report of the World Commission on Environment and Development 1987; Fletcher 2010; Walker, s. (2009).: Fuad-luke, a. (2009).; Koskinen et al.,2011; Niemelä, 2010; Saito, 2007; Shove et al., 2007; Tischner& Charter, 2001; Niinimäki, 2011; Dodd et al.,2000; msalow,1943; max-nnf,1992; sull and turaconi,2008; Byun and Sternquist, 2012; Piacentini and Mailer, 2004; Milbrath, 1984; Kilbourne et al.,2002;

3.8 Art Sequence of Colour

The history of the science of colours goes back to the times of Greek philosophers Plato and Aristotle. The scientific approach continues to the times of Newton, Helmholtz, Herring, Mansell, Land and Ostwald who lived in the second half of the 19th and the second half of the 20thcenturies and they were the ones to set the foundations of the comprehension and understanding of the colour phenomenon (Maribor al., 2001). The physical world in the human environment absorbs certain parts of sunlight while it rejects the others, which leads to the experience of different colours. Human beings can differentiate around 7 500 00 colours and nuances of colour (Tanhofer, et al., 2000).

The first known colour trend forecast was issued in 1917 by The Textile Colour Card Association of America (TCCA). The First World War, which had effectively stifled the famous Paris fashion industry and its global influence and featured ‘40 colours presented in silk and wool swatches’ (Hope &Walch, 1990:34). The colours were aimed at the women’s clothing and accessories markets and were developed to appeal to stylists and designers. As manufacturers and retailers adopted colour forecasting information more widely, the concept of producing written trend analyses and forecasting reports began to be formed by TobeColler Davies, a former visual merchandiser at Macy’s department store in the 1920’s. Her keen eye for detail, gathering ideas and inspiration from the theatre or society ladies, led her to found Tobe& Associates in 1927 in New York (Jabenis, 1972, pp.48). The organisation provided weekly reports, sketches and fabric swatches for clients to develop further ideas and collections from.

The first Cars were being sold in different of colors for the first time, and in 1927 the Ford company began production of the Model A (Eskilson, 2002).meanwhile The Colour Marketing Group (CMG) was established in 1962; now based in Alexandria, Virginia, it works closely with CAUS and has over 1300 American members (Hope &Walch, 1990:

34).It was very dictatorial in the 1970's and people tended to believe your forecasts as there was very little else other than the fibre companies (Hibbert, 2008).

In 1931, a British Colour Council (BCC) was set up, consisting of various colour experts who generally were individual representatives from British companies. The function of the BCC was to provide seasonal colour predictions. In 1974 this collapsed and in 1976 the British Textile Colour Group was formed. Their procedures were akin to those of ICA, but they worked 28 months ahead of the retail season. The final result was colour forecasting that was multi-national and therefore extremely marketable (Bruce, et al.). The first International Colour Authority (ICA) forecast was launched in September 1968. A panel consisting of 30 of the world's most experienced colorists and designers gather every six months to discuss colour information for the ICA forecasts.

During the 1980s when the forecasting industry began to be recognized as a useful design and marketing tool, and the pluralism suggested by McKelvey and Munslow (2008).meanwhile New York based forecasters 1981 most of a form Japanese and European designers started drawing sketch and illustration. Rodi had been developing trends with world renowned colour expert Li Edelkoort, for Comite International de la Mode (CIM) in 1973, eventually establishing her own trend agency in 1985, and experienced many of the changes in the industry over thirty years first hand. according to Rodi, 1970s to 1980s with key brands imposing a head to toe style on the consumer as the era of the super designer brand was born (Merrett, 1996). according IM report winter 1978 Calvin kelvin began color in addition to fabric type.

As Enid Verity states in *Colour Observed* (1980), 'In one way or another everyone is interested in colour'. A true statement as whether we are aware or not, every colour has the possible ability to affect our opinions and behaviour in everyday situations (Wilson,1960). In China, color forecasting researches could be dated back to the end of 1980's. China fashion color association (CFCA) contributes mostly to this research (Wu Y ,1986).

During the 1990's fashion forecasting witnessed worldwide growth during as forecasting professionals became prominent industry advisors (Brannon, 2000: 20).1995/96 began fashion seasons of Autumn/Winter and Spring/Summer, as consumers' lifestyles began to change (Jackson 2001).Worth Global Style Network, (WGSN), was founded in 1997, able to satisfy

on-line customer demands for immediate information by covering the latest fashion and fabric shows via their web site(www.WGSN.COM).

George Mason University, firstly contributed to the systematic demonstration of color forecasting and its application. In his book: Color Forecasting: A Survey of International Color Marketing (Linton ,1994). the forecasting way, the mystery and technology of color forecasting were described, which undo the puzzles that troubled the customers and the businessmen for a long time.

2.9 Research Gaps on Competitive Advantage

The literature reviewed shows that there are varying views as regards what determines competitiveness, and there is also lack of competitiveness framework on the determining factors of competitiveness for Ethiopia. The modern competitive advantage models should cover both color forecasting techniques factors and competitiveness factors, taking both view of the sources of competitive advantage.

This study contributes to addressing knowledge gap by developing such comprehensive framework, and uses SEM method to test it in competitiveness through color forecasting techniques. In so doing, the study combines the elements of the color forecasting and determining factors of competitiveness to propose a model of competitive advantage.

Chapter Three

Research Methodology

3.1 Introduction

This chapter provides discussion of the methodology adopted in this study and organized as follows. It describes the research methods, research design, sampling techniques, data collection methods and data analysis method are describing how data collected from the research has been analyzed.

3.2 Research methods

3.2.1 Quantitative approach

Quantitative research is resembled with the deductive approach as it utilizes the technique of utilizing numeric data and factual information to drive results from the collected data. It relies on the numeric information, a raw form of data that be quantified. Quantitative research mainly focuses on ensuring that any concept can be described in such a way that is can be quantified. Quantitative is used to answer “what” the important competitiveness factors and colour forecasting and “how” significant are in this research. Therefore, in this study quantitative used to the data should be highly specific and precise.

Quantitative research is generally takes the form of numbers, and their analysis involves counting or quantifying these to draw conclusions. Large r sets of data will be involved than is the case with qualitative research, and statistically rigorous techniques are used to analyze data. Quantitative data often provide a ‘macro’ view, in that they involve large samples or Larger sample sizes often make the conclusions from quantitative research generalizable, it is statistical methods mean that the analysis is often considered reliable data and to use appropriate for situations where systematic, standardized comparisons are needed in the research.

3.2.2 Qualitative approach

In this study qualitative research used due to lack of existing theory about enhancing competitiveness through color forecasting, it is reasonable to conduct a qualitative method to ensure that which are not addressed in the literature. Also, attempt to understanding influence of colour forecasting techniques on competitiveness market. Qualitative research can be to understand and interpret individual and social interactions reasons behind certain behavior

description. Additionally, qualitative research can be used to study non tangible aspects such as feeling; thought process and emotion and .in addition to, qualitative research techniques a more in-depth study of a particular area is done to develop new theories or factual information. Therefore, words and observations are used to express the reality where 'getting close to the data' and an 'in-depth' approach are key concerns. Additionally, qualitative methodology to capture multi-dimensional phenomena and can help to find the meaning behind the numbers provide flexibility without requiring sample size and better for determining the implicit truth of data.

3.3 Research design

This research is objective at examine the competitiveness through colour forecasting techniques in Ethiopian fashion industry. It is designed in is a cross-sectional study. The structural equation model (SEM), which is an extension of the regression method, approach to research design and data analysis than other multivariate statistical model as used to examine relationships among the variables. According to Hoyle, (1995) explained that “the SEM method assists in enhancing the explanatory power of the non-experimental data that are often collected in behavioral, social, and educational research”.

3.3.1 Sampling Design

There are many ideas for an adequate sample size in structural estimating modeling (SEM). According to (Hatcher, 1994) mention in his book, the minimum size of the sample should be 100 is enough for analysis to be used. Anderson and Garbing (1988) suggested a sample size for carrying out SEM to be between 100 and 150 as the minimum. According to, Hair et al., (1998) to be able to obtain a reliable and meaningful parameter estimates a large sample size is needed to run the SEM, though there is no estimate on how large the sample size required to carry out the SEM (Hair et al.1998).

3.3.2 Sampling Technique

The sampling method which will be applied in this study is the simple random sampling method. A simple random sample is a sampling method in which every member of the population has an equal and independent chance of being chosen. Data collection procedure in this study is a cross-sectional survey design. Cross-sectional studies involve observations of the whole population, or a representative subset, at specific period of time.

There are many ideas for an adequate sample size in structural estimating modeling (SEM). According to (Hatcher, 1994) mention in his book, the minimum size of the sample should be five times the number of variables.

3.4 Data Collection Methods

3.4.1 Secondary Data

Secondary data to describe Ethiopian fashion industry were collected from official publications and studies. The information was collected from the Ethiopian Textile Industry Development Institute, Ministry of Science and Technology, Ministry of Culture and Tourism Sellers and Customers, Ethiopia fashion designer's association, Ethiopia Psychologist association.

3.4.2 Primary Data Collection

Observation

A considerable volume of information was gathered from observational techniques used within the longitudinal studies, but also from personal experience within a colour forecasting and global colour research, 'Rather than denying personal interests and values, the methodology of participant observation requires awareness of how these thoughts and feelings influence the research (Jorgensen ,1989).

Questionnaires

A closed-ended questionnaire was carried for data collection. According to Sekaran (2001), suggests that questionnaires are an efficient data collection mechanism provided the researcher knows exactly what is required and how to measure the variables of interest. Hundred questionnaires were developed with close ended questions. The qualitative phenomenon is a complex task, an approach must be designed to measure the score of an individual in a Likert scale (Anjana, 2008). The respondents were presented with attributes in 5-point Likert Scale and were asked on their position on the scale (Appendix 1). The response was increased by using well paid research assistants, frequent physical and phone follow-ups to the respondents. The questionnaire was designed based on the scale from 5 excellent, 4 very good, 3 good, 2 low and 1 poor.

3.5 Data Analysis Methods

The data analysis proficiency used was structural equation modelling (SEM). This study follows Exploratory Factor Analysis as a first step and Confirmatory Factor Analysis (CFA) done using SEM as a second step. Before undertaking data analysis, reliability test was done to check whether the data reflects the builds it is intended to measure using SPSS-20 was done to figure the preliminary statics. The reliability analysis of the data using Cronbach's alpha based on standardized items was done to test the content validity of the builds and internal consistency of the items measuring the builds. After descriptive analysis, factor analysis was used to identify the underlying factors that are responsible for correlated variation among the variables. The objective was to find out few variables that contain the same data as those carried in the original data by combining variables that are collinear into new factors.

The data was test for suitability to factor analysis, and Bartlett 's Test of Sphericity was used to find whether the correlation matrix is an Identity Matrix. This step is significant in factor analysis as it serves to assess whether factor analysis will be suitable or not. Again, the adequacy of the sample size using the Kaiser Meyer-Olkin (KMO) measure of sampling adequacy was performed to test the eligibility of the data performed to test the eligibility of the data. small KMO values indicate that the sample size is not adequate. The KMO value of 0.9 is superb and the value below 0.5 is not good enough to proceed.

This thesis used principal component to extraction factors to find that a variable linear combination of greatest common variance. then the principal components analysis helps to determine factor extraction underlying of set of builds, that forms of linear combination of variance then the variable are makes relationship through factor rotation. After that varimax rotational techniques is proceed to uncorrelated components.

Lastly, the variables are grouping with the highest value loading factor for the similar factor was done, and linear factor equations for the principal components are presented and interpreted. Eigen values were used to this step, along with the next step, shows the factors that can be extracted with their eigenvalues and the percentage of variance that each factor explains, in addition to the cumulative variance of all the extractable factors.

The screen plots and Eigen values were used to explore the factors with Eigen value greater than one are taken and those with Eigen value less than 1 are rejected. The value of principal components was subjected to linear equation modelling using Analysis ANOVA to analyze the significance of the variables and assorted models; correlation coefficients of all independent variables used and the corresponding variance of all variables in each model.

Finally, I used to check the model by the use of the Structural Equation Modelling (SEM using AMOS 20) using Confirmatory Factor Analysis (CFA). SEM was carried using the two-stage approach recommended by Anderson and Garbing (1988). There are several absolute fit indices, but the most important are the Chi-square (χ^2) statistic, the Confirmative-Fit Index (CFI), the Root Means Square Residual (RMSR), the Root Mean Square Error of Approximation (RMSEA) and Normed Chi-square. Where applicable, the modification indices were used to improve the model fit.

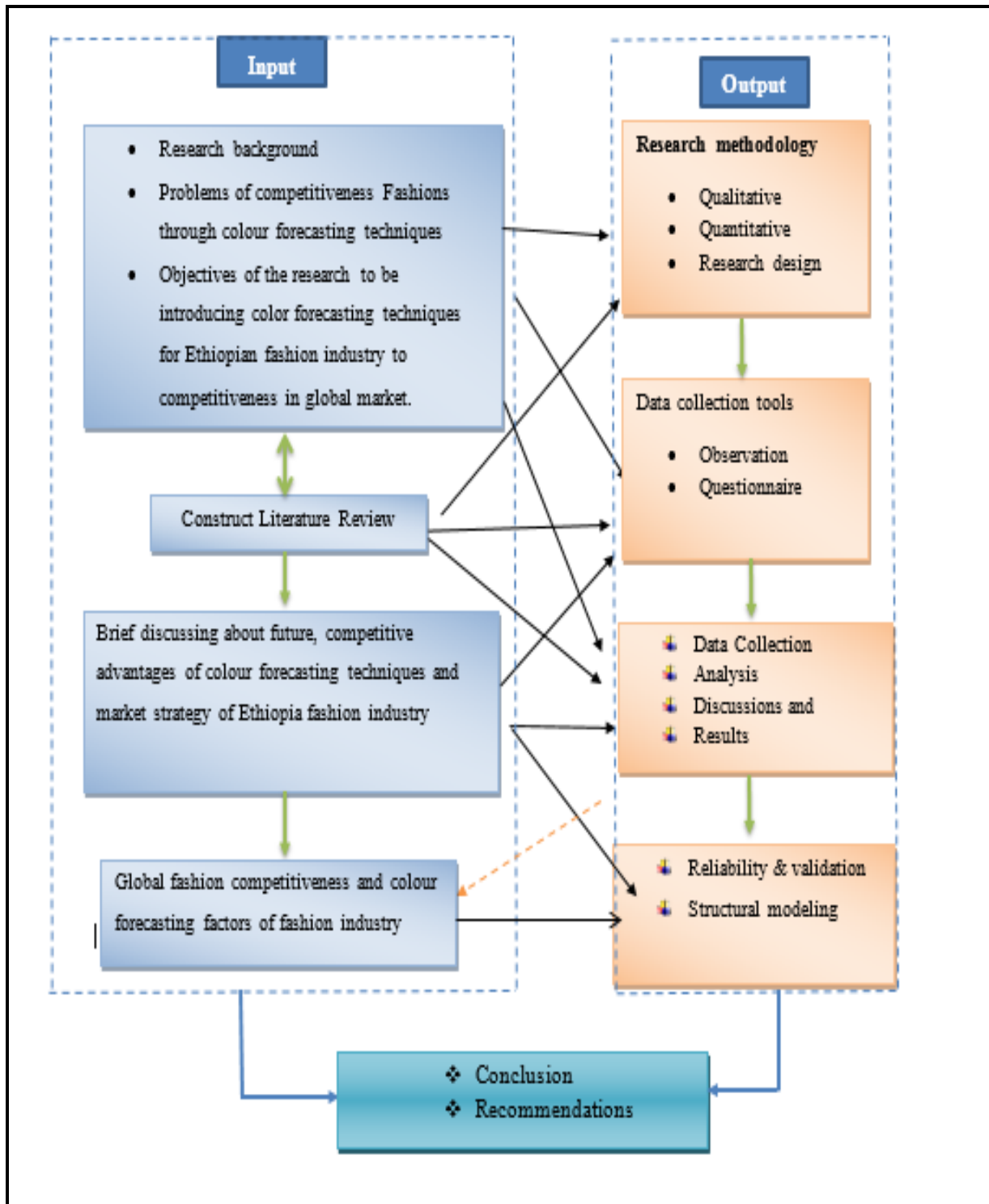


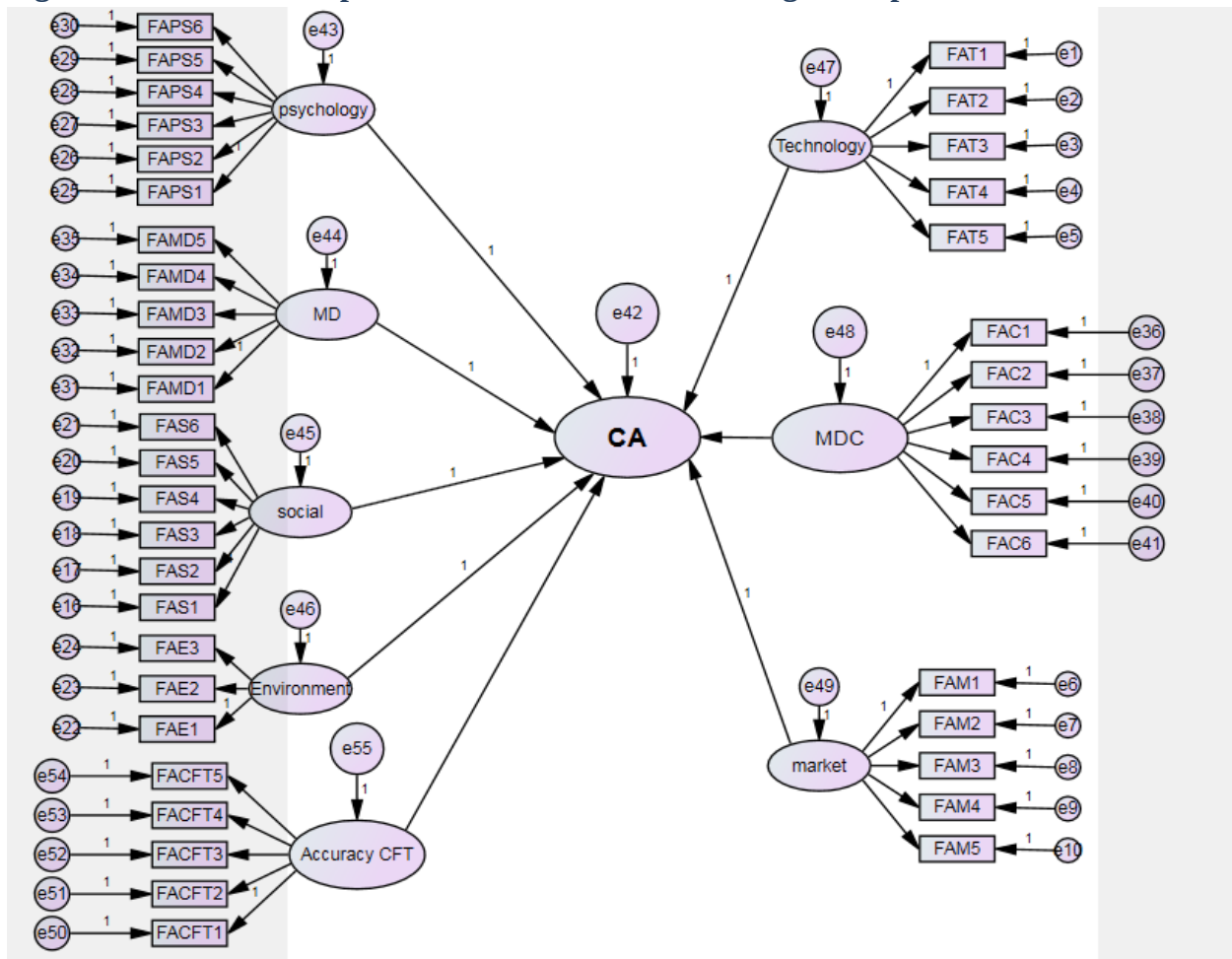
Figure 3.1: Research Frame Work Methodology

3.6 The SEM Model and Hypotheses

3.6.1 The SEM Model

This study tests two types of model, the measurement model involving the constructs and colour forecasting observed variables and competitiveness observed a structural model involving the relationship among the constructs used in the study. Figure 3.2 shows the conceptual model, which was developed after the literature review: In the conceptual model, our interest is to explore how the key colour forecasting and competitiveness variables are related. In this research, the measurement model explains the degree to which all the 43 observed variables were connected to one of the eight sub latent constructs/factors: technology, market, market demand on competitiveness, social, environmental, accuracy of CFT, psychology and market demand.

Figure 3.2 Over All Competitiveness of Colour Forecasting Conceptual Model



3.6.2 Model Specification

In mathematical notation, the relationship between the observed variables and the factors in SEM is expressed using the following formula:

$$\mathbf{x} = \mathbf{\Lambda}_x \boldsymbol{\xi} + \boldsymbol{\delta}$$

X represents a matrix of observed variables; Λ_x is the loading of variable x on the common factor $\boldsymbol{\xi}$ and $\boldsymbol{\delta}$ is the error term. For this study, the

$$A_1 = \lambda_{11}\xi_1 + \delta_1$$

$$A_2 = \lambda_{21}\xi_1 + \delta_2$$

$$A_3 = \lambda_{32}\xi_2 + \delta_3$$

$$A_4 = \lambda_{42}\xi_2 + \delta_4$$

$$M_i = \lambda_{ij}\xi_j + \delta_i$$

Where A_i (or M_i) are the endogenous, dependent or measured variable; δ_i is the residual variable (error) which is the unique factor affecting A_i ; λ_{ij} is the loading of the observed variable X_i on the common factor ξ_j , the sample covariance matrix is of the form

3.7 Surveyed Data for Competitiveness and color forecasting

1. *Ethiopian Textile Industry Development Institutes* selected because it is the Center of development of sustainable investment expansion, consultancy, training, research and development laboratory and marketing support and services for Ethiopian apparel industry. Also, Enhancing the Ethiopian fashion and textile industry to be competent in the global market through investment support, production capacity building and marketing support. (Department of marketing, department of designers.
2. *Ministry of Science and Technology* is selected because the organization supports the development of technology, innovation, production and transformation of the indigenously designed fashions products, and garment technologies.
3. *Ministry of Culture and Tourism* is selected because of its mandatory to keep the values, cultures, heritages and natural resources of these fashions on destination of competitiveness. E.g. market demand and social factors

4. *Sellers and Customers* are the key role players of the firms in the production, distribution and use of these fashions.
5. *Ethiopia fashion designer's association* (FDA) is supports designers for both market growth and expansion of based designers. In order to compete within the international market.
6. *Psychologist*; supports to understand the role colour psychology in individual and social behaviour to explore such as perception, cognition, attention, emotion, personality, behavior and inter personal relationship. In addition, they have strong impact over the investing metalation the market and to enhancing market competitiveness.

Table 3.1 Factors of colour forecasting and competitiveness

First Stage	Second Factors	Third Factors	Questionnaire distributed to institutes/organizations/stockholders
Colour forecasting	Social	Culture Age Gender Ethnic Political Nationality	• Ministry of Culture and Tourism (cultural and traditional values development sector)) • Sellers and Customers • Fashion designer's association
	Environmental	Seasons (autumn, winter, spring and summer) Geography	• Sellers and Customers • Fashion designer's association • ETIDI
	Accuracy colour forecasting techniques	Customer buying decision benchmark Personality Quality Branding	• Sellers and Customers • Fashion designer's association • ETIDI (marketing department)
	Psychological effect	Personality Social Customer buying behavior Branding image Company logo Quality Emotion	• Marketing Psychologist • Sellers and Customers • Fashion designer's association • Colour psychology or colour Consultant

	Market demand	New year Wedding Party and Special celebrity Occasional wear (Office and field trips) Holy day (Easter, epiphany, nation and nationality celebrity)	• Sellers and Customers • Fashion designer's association • Marketing department (TIDI)
Competitive	Technology	Quality Customer based Time Flexibility Price	• Ministry of Science and Technology (technology transfer) • ETIDI (fashion and technology department)
	Market force	Sale strategy Market share Seasonality Customer satisfaction Branding	• Marketing department •

Chapter Four

Result and Discussion

4.1 Introduction

This chapter presents the analysis of the data collected for the purpose of this study. The analysis includes two parts: First, descriptive analysis will be presented. Second, inferential analysis was conducted using the Structural Equation Model (SEM), applying Exploratory Factor Analysis in the first stage to identify the model that contains the factors that have the most significant impact on competitiveness through colour forecasting techniques using SPSS 20, and in the second stage the fitness of the model should be tested through Confirmatory Factor Analysis using AMOS.

4.2 Reliability Test and Cronbach Alpha

Before undertaking data analysis, reliability test was done to check whether the data reflects the constructs it is intended to measure. In view of the characteristics of the instrument used in this study, the inter-item reliability consistency (alpha) was used to measure its reliability. Construct validity is determined by how well certain constructs explain the variance of responses to a set of survey items (Page & Meyer, 2000). Accordingly, a person should get the same score if complete the questionnaire at two different points in time, in which case the individual items should produce results consistent with the overall questionnaire (Field, 2005). According to as the studies of (Syum, 2010), (Changiz&Azadeh, 2011) states the 0.70 Cronbach's Alpha value is a "commonly used threshold for acceptable reliability", and thus, is considered acceptable as table 4.1 shown

Reliability Testing: Cronbach's Alphas designed as a measure of internal consistency of items in the questionnaire. It varies between 0 and 1. The closer alpha is to one, the greater the internal consistency of the items in the questionnaire. Total number of questions or items in the questionnaire is 43 all testing variables are ordinal scale variables and nominal scale. Hence "N" of items in the below Cronbach's Alpha test is 100.

Table 4.1 Cronbach's Alpha-Reliability Test

No	Competitiveness and Colour Forecasting Measures	Reliability Statics	
		Cronbach's Alpha	N of Items
1	Technology Measures	0.857	5
2	Marketing Measures	0.861	5
3	Competitiveness Measures	0.883	6
4	Social Measures	0.706	6
5	Environment Measures	0.785	5
6	Accuracy Colour Forecasting Measures	0.800	5
7	Psychological Measures	0.844	6
8	Market Demanding Measures	0.802	5

4.3 Descriptive analysis

The factors that were expected to have an impact on competitiveness through colour forecasting were classified into two groups: the first group includes the factors technology measures, the second includes marketing measures, the third factor include market demand on competitiveness, the fourth factor include measures, the fifth include social measures, the sixth include environment measures, the seventh factor include accuracy colour forecasting and the last factor include measures psychological measures. The data merged analysis of the responses and the key points raised by the respondents are presented below. The respondents expressed their views and their degrees of agreement with the statements as follows:

4.3.1 Technology Measures

As shown in Table 4.4 The majority respondents about their feeling regarding the price to technology, where their responses show that 9% low, 1% poor, 9% good and 49% very good, while about 32% were excellent. The respondents regarding the time to technology, where their responses show that 7% low, 1% poor, 12% good and 43% very good, while about 37% were excellent. The respondents regarding the flexibility to technology, where their responses show that 2% low, 3% poor, 23% good and 32% very good, while about 40% were excellent. The respondents their feeling regarding the quality to technology, where their responses show that 2% low, 2% poor, 12% good and 37% very good, while about 47 % were excellent. The

respondents about their feeling regarding the time to technology, where their responses show that 2% poor, 18% good and 39% very good, while about 41% were excellent. Regarding the customer to technology, where their responses show that 3% low, 2% poor, 11% good and 31% very good, while about 53% were excellent.

Table 4.2 Factors Affecting Technology Measuring

		Excellent	Very Good	Good	Low	Poor
Price	Count	32	49	9	9	1
	Row N %	32.0%	49.0%	9.0%	9.0%	1.0%
Time	Count	37	43	12	7	1
	Row N %	37.0%	43.0%	12.0%	7.0%	1.0%
Flexibility	Count	40	32	23	2	3
	Row N %	40.0%	32.0%	23.0%	2.0%	3.0%
Quality	Count	47	37	12	2	2
	Row N %	47.0%	37.0%	12.0%	2.0%	2.0%

4.3.2 Marketing force measures

As shown in Table 4.3 The majority respondents about their feeling regarding the sale strategy to market, where their responses show that 15% low, 0% poor, 13% good and 23% very good, while about 49% were excellent. The respondents about their feeling regarding the market share to market measures, where their responses show that 15% low, 4% poor, 15% good and 31% very good, while about 35% were excellent. The respondents about their feeling regarding the seasonality to market measures, where their responses show that 9% low, 7% poor, 16% good and 41% very good, while about 27% were excellent. The respondents about their feeling regarding the customer to market measures, where their responses show that 9% low, 3% poor, 20% good and 33% very good, while about 35% were excellent. Regarding the branding market to market measures, where their responses show that 9% low, 2% poor, 12% good and 34% very good, while about 43% were excellent. Regarding the flexibility to competitiveness, where their responses show that 8% low, 2% poor, 15% good and 46% very good, while about 29% were excellent.

Table 4.3 Factors Affecting Marketing force measures

		Excellent	Very Good	Good	Low	Poor
Do fashion colour forecasting affect sale strategy?	Count	49	23	13	15	0
	Row N %	49.0%	23.0%	13.0%	15.0%	0.0%
Do colour forecasting affect global market share?	Count	35	31	15	15	4
	Row N %	35.0%	31.0%	15.0%	15.0%	4.0%
Do colour forecasting market is seasonal?	Count	27	41	16	9	7
	Row N %	27.0%	41.0%	16.0%	9.0%	7.0%
Do you think these colour forecasting enhancing the needs of customers?	Count	35	33	20	9	3
	Row N %	35.0%	33.0%	20.0%	9.0%	3.0%
Do you colour forecasting	Count	43	34	12	9	2

affect branding market	Row N %	43.0%	34.0%	12.0%	9.0%	2.0%
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4.3.3 Market Demand on Competitiveness

As shown in Table 4.4 The respondents about their feeling regarding the quality to competitiveness, where their responses show that 4% low, 2% poor, 10% good and 24% very good, while about 62% were excellent. The respondents about their feeling regarding the price to competitiveness, where their responses show that 5% low, 1% poor, 11% good and 31% very good, while about 51% were excellent. The respondents about their feeling regarding the customer to competitiveness, where their responses show that 3% low, 2% poor, 21% good and 42% very good, while about 32% were excellent. The respondents about their feeling regarding the market to competitiveness, where their responses show that 6% low, 2% poor, 12% good and 42% very good, while about 44% were excellent. The respondents about their feeling regarding the time to competitiveness, where their responses show that 2% poor, 18% good and 39% very good, while about 41% were excellent. Regarding the flexibility to competitiveness, where their responses show that 8% low, 2% poor, 15% good and 46% very good, while about 29% were excellent.

Table 4.4 Factors Affecting Market Demand on Competitiveness

		Excellent	Very Good	Good	Low	Poor
Quality	Count	62	24	6	8	0
	Row N %	62.0%	24.0%	6.0%	8.0%	0.0%
Price	Count	51	31	11	5	1
	Row N %	51.0%	31.0%	11.0%	5.0%	2.0%
Customer	Count	32	42	21	3	2
	Row N %	32.0%	42.0%	21.0%	3.0%	2.0%
Market	Count	44	36	12	6	2
	Row N %	44.0%	36.0%	12.0%	6.0%	2.0%
Time	Count	41	39	18	0	2
	Row N %	41.0%	39.0%	18.0%	0.0%	2.0%
Flexibility	Count	29	46	15	8	2
	Row N %	29.0%	46.0%	15.0%	8.0%	2.0%

4.3.4 Social measures

As shown in Table 4.5 The respondents were rating about their feeling regarding the culture to colour forecasting, where their responses show that 9% low, 1% poor, 6% good and 32 very good, while about 52% were excellent. The respondents were rating about their feeling regarding the age to colour forecasting, where their responses show that 15% low, 1% poor, 115% good and 44% very good, while about 25% were excellent. The respondents about their feeling regarding the gender to colour forecasting, where their responses show that 19% low, 1% poor, 11% good and 38% very good, while about 31% were excellent. The respondents about their feeling regarding the ethnic to colour forecasting, where their responses show that 12% low, 4% poor, 23% good and 41% very good, while about 19% were excellent. The respondents about their feeling regarding the education to colour forecasting, where their responses show that 231% low, 3% poor, 18% good and 33% very good, while about 10% were excellent. Regarding the nationality to colour forecasting, where their responses show that 18% low, 0% poor, 31% good and 26% very good, while about 25% were excellent.

Table. 4.5 Factors Affecting Socials Measures

		Excellent	Very Good	Good	Low	Poor
Does culture affect colour forecasting	Count	52	32	6	9	1
	Row N %	52.0%	32.0%	6.0%	9.0%	1.0%
Does age affect colour forecasting	Count	25	44	15	15	1
	Row N %	25.0%	44.0%	15.0%	15.0%	1.0%
Does gender affect colour forecasting	Count	31	38	11	19	1
	Row N %	31.0%	38.0%	11.0%	19.0%	1.0%
Does ethnic affect colour forecasting	Count	19	41	23	12	4
	Row N %	19.2%	41.4%	23.2%	12.1%	4.0%
Does education affect colour forecasting	Count	10	31	33	23	3
	Row N %	10.0%	31.0%	33.0%	23.0%	3.0%
Does nationality affect colour forecasting	Count	25	26	31	18	0
	Row N %	25.0%	26.0%	31.0%	18.0%	0.0%

4.3.5 Factors Affecting Environments

As shown in Table 4.5 The respondents were rating about their feeling regarding the summer to colour forecasting, where their responses show that 2% poor, 12% low, 11 % good and 42% very good, while about 33 % were excellent. The respondents about their feeling regarding the spring to colour forecasting, where their responses show that 2% low, 1% poor, 20% good and 39% very good, while about 49% were excellent. The respondents about their feeling regarding the winter to colour forecasting, where their responses show that 9% low, 2% poor, 20% good and 38% very good, while about 31% were excellent. The respondents about their feeling regarding the autumn to colour forecasting, where their responses show that 13% low, 1% poor, 15% good and 34% very good, while about 37% were excellent. Regarding the geographically to colour forecasting, where their responses show that 6% low, 3% poor, 10% good and 47% very good, while about 34% were excellent.

Table. 4.6 Factors Affecting Environments Measures

		Excellent	Very Good	Good	Low	Poor
Do colour forecasting affect summer	Count	33	42	11	12	2
	Row N %	33.0%	42.0%	11.0%	12.0%	2.0%
Do colour forecasting affect spring	Count	49	39	9	2	1
	Row N %	49.0%	39.0%	9.0%	2.0%	1.0%
Do colour forecasting affect winter	Count	31	38	20	9	2
	Row N %	31.0%	38.0%	20.0%	9.0%	2.0%
Do colour forecasting affect autumn	Count	37	34	15	13	1
	Row N %	37.0%	34.0%	15.0%	13.0%	1.0%
Do colour forecasting affect geographically	Count	34	47	10	6	3
	Row N %	34.0%	47.0%	10.0%	6.0%	3.0%

4.3.6 Accuracy of CFT Measures

As shown in Table 4.5 The respondents were rating about their feeling regarding the customer buying decision to Accuracy of CFT measures, where their responses show that 4% low, 16% good and 42% very good, while about 38 % were excellent. The respondents about their feeling regarding the bench mark to an accuracy of CFT measures, where their responses show that 2% low, 0% poor, 30% good and 52% very good, while about 11% were excellent. The respondents

about their feeling regarding the personality to Accuracy of CFT measures, where their responses show that 4% low, 2% poor, 23% good and 41% very good, while about 30% were excellent. The respondents about their feeling regarding the quality to an accuracy of CFT measures c, where their responses show that 5% low, 0% poor, 28% good and 43% very good, while about 41% were excellent. Regarding the branding market to an accuracy of CFT measures, where their responses show that 4% low, 2% poor, 28% good and 34% very good, while about 32% were excellent. Regarding the emotion to psychology measures, where their responses show that 9% low, 0% poor, 14% good and 45% very good, while about 32% were excellent.

Table. 4.7 Factors Affecting Accuracy CFT

		Excellent	Very Good	Good	Low	Poor
Does Customer buying decision affect fashion colour forecasting?	Count	38	42	16	4	0
	Row N %	38.0%	42.0%	16.0%	4.0%	0.0%
Does benchmark affect fashion colour forecasting?	Count	11	52	30	7	0
	Row N %	11.0%	52.0%	30.0%	7.0%	0.0%
Does personality affect fashion colour forecasting?	Count	30	41	23	4	2
	Row N %	30.0%	41.0%	23.0%	4.0%	2.0%
Does quality affect fashion colour forecasting?	Count	41	43	11	5	0
	Row N %	41.0%	43.0%	11.0%	5.0%	0.0%
Does branding market affect fashion colour forecasting?	Count	32	34	28	4	2
	Row N %	32.0%	34.0%	28.0%	4.0%	2.0%

4.3.7 Psychology Measures

As shown in Table 4.6 the respondents were rating about their feeling regarding the personality to psychology measures, where their responses show that 2% low, 15% good and 45% very good, while about 36 % were excellent. The respondents were rating about their feeling regarding the social to psychology measures, where their responses show that 2% low, 2% poor, 14% good and 62% very good, while about 20% were excellent. The respondents were rating about their feeling regarding the customer buying behavior to psychology measures, where their

responses show that 4% low, 0% poor, 12% good and 35% very good, while about 49% were excellent. The respondents about their feeling regarding the branding image to psychology measures c, where their responses show that 4% low, 5% poor, 15% good and 50% very good, while about 26% were excellent. Regarding the company logo to psychology measures, where their responses show that 7% low, 8% poor, 8% good and 58% very good, while about 19% were excellent. Regarding the emotion to psychology measures, where their responses show that 9% low, 0% poor, 14% good and 45% very good, while about 32% were excellent.

Table 4.8 Factors Affecting Psychology Measures

		Excellent	Very Good	Good	Low	Poor
Does fashion colour affect personality?	Count	36	45	15	4	0
	Row N %	36.0%	45.0%	15.0%	4.0%	0.0%
Does fashion colour affect Social?	Count	20	62	14	2	2
	Row N %	20.0%	62.0%	14.0%	2.0%	2.0%
Does fashion colour affect Customer buying behavior?	Count	49	35	12	4	0
	Row N %	49.0%	35.0%	12.0%	4.0%	0.0%
Do fashion colour forecasting affecting Branding image?	Count	26	50	15	4	5
	Row N %	26.0%	50.0%	15.0%	4.0%	5.0%
Does fashion colour affect Company logo?	Count	19	58	8	7	8
	Row N %	19.0%	58.0%	8.0%	7.0%	8.0%
Does fashion colour affect Emotion?	Count	32	45	14	9	0
	Row N %	32.0%	45.0%	14.0%	9.0%	0.0%

4.3.8 Market Demand Measures

As shown in Table 4.7 The respondents were rating investigated about their feeling regarding the new year to colour forecasting, where their responses show that 2% poor, 2% good and 49% very good, while about 47 % were excellent. The respondents were rating about their feeling regarding the wedding to colour forecasting, where their responses show that 8% low, 0% poor, 8% good and 41% very good, while about 51% were excellent. The respondents were rating about their feeling regarding the occasional wear to colour forecasting, where their responses show that 6% low, 2% poor, 16% good and 39% very good, while about 37% were excellent. The respondents were rating about their feeling regarding the holy day to colour forecasting, where their responses show that 0% low, 0% poor, 10% good and 34% very good, while about 56% were excellent. Regarding the nation and nationality celebrity to colour forecasting, where

their responses show that 3% low, 0% poor, 7% good and 47% very good, while about 42% were excellent.

Table 4.9 Factors Affecting Market Demand Measures

		Excellent	Very Good	Good	Low	Poor
Does colour forecasting affect new year	Count	42	45	2	9	2
	Row Valid N%	42.0%	45.0%	2.0%	9.0%	2.0%
Does colour forecasting affect new wedding	Count	46	38	5	9	2
	Row Valid N%	46.0%	38.0%	5.0%	9.0%	2.0%
Does colour forecasting affect occasional wear	Count	31	38	13	16	2
	Row Valid N%	31.0%	38.0%	13.0%	16.0 %	2.0%
Does colour forecasting affect holy day	Count	45	29	10	16	0
	Row Valid N%	45.0%	29.0%	10.0%	16.0 %	0.0%
Does colour forecasting affect nation and nationality celebrity	Count	33	43	4	17	3
	Row Valid N%	33.0%	43.0%	4.0%	17.0 %	3.0%

4.4 Factor analysis

This research conducted exploratory factor analysis to test the factor structure of the measures of technology, marketing, competitiveness and social, environmental, accuracy of colour forecasting, psychology and market demand. At first conducted factor analysis of individual concept because to see whether the concepts alone had KMO validity and internal reliability or not. It evaluates the question asked in questionnaire survey, was consistent with what it was supposed to be measuring. However, this research conducted a factor rotation analysis, to get clearer pattern between the variables (Johannsen, 2009). It will help to exclude those variables, which describe the several factors (Johannsen, 2009). In addition, factor analysis is useful for placing variables into meaningful categories (Yong and Pearce, 2013).

4.4.1 KMO- Bartlett's test

KMO- Bartlett's test, which is a measure of sampling adequacy, was performed to test the eligibility of the data. The KMO value of which should be close than 0.5 for satisfactory analysis to proceed. The value between 0.6 – 0.8 acceptable, and value above 0.9 are superb. Since the

significance value observed was less than 0.05, factor analysis was performed subsequently. Reasonably large values are needed for a good factor analysis. Small KMO values indicate that a factor analysis of the variables may not be a good idea. The Bartlett's test is highly significant ($p < 0.001$) and good enough for further analysis.

Table 4.10: KMO and Bartlett's Test result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.705
Bartlett's Test of Sphericity	Approx. Chi-Square	3853.756
	df	903
	Sig.	.000

As shown in Table 4.1 the conclusion is to reject the null hypothesis and proceed with the estimation of factor analysis because the p-value 0.00 is less than significance value of 0.05 (Field, 2005).

4.4.2 Factor rotation analysis of all variables

EFA is used to reduce the number of factors influencing inclusive competitiveness of colour forecasting, and to group the factors that have the same characteristics together in order to identify which factors have the most impact and remain in the model, and which factors have little or no impact so can be eliminated from the model, and accordingly obtain a model of the most effective factors (Henson and Roberts, 2006).

The analysis has also produced rotating correlation matrix table, which shows how much the extracted factors account for the variability in the observed variable, which is inclusive competitiveness of colour forecasting. This step, along with the next step, shows the factors that can be extracted with their eigenvalues and the percentage of variance that each factor explains, in addition to the cumulative variance of all the extractable factors. The first round of the factor analysis produced nine factors that can be extracted. However, the screen plot in Figure (5.1) shows that only 6 of these factors could have the most impact on competitiveness of colour forecasting and therefore they should be extracted.

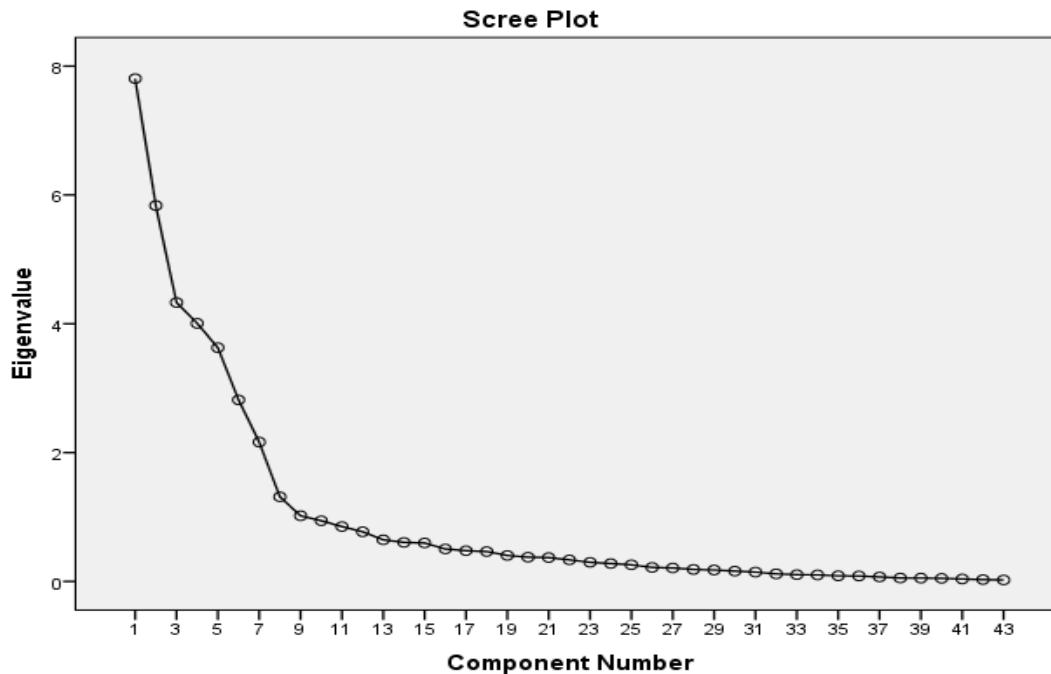


Figure 4.1: the Screen Plot of the Competitiveness and colour forecasting Model

As Table (4.11) shows these 9 factors explain 76.566 % of the variability in inclusive Competitiveness of colour forecasting, with the first factor explaining 12.902 %, the second factor explaining 10.796% and the third factor explaining 9.433 %.

Table 4.11: Rotated Correlation Matrix for the First Model

Total Variance Explained						
Compon ent	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulativ e %	Total	% of Variance	Cumulativ e %
1	7.806	18.154	18.154	5.548	12.902	12.902
2	5.835	13.571	31.724	4.642	10.796	23.699
3	4.330	10.070	41.795	4.056	9.433	33.131
4	4.006	9.317	51.112	4.021	9.351	42.483
5	3.628	8.438	59.550	3.989	9.276	51.758
6	2.818	6.554	66.104	3.845	8.941	60.700
7	2.163	5.030	71.134	3.529	8.206	68.906
8	1.313	3.054	74.188	1.837	4.272	73.178

9	1.020	2.371	76.559	1.454	3.382	76.559
10	.942	2.191	78.750			

However, if look at the table of the rotated components matrix in the Table 4.4, I still find some factors with low impact which indicate that a further extraction process could yield less factors with more loadings and thus more influence on inclusive colour forecasting and competitiveness. As Table (4.12) shows, the new process extracted six factors with higher loadings and thus more affect.

Table 4.12: Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.806	18.154	18.154	6.417	14.923	14.923
2	5.835	13.571	31.724	5.228	12.159	27.082
3	4.330	10.070	41.795	4.668	10.856	37.938
4	4.006	9.317	51.112	4.170	9.697	47.635
5	3.628	8.438	59.550	4.134	9.613	57.248
6	2.818	6.554	66.104	3.808	8.856	66.104
7	2.163	5.030	71.134			

4.4.3 Rotated Component Matrix

The goal of rotated component matrix is to transform the original component matrix to make interpretation as simple as possible by achieving a simple pattern structure. The items have been suppressed at the value of 0.5 and those above this value were retained. Table 4.14 shows the rotated component matrix for colour forecasting and competitiveness variables.

Table 4.14 Loading Factoring for Competitiveness and Colour Forecasting Variables

No	Component						
		1	2	3	4	5	6
A1	FAS1	.846					
A2	FAS2	.843					
A3	FAS5	.832					
A4	FAS3	.818					
A5	FAS6	.798					
A6	FAS4	.789					
A7	FAE3	.720					
A8	FAE2	.657					

A9	FAE1	.639					
A10	FAE4						
A11	FAMD5		.770				
A12	FAMD1		.716				
A13	FAMD2		.680				
A14	FAPS4		.670				
A15	FAPS1		.645				
A16	FAMD3		.639				
A17	FAPS5		.628				
A18	FAPS6		.588				
A19	FAMD4		.576				
A20	FAPS2		.573				
A21	FAPS3		.556				
A22	FAE5						
M23	FAC4			.885			
M24	FAC5			.858			
M25	FAC2			.857			
M26	FAC6			.855			
M27	FAC3			.803			
M28	FAC1			.729			
A29	FACFT4				.885		
A30	FACFT5				.863		
A31	FACFT3				.859		
A32	FACFT1				.855		
A33	FACFT2				.824		
M34	FAM4					.878	
M35	FAM5					.875	
M36	FAM3					.855	
M37	FAM1					.823	
M38	FAM2					.763	
M39	FAT5						.795
M40	FAT2						.784
M41	FAT1						.743
M42	FAT3						.714
M43	FAT4						.687

Note: Throughout this study, the Ai and Mi indicates colour forecasting and competitive variables

4.4.4 The Underlying Dimensions for the colour forecasting and competitive Model

Principal component one

The rotated component matrix above shows that the first one of these six factors is composed of the variables relates to the curriculum and it explains 14.926% of the variability in social and environment perspective competitiveness of colour forecasting, therefore it is the most effective factor. The significant components or individual variables that form this factor are related to the following:

$$PCs = 0.846A1 + 0.843 A2 + 0.832A3 + 0.818A4 + 0.798A5 + 0.789A6 (1)$$

A1. Does culture affect colour forecasting

A2. Does age affect colour forecasting

- A3. Does gender affect colour forecasting
 A4. Does education affect colour forecasting?
 A5. Does political affect colour forecasting
 A6. Does nationality affect colour forecasting

ANOVA statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 95.0 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model has no reason power is rejected at 0.000 level of significance. It implies that the independent variables collectively have power to explain the variation in the dependent variable as shown in Table 4.15:

Table 4.15: ANOVA Results for the social perspective									
Model	R	R Square	Adjusted R Square	Standard Error	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig.
1	.950 ^a	.902	.897	.392	.902	173.618	5	94	.000

$F = 173.618$; $p < 0.001$; $df=194$

$PCE = 0.720A7 + 0.657A8 + 0.637A9$ (2)

- A7. Do colour forecasting affect summer
 A8. Do colour forecasting affect spring
 A9. Do colour forecasting affect winter?

As shown Table 4.16 ANOVA statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 75.5 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.001 level of significance.

Table 4.16: ANOVA Results for The Environment Perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.755 ^a	.570	.552	.733	.570	31.462	4	95	.000

$F = 31.462$; $p < 0.001$; $DF=194$

Principal component two

The second factor is composed of variables relating to the factors of colour for casting which Explains 12.159. % of the variability of market demand and psychology perspectives, the significant components that constitute this factor is related to the following:

A11. Does colour forecasting affect nation and nationality celebrity?

A12. Does colour forecasting affect new year?

A13. Does colour forecasting affect wedding?

A14. Do fashion colour forecasting affecting Branding image?

A15. Do fashion colour affect personality?

A16. Does colour forecasting affect holy day?

A17. Do fashion colour affect Company logo?

A18. Do fashion colour affect emotion?

A19. Does colour forecasting affect occasional wear?

A20. Does colour forecasting affect social image?

A21. Do fashion colour affect Customer buying behavior?

Principal component two on market demand perspective

$$PC2 = 0.770A11 + 0.716A12 + 0.680A13 + 0.639A16 + 0.576A19..... (3)$$

As shown Table 4.17 ANOVA statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 80.0 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model has no reason power is rejected at 0.000 level of significance.

Table 4.17: ANOVA Results for the Market Demand Perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.805 ^a	.648	.633	.471	.648	43.641	4	95	.000

$F = 43.641$; $p < 0.001$; $df=95$

Principal component two on psychology perspective

$$PC2 = 0.670A14 + 0.645A15 + 0.628A17 + 0.588A18 + 0.573A20 + 0.556A21 \dots\dots\dots (4)$$

As shown Table 4.18 ANOVA statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 77.3 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.000 level of significance.

Table 4.18: ANOVA Results for The market demand on competitiveness perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.773 ^a	.598	.576	.656	.598	27.916	5	94	.000

$F = 27.916$; $p < 0.001$; $df=94$; $vif = 2.112$

Principal component three

$$PC2 = 0.0885M23 + 0.858M24 + 0.857M25 + 0.855M26 + 0.803M27 + 0.729M28 \dots\dots\dots (5)$$

The third factor is composed of variables relating to the psychology factors, which explains 10.856. Percentage of the variability of Inclusive competitiveness of colour forecasting, the significant components that constitute this factor is related to the following:

- M23. Technology
- M24. Time
- M25. price
- M28. Flexibility
- M27. Customer
- M28. Quality

As shown Table 4.19 ANOVA, statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 86.9 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.000 level of significance.

Table 4.19: ANOVA Results for the Psychology perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R	F	df1	df2	Sig.

					Square Change	Change			
1	.869	.755	.742	.450	.755	58.071	5	94	.000

$F = 58.071; p < 0.001; df=94$

Principal component four

$$PC2 = 0.885A29 + 0.863A30 + 0.859A31 + 0.855A32 + 0.824A33 \dots\dots\dots (6)$$

The fourth factor is composed of variables relating to the accuracy of CFT which explains 9.697. % of the variability of Inclusive colour forecasting, the significant components that constitute this factor is related to the following:

- A29. Does quality affect fashion colour forecasting?
- A30. Does branding affect fashion colour forecasting?
- A31. Does personality affect fashion colour forecasting?
- A32. Does Customer buying decision affect fashion colour forecasting?
- A33. Does Benchmark affect fashion colour forecasting?

As shown Table 4.20 ANOVA, statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 87.0 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.000 level of significance.

Table 4.20: ANOVA Results for Accuracy of CFT perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.870 ^a	.756	.746	.481	.756	73.634	4	95	.000

$F = 73.634; p < 0.001; df=95; VIF = 3.273$

Principal component five

$$PC2 = 0.878M34 + 0.875M35 + 0.855M36 + 0.853M37 + 0.763M38 \dots\dots\dots (7)$$

The fifth factor is composed of variables relating to the market, which explains 9.613. Percentage of the variability of Inclusive colour forecasting, the significant components that constitute this factor is related to the following:

- M34. Do colour-forecasting techniques affect customers at global market?
- M35. Do you colour forecasting affect branding market?
- M36. Do you colour forecasting affect seasonality?

M37. Do you fashion colour have a market problem?

M38. Do fashion colour forecasting affect sale strategy?

As shown Table 4.21 ANOVA, statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 94.6 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.000 level of significance.

Table 4.21: ANOVA Results for Market perspective

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.946 ^a	.895	.891	.342	.895	203.034	4	95	.000

$F = 203.034$; $p < 0.001$; $df=95$; $VIF = 3.370$

Principal component six

$$PC2 = 0.0.795M39 + 0.875M40 + 0.855M41 + 0.853M42 + 0.763M4 \dots\dots\dots (8)$$

The sixth factor is composed of variables relating to the technology factors, which explains 8.856 Percentage of the variability of competitiveness of colour forecasting, the significant components that constitute this factor is related to the following:

M39. Do customer behaviors affect competitiveness of colour forecasting?

M40. Does product flexibility affect the competitiveness of fashion colors?

M41. Does Price affect the competitiveness of colors forecasting?

M42. Does quality affect the competitiveness of colors forecasting?

M43. Does time affect the competitiveness of colors forecasting?

As shown Table 4.22 ANOVA statistics of this construct shows that the percentage of variation in dependent variable explained by independent variables collectively is 78.4 percent. The model is significant at $p < 0.001$; therefore, the null hypothesis that the model is accepted at 0.000 level of significance.

Table 4.22: ANOVA Results for Technology Perspective

Model	R	R Square	Adjusted R Square	Std. Error	Change Statistics				
					R Square Change	F Change	df1	df2	Sig.
1	.784 ^a	.615	.599	.589	.615	37.982	4	95	.000

$F = 37.982$; $p < 0.001$; $df=95$; $VIF = 2.681$

4.6 SEM Analysis of the CFT and Competitiveness Model

The objective entails finding out whether the parameters of the competitiveness structural and CFT structure model combine to estimate a population covariance matrix, which is similar to the sample covariance matrix. After assessing the results associated with the competitive model and CFT model of the study, confirmatory factor analysis based on the pattern matrix developed for the competitive model was undertaken. The model parameters of the competitive model were analyzed using AMOS 20 software to assess the extent to which the constructs reproduce the variance-covariance matrix among the indicator variables. Each construct was analyzed based on absolute fit indices and relative (incremental fit index).

The absolute fit indices that used were Chi-square (χ^2) statistic, Comparative Fit Index (CFI), the Root Means Square Residual (RMSR) and the Root Mean Square Error of Approximation. Confirmatory factor analysis was performed and the measurement models were tested for overall goodness of fit (Bentler, 2004; Hooper, Coughlan, & Mullen, 2008). Goodness of fit was tested using Chi-square but due to its sensitive to sample size and lack of a defined power function (Fornell& Larker, 1981), other measures were also used.

4.6.1 Colour Forecasting CFT Model

As Table 4.23 shows the value of chi-square for this model is 402.609 which is very high to be accepted and its P-value is significant, moreover, the value of the Comparative Fit Index (CFI) is .922 as Table 4.24 shows, which is the required value for CFI greater than 0.90 These values are in addition to the value of the Random Mean Squared Error RMSEA (.079) shown by Table 4.24, where the RMSEA value should be less than .08 for the model fit to be accepted, which indicate that the null hypothesis of the good fit of the model to data could be easily accepted.

Table 4.23 Model Fit Summary

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	102	402.609	248	.000	1.623
Saturated model	350	.000	0		
Independence model	50	2284.627	300	.000	7.615

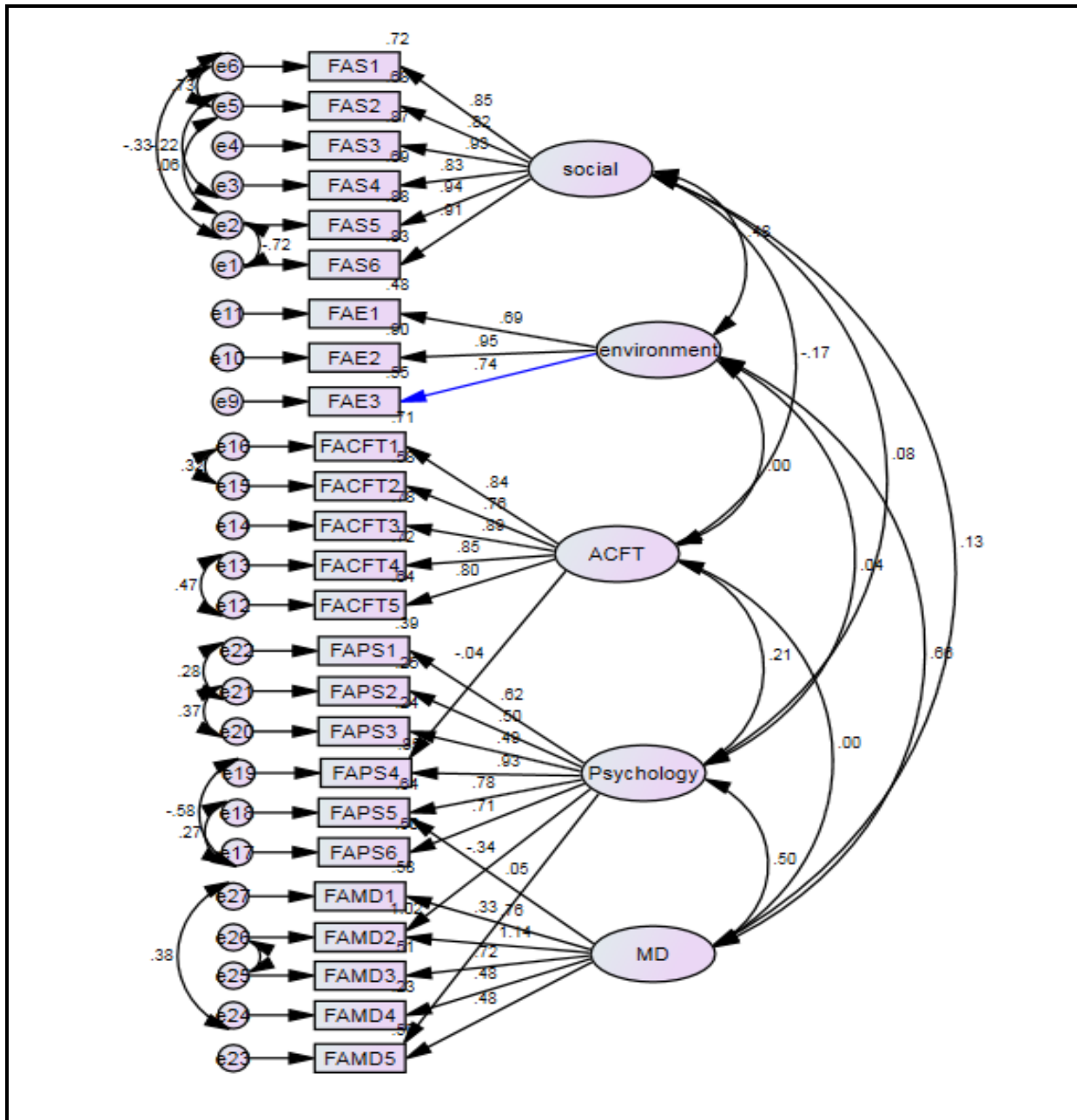
Table 2.24: Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.824	.787	.924	.906	.952
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 4.25: RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.079	.065	.093	.001
Independence model	.259	.249	.268	.000

Figure 4.2: CFA Results for Colour Forecasting Factors Model



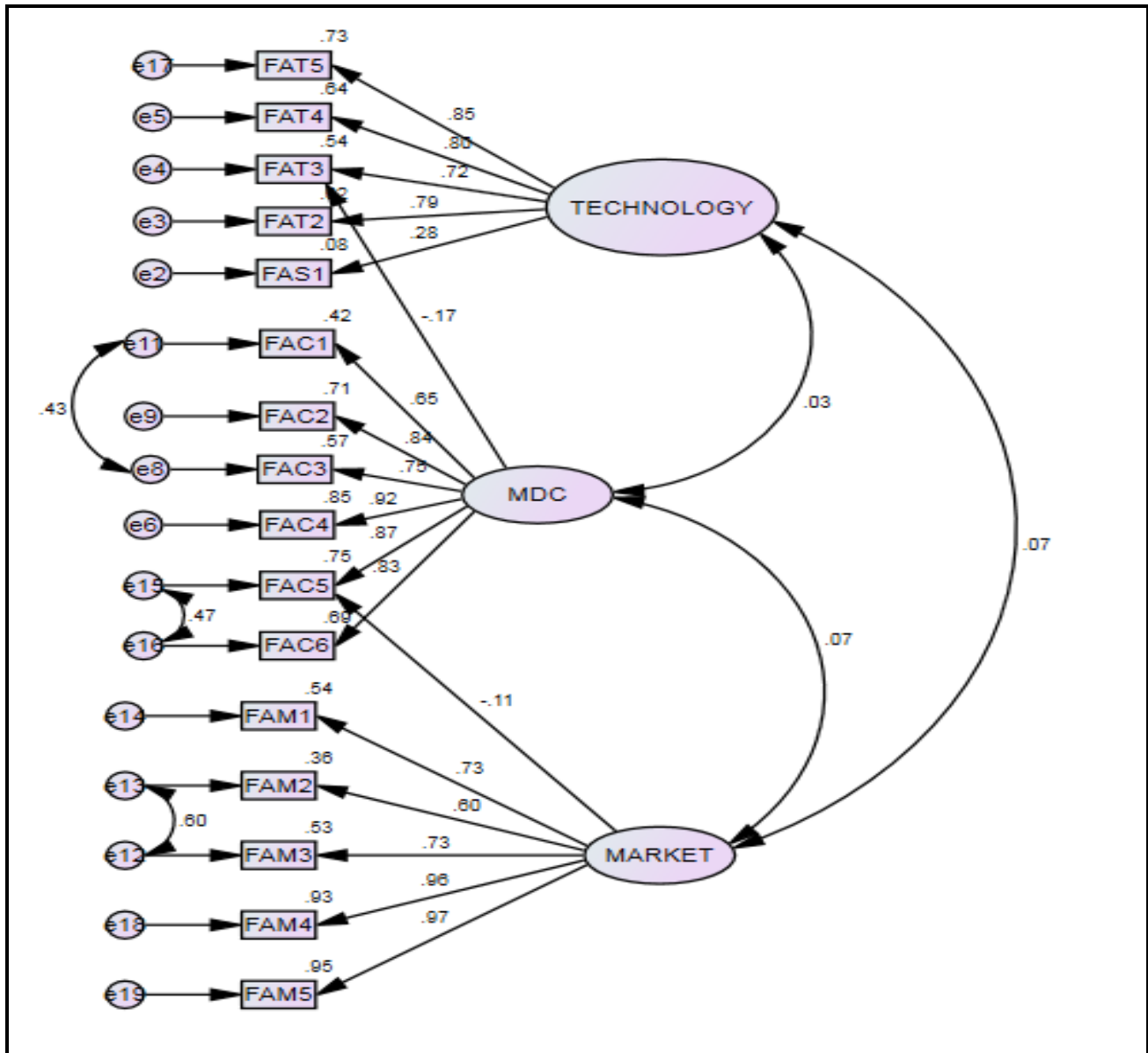
CMIN/df=1.623; p-Value=0.00; CFI=0.952; RMSEA=0.079

Fas1(factor affecting social) = culture, Fas2= age, Fas3= gender Fas4= ethnic, Fas5= education,Fas6 = nationality, fae1(factor affecting environment)= summer, fae2= spring, fae3= winter, Famd1 (factor affecting market demand)= does color affecting new year, Famd2= does color affecting wedding, Famd3 = does color affecting holy day, Famd4= holy day,Famd5 = does color affecting nation and nationality celebrity,Faps1(factor affecting psychology)personality, Faps2=social, Faps3= customer buying behavior, Faps4=branding image,Faps5 company logo, Faps6 = emotion, Facft1(factor affecting CFT)=customer buying decision, Facft2= bench mark, Facft3= personality, Facft4 = quality, Facft5 = branding colour.

4.6.2 SEM Analysis of the competitiveness Factors Model

The three objectives entails finding out whether the parameters of the competitiveness structural model combine to estimate a population covariance matrix, which is similar to the sample covariance matrix.

Figure 4.3: CFA Results for Competitiveness Factors Model



CMIN/df=1.418;p-Value=0.004; CFI=0.965; RMSEA=0.065

Fam1= factor affecting fashion color, Fam2 = factor affecting sale strategy, Fam3 = market share, Fam4= customer, Fam5= branding, Fat1= price, Fat2=flexibility, Fat3= quality, Fat4=time, Fat5=customer, fac2 price, = flexibility Fac3= quality Fac4=time and Fac5= customer.

As table (4.26) shows the value of chi-square for this model is 146.814 which is very high to be accepted and its P-value is significant, moreover, the value of the Comparative Fit Index (CFI) is .957 as table (4.27) shows, which is far less than the minimum required value for CFI greater than 0.90. These values are in addition to the value of the Random Mean Squared Error RMSEA (.071) shown by table (4.28), where the RMSEA value should be less than .08 for the model fit to be accepted, which indicates that the null hypothesis of the good fit of the model to data could be easily accepted.

Table 4.26: Model Fit Summary CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	40	136.592	96	.004	1.423
Saturated model	136	.000	0		
Independence model	16	1264.016	120	.000	10.533

Table 4.27: Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.892	.865	.965	.956	.965
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Table 4.28: RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.065	.038	.089	.159
Independence model	.310	.295	.326	.000

4.7 The Regression Weights of color forecasting and competitiveness Models

In this section, AMOS 20 software was used to establish whether the parameter estimates of determinants of color forecasting and competitiveness factors models produced using SEM analysis are statistically significant in measuring the constructs that they measure (objective 4 of the study).

4.7.1 Regression Weights of Color Forecasting Model

Social Perspectives

All standardized regression weights and associated t-values for this social were statistically significant at 0.00 level of significance. All these strongly support the model fit results and it further complements

the study in proving the hypothesis that social perspectives are statistically significant in determining competitive advantage of fashion industry in Ethiopia.

Table 4.29: Regression Weights for Social Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
A2	Social	1.044	.084	12.492	0.00
A3	Social	.933	.078	11.915	0.00
A4	Social	1.074	.067	15.939	0.00
A5	Social	1.280	.111	<u>11.535</u>	0.00
A6	Social	1.290	.104	12.369	0.00

Environment Perspectives

Furthermore, standardized regression weights and associated t-values for environment were statistically significant at 0.00 level of significance. All these strongly support the model fit results and it complement the study in proving the hypothesis that environment is statistically significant in determining competitive advantage of fashion industry in Ethiopia.

Table 4.30: Regression Weights for Environment Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
A8	Environment	1.125	.121	9.316	0.00
A9	Environment	.948	.138	6.877	0.00

Accuracy of CFT Perspectives

In addition, all variables were found to be statistically significant at 0.00 level of significance. All these strongly support the model fit results and proves that accuracy of CFT perspectives is statistically significant in determining competitive Advantage of fashion industry in Ethiopia.

Table 4.31: Regression Weights for Accuracy of CFT Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
A11	ACFT	.977	.075	13.028	0.00

A12	ACFT	1.018	.106	9.639	0.00
A13	ACFT	.846	.106	7.997	0.00
A14	ACFT	.897	.099	9.095	0.00

Psychology Perspectives

After proving that the fit indices are all statistically significant, the standardized regression weights and associated t-values were computed for psychology perspectives.

All were found to be statistically significant at 0.00 level of significance. All these strongly support the model fit results and it further complements the study in proving the hypothesis that psychology perspectives are statistically significant in determining Competitive advantage of fashion industry in Ethiopia.

Table 4.32: Regression Weights for Psychology Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
A16	Psychology	1.331	.188	7.066	0.00
A17	Psychology	1.465	.236	6.202	0.00
A18	Psychology	.766	.176	4.347	0.00
A17	Psychology	.601	.135	4.457	0.00
A20	Psychology	.906	.171	5.291	0.00

Market Demand Perspectives

The standardized regression weights and associated t-values were computed for market demand perspectives. All were found to be statistically significant at 0.00 level of significance. All these strongly support the model fit results and it further complements the study in proving the hypothesis that market demand perspectives are statistically significant in determining competitive advantage of fashion industry in Ethiopia.

Table 4.33: Regression Weights for Market Demand Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
A22	MD	.815	.207	3.943	0.00
A23	MD	1.702	.369	4.611	0.00
A24	MD	2.121	.395	5.371	0.00
A25	MD	1.328	.261	5.090	0.00

4.7. Regression Weights of Competitiveness Model

4.7.2 Market Demand On Competitiveness(MDC)Perspectives

The standardized regression weights and associated t-values were computed for market demand on competitiveness, a determinant of competitiveness model. All variables were found to be statistically significant at 0.00 level of significance. All these strongly support the model fit results and it further complements the study in proving the hypothesis that market demand on competitiveness is statistically significant in determining competitive advantage of fashion industry in Ethiopia

Table 4.34: Regression Weights for Market Demand on Competitiveness Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
M24	MDC	.882	.092	9.604	0.00
M25	MDC	1.089	.091	11.908	0.00
M26	MDC	.789	.105	7.499	0.00
M27	MDC	1.017	.081	12.522	0.00
M28	MDC	.964	.085	11.389	0.00

Market Perspectives

Further, standardized regression weights and associated t-values were computed for market perspectives. All variables were found to be statistically significant at 0.00 level of significance. They strongly support the model fit results and it further complements the study in proving the hypothesis that market perspectives are statistically significant in determining competitive advantage of fashion industry in Ethiopia.

Table 4.35: Regression Weights for Market Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
M35	Market	.827	.091	9.069	0.00
M36	Market	1.001	.135	7.396	0.00
M37	Market	1.279	.130	9.862	0.00
M38	Market	1.313	.132	9.937	0.00

Technology Perspectives

Lastly, as regards related and supporting industries, the regression weights and

associated t-values showed that the variables of this technology are statistically significant at $p < 0.05$ level of significance. All these strongly support the model fit results and it further complements our study in proving the hypothesis that technology is statistically significant in determining competitive advantage of fashion industry in Ethiopia.

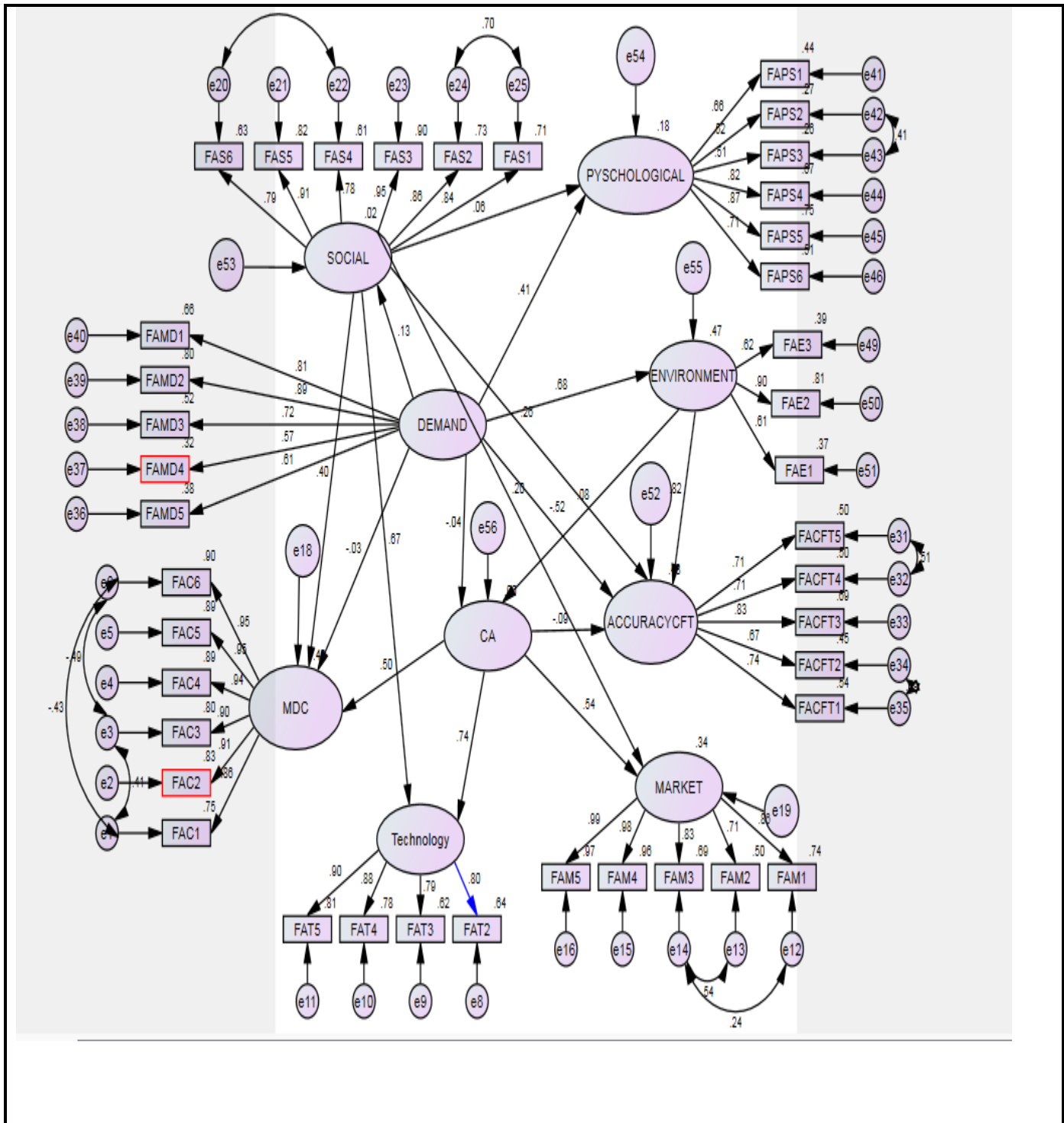
Table 4.36: Regression Weights for Technology Perspectives

Variable	Construct	β Estimate	S.E	t-Value	p-Value
M40	Technology	1.905	.719	2.650	.008
M41	Technology	2.397	.894	2.682	.007
M42	Technology	2.313	.864	2.677	.007
M43	Technology	2.295	.850	2.701	.007

4.8 CFA Over All Competitiveness Through Colour Forecasting Techniques

As Figure (4.4.) shows the value of chi-square for this model is 353.686 which is very high to be accepted and its P-value is significant at 0.00, moreover, the value of the Comparative Fit Index (CFI) is .957, which is greater than the required value for CFI greater than 0.95. These values are in addition to the value of the Random Mean Squared Error RMSEA (.057), where the RMSEA value should be less than .08 for the model fit to be accepted, which indicate that the null hypothesis of the good fit of the model to data could be easily accepted.

Figure 4.4 Over All Competitiveness Through Colour Forecasting Techniques



$CMIN/df=1.94$; $p\text{-Value}=0.00$; $CFI=0.957$; $GFI=0.961$; $RMSEA=0.057$

4.8.1 Model Interpretation

As figure (4.4) shows the appropriate model for the factors that influence competitiveness through colour forecasting techniques in Ethiopia and that fit the data of this study include some factors relating colour forecasting and competitiveness. Technology(T), market(M), market and demand on competitiveness (MDC), and social(S), environmental(E), accuracy of CFT(A), Psychology(P) and market demand(MD). We can express the model in an equation form as follows:

$$CCFT = (CFT + COM)$$

Then the model can be formed as:

$$CCFT = (S+E+A+ P+MD+ T + M + MDC)$$

4.9 Findings and Discussion

To summarize, the chapter has presented systematically the findings and discussion for all objectives of the study. The chapter has ended in providing a summary of key statistics that have been used to prove the hypotheses emanating from each objective; and in doing so; it has presented a linkage among the objectives and hypotheses. It shows that the ANOVA diagnostics, CFA fit indices, structural model coefficients, the β and t value of the variables are all significant; and therefore confidently proving the theoretical model used in the study. In short, it depicts that the technology, market, market demand of competitiveness, social, environment, accuracy of CFT, psychology and market demand are indeed key dimensions in the achieve for Ethiopia firms in the fashion industry to attain competitive advantage.

The internal dimensions constituting of the technology measures and market are proved to be significant as also predicted by the theory discussed earlier. Technology shows that ability to affect price of the product color, flexibility, quality, time and customer as well as use of research are revealed to be key factors. For the market measures the following factors are shown to be important: color forecasting ability to increase e sale strategy, market share, seasonality, enhancing the need of customer and to get brand market have significant on market factors, and competitiveness through colour forecasting affect the Ethiopian fashion industry in global market.

Furthermore, the internal dimension social and environment are the key factors of colour forecasting the ability to affect culture, age, gender, ethnic, educational and nationality, and the internal environmental factors influence the summer, spring, winter, autumn and geographically have positive significance on the competitiveness of colour forecasting. in addition to the internal dimension accuracy of CFT can affecting customer buying decision, bench mark, personality, quality and branding.

Lastly, the internal factors of psychology and market demand can influence the competitiveness through colour forecasting techniques. The internal dimension of psychology shows that the ability to affect personality, social, customer buying behavior, branding image and emotion, and the factors of market demand indicated that the ability to influence easily affecting the new year, wedding, occasional wear, holy day and nation and nationality on the competitiveness through colour forecasting can affect significantly.

Chapter Five

Conclusion and recommendation

5.1 Conclusion

This study aimed at investigating the enhancing competitiveness through colour forecasting techniques taking a case study of fashion industry in Ethiopia. The major conclusion is that the study strongly supports the competitiveness framework developed for this study; based on enhancing competitiveness through colour forecasting techniques, colour forecasting techniques and competitiveness factors.

The use of color can profoundly impact the brand accomplishment of product as much as shape and performance in the global and local markets. Consumer demands, psychological connotations and cultural associations of color may indeed play a factor in color forecasting of each model. In this context, they have developed specific colour forecasting techniques and expand the production strategies to decrease the cost and increase the quality of fashion product. Color forecasting techniques determination process is also one of the most significant sections of the entire design process.

More specifically, the study shows that adoption of firm specific characteristics embodied under the competitiveness model of the study are all significant and critical success factors, the competitiveness model as determined by technology factors, market and market demand of competitiveness are all significant factors that firms need to consider in their competitive strategies.

With respect to the technology measures of colour forecasting are highly influenced by customer, price, time, flexibility and quality to be sustainable in the market. this means that colour forecasting competitiveness of colour forecasting' technology is a crucial factor measure.

For market measures efforts to improve the sale strategy, market share, seasonality, enhancing the need of customer and create brand market have significant factors that fashion industry need to consider in their competitiveness strategy.fashioncolour still have market problem in local and international. In order to, to compete in market, share globally they should put need of customer

colour choice local and international use systematic colour forecasting techniques and increase the quality of colour, flexibility, seasonality and colour forecasting technology to fulfill the need of customer in the branding market. market perspective shows that colour is the first choice then fabric the last one is style.

Lastly, market demand of Competitiveness factors has significant effects on the commercially technology, quality and flexible with the need of customers to achieve customer satisfaction and increase the market size of these fashions, also helps to increasing the quality of a product colour, price, time, and, they are critical factors to innovating new colour brands and developing systematic production technology of existing product. Helps the right product colour quality, at right seasons and at right time to satisfies the customers demand in the market with a full of colour alternatives fabric.

As regard social perspectives is relevant for Ethiopian fashion in determining competitiveness of colour forecasting advantage of the firm. Specially, culture, age, gender, nationality and education all are significant factors on competitiveness of colour forecasting techniques. Because, social the colour preference of consumer. That means is to say cloth colour selection on economic situation, life style of community and fashion trend in the society has its own unique color meaning. Throughout the history, purple has been used by aristocrats, kings, queens and priests in Greece, Russia, Italia and England. Purple robes were symbol of authority and rank. The power of green is undeniably important both in Western and Eastern cultures. It has been recognized as a sign of spring and hope. Finally, each culture has its own unique color heritage and has very different meanings in different cultures and these meanings are transferred to the products.

As regard, environment perspective is relevant for Ethiopian fashion in determining competitiveness of colour forecasting have critical factors of the firm. Specially, summer, spring, winter, autumn and geographical locations are having significant effect on competitiveness advantage. Colour and environment have positive and relationship perception of surrounding influence and emotion.

The psychological factors of colour forecasting are highly influenced by personality, social, customer buying behavior, branding image, emotion and company logo. this means that colour forecasting of competitiveness' psychology is a crucial factor. Furthermore, psychological

reactions differ with respect to age, race, nationality, gender, seasons, locations, economic conditions and personal characteristics.

Lastly, market demand dimensions' crucial factors in competitiveness of colour forecasting a specially, new year, wedding, holy day, occasional wear and nation and nationality are significant effect on competitiveness of colour forecasting techniques. market demand of colour differ from country to country. in China, red and pink have a significant place that is, it is utilized as a symbol of good luck in cultural ceremonies and celebrations. Furthermore, red is associated with future, fertility, life, purity and joy, it was the color of wedding ceremonies not only in India, but also in China and Turkey.

5.2 Recommendation

The fashion industry need to consider acquiring competitiveness advantage to enable them compete in a sustainable and improving. Specifically, firms need to take into consideration both colour forecasting techniques and competitiveness factors in design of competitive strategies as proposed by this study. In doing so, firms need to take into consideration the dimensions of technology, market, market demand of competitiveness, social, environmental, accuracy of colour forecasting and psychology that aims to enhancing competitiveness and to sustainable competitiveness in the global market.

Colour forecasting techniques is situated at the beginning of the fashion supply chain as it is needed by fiber and yarn spinners and fabric manufacturers before fabrics can be manufactured to reduce un necessary colour choice.

To offer Ethiopian fashion members the chance to develop the disposition, values, knowledge and skills for collaboration for successfully applying colour forecasting techniques. The findings from this research show that fashion members working with all designers must have the suitable knowledge and approaches towards colour forecasting techniques. managers, designers, and those who intend to get involved in colour forecasting, should obtain sufficient training in terms of theory and practice.

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Appendix 1

Questionnaires Questions

Addis Ababa University; Institute of Technology

School of Mechanical and Industrial Engineering

(Graduate studies in Industrial Engineering)

Research Title: **Enhancing Competitiveness Ethiopian Fashion Industry through Colour Forecasting Techniques**

Name of the Organization.....Date.....

Participant's Name Age..... Sex.....

Education level.....Job title (Position)

Experience (service in years)

Instructions

1. The questionnaire contains 63 questions and you are invented to do all parts
2. Put (√) symbol on the space provided for questions with Yes or No answers
3. Put(X) symbol for the questions rated with 5-1.

Where; 5=Excellent (High), 4= Very good (moderate), 3=Good (little), 2= Fair (low) and 1=poor (none)

4. Please write your genuine answers for subjective questions or open ended questions

Notice: Please return this questionnaire within two days!

A. Competitiveness

No	Factors affecting technology	5	4	3	2	1
1	Does Price affect the competitiveness of colours forecasting?					
2	Does product flexibility affect the competitiveness of fashion colours?					
3	Does quality affect the competitiveness of colours forecasting?					
4	Does time affect the competitiveness of colours forecasting?					
5	Do customer behaviours affect competitiveness of colour forecasting?					

No	Factors affecting Marketing Questions	Yes	No
6	Do fashion colour forecasting affect sale strategy?		
7	Do colour forecasting techniques affect customers at global market?		
8	Do colour forecasting market is seasonal?		
9	Do you think these colour forecasting enhancing the needs of customers at the Global market?		
10	Do you colour forecasting affect branding market		

No	Factors affecting market demand oncompetitiveness	5	4	3	2	1
A	Quality					
B	Price					
C	Customer					
E	Market					
F	Time					
G	Flexibility					

B. Colour Forecasting

No	Factor Affecting Social	5	4	3	2	1
1	Does culture affect colour forecasting					
2	Does age affect colour forecasting					
3	Does gender affect colour forecasting					
4	Does ethnic affect colour forecasting					
5	Does education affect colour forecasting					
6	Does nationality affect colour forecasting					

No	Factors Affecting Environment	5	4	3	2	1
7	Do colour forecasting affect summer					
8	Do colour forecasting affect spring					
9	Do colour forecasting affect winter					
10	Do colour forecasting affect autumn					
11	Do colour forecasting affect geography					

No	Factors Affecting Accuracy Colour Forecasting Techniques	5	4	3	2	1
12	Does Customer buying decision affect fashion colour forecasting?					
13	Does Bench mark affect fashion colour forecasting?					
14	Does personality affect fashion colour forecasting?					
15	Does quality affect fashion colour forecasting?					
16	Does branding affect fashion colour forecasting?					

No	Factors Affecting Psychological	5	4	3	2	1
17	Do fashion colour affect personality?					

18	Do fashion colour affect Social?					
19	Do fashion colour affect Customer buying behaviour?					
20	Do fashion colour forecasting affecting Branding image?					
21	Do fashion colour affect Company logo?					
22	Do fashion colour affect Emotion?					

No	Factors Affecting Market Demanding	5	4	3	2	1
23	Does colour forecasting affect new year					
24	Does colour forecasting affect wedding					
25	Does colour forecasting affect occasional wear					
26	Does colour forecasting affect holy day					
27	Does colour forecasting affect nation and nationality celebrity					

