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An assessment of market and macro factors that affect forecasting in fast moving consumer goods companies – a case study of Glaxosmithkline

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An Assessment Of Market And Macro Factors That Affect Forecasting In Fast Moving Consumer Goods Companies – A Case Study Of Glaxosmithkline

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the report contains no material previously published or written by another person except where due reference is made in the thesis itself.

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APPROVAL

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ABSTRACT

Forecasting creates an estimation of future demand. Forecasting enables businesses to survive and companies to compete in today's market, by coming up with new advantages, as global competition grows stronger. Despite the vitality of forecasting, GlaxoSmithKline is facing forecasting–related challenges, whereby even after forecasting demand and supply, and reviewing on a monthly basis, a shortfall is experienced month on month and hence consumer dissatisfaction. The purpose of this study was to assess the market and macro factors that affect forecasting in GlaxoSmithKline. The specific objectives were to assess the effects of different market factors and macro factors on forecasting at GSK. Cross sectional research design was used with the population as employees of GSK who are directly involved in product forecasting. The population included production planning team members, sales, marketing team members; demand forecasting team members and the distribution team of GSK. Data collection involved the use of a structured questionnaire which was administered to the respondents by the researcher. Both descriptive and inferential statistics were used for data analysis. The reliability tests of the research instrument were carried out and the overall Cronbach's alpha for market factors which were the independent factor was (0.894), macro factors which were the intervening factor was (0.921) –and accurate market forecasting which was the dependant variable was at (0.943). The findings of the study were that macro factors significantly impacted forecasting at GSK. Market factors impacted on forecasting in GSK, though not rated as highly as macro factors. The study concluded that macro factors like the political indicators, consumer's purchasing power, seasons, promotions, holidays and festivals greatly impacted on forecasting at GSK. The study also concluded that the methods GSK uses to make up for inaccuracies included the use of historic data and reviewing the forecast to cater for the changing trends. The recommendations of the study were that GSK should assess the various political actions that may affect the future forecasting of products. For accuracy in forecasting, GSK should consider the impacts of consumers buying behaviour, competition from similar products, availability of cheaper substitutes, recency effects and consumer purchase power. An area for further research was need for a study on the effectiveness of the forecasting team in undertaking accurate forecasting of products at GSK.

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LIST OF ABBREVIATIONS

ARIMA	Integrated Autoregressive Moving Average
BU	Bottom Up
DRM	Demand Review Meeting
FMCG	Fast Moving Consumer Goods
GSK	Glaxo SmithKline
ModCF	Modular Consensus Forecasting
OTC	Over The counter
P&G	Procter and Gamble
SOP	Sales and Operations Planning process
SRM	Supply review meeting
TD	Top down
UK	United Kingdom

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Dedication

I dedicate this study to my husband and both my families whose immense support has assisted me to successfully complete this study. They have provided utmost love and patience which is beyond remembrance.

God bless them all.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Forecasting is about anticipating the future and planning accordingly. The two primary uses of forecasting are to help managers plan for the system and to help them plan the use of the system. The process of forecasting affects the services to be provided, the facilities and equipment required, the location, planning for supplies and workforce, production, budgeting and scheduling (Ozcan, 2005).

Often companies fail to recognize forecasting as a management function which is responsible for corporate success. Accurate sales forecasting helps the company to meet the demand requirements of consumers. Accurate forecasting can assist the company by not losing sales, avoiding stock out situations and avoid consumers from going to competitors. Likewise, for the company, accurate forecasting can assist in purchasing raw materials at a cost effective price and lower cost logistic services. Similarly, accurate forecasting ensures improvement in the bottom line of the company (Mark, Moon, Mentzer & Smith, 2003).

A mixture of time series, econometrics and economic theory models are employed to produce several forecasts which are interpreted jointly to generate a conclusion of a superior value. Forecasting accuracy is still a critical element of the supply chain that continues to challenge most companies (Vayvay, Dogan & Ozel, 2012).

Results of forecasting usually differ. All forecasting has similar elements but different techniques. The underlying assumption is that past events continue to occur. Due to randomness, the actual results vary from predicted. Short range forecasting is said to face less uncertainties compared to long range forecasting because it can easily respond to changes (Ozcan, 2005).

Forecasting techniques can be categorized as quantitative and qualitative. The quantitative categories include mathematical models like moving average, straight-line projection, exponential smoothing, regression, trend line analysis, simulation, life-cycle analysis, decomposition, Box-Jenkins etc. The qualitative category includes subjective or intuitive models such as executives' opinions, sales force composite and consumer expectations (McCarthy, Davis, Golicic & Mentzer, 2006).

Along with quantitative and qualitative techniques, forecasting models can be categorized as time-series, causal and judgmental. Past data is used as a basis for estimating future result in the time-series model. Decomposition, moving average, exponential smoothing and Box-Jenkins fall in this category. In the causal model, the output is directly affected by some other predictable factors. Regression model falls under this category. Lastly, the judgmental techniques are subjective in which forecasting is based on intuition, opinions and probability. These techniques include Delphi, sales force composite, consumer expectations and simulation (Wilson & Keating, 2009).

Two general approaches to forecasting are top-down (TD) and bottom-up (BU). In the TD approach data is used to forecast, which is then desegregated into individual units, based on historical fraction of sales. In the BU approach, each unit prepares its own forecast which is then aggregated (Widiarta, Viswanathan & Piplani 2007).

Demand forecasting has always been a major problem in production and operation management. Several decision such as inventory management, product development, production and supply chain planning, require forecasts. Recently, demand has tended to become more variable and uncertain. Managing such uncertain demand has posed significant problems for many industrial sectors (Kalchschmidt, Verganti & Zotteri, 2006).

Although predictions are largely used in order not to lose market share, not all companies consider forecasting as a key function within the organization. A survey carried out by McCarthy et al (2006) showed that less and less energy is being put into forecasting. As more energy is put and forecasting methods are used, improvements can be made to attain efficiency in predicting future sales. Various techniques are adopted in forecasting. These include: time series and causal methods and the newer methods like neural networks and generic algorithm in addition to the traditional judgmental methods.

1.1.1 Brief history of GlaxoSmithKline (GSK) in Kenya

GSK Nairobi is situated on Likoni Road in industrial area. It occupies about 33,000 square meters of land and currently employs about 250 employees. The site was originally opened in 1960's as an Over-The-Counter (OTC) medicine factory. It manufactures brands like Hedex, Panadol and Gastro-intestinal powders. In 1995,

when SmithKline Beecham acquired Sterling Health, a soft credit of £2.5 million was extended to Nairobi consumer Healthcare site to cater for the consolidation of manufacturing facilities (Orwochi, 2013).

In 2002, operations were consolidated on Likoni site after the GlaxoWellcome and SmithKline Beecham merger and pharmaceutical liquids were introduced. The site houses three business units': global manufacturing and supply, Pharma and consumer commercial. Key brands on the site are OTC medicines such as Panadol range, Hedex, gastro-intestinals such as Actal Tums, Eno and Andrews liver salt. Others include Cofta, Aquafresh range, pharmaceutical solutions and suspensions such as Piriton expectorant, Scotts range and nutritional health drinks such as Lucozade energy and Ribena range both in bottle and TetraPak packaging (Orwochi, 2013).

1.1.2 The process of forecasting at GSK

Currently, forecasting at GSK is done by using the statistical model with a mix of judgmental, seasonality and trending. The sales and marketing team together with the demand forecasting team looks at the past 12 months' of sales and response from consumers in terms of demand and then make a decision on what percentage to add for the coming years. The plan is locked for a period of 30 days i.e. no changes are allowed to be made for 30 days once the plan has been agreed and approved. The forecasted plan is reviewed on a monthly basis. However this is only theoretical. A percentage growth per year per region is realized. Together with using a percentage to increase demand, seasonality, market intelligence and promotions are used as well (Orwochi, 2013).

On the first and second calendar day of each month, the baseline forecast is generated from the system. Historical data on how the company performed in terms of sales and the closing stock is generated. Once this data has been generated, modular consensus forecasting (Mod CF) is used to run a report to forecast on what should be produced for the next month. Then from the 3rd to 7th calendar day of the month market intelligence is provided by a commercial team to modify the statistical forecast. Once the modification is done, a new forecast is generated. The market intelligence team gives information such as promotions from other companies, out of stocks of other companies, new marketing techniques of other

companies, and so on. This forecast is then discussed at the commercial review meeting and put into the system. A rolling forecast for 24 months is generated each month (Forecasting SOP at GSK, 2003).

Once it is put into the system, it is discussed in the Demand Review Meeting (DRM). In this meeting, head of commercial and heads of sales, challenge the figures based on previous month sales and promotions calendar. Once the final figure has been discussed and agreed upon in the DRM, they are forwarded to SOP (Sales and Operations Planning process). The plan once put in the system is static for a period of one month, where no changes can be made to the plan. In the SOP, the production planning team together with the production team discuss what needs to be supplied and if it is possible to supply in terms of availability of raw materials and packaging materials as well as machine capacities. The discussion from SOP is fed back to the DRM and forwarded to the Supply Review Meeting (Forecasting SOP at GSK, 2003).

1.2 Statement of problem

Forecasting is very important for organizations since it creates an enabling environment to meet the upcoming needs of the consumers. Bursa (2009) confirms this by saying that the basic purpose of forecasting is to create estimates of future demand. Organizations recognize the importance of gaining visibility and predicting consumer demand. Therefore they actively seek best practices to creating and improving their forecasts (Kaperi, 2011). Forecasting enables businesses to survive and companies to compete in today's market, by coming up with new advantages, as global competition grows stronger (Karnani, 2007). Therefore, companies need to continuously improve on the efficiency of their entire value chain in order to respond to the rapidly changing demands (Nordas, 2004). Due to these rapidly changing demands of the society a heavier role is played in future sales, also known as sales forecasting (Karnani, 2007).

Different scholars have different views about forecasting where (Sloman and Suteliffe (2000), Wolfers and Zitzewitz (2004), and Pilinkien (2008) suggest that forecasting should predict, project and assess the future events of a company which are within the company's control and other scholars like Hirschey and Pappas

(2009), strongly suggest that forecasting must include the tendency to be able to predict concretely the future sphere of the company's activity. There is also a lack of consensus on appropriate timelines for forecasting where Klassen et. Al (2001) suggests that monthly forecsting is the most common practice but Stevenson (2012) suggested that monthly forecasting was best used for operations and long term forecasting for new products. In addition to that there is lack of clarity on the type of forecasting methods to use while forecasting. Various scholars have outlined multiple factors that affect forecasting in FMCGs. Consumer buying behaviour (Ramanathan and Muyldermans 2010); homogenous markets (Lee, Padmanabhan and Whang 2004; Kalchschmidt et.al 2006); competition (Daruvala 2006, Wedel and Kamakura 2012);Recency effect **(**Croson and Donohue 2006) and availability of cheaper substitutes (Armstrong and Green 2005). However, the extent to which these methods should be used, collaboratively, to counter the effects of the different market factors and enhance forecasting, especially with regard to fast moving consumer goods, is not mentioned.

Despite the vitality of forecasting, GlaxoSmithKline is facing forecasting–related challenges, whereby even after forecasting demand and supply, and reviewing on a monthly basis, a shortfall is experienced month on month and hence consumer dissatisfaction. Apart from consumer dissatisfaction there is also an element of planning.The inaccuracy in forecasting, leads to inaccuracy in materials and labour planning. Materials eventually have to be airlifted in order to accommodate the additional products which need to be produced. The labour is forced to work overtime which in turn costs the company overtime expenditure and hence higher cost of goods (GSK annual forecasting report, 2014).

It is therefore necessary that the management of GSK knows forecasted sales for each month before the month for purposes of production planning. Considerable empirical studies have been performed on forecasting practices of a firm, however, research on market and macro factors that influence forecasting in FMCG companies in Kenya is scarce (Winklhofer & Diamantopoulos, 2002). There is a need to understand these market and macro factors that affect the original plan, and which forecasting techniques to use in order to address these market and macro factors.

1.3 Main objective of the study

The study was aimed at assessing the market and macro factors that affect forecasting in fast moving consumer goods companies: a case study of GlaxoSmithKline.

1.3.1 Specific objectives

Based on the broad objective above, specific objectives of this research were to:

1. Evaluate the effects of different market and macro factors on forecasting at GSK.
2. Assess how the organization is making up for the inaccuracy in forecasting.
3. Determine the various ways of improving forecasting at GSK.

1.4 Research questions

1. How do different market and macro factors affect forecasting at GSK?
2. How does the organization make up for the in-accuracy in forecasting?
3. Which are the various ways of improving forecasting at GSK?

1.5 Scope of the study

The study was focused on Glaxo Smith Kline, an FMCG company in Kenya. The study focused on over-the-counter drugs like Eno and Panadol range of products which includes Panadol blue, Panadol extra and Panadol advance. Sales data used was for a period of 36 months from June 2012 to June 2015. The production planning team, demand forecasting team, distribution team, sales and marketing team formed the targeted. GlaxoSmithKline was the organization of study due to its unique nature. It sells a combination of both fast moving consumer goods as well as pharmaceutical goods. There is no other organization in Kenya that is of a similar nature. Hence observations from other companies could not be directly implemented on GSK.

1.6 Significance of the Study

This study will be beneficial to the following groups of people:

The first beneficiary is the company itself – GSK. The study elaborates on the types of forecasting methods to adopt in order to reduce stock outs and enhance consumer satisfaction. This ensures that the company faces none or less stock outs and maintains the company's reputation. The distributors of GSK products benefit

because they will have a constant supply of goods to sell to their consumers. The consumers will benefit because they are assured of availability of GSK products and hence they need not get worried about looking for substitute products. The suppliers to GSK also will benefit as they are sure to receive constant orders for raw and packaging materials. In addition they will have sufficient time to plan for deliveries of raw and packaging materials due to accurate lead times and no pressure of deliveries. Other Fast Moving Consumer Goods companies whose goods resemble goods that are manufactured by GSK will benefit by adopting some of the tips for forecasting from GSK to reduce both stock outs and high cost of inventory. Scholarsin the field of marketing may also extend this study to determine other market factors that influence forecasting.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter defines forecasting, the need to forecast and when to forecast. It gives a description of various forecasting methods and their classification. The different market and macro factors together with their effects on forecasting are also discussed here. The chapter concludes on how industries make up for inaccuracies in forecasting and the conceptual framework for this study.

2.2 Definition and importance of forecasting

Forecasting is defined as the production of future events based on known past value of relevant variables (Makridakis, Wheelwright & Hyndman, 2008). Sundberg (2009) defines demand forecasting as the central piece of the operations of a modern firm. It is the decision making tool which takes into consideration various forces and hence justifies decisions. Karsten (1990) went ahead to define forecasting not as a process, but rather a constant resuming activity emphasizing apprehension and assessment of general economic tendencies. Pilinkiene (2008) supplements the previous conception of forecasting as establishing of the future course of researched process, emphasizing availability of practical experience and traditional theoretical background. Granger (2000) defined forecasting as getting information about future economic indices.However, he did not name the tools or ways to realize the process. The main idea of forecasting is to make predictions and estimate the future demandof products and services inpotential market for the coming period. It is also important to understand the environment in which the company shall conduct its activities (Sundberg, 2009). Forecasting is based on the history order of a consumer (Lee, Padmanabhan & Whang, 2004). However, the processes of good forecasting lacks arewarding system i.e. successful forecasters are not given rewards in the form of discounts for clients and bonuses for sales people (Sundberg, 2009). Further, Sundberg (2009) also mentions that even if forecasting is good, there may be situations where the goods are unavailable to the consumer. Availability of goods to consumers can be improved through inventory management.

Literature has shown two different attitudes of forecasting: from the analysis of conception of forecasting and from the viewpoint of microeconomics. In the opinion

of some theorists like Sloman and Suteliffe (2000), Wolfers and Zitzewitz (2004), and Pilinkien (2008) forecasting should take place in order to predict, project and assess the future events or conditions which are not under the control of the company. But on the other hand other theorists like Hirschey and Pappas (2009) strongly suggested that forecasting must include the tendency to be able to predict concretely the future sphere of the company's activity.

2.2.1 Reasons for forecasting and when to forecast

The main purpose of forecasting is to estimate the upcoming demand in order for the company to make plans to create the products. The goal is to create as accurate forecasts as possible.Accurate forecasts can be very profitable as it helps companies to meet the upcoming demand (Kaperi, 2011). If forecasts are too low, profits are most likely lower due to lost sales. Forecasts which are too high will create excess inventory which will increase the inventory carrying costs and products might have to be sold at a discount and discarded as obsolescence (Jain 2007).

Forecasting assists with long term planning and budgeting. Forecasting enables us todevelop foresight of what is yet to come and evaluate the extent, direction,and impact of the change. Forecasting is also made useful in knowing the factors that affect the organization even when the future is uncertain and when there is a time lag between the occurrence of an event and awareness of the same (Makridakis, Wheelwright & Hyndman, 2008). Lee, Padmanabhan and Whang (2004) say that forecasting is done for production scheduling, capacity planning, inventory control and materials requirement planning. It also assists to identify the potential opportunities and challenges in the business environment (Hamel & Prahalad, 2013).

Forecasting assists to reduce the bull whip effect (So & Zheng, 2003; Zhang, 2004). Zhao et al. (2001) also said that forecasting increases the possibility for the supplier to smoothen out production, optimize its resources, decrease costs, and improve the effectiveness of retailer's sourcing strategy. Furthermore, Mattila et al. (2002) said that forecasting reduces loss of sales and consequently results in increased profit margins. Sundberg (2009) in his study stated that demand forecasting offers the consumer higher value yet making the operations more profitable. It gives the

information needed, about buffer stocks, to the inventory management process, to overcome fluctuations in demand and also ensures that no unnecessary stock is carried (Sundberg, 2009). Stevenson (2012) mentioned that forecasting affects many decisions throughout the organization, in accounting, finance, human resources, marketing and management information systems as well as operations.

The most common time horizons for forecasting are yearly, monthly or daily. Producing forecasts on a monthly basis was found to be the most common practice. (Klassen et al, 2001). A study done by Klassen et.al (2001) also showed that the more distant the time horizon gets, the fewer models will be trusted and used. A similar view was again presented which stated that forecasts are made with reference to a specific time horizon, which could either be short i.e. an hour, week or month or it may be somewhat long i.e. next six months, next year, next five years or the life of the product or service. Short term forecasting is generally used for purposes of operations and long term forecasts are used for the purposes of new products or services, new equipment, new facilities etc. (Stevenson, 2012).

2.2.2 Different forecasting methods

Forecasting methods are broadly classified into qualitative and quantitative. Qualitative methods are intuitive and are largely based on educated guesses and not on past data. The quantitative methods of forecasting are based on mathematical or statistical models (Abraham, 2005).

2.2.2.1 Qualitative methods

Qualitative methods include judgment methodswhich are based on the opinion and estimates of managers, experts, sales personnel, or consumers (Krajewski et al. 2007). These people use their experience, opinions, judgment and estimates to predict sales and these predictions are then translated into quantitative forecasts (Kahn 2006). Makridakis et al. (2010) comments that empirical evidence has shown statistical forecasting models create better future forecasts than human judgment. Still it is good to remember that usually accuracy of the forecasts can be increased by using both qualitative and quantitative methods (Jain, 2007). The following judgment methods are briefly explained in this section: Consumer/market research, Jury of executive opinion, Sales force composite, Scenario analysis and Delphi

method. These techniques are usually quite easy to initiate.However implementation can be quite time consuming and difficult due to the employee involvement needs (Kahn, 2006).

Consumer/Market Researchis a forecasting method which predicts consumer interest by creating and testing hypotheses through data-gathering surveys (Krajewski et al. 2007). Consumer/market methods are divided into four general categories, which are: concept testing, product use testing, market testing, and premarket testing (Kahn 2006). These methods are used to gather and analysedata to make determinations.

Jury of Executive Opinionis a forecasting method in which knowledgeable professionals and experts provide ad-hoc demand predictions about the future demand. These predictions are provided for the highest level and then distributed accordingly which makes this a top-down forecasting method (Kahn 2006). According to Krajewski et al. (2007), the main factor in using this method effectively is to make certain that the forecasts are not created by individuals but as a consensus among the experts with a single forecast.

Sales Force Compositeis a forecasting method which combines individual staff sales predictions for their own sales district into an overall forecast. In some cases the best forecasts are attained from people closest to the external consumer (Krajewski et al. 2007). Sales people know their consumers wants and needs very well therefore the responsibility of forecasting is often given to them. This method is opposite from the previous method, Jury of Executive Opinion, therefore this technique is called bottoms-up forecasting approach (Kahn 2006). This process is very time consuming and also has a greater possibility of intentional bias (Gilliland & Guseman 2010).

Scenario Analysisisa narrative forecasting method which does not produce a numeric forecast. The purpose of scenario analysis is a representation and description of a future state. This forecasting methods offers two approaches, exploratory or extend approach and normative or leap approach. In the exploratory approach the forecast planner uses current market occurrences and trends to predict

the future. The normative approach creates predictions of the future without consideration for the current trends (Kahn 2006).

In the Delphi Methoda panel of experts, anonymously provides projections and comments and these are then combined and sent back to the panel members. Experts can then view predictions of the other members of the panel and they have an opportunity to adjust their own projections. This process is repeated until consensus is reached (Krajewski et al. 2007). This method aims to minimize the effects of social pressure, by maintaining an anonymous panel of members (Kahn 2006). This is a way to try to avoid bias in the initial forecast. The Delphi method is time consuming and is not very appropriate for a situation where there is need to create a large quantity of forecasts. For these reasons the Delphi method is not a very common forecasting technique (Gilliland & Guseman, 2010). Judgmental method is a subjective method that relies on intuition, opinions and probability to derive forecasts. Delphi method, sales force composite and consumer expectation are used as techniques in judgmental method (Winklhofer et.al, 2002). Dalkey and Helmer (1963) first applied Delphi method in 1963. It is dependent on the accumulated experience of experts, and involves assembling a panel of experts from different disciplines in order to obtain a group consensus on a likely outcome of future events. When changes of a large and unprecedented nature are taken into consideration by forecasting experts, in case of long term forecasting, qualitative forecasting techniques such as the Delphi model are particularly suitable (Lee, Song & Mjelde, 2008). Sales force composite method employs the knowledge of sales persons in forecasting. The sales force themselves estimate the quantities the clients would request.

2.2.2.2 Quantitative methods

The quantitative methods of forecasting are based on mathematical or statistical models (Abraham, 2005). The statistical forecast methods assume that a historical pattern of demand is a good indicator for the future. These methods can be successfully applied when the historical data is reliable and the environment in which they are being applied is stable (Petrovic, Xie & Burnham, 2006).

The different quantitative forecasting methods include time series decomposition, exponential smoothing method, simple regression method, multiple regression method, Box-Jenkins method, and advanced forecasting models like ARIMA (Makridakis, Wheelwright & Hyndman, 2008).

Time series decomposition method manifests in two ways; one is the seasonal variation and the other is trend variation. Seasonality is a recurrent and periodic trend which is as a result of factors such as holidays, weather, repeating promotions and behaviour of economic agents (Zhang & Qi, 2005). The time series for trends is considered to be non-stationary and hence has to be made stationary before any modelling and forecasting is done. For effective decision making in retails, marketing, production, inventory control, personnel and other business sectors, accurate forecasting of seasonal and trend time series is very important (Makridakis, Wheelwright & Hyndman, 2008).

Brannon (2005) defined time series technique as a quantitative technique, in which values recorded at regular time intervals are used to predict future values. Time series techniques are statistical methods which use historical sales datathat contain a relatively clear and stable relationship and trend. Time series is used to identify seasonality, cyclical patterns as well as trends. Time series method assumes that the future will reflect the past which also suggests that the past demand patterns will continue in the future. This assumption is usually correct for the short term and time series is most appropriate for the short range forecasting. Two commonly used approaches for time series are moving average and exponential smoothing (Brannon, 2005). Box-Jenkins method is a time series method which refers to a systematic method of identifying, fitting, checking, and using integrated autoregressive, moving average (ARIMA) time series models. The Box- Jenkins method is appropriate for time series of medium to long length.

Exponential smoothing method is a way to conduct weighted moving average and the technique is based on the estimation of future sales on weighted average of the previous forecast levels. The new forecast is based on the previous forecast and modified by a fraction of the difference between the old and new sales realized (Bowersox, Closs & Cooper, 2010). Exponential smoothing method is used for

forecasting demand in a routine stock control system when a large number of products are involved. This method assists to reduce doubling the quantity really needed by determining quantity demanded at regular intervals (Gardner, 2006). Exponential smoothing method cannot distinguish between seasonality and random fluctuation and hence the need for judgment (Bowersox et al., 2010).

Simple regression method and multiple regression method are causal techniques. Causal techniques are quantitative methods used for investigating the cause and effect relationship between two or more variables. Forecasting in causal techniques is done using regression, where the cause and effect of one variable on another is studied for example the effect of price change on the demand of a product. This is done by collecting data for the variables of interest and then using regression analysis to estimate the quantitative effect of the independent variable on the dependent variable (Chase, 2009). In case of forecasting for a single variable, simple regression is used, and if there is more than one forecasting factor then multiple regression is used. Since causal techniques have the ability to effectively consider external factors, such as changes in the economy, it is most suitable for long term forecasting (Bowersox et al., 2010).

Kuo, Wu and Wang (2002) stated that quantitative, statistical methods, such as regression modelling and ARIMA, are good candidates for making decisions, however, these methods are only useful for data that is seasonal or cyclical, but not for special cases such as promotions. Huang (2009) showed that statistical methods frequently fail to capture components of random variability in demand. Quantitative forecasting methods have some disadvantages, which include lack of expertise, leading to misspecification of the functional form, linking the dependent and independent variables together, which results in a poor regression. Quantitative forecasting methods require collection of a large amount of data, without which accurate predictions may not be achieved. Nonlinear patterns are difficult to capture using quantitative forecasting methods. Sometimes outliers can bias the estimation of the model parameters (Garetti & Taisch 2009).

2.2.3 Macro factors and their effects on forecasting

The most important macroeconomic indicators are changes in interest rates, exchange rates, unemployment, and aggregate demand. On average, roughly two-thirds of the changes in the local banks' aggregate financial performance, can be explained by changes in the macro environment (Clair, 2004).

Various macro factors include political factors, purchasing power of the consumer, seasons, promotions, holidays, festivals, demographics and economic factors like inflation rate and unemployment rates.

When forecasting for the next year, it is important for the company to understand the various political actions that may occur in the coming year. It is important to consider how the current political climate looks like in terms of what kind of policies are in place and stability of the government. It is also necessary to consider if the company is prepared for changes in regulation and tax-rates (Fregert & Jonung, 2005). They are influenced by the global, regional and national politics, as well as public sector programs and lobbying.Therefore it should not be disassociated from forecasting (Armstrong, 2001).

Purchasing power is especially important when a company is considering expanding its market and setting processes in the new market (Fregert & Jonung, 2005). Globalization as well as positive or negative developments in the economy has an effect on forecasting. Purchasing power of a consumer is his ability to buy and this can be measured by the income of an individual in monetary units. Once the cost of the product is known and the consumer has the three variables of demand namely: need, willingness and the ability to buy; demand for a product is positive (Chendroyaperumal, 2008).

Seasons like Christmas and other holiday seasons result in erratic purchasing patterns. A study conducted by Lee, Padmanabhan and Whang (2004) showed that during Christmas of 1992 and 1993 demand for Motorola handsets was very high and even distributors were unable to meet those demands. Due to that effect distributors over ordered towards the end of 1994 and Motorola reported very high sales for quarter four 1994. However, dealers were swamped with inventory and

orders were not as healthy as before. Motorola stocks fell almost 10% (Lee et al., 2004).

Ramanathan and Muyldermans (2010) attempted to relate sales demand to promotional factors. The various types of promotion factors taken into consideration include sales price discount with advertisement, on-shelf discounts without advertisement and coupon discounts. Promotions can improve normal sales alone or in conjunction with other factors such as holidays, temperatures and display locations (Fildes, Nikolopoulos, Crone, & Syntetos, 2008). Effectiveness in sales as a result of promotions is reflected through increase in volumes of sales during the period of promotion and therefore it is important to study the effect of the various factors individually (Divakar et. al, 2005). Dube (2004) also says that promotional sales forecasters need good knowledge of the local market such as the behaviours of the consumers and their buying habits. Studies carried out by Kalchschmidt et.al (2006) showed that in case of retail stores, proper forecasting of demand during periods of promotion were critical. It has an impact on performance in terms of sales as well as inventory management and distribution planning.

However in fresh food businesses, promotional activities highly affect both sales and planning activities,which in turnaffected forecasting because fresh foods have an average shelf life of two to three weeks. In a typical FMCG model company, each product has several competing products in the same product line, which equally satisfy the consumer's wants. Planning for these promotions with different price structures requires great deal of information sharing between partners which are the suppliers and retailers. This information sharing can improve the availability and flow of goods in the supply chain (Cachon & Fisher 2000).

However, the benefit of information sharing highly depends upon the quality and proper use of the available data (Forslund & Jonsson 2007; Li & Wang, 2007; Raghunathan, 2001). Ramanathan and Muyldermans (2010) research showed that promotional calendars,that show product/product families on promotion, timing and duration of the promotion as well as the type of promotions and price discounts were used. Promotions result in forward buying by distributors and suppliers during times of price discounts. This results in over purchasing and stocking of

products. Due to these effects of forward buying, a false picture is drawn to the forecasters at the manufacturing plant. Promotions come in the form of price discounts, quantity discounts, coupons rebates as well as payment terms. These promotions can be very costly to the supply chain because when the prices are low consumers buy in large quantities even if these quantities are not needed. When the price of the product returns to normal the consumer stops buying until the inventory is depleted. As a result of that the consumption pattern gets distorted and reflects an incorrect picture and hence the bullwhip effect (Lee et al., 2004).

Price reduction and promotions have a potential of boosting sales, but they also cause brand switching and stock piling, which increases the variation in product sales and hence makes it more difficult to forecast for sales. Together with this, price reduction and promotion of one set of goods, can have a negative effect on another set of goods which still affects forecasting (Ailawadi, Beauchamp, Donthu, Gauri & Shankar, 2009).

The continuously changing demographics, in terms of changing age composition, change in distribution of population the change in disposable income and also change in consumption habits affect effective forecasting (Armstrong & Green, 2005).

2.3 Market factors and their effects on forecasting

There are many market factors that affect forecasting. Some of which include consumers buying behaviour, recency effect, availability of cheaper substitutes and competition.

The consumers themselves contribute to forecast inaccuracy. The consumer is increasingly becoming highly demanding, with respect to faster response time, shorter product cycle time, customized products and services (Hudnurkar, Jakhar & Rathod, 2014). But then again it is very important to know consumer demand and their preferences for the purposes of planning and forecasting, which in turn are important to avoid lost sales and excess inventory (Ramanathan & Muyldermans, 2010). Lee, Padmanabhan and Whang (2004) state that consumers greatly engage in forward buying as a result of price fluctuations e.g. price discounts, coupons,

rebates etc. in the market place. Forward buying becomes a norm when the prices drop, and consumers stop purchasing goods when the price returns to normal. This in turn causes fluctuations on forecasting. Also the structure of the supply chain has a great effect on demand forecasting. If the supply chain is complex i.e. it has many distribution channels, where some consumers are managed directly, others through distributors and others through retailers or other dealers, it makes it difficult to maintain accuracy in forecasting (Kalchschmidt et al., 2006).

Kalchschmidt et.al (2006) also stated that in a homogeneous market, companies usually solve the problem of balancing the trade-off between the costs of information gathering and forecast error by focusing their efforts on their most important consumers, who, in many cases, are also the primary source of demand variability. The consumers cause a misconception to the supplier through repeated purchase, which results into bullwhip effect.This is of course slightly exaggerated to cater for safety stock. The distributor in turn orders a slightly higher quantity in order to cater for his own safety stock in order to avoid stock outs. Consumers further contribute to the bullwhip effect due to their erratic ordering and consumption patterns (Lee et al., 2004). Forecasting for the market size is influenced by several environmental factors such as economic conditions, population, ability to purchase, social trends, technological change or government legislation.

It is also important to understand the consumer. The consumer may be a distributor or supplier. It is important to involve them in the forecasting decisions. It is also important to understand their needs, time horizons and at which stage they will be involved in making certain decisions. Different consumers require forecasts for different purposes, with varying time horizons and a level of accuracy. For each consumer a separate forecasting process should be used in order to ensure forecast accuracy (Armstrong, 2001).

Competition also influences the process of demand forecasting. Demand forecasting becomes challenging in a highly competitive market especially where demand for products depends on the number of competitors existing in the market. There is always a risk of new entrants. Changing pricing policies of competitors, makes it difficult to estimate the exact demand of products. Also technology adoption by

competitors leads to changes in sales of their products, and change in demand of products.Hence the difficulty in forecasting. Knowledge about new competitors, new locations for existing competitors and mergers assist in making forecasting decisions easier. By being up-to-date with their competitors, a company can improve their forecasting accuracy and also save some capital (Daruvala, 2006). Wedel and Kamakura, (2012) said that companies can generally know their competitors volume of sales, turnover and market share but cannot ascertain their advertising campaign and influence of branding.Hence this cannot be incorporated into the forecasting plan.

Bayus, Kim and Shocker (2000) stated that single-product models are concerned only with the forecasting of sales growth for a single product. Usually new products are not introduced in a vacuum and nor do they exist in isolation. It is therefore important to note that the existence of other products may influence, positively or negatively, the sales of a new product. The rates of a company against its competitors in terms of market share, research and development, quality, pricing, sales financing policies and public image also affects forecasting. Together with this, the forecaster also evaluates the quality and size of its consumer base, to determine brand loyalty response to promotions, economic viability and credit worthiness. This in turn informs us, if a consumer would repeat a purchase (Kress & Snyder, 1994).

Competition has become intensive as a result of fast changing market conditions.This has given rise to the necessity of solving relevant business bearing problems using demand forecasting information, connected with general market demand. The general experience with forecasting, in a dynamic competitive market, determines inaccurate results of the analysis of the market demand, and hence invalid decisions connected with the companies' activities. This gave rise to the necessity of comparing present structures of the market demand forecasting and, on that ground, forming the principles of efficient forecasting of market demand in competitive market (Pilinkiene, 2008).

Recency effectis defined as a situation whereby, participants overweight more recent information, compared to information received in the distant past (Croson &

Donohue, 2006). Due to this the inventory stocks would differ in different time periods and would not match with the current demand of the consumers (Croson & Donohue, 2006). Roohani (2003), states that in recency effect greater weight is ascribed to later information as compared to earlier information in a sequence of releases. Also, a positive news release has a greater positive impact on the stocks and hence on the business of a company, compared to a negative news release. Due to this more goods would be bought and hence this would affect forecasting (Roohani, 2003).

If a particular product has a substitute that is readily available, it again causes a difficulty in forecasting, as there is no control over the substitutes price changes(Armstrong & Green, 2005).

2.4 How industries make up for inaccuracies in forecasting

Ailawadi et al (2009) and Aviv (2007) suggest that there is a great need for more intense collaboration for promotional planning, forecasting and replenishment, in order to avoid stock-outs, as well as excess inventory. Several businesses have been successful, due to supply chain collaboration as an important strategy in business, as well as exchanging information to improve sales performance (McIvor et al., 2003; Mc Carthy & Golicic, 2002). In addition to that the frequency and level of wholesale price discounting must be reduced. Major manufacturers like P&G, Kraft, and Pillsbury have moved from price discounts to everyday low price strategy. This in turn has resulted in P&G greatly benefitting in terms of highest end of year profits and increased market shares (Lee et al., 2004).

A study conducted by Ramanathan and Muyldermans (2010) on a soft drink company in UK, showed that the company encouraged information sharing and collaborative forecasting with its retailers in order to improve forecast accuracy, timely replenishment of goods, inventory management and cost reduction. The same study further established that a promotional calendar showing the products (or product families) on promotion, the timing and duration of the promotions, with the types of promotions and price discounts should be adequately displayed for visibility (Ramanathan & Muyldermans, 2010). The same study also suggested that during a promotional event the actual sales and inventory levels are monitored

closely, in order to release only the right amount of products into the distribution channel, to prevent stock outs.

For seasonal time series decomposition methods to be successful in a business, seasonal variations must be removed using certain seasonal adjustment methodsand then the models are scaled back, using the estimated seasonal effects for forecasting purposes. The classic decomposition method, for example, decomposes seasonal time series into trend, seasonal, cyclical and irregular components. The seasonal influence is estimated and removed from the data first before other components are estimated (Zhang & Qi, 2005).

McCarthy, Davis, Golicic & Mentzer, (2006) suggested that simple mathematical models, such as simple moving average and simple exponential smoothing, can beeffectively used in a food service industry.However seasonality needs to be taken into consideration in order to avoid wastage or shortages of personnel, materials, facilities and consumer satisfaction. Furthermore judgment is also used, in order to improve forecasting (McCarthy, Davis, Golicic & Mentzer, 2006). Combinations of use of management techniques, as well as behavioural decision theories that combine economics with psychology, are likely to be more useful in competitor analysis. Usually forecasting techniques that employ expert opinions, intention surveys, role playing and expert systems are recommended to be used for forecasting (Hanssens, Parsons, & Schultz, 2003).

Companies can survive through inaccuracy in forecasting by understanding the causes of the bullwhip effects. Once the causes are understood, strategies to mitigate the same can be put into place. Various initiatives have been taken by companies to resolve the issue of the bullwhip effect. These include information sharing, channel alignment, and operational efficiency. In information sharing, information at the downstream site is immediately transmitted to the upstream site in a timely fashion. With channel alignment there is coordination of pricing, transportation, inventory planning and ownership between the upstream and downstream sites of the supply chain. Operational efficiency refers to activities that improve performance, such as reduced costs and lead times. Further to this, forecast inaccuracy can be overcome

by directly selling to the consumer, bypassing the distributor as seen in the case of Apple and Dell (Lee et al., 2004).

Generally companies overcome forecasting inaccuracies by dampening the trend over the forecasting horizon, use more than one method for forecasting,use of simple forecasting methods rather than complex forecasting methods, use data of actual behaviour rather than judgments or intentions to predict behaviour (Armstrong & Green, 2005). Sekhri, (2006) also suggested that inaccuracies as a result of political issues, can be overcome by identifying the political issues, and then developing a strategy to manage them. These should be documented and be supported with evidence, which has been agreed upon. Companies also use the rolling forecast as a standard practice. Operational forecast can be updated monthly, quarterly or more frequently as the need may be. Further to this companies adopt governance policies together with evaluation of the forecast accuracy. Opinions of both current and potential consumers should be sought through market research processes, using survey and panel analysis of the past events, in order to understand what is happening in the market segments. These consumers may include retailers, wholesalers, agents and other gatekeepers (Sekhri, 2006).

2.5 Conclusions and research gap

Different scholars have differing viewpoints on the need for forecasting. In the opinion of theorists like Sloman and Suteliffe (2000), Wolfers and Zitzewitz (2004), and Pilinkien (2008) forecasting should take place in order to predict, project and assess the future events or conditions, which are not under the company's control. But on the other hand, theorist like Hirschey and Pappas (2009), strongly suggest that forecasting must include the tendency to be able to predict concretely the future sphere of the company's activity. This study has attempted to reconcile the differences.

Scholars also seem to lack consensus on the appropriate timelines for forecasting. The most common time horizons for forecasting are yearly, monthly or daily. Scholars such as Klassen et.al, (2001) suggest that producing forecasts on a monthly basis was found to be the most common practice. Stevenson (2012) on the other hand indicated that short term forecasting is generally used for purposes of

operations and long term forecasts are used for the purposes of new products or services, new equipment, new facilities and so on. Reconciling this gap was attempted in this study, which will assist in identifying various ways and durations of improving forecasting at GSK.

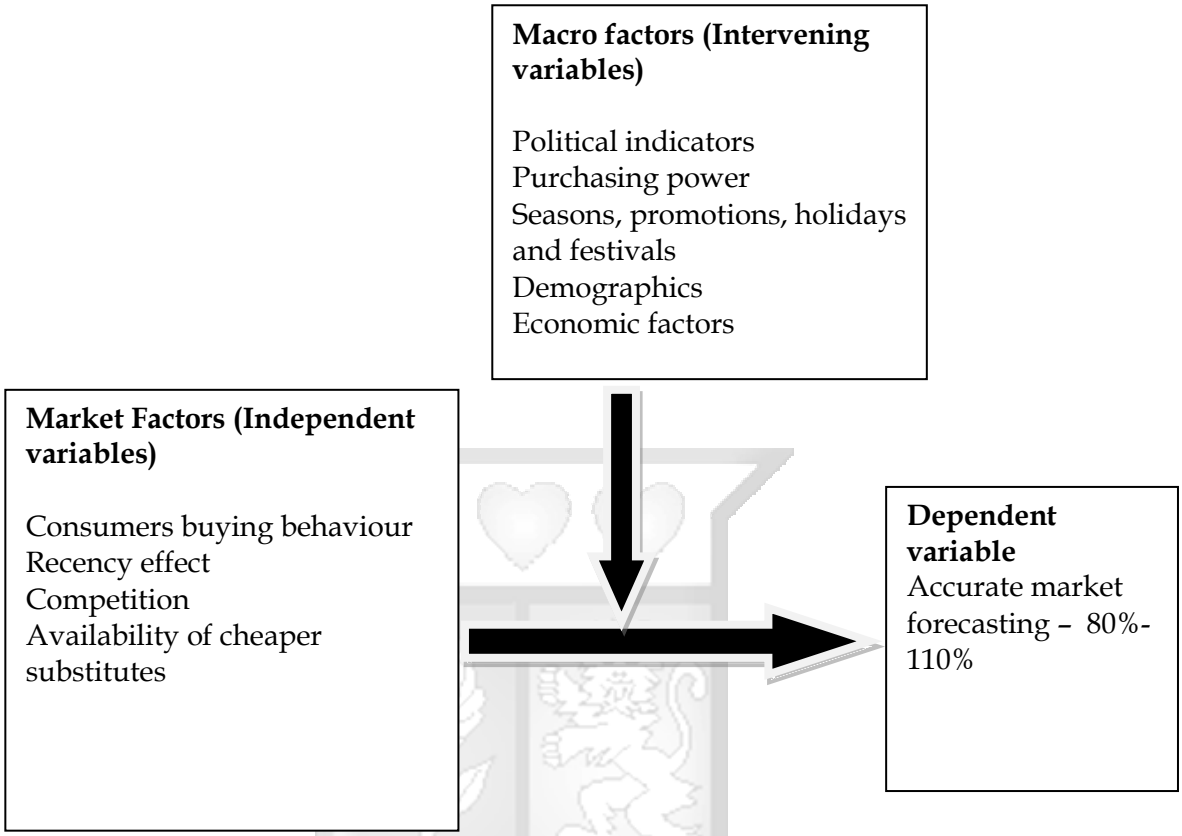
There is lack of clarity among scholars on the best methods for forecasting for FMCG companies like GSK. Whereas Huang (2009) showed that quantitative forecasting methods have some disadvantages, which include lack of expertise, that may lead to misspecification of the functional form linking the dependent and independent variables together, which results in a poor regression. Jain (2007) insists that it is good to remember, that usually accuracy of the forecasts can be increased by using both qualitative and quantitative methods. The gap of identifying the mix of methods of forecasting in GSK was filled in this study.

Various scholars have outlined various factors that affect forecasting in FMCGs. Consumer buying behaviour (Ramanathan & Muyldermans 2010); homogenous markets (Lee, Padmanabhan & Whang 2004; Kalchschmidt et.al 2006); competition (Daruvala 2006, Wedel & Kamakura 2012); Recency effect (Croson & Donohue 2006) and availability of cheaper substitutes (Armstrong & Green 2005). However, the extent to which these methods should be used collaboratively, to counter the effects of the different market factors and enhancing forecasting, especially with regard to fast moving consumer goods, is not mentioned. This gap was filled by establishing the contribution of different market factors on forecasting at GSK.

From the literature review there was evidence that consumers buying behaviours, competition, seasons and promotions were factors that greatly affect forecasting. Hudnurkar, Jakhar and Rathod (2014), Ramanathan and Muyldermans (2010), Lee (2004), Padmanabhan and Whang (2004), Kalchschmidt et al (2006), and Armstrong (2001) mentioned the need to consider consumers buying behaviour, when forecasting. However the previous researches did not factor in the weight that each factor should be given while forecasting in various situations. This research aimed to bridge the gap of the relative importance that each factor should be given while forecasting in an FMCG.

2.6 Conceptual framework

Figure 2. 1Conceptual Framework



Source : Researcher 2016

The independent factors included Consumers buying behaviour, recency effect, competition and availability of cheaper substitutes. The intervening factors included political indicators, purchasing power, seasons, promotions, holidays and festivals, demographics and economic factors. The dependent factor was accurate market forecasting.

Inaccurate forecasting is when the forecast accuracy is less than 80% or more than 110%. This is as per the key performance indicators of GSK, which in turn is based upon GSK policies. Each market factor was measured as follows: Consumer buying behaviour – Number of consumers served by the company; repeat purchase by the consumer- number of consumer needs addressed verses how many consumer needs were reported; frequency of consumer feedback session; and trending of consumers buying behaviour; Competitors – knowledge of existence of competitors, number of competitors, whether competition is on quality or price, accommodating them or

retaliating; Political indicators – planning during years of elections and perceptions on political stability.

Purchasing power – effect of recession and changes in purchasing power of consumers. Seasons, promotions, holidays and festivals – frequency of promotions, effectiveness of planning for promotions, stocking and selling of seasonal products, stocking and selling of products for holidays and festivals, stock outs for seasonal, promotional, holiday and festival products. Recency effect – frequency of reminding your consumers of your products, and changes in purchase pattern of your consumers after reminding them of your product. Availability of cheaper substitutes – number of cheaper substitutes, difference in prices of the two competing products, and ease of availability of these cheaper substitutes.

Forecast accuracy was defined as the percentage difference between a forecast and the actual sales. Sales forecast accuracy was measured at 2 points in the supply chain. Namely: 1) point of selling from GSK to first line consumers (may be also called primary sales or to-market sales) or 2) point of selling from first line consumers further down the supply chain (may be also called secondary sales or in-market sales). The 2 measures were used to understand the accuracy across those 2 points in the supply chain. However, for the purpose of global, regional and country reporting and aggregation, sales forecast accuracy was measured at the point of selling from GSK to first line consumers. This made the sales forecast accuracy, as close as possible, to the financial revenue recognition of GSK.

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This chapter gives a description of the research design, population and sampling method, data collection method and data analysis methods used for the research. It also includes data validity and reliability, together with ethical considerations related to this research.

3.2 Research design

Cooper and Schindler (2008) define research design, as the blueprint or plan for the collection, measurement and analysis of data. The methodology used in this research was a case study research design. Cooper and Schindler (2008) further state that case study design is an intensive examination of a particular situation or instance. Yin (2009) suggests that case study research is relevant for gaining a rich understanding of the context of the research and the processes being enacted, especially where unique cases are identified. It has considerable ability to generate answers to the 'what', 'why' and 'how' questions. As such it is often used in explanatory studies. Because of the need for in-depth understanding and analysis of the case, a mix of data collection methods is encouraged. The case study method was therefore used to study forecasting at GSK to allow for the unique characteristics and practices of this company to emerge. Multiple data sources – interviews with several departmental staff as well as secondary forecasting and actual sales data were used to allow for an in-depth and holistic analysis of forecasting at GSK. Cross sectional method was used because data was collected only once during the study. The case study focused on the forecasting of fast moving consumer goods at GlaxoSmithKline.

3.3 Population and sampling

Cooper and Schindler (2008) define population as the total collection of elements about which the researcher wishes to make some inferences. The population of the study was the employees of GSK, who are directly involved in product forecasting. The population included production planning team members, sales, marketing team members; demand forecasting team members and distribution team of GSK. A census the departments included; production planning department, demand

forecasting department, sales department, marketing department and distribution department have 55 employees .

Table 3. 1 Sampling Distribution

Department	Population	Sample size
Production planning	4	3
Demand Forecasting	4	4
Distribution	25	23
Sales	14	13
Marketing	8	7
Total	**55**	**50**

3.4 Sample and sampling technique

Sample size

A sample size refers to the actual respondents the researcher aims to interview (Barbie, 2010). Dawson, (2002) suggests that in quantitative research the larger the sample the more accurate your results. The researcher used sample size determination using Krejcie and Morgan, (1970) formula as given below;

$s=X^2NP(1-P)/d^2(N-1)+X^2P(1-P)$

Where

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841).

N = the population size.

P = the population proportion (assumed to be .50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (.05)

Substituting for the values:

$$s = \frac{3.841 \times 55 \times 0.50 (1-0.50)}{0.05^2 (55-1) + 3.841 \times 0.5 (1-0.5)}$$

S= 48

Using the Krejcie and Morgan formula from a population of 55, 48 respondents would be the sample size for the study, however this was rounded upwards to 50

respondents. Fifty respondents represent 90% of the target population. Kerlinger, (1986) indicates that a sample size of 10% of the target population is large enough so long as it allows for reliable data analysis and allows testing for significance of differences between estimates. The sample size depends on what one wants to know, the purpose of the inquiry, what is at stake and what is useful.

3.5 Data collection methods

Data collection method is a critical task of the research methodology, since it is the tool which is used to discover answers to the research questions. In this research data collection involved the use of a structured questionnaire to gather the perception of the employees on forecasting at GSK. The questionnaire was administered to the respondents by the researcher to collect primary data. Saunders et al. (2012), define a questionnaire as a general term including all data collection techniques, in which each person is asked to answer the same set of questions in a predetermined order. Both close ended questions and open ended questions were used. The questionnaire comprised of five sections. The first section sought the demographic information of the respondent. The second section comprised of questions concerning the importance of forecasting. The third section entailed questions related to effects of different market and macro factors on forecasting. The fourth section asked questions about how the organization makes up for inaccuracy in forecasting. Section five comprised of questions related toways of improving forecasting.

Secondary data on actual sales and forecasted sales, for the past 36 months, was also collected. The period covered for the secondary data was January 2013 to December 2015 (36 months).

3.6 Data analysis

The responses from open ended questions were coded, interpreted and their frequencies were determined. To permit quantitative analysis, qualitative data was converted into numerical codes, representing attributes and measurement of variables (market and macro factors). The primary data were coded into numerical figures which were then entered into the Statistical Package for Social Sciences (SPSS) for analysis. Both descriptive and inferential statistics were used to analyse

primary data.Simple regression for all the variables was conducted to establish the criteria of relationship (correlation and regression analysis).Secondary data was tabulated and line graphs were used to study the differences between forecasted and actual sales. This assisted in ascertaining the differences between the two.

3.7 Model specification

The Path analysis for the model is

$Y_1 = \alpha_1 + X_1 + X_2 + \epsilon_1$

The measurement model represents the relationship path between the independent variable (market and macro factors denoted by X_1 and X_2) versus the dependent variable denoted by Y_1.

$Y_1 = \alpha_1 + X_1 + \epsilon_2$

The measurement model represents the relationship path between the independent variable (market factors denoted by X_1) versus the dependent variable denoted by Y_1.

$Y_2 = \alpha_{2+} X_1 + \epsilon_3$

The measurement model represents the relationship path between the independent variable (market factors denoted by X_1) versus the dependent variable denoted by Y_2.

Y_1= Forecast Accuracy (measured by use of descriptive and inferential statistics)

X_2, Y_2= Macro factors (measured by use of descriptive and inferential statistics)

α_1 = Constant

X_1 = Market factors (measured by use of descriptive and inferential statistics)

ϵ_1, ϵ_2, ϵ_3= Error terms

Sobel test for mediation was used to determine the significance of the macro factors as mediators in the mediated path. Z statistic for Sobel was used to determine the strength of mediation.

3.8 Data validity and reliability

Kombo and Tromp (2006) noted the reliability of an instrument is a measure of how consistent the results of a test are. Reliability is defined as the extent to which the results can be replicated when enquired by a different researcher. Reliability was ensured by designing a robust and well-structured questionnaire which enabled another inquirer to arrive at a similar conclusion, on administering the same questionnaire. In this study reliability test was carried out by computing Cronbach's Alpha. Cronbach's alpha was used to test the reliability of the measures of the questionnaires. Bryman and Bell (2011) suggests that where Cronbach's Alpha is used for reliability test, a rule of thumb is also used, that states that the Cronbach's values of the items in the study should not be lower than 0.7.

Validity refers to the extent to which the measures used in the questionnaire are truthfully measuring the intended concept (Sekaran & Bougie, 2009). Both internal and external validity of the research findings were ensured. Internal validity is the extent to which the research designs and the data it yields, allows the researcher to draw accurate conclusions. The findings have to make sense; they must be credible, authentic and must correctly map the phenomena in question. Internal validity was ensured through a well designed questionnaire, which captured details for the three objectives. Each of the questions was answered using a five point scale to avoid subjectivity and to ensure ease of analysis. Sub questions for each of the macro and market factors were asked in the questionnaire, in order to collect data for each of the macro and market factors. The questions in the questionnaire were informed by the literature reviewed and discussion with experts. (Cooper & Schindler, 2008).

External validity refers to the extent to which the results of the study apply to situations beyond the study itself, that is the extent to which the results can be generalized to other contexts similar to the one in which the study is carried out in. The results of this study could benefit companies that sell Fast Moving Consumer Goods and pharmaceutical products, as well as pharmaceutical companies that are experiencing problems of forecast inaccuracy. External validity was ensured by engaging a large pool of people, from different functional areas, to provide a well completed and rigorous case study analysis (Saunder, 2012).

Objectivity of the findings was also ensured. Objectivity refers to the extent to which the findings are free from bias, where bias is defined as any influence, condition or sets of conditions that singly or together distort data. Objectivity was ensured by questioning all personnel in the selected teams.

3.9 Ethical considerations

The following ethical issues were considered during the study. Informed consent was sought from participants before asking them to participate in the research. Confidentiality was maintained, where their identity were not disclosed. If any participant wished to disclose their identity, their name would not appear in the final report. The confidentiality of data obtained from the company for this research was maintained.

CHAPTER FOUR: FINDINGS AND DATA ANALYSIS

4.1 Introduction

This chapter presents the findings of the study, data analysis and interpretation. The study was aimed at assessing the market and macro factors that affect forecasting in fast moving consumer goods in GlaxoSmithKline and was guided by the following research objectives: evaluating the effects of different market and macro factors on forecasting at GSK; assessing how the organization is making up for the inaccuracy in forecasting; and determining the various ways of improving forecasting at GSK.

4.2 Research instruments return rate

The study was carried out in five (5) departments as shown below:

Table 4.1 Research instrument return rate

Department	**Total realized**	**Total expected**	**Response rate (%)**
Production planning	3	3	100.00
Demand forecasting	4	4	100.00
Sales	21	23	91.00
Marketing	11	13	85.00
Distribution	6	7	86.00
Total	**45**	**50**	**90.00**

The results showed that 45 out of 50 questionnaires were returned, well filled and ready for analysis. Out of the five departments, demand forecasting and production planning realized 100% questionnaire return rate. Sales realized 91% questionnaire return rate,marketing department realized 85% questionnaire return rate and distribution department realised 86% questionnaire return rate. On average, a 90% questionnaire return rate was realized. Mugenda (2003) stated that a response rate of above 70.0% is acceptable in research. The high response could be attributed to self-administration of the questionnaire. In this study it was important to collect data from different departments, as they have different experiences and considerations, that inform their forecasting decisions. This provided a holistic perspective of forescasting at GSK.

4.3 Reliability analysis of study variables

Reliability refers to the extent to which a measuring instrument contains variable errors, that is, errors that appear inconsistently from observation to observation, during any one measurement attempt, or that vary each time a given unit is measured by the same instrument (Sekaran & Bougie, 2010). Cronbach's coefficient alpha, which is one of the most common methods in gauging reliability (Bryman, 2011) for each variable, was done. Cronbach's alpha type of reliability co-efficient value of 0.7 or higher is considered as usually sufficient (Sekaran & Bougie, 2010).

The reliability tests of the research instrument were carried out to determine the consistency of the measures of the research instrument as explained in table 4.2.

Table 4.2 Reliability analysis of variables

Reliability	**Construct**	**Cronbach's Alpha**	
Market Factors	Consumers buying behaviour	0.904	0.894
	Recency effect	0.901	
	Competition	0.961	
	Availability of cheaper substitutes	0.900	
Macro factors	Political indicators	0.923	0.921
	Purchasing power	0.951	
	Seasons, promotions, holidays and festivals	0.918	
	Economic factors	0.940	
Accurate market forecasting	Forecast accuracy		0.943

The study found that overall Cronbach's alpha for market factors which were the independent factors was (0.894), macro factors which were the intervening factors was (0.921), and accurate market forecasting which was the dependant factor was at (0.943). The results show an overall Cronbach's alpha of well above 0.7 implying that the instruments were sufficiently reliable for measurement. Thus there was an internal consistency of the constructs.

4.4 General and demographic information

This section presented demographic information of respondents. It included the department that the respondent worked with, the position that the respondent held in the department and the number of years of experience the individual had in the organization.

4.5 Descriptive analysis of study variables

This section highlighted the effect of various variables on forecasting at GSK.

4.5.1 Effects of different market factors on forecasting at GSK

The respondents were requested to rate the effect of the following markets factors on forecasting in GSK and the results are presented in table 4.3.

Table 4.3 Effect of market factors on forecasting

Market factors	Very low (%)	Low (%)	Moderate (%)	High (%)	Very High (%)
Consumers buying behaviour	0	4	18	38	40
Competition from similar products	0	9	22	29	40
Recency effect (overweighing more recent information compared to information received in the distant past in a product)	0	27	16	53	4
Availability of cheap substitutes	0	18	31	44	7
Economic conditions e.g. employment rate, inflation, interest rates	0	27	24	33	16
Consumer purchase power	0	7	40	11	42
Popularity of the product among social classes of consumers	0	4	47	9	40
Technological change	33	38	7	9	13
Government legislation	18	58	2	7	15

The results above indicate that 96% of the respondents moderately, highly and very highly agreed that consumers buying behaviour affects the process of forecasting at

GSK. Ninety six percent of the respondents also moderately, highly and very highly agreed that popularity of the product among social classes of consumers affected forecasting at GSK. Ninety three percent highly and very highly agreed that consumer purchasing power had an effect on forecasting at GSK. Seventy six percent of the respondents were in very little agreement that government legislation had an effect on forecasting at GSK. Furthermore 71% of the respondents responded that technological changes had very little effect on forecasting at GSK. The implication for GSK is that market factors and macro factors should never be ignored in ensuring accurate forecasting of products.

4.5.2 Aspects of consumer buying behaviour

The respondents were asked to rate their opinion on aspects of consumer buying behaviour. The response was presented in table 4.4.

Table 4.4 Effects of consumer buying behaviour on forecasting

Aspects of consumer buying behaviour	**Highly disagree (%)**	**Disagree (%)**	**Moderately agree (%)**	**Agree (%)**	**Highly agree (%)**
Number of consumer served by the company	0	14	44	0	42
Repeat purchase by the consumer	0	0	42	29	29
Number of consumer needs addressed	0	13	44	13	30
Number of consumer needs that were reported	0	29	16	13	42
Frequency of consumer feedback session,	16	28	27	0	29

Hundred percent of the respondents state that repeat purchase by the consumer is a major contributor to the effects of consumer buying behaviour on forecasting at GSK. Another 87% of the respondents state that number of consumers needs that are addressed also contribute towards the effect of consumers buying behaviour on forecasting at GSK. However, 44% of the respondents responded that the frequency

of consumer feedback sessions does not contribute to the effect of consumers buying behaviour on forecasting at GSK. The implication for GSK is that it is very important to know the consumer demand and their preferences for the purposes of planning and forecasting, which in turn are important to avoid lost sales and excess inventory.

4.5.3 Aspects of competition

The respondents were asked to rate their opinion on aspects of competition. The findings were presented in table 4.5.

Table 4.5 Aspects of competition and forecasting

Aspects of competition	Highly disagree (%)	Disagree (%)	Moderately agree (%)	Agree (%)	Highly agree (%)
Knowledge of existence of competitors	15	0	16	13	56
Number of potential competitors	15	16	0	27	42
Whether competition is on quality or price	15	0	16	42	27
Demand forecasting is challenging in a highly competitive market.	15	16	16	40	13
Changing pricing policies of competitors makes it difficult to estimate the exact demand of products.	16	0	40	31	13
Technology adoption by competitors leads to changes in sales of their products and changes in demand of products and creates a difficulty in forecasting.	15	29	27	29	0
Knowledge about new competitors, new locations for existing competitors and mergers assist in making forecasting decisions.	15	0	16	42	27
A company in touch with consumers can improve its forecasting accuracy and also save capital	16	13	0	31	40
The rates of a company against its competitors in terms of market share, research and development, quality, pricing, sales financing policies and public image affects forecasting.	14	16	27	16	27

Eighty five percent of the respondents mentioned that knowledge of existence of competition, competition on price and quality, and knowledge about new competitors, new locations for existing competitors and mergers assist in making forecasting decisions. On the other hand 44% respondent felt that technology adoption by competitors, that would lead to changes in sales of their products and changes in demand of products, had very little effect on forecasting at GSK.For GSK, being up-to-date with their competitors, and learning their competitive edge, will greatly improve the forecasting accuracy.

4.5.4 Recency aspects and forecasting

The responses of the respondents on rating the effects of recency effect on forecasting were sought as presented in table 4.6.

Table 4.6 Recency effect and forecasting

Recency aspects	**Highly disagree (%)**	**Disagree (%)**	**Moderately agree (%)**	**Agree (%)**	**Highly agree (%)**
Frequency of reminding your consumers of your products,	0	0	18	32	50
Changes in purchase pattern of your consumers after reminding them of your product.	0	0	0	50	50

The results indicated that all the respondents rated changes in purchase pattern of consumers after being reminded of the product as affecting product forecasting at GSK. In addition, 82% of respondents stated that frequency of reminding consumers, of your products, affected forecasting at GSK.This implies that more accurate forecasting of product sales at GSK will in future be determined fully, when the company accommodates the knowledge of recency effect in its forecasting systems.

4.5.5 Availability of cheaper substitutes

The results of response of respondents, on the relationship between availability of cheaper products and accurate forecasting are presented in table 4.7.

Table 4.7 Availability of cheaper substitutes

Availability of cheaper substitutes	**Highly disagree (%)**	**Disagree (%)**	**Moderately agree (%)**	**Agree (%)**	**Highly agree (%)**
Number of cheaper substitutes	16	0	13	44	27
Difference in prices of the two competing products	15	0	27	31	27
Ease of availability of the cheaper substitutes	15	0	29	16	40

The results showed that 85% of the respondents moderately agreed, agreed and highly agreed,that difference in prices of the two competing products rated and the ease of availability of cheaper substitutes affected forecasting at GSK. Another 84% of the respondents moderately agreed, agreed and highly agreed that the number of cheaper substitutes, also affect forecasting at GSK. The implication for forecasting at GSK is that, the forecasting team should invest time in inquiring on the effects substitute products from competitors have on actual forecasting in the market, and react appropriately to that knowledge.

4.5.6 Macro factors on forecasting at GSK

The respondents were asked to express their opinion on how macro factors impact forecasting at GSK. The response was presented in table 4.8.

Table 4.8 Macro factors and forecasting

Macro factors	Very low(%)	Low (%)	Moderate (%)	High (%)	Very High(%)
It is important for the company to understand the various political actions that may occur in the coming year.	0	0	29	15	56
It is important to consider the consumer's purchasing power when expanding to new markets	0	0	0	44	56
It is vital to consider seasons, promotions, holidays and festivals which result in erratic purchasing patterns.	0	0	0	44	56
It is important to consider the changing demographics in terms of changing age composition, change in distribution of population and the disposable income.	0	0	16	42	42

The results showed that, 71% of the respondents stated that it is important for the company to understand the various political actions that may occur in the coming year. All the respondents had an opinion that, it is important to consider the consumer's purchasing power, when expanding to new markets and also it is vital to consider seasons, promotions, holidays and festivals which result in erratic purchasing patterns. Finally, 84% of the respondents indicated that, it is important to consider the changing demographics in terms of changing age, composition, change in distribution of population and the disposable income. This implies that for accurate and effective forecasting at GSK, the forecasting team should always consider the effects of macro factors on accurate forecasting of sales and demands of products.

4.5.7 Effects of aspects of macro factors on forecasting

The respondents were asked to rate the impact of following macro factors (seasons, promotions, holidays and festivals, political indicators and purchasing power) on forecasting. The response was presented in table 4.9.

Table 4.9 Effects of seasons, promotion, holidays and festivals, political indicators and purchasing power on forecasting

Seasons, promotions, holidays and festivals	**Highly disagree (%)**	**Disagree (%)**	**Moderately agree (%)**	**Agree (%)**	**Highly agree (%)**
Frequency of promotions	0	0	31	29	40
Stocking and selling of seasonal products	0	15	0	29	56
Stocking and selling of products for holidays and festivals	0	16	0	44	40
Political indicators					
Planning during years of elections.	0	15	29	16	40
Anticipated or real political instability.	0	15	29	16	40
Purchasing power					
Effect of recession on the market	0	31	14	42	13
Changes in purchasing power of consumers	0	31	40	16	13

The results indicated that 100% of the respondents indicated that frequency of promotions have an effect on forecasting at GSK. Another 85% of respondents agreed and strongly agreed that stocking and selling of seasonal products affects products forecasting at GSK. In addition, stocking and selling of products for holidays and festivals rated at 84%. The implication for GSK is that the forecasting team should consider proper forecasting of products, during periods of promotions

which are critical due to their impact on performance in terms of sales, inventory management and also for distribution planning.

The findings on political factors pointed out that 85% of the respondents agreed that planning during years of elections and years of anticipated or real political instability, had an impact on forecasting at GSK. When forecasting for the next year, it is important for the company to understand the various political activities, that are to occur in the coming year, for better forecasting. It is important to consider how the current political climate looks like, in terms of what kind of policies are in place and stability of the government. It is also necessary to consider if the company is prepared for changes in regulation and tax-rates. The implication for GSK is that, considerations for the effect of political factors in the country, must always be at foresight of forecasting team while forecasting for future sales and demand of products.

The results on purchasing power of consumers showed that, 69% of the respondents stated that effect of recession on the market, and changes in purchasing power of consumer's, impacted forecasting at GSK.This means that, at GSK, the forecasting team should put emphasis on the following attributes of consumers: need, willingness and the ability to buy for accurate forecasting of demand and sales.

4.5.8 Organization makes up for inaccuracy in forecasting

The findings of respondents on how the organization makes up for inaccuracy in forecastingwere presented in table 4.10.

Table 4.10Methods that are used by GSK for forecasting

Forecasting methods	Not at all (%)	Rarely (%)	Often (%)	Quite often (%)	Very often (%)
Through the use historic data while forecasting	0	16	0	13	71
Through the use of gut feeling while forecasting	0	66	16	18	0
Through studying market trends in times of forecast inaccuracy to make corrections	19	0	0	47	34
Through reviewing the forecast to cater for the changing trends	0	18	0	32	50
Through use of computer software for forecasting	0	14	16	20	50

Eighty six percent of the respondents stated that forecasting at GSK was done using computer software. Another 84% mentioned that forecasting was done with the use of historic data and 82% stated that forecasting was done by reviewing the forecasted figures, to cater for changing trends. However, 66% of the respondents felt that gut feelings of the forecasters, was not used to forecast at GSK. The implication for GSK is that, using the correct method in forecasting will ensure that, actual sales and inventory levels are closely monitored in order to avoid stock up or stock outs in the distribution channel.

4.5.9 Aspects of how the organization makes up for inaccuracies

The respondents were requested to rate various aspects of how the organization makes up for inaccurate forecasting. The results were presented in table 4.11.

Table 4.11How the organization makes up for inaccurate forecasting

Aspects of organization make-up	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
The company regularly caters for out of stock	16	0	16	26	42
The company regularly keeps track of competitors' moves	15	0	16	27	42
The company constantly addresses price change move by competitors	16	0	42	42	0
The company is aware of the many alternative substitutes in its products and price structures	15	0	0	58	27
The company has clear-cut identity for its products in trade	15	0	16	56	13
The company always has promotional teams in specific locations to promote its products	16	44	0	13	27

The results showed that the respondents rated their agreement with aspects of how the organization makes up to forecasting inaccuracies as follows: Eighty five percent agreed that the company regularly kept track of competitor's moves. 85% also agreed that the company kept track of various alternatives in terms of products and price structures of their competitors, and thatthe company has clear-cut identity for its products in trade.All of which assisted the company to make up for the inaccuracies in forecasting. Sixty percent of the respondents stated that the company did not always have a promotional team in specific locations to promote its products. This implies that forecasting team at GSK should be aware of the existing and emerging threats in forecasting, and equip itself with appropriate fall back techniques, to deal with various forecasting inaccuracy issues in the market.

4.5.10 Various ways of improving forecasting at GSK

The respondents were asked to indicate the ways of improving forecasting at GSK. The response was presented in table 4.12.

Table 4.12 Ways of improving forecasting at GSK

Forecasting measures	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Yearly forecasting of products should be practiced	42	0	16	13	29
Monthly forecasting of products should be practiced	0	0	0	0	100
Daily forecasting of products should be practiced	42	16	13	16	13
GSK should invest the time and effort in creating effective and efficient forecasting methods	0	0	0	13	87
GSK should create quality forecasts to enhance accurate view of future demand	0	0	0	27	73
A mixture of qualitative and quantitative method should be practiced to create quality forecasting	0	0	0	58	42
Quantitative forecasting methods should regularly be utilized than qualitative ones, as they are more valuable.	0	0	29	56	15
GSK should focus more on political forecasting indicators since they influence the success of product forecasting more than other factors	8	7	69	16	0

All the respondents agreed that monthly forecasting of products should be practiced, time and effort should be invested in creating effective and efficient forecasting methods and a mixture of qualitative and quantitative methods should be used to forecast, with a greater focus on quantitative methods in order to improve forecasting at GSK. The implication for GSK is that to improve forecasting accuracies, opinions of both current and potential consumers such as wholesalers and retailers should be sought through market research processes using survey and panel analysis of the past events in order to understand what is happening in the market segments.

4.6 Presentation of actual and forecasted sales analysis

To enhance the descriptive analysis, an analysis of actual and forecasted sales was extracted from secondary data at GSK as presented in figure 4.1 and table 4.13

Figure 4. 1Actual and forecasted sales, 2013

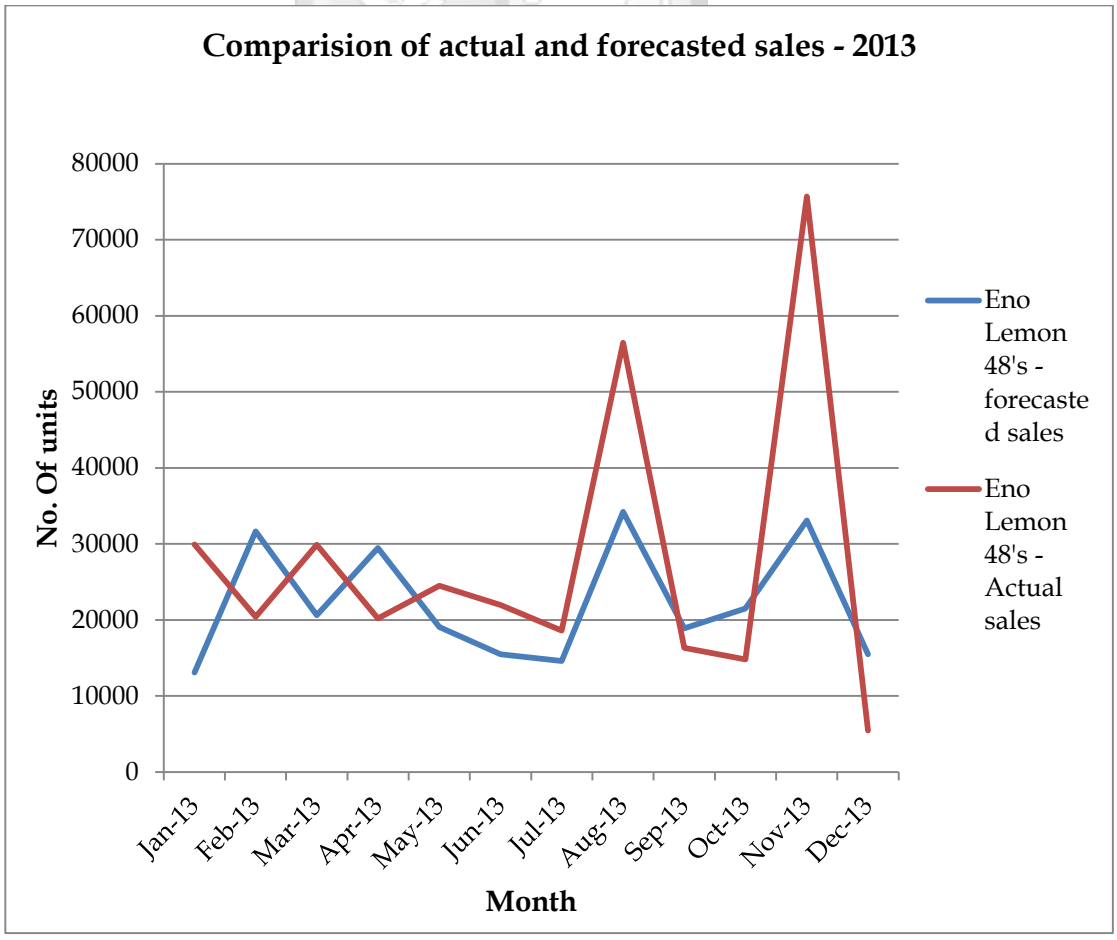


Table 4. 13 : Actual and forecasted sales 2013

2013			
Year	Eno Lemon 48's (in units) - forecasted sales	Eno Lemon 48's (in units) - Actual sales	Forecast accuracy
Jan-13	13092	29912	228%
Feb-13	31661	20411	64%
Mar-13	20611	29866	145%
Apr-13	29441	20178	69%
May-13	19056	24509	129%
Jun-13	15493	21983	142%
Jul-13	14598	18584	127%
Aug-13	34210	56462	165%
Sep-13	18869	16335	87%
Oct-13	21479	14815	69%
Nov-13	33075	75696	229%
Dec-13	15496	5447	35%

Forecast accuracy is calculated as follows: (Actual sales/ forecasted sales) *100

The accepted range for forecast accuracy for GSK is 80% to 110%. From Table 4.13 above,it was noted that except in the month of September, where forecast accuracy was 87%, no other month had forecast accuracy within the stated range. January, March, May to August and November were months in which more units of Eno Lemon were sold than forecasted. In the months February, April, October and December less units of Eno were sold than forecasted, which indicates that there was accumulation of inventory in the warehouse of GSK.Of all the months December showed a larger percentage of disparity between actual and forecasted sales, where 3 times less product was sold than forecasted.

Figure 4.2Actual and forecasted sales, 2014

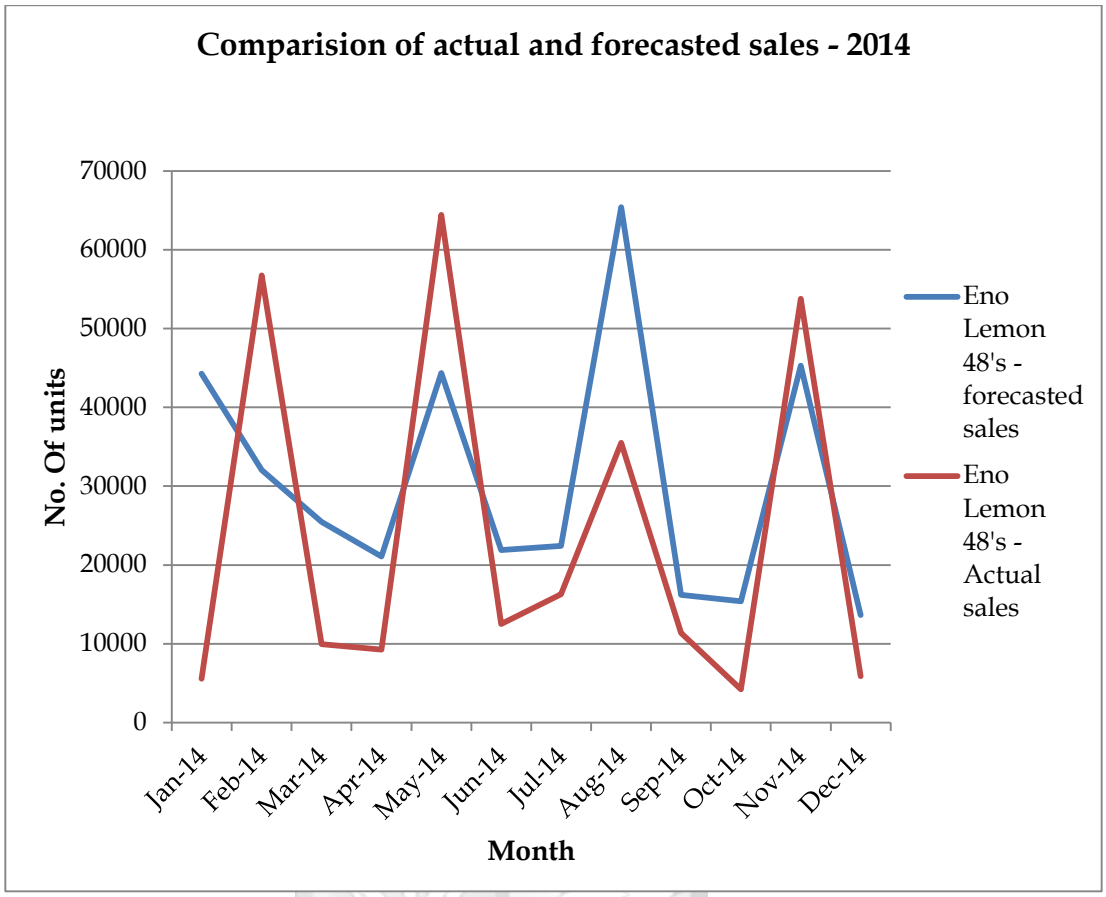


Table 4.14 : Actual and forecasted sales 2014

2014			
Month	Eno Lemon 48's (in units) - forecasted sales	Eno Lemon 48's (in units) - Actual sales	Forecast Accuracy
Jan-14	44266	5551	13%
Feb-14	32034	56767	177%
Mar-14	25451	9934	39%
Apr-14	21073	9258	44%
May-14	44360	64439	145%
Jun-14	21897	12496	57%
Jul-14	22418	16279	73%
Aug-14	65426	35505	54%
Sep-14	16209	11369	70%
Oct-14	15371	4216	27%
Nov-14	45306	53793	119%
Dec-14	13651	5862	43%

The trend of lower actual sales, compared to forecasted sales, continued in January 2014 from December 2013. However, sales picked up in February. Again in March and April actual sales were less than forecasted sales. The trend of lower actual sales than forecasted sales continued in June through to October 2014, being least in October 2014. December also had lower actual sales than forecasted sales. May and November had more actual sales than forecasted sales. This is an indication that, in most of the months, there was inventory stored in the warehouse. None of the months managed to hit the forecast accuracy target.

Figure 4.3Actual and forecasted sales, 2015

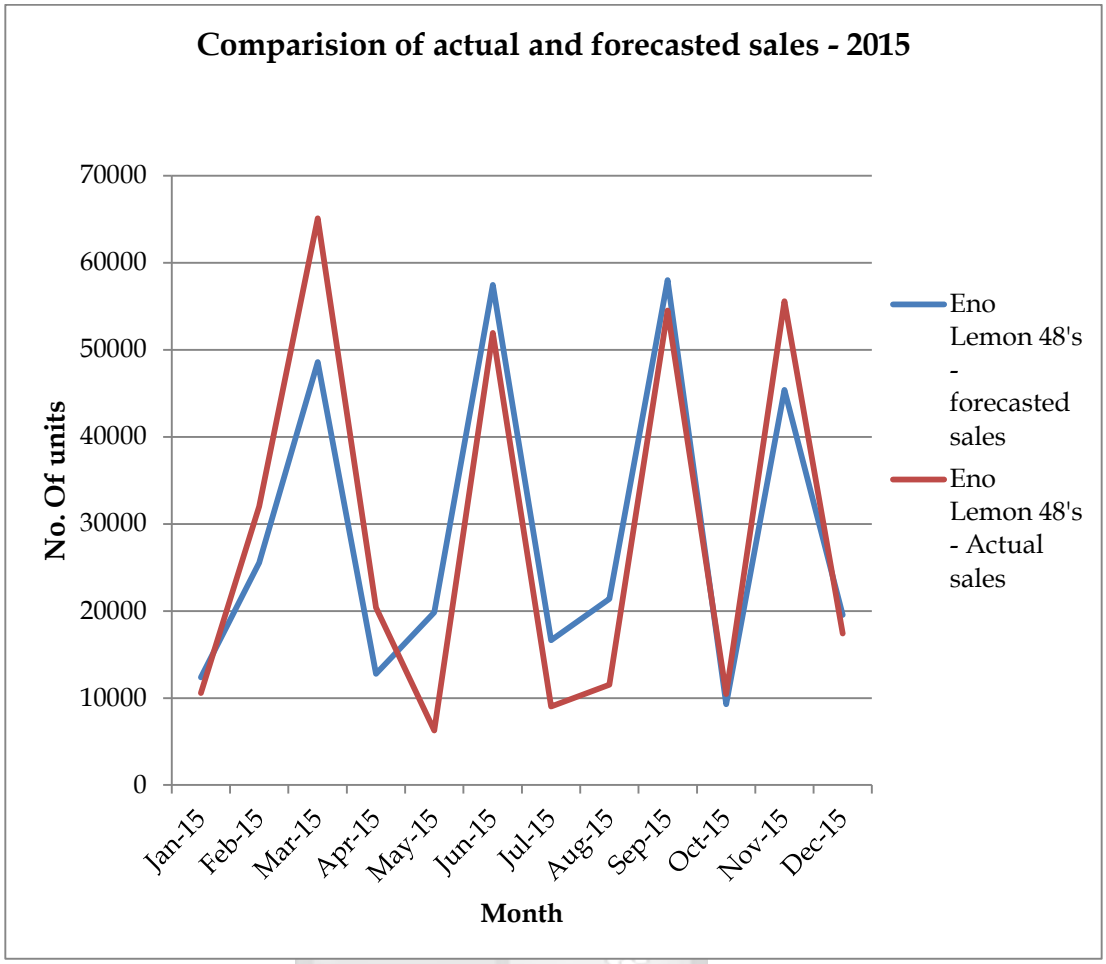


Table 4.15 : Actual and forecasted sales 2015

2015			
Month	Eno Lemon 48's (in units) - forecasted sales	Eno Lemon 48's (in units) - Actual sales	% difference in actual and forecasted
Jan-15	12384	10583	85%
Feb-15	25531	32016	125%
Mar-15	48585	65087	134%
Apr-15	12791	20376	159%
May-15	19838	6264	32%
Jun-15	57455	51937	90%
Jul-15	16643	9027	54%
Aug-15	21379	11519	54%
Sep-15	58005	54516	94%
Oct-15	9283	10464	113%
Nov-15	45388	55584	122%
Dec-15	19549	17424	89%

The results in Table 4.15 above show that the months January, June, September and December hit the forecast accuracy target. February, March April, October and November were months in which the actual sales were higher than forecasted sales. Whereas in May, July and August forecasted sales were above actual sales which indicates that there were stocks in the warehouse.

4.7 Inferential analysis

For inferential analysis, correlation and regressions analysis were conducted and the results are displayed in this section.

4.7.1 Correlations analysis

This section outlines the correlation of the independent and dependent variables. The correlation matrix for the independent and depended variable is presented in Table 4.16.

Table 4.16 : Correlation matrix of variables

		Forecast accuracy	Macro factors	Market factors
Forecast accuracy	Pearson Correlation	1	.744**	-.513**
	Sig. (2-tailed)		.000	.000
	N	45	45	45
Macro factors	Pearson Correlation	.744**	1	-.368*
	Sig. (2-tailed)	.000		.013
	N	45	45	45
Market factors	Pearson Correlation	-.513**	-.368*	1
	Sig. (2-tailed)	.000	.013	
	N	45	45	45
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Correlations among variables are used to explore the relationship among group of variables. Correlation indicates the strength and direction of the relationship of each of the individual independent variable, on the dependent variable. In this case, correlation describes the strength and direction of the relationship between market factors and forecast accuracy, as well as macro factors and forecast accuracy.

The results indicates that, macro factors (r=0.744) were positively significantly correlated to forecast accuracy. In contrast, market factors (r=-0.513) had a negative moderate relationship to forecast accuracy. The positive significant correlation between macro factors and forecast accuracy implied that macro factors (political indicators, purchasing power, seasons promotions, festivals, holidays, demographics and economic factors) plays a greater role in the forecasting of products in an organization. The negative relationship between market factors and forecast accuracy implied that market factors (like consumers buying behaviours, recency effect, competition and availability of cheaper substitutes)also affect forecasting at GSK. The significant role played by macro factors in determining forecasting accuracy of products, should largely dictate decision making. In addition, GSK must also note that market factors like competition, recency factors among others have a lesser role in products forecasting, thus more resources should

be committed to understanding the macro factors better. However, market factors should not be ignored.

4.7.2 Regression analysis

The regression analysis of the market and macro factors as the independent variable and forecast accuracy as the dependent variable is outlined in this section.

4.7.2.1 Macro factors regression coefficients

A regression analysis was done, with macro factors being the dependent variable, while market factors being the independent variable.

Table 4. 17: Macro factors regression

Outcome: Macro factors

Model summary

R	R-sq	MSE	F	df1	df2	p
.6035	. 3630	.3225	3.2238	1.0000	38.0000	.0007

Model:

	coeff	se	t	p	LLCI	ULCI
Constant	.0293	.1594	.1840	.8550	-.2394	.2981
Market Factors	-.3482	.0939	-3.7082	.0007	-.3791	-.3173

The coefficient table shows the value of R-squared to be 0.3630. This shows that the amount of variation accounted for by the market factors is 36.3%. Therefore, 36.3% of the variation in macro factors is as a result of the variation in market factors, adopted by GSK. This indicates that there is a significant relationship between macro factor and the market factors. The F value is 3.2238 with a p value of 0.0007 which is less than 0.05 and hence the model is a good fit. The regression model explaining the results in the above table is given by:

Macro factors = 0.0293 - 0.3482 × market factors + error

The model shows that market factors negatively and significantly affects macro factors, i.e. holding other factors constant, an increase in mean index market factors decreasesthe macro factor by a mean index value of 0.3482.

4.7.2.2 Market factors Regression Coefficients

A regression analysis was done with forecasting accuracy being the dependent variable while market factors (consumers buying behaviour, recency effect, competition and availability of cheaper substitutes) being the independent variable to determine the market factors affecting forecasting accuracy at GSK.

Table 4. 18 Market factors regression coefficients

Outcome – forecast accuracy

Model summary

R	R-sq	MSE	F	df1	df2	p
.6636	. 4404	.5143	19.1577	1.0000	38.0000	.0001

Model:

	coeff	se	t	p	LLCI	ULCI
Constant	-.0035	.1211	-.0286	.9773	-.2076	.2006
Market Factors	-.6433	.1470	-4.3770	.0001	-.8910	-.3955

The table shows the value of R-squared to be 0.4404. This indicates that the amount of variation accounted for by the market factors is 44.04%. Therefore, 44.04% of the variation in forecasting accuracy is as a result of the variation in market factors. This indicates that there is a significant relationship between forecast accuracy and market factors.The F value is 19.1577 with a p value of 0.0001 which is less than 0.05 and hence the model is a good fit.

The regression model explaining the results is given by:

Forecast accuracy= - 0.0035 - 0.6433 × market factors + error

The model shows that market factors negatively affects the forecast accuracy, i.e. holding other factors constant, an increase in mean index of consumers buying

behaviour, recency effect, competition and availability of cheaper substitutes decreases the forecasting accuracy at GSK by an unit mean index value of 0.6433.

4.7.2.3 Macro and market factors Regression Coefficients

A regression analysis was done with forecasting accuracy as the dependent variable and market and macro factors as the independent variables to determine the factors affecting forecasting accuracy at GSK.

Table 4. 19 Market and macro factors Regression Coefficients

Outcome – forecast accuracy

Model summary

R	R-sq	MSE	F	df1	df2	p
.9136	.8347	.1560	347.1777	2.0000	37.0000	.0000

Model:

	coeff	se	t	p	LLCI	ULCI
Constant	-.0234	.0589	-.3979	.6930	-.1228	.0759
Macro Factors	.6810	.0309	22.0499	.0000	.6289	.7331
Market Factors	-.4061	.0786	-5.1676	.0000	-.5387	-.2735

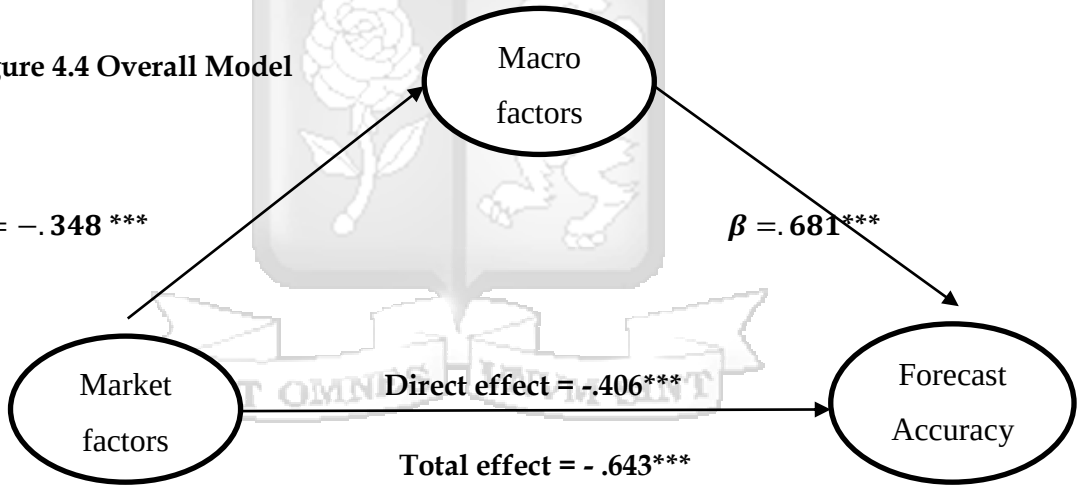
The coefficient table shows that the value of R-squared to be 0.8347. This indicates that the amount of variation accounted for in the model by the market and macro factors is 83.47%. Therefore, 83.47% of the variation in forecasting accuracy is as a result of the variation in market and macro factors. This indicates that there is a significant relationship between forecast accuracy and macro factors and market factors. The F value is 347.1777 with a p value of 0.0000 which is less than 0.05 and hence the model is a good fit.

The regression model explaining the results in the above table is given by:

Forecast accuracy= -0.0234 + 0.6810 × macro factors - 0.4061 × market factors + error

The model shows that macro factors positively affects the forecast accuracy, i.e. holding other factors constant, an increase in mean index of macro factors increases the forecast accuracy by a unit mean index value of 0.6810. However, market factors negatively affects the forecast accuracy, i.e. holding other factors constant, an increase in mean index of macro factors decreases the forecast accuracy by a unit mean index value of 0.4061. The findings imply that macro factors are the predictor variable that contributes the highest to forecasting accuracy at GSK. Therefore, to categorically predict the sales patterns in GSK, emphasis should be placed in focussing on the macro factors in terms of financial and human resources rather than the market factors. However, since the market factors also affect forecasting at GSK they should also be considered while forecasting.

Figure 4.4 Overall Model



* *P*< .05 ** p < .01, *** p < .001

There was a significant direct effect of Market factors on Forecast Accuracy, β = -.406, p<.001. Macro factors were found to be significantly related to the Forecast Accuracy, β = .681, p < .001. Market factors could account for roughly two third of the total effect, β = -.643. Forecast Accuracy was significantly related to a linear combination of Macro Factors and Market factors, F (2, 37) = 347.17, p < .001, R-square= .834.

Sobel test for mediation

The Sobel test uses the regression weights (β) and standard error (SE) of the two paths: Independent variable - mediator and mediator - dependent variable. This resulted in a Sobel test *z*-score and *p*-value to determine the strength of the mediation. Initially the direct effect of the independent variable was determined without the mediator. The mediator was then included in the model and the corresponding Z- statistics was used to determine the strength of mediation alongside the Sobel Test statistics. The analysis and results are presented in Table below.

The Sobel Test results indicated that Macro factors mediated the relationship between Market factors and Forecast Accuracy and the mediation was statistically significant (Z-score = -3.654, $p<0.05$)

Table 4.20 Analysis and Results of Sobel Test for mediation

Path		R^2	B	SE	z-score	p-value
Direct	Market factors – Forecast Accuracy	.440	-.406	.0786		
Meditated	Market factors - Macro factors	.834	-.348	.0939	-3.654	0.000***
	Macro factors – Forecast Accuracy		.681	.0309		

CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the discussions of the research findings, conclusions and recommendations based on the specific objectives of the study.

5.2 Discussions

The discussions of the study are presented in this section:

Effect of market factors on forecasting at GSK

In response to objective one, the analysis shows that any changes in consumer buying behaviour will have a great impact on forecasting at GSK, as indicated by 96 percent of respondents. If the consumers buy more through repeat purchases or less because their needs have not been satisfied, forecasting will be affected due to the differences in the forecasted sales figures and actual sales figures. The findings complemented Hudnurkar, Jakhar and Rathod (2014), who stated that the consumer is increasingly becoming highly demanding with respect to products and services. The implication for GSK is that it is important to know the consumer demand and their preferences for the purposes of planning and forecasting, which in turn are important to avoid lost sales and excess inventory.

The knowledge on existence of competitors is important when forecasting as indicated by 91% of the respondents. This is because it gives the company a picture of what the competitor is selling, at what locations and the price range of their products. With that in mind, it would make it easier for forecasting for various target markets. Further to that while forecasting for various target markets, it would also be helpful for GSK to understand whether their competition is quality-based or price-based. With better quality and reduced price of products, the competitor can easily attract customers. The results supports Daruvala's (2006), and Wedel and Kamakura's (2012) findingsthat argue that forecasting of products always becomes challenging in a highly competitive market, especially where demand for products depends on the number of competitors existing in the market. However, as indicated by 71% of respondents, it would not be very important for GSK to keep track whether their competitor is changing or adopting new technology for their

products, because it would not necessarily affect forecasting at GSK. For GSK, being up-to-date with their competitor's products and prices, and learning their competitive edge, will improve forecasting accuracy.It is equally important to understand the competitors and the level of competition.

Recency effect plays an important role in forecasting at GSK, as stated by 73% of the respondents. Similarly frequency of reminders, about GSK products, also increases the number of units purchased of a particular item. Therefore the instances of reminders must be communicated, to the forecasting team, in order to achieve accuracy in forecasting. The results agreed with Roohani (2003) that in recency effect, greater weight is ascribed to later information, as compared to earlier information, in a sequence of releases. Also a positive news release has a greater positive impact on the stocks, and on business, compared to a negative news release. Due to this more goods would be bought and hence this would affect forecasting. This implies that more accurate forecasting of products sales at GSK may, in the future, be determined when the company accommodates the knowledge of recency effect, in its forecasting systems.

Availability of cheaper substitutes has an impact on forecasting at GSK, as indicated by 82% of respondents. With greater number of cheaper substitutes, the number of GSK products sold,is likely to reduce and hence affect forecasting. Similarly if the substitutes are easily available to consumers, as opposed to GSK products, it would lead to inaccurate forecasting. This is because the forecasting team would assume, that the products would be available in all parts of the market and forecasting is done based on that information yet in a real situation the product may not be available in some markets, hence inaccurate forecasting. The converse may also happen, where some markets were not considered, while forecasting, but eventually sales happened in those markets. The results corroborated the argument advanced by Armstrong and Green, (2005) that if a particular product has a substitute that is readily available, it causes a difficulty in forecasting as there is no control over the substitutes price changes. The implication for forecasting at GSK is that, the forecasting team should invest time in inquiring on the effect, substitute products from competitors have on actual forecasting in the market and react appropriately to that knowledge.

Market factors had a negative significant relationship to forecast accuracy (r= -0.513), which implied that market factors like consumers buying behaviours, competition, recency effect and availability of cheaper substitutes are factors that also affect forecasting. The coefficients of the regression analysis show a negative relationship between market factors and forecasting,that indicate that for every one unit increase in market factors, there is a decrease forecasting accuracy at GSK by 0.4601, holding other variables constant. In case of market factors when there is an improvement in customer buying behaviour, they tend to purchase more and hence there is a negative effect on forecasting accuracy. Similarly when an awareness of the product has been created in the market, it leads to improved purchasing of the product in the market which again leads to more sales and poor forecasting accuracy and hence a negative effect. A negative significant relationship is possible because selling more than forecasted figures or less than forecasted figures leads to forecasting inaccuracy.The findings imply that to predict the sales patterns in GSK, emphasis should be placed on the market factors, in terms of financial and human resources commitment.

Effects of macro factors on forecasting at GSK

In response to objective one, the analysis suggested that a year with political elections should be viewed specially while forecastingand also cases of political instability should be given special consideration as indicated by seventy two percent of respondents. When forecasting for the next year, it is important for the company to understand the various political actions that may occur in the coming year. It is important to consider how the current political climate looks like, in terms of what kind of policies are in place and stability of the government. It is also necessary to consider if the company is prepared for changes in regulation and tax-rates. The results agreed with Fregert and Jonung (2005) assessment that macro factors affect forecasting. They argued that when forecasting for the following year, it is important for the company to understand the various political actions that may occur in the coming year. The implication for GSK is that, considerations for the effect of political factors in the country, must always be at forefront while forecasting for future sales and demand of products.

Hundred percent ofthe respondents had an opinion that it is important to consider the consumer's purchasing power, when expanding to new markets.Furthermore 100% of respondents also agreed that it is vital to consider seasons, promotions, holidays and festivals which result in erratic purchasing patterns. Purchasing power is equally important when a company is considering expanding its market, and setting process in the new market, as agreed by hundred percent of respondents. Purchasing power of consumers changes with changes in economic environment like inflation, unemployment rate, and so on. With inflation rate increasing, the cost of living increases, and in turn a consumer has less disposable income to spend. Similarly with high unemployment rates, more people are jobless, and hence do not have money to purchase items. The results agreed with Fregert and Jonung (2005); Chendroyaperumal (2008) statement that purchasing power of consumers is especially important when a company is considering expanding its market and setting process in the new market. This means that, at GSK, the forecasting team should put emphasis on the following attributes of consumers: need, willingness and the ability to buy for accurate forecasting of demand and sales.

With seasons and festivals people tend to purchase more and due to this it draws a wrong picture to the forecasting team for the next month and next year as well.This leads them to forecast higher sales. With promotions, sales volumes increase, giving an inaccurate picture to forecasters. In these cases, forecasters should treat these situations as one of situations. The results agreed with Lee, Padmanabhan and Whang's (2004) findings that, seasons, promotions, holidays and festivals affect accurate forecasting in a company. In addition the results support Fildes et al., (2008) findings that promotions can improve normal sales alone, or in conjunction with other factors such as holidays. The implication for GSK is that the forecasting team should consider proper forecasting of demand during periods of promotions, which are critical, due to their impact on performance, in terms of sales, inventory management and also for distribution planning. Finally, 100% of the respondents argued that it is important to consider the changing demographics in terms of changing age, composition, change in distribution of population and the disposable income. This statement is explained by the fact that some products are not popular with certain age groups and the different gender groups as well. However, this

change is experienced slowly, but it is vital to keep track of the changes in order to avoid inaccurate forecasting.

Correlation analysis established that macro factors were positively significantly correlated to forecast accuracy (r=0.744), which implied that macro factors plays an important role in the forecasting of products in an organization. No organization stands to succeed in the process of forecasting for its products, without aligning its sales objectives with macro factors. Therefore, to categoricallyand accurately predict the sales patterns in GSK, emphasis should be placed in focussing on the macro factors, in terms of financial and human resources. The coefficients of the regression analysis show a positive relationship between macro factors and forecasting that indicate that, for every one unit increase in macro factors, there is an increase in forecasting accuracy at GSK by 0.6810, holding other variables constant. The findings imply that to predict the sales patterns in GSK, emphasis should be placed on the macro factors as well.

How the organization makes up for inaccurate forecasting

In response to objective two, eighty four percent of the respondents indicated that historical data was considered while forecasting. For GSK the use of historical data should be able to foretell the trend analysis of monthly and annual forecasting accuracies of the various products. This will assist in creating a correction tool for any future forecasting inaccuracies. In addition, 82% of the respondents mentioned that forecasting was reviewed to cater for the changing trends. Reviews of inaccuracies in forecasting should assist GSK in calibrating an almost accurate forecasting tool for future forecasting of products. Finally, 86% of the respondents mentioned that forecasting was done using computer software for forecasting. The use of technology should simplify and enhance forecasting accuracies in GSK. The results corroborated Lee et al., (2004) argument that companies can survive through inaccuracy in forecasting, by understanding the causes of the bullwhip effects, which include repeat purchase orders to suppliers by distributors due to erratic ordering and consumption patterns by consumers. This implies that forecasting team at GSK should be aware of the existing and emerging threats in forecasting, and equip itself with appropriate fall back techniques to deal with various forecasting inaccuracies that arise in the market.

Various ways of improving forecasting at GSK

In response to objective three, all the respondents strongly agreed that monthly forecasting of products should be practiced as a way to improve forecasting at GSK. Therefore, the management at GSK should support this view and consider revising the annual forecasting calendar, so that it can correspond with the view of the technical teams.

In addition, 100% of the respondents strongly agreed that GSK should invest time and effort, in creating effective and efficient forecasting methods. This means that GSK should undertake an inventory of the current forecasting methods, followed by an analysis of the success of each method in forecasting accuracy.This is particularly important given the discrepancies between forecasted and actual sales, as shown in Figures 4.1, 4.2 and 4.3.

The results agreed with Armstrong and Green (2005), that companies overcome forecasting inaccuracies by using more than one method i.e. integratingjudgmental and statistical methods for forecasting in highly uncertain situations, and use of simple forecasting methods rather than complex forecasting methods or intentions to predict behaviour. The implication for GSK is that to improve forecasting accuracies, opinions of both, current and potential consumers, such as wholesalers and retailers, should be sought through market research processes, using survey and panel analysis of the past events, in order to understand what is happening in the market segments. However, as discussed in previous sections, past events are not a sufficient condition to improve forecasting. Both ongoing macro and market factors are important.

Macro factors mediated the relationship between market factors and forecast accuracy. The mediation was statistically significant, informed by the Z score for Sobel test of -3.654 and P value of less than 0.05.

5.3 Conclusions

The study concludes that macro factors impact forecasting at GSK. It is important for GSK to understand the various political actions that may affect the future forecasting of products. All the respondents were of the opinion that it is important

to consider the consumer's purchasing power, when expanding to new markets and also it is vital to consider seasons, promotions, holidays and festivals which result in erratic purchasing patterns. The demographics factors such as changing age, composition, change in distribution of population and the disposable income are significant in accurate forecasting of products at GSK.

On the market factors, the study concludes that they are quite important, although they did not rate as highly as macro factors. GSK is aware of the many alternative substitutes to its products and price structures and the presence of competitors.Although this knowledge does not necessarily translate to accurate forecasting.

The study concluded that the methods the organization uses to make up for inaccuracies, included the use of historic data, and reviewing the forecast to cater for the changing trends, through the use of computer software for forecasting. However, given the large discrepancies in the forecasting data in some of the months, over the past three years, it seems evident that these methods are inadequate.

5.4 Recommendations

Based on the discussions and conclusions, the study makes the following managerial based, and policy based recommendations:

On the macro factors, it is important for GSK to consider the consumer's purchasing power when expanding to new markets. This can be done by keeping track of the changes in recession, as well as economic factors, such as unemployment rate and inflation rates. With high unemployment rates and inflation rates, people tend to purchase less and hence lower sales should be forecasted. Seasons, promotions, holidays and festivals should be considered while forecasting, to avoid under or over forecasting. This can be ensured by firming the promotional calendar and frequency of promotions. Further to this, stock outs and excessive sales as a result of seasons, promotions, festivals and holidays must be studied individually so that forecasting and sales for the future months does not become erratic. It is also important to consider the changing demographics in terms of changing age, composition, change in distribution of population and the disposable income. The

management of GSK should strive to understand the various political factors that may affect the future forecasting of products.

On the market factors, it is important that GSK considers needs and wants of the consumers and understands consumer buying behaviour. This can be achieved by studying the frequency of receipt of customer needs and the frequency of needs fulfilment. In addition to this, the number of customers served and repeat purchases can also be studied. GSK should also spend time to understand the recency effect on forecasting and hence incorporate the effects of the recency effect in forecasting of products at GSK. GSK should keep track of competitors who sell very similar products that are sold by GSK. With these competitors, GSK should identify whether competition is based on price or quality in order to execute a plan to overcome competition. Further to this it is important that GSK also keeps track of when the competitor is advertising its products, technology changes that have been adopted by the competitor, as well as promotions by the competitors.

In the management of future forecasting, GSK should consider revising the forecasting calendar from annual to monthly as indicated by the respondents. GSK should undertake an inventory of the current forecasting methods, to evaluate the value of each method in forecasting accuracy. This should result in identifying a different mix of forecasting methods, that could more effectively forecast the products.To make-up for forecasting inaccuracies, GSK should continue to embrace technology to enhance and simplify the forecasting process.

Policy based recommendation includes the need to review the forecasting target of 80 to 110% in order to match it to the industry standard which is usually at around 60%.

5.5 Study limitations

There was a challenge of interpreting the questionnaire by the respondants, which involved explaining to the respondants, what was required of them while answering the questions. The other limitation of the study was that the case study research design makes the study context specific, therefore it cannot easily be

generalized to other contexts and organizations. Despite the limitations, the research objectives were achieved and key lessons drawn from the study.

5.6 Area for further research

The study examined the market factors that affect forecasting at GSK and specifically focused on the market and macro factors that affect forecasting, as well as how the organization makes up for forecasting inaccuracy. The study finally looked at the various ways of improving forecasting at GSK. Since this study was only based at GSK, and considering the numerous other companies dealing with fast moving consumer goods in Kenya, a similar study should be undertaken in a similar organization for comparative analysis of the results.

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APPENDICES

APPENDIX 1: LETTER OF INTRODUCTION

Dear Participant,

My name is Binita Haria and I am undertaking an MBA at Strathmore Business School. I am currently doing a project to **Assess the Market and Macro Factors That Affect Forecasting in Fast Moving Consumer Goods Companies - a Case Study of GlaxoSmithKline**. I am inviting you to participate in this study by taking part in filling the questionnaire.

The questionnaire will require approximately 45 minutes of your time. There is no risk if you decide to participate in this exercise. All information that you provide in this questionnaire will remain confidential. Participation is strictly voluntary and you can choose to withdraw at any time.

Thank you for taking the time to assist me in my educational endeavours. The data will provide useful information regarding the forecasting methods used in GSK. Participating in the filling the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me on shah.binita85@gmail.com.

APPENDIX 2: RESPONDENTS' QUESTIONNAIRE

Assurance is hereby given that your individual responses are entirely confidential and will be treated as such. Once again thank you for participating in this questionnaire. In case you may need a preview of the report of this work, you can give your email.

Email address ……..

SECTION A: PERSONAL INFORMATION OF RESPONDENTS

1. Department: ……
2. Position: ……
3. Experience / No. of years worked in the current organization.

   1-3 years ( )

   4- 6 years ( )

   7- 10 years ( )

   10 years and above ( )

SECTION B: EFFECTS OF DIFFERENT MARKET FACTORS ON FORECASTING

4. Rate the effect of the following markets factors on forecasting in GSK using a five point scale of **1-5 with Very low =1, Low =2, Moderate=3, High= 4, Very high =5.**

Market factors	**1**	**2**	**3**	**4**	**5**
Consumers/consumers buying behaviour					
Competition from similar products					
Recency effect (overweighing more recent information compared to information received in the distant past in a product)					
Availability of cheap substitutes					
Economic conditions e.g. employment rate, inflation, interest rates					
Consumer purchase power					
Popularity of the product among social classes of consumers					
Technological change					
Government legislation					

5. Rate the applicability of the following aspects of market factors on your day to day products forecasting at GSK. Tick appropriately. Use a five point scale of 1-5 with**: Key: 5 = Highly agree; 4 = agree; 3 = moderately agree; 2 = disagree; 1 = highly disagree**

Aspects of consumer buying behaviour	**1**	**2**	**3**	**4**	**5**
Number of consumers served by the company					
Repeat purchase by the consumer					
Number of consumer needs addressed					
Number of consumer needs that were reported					
Frequency of consumer feedback session,					
Aspects of competition					
Knowledge of existence of competitors					
Number of potential competitors					
Whether competition is on quality and price					
Demand forecasting is challenging in a highly competitive market.					
Changing pricing policies of competitors makes it					

difficult to estimate the exact demand of products.					
Technology adoption by competitors leads to changes in sales of their products and changes in demand of products and creates a difficulty in forecasting.					
Knowledge about new competitors, new locations for existing competitors and mergers assist in making forecasting decisions.					
A company in touch with consumers can improve its forecasting accuracy and also save capital					
The rates of a company against its competitors in terms of market share, research and development, quality, pricing, sales financing policies and public image affects forecasting.					
Recency aspects					
Frequency of reminding your consumers of your products,					
Changes in purchase pattern of your consumers after reminding them of your product.					
Availability of cheaper substitutes					
Number of cheaper substitutes					
Difference in prices of the two competing products					
Ease of availability of the cheaper substitutes					
Seasons, promotions, holidays and festivals					
Frequency of promotions					
Stocking and selling of seasonal products					
Stocking and selling of products for holidays and festivals					

Political indicators					
Planning during years of elections					
Anticipated or real political instability					
Purchasing power					
Effect of recession on the market					
Changes in purchasing power of consumers					

6. Rate the effect of the following macro factors on forecasting in GSK using a five point scale of 1-5 with**: Very low =1, Low =2, Moderate=3, High= 4, Very high =5.**

Macro factors	**1**	**2**	**3**	**4**	**5**
It is important for the company to understand the various political actions that may occur in the coming year.					
It is important to consider the consumer's purchasing power when expanding to new markets					
It is vital to consider seasons, promotions, holidays and festivals which result in erratic purchasing patterns.					
It is important to consider the changing demographics in terms of changing age composition, change in distribution of population and the disposable income.					

SECTION D: ORGANIZATION MAKE UP FOR INACCURACY IN FORECASTING

7. Which methods does GSK employ to make up for inaccuracies in forecasting of its products? – use a rating scale of **5=very often, 4=quite often, 3=often, 2=rarely, 1=not at all**

Forecasting methods	5	4	3	2	1
Through the use historic data while forecasting					
Through the use of gut feeling while forecasting					
Through studying market trends in times of forecast inaccuracy to make corrections					
Through reviewing the forecast to cater for the changing trends					
Through use of computer software for forecasting?					

8. State your agreement on the various aspects of organization make up for inaccuracy in forecasting. Use the **Key: strongly agree= 5; Agree= 4; Neutral= 3; Disagree= 2; Strongly disagree= 1**

Aspects of organization make-up	Rating				
	5	4	3	2	1
The company regularly caters for out of stock					
The company regularly keep track of competitors' moves					
The company constantly addresses price change move by competitors					
The company is aware of the many alternative substitutes in its products and price structures					
The company has clear-cut identity for its products in trade					
The company always has promotional teams in specific locations to promote its products					

SECTION E: WAYS OF IMPROVING FORECASTING AT GSK

9. Rank which measures should be put into action to improve the practicality of forecasting at GSK. Please tick appropriately using the following scale **strongly agree= 5; Agree= 4; Neutral= 3; Disagree= 2; Strongly disagree= 1**

Forecasting measures	**Rating**				
	5	**4**	**3**	**2**	**1**
Yearly forecasting of products should be practiced					
Monthly forecasting of products should be practiced					
Daily forecasting of products should be practiced					
GSK should invest the time and effort in creating effective and efficient forecasting methods					
GSK should create quality forecasts to enhance accurate view of future demand					
A mixture of qualitative and quantitative method should be practiced to create quality forecasting					
Quantitative forecasting methods should regularly be utilized than qualitative ones, as they are more valuable.					
GSK should focus more on political forecasting indicators since they influence the success of product forecasting more than other factors					

10. Are the current skills available among employees sufficient for product forecasting requirement of GSK?
    1. Yes ( )
    2. No ( )

    If No, suggest possible remedies ……
11. Kindly list human resource forecasting challenges that you encounter at GSK?

    ……..
12. Suggest ways in which the company's human resources should be improved to ensure they are more effective in delivering quality forecasting of products.

    …….

END OF QUESTIONNAIRE, THANK YOU