

Predictive Modeling of Athletic Footwear Sales using Trend Analysis

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ABSTRACT

In fashion business, forecasting is very crucial given the uncertainty associated with demand and supply. Footwear industry being an integral part of fashion has evolved and become a multi-billion dollar industry. This paper focuses on athletic/sports shoes, its present and future market. This paper also talks about the reasons, which influences the athletic shoes sales globally, though it may vary slightly with different culture, economy and taste. Past sales figure of Shoe store sales in the United States from 1992 to 2013 (in billion U.S. dollars) is used to estimate the future sales. Trend analysis forecasting is used to predict the future sales and growth of athletic shoes market.

Keywords: Athletic footwear, Fashion, Ath-leisure, Trend analysis

Introduction

With the concept of "Time is Money" more accepted in all business activities, decision making has become an integral part in solving the managerial problems where time and money both are involved and directly related (11). In case of uncertainties, strategic decision is the key. This is where forecasting plays an important part. In order to be more competitive in business and to gain a unique selling proposition, forecasting the demand in terms of quality, trend, quantity for the next period has become more important than ever. This has become more crucial with constantly fluctuating environment. In case of textile and apparel industries, companies needs to be more dedicated in rigorous management of sourcing, production and

distribution and make the right decision in time depending on the information at hand. This is especially important when there are numerous factors like color, price, fashion, store numbers, merchandising, weather, economic conditions, etc. are involved (2), (3). With the maturing athletic footwear market, focus is now shifted to innovation and style. However, there are many constraints, which complicates forecasting.

Literature review

Being healthy never goes out of style and so is the demand for sport shoes. But it is not just health aspect. There is a new dimension added to health and shoes and that is fashion. Sports shoes are now very much fashion driven and therefore a new word "ath-

leisure” has emerged. Within the fashionable athletic footwear markets, “*ath-leisure*” maintains that “products should be extremely wearable, versatile, utilitarian, and definitely comfortable.” (10). This lifestyle revolution definitely presents an opportunity for the shoe industry and a lot of room for innovations. Companies are experimenting with styles, details, fabric, color, etc.

Athletic shoes and fashion –As quoted by Marshal Cohen, Chief Industry Analyst, NPD Group – “This is not a fashion trend, it’s a lifestyle trend. The difference here is that there’s functionality mixed with fashion, not just solely fashion. The rise of the post-workout look reflects a more fundamental shift.” Compared to other service industries, sales forecasting of athletic shoes is a difficult task as it is now associated with fashion. “Given fashion product’s demand is highly volatile with ever-changing taste of the consumers and the fashion product’s life cycle is very short” (4). Fashion products sales is highly influenced by many seasonal factors, fashion trends, promotion strategies and other macroeconomic factors.

Evolution of athletic shoes

Athletic shoes were previously designed for very general functions like exercising and other physical activities. They were first created for a basic purpose to cover the foot and provide a new level for comfort. But with time, it has evolved as shoes for more casual everyday activities. But in the current scenario, it is often worn as fashion statement. It is more about style and comfort and that is the reason why people do not hesitate to wear on any occasion or with any dress including formals. It has also more leisure oriented now. As the medium class income level growing, people do not hesitate to spend extra bucks on the latest trend of shoes. The number of pair of shoes an average American man owns is 12 pairs, while the average American woman owns a whopping 27 pairs [TIME Style and Design Poll]. Out of which, 20 -30 % are athletic shoes. The famous economic theory by Adam Smith

applies here – “Human wants are unlimited”. Whenever there is a new style of athletic shoes is launch by the favorite brand, people hop onto the opportunity to buy another pair instantly. As sports shoes is now not restricted to gym or sports, people wear it at all possible occasion. “The bridge between contemporary and athletic lines is merging and that is what is appealing to the consumer – Stephanie Kennedy” (9).

Factors responsible for growth in sales of athletic shoes

1. Seasonality – The demand for athletic shoes is highest in the third quarter of the year (15). This is due to the fact that the weather is more favorable and people are motivated towards more outdoors activities.
2. Sports events – This is the time shoes company waits for. Famous sports events like NFL, NBA, FIFA, etc. trigger demand for athletic footwear. Since these events are held throughout the year, companies change their advertisement and endorsements accordingly to boost the sales. Currently, NBA is in season and therefore we see NBA players endorsing different brands of athletic shoes (15).
3. Celebrity sponsorship deals – Many companies signs famous celebrity for multi-million dollar contract. For example – NIKE has signed Cristiano Ronaldo, Kobe Bryant, Maria Sharapova, Rafeal Nadal, Federer, Lebron James, Michael Jordan (14). Rihanna is a new addition to the Puma family but these are not restricted to just sports. Since athletic shoes cater to all age group, even children, companies collaborate with names like Disney, Monster, etc.
4. Promotion -There are various ways athletic shoes company promote their shoes. The new definition of athletic given by NIKE is “If you have a body, you are an athlete” (14). The main idea behind this line is to increase the sales figure by inducing in the mind that everybody is an athlete and therefore

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needs shoes. Also, associating to the events like marathon, improves their public image. The recent one is the event “We are marathoners campaign” by Asics shoes (8).

5. Fashion - Fashion is best depicted and inspired by celebrities (7). Since women are more fashion driven, when some celebrity from entertainment industry wears them, it becomes a trend and style statement. This also increases sales.” The once ungentlemanly sneaker, it seems, has undergone a fashion baptism” (6).
6. Innovation – All athletic shoes company come up with various innovations to boost their sales year after year. Running shoes continues to evolve with new designs, new colors, new materials and new construction techniques (8). The recent one from Nike is the free trainer 5.0 that is built to match the diversity of modern athleticism. Puma released its graphic concept, evoSPEED 1.3, inspired from Japanese dragon, which is a symbol of power, speed, wisdom and agility.

Methodology

The research uses sales data from year 1992 to 2014. The data used in this report was obtained from secondary research. Secondary research involved gathering information from various publications including financial, marketing, and trade publications, company literature, and independent research reports, reviews from articles and reports from newspapers, and various associations like National Shoe Retailers Association, USA. Sales data is gathered to analyze the trend and forecast the future sales for the next 5 years. It includes retailing all types of new footwear (except hosiery and specialty sports footwear, such as golf shoes, bowling shoes, and spiked shoes). Since the athletic market is about 25% - 30% of the entire footwear market, data is proportioned accordingly to 30 % of total sales. [National Shoe Retailers Association, U.S. Census Bureau]

Trend analysis

Trend analysis is a graphical representation of data over a period of time in order to predict the future. Trendlines are used to extrapolate the data beyond the available data to forecast future values. The advantages of using trend analysis are that it is simple, easy to implement and results can be computed very quickly (3),(4). In context of the business, strategy and development, trend analysis focuses multi- variables affecting market and market segment which includes consumer behavior patterns, population, sales growth, geographical regions, product demand and technological advancement, etc. (12).

For the purpose of forecasting, polynomial trendline is used as the data represents gradually fluctuation. The advantage of using polynomial trendline is to bring out the effect of individual fluctuations, which is otherwise suppressed in moving average method. Polynomial trendlines are classed according to the maximum number of peaks or valleys they contain. In this case, order 3 trendline is used, as there is one or two valley/peaks. For the data in this report, there are three Valleys/peaks. Therefore, we use polynomial value of 4 (13).

Hypothesis

Research –based perspective suggests that sales of athletic shoes is based leisure/ fashion oriented, has no/little impact of cost, and innovation plays a key role.

Accordingly, the hypothesis of these relationship can be made:

- H1 (a): Leisure/fashion has positive impact on the sales of athletic shoes market.
- H1 (b): Cost has no/minimum impact on the sales of athletic shoes market.
- H1 (c): Innovation has positive impact on the sales of athletic shoes market.

Results and conclusion

The increasing trend of footwear market will continue to rise. The graph [2], [3] shown below explains the market growth of footwear industry as well as athletic shoes market. It explains the fact that after 2008-09 recession, when the economy began to improve in 2010, people who previously held off on athletic shoe purchases, proceeded to buy. Also, public health awareness has also increased over the decade and therefore people are more encouraged to buy sports shoes. Furthermore, increased athletic activity puts more wear and tear on athletic shoes, necessitating more frequent purchases

to replace worn out footwear. Also, rising disposable incomes allow consumers to afford premium-priced shoes. Companies subsequently gained leverage to raise prices as consumers shifted their focus from price to quality in light of improving.

The price of shoes (index) will also continue to rise as shown in figure 3 below. When the price of shoes increases, consumers still buy these products because there is no substitute to shoes. However, for price-conscious consumers, there is always an option of inexpensive style or brand of athletic shoes. Thus, all three hypotheses are true.

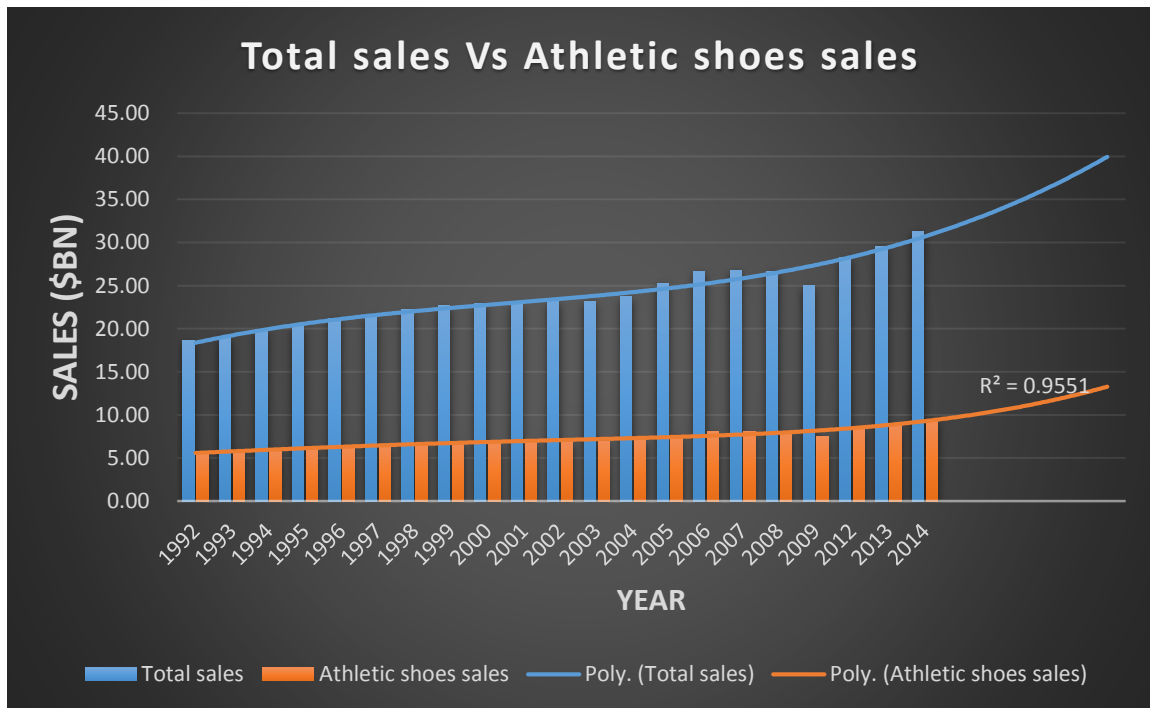


Figure 1. Total sales of footwear Vs sales of athletic shoes in (\$bn) . [National Shoe Retailers Association, U.S. Census Bureau][1]. Poly. Indicates polynomial trendline with power 4,

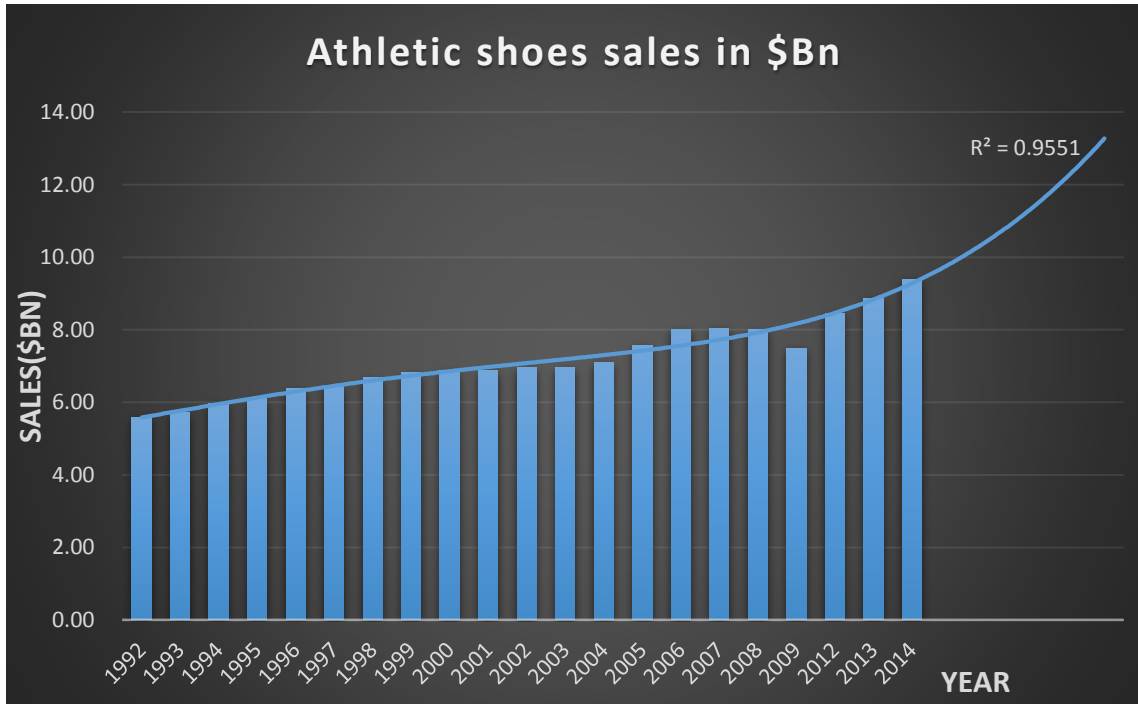


Figure 2: Market forecast of athletic shoes for the year 2015 – 2020. [National Shoe Retailers Association, U.S. Census Bureau][1],



Figure 3. Growth in the price index of shoes [IBIS world Industry report, 2014](5),

Conclusion

The price of shoes is projected to grow due to improving economy as well due to fashion inflation over the five years to 2020 (5). As demand is in the upward trend and will continue to be so, the disposable incomes of individual is predicted to increase as well. As a result the shoe manufacturers will have to continuously evolve and come up with more innovative products to keep customers on their toes, literally. . As fashion is never going to be out of fashion, people will continue to investment part of their income on footwear.

List of references

1. <http://www.statisticbrain.com/footwear-industry-statistics/>
2. S. Thomassey, M. Happiette, N. Dewaele, J. M. Castelain, 2009, A Short and Mean Term Forecasting System Adapted to Textile Items' Sales.
3. [Yanrong Ni; Feiya Fan](#), 2010, A two-stage dynamic sales forecasting model for the fashion retail.
4. Na Liu, Shuyun Ren, Tsan-Ming Choi, Chi-Leung Hui, and Sau-Fun Ng, 2013, Sales Forecasting for Fashion Retailing Service Industry: A Review
5. Athletic shoes stores in the US, 2014, IBIS world Industry report, Brittany Carter.
6. The sneaker comes of age, NY Times, Jun 11, 2014.
7. New athletic shoe trends, Chicago Tribunal, Nov 2014.
8. What are the trends in athletic shoes, Bloomberg Business, Asics America CEO Kevin Wulff.
9. Sneakers Are No Longer Just For The Gym, Forbes life, Aug, 2014.
10. Consumer Behavior That is Driving Active Footwear, 2015 Trend Report, Nov 2014, Wendy Bendon.
11. Time-Critical Decision Making for Business Administration, [Professor Hossein Arsham](#)
12. Market trend analysis, Legal power consulting, <http://legalpower.ca/business-consulting/market-trend-analysis/>
13. “Adding a Trendline to Your Chart “, Intel® Teach Program, Designing Effective Projects
14. www.nike.com/
15. <http://www.bidnesetc.com/20791-athletics-footwear-industry-hurdles-sight/>

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