

1a) Overview of Tea Market

i) Major Products of Tea

Basically, the major products of tea in Singapore are divided into 3 categories namely: English, Chinese and Japanese. E.g. of English tea are Earl Grey Tea and Ceylon Tea, Chinese tea are Tie Guanyin and Oolong while under the Japanese tea category, we have Green tea (See Appendix 1). For the purpose of this report, we are only considering sachet tea bags.

ii) Brand Names of Tea

According to **Kotler and Armstrong (1999)**, "Brand name is intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors". The major brand names identified in the Singapore market are Twinings, Lipton and Boh.

iii) Suppliers of Tea

The current major suppliers for the Tea market in Singapore are Auric Pacific (Twinings), Unilever (Lipton) and Boh (Boh Tea) with 31%, 41% and 18% as their market share respectively. And the others with a 10% market share. (See Appendix 2 for data on market share)

1b) Other Types of Beverages

Soft Drinks

Basically, the soft drinks in Singapore are classified into two categories namely: carbonated and non-carbonated. Under carbonated soft drinks, there are Coca-cola, Pepsi, Sprite, 7-up etc. Under non-carbonated soft drinks, there are mineral water, fruit juices and other types of non-gassy, flavoured drinks. There is a growing trend in consumers being more health conscious, which leads to an increase in the consumption of non-carbonated drinks. (See Appendix 3) Tea being a form of non-carbonated drink can be considered as a close substitute with non-carbonated soft drinks. However, tea consumers will not consider carbonated soft drinks to be a close substitute due to the different consumption pattern. Both drinks are consumed at different time of the day and at different occasion. It is normally the case that tea is consumed during breakfast while soft drinks are taken other than in the morning.

Therefore, it can be concluded that non-carbonated soft drinks are considered as close substitutes to tea and hence, soft drinks are relatively close substitutes to tea. This implies that its cross-elasticity of demand is likely to be positive and greater than one.

Hot Beverages

Hot beverages consist of coffee, cocoa drinks, malt drinks, etc. These drinks are viewed as having a relatively similar consumption pattern as tea. Normally, hot beverages would be taken in the morning or early part of the day and the same goes for tea. Therefore, they are considered as close substitutes and a change in price of hot beverages will have a significance change in the demand for tea. Hence, the cross-elasticity of demand will be positive and greater than one.

Alcoholic Beverages

Alcoholic Beverages consists of spirits, beer, stouts and wine. Local Laws restrict the consumption of alcohol to persons aged 18 and above. People who are underage will not be able to consider alcoholic drinks as substitute for tea as they are prohibited to consume them. Moreover, the consumption pattern of tea and alcoholic drinks differs. Alcohol is normally consumed in nightspots and pubs. It is normally served at places where tea is virtually not on sale (except supermarkets) and people who visit these places usually consume only alcohol or soft drinks. Lastly, tea (See Appendix 4) is reported to be beneficial to health while alcohol has been proven to **damage the liver** (See Appendix 5). Therefore alcoholic beverages are not considered to be close substitutes to tea.

1c) Demand And Supply Substitutability

A Market is defined as a mechanism that brings buyers ('demanders') and sellers ('suppliers') of a good or service in contact with one another. **(Jackson et.al, 1998)**. It can be define by the elements Demand (product level, geographic dimension and functional level) and Supply (is the listing of sellers that are regarded as currently or potentially producing a good and considering these sellers as members to that market) Substitutability.

i) Demand Substitutability

▪ Product level

Demand substitutability at the product level states that firms must be selling products, which are closely substitutable in the eyes of consumers. This degree of substitutability may be subjective in the minds of consumers. For case study purpose, the following beverages are chosen for comparison:

As discussed in part (1b);

Soft Drinks:

Soft drinks are generally classified as a relatively close substitute to tea, thus its substitutability is relatively high.

Coffee (Hot Beverages):

Hot beverages are classified as close substitutes to tea, hence substitutability between these products is high.

Beer (Alcoholic Beverages):

Alcoholic beverages are not close substitutes to tea, therefore, its substitutability is low.

▪ Geographical Dimension

Demand substitutability at geographical level is achieved when firms sell to a common group of buyers. A point to note here is that people of all ages do drink soft drinks, coffee (hot beverages) and tea quite frequently. It can therefore be said that the firms supplying these beverages are selling to a common pool of consumers, however, alcohol are only allowed to people over 18 years old. Since tea can be drunk at all ages while alcoholic drinkers have to be above 18 years of age, the latter group would not be considered as a homogenous group of consumers as tea drinkers.

▪ Functional Level

Functional level refers predominantly to operational level of the firm. The manufacturers, distributors and retailers are at various functional levels that determine the demand substitutability. In order for firms to be classified as competitors in the same market, firms must operate at the same functional level. The market in local context can be analysed at the Manufacturing, Distributor and Retailer Level.

▪ Manufacturing Level

Only soft drinks and beer (alcoholic beverages) are manufactured in Singapore. The former has Yeo Hiap Seng (YHS) and Fraser and Neave (F&N) as the two main manufacturer as well as distributor while the local beer brewery and distributor is Asia Pacific Breweries Ltd. On this level, only soft drinks and beer are considered as competitors.

▪ Distribution Level

At this level, all the previously mentioned beverages are considered as competitors as all of them are distributed to retailers to bring them to the final consumers. Coffee (hot beverages) is distributed by Nestle Ltd.(Nescafe) and Boncafe International Pte Ltd, while tea by Auric Pacific and Unilever. Soft drinks and beer (alcoholic beverages) are as mentioned above. Therefore at this level, all of them are seen to be competitors.

▪ Retail Level

There are many retail outlets in Singapore selling all the above types of beverages, hence the retail market is dense. This level sees the beverages as competitors too. This is because, they are all sold off the shelves to the final consumers at retailing outlets. They are seen as competing products as a dollar spent on one beverage will cause the expenditure of the other beverages to decrease by that same dollar and hence the concept of Opportunity Cost.

ii) Supply Substitutability

▪ Current Suppliers

Currently, since all suppliers of coffee (hot beverages), beer (alcoholic beverages), soft drinks and tea are producing/distributing their respectively beverages, they are considered to be members of the Beverage industry. However, they are in different markets as Asia Pacific Breweries are in the alcoholic beverages market while YHS and F&N are in the soft drinks market. The only exception is coffee and tea which are very closely related in the hot beverage market.

▪ Potential Suppliers

Only when there is signs of profit incentives would these current suppliers switch their production/distribution to tea. However, as Singapore has no vast land for tea plantations, they would have to import the tea from foreign manufacturers as with the practices of Unilever and Auric Pacific . This would most probably not pose a problem

to them as firstly, they are all in the beverage industry. Secondly, they all are rather well established beverages suppliers, hence acquiring distributorship from abroad would be relatively easy as oppose to a newly set-up beverage supplier. Therefore there is high supply substitutability in his case.

Determination of “Tea” market:

It can be seen that the demand substitutability is relatively high for soft drinks, coffee and tea with the exception of alcoholic drinks. It is only at the Functional Level (both distributor and retailer levels) where all the beverages are seen to be competitors, hence demand substitutability here is rather high. With regards to current supply substitutability, it is only relatively high between coffee and tea while potential supply substitutability is relatively high for all beverages.

Therefore, it can be concluded that “Tea” belongs to the Hot, Non-Alcoholic and non-carbonated Beverage Market with only a few key suppliers at the moment.

1d) Market Structure Classification

There are 7 types of structures to be looked at in terms of product differentiation, concentration of firms and their industry's barriers to entry (See Appendix 6). The tea market in local context can be divided into the Distributor and Retailer level. The manufacturing level has been left out as there are no tea plantations on the island. For the purpose of this assignment, only the selling side of the market will be discussed.

i) Product differentiation is defined as the differences in consumers' minds with regards to rival firms' products (Jackson et al, 1998). With regards to the Distributor level, the suppliers bring in various tea such as Earl Grey, English Breakfast, Darjeeling, etc. Some suppliers may sell the same type of tea, however the tea brand may be a crucial differentiating factor. For instance, people will rather go for Auric Pacific's Twinings English Breakfast tea rather than Unilever's St. Thomas Lipton English Breakfast tea as Twinings has a more fragrant taste and scent to most consumers (See Appendix 7) This evidently showed a high level of product differentiation. Likewise, the Retailer level sees many retailers carrying practically all major brands and types of tea. All types of tea are also shelved collectively and hence enable easy comparison of tea by the consumers. This clearly denotes that the differentiation of tea at this level is considered high too.

ii) Concentration of firms refers to the size of market share held by the largest 5 to 10 firms in the market (Jackson et al, 1998). At the Distributor level, it was identified that there are a few key distributors namely, Auric Pacific, Unilever, Boh. This points to a relatively high market concentration.

The Retailer level shows signs of low market concentration because there are a lot of retailers in Singapore selling tea within a stone's throw away from each other.

iii) Barriers to entry is said to be the degree of difficulty new firms might have to experience when breaking into an industry with existing firms (Jackson et al, 1998). The Distributor level of the tea market has a considerable high barriers to entry. This is because tea manufacturers will not grant distributorship to just about any firm. Careful analysis of potential distributors' profiles and financial positions have to be made lest the quality and namesake associated with the tea brands be tarnished by lousy distributors. In Singapore, not many food and beverage firms or retailers can be of such standings, hence local tea distributors enjoy “protection” to a certain extend.

At the Retailer level, barriers to entry is very low. As Singapore has a relatively affluent economy, Singaporeans are spoilt for choice over tea among other things. Supermarkets and grocery stalls all over the island do carry almost all sorts and brands of tea. Also, a newly opened provision shop can contact the respective distributors and stock up its shelves with all types of tea without any difficulty as the more retailers a distributor has, the more its profitability will increase.

iv) Summary: From the above analysis, it can be concluded that the local distributors of tea are in an Oligopoly as there are a few key distributors (hence having high concentration) supplying differentiated types of tea and having considerable high barriers to entry. At the retailer end, they somewhat are fighting in a Monopolistic Competition.

This is because there are many tea retailers here selling differentiated types of tea (as with their distributors) and having only slight barriers to entry.

2) a) Theoretical And Statistical Expectations

i) Own Price Elasticity

We expected the consumption of tea to follow the law of demand and will display an inverse relationship to the price of tea. The price elasticity of tea will be negative and slightly more than one (relatively elastic). Hence, when the price of tea increases, consumption of tea will decrease more than proportionate and vice versa.

ii) Cross Price Elasticity With Coffee

We expected coffee to be close substitute of tea. The cross price elasticity of coffee is expected to be positive and slightly more than one (relatively elastic). Hence, when the price of coffee increases, consumption of tea will increase and vice versa.

iii) Cross Price Elasticity With Soft Drinks

We expected soft drinks to be a relatively close substitute for tea. The cross price elasticity of soft drinks is expected to be positive and more than one. Hence, when the price of soft drinks increases, consumption of tea will increase more than proportionate and vice versa.

iv) Cross Price Elasticity With Beer

We expected beer to be a poor substitute of tea. The cross price elasticity of beer is expected to be positive and close to zero. Hence, when the price of beer increases, consumption of tea will only increase insignificantly and vice versa.

2)b) Summary Table (See Appendix 8)

2)c) Best Fit Equation

i) Methodology

To determine the best-fit equation for the Singapore tea market, non-linear (logarithmic equation) regression analysis is applied to estimate the demand of tea. The equation that provides the highest R^2 & lowest Standard Error is deemed to be statistically sound.

ii) Best Fit Equation

The best-fit equation for the consumption/demand of tea obtained from the regression analysis is:

$$\log C_1 = \log a + b \cdot \log P_T + c \cdot \log P_{SD} + d \cdot \log P_B$$

$$\log C_1 = 1.851 - 0.974 \log P_T + 0.188 \log P_C$$

$$C_1 = 71.07 P_T^{-0.974} P_C^{0.188}$$

Where C_1 = Consumption Of Tea, Per Capital (kg)

P_T = Deflated Price Of Tea Index

P_C = Deflated Price of Coffee Index

Adjusted R^2 Value = 68.37%

Standard Error = 0.0497

Number Of Observations = 15

The equation above shows that the demand for tea is correlated to the price of tea and coffee (See Appendix 9).

iii) Price Elasticity Of Demand For Tea measures the responsiveness of quantity demanded of a good to a change in one of the determinants of demand for that good (assuming all other determinants remain constant). Here, the elasticity of demand is -0.974 . This illustrates that if price of tea increase by 1%, consumption of tea will decrease by 0.974% and vice versa. The negative sign indicates that it follows the Law Of Demand where it says that any increase in price of a commodity (tea) will lead to a decrease in the quantity demanded for that commodity (tea).

As the demand is inelastic (less than 1), it also indicates that consumers in the data provided are less sensitive to price changes. This suggests that the marginal change in quantity demanded will be less than the marginal change in price. This may be due to the following reasons: a) Tea may be considered a necessity or b) There are few close substitute for tea. Therefore, to increase total revenue, the seller should increase prices of tea.

iv) Cross Price Elasticity Of Coffee measures the degree of responsiveness of tea's demand to the changes in price of coffee. Here, the cross price elasticity derived from the equation is 0.188. This indicates that a 1% increase

in the price of coffee will lead to a 0.188% increase in the demand of tea and vice versa. A positive cross price elasticity value indicates that coffee and tea are substitutes. However, as the cross price elasticity is less than 1, it also implies that coffee and tea are substitutes. This may be due to different consumers' taste and preferences. From the above analysis, the equation is shown to be theoretically sound.

v) Statistical Justification Of Best-Fit Equation

vi) The Coefficient Of Determinant (R^2)

The coefficient of determination shows how much change in the dependent variable (consumption of tea), which can be explained by changes in the independent variables (price of tea and coffee). The adjusted R^2 value in this equation 0.6837, which implies that a 68.37% change in demand for tea (C_1) can be explained by the changes in price of tea (C_2) and coffee (C_3).

The remaining 31.63% of changes in demand for tea can be accounted by other qualitative factors e.g. consumers' tastes and preference, health consciousness and brand loyalty and quantitative factors e.g. promotion campaigns, advertising expenditure and packaging that are not considered in the equation.

vii) Standard Error Of Estimate (SEE)

SEE measures the predictive capacity of the equation. The lower the SEE, the higher the predictive ability. In this case, the equation gives the lowest degree of SEE (0.0497) compared to other 7 equations. Therefore the equation can provide a good estimation of demand for tea, with considerations for the price of tea and coffee. Its predictability is further illustrated by the following:

$$\begin{aligned}\text{Assuming demand for tea is 100kg: Estimated demand} &= \text{Given demand} \pm \text{SEE } (t_{0.05, 12}) \\ &= 100 \pm 0.0497 (t_{0.05, 12}) \\ &= 100 \pm 0.0497 (2.179) \\ &= 100.1083\text{kg to } 99.8917\text{kg}\end{aligned}$$

viii) The t Statistics

The t statistics measures the significance of the relationship between the dependent variable and each independent variable. The t-calculated values for the independent variables of demand for tea are as follows:

$$\text{Price of Tea, } P_T = -4.612, \quad \text{Price of Coffee, } P_C = 0.851$$

Given that the number of observations is 15, the degree of freedom is 12. At this degree of freedom, the comparison of t-calculated values and t-table values (See Appendix 8) shows the following:

Price of tea has a significant influence on the demand of tea at a 99% level of confidence (t-calculated value 4.612 > t-table value 3.055)

Price of coffee has a significant influence on the demand of tea at a 50% level of confidence (t-calculated value 0.851 > t-table value 0.695)

Hence, it can be concluded that the price of tea has a higher level of influence than the price of coffee. From the above, it is shown that the equation is statistically sound.

2)d) Justification Of Choice

The equation is theoretically sound because the negative price elasticity of tea follows the demand of coffee. The cross price elasticity for coffee shows that it is a substitute for tea but not a close substitute, however, it is still a substitute of tea, which is in line with our expectation. Soft drinks and beer turn out to be a complement and a very good substitute to tea respectively when the equation is tested and hence rejected because it is not in line with our expectation. In addition, the equation is statistically sound as the results derived from the 3 statistical interpretations showed that the prices of tea and coffee have significant influences on tea consumption. Hence, that best-fit equation is both theoretically and statistically sound.