

Assignment 1

Marketing Information Management

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Introduction

This first assignment is about evaluating the customer base of a company, following the Gupta, Lehmann and Stuart method (GLS method). This method is used to calculate the value of a firm's current and future customers. A file with the needed data was provided on blackboard. Gupta, Lehmann and Stuart (2004) are arguing that customers are extremely important assets and that customer value offers strong proxy to firm value. We will follow the GLS method and first learn about the customer acquisition process and then forecast the number of acquired customers obtained by extending the fitted curve to the future. After this we will compute all the relevant metric and calculate the elasticity for retention, acquisition costs, margin and for discount rate. Finally there will be a short discussion of the results. The reader should also notice that margins and costs are in dollars, and the number of customers is expressed in millions.

Before we proceed it is notable to mention that we have used the Dutch number formatting.

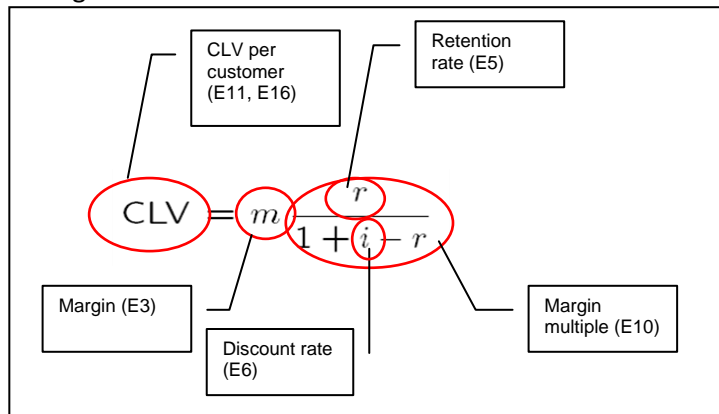
Value of current customers (both before and after 38% corporate tax)

→ Preparing the data:

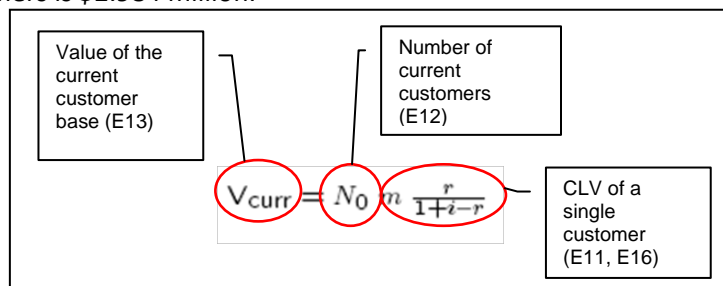
To implement the method of Gupta, Lehman and Stuart the selected data for our group were imported into Excel. After this step we started preparing the data, so they would be suitable for calculating the requested information. At first an extra column 't' was added (Excel:column D) where the quarters of the current data were numbered from 1 to 32. For the graphical representation we added the period in column A in the format of yyyy–qq (for the layout in the graphs etc.). The last step of the data preparation was to make a graphical overview of the cumulative number of customers. (blue line, figure 1 – page 4)

→ Calculation value of current customers:

First the variables (m , A/a , r , i) were placed in the Excel sheet. To calculate the value of one current customer, the following formula was used:



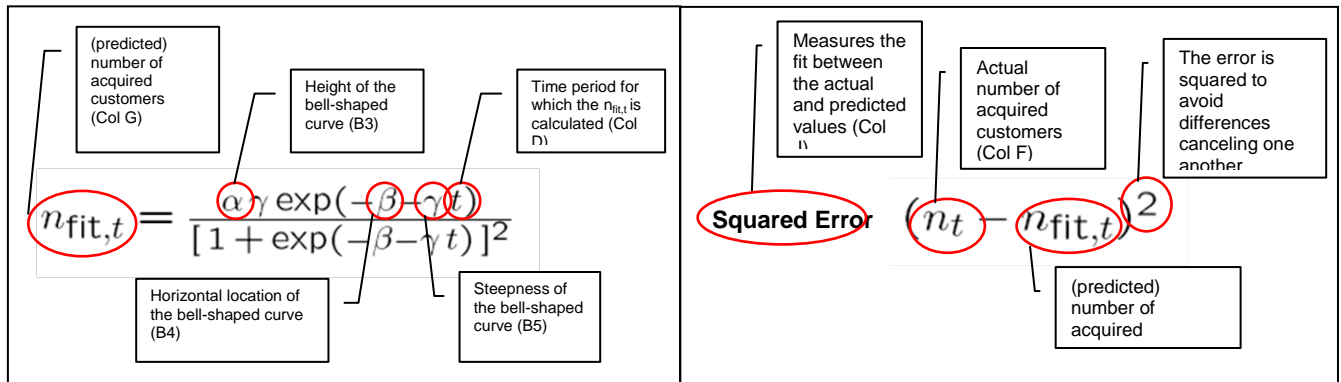
This resulted in a CLV per customer of **\$140,77**. By multiplying the CLV for a single customer with the total number of customers (Q4 2008) we can calculate the value of all current customers. The calculated CLV of all current customers resulted into an amount of \$4.813 million before tax. After tax the CLV for all current customers is \$2.984 million.



Value of future customers (both before and after 38% corporate tax)

→ Preparing the data:

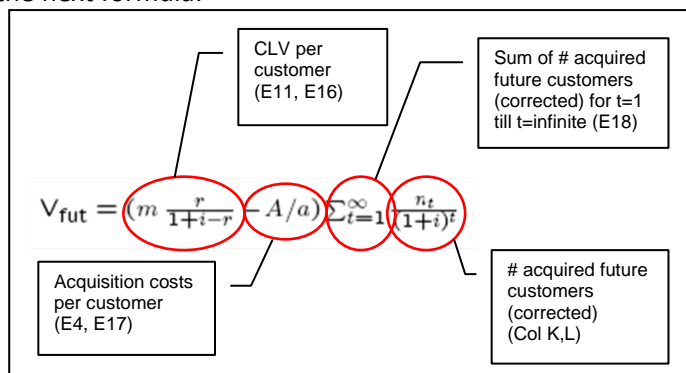
Next a column 'growth (nt)' was added to the data, describing the quarterly growth in customers. (red line and bell shaped, figure 1 – page 4). Then the parameters α, β and γ were centrally placed in the Excel sheet with random values. We fitted the bell-shaped curve to the numbers of acquired customers. To do this properly we needed two extra columns: error and squared-error (I and J). This data resulted in an extra variable: Sum of squared error. With the sum of squared error it is possible to calculate the minimal error of the model. To fit the model with the data we used the excel solver which resulted in a sum of square error of 0,711.



The next thing we had to do was extending the model to the future, which was easily accomplished by extending the formulas to more rows. To get a clear overview an extra column with the number of predicted new customers was added (column H, not in millions). Because the number of current customers is more important than the number of the future customers, the numbers have to be discounted. Therefore we used the discount rate (i) and the time period (column H).

→ Calculation value of future customers:

To calculate the value of all future customers we can use the CLV per customer, which is calculated before, margin minus the acquisition costs per customer and the sum of the acquired future customers (column A). When we multiply these two we get the value of all future customers (in millions). This is shown in the next formula:



This resulted in a CLV per future customer of **\$123,87**. By multiplying the future CLV per single customer with the total number of future customers we can calculate the value of all future customers. The calculated CLV of all future customers resulted into an amount of \$345 million before tax. After tax the CLV for all future customers is \$214 million.

Total value of entire customer base (both before and after 38% corporate tax)

The value of the entire customer base is easily calculated by adding the value of the current customers and the value of the future customers resulting in a total value of \$5.158 mln (after tax: \$3.198 mln).

Preparation for elasticity calculations:

To be able to calculate with the same parameters per time unit, we had to convert the annual increase of 1% to a quarterly rate, with the following formula: $1,01^{(3/12)} = 1,002491$. This results into the multiplication factor 1,002491.

Elasticity for retention (based on 1% annual increase)

Due to the design of the Excel model (all formulas are based on the quarterly retention rate), changes in the values of the variables automatically generate adjusted end values of customer value. We multiplied the quarterly retention rate with the multiplication factor 1,002491 resulting in a quarterly retention rate of 0,948. The sum of the current and future CLV of all customers increases from \$5.158 million to \$5.321 million. This results in an elasticity of 3,171% for the retention rate.

Elasticity for acquisition cost

Like before the design of the Excel model generates adjusted end values in customer value. We increased the value of the variable acquisition cost with 1%, resulting in \$17,069 acquisition cost. As a result of this the total current plus future CLV of all customers decreased from \$5.158 to \$5.157 million. This results in an elasticity of -0,009% for acquisition cost.

Elasticity for margin (based on 1% annual increase)

An annual increase of 1% of margin is converted in a quarterly increase of margin by multiplying $12,50 \times 1,002491 = 12,531$. As a result the total current plus future CLV of all customers increases from \$5.181 million to \$5.171 million. This results in an elasticity rate of 0,251% for the margin.

Elasticity for discount rate (based on 1% annual increase)

To convert the annual increase of 1% discount rate into a quarterly discount rate we multiply the discount rate 0,030 with $1,002491 = 0,030074$. As a result the total current plus future CLV of all customers decreases from \$5.158 million to \$5.153 million. This results into an elasticity rate -0,092% for discount rate.

Discussion of the results

General

As mentioned before, Figure 1 represents the data in a graphical way. It clearly shows that the focal company is over the top of its growth in new customers. That in turn can be a consequence of either a mature or even a declining market situation or that the focal company's competitive position has deteriorated. In either way, the company has to improve its performance. Which specific instrument is most effective will be discussed under elasticity's.

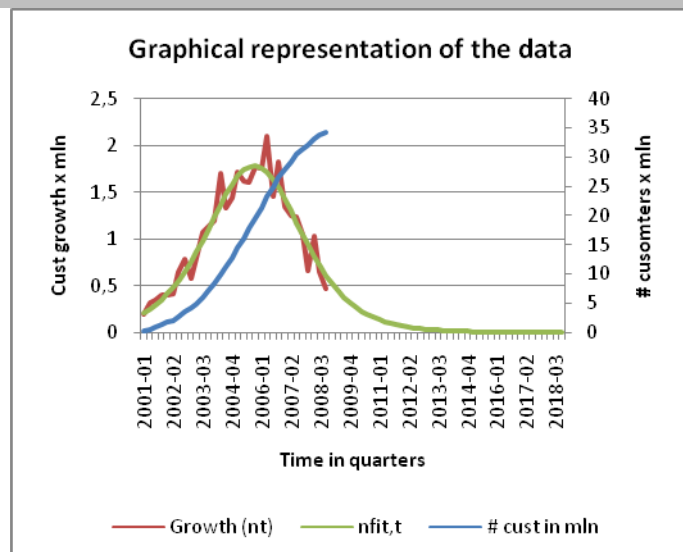


Figure 1: Graphical representation of the data

Value of the entire customer base

In correspondence to the previous results the value of the current customer base is much larger than the value of the future base (Figure 2). This is another indicator that the company has to engage in some sort of action to counter this decline in customer growth.

In theory the calculation of the value of the future customer base will use an infinite timeframe, in practice

this means taking the sum until the number of customers is zero. Because the sum over 1.000 lines is of no effort to Excel we've taken the sum until Q4 of the year 2250. According to the calculated predictions the company will acquire no more new customers after 2027 Q4 (column H in the Excel file), when the number of new customers is discounted ($i = 0,03$; see column L in the Excel file) this changes to 2025 Q1.

Value of Customer Base		
	Before Tax	After Tax
Value of current customers (2008 Q4)	\$ 4.813 mln	\$ 2.984 mln
Value of future customers (2009 Q1 - 2250 Q4)	\$ 345 mln	\$ 214 mln +
Total value of entire customer base	\$ 5.158 mln	\$ 3.198 mln

Figure 2: Value of Customer Base

Elasticity's

The elasticity's were calculated to determine the influence of the variables in the CLV calculation; these are displayed in Figure 3. For this company a change in the retention rate will be most effective. Followed by the margin and the discount rate. The acquisition costs have the least impact on the total CLV.

This does not mean that improvement to retention is the best thing to do, because costs of improvements are not taken into account. This requires additional analysis.

The calculated CLV can be used as a baseline to compare with future or past results to assess the effectiveness of certain campaigns. It can also be applied to several customer segments or business units to compare the values of their respective customer bases.

Elasticity for retention (based on 1% annual increase)	
Elasticity over total value of customer base	3,171%
Elasticity for acquisition cost (1% increase)	
Elasticity over total value of customer base	-0,009%
Elasticity for margin (based on 1% annual increase)	
Elasticity over total value of customer base	0,251%
Elasticity for discount rate (based on 1% annual increase)	
Elasticity over total value of customer base	-0,092%

Figure 3: Elasticity results

Thus remains the conclusion that this firm has to take action, to cease the decline in customer growth, or to align the company with this decline to be able to survive in the long run. Of course their can be alternate explanations to this decline, but these can not be derived from the data.