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USING CLV CONCEPT FOR MARKETING BUDGETS ALLOCATION

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The paper evaluates the usefulness of customer lifetime value (CLV) as a metric for marketing budget allocation by developing a framework that enables managers to maintain customer relationships proactively through different elements of marketing mix, in order to maximize CLV. The analysis is based on data from a hardware components PC B2B company and suggests that there is a potential for increased sales and CLVs when managers design resource allocation rules that maximize CLV. Managers can use the authors' framework to distribute marketing resources efficiently across customers and when choosing between different promotional activities.

JEL Classification: M31.

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1. Introduction

Today more and more directors and managers are paying close attention to the marketing function. Until the global financial crisis, marketing budgets were gradually increasing from one year to the next, although marketing productivity was in question (Rust, Ambler, Kumar 2004). Probably this is one of the main reasons why now in the current economical situation marketing professionals are laid off first and marketing spending is cut so dramatically.

This is why now, like never before, marketing professionals need to justify their presence and prove the efficiency of their activities. In reality, lots of activities aimed at short-term increase in sales or market segment share can undermine long term company profitability and decrease marketing assets of the company (Rust, Ambler, Kumar 2004). Moreover, path dependency in the way marketing budgets were allocated among the marketing instruments is likely to result in investing in those activities that proved to be efficient in the growing market, or in maintaining relationships with “dying”, unprofitable customers. In the current economical situation it is crucially important for customer-oriented companies to identify this type of clients in order to shift their focus to other customers and maximize customer lifetime value and customer equity.

The aim of this paper is to provide a framework for rational allocation of marketing budgets that could result in the customer equity maximization. We provide a framework for measuring CLV that links the influence of different components of marketing mix on CLV. Given the assumed link between CLV and firm profitability, these are important issues. In this article, we use data from marketing budgets and customer sales for one of the regions in Russia and CIS office from a large multinational business-to-business (B2B) PC hardware manufacturer to illustrate the proposed framework empirically.

2. Framework

As it was previously mentioned by Venkatesan and Kumar (2004), there is no single CLV calculation that is suitable for all companies; it differs from industry to industry. We would like to add that this is true not only from the industry, but from business model to business model perspective.

On the picture below you can find drivers that influence the sales out volume, customer profitability and CLV for the selected PC hardware component manufacturer and its competitors.

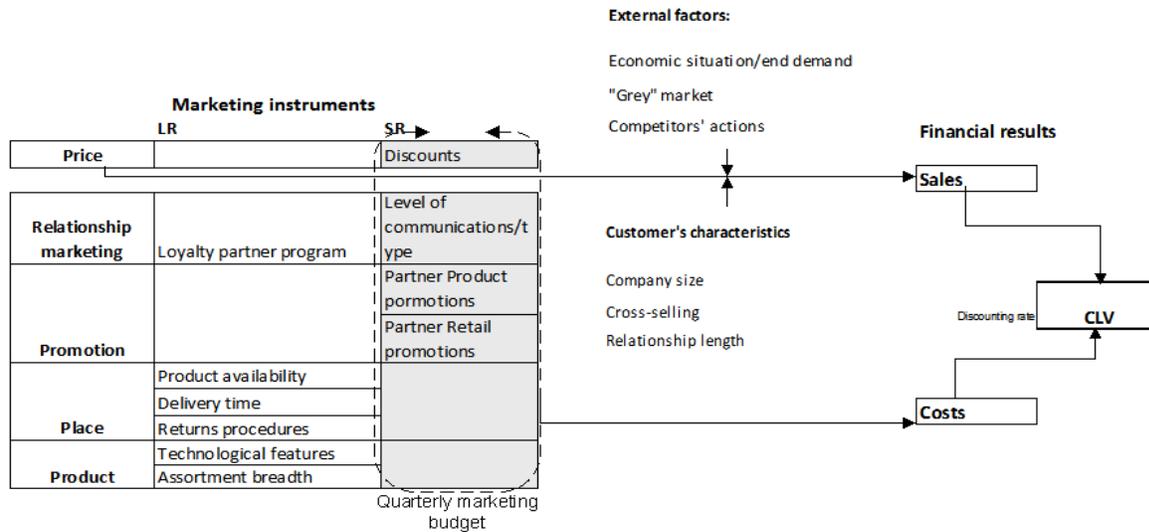


Fig 1 . Drivers impacting CLV

Marketing instruments used by the company in the study should be stimulating customers behaviors and thereby impact the financial outcome of relationships with them. Instruments on the scheme can be divided into two groups: on the left, there are long-term components of the marketing (changing them can take a while and the result will be visible in the long term, or some of those components are determined by the head office and Russian branch can't do anything to change the balance between them). Second block includes those activities funded by local quarterly marketing budgets. These are spending on communication, promotion, advertising. Spending on discounts is funded and approved by the head office and is not calculated as a marketing budget, but the Russian branch can determine whether the discounts should be given. A balance between the instruments is determined locally. This is why it is especially important to identify the instruments with the highest ROI and allocate budgets accordingly for each customer. Each marketing instrument influences the length of the relationship with the customer, and the customer's perception of this relationship (not included in the model). They help generate revenue (by influencing the customer) and are variable costs and thus determine the CLV value. Local offices can't change the product itself; all regions sell thousands of products, so this element won't be considered in this paper. Also, distribution models and channels are set by the head office.

Now let us pay closer attention to each element of the marketing mix and relationship marketing, in order to theoretically predict their impact on CLV and in order to determine which empirical data is needed for the study.

Price. The offering discounts has a great impact on the sales out volume in the short term. But as for CLV and customer equity, Pauwels et al. (2003) found out that discounts have a negative impact on the firm capitalization in long term period. We need to study the impact of discounts on the CLV for a hardware IT company to find out if the results will be similar to those from other industries.

Communications. Following Venkatesan and Kumar (2004) study, we divided methods of communication into three categories: rich (face to face meetings, trade shows, etc.), standard (phone calls, direct mail, etc.), and online communication. We can assume that different means of communication will have different impact on the customer and the frequency of their purchases. Also, apparently, the cost of these means of communication would be different. For the company in the study, we have three levels of communications. The first is direct touch, meaning that each partner has its personal account manager within the company. We can assume that the fewer companies each manager covers, the more time he spends on each account and the higher the level of communication is.

The second is sales center: partner accounts are covered by a call center. Managers of the call-center are less experienced than regular account managers, and each call center employee covers 40-50 accounts. It's apparent that level of communication is lower and communication is pretty much initiated by the customers themselves.

The third is E-touch: these companies only receive email contacts from the company website. These partners buy very little product and are not interesting to the company in study.

In this study the level of communication will be studied from the financial perspective. We need to find out if communications are an effective marketing instrument for the company and if increase of spending on communication (like hiring an additional account manager – that would be additional costs) results in increase of sales and CLV.

Co-marketing. Since the demand for the PC hardware depends on the demand for the end-product – computer, the hardware company in study helps its customers stimulate the initial PC demand. In order to do this, the company allocates marketing funds for partner promotional activities, funding up to 50% of the total campaign sum. Campaigns can be of any type – from a

seminar for the end industrial customers to promo actions in retail shops and co-branded merchandise.

We expect that this type of marketing will significantly impact the volume of customers purchases and their profitability and CLV. Also, we need to find out if promotions for different product groups have the same impact on the CLV.

Moreover, in addition to the above mentioned marketing activities that are under the company's control, there are other uncontrolled values and external factors that have an impact on the CLV and on the customers themselves.

Customers' characteristics. Cross-purchasing (cross-selling to customers) is supposed to increase the purchase frequency and sales volumes (Gupta, Hanssens, 2006). The company in study has one core hardware product. Moreover, other products manufactured by this company are complementary to the core product. Market share in the core product for the company in study is about 80%, while in other products is about 5%; 80% of sales are from the core products, they are the most profitable ones. It is unlikely that increase in purchasing of the complementary products will force customers to increase purchasing of the mail product. That means that cross-selling is not playing crucial role for the company, so we don't include this factor to our framework.

Customers' size. Venkatesan and Kumar (2004) use customers' size as characteristic in their CLV empirical model. We assume that small end customers have few employees and are small scale business and this will limit their purchases. Relationship length is supposed to impact on CLV (Bolton, Lemon, 2004).

To sum up, the authors offered a model that helps determine the impact of marketing instruments on the CLV. This model is suitable for PC hardware components companies. As the scheme shows, the following marketing instruments and factors have impact on the company performance: price, loyalty programs, product availability, delivery time, return conditions, technical characteristics of the product, assortment, communication, co-marketing, discounts and also PEST factors and customers' characteristics.

Since the aim of this paper is to provide recommendations for marketing funds allocation only those instruments that can be monetarily valued and changed on the local level will be studied. Consequently other drivers mentioned will be limitations of the model.

3. Data characteristics

Our paper is based on the data about the marketing expends and sales to the customers in one of the sub regions of Russia and CIS countries for 5 periods. Company in this study has a market segment share of about 80% for its main product, so there is not a single case known when a customer completely stopped purchasing from the company. The customers can change the share of the vendor (on average between 50% and 100%), but they still stay with the company. The customer is “gone for good” only if it goes bankrupt and leaves the industry. Therefore, dynamic and static client capital in this case is the same. It means that without gross of generality, we can take the customer retention rate equal to 100%, because the amount of customers going out of business is, unfortunately, quite unpredictable. In the past three years there were no significant new customers, so for the CLV calculation we used the formula below:

$$CLV_i = \sum_{t=1}^n \frac{(\text{Future contribution margin}_{it} - \text{Future cost}_{it})}{(1+r)^t}$$

Where I is the customer's index,

$$R= 4\%, t = 4.$$

Thus, we have 1471 observations for 451 customers over 4 time periods. We have their purchase volumes and marketing budgets spent on various marketing activities for these b2b clients. As did Venkatesan and Kumar (2004), we will do the forecasting for a limited number of periods starting with t-2, t-1, t and forecast t+1. Marketing spending in past periods can't be changed, but we can optimize future spending for the CLV maximization. We will calculate the forecast using the discount rate of 15%, which is equal to the head office country use, so discount rate each quarter is about 4%. Of course, the proposed model wouldn't be able to predict the sales volume and profitability with the perfect accuracy, since economical situation, government regulations, credit lines, etc., also have a great impact on the purchasing power of the customers.

The proposed model is aimed at increasing the efficiency of the intrafirm budget allocation because it will help determine which marketing instruments have the greatest impact on CLV and sales out. Furthermore, sales targets are set on individual level and don't take into the account marketing budgets spent on each single customer in order to achieve these results. So we need to find out if there are any differences in how marketing instruments contribute to the sales volumes and CLV.

Thus we want to test the following hypotheses:

H1: *discount amount positively influences the sales volume, but doesn't significantly add to the CLV*

Then we studied the historical budget allocation pattern for this company. It has been relatively stable over the years. If we suppose that it is the most efficient one, we can assume that: H2 - account manager (communication level) has the greatest impact on sales, H3 - then retail promotion, H4 - then core product promotion, H5 - then other product promotions.

We also assume that independent values determine the dependant ones.

In order to test the hypotheses let's build two models that estimate marketing influence on sales volumes and CLV. We analyze the data in SPSS using the STEPWISE method on order to find out the equation on the linear regression. Independent variables for the models were:

- Account manager – investments in relationship marketing
- Retail promotions – budgets for co-marketing with retailers
- Discount – price reductions given to specific customers
- EPSD – budgets for co-marketing activities with clients for server products (seminars for end-users, trade-shows)
- UPSD – budgets for co-marketing activities with clients for motherboards (seminars for end-users, trade-shows)
- DT - budgets for co-marketing activities with clients for core product (seminars for end-users, trade-shows)

Dependent variables for each customer are Sum of SO Amt Disti Cost (sales volume) and CLV.

Sums of the variables for all customers are in the table below:

Table 1. Variables and CLV

Sum of SO Amt Disti Cost	CLV	Discounts	Retail promotions	Account Manager	UPSD	EPSD	DT
13073530	50692756	376987	17000	63110	9000	4000	14700

Details of the overall correlation between the variables left in the models and the dependent variable for CLV and the sales out volume are below. After performing the validation analysis, we found out that the selected method can be used.

Table 2. Model Summary(g) for the sales out volume

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,735(a)	,541	,540	110167,890
2	,923(b)	,852	,852	62514,641
3	,932(c)	,868	,867	59117,986
4	,937(d)	,878	,876	57085,673
5	,939(e)	,881	,880	56339,154
6	,940(f)	,884	,882	55737,730

f Predictors: (Constant), Account Manager, EPSD, UPSD, DT, Retail promotions, Discounts

g Dependent Variable: Sum of SO Amt Disti Cost

Table 3. Model Summary(f) for CLV

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,778(a)	,605	,604	482183
2	,883(b)	,779	,778	360998
3	,895(c)	,801	,799	343446
4	,900(d)	,810	,808	336185
5	,905(e)	,820	,818	327312

e Predictors: (Constant), Account Manager, EPSD, UPSD, Retail promotions, DT

f Dependent Variable: CLV

With models 5 above, some 88% of the sales out volume and 82% of the variation in the dependent variable can be explained using the independent variables. R is equal to 0.940 и 0.905 which is a high number. Moreover, the CLV table doesn't contain the discount variable, which confirms that they don't influence CLV significantly.

Below is a Coefficients box, showing the linear regression equation coefficients for the various model variables. The "B" values are the coefficients for each variable, that is, they are the value

which the variable's data should be multiplied by in the final linear equation we might use to predict CLV with.

Table 4. Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
6	(Constant)	-2080,950	2844,633		-,732	,465	-7672,915	3511,016
	Account Manager	215,468	8,273	,764	26,045	,000	199,205	231,731
	EPSD	594,232	19,225	,719	30,910	,000	556,440	632,023
	UPSD	-163,746	18,840	-,226	-8,691	,000	-200,783	-126,709
	DT	55,565	8,672	,117	6,408	,000	38,518	72,612
	Retail promotions	-115,572	26,309	-,141	-4,393	,000	-167,290	-63,854
	Discounts	1,548	,493	,062	3,142	,002	,580	2,517

a Dependent Variable: Sum of SO Amt Disti Cost

Table 5. Coefficients(a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
5	(Constant)	-43336,460	16671,892		-2,599	,010	-76109,750	-10563,170
	Account Manager	1204,753	48,275	,904	24,956	,000	1109,855	1299,651
	EPSD	2261,849	111,820	,579	20,228	,000	2042,036	2481,662
	UPSD	-775,462	109,376	-,227	-7,090	,000	-990,472	-560,453
	Retail promotions	-767,601	144,021	-,199	-5,330	,000	-1050,714	-484,487
	DT	246,695	50,856	,110	4,851	,000	146,722	346,667

a Dependent Variable: CLV

By examining the models above, we can see that models are quite different, which means that different marketing instruments have different impact on the sales volume. By examining the beta coefficient we can see which variable influences the dependent variable the most and if its impact is positive or negative.

According to the tables, regression equations are as follows:

$$\text{Sales out} = -2080,950 + 215,468 * \text{Account manager} + 594,232 * \text{EPSD promo} - 163,746 * \text{UPSD promo} + 55,565 * \text{DT promo} - 115,572 * \text{retail promo} + 1,548 * \text{discount}$$

$$\text{CLV (for 4 periods)} = -43336,460 + 1204,753 * \text{Account manager} + 2261,849 * \text{EPSD promo} - 775,462 * \text{UPSD promo} - 767,601 * \text{retail promo} + 246,695 * \text{DT promo} + 0 * \text{Discount}$$

Interpretation of the coefficients for the independent variables is as follows: if the server promotion (EPSD) is increased by one dollar, sales in the quarter will increase by on average of 549 dollars and the CLV for 4 quarters will increase by 2261 dollars.

In order to rationalize the budget allocations, we need to determine the equation of the multiple regression. In order to do this we add calculated variables, such as product of each independent variable with another. Then we repeat the STEPWISE SPSS analysis. So the non-linear equation for Sales will be:

$$\text{Sales out} = 11311.215 + 0.247\text{Account Manager*EPSD} + 0.056 \text{ Account Manager}^2 + 0.002 \text{ Discounts}^2 - 0.051\text{Account Manager*UPSD} + 0.034 \text{ DT}^2 - 51.218 \text{ Account Manager} + 0.109 \text{ Retail promotions*DT} - 0.003 \text{ Discounts*EPSD} - 79.975 \text{ DT}$$

Then in we used “Microsoft Excel Solver” add-in in order to find the optimal spending on each instrument that would help maximize CLV and Sales with the current marketing budget. With Solver, you can find an optimal value for a formula in the target cell. We set overall marketing budget as a limitation for our models. We also set empirical limits for non-core product promotions due to the limited market capacity. We also set discount equal to zero due to imposed legal limitations.

Table 4. Budget allocation optimization

	Current budget allocation	Optimized allocation	budget Difference
Discounts	376987	0	
Retail promotions	17000	9634	
Account Manager	63110	69000	
UPSD	9000	0	
EPSD	4000	5000	
DT	14700	24176	
Company local budget	107810	107810	
Company overall budget (incl discounts)	484797	107810	-376987
CLV	285515711	391037021	105521311

Thus, we came to a conclusion that in order to have the optimal marketing budget allocation, the company in the study should not spend on providing discounts, decrease spending on co-marketing campaigns in retail, increase budgets on account management, decrease co-marketing on motherboards and significantly invest in co-marketing for the core business. The proposed variant above should decrease marketing spending by 376987 dollars due to providing no discounts and boost calculated CLV by 37%. This framework can be used by management of the company while prioritizing the budget expenses and also can be a guidance for other similar companies in their business.

4. Framework limitations and directions for further research

Nonetheless, the proposed framework has a series of limitations, which suggest directions for future studies of CLV and budget allocation.

Firstly, after implementing the described changes the company should re-evaluate the model in order to adjust the coefficients. Secondly, the conducted study is based on one B2B hardware PC company in IT industry. Researchers need to conduct similar studies in identical companies to outline general correlations. Thirdly, it would be useful to calculate CLV and customers' profitability not on aggregated level, but on an individual, in order to tailor marketing mix tactics for each customer specifically. Fourthly, we evaluated only those budgets that can be attributed to each customer specifically. We didn't take into account corporate marketing activities, such as PR, ATL, etc. How will the proportion between those "customer-specific" and "general" budgets influence the CLV? What if "general" budgets are more efficient on the company level? Moreover, we supposed that there are no "lost for good" customers. But during the financial crisis it is highly possible, so how will the company predict the number of these lost customers? Finally, we didn't take into the account competitor's response to marketing actions. But for the oligopoly in which the company in study is operating, it is vitally important.

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