Determining the Financial Value and Risk of Profitable Customers

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Abstract

The purpose of this paper is to determine the financial value and risk of profitable customers and customer cohorts in a retail banking setting. Furthermore, founded on portfolio theory a risk measurement, CLV_{β}, is proposed. This paper contributes to the marketing finance interface literature by using individual retention and margin figures and by integrating data from a customer survey with financial data. The most valuable 20 percent of customers in the customer base equal 50 percent of the total value and 48 percent of the proportion of risk. The higher expected value the higher spread within the customer cohort.

Key words: Customer lifetime value, customer portfolio, risk

Track: Marketing Strategy and Leadership

Introduction

The linkage between marketing and financial performance and shareholder value in particular has recently received an increasing attention in the literature. The integration of marketing and finance is becoming imperative for strategic marketing, since strategic marketing deals with both value generation for customers and value capture for the firm. The current customer base is said to be the most reliable source of future revenues and profits for a firm. However, the value of customers can differ substantially. Therefore, the customer base can be pictured as a portfolio of customers. The purpose of this paper is to determine the financial value and risk of current profitable customers and customer portfolios in a retail banking setting. Furthermore, founded on portfolio theory and drawing on these customer portfolios a risk measurement, CLV beta (CLV_{β}), is proposed. This paper argues that the individual customer level represent a starting point when calculating the value and risk of customer portfolios.

Financial Value of Customers

To a growing extent it is accepted that the governing business objective of a firm is to maximise shareholder value (Black, Wright, and Davis, 2001). Shareholder value depends upon four key financial drivers; the level of expected cash flow, its timing, its sustainability, and the risk attached to it (Rappaport, 1998). Marketing activities can be evaluated in terms of their impact on these four drivers (Srivastava, Shervani, and Fahey, 1998, 1999). According to Lukas, Whitwell, and Doyle (2005) the shareholder approach changes the objectives of marketing. The goal of marketing should be to contribute to the central objective of a firm to maximise shareholder value. A shareholder value approach lets top management and boards to evaluate marketing activities in terms of the impact on future cash flow (Lukas et al., 2005).

Traditionally marketing objectives comprise sales growth, improved market share, and customer satisfaction (Butterfield, 1999). However, these traditional objectives of marketing can be counterproductive in generating shareholder value (Anderson, 1982). Shareholder value is created when the return on capital exceeds its cost of capital (Reimann, 1990; Lieber, 1996). In addition, the relationship between the traditional marketing objectives and profitability can be weak. It has been argued that profitability can be a potentially misleading performance indicator (Day and Wensley, 1988; Ryals 2002). Sales growth may decrease or increase profits. Sales growth increases economic profits only if the operating margin on the additional sales covers the higher costs and investments made to achieve the growth (Copeland, Koller, and Murrin, 2000; Rappaport, 1998).

A shareholder value analysis takes a longer-term perspective and is a better measure of performance than profit, since it enables marketers to consider investment risks in customer relationships as well as their returns (Rappaport, 1998; Cornelius and Davies, 1997). In order to manage relationships as assets and to decide on appropriate marketing strategies, companies need to know which are their most valuable and which are their least valuable customer relationship assets (Ryals, 2002). Customer lifetime value (CLV) looks at what a retained customer is worth to the organisation today, based on the predicted future transactions and costs. It is therefore much more useful than historic customer analysis as a basis for developing marketing strategies to maximise shareholder value.

Berger et al. (2002) conceptualise customer value as “the value that the customer provides to the firm” instead of “the value provided by the firm to the customer”, as in traditional

microeconomic theory. The value the customer provides to the firm is the sum of the discounted net contribution margins over time of the customer, that is, the revenue provided to the firm less the firm's costs associated with maintaining a relationship with the customer. Based on this characterization of customer value, the customer can be viewed as an asset to the firm. Customer lifetime value is treated as a dynamic construct, it influences the eventual allocation of marketing resources but it is also influenced by that allocation. By viewing customers as assets and systematically managing these assets, a firm can identify the most appropriate marketing actions to acquire, maintain, and enhance customer assets and thereby maximize financial returns.

One common approach in customer lifetime value calculations is to assume that we know how long a customer will be with a firm and then generate a discounted cash flow for that time period (Berger and Nasr, 1998; Blattberg et al., 2001; Jain and Singh, 2002). However, in general a customer has a probability to switch or defect from the firm in any time period. Furthermore, the typical method of converting retention rate into expected lifetime and then calculating present value over that finite time period overestimates lifetime value. Gupta & Lehmann (2003) propose a simplified equation to calculate CLV by assuming constant margins (m) and constant retention rate (r). The discount rate is marked by (i). CLV is equal to margin multiplied by a factor, the "margin multiple".

(1) $CLV = m * (r/(1+i-r))$

This paper differs from previous research in that individual retention rates and margins are used for each customer. The retention figures are based on what customers state their propensity to stay with the bank is in a survey. The margin figures were linked to each customer after they returned the questionnaires. The finance literature suggests a typical range of discount rates of 8% to 16% (Brealey and Myers, 1996). In this paper a discount rate of 12% is applied.

Gupta, Lehmann, and Stuart (2004) argue that there are several reasons to use an infinite time horizon. First, we do not need to arbitrarily specify the number of years that a customer will stay with the company. Second, the retention rate accounts for the fact that over time, the chances of a customer staying with the company decreases significantly. Third, the typical method of converting retention rate into expected lifetime and then calculating present value over that finite time period overestimates lifetime value. Fourth, both retention and discount rates ensure that earnings from the remote future contribute significantly less to lifetime value. Finally, models with infinite horizons are significantly simpler to estimate. In addition, in this paper an infinite time horizon is better suited for the retail-banking context, since the service is continuous and therefore it is hard to estimate a finite time horizon.

Measuring Risk

Ryals (2002) argue that the reliability of a CLV calculation depends on the ability to accurately predict a customer's future spending patterns and the cost of acquiring future sales to that customer. Analysing a customer's past transactions history and likely future helps companies to develop a view of the risk, as well as the returns, associated with individual customers. Risk is a concept that relates to the creation of value. When considering value, the profits that a company earns must be offset against the risk it takes in earning that profit.

However, surprisingly few studies discuss the risk perspective of customer portfolios in relation to expected return. Hopkinson and Lum (2001); Ryals (2002); Dhar and Glazer

(2003); and Ryals and Knox (2005) address the importance of measuring risk of customer relationships.

Dhar and Glazer (2003) propose a risk-adjusted customer lifetime value (RALTV). The RALTV "adjusts" the traditional customer lifetime value by the factor of β_C, the Beta or risk of the customer. Also Ryals and Knox (2005) propose a risk-adjusted customer lifetime value, which is termed the economic profit. However, in this paper the risk contribution of each customer portfolio is in the focus.

Perhaps the closest comparable approach is that of Hopkinson and Lum (2001), who propose to use the capital asset pricing model (CAPM) to incorporate relationship risk. However, they address a business-to-business (B2B) context, while this paper address a business-to-consumer (B2C) perspective. Also Anderson (1981) discussed applying CAPM in a marketing context.

Risk is defined by Mullins (1982) as the possibility that actual returns deviate from those expected and the degree of potential fluctuations. Risk refers to the volatility of return and the same concept may be applied in the evaluation of an organisation's relationships (Hopkinson and Lum, 2001).

In financial markets, β relates the fluctuation of the individual security to that of the stock market. Brealey & Myers (1996) suggest the following equation to calculate β:

(2) $\beta_I = \sigma_{Im} / \sigma_m^2$

In this equation, β_I = Beta of asset I; σ_{Im} = covariance of asset I with the market; σ_m^2 = the variance of the market.

Hopkinson and Lum (2002) propose that this principle can be transferred to calculate the β value of a customer relationship, given that the market can be appropriately defined.

In this paper the market is defined as the customer base. The customer base is divided into CLV percentiles, representing ten equally large customer cohorts. These customer cohorts are equivalent to the customer portfolio. Following the principles of financial theory a risk measure is proposed in this paper. The risk measure is called CLV Beta (CLV_β), and it is calculated in order to illustrate the risk associated with the mean customer lifetime value of each customer cohort (see also Appendix 1). The CLV Beta shows the risk contribution of each cohort. In other words, when there is a one percent change of customer lifetime value of the customer portfolio, each cohort beta illustrates how much its customer lifetime value would change.

The Use of Customer Portfolio Theory

Portfolio theory has its origin in financial investment decision-making. Markowitz (1952) worked out the basic principles of portfolio construction and diversification. These principles are the foundation for most of what we can say about the relationship between risk and return (Brealey & Myers, 1996). Portfolio theory has since then also been applied in other areas than finance. According to Yorke & Droussiotis (1994) an early area of application was in auditing product programs (Marvin, 1972), where individual products or groups of products were analysed in terms of their current and future market share, sales, volume, costs and investment

requirements. Furthermore, according to Yorke & Droussiotis (1994), subsequently the portfolio approach received increasing attention from corporate strategists (Ansoff and Leontiades, 1976; Hedley, 1977; Hofer and Schendell, 1978; Wind and Douglas, 1981). The primary concerns in these applications have been the classification of products and/or businesses on certain key dimensions in order to support in the achievement of corporate strategic objectives. Key dimensions in the offered models have included market share, market growth, market attractiveness and competitive position.

The application of portfolio theory to customers is a more recent phenomenon (Yorke & Droussiotis, 1994). Among the early adaptors in a business-to-business context (B2B) were Fiocca (1982) and Campbell and Cunningham (1983). Recently, Johnson and Selnes (2004, 2005) have argued for applying portfolio theory on different customer relationship stages. They argue that customer portfolio management emphasizes the management of an entire portfolio of relationships, rather than individual customers or customer accounts. Johnson and Selnes (2004) developed a model of customer portfolio lifetime value (CPLV). The model distinguishes weak relationships (acquaintances) from intermediate relationships (friends) and from close relationships (partners). Furthermore, they argue that weaker relationships form a key to long-term growth and profitability. The rationale is that these weaker relationships provide a base from which more profitable, stronger relationships are built, and they provide economics of scale or capacity utilization. Also Dhar and Glazer (2003) argue for the importance of attracting different revenue generating types of customers. These customers are a mean to hedging a company's customer portfolio and associated risks.

Empirical Data

The empirical data originates from a retail-banking context (B2C). Typical for this service is that it is contract based and provided on a continuous basis. The population was divided into two sub-groups, i.e. so-called strata, representing two preferred and in this case profitable customer segments (A and B). A stratified random sample was selected from each stratum. The response rate in the survey was 32 percent. In this paper only data on propensity to stay was used from the survey. The margin figures were linked to each individual after they had returned their questionnaires. Only those observations with complete data were included in the analysis. This approach is also known as the *complete case approach* (Hair et al., 1998). After several steps of data reduction 30.516 respondents were included in the analysis.

Results

First, customer lifetime value figures were calculated for each customer in SPSS based on equation 1. Secondly, the customer base was divided into ten percentiles, i.e. ten equally large customer cohorts. In Table 1, CLV P10 represents the least valuable cohort (expected CLV = 17), and CLV P100 the most valuable cohort (expected CLV = 1 207). The most valuable 20 percent of customers equal 50 percent of the total value of the customer base. In addition, the higher expected value of the cohort the higher spread, i.e. risk, within the cohort.

Table 1. Descriptive Data.

Cohorts		N	Share	Minimum	Maximum	Mean	Std. Deviation	Sum	Value share
1	CLV_P10	3 051	0,10	0,00	37,62	17	11,25	50 573	0,00
2	CLV_P20	2 940	0,10	37,82	85,11	59	13,14	174 063	0,01
3	CLV_P30	3 123	0,10	85,98	142,54	110	16,51	344 881	0,03
4	CLV_P40	3 069	0,10	143,29	213,25	174	20,28	534 813	0,04
5	CLV_P50	3 038	0,10	214,94	297,01	251	24,03	764 042	0,06
6	CLV_P60	3 064	0,10	297,61	402,53	349	31,59	1 069 208	0,08
7	CLV_P70	3 076	0,10	403,43	546,20	473	41,81	1 454 245	0,11
8	CLV_P80	2 996	0,10	547,12	742,52	639	55,56	1 914 574	0,15
9	CLV_P90	3 106	0,10	745,13	1 016,08	871	78,65	2 706 750	0,21
10	CLV_P100	3 053	0,10	1 017,39	1 432,94	1 207	122,61	3 685 317	0,29
CB	*Customer Base*	*30 516*	*1,00*	*0*	*1 432,94*	*416*	*372,28*	12 698 839	*1,00*

Given the customer lifetime values of each customer and customer cohort the CLV_β was calculated for the cohorts. Since the market is defined as the customer base in this paper, the Beta for the customer base is 1,00. The Beta values for the cohorts vary between 0,27 for the least valuable one to 2,95 for the most valuable one. In other words, when there is a 1 percent change of the CLV for the customer base, there is a change of 0,27 percent and 2,95 percent respectively for these two cohorts. One can note that the most valuable 20 percent of customers equal 48 percent of the risk. Note also that all customers in this case are profitable customers. However, approximately one percent of the customer base, i.e. ten percent of cohort one, has a customer lifetime value of zero due to zero probability to remain as customers.

Table 2. Financial Value and Risk.

		Average CLV	Beta	Share of portfolio	Proportion of risk
	Customer Base	416	*1,00*	*1,00*	*1,00*
1	CLV_P10	17	0,27	0,10	0,03
2	CLV_P20	59	0,32	0,10	0,03
3	CLV_P30	110	0,40	0,10	0,04
4	CLV_P40	174	0,49	0,10	0,05
5	CLV_P50	251	0,58	0,10	0,06
6	CLV_P60	349	0,76	0,10	0,08
7	CLV_P70	473	1,00	0,10	0,10
8	CLV_P80	639	1,33	0,10	0,13
9	CLV_P90	871	1,89	0,10	0,19
10	CLV_P100	1 207	2,95	0,10	0,29

Conclusion

To determine the financial value of customers and the associated risk represent an important strategic measure. It is not enough to base strategic customer decision only on profit, since profit is history oriented. Marketing needs forward-looking measures in order to contribute to the strategy dialogue. Customer lifetime value integrates marketing and finance by discounting the value of future estimated cash flow of the customers to the present. The focus should not be on the actual figures; rather the relative figures are relevant when deciding on customer strategies. This paper contributes to the marketing finance interface literature by using individual retention and margin figures and by proposing a CLV_β for customer cohorts.

The rationale to calculate a Beta value based on CLV is manifold. First, the equation applied to calculate CLV in this paper assumes that the margin and the retention rate are constant but individual. Therefore, it does not make sense to base the Beta calculation on margin, since the cash flow is not assumed to be volatile. Secondly, the volatility is reflected by the customer lifetime values in the various portfolios. In other words, the focus here is on the estimated future cash flows, not on historical profits. Thirdly, since customer lifetime value reflects the expected future revenues an equivalent risk measure would be needed in accordance with financial theory. Finally, such a risk measure is also valuable for managers, especially when deciding on strategies to manage customer relationships. Managers can now take into account both expected customer lifetime value and the risk contribution associated with the various customer cohorts.

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Appendix 1.

Portfolio variance

The diagonal cells (the shaded boxes) contain the variance weighted by the square of the proportion invested, i.e. the variance terms (x2i σ2i). Each of the other boxes (the off-diagonal cells) contains the covariance between that pair of securities, weighted by the product of the proportions invested, i.e. the covariance terms (xi xj σij).

	1	2	3	4	5	6	7	8	9	10
1	1,27	1,42	1,90	2,29	2,69	3,57	4,74	6,14	9,01	13,80
2	1,42	1,60	2,14	2,58	3,03	4,01	5,33	6,90	10,13	15,52
3	1,90	2,14	2,85	3,45	4,04	5,36	7,12	9,22	13,52	20,73
4	2,29	2,58	3,45	4,16	4,88	6,47	8,59	11,12	16,32	25,01
5	2,69	3,03	4,04	4,88	5,72	7,59	10,08	13,05	19,15	29,34
6	3,57	4,01	5,36	6,47	7,59	10,06	13,37	17,30	25,39	38,91
7	4,74	5,33	7,12	8,59	10,08	13,37	17,76	22,99	33,74	51,70
8	6,14	6,90	9,22	11,12	13,05	17,30	22,99	29,76	43,67	66,92
9	9,01	10,13	13,52	16,32	19,15	25,39	33,74	43,67	64,08	98,20
10	13,80	15,52	20,73	25,01	29,34	38,91	51,70	66,92	98,20	150,48

The formal equivalent is: Portfolio variance = $\sum_{i=1}^{N} \sum_{j=1}^{N} x_i x_j s_{ij}$:

Portfolio variance = 1 732,65
Portfolio standard deviation = 41.63
Correlations = 1

Covariance = correlation between the entire portfolio and the single portfolio times the standard deviation of the entire portfolio times the standard deviation of the single portfolio.

		Portfolio
	CLV /	covariance
	CLV	*1 732,65*
1	CLV_P10	468,38
2	CLV_P20	546,77
3	CLV_P30	687,18
4	CLV_P40	844,00
5	CLV_P50	1 000,06
6	CLV_P60	1 314,97
7	CLV_P70	1 740,43
8	CLV_P80	2 312,84
9	CLV_P90	3 273,82
10	CLV_P100	5 103,84

Beta = covariance / variance (from entire portfolio).