Customer Profitability Analysis and Customer Lifetime Value:

comparing and contrasting two key metrics in Customer Accounting

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ABSTRACT The main objective of this paper is to compare two key approaches in the field of Customer Accounting (CA), namely Customer Profitability Analysis (CPA) and Customer Lifetime Value (CLV). While CPA is a retrospective analysis of past accruals that represent the results of doing business with a customer over a certain, mostly single-period of time, CLV is a predictive measure of future customer-related cash flows over a certain (multi-)period of time. This paper draws on the state-of-the-art knowledge in the Customer Accounting (CA) literature to identify the impacts of CPA and CLV on managerial decision-making. It also offers recommendations as to the scenarios in which these metrics should be deployed in order to arrive at meaningful managerial decisions, and highlights their collective limitations.

PRACTICAL RELEVANCE Organizations may be confronted with the need to extend their cost system design from a product-based orientation towards a customer-focused orientation, which is also known as Customer Accounting (CA). This paper is valuable for practitioners that want to learn more about the most important approaches in CA: Customer Profitability Analysis (CPA) and Customer Lifetime Value (CLV). After a brief introduction into CPA and CLV, it is shown that both approaches differ considerably when it comes to issues like complexity, impact on managerial decision making, and implementation. The analysis may serve as a support for practitioners who are in the process of assessing which approach is best, given their typical organizational contingencies.

1 Introduction

Managing customer relationships is the essence and crux of any business. A satisfied customer is probably the best form of publicity a company can get. This is valid for business-to-business (B2B) as well as business-to-consumer (B2C) scenarios. According to Ryals (2008), the true value of a customer comprises not just the *cash* that a person, or a business entity, generates for the company, but also the *relational value* (which also includes the willingness to recommend the company to a third party, i.e., advocacy) brought in by that very customer. It is generally considered more efficient for a business to keep its existing customers satisfied, than to focus on customer acquisition with little regard to customer churn (Stone, Woodcock & Machtynger, 2000, p. 102). It is, nevertheless, important for a company to distinguish between customer satisfaction and customer retention, and handle these as separate, albeit related, aspects. For it is likely that a company can retain a satisfied customer, this is, however, not a given. On the other hand, it is also possible that an unsatisfied customer can still be retained. There are a host of other factors besides customer satisfaction that play a role in customer retention, see, e.g., Hong and Lee (2014, p. 43-44) and Kumar, Batista and Maull (2011). An important facet of company-customer relationship is the notion that a satisfied customer need not necessarily be retained by all means. In fact, satisfied customers may well turn out to be unprofitable! In other words, the company has to be aware of the costs and the revenues of keeping a customer satisfied - this is where Customer Accounting (CA) comes into the picture.

CA plays an increasingly important role as companies shift from a product-centric approach to a customer-centric approach (in which customers are treated as assets). It is an essential approach that helps companies to identify and to distinguish between the most profitable customers and the less profitable or loss-generating ones, so that they can find the right balance between customer retention and customer acquisition. According to Kotler (CIMA, 2009, p. 3), a profitable customer is "a person, household or company that, over time, yields a revenue stream that exceeds by an acceptable amount the company's cost stream of attracting, selling and servicing that customer."

The measurement of Customer Profitability (CP) is an important element in Customer Relationship Management (CRM) (Holm, Kumar & Rohde, 2012). There are two key, distinct metrics to quantify CP: Customer Profitability Analysis (CPA) and Customer Lifetime Value (CLV). In the literature, there seems to be a lack of consensus as to whether or not CLV is a measure of CP. Mulhern (1999) lists seven terms that refer to CP, one of which is CLV. Rohm et al. (2012) clearly classify CLV as one of the two distinct measurement approaches for CP measurement (the other being the CPA), whereas Pfeifer, Haskins and Conroy (2005) suggest that there is a difference between CP and CLV. They object to the interchangeable use of these two terms in the literature, and argue that the word *profitability* in CP is linked to *accounting profitability*, while the word *value* in CLV is linked to *present value* and *valuation* in finance theory. Ryals (2008) refers to CPA and CLV as *financial measures of value*, a term that is also used by Rohm et al. (2012). In this paper, CPA and CLV are treated as measurement approaches for CP, *a la* Rohm et al. (2012), based on the definition of a profitable customer provided by Kotler (see the previous paragraph). CPA and CLV neither ask the same set of questions, nor do they provide answers that are one-to-one comparable. They are simply treated here as independent measures of profitability of customers based on historic data (CPA) and forecast data (CLV). Although Holm, Kumar and Rohde (2012) fairly recently studied CPA and CLV together, their paper focused mainly on when sophisticated CPA and CLV models will be most useful. The current paper takes one step back, and explores the CA literature in order to compare and contrast these two metrics.

The structure of this paper is as follows: Section 2 presents a brief overview of CPA based on the literature, Section 3 presents a brief overview of CLV based on the literature, Section 4 compares and contrasts these two metrics using several criteria, and finally Section 5 presents the conclusions of this research.

2 A brief overview of CPA

The Chartered Institute of Management Accountants (CIMA) (2009, p. 3) defines CPA as "the analysis of the revenue streams and service costs associated with specific customers or customer groups." It enables the allocation of revenues and costs to customer segments or customers (Corbey & Slagmulder, 2005), making it useful for evaluating the following customer parameters (Ryals, 2008):

- Customer dependency;
- Balancing customer retention and customer acquisition;
- Payback period after customer acquisition.

In its basic form, the CPA for a customer or customer segment can be performed using the following equation reproduced from Ryals (2008, p. 42):

$$CP_t = CR_t - (COGS_t + CTS_t + CSO_t) \quad (1),$$

where *CP* is the customer profitability of a customer, *CR* is the revenue from that customer, *COGS* is the cost of goods sold to that customer, *CTS* is the cost to serve that customer, and *CSO* is the customer-specific overhead. The suffix *t* denotes the time period taken into consideration for the CP calculation.

Saukko (2014) classified the factors that influence customer profitability into customer-related factors and firm-related factors, based on a detailed survey of the literature. The main influencing factors are listed below.

Customer-related factors:

- Purchase frequency;
- Loyalty;
- Cross-buying;
- Satisfaction;
- Relationship duration;
- Social and demographic factors;
- Share of wallet;
- Company size;
- Word of mouth.

Firm-related factors:

- Value equity;
- Relationship equity;
- Brand equity;
- Marketing actions;
- CRM;
- Online service channel.

The allocation of revenues and costs to customers is enabled by costing approaches, predominantly activity-based costing (ABC), making use of *historic* data on customer revenues and costs. Corbey and Slagmulder (2005) point out that the success of CPA implementation hinges on the success of the underlying ABC system. It makes it possible to generate pictorial representations of classification of customers, such as the *Whale Curve* based on customer profits, and the *Customer Pyramid* based on customer turnover. More details on these diagrams can be found in, e.g., Corbey & Slagmulder (2005) or Van Raaij, Vernooij, and Van Triest (2003).

The ABC analysis in itself is a time- and resource-consuming exercise, see, e.g., Kaplan and Anderson (2007). For it is usually based on ABC, CPA as a whole is a long and arduous exercise as well. Hence, Ryals (2008) proposes that a company determines the degree of *granu-*

larity before starting a CPA-project. The highest granularity is the individual customer view, and the lowest granularity is the consideration of the profitability of the entire customer base of the company. Unnecessarily high granularity will lead to the big picture getting obscured by the details, not to mention the needlessly high expenses, whereas low granularity might result in insufficient conclusions that preclude sound decision-making. The degree of granularity should be selected by the company depending on the nature of its business, customer base, customer types, company philosophy, the targets and the objectives of the CPA, etc. Ryals (2008) provides an audit tool to determine the degree of granularity based on the company's situation. This tool, which is essentially a set of *yes* or *no* questions, guides the user in selecting high granularity (considering small groups, or even individual customers) or lower granularity (considering customer segments). It does not, however, provide different levels of granularity appropriate for different scenarios.

In order to make the CPA exercise meaningful, Van Raaij, Vernooij and Van Triest (2003) suggested a six-step approach for CPA implementation, depicted in Figure 1. To execute the six-step approach, Van Raaij et al. (2003) also propose that the team carrying out this analysis should consist of at least a marketeer and a management accountant, but can also contain operations managers and information specialists. A similar six-step approach for CPA was also proposed by CIMA (2009). To conclude: CPA is useful for managers to understand the following (CIMA, 2009; Ryals, 2008):

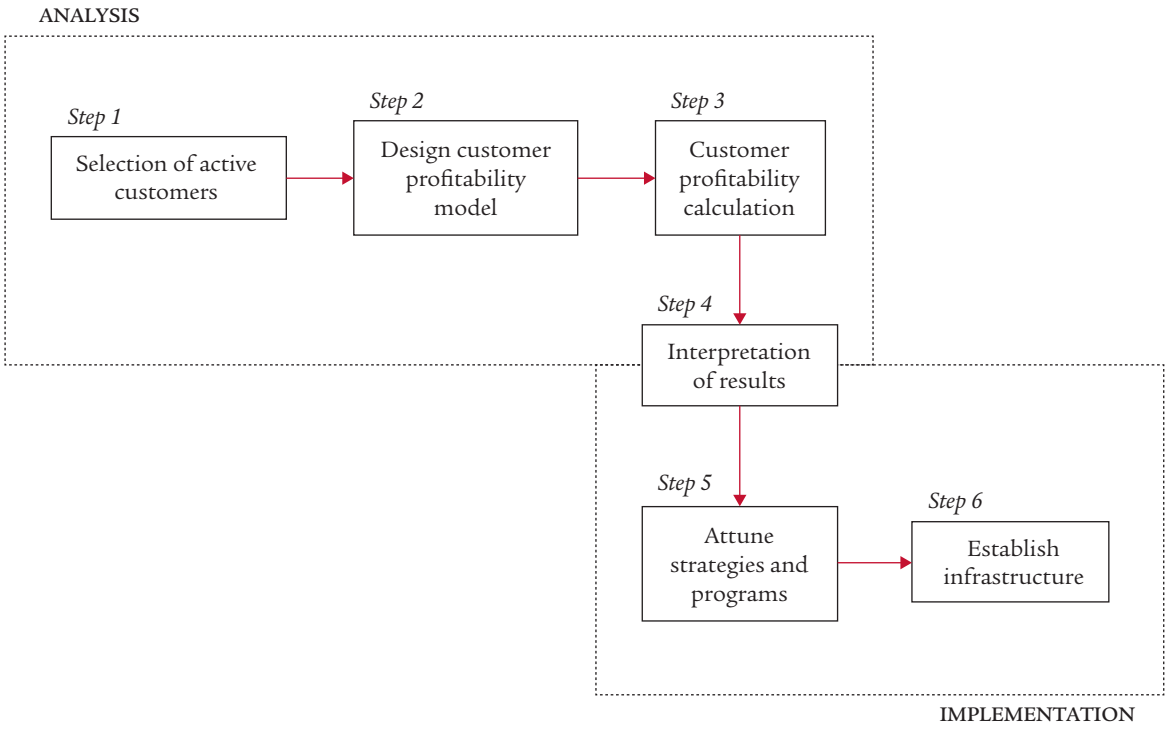
- Which customers are the most profitable and the least profitable ones?
- How dependent is the company on the most profitable customers?
- How are the company's often limited resources allocated to serve different customers?
- What are the costs involved to serve the customers?

Based on this understanding, the managers can devise customer-specific strategies, by answering the following questions:

- How to maximize the profits from the profitable customers?
- How to deal with the less profitable or loss-making customers?
- What will be consequences of reducing the service to/getting rid of less profitable or loss-making customers (e.g., impact on cross-selling, the phase in the customer lifecycle, etc.)?

While the latest CRM software enables the capturing of detailed information regarding transactions with each and every customer of a company, resulting in reliable inputs for CPA implementation, several publications in the literature offer a word of caution due to potential pitfalls of the CPA (CIMA, 2009; Corbey &

Figure 1 A six-step approach for effective CPA implementation. Reproduced with minor changes from Van Raaij et al. (2003, p. 575)



Slagmulder, 2005; Ryals, 2008). These pitfalls are discussed in Section 4.

3 A brief overview of CLV

Kumar (2007) defines CLV as "the sum of cumulated cash flows – discounted using weighted average cost of capital (WACC) – of a customer over his or her lifetime within the company (p. 15)". In other words, CLV gives an indication of the future profitability of a customer. Hence, it is a *prospective* measure of CP, whereas CPA is a *retrospective* measure (Holm et al., 2012). Unlike CPA, CLV is a multi-period metric of a customer's value to a company. Kumar and Rajan (2009) define CLV as the "best metric to manage customers profitably (p. 2)". We feel that these authors have a point when it comes to *decision support:* since CLV is based on the *economic concept of profit* (i.e., the net present value of future cash flows), it is by nature designed for future investment analysis (which is nothing else than decision support). CPA is based on the *accounting concept of profit* which is designed for reporting purposes and not (so much) for decision support. Nevertheless, CPA may still serve as a tool for *analytical purposes* as it is shown in the previous section.

According to Jain and Singh (2002), the relevance of CLV has increased significantly due to an exponential increase in the number of companies on the internet. Many of such companies are likely to have minimal physical assets. Hence, such companies can be valued correctly only if their intangible assets are taken into consideration. For internet-based companies, the customers are the most important intangible assets. The estimation of lifetime value of the customer base plays an important role here.

In its simplest form, the CLV of a customer can be calculated using the equation (2) below (Gupta & Lehmann, 2003, p. 10):

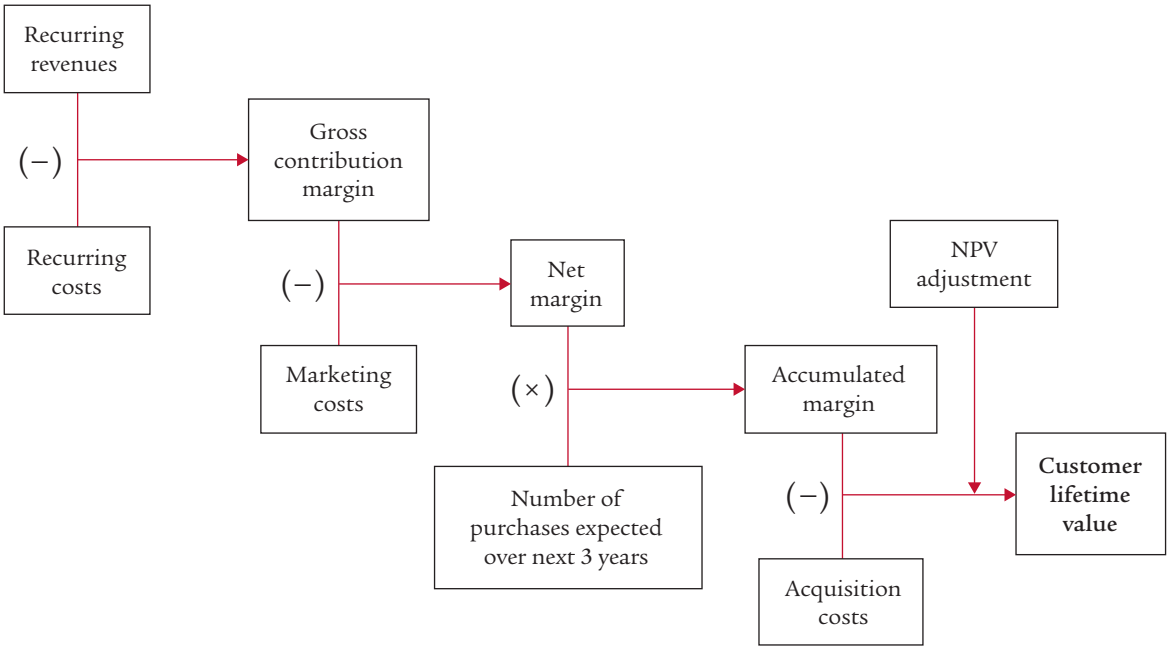
$$CLV = \sum_{t=1}^{n} \frac{(Contribution\ of\ customer_A)^t}{(1+i)^t} \qquad (2),$$

where *CLV* is the lifetime value of customer A measured at a time point 1, *Contribution of customer A* is the margin or contribution[1] from customer A in a given time period t, and *i* is the discount rate. As for the latter, the Weighted Average Cost of Capital (WACC) may serve as the discount rate.

A clear, systematic approach to CLV measurement was put forth by Kumar and Rajan (2009). It is schematically represented in Figure 2. According to this approach, the CLV can be estimated using three main components in company-customer interaction: contribution margin, marketing cost and probability of purchase in the time period under consideration. Kumar and Rajan (2009) further state that in most cases, the time period is three years, due to the product lifecycle, customer lifecycle and the assumption that 80% of profit can be realized in three years.

CLV analysis is not a one-off exercise, but should be treated as a dynamic analysis. Ryals (2008) has identi-

Figure 2 An approach to CLV measurement. The arithmetic operators deployed in the measurement are shown in the figure. Reproduced with minor changes from Kumar & Rajan (2009, p. 2)



fied three factors that are affecting/influencing the lifetime value of a customer (also see Figure 3):

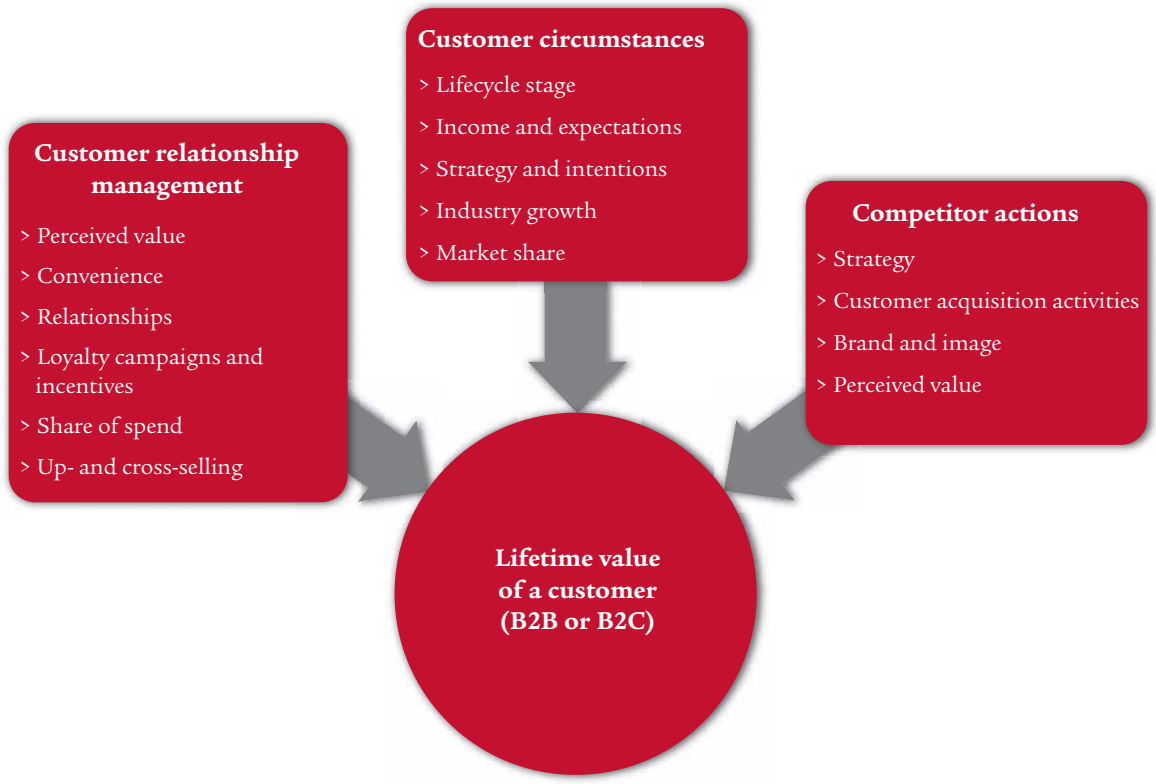
1. Customer relationship management (CRM).
2. Customer circumstances.
3. Actions and responses of competitors.

Each of these three factors are time-dependent, hence the CLV is also a dynamic metric. Figure 3 also shows the attributes encompassed by each of these three factors. Only one of these three factors, namely customer relationship management, is directly influenced by the company offering a product or service to the customer. The two other factors are external to the relationship: one is the actions of competing companies, and the other is the dynamics of customer's own circumstances. The relevance of individual attributes of each of the three factors may differ for B2B and B2C scenarios, but collectively they capture the overall influence of these factors on the lifetime value of a B2B or B2C customer.

Due to the fact that CLV is a prospective or predictive metric, it is essential that the forecasting accuracy of a company matches the degree of accuracy expected by that company from a CLV analysis. This is also one of the reasons why Ryals (2008) proposes regular updating of the CLV calculation.

One of the points of contention regarding CLV calculations in the literature, is whether or not to include new customer acquisition costs in the calculation. Jain and Singh (2002) argue that the acquisition costs (or, to be more precise: cash-outflows) for new customers should be considered. They give an example of a company that spends a million dollars to attract customers. If only a few customers end up making a low-value purchase in the first period, then the costs incurred in that period are acquisition costs. They warn that ignoring this in CLV calculations will result in giving a positive lifetime value to each customer, which cannot be true. On the other hand, Berger and Nasr (1998) do not consider the acquisition costs to be part of CLV calculations. Instead, they postulate that the computed CLV value can be considered as the maximum value managers are willing to incur for acquisition, and that acquisition costs exceeding the computed value indicate that the customer is unprofitable. Pfeifer et al. (2005) arrive at a conclusion in their paper that while acquisition spending should be part of CP, it should not be included in CLV. This conclusion was drawn based on their argument, mentioned in Section 1, that while CP is linked to accounting profitability (hence covering

Figure 3 **Factors influencing the lifetime value of a customer. Reproduced with minor changes from Ryals (2008, p. 91)**



the acquisition costs), CLV is linked to present value of *future* cash flows (hence will not include expenses incurred when acquiring a customer).

To conclude: the impact of CLV on managerial decision-making is evident from the following points:

- In the context of existing customers, it can be used to allocate the company's often limited resources in those customers who bring maximum returns to the company (Kumar, 2007).
- In the context of new customers, it can be used to identify which of them to attract, based on the future value they bring in to the company, and devise a marketing strategy to bring them into the fold.
- It is a useful tool in identifying a company's key accounts. If a particular level of future profits is predicted from an existing or a new customer, then the customer can be classified as a key account. Here, CLV can act as a *selection criterion* that defines a key account (Ryals, 2008).

4 Comparing and contrasting CPA and CLV

CPA and CLV have proven to be valuable metrics powering the drive towards customer-centric approach of a wide variety of companies. The literature has highlighted the suitability of these two approaches to CP determination for various scenarios and settings, but neither has established itself as universally applicable. To quote Lind and Strömsten (2006), "previous research on customer accounting has revealed that different techniques are of more value to one firm than another" (p. 1264). Nonetheless, it is possible to identify their advantages and disadvantages as well as application possibilities and limitations.

Reliability of the analysis

According to Ryals (2008), there is generally a greater certainty about the reliability of CPA data, as it is based on actual transactions with the customer. Such data is readily available to the company, especially with a state-of-the-art CRM software. On the other hand, CLV is based on forecasts, and it is very difficult to make highly accurate forecasts. This leads to some uncertainty in the minds of managers, leading to hesitance in using this approach. As mentioned in Section 3, a regular updating of the CLV calculation is necessary, in order to increase the reliability of the data.

It should be mentioned though, that since the success and reliability of CPA hinges on the success of the underlying ABC system, the latter requires enormous time- and resource investments (Corbey & Slagmulder, 2005), especially if a high degree of granularity is required.

Estimating future potential of a customer

The fact that CPA uses historic data may have led to a generally favorable opinion on its reliability, but it is also a disadvantage that the future potential of a customer is overlooked. Ryals (2008) calls this the 'rear-view mirror' problem: looking only at CP^2 is akin to looking only in the rear-view mirror. For robust decision-making, it is important to also look into what would happen in the future ("looking out of the front windscreen" (p. 36)). This is where CLV can prove to be advantageous. It provides a look into the future and "enables the customer relationship to be managed as an asset that might require investment in one period that will not pay off until future periods" (Ryals, 2008, p. 85).

According to Holm et al. (2012), CPA models implicitly assume that the behavior of a customer does not undergo radical transformation over time. This is due to the retrospective nature of this methodology. As a result, these authors explain that "the retention patterns are assumed to be homogeneous across customers, and purchasing amounts are assumed to be stable over time (i.e., limited expansion potential)" (p. 391). In dynamic scenarios, CPA could provide misleading information by overvaluing or undervaluing customers. This is possibly a reason why the literature (Helgesen, 2007; Niraj et al., 2001) demonstrating the applicability of CPA, deals mainly with business-to-business (B2B) scenarios. A B2B relationship is usually fairly stable, and it is possible to equate the future profitability of the customer to his or her past profitability. This does not mean that CPA is not applicable for B2C scenarios; on the contrary, there is literature (Andon, Baxter & Bradley, 2003; McManus, 2007) demonstrating its successful implementation in B2C cases.

CLV, on the other hand, can accommodate the dynamic nature of B2C relationships, due to the fact that it is also a dynamic metric based on forecasting. There is an abundance of literature showing the implementation of CLV in such scenarios (Aeron, Bhaskar, Sundararajan, Kumar & Moorthy, 2008; Kumar, Shah & Venkatesan, 2006; Libai, Narayanadas & Humby, 2002). Having said this, accurate forecasting/prediction is very difficult, as demonstrated by Malthouse and Blattberg (2005), who provided evidence to this end from four different types of organizations. These authors also offer explanations from the literature as to why the customer behavior is so difficult to predict,

and conclude that misclassifying a customer based on the lifetime value is a likelihood companies have to be wary of.

Pitfalls in implementation

As mentioned in Section 2, literature highlights potential pitfalls in CPA implementation. Some of the keys ones are listed below:

- It is possible that the manager gets carried away by the CPA outcomes and decides to reduce the level of involvement with low or unprofitable customers, or to even get rid of them. Such actions might have drastic consequences on the company if the affected customer happens to trade in large volumes with the company. Such a customer bears a significant proportion of fixed costs, which might have to be reallocated to other customers, which in turn leads to another set of low or unprofitable customers. If they are also treated the same way as the previous customer was, then this leads to a *deadly spiral* (Corbey & Slagmulder, 2005). On the other hand, it would have a negative impact on the company if an unprofitable customer is retained over a long period, as this would require cross-subsidization (Ryals, 2008). As Jain and Singh (2002) state, "loyalty of unprofitable customers is not good for a firm" (p. 35).
- Corbey and Slagmulder (2005) as well as Ryals (2008) point out that getting rid of an unprofitable customer based on CPA outcomes in an over-hasty manner, without taking relational benefits of that customer, might lead to problems for the company. CPA does not take relational aspects into account, and if the affected customer's profile attracts other customers *(cross-selling)*, then the overall outcome of the implementation process will leave a lot to be desired.

CLV implementation is not entirely without pitfalls either. In their research based on the review of CLV literature from 1990 to 2010, Damm and Monroy (2011) concluded that CLV does not incorporate indirect forms of revenues such as sales due to word of mouth, as well as other indirect benefits such as learning and innovation. Ryals (2008) also pointed out that the indirect effects of the lifetime value of the customer is not sufficiently taken into account by mainstream methods. Indeed, as highlighted by Ryals (2008) that the true value of a customer consists of financial as well as relational value, and the CLV analysis may not present the right picture if only the direct financial value is taken into account.

Implementation in complex environments

Holm et al. (2012) conclude from their detailed investigation into CPA and CLV models that there is a need for an integrated CPA/CLV model to measure CP in organizations having high complexities in customer service as well as customer behavior. The individual CPA and CLA models are insufficient to capture CP in such scenarios. To quote Holm et al.:
"Sophisticated CLV techniques for estimating retention patterns, gross profits per transaction, and direct marketing costs must therefore be integrated with sophisticated CPA techniques for estimating the amount of service activities required to fulfill the future customer demands that the CLV technique predicts. This can be achieved by converting CLV estimates of future customer behavior into predicted service activity demands in future periods that, in turn, can be translated into cost estimates by utilizing the service activity cost drivers from the CPA technique" (p. 396).

Holm et al. (2012) propose that the integration of CPA and CLV to be researched further, as only an integrated model can effectively capture the relationship heterogeneities in such complex environments.

Collective limitations

Holm et al. (2012) found that both these approaches fall short in two areas:

1. Tax effects on cash flows are not incorporated in the models. This will lead to multinational companies that operate under different taxation systems to undervalue customers in low-tax regimes and overvalue those in high-tax regimes.
2. Ignoring customer's risk contribution to the company's risk. The treatment of risk related to the predicted future cash flows from customers has not received the due attention so far.

Holm et al. (2012) advocate further research for expanding the current CPA and CLV models in order to capture the impact of tax effects and customer's risk on the outcomes of CP calculations. Ahmadi (2011) observes that simple net present value (NPV) based CLV models do not capture the high risks in B2C e-commerce markets.

5 Conclusions

In this paper, the customer profitability analysis and customer lifetime value approaches to determine customer profitability have been compared and differentiated in terms of their salient features, advantages and disadvantages, application possibilities, and limitations. A detailed review of the literature, carried out within the scope of this paper, revealed that both CPA

and CLV are valuable tools if used in an informed manner, and for the appropriate scenario. While CPA seems more suitable for B2B scenarios where the customer behavior is usually predictable over time, CLV's main strength, which is its dynamic nature, can be put to good use in B2C scenarios with high customer churn and unpredictable behavior. But it should be borne in mind that these two models are only as good or as bad as their inputs, namely the ABC analysis (for CPA) and forecasting (for CLV). Table 1 summarizes some key differences between CPA and CLV.

Table 1 Key differences between Customer Profitability Analysis and Customer Lifetime Value

	Customer Profitability Analysis	Customer Lifetime Value
Perspective:	Past	Future
Single / Multi period	Single period	Multi period
Based upon:	Accruals	Cash flows
Concept of profit:	Accounting profit	Economic profit
Objective:	Analysis	Decision support
Market conditions:	Stable	Dynamic
More suitable for:	B2B	B2C
Important constraint:	Indirect cost allocation	Forecasting

During this research, it was found that neither of these approaches are all-encompassing. Hence, there is a push towards further research aimed at improving the CP measurement systems in order to capture reality more effectively. Besides the now widely understood need to improve the ABC system to capture the costs accurately, as well as the importance of accurate forecasting, the relational value of the customer should also be taken into account in customer lifetime value calculations. Also, there is a need to quantify the impacts of multiple taxation systems and customer's risk on CP calculations, and find ways to capture them using sophisticated CPA and CLV models. That said, the bottom line is the degree of granularity a company actually needs to calculate its customers' profitability, and how much resources it can allocate to the process of execution and implementation of the CP models, sophisticated or otherwise. ■

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Noten

1 Opinions regarding the margin or contribution of a customer in the context of CLV differ in the literature. While Jain and Singh (2002) and Niraj, Gupta and Narasimhan (2001) use *net profit* to denote the customer contribution, Pfeifer et al. (2005) argue that *cash flow* is more appropriate, as *net profit* can account for costs (such as depreciation on a fleet of delivery trucks) that are not cash flows. They also point out that only *cash flow* can have a time value ascribable to them.

2 As mentioned in Chapter 1, Ryals (2008) treats CPA and CLV as *financial measures of value*. In this context, Ryals refers to CPA.

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