Customer Value Elasticity, Equi-value Curves and Value Vectors: Implications for Customer Behaviour and Strategic Marketing

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Abstract

The analysis presented in the paper uses algebraic and geometric methods to explore the implications of the two different specifications of the customer's value equation, the ratio approach and the subtractive approach, for customer behaviour and strategic marketing decisions. Three key concepts are defined and investigated for each specification of the customer's value equation: customer value elasticity, equi-value curves (or "iso-values"), and value vectors. Customer value elasticity measures the sensitivity of customer value to small changes in customer perceived benefits and sacrifices. Equi-value curves are functions connecting points of equal customer perceived value. Value vectors are customer-value-based marketing strategies which have a specific directional orientation with respect to equi-value curves. The analysis of customer value elasticity and of equi-value curves suggests a number of important hypotheses for subsequent empirical testing. The analysis of value vectors suggests that there are eight feasible customer-value-based marketing strategies available to business organisations.

KEYWORDS: Strategy; Customer Value

Introduction

The topic of customer value has received a great deal of attention in the marketing literature over the last two decades. In particular, customer value is acknowledged to be a concept of great importance in the field of business-to-business marketing, evidenced by the special issue of *Industrial Marketing Management* devoted to the subject (Ulaga, 2001), and by the title of an influential book in the field, *Business Market Management: Understanding, Creating and Delivering Value* (Anderson & Narus, 1999), amongst many other important contributions. Anderson & Narus (1999) argue that delivering value to the customer is the very cornerstone of business to business marketing, that B2B marketing plans should be organised around the principle of creating and delivering value to customers, that the creation of customer value is central to the development of buyer-seller relationships, and that it is only by delivering greater customer value than competitors that B2B organisations can achieve a competitive advantage.

The many contributions to our understanding of customer value from marketing and other management scholars can be roughly classified into those that have concentrated on conceptual development of the notion of customer value (e.g. Blois, 2003), those that have concentrated on formulating and testing empirical hypotheses concerning customer value (e.g. Walter, Ritter, & Gemunden, 2001), those that have aimed to contribute both conceptually and empirically (e.g. Zeithaml, 1988), and, finally, those that have sought to summarise the state of knowledge about customer value by reviewing the literature (e.g. Lindgreen & Wynstra, 2005). The current paper takes a novel approach to the first of these categories (conceptual development). In essence, this paper takes as axiomatic the consensus that customer value can be conceptualised as a trade-off between the customer's perceived benefits and perceived sacrifices, accepts that two principal functional forms have been suggested for this trade-off (first, that value is the difference between benefits and sacrifices, second, that value is the ratio of benefits to sacrifices), and extends the ideas

suggested by Blois (2003), namely, that the formal analysis of value equations can be used to illuminate the concept of customer value.

It is normal to present the limitations of one's work in the final section of a paper. However, since the approach adopted in this paper is unusual for the field of marketing, it seems advisable to state the limitations of this approach at an early stage. It is the purpose of this paper neither to argue that the trade-off model of customer value is "correct" nor to contend that any particular functional form for the fundamental customer value equation is right or wrong; those are empirical questions, this is not an empirical study, hence this paper is silent on such questions. Rather, by accepting the trade-off model of value, and exploring two alternative functional forms, the purpose is to investigate the logical consequences of a set of assumptions about customer value that have received substantial support in the literature. However, since this paper uses the method of logical argumentation, employing mathematical operators to deduce conclusions from axioms, the analysis presented here can only be "true" if the axioms are "true". This is not to say that the analysis need be entirely valueless if the axioms are not "true"; analysis such as this can be illuminating, can throw up interesting questions and curious findings even if the axioms are poor descriptors of reality. Rather than labouring that point at this stage, it is probably best to let the reader reach their own conclusions on that matter.

The paper begins with a fairly brief review of prior literature in the field of customer value. The point of the literature review is not to be exhaustive, but to provide sufficient justification for the conceptualisation of customer value as a trade-off between perceived benefits and sacrifices, and to show that both subtractive and ratio models of customer value have been proposed by scholarly authorities. Subsequently, the analysis proceeds to investigate the relationship between customer value and perceived sacrifices (benefits held constant), and the relationship between customer value and perceived benefits (sacrifices held constant); the concept of customer value elasticity is introduced here. The analysis is extended to explore the implications for customer value of allowing simultaneous small changes in both sacrifices and benefits. The next concept to be explored is that of equi-value lines (or isovalues); that is, different combinations of benefits and sacrifices that deliver the same level of customer value. This concept leads naturally into the discussion of the concept of "customer value space" which, it will be seen, has fairly direct managerial implications that are explored in the final section of the document.

Customer Value Equations

A widely supported current conceptualisation of customer value considers value to be the customer's subjective trade-off between the perceived benefit and perceived cost components of an exchange or related series of exchanges (Zeithaml, 1988). The term "trade-off" has been used quite widely, and is clearly a vague term that could apply to a many different functional forms. When it comes to the more precise specification of the functional form that relates customer value to perceived costs and perceived benefits, two key alternatives have been proposed – value as the difference between benefits and costs, and value as the ratio of benefits to costs. These can be conveniently expressed as follows.

Subtractive model (Blois, 2003): $V = B-S$
Ratio model (Christopher, 1996): $V = B/S$

In both cases, B is understood to include all relevant customer-perceived benefit elements, whether economic or non-economic, tangible or intangible, and S is understood to include all relevant customer-perceived cost elements, price and non-price.

A few papers have given explicit consideration to the functional form of the value equation; Blois did so in a conceptual paper (2003) and Desarbo et al in an empirical paper (Desarbo, Jedidi, & Sinha, 2001). What has been missing from the debate, so far, is consideration of the customer behavioural and strategic marketing implications of different functional specifications of the customer value equation. The purpose of this paper is to illustrate the different implications – for customer behaviour and strategic marketing – of the subtractive and ratio forms of the customer value equation.

Zeithaml (1988) explored the concepts of perceived price, perceived quality, and perceived value. She contended that customers conceived of value in four ways: value is low price; value is whatever I want in a product; value is the quality I get for the price I pay; value is what I get for what I give. Zeithaml (1988:14) proposed this definition of customer perceived value: "Perceived value is the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given … value represents a tradeoff of the salient give and get components." She made the point that different consumers will often have different salient give and get components and will weight components differently. Both the give (sacrifice) and the get (benefit) components included a range of different attributes; in particular, the sacrifice components include monetary and non-monetary elements.

Zeithaml's definition of value has proved highly influential, and has been invoked by many subsequent authors. The give-get or trade-off definition has been used in many conceptual and empirical studies of customer value (Anderson & Narus, 1999; Blois, 2003; Christopher, 1996; Desarbo et al., 2001; Kothandaraman & Wilson, 2001; Lapierre, 2000; Ravald & Grönroos, 1996; Ulaga, 2001). However, there are differences at the level of detail between these authors. Christopher (1996) argued that customer value is a *ratio* of perceived benefits to total costs of ownership, and that both benefits and costs should be measured relative to competitive offers. Ravald & Grönroos (1996), and Kothandaraman & Wilson (2001) also proposed a ratio model, but put price/perceived price in the denominator rather than total costs of ownership. Blois (2003) advocated a *subtractive* functional form (value equals benefits minus sacrifices). While researchers substantially agree that perceived customer value should be conceptualised as a trade-off between benefits and sacrifices, there is no agreement on the functional form of that trade-off relationship.

There have been noteworthy attempts to investigate customer value empirically. For example, Desarbo et al (2001) and Lapierre (2000) both carried out substantial empirical studies of customer value in industrial markets. However, their operational definitions of customer value were rather different. Both used give-get conceptual definitions of customer value, but Desarbo et al used narrower definitions of give and get than Lapierre. Desarbo et al (2001:846) defined customer value as the "trade-off between (customer-perceived) quality and (customer-perceived) price", while Lapierre defined customer value as the difference between benefits and the sacrifices, explicitly including all monetary and non-monetary costs among the sacrifices. Lapierre found that "a value proposition implies much more than a trade-off between product quality and price".

Any exchange requires at least two parties, and for voluntary exchange to take place, both parties must believe that they will be better off as a result (Blaug, 1997). Marketing researchers tend to focus on customer value, because the theory and practice of marketing has focused primarily on converting the seller's products into cash. However, with the increasing emphasis on the supplier-customer relationship rather than just making the sale, the concept of supplier value has become of interest. Walter et al (2001) argued that supplier value was a neglected, but important, topic, since the supplier will only enter into or persist with a relationship so long as it yields net benefits. They defined supplier value as: "the perceived trade-off between multiple benefits and sacrifices gained through a customer relationship by key decision makers in the supplier's organization" (Walter et al., 2001:366). This is a simple transference of the give-get concept of customer value to the supplier.

Since they conceive of the supplier as an organisation, they refer to the key decision makers in the organisation as the judges of value.

Blois (2003) proposed the application of 'value equations' in business-to-business exchanges. He argued, following the subjective value theorists in economics (Blaug, 1992; Viner, 1925), that both parties to an exchange have a 'wants list', and consequently both parties can be considered to have a value equation for the exchange. Marketing literature has implicitly concentrated on the customer's value equation, but in order for an exchange to take place both parties to it must expect that the benefits of the exchange will exceed the sacrifices. Blois postulated value equations of the form:

$B_c - Sa_c = V_c$ Customer's value equation
$B_s - Sa_s = V_s$ Supplier's value equation

He provided illustrative lists of the likely components of benefits and sacrifices in business-to-business markets. These include both short-term and 'life-cycle' benefits and sacrifices, and both easily measurable (in monetary terms) and intangible benefits and sacrifices. Blois then illustrated how, by simultaneously considering the value equations of both parties, it is possible to devise creative strategic marketing options.

This paper aims to build on the ideas suggested by Blois in two key ways. Firstly, we explore the logical consequences of two prominent formulations (the subtractive form and the ratio form) of the trade-off model of customer value for customer behaviour. Secondly, we explore the logical set of strategic marketing options that emerge, fairly intuitively, from this line of analysis.

Customer Value Functions and Customer Value Elasticity

In the following sections we explore the implications of the trade-off model of customer value (perceived customer value is a trade-off between perceived customer benefits and sacrifices), expressed in terms of two functional forms, the subtractive form (V = B-S) and the ratio form (V = B/S). First (in Figures 1 to 4), we consider what happens to value, under both functional forms, when benefits or sacrifices are held constant, and the other variable is changed; this yields the concept of customer value elasticity with respect to benefits and sacrifices (explained in Box 1). Second (in Box 2), we consider the effects on value of simultaneous small changes in benefits and sacrifices. Third (in Figures 5 and 6), we introduce the analysis of equi-value curves, that is to say lines connecting points of equal customer value. Finally, the managerial implications of the analysis are explained through an analysis of "customer value space" (Figure 7) and "customer value vectors" (Figure 8). In the subsequent discussion, for reasons of brevity, "perceived customer value", "perceived customer benefit", and "perceived customer sacrifice" will be referred to simply as value, benefit and sacrifice.

Throughout the subsequent analysis, we will distinguish between "feasible trades" and "infeasible trades". Feasible trades are those for which value is greater than zero, and infeasible trades are those for which value is less than zero. For purposes of this paper it matters little whether trades for which value equals zero are considered to be feasible or infeasible. Also, for the present purpose trades with negative value are simply *assumed* to be infeasible (customers never voluntarily enter into trades which generate negative value). This seems to be a legitimate assumption in the B2B field, where the customer is an organisation. In consumer marketing it may be that altruism is a real phenomenon, and that consumers are prepared to enter into exchanges that generate negative value. However, this point of view is by no means clear-cut, since normally, where there is the appearance of negative customer value (for example, where a participant in a charity auction pays far more than the market price for an item), one can invoked psychological benefits to contend that value is actually positive

(the charitable bidder purchases feelings of self-worth that have to be included in perceived benefits). This argument is not of great concern for the present purpose and so is not explored further here.

Value as a function of sacrifice (constant benefit)

Figure 1: Value as a function of sacrifice (constant benefit)

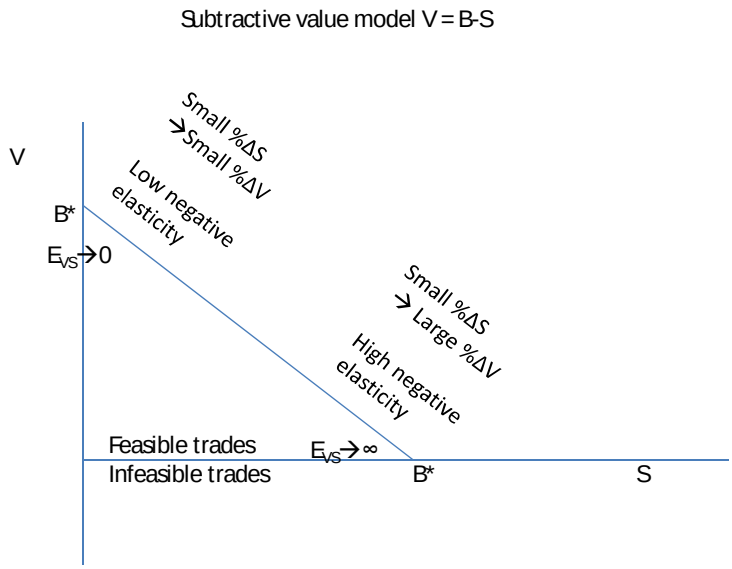


Figure 2: Value as a function of sacrifice (constant benefit)

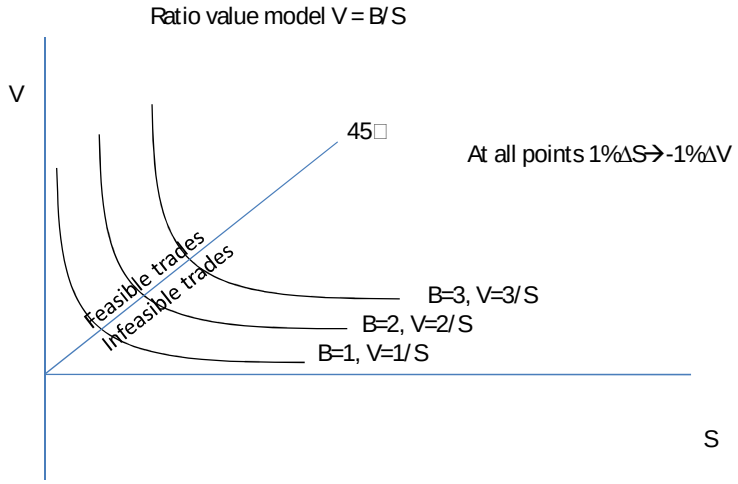


Figure 1 illustrates the relationship between value and sacrifice when benefit is held constant, for the subtractive value model. This is a straight line that intersects the value (vertical) axis and the sacrifice (horizontal) axis at the point B*, where B* is the given, constant value of benefit. The minimum numerical level of value for feasible trades is zero; all trades with positive levels of value are feasible. Hence, all points above the x-axis and to the right of the y-axis are feasible trades.

Figure 2 illustrates the same relationship for the ratio value model. The relationship is a rectangular hyperbola (that is, the curve approaches, but never intersects, the axes in both directions). The

minimum numerical level of value for feasible trades is one; all trades where value is greater than one are feasible. It follows that the 45^0 line is the boundary between feasible and infeasible trades, since at all points on the 45^0 line benefit equals sacrifice, so that value equals 1.

Value as a function of benefit (constant sacrifice)

Figure 3: Value as a function of benefit (constant sacrifice)

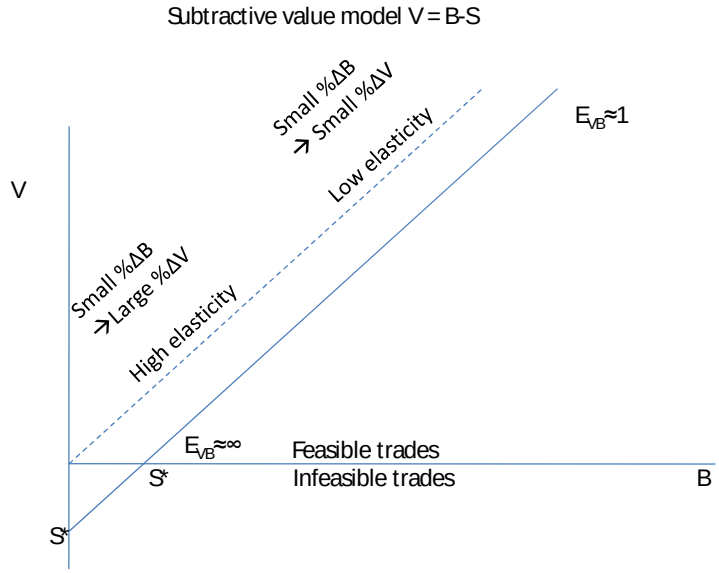


Figure 4: Value as a function of benefit (constant sacrifice)

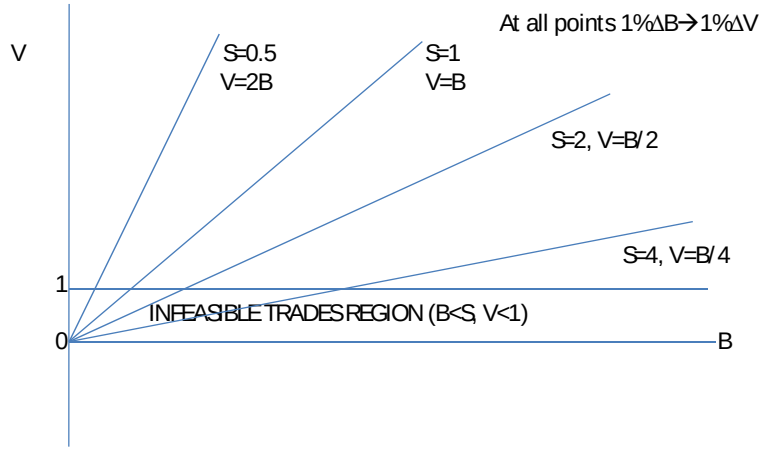


Figure 3 illustrates the relationship between value and benefit when sacrifice is held constant, for the subtractive value model. This is a straight line that intersects the value (vertical) axis and the benefit (horizontal) axis at the point S*, where S* is the given, constant value of sacrifice. As in Figure 1, all points above the x-axis and to the right of the y-axis are feasible trades.

Figure 4 illustrates the same relationship for the ratio value model. The relationship is a straight line through the origin. The minimum numerical level of value for feasible trades is one; all trades where value is greater than one are feasible. It follows that the V=1 straight line is the boundary between feasible and infeasible trades, since at all points on the V=1 line benefit equals sacrifice, so that value equals 1.

In each of Figures 1 through 4 elasticity of value with respect to benefits or sacrifices (whichever is being treated as a variable) is illustrated in the Figure. The formal mathematical derivation of the equations for value elasticity is given in Box 1. Value elasticity is defined by direct analogy to better-known concepts such as price and income elasticity of demand (generally referred to as the "responsiveness" of demand to small changes in price or income). Value elasticity can be thought of as the percentage change in value brought about by a 1% change in sacrifice (or in benefit), with everything else held constant. Mathematically, point (instantaneous) elasticity is defined using differential calculus, as shown in Box 1.

For the ratio model, V = B/S, the elasticity of value with respect to benefits is always +1, and the elasticity of value with respect to sacrifices is always -1. That is to say, a 1% increase in benefits always leads to a 1% increase in value, and a 1% increase in sacrifices always leads to a 1% reduction in value (ceteris paribus).

For the subtractive model, V = B-S, the results for elasticity are perhaps more interesting. The elasticity of value with respect to sacrifices varies between zero, and minus infinity. Where sacrifices are low relative to benefits, the elasticity of value with respect to sacrifices is slightly negative; that is to say, where customers perceive they are receiving high value, they perceive small changes in sacrifice to have little effect. Where sacrifices are high relative to benefits, the elasticity of value with respect to sacrifices is high and negative; that is to say, where customers perceive they are receiving low value, small changes in sacrifice have a large effect on perceptions of value. In a very similar way, the elasticity of value with respect to benefits varies between one, and infinity. Where customers perceive value to be high, small changes in benefit lead to equally small changes in value. Where customers perceive value to be low, small changes in benefit lead to large changes in value.

Box 1: Elasticity of value with respect to benefits and sacrifices

Elasticity of value with respect to sacrifices

Subtractive value model V = B-S

$E_{VS} = \partial V/\partial S.S/V = -1.S/V =$ **$-S/(B-S)$**

Interpretation: E_{VS} becomes more negative as S rises (for constant B). For small S (with constant B), E_{VS} approaches zero (hence V approaches B); as S approaches B (hence V approaches 1), E_{VS} approaches $-\infty$.

Ratio value model V= B/S

$E_{VS} = \partial V/\partial S.S/V = -B/S^2.S/V = -B/S^2.S/(B/S) =$ **-1**

Interpretation: V always declines in direct proportion to S (for constant B).

Elasticity of value with respect to benefits

Subtractive value model V = B-S

$E_{VB} = \partial V/\partial B.B/V = 1.B/V =$ **$B/(B-S)$**

Interpretation: E_{VB} declines as B rises (for constant S). For large B (with constant S), E_{VB} approaches 1; as B declines towards S (hence V approaches zero), E_{VB} approaches ∞.

Ratio value model V=B/S

$E_{VB} = \partial V/\partial B.B/V = 1/S.B/V = 1/S.B/(B/S) =$ **1**

Interpretation: V always increases in direct proportion to B (for constant S).

The analysis of the manner in which value changes with sacrifices or benefits, with the other variable held constant, is both interesting and of relevance to real-world managerial decisions. No doubt there are many circumstances in which a business wishes to evaluate the impact of changes in the benefits delivered, or the sacrifices imposed on customers, on the assumption that nothing else changes. For example, an improvement in information systems efficiency could reduce transaction costs (hence customer sacrifices) with few or no other effects on the exchange relationship. A small improvement in product performance, delivered at no increase in cost, would represent a typical increase in benefits (with no change in sacrifices). However, it is also interesting, and managerially relevant, to consider simultaneous changes in both benefits and sacrifices. Typical circumstances in which this might arise are where a supplier has devised a method of enhancing customer benefits (improved performance) but in order to deliver this benefit customer sacrifices will also increase (increased costs), or where the supplier can deliver cost reductions, but these will necessitate some reductions in benefits. The formal analysis of such circumstances is presented in Box 2.

When considering simultaneous small changes in benefits and sacrifices, for the subtractive model of value the result is very straightforward. Small increments in benefits and sacrifices always have the same quantitative effect on value (although, of course, they are of different sign). But for the ratio model of value the result is more complicated. Where benefits are only slightly greater than sacrifices, so that value is close to one, the quantitative effect on value of a change in benefits is very much the same as, but slightly smaller than, the quantitative effect of a change in sacrifices. However, where benefits are substantially greater than sacrifices, so that value is large, a change in sacrifices has a much larger effect on value than a change (of equal size) in benefits. In general, using the ratio model of value, one would expect that a small change in sacrifices would have a larger effect on value than a small change in benefits. Clearly, the practical implications of these different results, for the subtractive model and the ratio model of value, are considerable. The subtractive model suggests that benefits and sacrifices have equal “leverage” on value, while the ratio model suggests that sacrifices tend to have greater “leverage” on value than do benefits, particularly where value is high.

Box 2: How does value change when B and S are changed simultaneously?

We use the following general result for small increments (Stroud, 2007:702):

$V = f(B,S)$

$\delta V \approx \partial V/\partial B.\delta B + \partial V/\partial S.\delta S$

Subtractive value model $V = B-S$

$\delta V \approx 1.\delta B - 1.\delta S$

Interpretation: For the subtractive value model a small increment in benefit always has the same quantitative effect as a small increment in sacrifice (although, of course, the effects have opposite signs, since an increment in benefit increases value and an increment in sacrifice decreases value).

Ratio value model $V=B/S$

$\delta V \approx 1/S.\delta B - B/S^2.\delta S$

$\approx 1/S(\delta B - \delta S.[B/S])$

Interpretation: We know that for feasible trades $B \geq S$, and that generally $B>S$ (that is, customers enter into transactions on the expectation that they will receive positive value). It follows that in general a small increment in sacrifice has a greater effect on value than a small increment in benefit. Where V is large, a change in S has a much larger effect on V than a change in B. Where V is small, a change in S has a similar quantitative effect on V as a change in B (although the sign of the effect of S is the opposite of the sign of the effect of B).

Equi-Value Curves (Isovalues)

Figure 5: Equi-value lines (isovalues)

Subtractive value model V = B-S

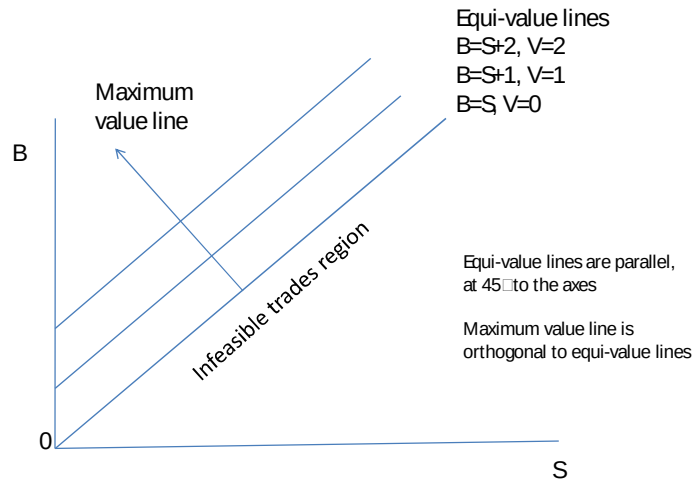
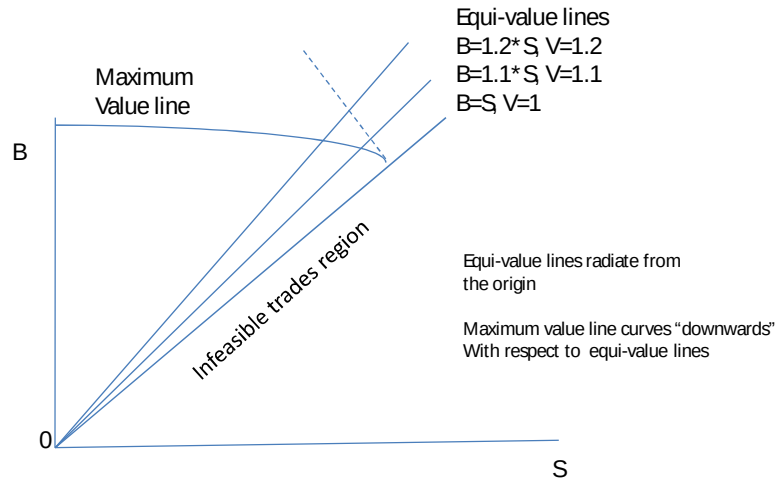


Figure 6: Equi-value lines (isovalues)

Ratio value model V = B/S



Equi-value lines, or isovalues, link points of equal value; that is to say, they show different combinations of perceived benefits and sacrifices that combine to generate the same level of perceived customer value. Figure 5 illustrates equi-value lines for the subtractive value model, and Figure 6 for the ratio value model. For the subtractive value model the equi-value lines are parallel straight lines at 45^0 to the origin; the boundary between feasible trades and infeasible trades is the 45^0 line through the origin, which connects points of zero value. A "maximum value line" can be defined, which is the vector along which value increases at the maximum possible rate from any

given level of value. For the subtractive model, the maximum value line is orthogonal to the equi-value lines.

For the ratio value model the equi-value lines are straight lines radiating from the origin; the 45^0 line through the origin is the boundary between feasible and infeasible trades. The "maximum value line", showing the maximum possible increase in value from any given point, is a curve that bends back towards the y-axis from the given starting point. The abstract analysis of equi-value lines is not pursued further here. The practical applicability of the concept of equi-value curves is addressed in the following section.

Managerial Implications: Managing Exchange Relationships

The purpose of this section is to illustrate how the ideas developed in the preceding pages may be useful in the development of strategies to manage exchange relationships. Although these ideas may have some relevance in B2C marketing, they have far greater relevance in the field of B2B marketing where extensive research undertaken by the IMP Group and others has demonstrated that the management of inter-firm buyer-seller relationships is central to marketing practice (Håkansson, 1982; Håkansson & Snehota, 1989, 1995). For this section, to avoid unnecessary complication and excessive length, we concentrate on the application of the analytical results derived from the subtractive model of value. This makes for greater convenience of exposition.

Figure 7: Managerial implications: Mapping value space

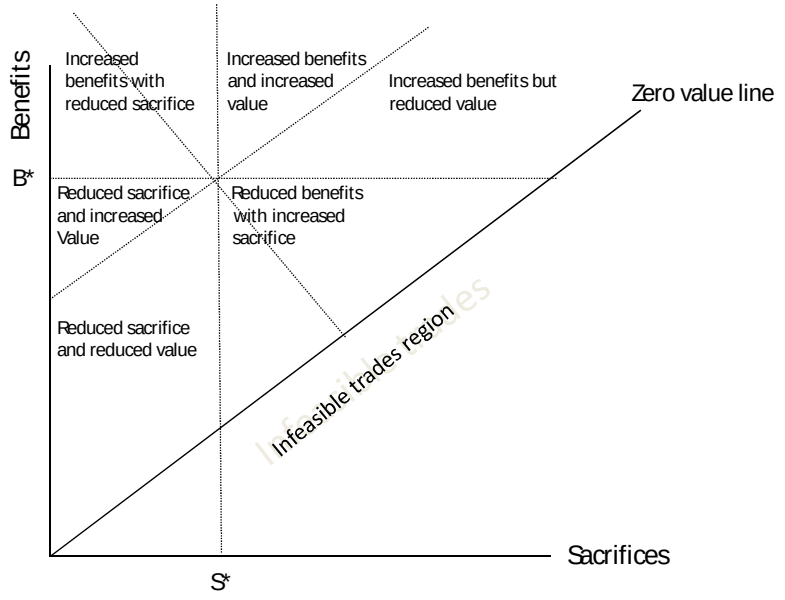


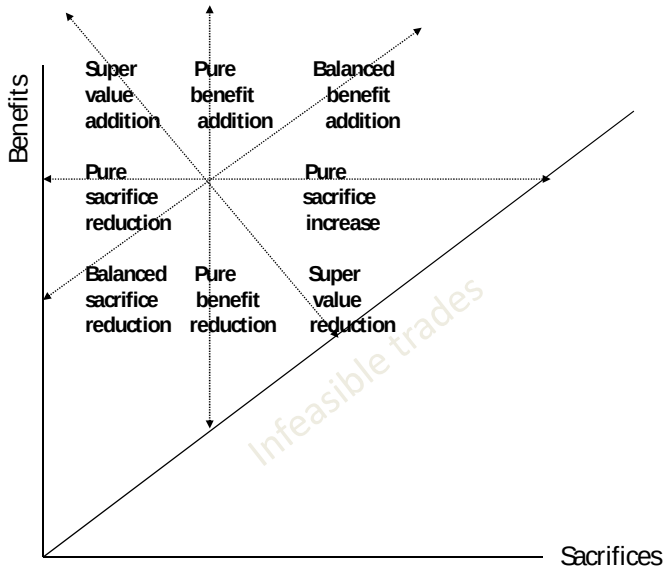
Figure 7 is a development from Figure 5. The "feasible trades" region above the 45^0 "zero value line" is now called the "value space" of the customer, and is sub-divided into six segments, which are defined relative to the maximum value line (the line orthogonal to the zero value line). The customer's current position in this value space is mapped at (B*,S*). B2B exchange relationships are typically complex and dynamic. It is unlikely that the customer will remain at (B*,S*) for long. Three simple, but important, questions that concern the B2B marketing manager or key account manager are illustrated in Figure 7: Where does the customer perceive itself to be in value space? In which direction does the customer want to move in value space? In which direction does the customer perceive itself to be moving in value space? The logically related question which will be

addressed in the later discussion of Figure 8: Where does the supplier want to move the customer in value space?

The six named segments of value space, in Figure 7, represent six possible directions in which perceived customer value can move. Any point above the 45^0 line through (B*,S*) represents an increase in value, which can be brought about by increasing benefits and reducing sacrifice, by increasing both benefits and sacrifices (but benefits by more), or by reducing benefits and sacrifices (but sacrifices by more). Any point below the 45^0 line through (B*,S*) represents a reduction in value, which can be brought about by reducing benefits and increasing sacrifices, by increasing benefits and sacrifices (but sacrifices by more), or by reducing benefits and sacrifices (but benefits by more).

From the point of view of a well-informed and fairly rational customer, some areas of value space clearly dominate others. For example, "increased benefits and reduced sacrifice" is preferable to all other directions. However, customer preferences between other areas of value space would depend on contingent factors. For example, "increased benefits, increased sacrifice, and increased value" may or may not be preferred to "reduced benefits, reduced sacrifice, and increased value". This would depend on a wide range of contingent factors, including broad economic factors, developments elsewhere in the business network, the atmosphere of the relationship, and the strategic intent of the parties to the relationship (whether they want it to grow or shrink).

Figure 8: Eight customer value vectors for strategic marketing



In Figure 8 we take the ideas from Figure 7 and now look at them through the eyes of the supplier. Rather than focusing on the spaces between the lines, we now focus on the eight arrows originating from the point in value space where the customer currently stands. We call these the "customer value vectors for strategic marketing". That is to say that, when devising a customer-based B2B marketing strategy, we advocate the consideration of eight key strategic options. The reason for calling these options "vectors" is that they have a well-defined direction in value space, and in order to formulate a meaningful strategic option it is necessary to add to this direction some notion of "magnitude of change" (a vector having direction and magnitude). There are three value addition strategies (super value addition, pure benefit addition, and pure sacrifice reduction). Such strategies amount to giving the customer "something for nothing", and even, in the case of super value addition, "something for

less than nothing". They are manifestly powerful strategies for strengthening a customer relationship, which would be suitable, for example, where the customer is extremely powerful and the relationship is under threat, or where the supplier has decided to make a strategic investment in the development of this customer relationship.

The three value reduction strategies (super value reduction, pure benefit reduction, pure sacrifice increase) amount to giving the customer "nothing for something", or even "less than nothing for something". Such strategies might, for example, signal that the supplier wishes to terminate the relationship, or that a powerful supplier is seeking to increase the value that it extracts from a relationship.

Under normal business circumstances it is likely that the majority of realistic strategic options (vectors) for supplier action in customer value space will be reasonably close to the equi-value line running through the current level of customer value; that is to say, they will be variations on balanced value addition or balanced value reduction. In accordance with the ideas of Anderson and Narus (1999), suppliers will in general be seeking to increase the value that they deliver to customers. So one could speculate that the majority of appropriate strategic options for most B2B suppliers when considering customer-based marketing strategies will lie in the area just to the left of the 45^0 line, somewhere between balanced benefit addition/balanced sacrifice reduction, and pure benefit addition/pure sacrifice reduction.

Conclusion and Research Implications

The analysis presented in the paper has used algebraic and geometric methods to explore the implications of the two different specifications of the customer's value equation, the ratio approach and the subtractive approach, for customer behaviour and strategic marketing decisions. Three key concepts were defined and investigated for each specification of the customer's value equation: customer value elasticity, equi-value curves (or "iso-values"), and value vectors. Customer value elasticity measures the sensitivity of customer value to small changes in customer perceived benefits and sacrifices. Equi-value curves are functions connecting points of equal customer perceived value. Value vectors are customer-value-based marketing strategies which have a specific directional orientation with respect to equi-value curves. The analysis of customer value elasticity and of equi-value curves suggests a number of important hypotheses for subsequent empirical testing. The analysis of value vectors suggests that there are eight feasible customer-value-based marketing strategies available to business organisations.

The results of our analysis suggest a novel approach to the empirical investigation of the relationships between perceived customer value, perceived benefits, and perceived sacrifices. Rather than attempting directly to specify and operationalise the functional relationship between the three concepts, researchers can investigate the underlying functional relationship by exploring the responsiveness of value to benefits and sacrifices (customer value elasticity), and the shape of the equi-value curves. In other words, simpler measures involving only two variables, which may be easier to operationalise, can be used to illuminate the more complex three-way relationship between value, benefits and sacrifices. Some fairly simple research question and hypotheses can be developed from the foregoing analysis. For example, does the responsiveness of customer value to small changes in benefits remain constant, or change, at different levels of value? Does the responsiveness of value to small changes in sacrifice remain constant, or change, at different levels of value? Do customers perceive equivalent small changes in benefits and sacrifices to generate equal or different changes in their perceived value? We assume that there are no single, right answers to any of these questions; that is to say, there is no universally valid functional form for the customer value equation. Rather, one would expect to find different functional forms under different sets of contingent variables (for example, dynamism of the industry sector, cultural considerations, network

considerations, and broad economic conditions). Empirical investigations in a variety of settings would be very helpful to establish what the range of normal parameters for customer value functions is.

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