Customer satisfaction and profitability: A reappraisal of the nature of the relationship

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Abstract   Delivering customer satisfaction is at the heart of modern marketing theory. There is growing research evidence of the beneficial effects of customer satisfaction in terms of both behavioural outcomes such as loyalty, and performance outcomes such as profit. At the same time, a number of commentators are questioning the value of merely satisfying customers and focusing attention instead on the idea of customer delight. Implicit in these debates is the idea that the assumption of a simple linear relationship between satisfaction and relevant outcomes may no longer be appropriate. Using data from the American Customer Satisfaction Index (ACSI) and firm-level performance, this paper re-examines the nature of the relationship between satisfaction and performance with the specific objective of examining the extent to which such relationships may be non-linear. The results contradict the presumption of non-linearity and suggest that, at least over the observed range of satisfaction scores, the assumption of a linear relationship is acceptable.

INTRODUCTION

At the heart of both marketing theory and practice is the principle that organisations will be able to improve their performance by satisfying customers. For many years this principle was accepted without question and implicitly, higher levels of satisfaction were assumed to be a sensible target because they would lead to higher levels of performance. Where satisfaction was the subject of systematic research, the focus of attention was on defining and measuring the construct.[1] While definition and meaning continue to be subject to some debate, the past decade has seen a shift in the focus of attention, towards the modelling, measurement and

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analysis of the antecedents and consequences of satisfaction. The result has been a growing body of evidence which confirms the beneficial impact of customer satisfaction on a range of attitudinal, behavioural and performance variables.[2]

At the same time, a number of researchers have started to question the value of satisfaction *per se*. Satisfaction as the confirmation of expectations has started to be conceptualised almost as a threshold for customers — ie the delivery of satisfaction is the minimum that customers would expect. From this perspective, the simple presence of customer satisfaction was unlikely to have much of an impact on business performance. Attention began to shift towards concepts such as customer delight[3] in order to emphasise the need for organisations to go beyond simply matching a set of baseline expectations. Implicit in this approach was the idea that, where levels of satisfaction can vary, the relationship between satisfaction and performance may not be linear as previous empirical studies had assumed. Evidence on the nature of the relationship between satisfaction and performance is limited; while some studies find linear relationships to be perfectly acceptable, others point to the need to accommodate non-linear relationships.[4]

This paper revisits the subject of customer satisfaction and profitability using data from the American Customer Satisfaction Index (ACSI) and data on internal measures of financial performance. The specific objective of the analysis is to examine the nature of the relationship between the two variables and consider the extent to which there is evidence for non-linearities in the relationship. The paper begins with a brief overview of relevant literature. Thereafter, there is a

discussion of the nature of the data set being used followed by a brief discussion of methodology and findings. The paper closes with a summary and conclusions.

BACKGROUND

The principles that underlie the relationship between satisfaction and firm performance are well documented, being based around the cost and revenue effects associated with increased loyalty and repurchase. These relationships are probably most neatly encapsulated in the concept of the service–profit chain,[5] although their relevance extends beyond the service context alone. Much of the most recent research in the area of customer satisfaction has concentrated on the examination and evaluation of empirical evidence relating to its antecedents and consequences.[6,7] Typically, research on the consequences of satisfaction focuses attention on behavioural outcomes such as repurchase intention, complaining behaviour and word of mouth. Thus, for example, a number of studies have identified a positive relationship between satisfaction and repurchase.[8–10] Other research has pointed to the relationship between dissatisfaction and negative word of mouth[11] and dissatisfaction and complaining behaviour.[12]

The link between satisfaction and performance (profitability) has been the subject of a number of studies, most of which find evidence of a positive link between the two variables.[13–18] The estimation of this relationship has, however, always proved relatively complex because of issues associated with comparing individual–level customer measures (satisfaction, repurchase intention) with aggregate, firm–level measures. To obtain sensible estimates requires either an aggregation of individual customer responses to the firm

level or a disaggregation of firm-level performance measures to the level of the individual customer. Loveman[19] used customer-level data to overcome this problem and presents evidence to support the idea of a positive relationship between satisfaction, loyalty and revenue/profit. Other evidence that supports the positive effects of satisfaction on performance has been based on aggregate firm-level data and has focused primarily on a direct satisfaction–performance relationship.[20–22]

Despite the growing body of academic evidence to support the beneficial effect of customer satisfaction on firm performance a number of researchers have begun to question the value of customer satisfaction *per se*. To a large degree, these concerns have arisen from empirical observations that suggest that the proposed benefits of both quality and satisfaction have failed to materialise. The subsequent failure of many of Peter's and Waterman's[23] 'excellent' companies is well known. Similarly, Rust *et al.*[24] noted that many firms that received prestigious quality awards subsequently struggled financially. Other researchers have noted that firms with reportedly high levels of satisfaction have relatively low levels of loyalty. Jones and Sasser[25] commented on the propensity of satisfied customers to defect while Reichheld,[26] introduces the concept of the satisfaction trap in which he notes that car manufacturers in the USA consistently report high levels of customer satisfaction (in excess of 90 per cent) and yet observe low levels of repurchase (30–40 per cent). More recently, Schneider and Bowen[27] noted that Xerox discovered that totally satisfied customers were six times more likely to repurchase than those customers who were simply 'satisfied'.

Trying to disentangle the factors behind these apparently counterintuitive results raises a number of issues. To some degree, the problematic relationship between satisfaction and loyalty in commercial satisfaction surveys can be attributed to problems in the design, administration and use of satisfaction surveys.[28–29] In particular, it is apparent from the observations of Schneider and Bowen[30] that measuring the degree of satisfaction is important. Indeed, they, along with others, attempt to distinguish between a level of satisfaction in which the product or service simply meets customer expectations and a level of satisfaction which exceeds expectations — the concept of 'customer delight'.[31] Whether customer satisfaction and customer delight are genuinely separate constructs or different levels of the same construct may be open to debate.[32] Whatever the outcome of such a debate, there are a growing number of researchers who suggest that in order to realise the beneficial effects of customer satisfaction organisations must do more than just meet customer expectations.[33–34]

While some of the difficulties in understanding the relationships between satisfaction and its outcomes may be attributed to data collection and construct measurement, there are two further issues which relate to the form of the relationship between degrees of satisfaction and its outcomes. First, most studies assume that the relationship is contemporaneous and link current period satisfaction to a current period performance measure. Secondly, most studies assume a simple linear relationship between satisfaction and its outcomes without explicitly considering other functional forms. It is the second of these two issues that is the focus of the current paper. The importance of assessing the temporal dimension of the relationship has been recognised[35] and there is evidence to suggest the potential existence of lagged effects in the relationship.[36] Given the difficulty of

examining the issue of lags and functional form simultaneously, however, the current paper focuses on the latter because of the comparative shortage of empirical evidence in the area.[37]

The issue of possible non-linear relationships between quality and its various outcomes was raised by Rust *et al.* in their study of returns on quality.[38] Oliva *et al.*[39] used catastrophe theory to suggest non-linearities in the relationship between satisfaction and loyalty while Schneider and Bowen[40] suggest that there may be significant non-linear effects on repurchase intentions as customers move from dissatisfaction, through satisfaction and to delight.

In practice, most studies have implicitly assumed a linear relationship between satisfaction and its outcomes, although there appears to be increasing evidence to suggest that this assumption may not be justified. If these relationships are in fact non-linear then there are alternatives that may be considered. The most obvious framework is one in which the relationship between satisfaction and its consequences displays some form of increasing returns such that the movement from mere satisfaction to delight produces proportionately greater gains in the relevant outcome measure. This perspective would be consistent with the arguments put forward by Reichheld[41] and Schneider and Bowen,[42] among others. An alternative might be a model based on diminishing returns such that progressive investments in increasing satisfaction produce progressively smaller increases in the relevant outcome variable. This approach would be more consistent with the notion of there being diminishing returns to quality/satisfaction.[43–44] Conceptually, there are arguments in favour of both non-linear forms and a linear form. Accordingly, the current paper turns to empirical evidence to provide insight into the extent to which the link between satisfaction and profitability (as one specific outcome) can be shown to be non-linear.

DATA, METHODS AND FINDINGS

Data for the analysis were collected from two sources — the American Customer Satisfaction Index (ACSI, currently available online) and a proprietary financial database, Standard and Poors' CompuStat. The ACSI[45] is a continuous measure which has been widely used in the study of satisfaction and its outcomes[46–48] and it covers a wide range of industries. It has been collected on a consistent basis over a period of time and thus provides an ideal data set on which the testing of the nature of the satisfaction–performance relationship can be undertaken.

The sample consists of firm-level data for companies that participated in the ACSI project whose financial data are also available through Compustat. For the purposes of the current analysis it is assumed that the impact of satisfaction on a firm's profitability is contemporaneous. This requires a matching between financial and ACSI data. A two-step procedure was used to match data from the ACSI with data from Compustat. The identities of companies participating in the ACSI were matched with the identities of companies in the Compustat database for the period 1994–98. The two data sets were then merged using the financial data for the year end subsequent to the ACSI filing date. The final data set comprised approximately 100 observations for each year.

The objective of the current study is to explore the relationship between satisfaction and profitability. An understanding of the appropriate functional form is of importance in relation to the conceptual issues discussed
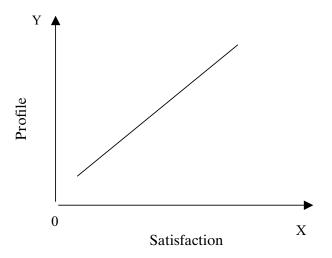
Figure 1

in the literature review. It is perhaps equally important from an empirical perspective because of the consequences of mis-specifying functional form.[49] In line with other studies in the area, there was no attempt to specify fully a model of business performance (profitability); rather, the focus of attention was to explore the suitability of different function forms in a regression of profitability on satisfaction. Specifically, the data set was used to estimate a simple linear relationship between the two variables and then to undertake appropriate transformations of the data to allow a non-linear specification to be estimated.

Functional form selection is not a mechanistic process and requires a careful consideration of the features of different possible functional forms. For the purpose of the current study, three different functional forms were considered to match the different theoretical perspectives identified in the literature. These are first, the linear model (Model 1), second, the square root model (Model 2) and third, the log-linear (exponential) model (Model 3). The proposed models (specified in a

deterministic fashion) are as follows:
Model 1:

$$Y = \alpha_1 + \beta_1 X$$

$$\frac{dY}{dX} = \beta_1$$

This is a linear model giving a constant relationship between X (satisfaction) and Y (profit). A positive relationship is observed if $\beta_1 > 0$ as shown by Figure 1. This would be consistent with the most commonly used specification of the satisfaction–performance relationship — namely that the relationship between an increase in satisfaction and an increase in profitability is the same at all levels of satisfaction (ie the relationship is linear).
Model 2:

$$Y = \alpha_2 + \beta_2 X^{1/2}$$

$$\frac{dY}{dX} = \frac{\beta_2 X^{-1/2}}{2}$$

In this case, the relationship between X and Y changes at every point. If $\beta_2 > 0$, then as X (satisfaction) increases the increase in Y (profit) increases but at a
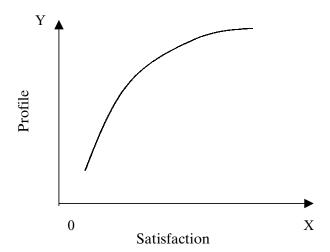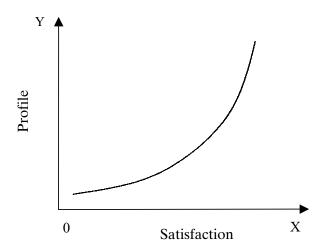
Figure 2

Figure 3

diminishing rate as shown by Figure 2. In effect, this specification would suggest that initial increases in satisfaction have a relatively large effect on profitability but that, beyond a certain point, the gains from further increasing satisfaction will progressively decline. Given the relationship between quality and satisfaction, this would be consistent with the observation that the additional benefits of increasing quality will tend to decline at higher and higher levels of quality.

Model 3:

$$\ln(Y) = \alpha_3 + \beta_3 X$$

which can be rewritten as $Y = e^{\alpha_3 + \beta_3 X}$

$$\frac{dY}{dX} = \beta_3 e^{\alpha_3 + \beta_3 X} = \beta_3 Y$$

This model can be transformed into exponential function. Its shape is shown is Figure 3 for $\beta_3 > 0$. In this specification, as X (satisfaction) increases then Y (profit) will initially increase gradually and only increase rapidly beyond a certain point. This specification is consistent with the idea that moving from dissatisfaction to satisfaction generates small increases in profit and that it is moving from satisfaction to

Table 1: Operating income as dependent variable

Year	Model 1 $\hat{\beta}_1$	t-value	R^2	Model 2 $\hat{\beta}_2$	t-value	R^2	Model 3 $\hat{\beta}_3$	t-value	R^2
1994	0.0035	3.0640	0.1027	0.0625	3.0601	0.1025	0.0498	3.2219	0.1136
1995	0.0037	3.5370	0.1245	0.0646	3.5297	0.1240	0.0373	2.8983	0.0899
1996	0.0032	2.7086	0.0762	0.0548	2.6739	0.0744	0.0405	3.2553	0.1086
1997	0.0043	3.6719	0.1266	0.0727	3.6299	0.1241	0.0410	3.4419	0.1186
1998	0.0033	3.0146	0.0865	0.0557	2.9952	0.0855	0.0257	**1.9324**	0.0407

Table 2: Net income as dependent variable

Year	Model 1 $\hat{\beta}_1$	t-value	R^2	Model 2 $\hat{\beta}_2$	t-value	R^2	Model 3 $\hat{\beta}_3$	t-value	R^2
1994	0.0033	3.7943	0.1448	0.0580	3.8158	0.1462	0.0517	3.6356	0.1418
1995	0.0019	2.7786	0.0807	0.0340	2.7785	0.0807	0.0371	2.5967	0.0751
1996	0.0020	2.4791	0.0653	0.0337	2.4395	0.0633	0.0351	2.8036	0.0846
1997	0.0028	3.2671	0.1030	0.0478	3.2283	0.1008	0.0397	2.8966	0.0870
1998	0.0022	2.9805	0.0847	0.0381	2.9595	0.0836	0.0264	**1.9512**	0.0415

delight that has the most significant impact.

These three models were estimated for the satisfaction–profitability data set, using ordinary least squares and appropropriate data transformations as necessary. Two different indicators of profitability were used, namely operating income and net income. Table 1 records the estimated coefficient for each model, its corresponding t-value and the R^2 of the model. $\hat{\beta}_h$ is the estimated value for β_h, where $h = 1, 2$ or 3. The estimated intercept for each of the models is not reported because the focus of the analysis is only on functional form.

Customer satisfaction has a significant and positive impact on profitability at the 1 per cent level in every year, except for 1998 where the relationship is only significant at the 10 per cent level. The value of the estimated coefficients is generally consistent across years and each functional form appears to produce a low but acceptable fit as indicated by R^2 values. The relatively low R^2 values are not surprising given the complexity of the factors

determining performance and they are consistent with those reported in other studies.[50] To determine whether there is any evidence for choosing a non-linear form over and above the linear form requires further investigation.

One of the simplest ways to test whether the linear relationship (Model 1) is appropriate would be to test whether the overall fit of the model can be significantly improved by the addition of non-linear terms in X. Such an approach, however, reduces degrees of freedom and this can be particularly problematic when there are a large number of explanatory variables. To overcome such a problem, Ramsey has proposed the following procedures.[51] This test is usually referred to as the RESET test (regression specification error test). Although the loss of degrees of freedom is less likely to be a major issue in this case, the Ramsay RESET test will be used for consistency with common practice. The testing proceeds as follows:

Step 1: First fit Model 1:
$Y = \alpha_1 + \beta_1 X$ and then obtain the fitted value, $\hat{Y}$.

Table 3: The RESET test

Year	Operating income as dependent variable		Net income as dependent variable	
	$k = 2$	$k = 3$	$k = 2$	$k = 3$
1994	0.0019	**2.3806**	0.9596	1.2492
1995	0.0155	1.7867	0.0139	1.4785
1996	1.2743	1.0407	1.7828	1.1889
1997	2.5744	1.2756	2.2951	1.1457
1998	0.6512	0.4649	0.7577	0.4277

Step 2: Estimate following new model.

$$Y = \alpha_1 + \beta_1 X + \sum_{i=2}^{k} \delta_i \hat{Y}^i + \varepsilon$$

In this step, $\hat{Y}$'s have been added into the original equation to capture non-linear functions of X. Generally, k is fixed at either 2 or 3.

Step 3: Carry out an F-test for the k-1 restrictions in H_0: $\delta_2 = \delta_3 = \ldots = \delta_k = 0$. If the null hypothesis is rejected, that is an indication of specification error.

In practice, the RESET test is not specifically concerned with detecting any specific alternative to a proposed model; rather its usefulness lies in acting as a general indicator of the extent to which a proposed (linear) functional form is acceptable. If the RESET test rejects the null hypothesis that the linear form is acceptable, further investigation is required to determine the extent to which an alternative specification is appropriate. Thus for the current study, the RESET test can provide guidance on the acceptability of the linear functional form but if the null hypothesis of linearity is not accepted, the RESET test cannot identify what form the non-linearity takes.

The results for the RESET test for Model 1 for both measures of profitability are reported in Table 3. For each data set, two models in Step 2 of the RESET test have been estimated:

one with only $\hat{Y}^2$ (the F-statistic for each year is reported in column with label $k = 2$) and other with $\hat{Y}^2$ and $\hat{Y}^3$ (the F-statistic is reported in column with label $k = 3$).

From Table 3, the calculated F-statistic for each case is observed to be smaller than the critical value at 10 per cent significance level, with the exception of the 1994 model with operating income as dependent variable and $k = 3$. With only one instance of an apparent departure from linearity, the testing procedure suggests that, on balance, there is no evidence to reject the null hypothesis that the relationship between satisfaction and profitability is linear. Hence, it is possible to conclude that Model 1 (the linear model) represents the correct functional form for the relationship between profitability and customer satisfaction. Thus the commonly made assumption that the relationship between customer satisfaction and profitability is linear can be defended on the evidence of the ACSI and income–based measure of profitability.

SUMMARY AND CONCLUSIONS

Although it is generally accepted that customer satisfaction does have a positive impact on outcomes such as loyalty, retention and business performance, the precise nature of the relationship has been open to debate. While the vast

majority of empirical studies have tended to assume, at least implicitly, that this relationship is linear, other evidence has begun to point to potential non-linearities. The most obvious of these has been the apparently substantial gains that may accrue from moving customers between being simply satisfied and being delighted, although an alternative perspective, as has been observed in quality-focused studies might suggest decreasing performance improvements as satisfaction increases.

Some further understanding of the nature of these relationships is of importance both conceptually and also statistically because of the problems that may arise with misspecification. This paper uses data on net and operating income, alongside firm-level satisfaction measures from the ACSI to examine whether or not the relationship between satisfaction and performance is linear. The results suggest that both linear and non-linear specifications appear to fit the data equally well. In particular, two non-linear functional forms were examined. The first, the square root model, would imply that there are diminishing returns to satisfaction and that, beyond a certain point, additional satisfaction will have little impact upon profitability. The second, the log linear model would suggest that there are increasing returns to satisfaction and that satisfaction only has a noticeable impact on profitability beyond a certain point. Although the three models produced similarly acceptable fits a formal test for functional form suggested that there was no reason to reject the assumption that a linear relationship existed between satisfaction and profitability. Thus, the use of linear functions to model relationships between satisfaction and performance would appear to be acceptable.

It would be unwise to generalise from these findings to other outcome variables such as retention or loyalty. Equally, it is important to note that the range of reported ACSI values reflects an aggregation across customers and as such does not tend to include extreme values, particularly at the lower end of the range. Thus, for each year's data, the reported index value is roughly in the range of 60–90. This data range would appear to be less problematic in relation to the top end of the distribution, but in the absence of a spread of values in the lower ranges, the possibility that the testing procedure has identified local rather than global linearity cannot be ignored. Given this reservation, there is clearly a need for further research to investigate the nature of the relationship between satisfaction and profitability, and ideally such research should consider the issue of both contemporaneous and non-contemporaneuos relationships. The evidence presented in the current paper provides, however, an initial indication to suggest that linearity continues to be a safe assumption in modelling the aggregate satisfaction–performance relationship, at least in the case of the ACSI. By implication, the findings also suggest that the existence of either increasing or decreasing returns to satisfaction remains open to debate.

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