Send Orders for Reprints to reprints@benthamscience.net

The Open Economics Journal, **2013,** *6,* **11-17**

Open Access

Modeling Customer Satisfaction: A Panel Cointegration Perspective of The Limited Service Restaurant Sector

Peter Sephton*

School of Business, Queen's University, Kingston, ON, K7L3N6, Canada

Abstract: Panel cointegration analysis is used to examine the links between customer satisfaction and its antecedents as well as satisfaction and consumer voice and loyalty for four firms in the limited service restaurant sector. The results suggest satisfaction and perceived value continually move to maintain a stable balance between perceived quality, expectations, perceived value, and satisfaction. Loyalty and complaints are strongly linked to customer satisfaction. The findings provide conclusive support for enhancing corporate performance through improving measures of customer satisfaction.

Keywords: Customer satisfaction, loyalty, panel cointegration, unit roots.

1. INTRODUCTION

The American Customer Satisfaction Index (ACSI) is maintained at the University of Michigan and it is constructed as a function of several antecedents linked to the ultimate outcomes of satisfaction, customer loyalty and customer complaints. Indexes for firms and industries have been constructed since 1994, with indexes for government agencies and departments from 1999, and electronic commerce government scores since 2003. Similar indexes exist in other nations and areas, for example, the Pan European Customer Satisfaction Index, the National Customer Satisfaction Index of the Republic of Korea, and the Swiss Index of Customer Satisfaction Bruhn and Grund [1]. The ACSI is the most widely studied index (see http://www.theacsi.org/about-acsi/acsi-methodology).

Research into customer satisfaction suggests that satisfied customers are more likely to return and through word-of-mouth increase traffic and sales; they reduce marketing costs; they provide feedback to managers on corporate performance; and in the aggregate, affect business and consumer confidence and thereby macroeconomic conditions. Understanding the specific channels through which measures of customer satisfaction operate is of importance to both firms and policymakers.

The marketing theory behind the ACSI is well described by Anderson and Fornell [2] and is based on a causal model in which expectations, perceived quality, and value are tied to consumer voice (complaints to both personnel and management) and consumer loyalty (measuring price tolerance and the likelihood of repurchase). Exit-voice theory (Hirschman [3]) suggests that higher levels of customer satisfaction decrease complaints and increase loyalty (Gengler and Leszczyc [4], Allen [5]) they decrease the elasticity of demand so that as firms charge higher prices, consumers are less price sensitive when they are satisfied, perhaps explaining the asymmetries reported by Pauwels *et al.* [6]); and they have the potential to raise profitability (Anderson, Fornell and Rust [7] among others). Some researchers have suggested that a firm's index in comparison to its competitors provides a measure of its relative performance and can be used as an incentive for managerial contracts and employee compensation (Luo and Homburg [8], Chen *et al.* [9]). Both industry and national scores might be used by policymakers searching for information on industrial and macroeconomic performance (Fornell, Rust and Dekimpe [10], Sephton [11]).

The actual index is created using partial least squares applied to survey data. Each quarter customers are randomly selected for telephone interviews and their responses to questions provide information on price sensitivity, repurchase intention, complaints, expected value and service, reliability and overall satisfaction. This information is used to construct indexes of customer satisfaction for over 200 firms and the government. Firms are selected on the basis of their total sales and coverage is adjusted as market positions change and as a result of mergers and acquisitions. Scores are constructed for over 40 industries as a function of the individual firm indexes; new industries are added as products and services are developed. A national index is created each quarter as the survey sample rolls through different industries, and as the sectoral weightings of the industries in gross domestic product evolve.

The purpose of this paper is to examine customer satisfaction and its antecedents and consequences in the limited service restaurant industry to determine whether customer satisfaction "matters". Should firms in this industry care about their satisfaction scores? After all, fast food is "fast food". Maybe customer satisfaction is not as important a business driver as one might believe. Maybe there is little

*Address correspondence to this author at the School of Business, Queen's University, Kingston, ON, K7L3N6, Canada; Tel: 613 533 3013; Fax: 613 533 6847; E-mail: psephton@business.queensu.ca

1874-9194/13

merit to rebranding through new menus, healthy choices, storefront renovations, and their associated costs. Maybe a "happy meal" is any meal, at the "fast food joint".

Satisfaction measures should be positively related to perceived value, perceived quality, and consumer expectations, the factors used to construct the satisfaction index. The index itself should be positively related to customer loyalty, wither high loyalty raising customer satisfaction, while customer voice – a measure of complaints – should be negatively related to satisfaction. It would be fairly reasonable to expect that satisfaction improves as customers exhibit greater loyalty and as their complaints fall.

Omachonu *et al.* [12] recently examined the related issue of whether there is evidence of Granger causality between the ACSI and its antecedents and the ultimate outcomes, loyalty and voice, for a single national fast food restaurant chain. They reported that satisfaction and perceived quality are jointly and positively related in the long-run and that expectations have both short-run and long-run affects. Unfortunately, their empirical work was not done properly since they employed annual data over a relatively short time span. To increase the number of observations and provide degrees of freedom, they distributed the annual data over each year to obtain "quarterized" data. This introduced an *ad hoc* temporal dimension to the behavior of their series that renders all of their empirical work using time series methods unreliable. These methods, non-causality testing and single and multiple equation cointegration analysis, depend critically on the frequency, periodicity, and temporal behavior of the data.

Nevertheless, it is possible to employ advances in time series econometrics to revisit the issue of non-causality testing and cointegration to identify channels through which the various antecedents of satisfaction are related to the objectives of voice and loyalty. In particular, panel cointegration analysis can show whether one or more of the series is weakly exogenous to the causal relationship, suggesting that the variable does not react to restore the system to its long-run equilibrium when the system is "out of balance". This might confirm, for example, findings reported by some authors (Parasuraman *et al.* [13], Martensen *et al.* [14]) that expectations have a negligible effect on customer satisfaction. Perhaps expectations are a weakly exogenous variable so that other factors, such as perceived quality and value, react when satisfaction moves away from its equilibrium with the antecedents and the outcomes (voice and loyalty). This paper contributes to our understanding of whether the antecedents of the indexes are truly causal to the ultimate objective of voice and loyalty for this particular sector. While the indexes themselves may be directly related to customer complaints and loyalty, there may be different mechanisms linking voice and loyalty to expectations and perceived quality and value. The panel cointegration analysis will determine the extent to which customer satisfaction responds to changes in the antecedents of the indexes, and the indexes themselves.

The next section presents the panel data framework and describes the various error correction model tests for cointegration. This is followed by the analysis of the links between customer satisfaction and perceived quality, expectations, and perceived value for four firms in the limited service restaurant sector using data spanning from 1994 to 2008. Loyalty and complaints are also shown to be linearly related to measures of satisfaction, with changes in customer satisfaction tending to restore the system to balance rather than changes in loyalty or consumer voice. Final remarks and suggestions for future work follow.

2. PANEL COINTEGRATION ANALYSIS

In this section we discuss the error correction specification and associated tests for cointegration. The panel approach allows us to examine the link between customer satisfaction and its antecedents as well as the links between loyalty, complaints, and satisfaction. Consider a series Y_{it} and a (k x 1) vector of others, X_{it}, which are all I(1). Here are 4 cross-sectional units and 14 time periods: i=1,…,4 and t=1,..,14. The long-run equilibrium between the variables is captured in the cointegrating regression, described by (1), with normalization on Y_{it} and β_i the cointegrating vector:

$$Y_{it} = \beta_i' X_{it} + \varepsilon_{it} \tag{1}$$

An error correction representation of thecointegrated system typically takes the form of equation (2) where lags and leads of changes in variables are included in the regressor set to "whiten" the covariance matrix and to allow for weak exogeneity, respectively.[1]

$$\Delta Y_{it} = \varphi_{11} + \sum_{j=1}^{p} \varphi_{12\,ij} \Delta Y_{it-j} + \sum_{j=-p}^{p} \varphi'_{13\,ij} \Delta X_{it-j} + \gamma_i \{Y_{it-1} - \beta_i' X_{it-1}\} + \omega_{it} \tag{2}$$

Tests of cointegrationexamine the statistical significance of the adjustment coefficient γ_i. If the variablesare not cointegrated, Y_{it} would not respond to the disequilibrium from last period, represented by $\{Y_{it-1} - \beta_i' X_{it-1}\}$, whereas if γ_i is statistically different from zero, Y_{it} does move to help restore balance to the system and the series are cointegrated. Repeating the test for various "normalizations" on each variable included in the cointegrating regression provides insight into whether the variables are cointegrated and/or whether some series are weakly exogenous, in that they do not adjust to re-equilibrate the system.

Tests of the null hypothesis of non-cointegration based on the statistical significance of the speed of adjustment coefficients in (2) can be contaminated by possibly invalid common factor restrictions; specifically $\xi'_i = \gamma_i \beta_i$ in (3):

$$\Delta Y_{it} = \varphi_{11} + \sum_{j=1}^{p} \varphi_{12\,ij} \Delta Y_{it-j} + \sum_{j=-p}^{p} \varphi'_{13\,ij} \Delta X_{it-j} + \gamma_i Y_{it-1} + \xi'_i X_{it-1} + \omega_{it} \tag{3}$$

[1]See Phillips and Loretan [15] and Saikkonen [16].

This is why error correction tests of non-cointegration typically examine the statistical significance of the $Y_{i\,t-1}$ term in (3) without imposing the common factor restrictions.[2] If one does not reject the null hypothesis that the γ_i are zero, the evidence suggests the series are not cointegrated. As noted above, repeating the test for different normalizations may confirm a finding non-cointegration, or, when there is evidence that some, but not all of the variables respond to the previous diseqilibrium, it may identify those variables which are weakly exogenous.

Westerlund [18] provides a test of non-cointegration that examines the statistical significance of the error correction coefficients γ_i in (3). This test has good small sample properties and is relatively more powerful than residual-based panel cointegraton tests such as those of Pedroni [19]. The Westerlund [18] test allows for either a common degree of adjustment for each member of the panel under the alternative (known as the panel tests), or different degrees of adjustment under the alternative (the group mean tests). The tests are asymptotically normally distributed, and sieve-type bootstrapping that accounts for both time series and cross-sectional dependence in the errors is used to guide inference.

The next section presents empirical results suggesting the ACSI index shares a long-run attractor with some of its antecedents and that it is also part of a broader relationship between loyalty and customer voice.

3. SATISFACTION AND ITS ANTECEDENTS

Logically prior to undertaking panel cointegration analysis is determining whether each series contains a unit root. To that end, the panel unit root tests of Smith, Leybourne, Kim and Newbold [20] and Lopez [21] are presented in Table **1**. Both tests employ bootstrapping to allow for potential correlation in the errors across members of the panel and to guide inference. The Smith *et al.* [20] tests are based on simple modifications, due to Pantula, Gonzalez-Farias and Fuller [22] and Leybourne [23] to the Dickey-Fuller type tests of Im, Pesaran and Shin [24]. The Lopez [21] test employs GLS detrending due to Elliott, Rothenberg and Stock [25] and is based on estimates from a seemingly unrelated regressions approach. Both tests perform well when the cross sectional and time series dimensions are relatively small, as is the case here.

Fig. (**1**) contains a plot of the variables for each of the four firms whence it is clear that all appear to contain trending components. While the unit root tests presented in Table **1** assume a trend in the data generating process, inferences were qualitatively unaffected when only a constant was included in the testing equations. At or about the five percent level of significance, all series appear to contain a unit root.

The top panel of Table **2** presents the results of the Westerlund [18] cointegration tests between the ACSI and its antecedents; perceived value, perceived quality and expectations. When the test is performed with customer satisfaction as the dependent variable, one rejects the null of non-cointegration. Normalization on perceived value leads to a similar conclusion but when expectations or perceived quality are the dependent variables, there is scant evidence of cointegration. These results suggest that the ACSI and its antecedents are cointegrated and that satisfaction and perceived value move to restore the system to balance but that neither perceived quality nor expectations respond to a disequilibrium between the ACSI and its antecedents.

Table 1. Unit Root Tests

	Lopez	Smith				
		t	MAX	WS	LM	Min
ACSI	-6.25	-2.87	-2.68	-1.78	5.62	5.28
	-7.82	0.07	0.04	0.99	0.15	0.07
Expectations	-6.92	-2.89	-2.7	-1.4	6.51	6.09
	-8.19	0.07	0.03	0.99	0.07	0.03
Perceived						
Value	-5.65	-2.51	-2.02	-1.56	5.53	4.21
	-8.17	0.24	0.31	0.99	0.21	0.3
Perceived						
Quality	-4.25	-2.91	-1.42	-1.35	5.71	3.03
	-7.33	0.07	0.58	0.99	0.28	0.66
Complaints	-4.25	-2.91	-1.55	-1.26	6.41	2.75
	-6.12	0.13	0.66	0.99	0.11	0.67
Loyalty	-4.68	-2.42	-1.82	-0.9	5.14	3.48
	-5.8	0.29	0.47	0.99	0.26	0.48

Notes: Lopez and Smith denote the Lopez [21] and Smith *et al.* [20] tests for a unit root. Tests include a deterministic trend and a maximum lag length of two. Values below the Lopez tests are the simulated 5% bootstrap critical values. Values below the Smith tests (variants denoted by t, Max, WS, LM and Min) are the bootstrap probability values. Bootstrap critical values and probability values were based on 5,000 replications. The data period spans 1994 to 2008 for four firms in the limited service restaurant sector.

Tests for strict exogeneity – that the leads and lags of the first differences in (3) are jointly zero – appear in the top panel of Table **3**. For each normalization there are four regressions to examine, one for each of the four firms in the panel. Choi [26] argues that if the individual tests are independent across members of the panel, then the probability values of the individual F-tests can be combined to guide inference according to equation (4), where P_m is the combined probability value and P_i is the probability value of an individual F-test:

$$P_m = -\frac{1}{\sqrt{N}} \sum_{i=1}^{N} \{\ln(P_i) + 1\} \quad (4)$$

Given the assumption of cross-equation independence is unlikely to be valid in the current context, bootstrapping of the individual F-tests of exogeneity is used to construct the individual probability values in (4). As Westerlund *et al.* [27] argue, this suggests P_m should still converge to the standard normal distribution.

[2]SeeBanerjee *et al.* [17].

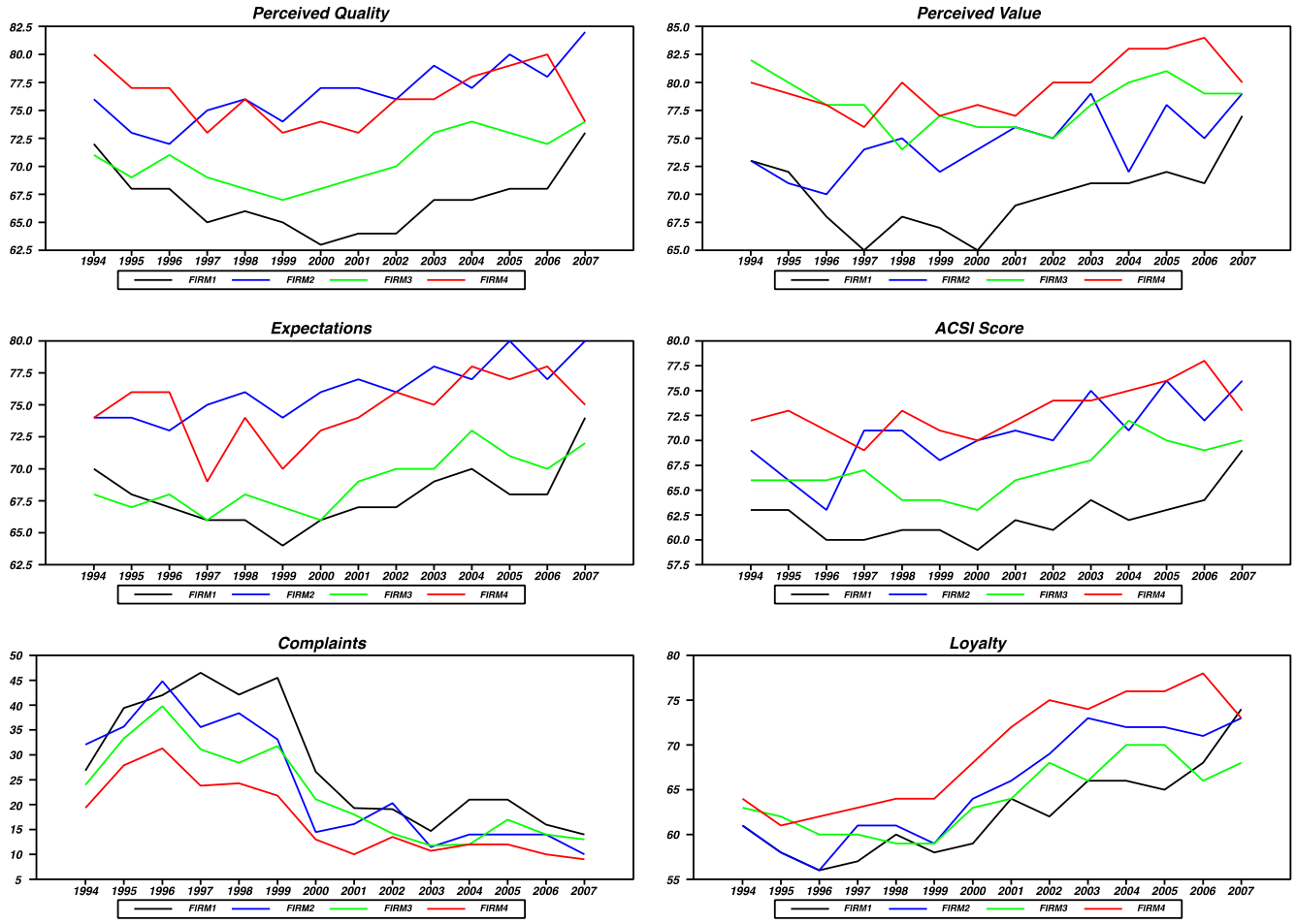

Fig. (1). Limited service restaurants.

Table 2. Cointegration Tests

Test	ACSI	Expectations	Perceived Value	Perceived Quality
Gt	0.015	0.153	0.08	0.061
Ga	0.006	0.171	0.033	0.039
Pt	0.01	0.208	0.038	0.127
Pa	0.004	0.133	0.025	0.055
	ACSI	**Loyalty**	**Complaints**	
Gt	0.088	0.316	0.389	
Ga	0.01	0.207	0.365	
Pt	0.065	0.18	0.358	
Pa	0.013	0.141	0.289	

Notes: Tests of the null hypothesis of non-cointegration are based on Westerlund [18]. Gt and Ga refer to the group mean tests based on the t-test and the estimated coefficient, respectively, whereas Pt and Pa refer to the associated panel tests. The group mean tests allow for different coefficients across firms under the alternative whereas the panel tests assume the firms share a common degree of persistence under the alternative. Tests include a constant in the error correction equation; with 14 annual observations the lag and lead lengths were set at zero to preserve degrees of freedom: bootstrap probability values appear below the test statistics based on 1000 replications.

Table 3. Exogeneity Tests

Test	ACSI	Expectations	Perceived Value	Perceived Quality
Antecedents				
ACSI	-	0.565	0.057	0.195
Expectations	0.548	-	0.961	0.486
Perceived				
Value	0.006	0.958	-	0.331
Perceived				
Quality	0.517	0.531	0.456	-
Consequences	**ACSI**	**Loyalty**	**Complaints**	
ACSI	-	0.27	0.25	
Loyalty	0.073	-	0.031	
Complaints	0.225	0.013	-	

Notes: The exogeneity tests examine the null hypothesis that the leads and lags in the error correction equations are jointly zero. The table contains the bootstrap probability values of the null based on 1000 replications for each normalization of the error correction equation.

The results of exogeneity tests suggest that the ACSI and perceived value are not exogenous whereas expectations and perceived quality are exogenous. This confirms the results of Table **2**; for the limited service restaurants considered, customer satisfaction and perceived value appear to move together to restore balance; perceived quality and expectations have little affect on the adjustment to equilibrium. This result is somewhat intuitively pleasing – after all, a fast food joint is a fast food joint. Perceived value, perceived quality, and expectations are important determinants of satisfaction; but a burger is a burger and its perceived quality (for example, "fresh never frozen") and one's expectation of the consumption experience may play little role in moderating the links between customer satisfaction and the perceived value of its consumption.

Table **4** contains estimates of the cointegrating vectors; the results indicate that customer satisfaction is positively affected by increases in perceived value, quality, and expectations whereas perceived value is positively linked to satisfaction and quality, but negatively affected by an increase in expectations. This latter result may be specific to the limited service restaurant sector, as a higher level of expectations may involve a tradeoff with the perceived value associated with the product, and vise versa. Expectations measure the level of quality customers expect on the basis of their prior consumption experience and their perception of future quality, while perceived value is a measure of the quality relative to the price paid. Given an increase in quality will most likely involve an increase in price, finding a negative link between perceived value and expectations is not unreasonable.

Table 4. Cointegrating Vectors

Dependent	ACSI	Expectations	Perceived Value	Perceived Quality
Variable				
Constant	-22.97	23.21	44.11	-9.26
	(0)	(0)	(0)	(0.02)
ACSI		0.56	1.47	0.18
		(0)	(0)	(0.08)
Expectations	0.56		-1.42	0.77
	(0)		(0)	(0)
Perceived				
Value	0.52	-0.5		0.19
	(0)	(0)		(0.01)
Perceived				
Quality	0.16	0.67	0.46	
	(0.08)	(0)	(0.01)	
R-squared	0.93	0.9	0.76	0.92

Notes: Seemingly unrelated regression estimates of the cointegrating vectors appear with small sample probability values in parentheses.

Perceived quality is positively related to satisfaction, expectations, and perceived value whereas expectations rise with increases in satisfaction and perceived quality, but as noted above, they are negatively related to perceived value.

These findings suggest that customer satisfaction and its antecedents in the limited service restaurant industry were highly related and that satisfaction and perceived value moved to restore the system when it was out of balance. Expectations and perceived quality do not appear to respond to help equilibrate satisfaction with its determinants. Perceived value and expectations appear to be negatively related, a finding that might satisfy intuition insofar as a 'Happy Meal' makes one happy. Standardization across locations within each firm may neutralize the impact of perceived quality on the consumption experience, as might customers' expectations.

Next we turn to an analysis of customer satisfaction and the ultimate objectives of loyalty and consumer voice to see whether they share a long-run attractor. The results indicate that satisfaction moves in response to short-run changes in loyalty and complaints and that changes in customer satisfaction restore the system to its equilibrium.

4. SATISFACTION – DOES IT MATTER?

The preceding analysis allows us to conclude that satisfaction and its antecedents share a long-run attractor, but an equally important question for the firm is whether satisfaction affects measures of its performance, which for present purposes, will be reflected in consumers' voice and loyalty. Voice is measured by the percentage of survey respondents reporting that they filed consumer complaints during the specified time period, while loyalty is a composite variable capturing the likelihood of repurchase and consumers' price sensitivity. If there is a reliable link between loyalty and satisfaction, firms can enhance their performance through improving satisfaction, which might be easily accomplished through managing expectations, customers' perceived value, and the perceived quality of their products. Understanding the links between these outcomes and the tools available to the firm is a critical input to designing marketing strategy.

Test results in the bottom panel of Table **2** indicate that the ACSI and loyalty and complaints are cointegrated, with customer satisfaction moving to re-equilibrate the relationship. Loyalty and complaints do not appear to respond to deviations from the long-run equilibrium suggesting that dissatisfied customers report lower measures satisfaction rather than increase their complaints or become disloyal and "move to the competition". This finding may be specific to the limited service restaurant sector, where convenience, consumer preferences (for tacos over burgers, for example) and the consumers' perception of the complaints process may be reflected more in satisfaction scores than consumer voice and loyalty when customers are unhappy. Satisfied customers do not reduce complaints or become "more loyal"; they report higher levels of satisfaction.

The bottom panel of Table **3** presents tests for the exogeneity of the series. At the five percent level of significance, complaints do not respond to deviations from the long-run attractor, nor does loyalty. Complaints do respond to short-run changes in loyalty as does loyalty respond to short-run changes in complaints. Customer satisfaction responds to both the disequilibrium and to short run changes in loyalty.

Table **5** contains estimates of the cointegrating vectors. Customer satisfaction is positively associated with loyalty, but it rises as complaints rise, perhaps because those complaints are effectively managed to the customers' satisfaction. This simultaneity is also reflected in the estimated sign of the effect of customer satisfaction on complaints, with higher levels of satisfaction raising complaints. As one might expect, loyalty increases as satisfaction increases and as complaints decline, and complaints fall when loyalty improves.

Table 5. Cointegrating Vectors

Dependent	ACSI	Loyalty	Complaints
Variable			
Constant	2.44	38.54	117.79
	(0.8)	(0)	(0)
ACSI		0.52	0.52
		(0)	(0.01)
Loyalty	0.94		-1.99
	(0)		(0)
Complaints	0.18	-0.4	
	(0.01)	(0)	
R-squared	0.54	0.8	0.74

Notes: Seemingly unrelated regression estimates of the cointegrating vectors appear with small sample probability values in parentheses.

Taken together, the findings indicate that complaints and loyalty respond to short-run changes in each other but not the error correction term, indicating that they are exogenous. Satisfaction does appear to do the "heavy lifting", responding to both short-run changes in loyalty and the deviation from the long-run equilibrium.

The managerial relevance of these results is clear. Firms in this industry can improve loyalty through raising the level of customer satisfaction. This can be achieved directly, given the results in Tables **2** through 4, *via* increasing the perceived value and qualities of their products as well as customers' expectations of the consumption experience. It is no surprise that we see this in the real world, with firms emphasizing low calorie meals, value combos, clean kitchens, pristine dining areas, and a choice over the consumers' personalized bundle of menu items. All increase satisfaction, reduce complaints, and increase loyalty. While these findings might appear to be obvious to the layman, the important contribution here is that they are supported by empirical evidence. There are strong reasons for firms in this industry to be concerned with customer satisfaction as they attempt to maximize their profits through raising loyalty and reducing complaints.

5. DISCUSSION AND CONCLUSION

In this paper the links between customer satisfaction and its antecedents and consequences were examined for four firms in the limited service restaurant sector. Using panel cointegration analysis, satisfaction was found to be tied to perceived quality, perceived value and customers' expectations. When the system was out of balance, perceived quality and expectations did not respond to restore equilibrium whereas perceived value and customer satisfaction did adjust to maintain stability. Higher levels of satisfaction could be achieved through raising perceptions of quality and value, and boosting expectations.

Higher levels of satisfaction were related to increases in consumers' loyalty, but perhaps surprisingly, they also raised the number of complaints. This may be due to satisfied consumers knowing that their complaints will be effectively managed to their benefit, or it could be related to the negative correlation between complaints and loyalty. Higher satisfaction raises loyalty, which indirectly reduces complaints; estimates in suggest that the direct effect of higher satisfaction on complaints is nearly fully offset by the indirect effect of loyalty on complaints.

In toto, these findings argue that firms in the limited restaurant service sector can increase their performance through raising customer satisfaction by improving expectations, and raising perceived quality and perceived value. In these challenging economic times, consumers look for value and quality – investing in both will reap benefits, particularly through enhancing consumers' loyalty.

Future work in this area might examine other economic sectors to determine whether customer satisfaction is similarly linked to its antecedents and consumers' loyalty and voice.

CONFLICT OF INTEREST

The author confirms that this article content has no conflict of interest.

ACKNOWLEDGEMENTS

I thank the Editor and two anonymous referees for comments and suggestions.

REFERENCES

[1] Bruhn M, Grund M. Theory, development and implementation of national customer satisfaction indicies: the swiss index of customer satisfaction (SWICS). Total Qual Manage 2000; 11: S1017-28

[2] Anderson E, Fornell C. Foundations of the American customer satisfaction index. Total Qual Manage 2000; 11: S869-82.

[3] Hirschman A. Exit, voice and loyalty – responses to decline in firms, organizations, and states. Cambridge MA: Harvard University Press 1970.

[4] Gengler C, Leszczyc P. Using customer satisfaction research for relationship marketing: a direct marketing approach. J Direct Marketing1997; 11: 23-29

[5] Allen, D. Customer Satisfaction research management. Wisconsin. American Society for Quality Press 2004.

[6] Pauwels K, Srinivasan S, Franses P. When do price thresholds matter in retail categories? Market Sci 2007; 26: 83-100.

[7] Anderson E, Fornell C, Rust R. Customer satisfaction, productivity, and profitability: differences between goods and services. Market Sci 1997; 16: 129-45.
[8] Luo X. Homburg C. Neglected outcomes of customer satisfaction. J Market 2007; 71: 133-49
[9] Chen C, Matsumura E, Shin J. The effect of competition on the contracting use of customer satisfaction: Evidence from the American Customer Satisfaction index 2008.
[10] Fornell C, Rust R, Dekimpe M. The effect of customer satisfaction on consumer spending growth. J Market Res 2010; 47: 28-35.
[11] Sephton PS. Consumer spending and customer satisfaction: untying the knot. Econ Res Int 2012: 1-7.
[12] Omachonu V, Johnson W, Onyeaso G. An empirical test of the drivers of overall customer satisfaction: evidence from multivariate granger causality. J Service Market 2008; 22: 434-44.
[13] Parasuraman A, Zeithaml V, Berry L. Reassessment of expectations as a comparison standard in measuring service quality: implications for future research. J Market 1994: 111-24.
[14] Martensen A, Gronholdt L, Kristensen K. The drivers of customer satisfaction and loyalty: cross-industry findings from Denmark. Total Qual Manage 2000; 11; S544-53
[15] Phillips P, Loretan M. Estimating long-run economic equilibria. Rev Econ Stud 1991; 58: 407-36.
[16] Saikkonen P. Asymptotic efficient estimation of cointegration relations. Econ Theor 1991; 7: 1-21.
[17] Banerjee A, Dolado J, Mestre R. Error-correction mechanism tests for cointegration in a single equation framework. J Time Ser Anal 1998; 19: 267-83.
[18] Westerlund J. Testing for error correction in panel data. Oxford B Econ Stat 2007; 69: 708-48.
[19] Pedroni P. Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. Econ Theor 2004; 3: 579-625.
[20] Smith L, Leybourne S, Kim T, Newbold P. More powerful panel data unit root tests with an application to mean reversion in real exchange rates. J Appl Econ 2004: 19: 141-70.
[21] Lopez C. A panel unit root test with good power in small samples. Econ Rev 2009; 28: 295-313.
[22] Pantula S, Gonzalez-Farias G, Fuller W. A comparison of unit root test criteria. J Bus Econ Stud 1994; 12: 449-59.
[23] Leybourne S. Testing for unit roots using forward and reverse dickey-fuller regressions. Oxford B Econ Stat 1995; 57: 559-71.
[24] Im K, Pesaran M, Shin Y. Testing for unit roots in heterogeneous panels. unpublished manuscript, Department of Applied Economics (University of Cambridge) 1997.
[25] Elliott G, Rothenberg T, Stock J. Efficient tests for an autoregressive unit root. Econometrica 1996; 64: 813-36.
[26] Choi I. Unit root tests for panel data. J Int Money Financ 2001; 20: 249-72.
[27] Westerlund J, Mahdavi S, Firoozi F. The tax-spending nexus: evidence from a panel of US state-local governments. Econ Model 2001; 28; 885-90.

Received: April 12, 2013 Revised: August 21, 2013 Accepted: September 19, 2013