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How Does Customer Service Offshoring Impact Customer Satisfaction?

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Abstract

Information technology (IT) plays a vital role in customer relationship management (CRM), because CRM processes include the collection and analysis of customer information, firms use technology tools to interact with customers, and IT created the conditions under which firms can offshore CRM processes. Customers have negative perceptions toward offshoring, which suggests that firms might be reluctant to offshore IT-enabled CRM processes. However, firms have significantly increased offshoring for CRM processes, presenting a conundrum. *Why would firms increase offshoring for CRM processes if there could be a risk to customer satisfaction?*

This paper helps to resolve the conundrum by studying the impact of CRM sourcing on customer satisfaction with the firm's products and services, as measured by the American Customer Satisfaction Index™. We analyze data for 150 North American firms and business units over a nine-year period. Front office *offshore outsourcing* and front office *onshore outsourcing* are both negatively associated with customer satisfaction, which suggests that negative customer perceptions may be due to the firm boundary dimension rather than the geographic location dimension. Front office offshore outsourcing is not statistically significant for services firms, which suggests that customers are more accepting of offshore providers in a service setting. Over time, the coefficient for *back office* offshore outsourcing has become more positive, which suggests that firms may expect to see a similar improvement for *front office* offshore outsourcing in the future. Our empirical results provide a basis to understand why firms have increased IT-enabled CRM offshoring despite short-term risks to customer satisfaction.

Keywords

customer satisfaction; customer service; customer relationship management; offshore; outsource

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Introduction

Customer relationship management (CRM) requires a cross-functional integration of information technology (IT) and marketing capabilities [49], and is an important function for global firms. CRM includes activities that enhance or facilitate the sale and use of a firm's product or service, and is often inseparable from the product or service [32]. CRM reduces the cost of customer acquisition, promotes customer retention and loyalty [27], and creates opportunities to improve products through customer-focused innovation [28]. CRM includes customer service centers, which handle product inquiries, orders, transactions, and post-purchase service and support by phone, e-mail, chat, and/or websites [58].

IT plays a vital role because CRM processes include the collection, interpretation, analysis and dissemination of customer information [52], and because firms use technology tools to interact with customers [35]. Customer service centers respond to inbound calls, e-mails and web-based inquiries, produce outbound calls and e-mails for direct marketing and customer service, track inbound and outbound contacts, and maintain telecommunications infrastructure and corporate databases [20].

In addition to being an integral component of CRM, IT helped create the conditions under which firms can outsource and offshore a wide range of CRM processes, because IT facilitates the codification, standardization and modularization of customer service activities [41]. Personnel costs represent 65% of operating expenses for customer service centers [59], and firms can save 25-30% of total costs by outsourcing and offshoring CRM processes [48]. As firms pursue these cost savings, the global market for CRM outsourcing and offshoring is expected to reach $81 billion per year by 2018.

While we understand the *antecedents* of CRM process sourcing, there are significant gaps in our knowledge of *outcomes* for CRM process sourcing. For example, while there has been useful research on customer attitudes toward offshoring and outsourcing which may *indirectly* influence the customer's perception of the firm, we do not yet have a clear understanding of how CRM process sourcing *directly* impacts customer satisfaction with the firm's products and services. The lack of research on CRM process sourcing outcomes is surprising, because customer satisfaction is one of the most important outcomes for firms [2].

The gap in our understanding of CRM process sourcing outcomes manifests in at least one unresolved conundrum. Research indicates that customers have negative perceptions toward offshoring and outsourcing [61], which suggests that firms might be reluctant to engage in offshoring and outsourcing for CRM processes. However, contrary to this expectation and as described above, firms have significantly increased their use of offshoring and outsourcing for CRM processes. Why would firms significantly increase offshoring and outsourcing for CRM processes if there could be a risk to customer satisfaction?

Our goal in this paper is to fill this gap in the literature and resolve the conundrum by studying the direct impacts of CRM sourcing on customer satisfaction with the firm's products and services. We begin by identifying the relevant considerations for customer satisfaction from Marketing research, and then we incorporate Information Systems (IS) research that has developed substantial intellectual capital in the domain of outsourcing and offshoring [55]. We build on IS research to discuss the sourcing of front office processes vs. back office processes, and various sourcing modes such as onshore outsourcing, offshore outsourcing, and captive operations [36, 67]. One strength of this paper is the use of data from multiple sources, including customer satisfaction data from the American Customer Satisfaction Index™ [16], and data on

firm offshoring and outsourcing activities from published news reports [similar to 25]. We test empirical relationships using data on 150 North American firms and business units over a nine-year period. To generate additional insights, we study differences between services firms and manufacturing firms, and differences between the early stages of offshoring in the late 1990s/early 2000s and the mid 2000s as offshoring became more established.

The rest of this paper is structured as follows. We begin with an overview of the Marketing concepts of customer satisfaction and Country of Origin, and we trace these concepts into early research on CRM offshoring. We illustrate the tensions in early research on CRM offshoring, and bring in IS research to identify gaps that need to be filled. We introduce our data and model, present empirical results, and discuss the implications for research and practice.

Literature review

Customer satisfaction has significant implications for firm performance. Customer satisfaction is associated with increased consumer spending, repurchase intentions, and customer lifetime value, and higher equity value [17, 18]. These findings have been demonstrated across firms, industries and countries [31, 42]. The most significant driver for customer satisfaction is the customer's perceived quality of the firm's product or service [16] (see Figure A1 in the Appendix). Perceived quality reflects the customer's recent consumption experience, and includes two components: 1.) customization (degree to which the product or service is customized to meet heterogeneous customer needs), and 2.) reliability (degree to which the product or service is standardized and free from deficiencies) [38]. Perceived quality impacts customer satisfaction directly and indirectly through perceived value, which is perceived quality relative to the price paid.

Naturally, firms face tradeoffs between quality and value, including tradeoffs related to the CRM function. For example, firms can reduce customer service expenses by cutting labor costs and/or substituting technology for labor, but service quality and customer satisfaction may suffer [20]. The challenge for firms is to reduce overall expenses while providing superior customer value. If firms can provide the same level of customer service at a lower cost, then all else equal the firm has an incentive to employ the less costly resource [64]. However, in practice the picture has been less clear, with the business press reporting that many firms are locating customer service offshore while other firms are bringing customer service back onshore, amid a turbulent environment where citizens in developed economies are afraid of domestic job loss and are threatening boycott actions against firms that move jobs offshore.

The Country of Origin concept provides the theoretical foundation for customer reactions to offshoring [51]. Country of Origin builds on the idea that most individuals have mental associations or images of each country. In situations where customers do not have objective data to evaluate a product or service, customers use these mental associations as a signal for product quality. The more favorably a customer regards the country of headquarters and/or manufacture, the more favorably the customer will evaluate product quality. Most Country of Origin research shows that customers prefer products from their own country, a country culturally similar to their country, or an economically-stable country. Customers tend to prefer domestic products and can be reluctant to purchase foreign products because of loyalty toward their home country [53]. Extending the Country of Origin concepts to the customer service setting enables us to identify reasons why customers might prefer to receive customer service from their home country. Customers may resent global trade or be concerned with ethics or lax labor laws in other countries [21]. Customers may feel uneasy to speak with a customer service agent that has a

foreign accent, or may be uncomfortable to exchange private or personal information with a customer service agent in another country [61].

This background on customer satisfaction and Country of Origin leads into early research on CRM offshoring, which does not show a complete or consistent picture of the manner in which CRM process sourcing directly impacts customer satisfaction. On one hand, 78% of U.S. consumers have an unfavorable opinion of offshore outsourcing by U.S. firms [53]. Even when presented with the rationale that U.S. firms may benefit from offshoring by becoming more competitive or more profitable, 51% and 46% of these consumers (respectively) continue to hold an unfavorable opinion of offshore outsourcing by U.S. firms. Consumers who experienced service from offshore centers report that they would be 4.5 times more likely to switch firms compared with consumers who did not experience offshore service [53].

A survey of U.S. consumers rated Canada significantly higher than India, China, Mexico and the Philippines on customer service attributes such as communication, security of information, and reliability [60]. Another paper finds that offshore customer service personnel take considerably longer to handle customer inquiries compared with U.K.-based agents, with U.K.-based agents able to close 10 sales per day compared with four sales per day for offshore agents [54].

While it seems unlikely that firms would continue to outsource and offshore CRM if most customer evaluations are negative, other research provides some conceptual direction on the conundrum of negative customer evaluations and an increase in offshoring at the same time. Many industries which rely on customer service, such as financial services and travel, have built-in exit barriers and switching costs (such as the loss of credit card rewards or frequent flier miles, respectively) that inhibit customers from changing firms even if they receive sub-par service for

a particular transaction [54]. The Country of Origin effect matters less as customers move closer to purchase [30], and has even less impact after customers actually experience the product [6]. There is a difference between what customers say they are going to do and what they actually do, because customers may not want to disclose their actual beliefs or because their beliefs may change between the time of intention and the time of purchase [30].

Overall firm reputation is more important than location of the customer service center [50]. Competence of the customer service agent is also important, and customers do not automatically attribute low competence to service agents with an accent [64]. Any perceived difference in the performance of offshore vs. onshore service agents is even smaller in the context of technical support [58]. While customers may threaten to boycott firms that offshore CRM processes, customers do not directly benefit from boycotts and may have to pay higher prices if they intentionally limit their selection of firms [24]. While 81% of customers disapprove of firms sourcing CRM processes from offshore, only 16% of customers were actually boycotting a firm for offshoring [61].

While this research does provide some conceptual direction for the conundrum of negative customer evaluations and an increase in offshoring at the same time, the story is far from complete. For example, very little of the research described immediately above involves data from actual customers of firms that offshore or outsource CRM processes. Instead, the vast majority of research discussed above is based on hypothetical scenarios presented to consumers in a mall-intercept or similar setting (when a researcher stands at a shopping mall and interviews passers-by), or based on student exercises or experiments in a classroom setting. In these cases, the research would not reflect the manner in which customer service impacts customer satisfaction with a firm based on actual consumption experience of a product or service from that

firm. It is one thing to develop a reasonable story based on related theory, but quite another to perform empirical analysis using actual data that corresponds directly to the conundrum we wish to resolve.

In addition to the use of actual customer data for companies that offshore and outsource CRM processes, our data gives us the ability to simultaneously evaluate multiple sourcing scenarios to identify the relevant customer satisfaction implications under each scenario. IS research identifies that the broad term 'outsourcing and offshoring' actually includes multiple variants [56]. Sourcing modes can be conceptualized along two dimensions. One axis is geographic location, where an activity can be sourced from a domestic location or an offshore location [41]. The second axis is the firm boundary, where an activity can be sourced from within the firm or outside the firm [12]. These dimensions create four quadrants – domestic insourcing (shared service centers), offshore insourcing (captive centers), domestic outsourcing, and offshore outsourcing [25]. We further build on these conceptual axes and quadrants in the next section.

Dimensions for analysis

Because IS research has generated considerable intellectual capital in the domain of process sourcing, we apply IS research to identify four dimensions for empirical analysis that will contribute to our understanding of the manner in which CRM process sourcing impacts customer satisfaction and perceived quality.

Offshore outsourced customer service vs. offshore captive customer service

[33] describes the mechanisms that enable IT outsourcing vendors to create value in outsourcing engagements, as compared with in-house staff. Outsourcing vendors can rotate personnel across client engagements, which enables outsourcing vendors to offer greater depth

and variety of experience to their staff. Outsourcing vendors also have the ability to achieve higher staff utilization, because some client engagements may ramp up at the same time that other client engagements ramp down. This higher staff utilization can result in higher revenue per staff member, and outsourcing firms can use part of this higher revenue to offer higher compensation to their staff compared with the compensation of in-house staff [33]. The combination of higher compensation and greater task variety may enable outsourcing vendors to attract and retain more qualified staff that could ultimately provide better customer service. Outsourcing vendors may also be able to offer a reduced price per unit of service due to their larger scale, and access to specialized skills that firms may not have with in-house staff.

There are commensurate risks of outsourcing, and potential benefits of in-house staff. For example, research has noted the 'replicate fade' phenomenon of offshore outsourcing vendors, where highly-qualified vendor personnel that train at the client headquarters in turn train other vendor personnel at the offshore location, who in turn train other vendor personnel until the actual vendor personnel providing service are much less skilled and much farther removed from the client [48]. The risks of 'replicate fade' and personnel turnover can be lower in company-owned (captive) service centers, which large firms have sufficient scale to run and which can enable the firms to establish a market presence in emerging economies [66]. While we are aware of one research paper [7] which indicates that customers who received service from an offshore *captive* service center were more satisfied with the service agent's problem-solving ability and troubleshooting steps compared with customers who received service from an offshore *outsourced* service center, the prevalence of viewpoints on both sides suggests that further analysis is required to identify potential differences in the impact of offshore outsourced service vs. offshore captive service on customer satisfaction and perceived quality.

Offshore outsourced customer service vs. onshore outsource customer service

Offshore outsourcing may differ from onshore outsourcing due to differences in language and culture [19], distance [10], time zones [15], risks and challenges [23], and governance by the client firm [55]. Surprisingly, there is limited research that compares outsourcing to providers from emerging economies vs. outsourcing to providers from developed economies [48]. This assessment is consistent with other research in the IS discipline, which has to-date focused on global issues such as compensation of IT professionals in the context of one developed economy [40], one emerging economy [13], or a comparison across developed economies [34]. Consistent with the call for IS research to study global issues by comparing across regions [1], further analysis is required to identify potential differences between offshore and onshore outsourced customer service.

Offshore outsource customer service vs. offshore outsource back office

Customer service processes are differentiated from back office processes based on interaction with customers [65], and may have a different impact on customer satisfaction compared with back office processes [25]. Offshoring back office processes can enhance firm value when the reduction in production costs is greater than agency costs incurred to manage the offshore vendor [36]. Research has identified the impacts of offshoring customer service for firm value [25], but we are not aware of any research that considers both offshore outsource *customer service* and *back office* activities in the same study. Such research would be useful for a side-by-side comparison of the relative impacts of offshore outsource customer service and offshore outsource back office on customer perceptions of quality and value. The novelty of customer service offshoring compared with manufacturing offshoring [44] or IT offshoring [67] suggests that vendors and firms may not be able to draw from experience for customer service

offshoring in the same way that they can draw from experience for manufacturing or IT offshoring.

Differences between manufacturing firms and services firms, and across time periods

In addition to differences in customer satisfaction based on the geographic location and firm boundary of the customer service function, we also consider differences by industry because of differences in the consumption experience for services versus manufactured goods [3]. For services, production and consumption occur simultaneously, and customers are able to evaluate service quality only during consumption and post-purchase [45]. Compared with manufactured goods, services are more intangible, heterogeneous, and perishable [46]. As a result, services are harder to customize, standardize and automate, which reduces the potential to achieve economies of scale in services [25].

Consistent with recent IS research on the relationship of IT with customer satisfaction [38], there is reason to believe that the impact of CRM sourcing choices on customer satisfaction may differ across time periods, as offshore customer service sourcing began in the late 1990s but quickly grew toward maturity over the following decade. Part of the difference across time periods may be attributable to organizational learning over time [67].

Research design and methodology

To test the relationship of CRM sourcing with customer satisfaction, we need proper measures of the dependent and independent variables. An accepted measure of customer satisfaction is the American Customer Satisfaction Index (ACSI), developed by researchers at the University of Michigan in conjunction with the American Society for Quality. The ACSI is the *only* national cross-industry measure of customer satisfaction in the U.S., and at the time of our study included approximately 200 private-sector firms and business units with total revenue

and funding equal to about 40% of U.S. gross domestic product. The ACSI interviews 250 customers of each firm on an annual basis, and collects data from each customer that are used as indicators of six latent constructs including customer satisfaction and perceived quality. The ACSI was first published in 1994, with updates released each quarter. A detailed description of the ACSI is provided in [16], and more information on the ACSI is provided in Appendix A.

For data on CRM outsourcing and offshoring, researchers have noted the dearth of offshoring data because there are no regulatory requirements for firms to report their offshoring activities [43]. Therefore, using similar methods and timeframes as [25] and [48], we gathered offshoring and outsourcing data directly from published news and media reports. Most organizations in the ACSI are *Fortune* 500 firms that are large and prominent in their regions and nationally, and attract significant media coverage and business analysis. *Fortune* 500 firms are also more likely to conduct a sufficient amount of business that might require the use of offshoring and outsourcing [57]. One author performed a dedicated search on the offshoring and outsourcing activities of each ACSI firm on a company-by-company basis, including company name and relevant search terms related to offshoring and outsourcing. We used Lexis Nexis® as a starting point, because Lexis Nexis is the research database that includes the broadest range of local and national newspapers that would be most likely to report stories on Fortune *500* firms in their respective region(s). In some cases, we discovered stories in Lexis Nexis that required further detail to understand the firms' CRM sourcing activities. In those cases, we used EBSCO Business Source Complete and ABI/INFORM to collect additional detail. The lead author reviewed approximately 60,000 – 70,000 articles from the 1998 – 2006 timeframe (including articles before 1998 and articles after 2006), which included investigative reports and press releases by the ASCI firm or the offshoring provider, and then performed deep reading of

approximately 1,500 – 2,000 articles that specifically described the offshoring and outsourcing (or lack thereof) activities for firms in our sample. The author recorded whether each firm engaged in offshoring front office and/or back office functions during each year of the study timeframe, and/or whether each firm engaged in domestic outsourcing for front office functions during the study timeframe. Appendix B contains additional details of the coding process. Limitations of this data source are discussed in the limitations section below.

In our equations, we control for complementary and alternative explanations of customer satisfaction and perceived quality, including firm size and industry concentration [2]. To separate the effects of CRM sourcing from other economy-wide or management trends over the same timeframe, we control for the time dimension, as the ACSI National Quarterly Scores suggest that there has been a steady overall upward trend in the ACSI from 1998 – 2006.

Variable definition

Customer Satisfaction: Overall satisfaction with the firm's product or service. As shown in Figure A1 in the Appendix, customer satisfaction is based on perceived quality, perceived value, and customer expectations, with perceived quality as the most significant driver of customer satisfaction. The customer satisfaction score for a firm ranges from 0 – 100. This variable is from the ACSI.

Perceived Quality: The perceived quality of a firm's products or services is measured by asking customers to rate their recent experience with a product or service based on overall post-purchase evaluation of perceived quality, perceived customization, and perceived reliability. The customer satisfaction and perceived quality constructs are inter-related, and the ACSI model explicitly accounts for this relationship through its measurement and structural model. The perceived quality score for a firm ranges from 0 – 100. This variable is from the ACSI.

Front Office Offshore Outsourcing: Binary variable that indicates whether the firm engaged in offshore outsourcing for front office functions during a specific year (1=yes, 0=no). Front office functions include telephone customer service call center and e-mail customer service center. This variable is from Lexis-Nexis and other news sources.

Front Office Offshore Captive: Binary variable that indicates whether the firm used a company-owned and company-staffed offshore captive center for front office functions during a specific year (1=yes, 0=no). This variable is from Lexis-Nexis and other news sources.

Front Office Onshore Outsourcing: Binary variable that indicates whether the firm engaged in outsourcing front office functions to a domestic service provider (located in North America) during a specific year (1=yes, 0=no). This variable is from Lexis-Nexis and other news sources.

Back Office Offshore Outsourcing: Binary variable that indicates whether the firm engaged in offshore outsourcing for a back office function during a specific year (1=yes, 0=no). Back office functions include IT, human resources, finance and accounting, and R&D. This variable is from Lexis-Nexis and other news sources.

Back Office Offshore Captive: Binary variable that indicates whether the firm used a company-owned and company-staffed offshore captive center for a back office function during a specific year (1=yes, 0=no). This variable is from Lexis-Nexis and other news sources.

Manufacturing: Binary firm that indicates whether the firm is in the manufacturing industry (1=yes, 0=no). Based on North American Industry Classification (NAICS) two-digit code. The NAICS code is from Compustat and Dun & Bradstreet.

Firm Size: Natural log of annual firm revenue. This variable is based on data from Compustat and Dun & Bradstreet.

Industry Concentration: We compute the Hirschman-Herfindahl Index (HHI) measure of industry concentration for each industry at the four-digit NAICS level, and use that HHI as a control for all firms in the industry. The industry concentration data is from Standard & Poors and Dun & Bradstreet.

Time: Variable to control for each unique year in the data set from 1998 – 2006. The value of this variable ranges from 4 – 12 based on years since inception of the ACSI.

Overview of data

We perform empirical analysis on CRM outsourcing/offshoring and customer satisfaction/perceived quality for the years 1998 – 2006, to include a timeframe before, during and after the maturation of offshore outsourcing [47]. Consistent with the notion that U.S.-based firms account for a majority of the global offshore market [55], we analyze panel data from all 150 North American firms and business units that were included in the ACSI for at least the three more recent years of 2004, 2005 and 2006. We do not include ACSI data for U.S. government entities, for firms headquartered outside North America (to maintain consistency in the geographic dimension), or for firms that do not charge for their products (to maintain consistency in the computation of perceived value). The 150 firms in our sample include 103 services firms and 47 manufacturing firms, which is relatively consistent with the service sector's share of the U.S. economy. Table 1 shows how many times each firm appears in the panel. As shown in Table 1, 102 of the 150 firms appear in the panel for all nine years from 1998 – 2006, and 48 firms appear in the panel for fewer than nine years. There are 1,145 total observations across all firms and all years.

Insert Table 1 here

Table 2 shows the number of firms that began front office offshore outsourcing, front office offshore captive operations, front office onshore outsourcing, back office offshore outsourcing, and back office offshore captive operations in each year from 1998 – 2006, along with the total number of firms that engaged in each sourcing practice during the study period. As shown in Table 2, 32 of the 150 firms engaged in front office offshore outsourcing during the 1998 – 2006 timeframe, four firms engaged in front office offshore captive operations, 51 firms engaged in front office onshore outsourcing, 89 firms engaged in back office offshore outsourcing, and 24 firms engaged in back office offshore captive operations.

It is also helpful to note the timeframe during which most firms began to engage in these sourcing practices. Column D shows that 29 firms began back office offshoring during the 1999 – 2001 timeframe, consistent with the timeframe that IT offshoring reached maturity [11]. Column D shows a 'second wave' of 34 firms that offshored back office functions during the 2002 – 2004 timeframe, which coincided with the 'first wave' of 24 firms that offshored front office functions (Column A) during the same timeframe, and is consistent with the insight that offshore vendors built on their IT outsourcing experience to offer outsourcing for other front and back office functions [47]. Column C shows that beginning in 1999 the number of firms engaging in onshore front office outsourcing is more evenly spread across the timeframe of this study, consistent with the fact that onshore outsourcing is a more established practice than offshoring.

Insert Table 2 here

Table 3 provides descriptive statistics for our model variables, and Table 4 provides correlations for our model variables. Table 3 shows that of the 1,145 firm/year observations in our data, 10% of the observations include front office offshore outsourcing, 2% include front

office offshore captive operations, 24% include front office onshore outsourcing, 44% include back office offshore outsourcing, and 9% include back office offshore captive operations. These percentages are commensurate with the relative maturity of these sourcing practices. Table 4 shows that among statistically significant correlations in our data, customer satisfaction is positively correlated with perceived quality, front office offshore outsourcing is negatively correlated with customer satisfaction and perceived quality, and back office offshore captive operations is positively correlated with customer satisfaction and perceived quality. Front office offshore captive operations, front office onshore outsourcing, back office offshore outsourcing, and back office offshore captive operations are all positively correlated with front office offshore outsourcing, which suggests that a firm which pursues one of these sourcing practices is more likely to also pursue other sourcing practices.

Insert Table 3 here

Insert Table 4 here

We test the relationship of outsourcing and offshoring with customer satisfaction and perceived quality using a linear model estimation approach. Consistent with prior research [25, 48], we control for other variables that may influence the relationship between outsourcing/offshoring and customer satisfaction/perceived value, such as firm size, industry concentration, and time. Our empirical models are as follows:

$$\begin{aligned} Satisfaction = {} & \alpha\, Constant + \alpha\, FrontOffshoreOustource + \alpha\, FrontOffshoreCaptive + \\ & \alpha\, FrontOnshoreOutsource + \alpha\, BackOffshoreOustource + \\ & \alpha\, BackOffshoreCaptive + \alpha\, Manufacturing + \alpha\, FirmSize + \\ & \alpha\, Concentration + \alpha\, Time + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} Quality = {} & \alpha\, Constant + \alpha\, FrontOffshoreOustource + \alpha\, FrontOffshoreCaptive + \\ & \alpha\, FrontOnshoreOutsource + \alpha\, BackOffshoreOustource + \\ & \alpha\, BackOffshoreCaptive + \alpha\, Manufacturing + \alpha\, FirmSize + \\ & \alpha\, Concentration + \alpha\, Time + \varepsilon \end{aligned} \quad (2)$$

The ordinary least squares approach for estimating equations (1) and (2) may not be appropriate for our longitudinal data set, because the residuals across time for the same firms may be correlated. A preferred way to estimate the parameters more efficiently is through random effects models, which allow for correlations among residuals of firms across time periods and control for unobservable firm-specific effects [5], so we estimated equations (1) and (2) allowing the intercept to vary across individual firms [68].

For longitudinal data, there are two tests that together determine whether a random effects model is more appropriate than a fixed effects model. The first test is the Breusch-Pagan Lagrange multiplier test that indicates whether random effects are significant [8]. The null hypothesis is that random effects are not significant. For equations (1) and (2), the test statistic exceeded the critical value of chi-square with one degree of freedom, rejecting the null hypothesis and favoring the random effects model for our data set. The second test is the Hausman specification test that indicates whether firm-specific tests are correlated with other model variables [22]. If firm-specific effects are not correlated with other model variables, then the random effects model will be more appropriate than the fixed effects model. The null hypothesis is that firm-specific effects are not correlated with other model variables. For equations (1) and (2), the test statistic did not exceed the critical value of chi-square with k-1 degrees of freedom, failing to reject the null hypothesis and favoring the random effects model for our data set. As an additional specification test, we also computed the Sargen-Hansen statistic [4] for equations (1) and (2). The *p* value for the Sargen-Hansen statistic is greater than 0.05, also favoring the random effects model for our data set.

To analyze differences between services firms and manufacturing firms, we perform a split-sample analysis of customer satisfaction for services firms and manufacturing firms, and of

perceived quality for services firms and manufacturing firms. Because the sample is split by industry, we omit the manufacturing control variable in this analysis. To analyze differences by time period, we perform a split-sample analysis of customer satisfaction during the first half (1998 – 2002) and second half (2003 – 2006) of our study timeframe, and of perceived quality during the first half and second half of the timeframe. Because individual years still vary within each sub-sample, we maintain the time control variable in this analysis.

Results and discussion

Empirical results and commentary

The results of our main model for equations (1) and (2) are shown in Table 5. Equation (1) tests the relationship of outsourcing and offshoring with customer satisfaction with the firm's product or service. The coefficient for front office offshore outsourcing is negative ($\alpha = -1.252$, $p<0.01$), which indicates that customers are less satisfied with the firm's product or service when they receive service from an offshore outsourced service center. However, we identify an interesting insight from the coefficient for front office onshore outsourcing that is also negative ($\alpha = -0.624$, $p<0.10$). This suggests that the negative consumer reaction found in earlier research *could be based on the outsourcing dimension*, because outsourced customer service representatives may not have complete knowledge of the firm's products and services [64], *rather than the offshoring dimension* based on the service center location. Because most prior research did not account for the firm boundary of providers, it is possible that prior research attributed negative customer reactions to offshoring when offshoring alone did not cause the negative customer reactions. Adding further support to this potential explanation, we note that the coefficient for front office offshore captive is not statistically significant, which would indicate no negative impact of front office offshore captive operations on customer satisfaction.

Equation (2) tests the relationship of outsourcing and offshoring with the customer's perception of quality for the firm's product or service. Similar to equation (1), we find that front office offshore outsourcing has a negative association with perceived quality ($\alpha = -0.847$, $p<0.05$) and front office onshore outsourcing also has a negative association with perceived quality ($\alpha = -0.655$, $p<0.05$). While the similar results between equations (1) and (2) would be expected because perceived quality is the most significant driver of customer satisfaction, our split-sample analyses below will uncover some interesting differences between customer satisfaction and perceived quality.

Results for control variables provide additional confidence for our empirical results. Customer satisfaction and perceived quality for manufactured goods is considerably higher than that for services ($\alpha = 8.565$, $p<0.01$ for customer satisfaction; $\alpha = 8.354$, $p<0.01$ for perceived quality), consistent with prior research that customer satisfaction for manufactured goods is higher than customer satisfaction for services [3]. Customer satisfaction and perceived quality are positively associated with the time dimension ($\alpha = 0.190$, $p<0.01$ for customer satisfaction; $\alpha = 0.128$, $p<0.01$ for perceived quality), consistent with the fact that customer satisfaction scores generally increased during the timeframe of this study.

A split-sample analysis presents an opportunity to understand the differential impacts of offshoring and outsourcing for services vs. manufacturing firms. The results of our split-sample analysis for services vs. manufacturing firms are shown in Table 6, with customer satisfaction shown in column 1 for services firms and column 2 for manufacturing firms, and perceived quality shown in column 3 for services firms and column 4 for manufacturing firms. For customer satisfaction, we find *differences in three of the five sourcing practices* for services firms vs. manufacturing firms. For perceived quality, we find *differences in four of the five*

sourcing practices for services firms vs. manufacturing firms. For manufacturing firms, the coefficient for front office offshore outsourcing is negative for customer satisfaction ($\alpha = -1.660$, $p<0.01$) and perceived quality ($\alpha = -0.887$, $p<0.10$), while for services firms these coefficients are not statistically significant. For manufacturing firms, the coefficient for front office offshore captive operations is negative for perceived quality ($\alpha = -1.479$, $p<0.05$), while for services firms this coefficient is not statistically significant. For services firms, the coefficient for back office offshore captive operations is positive for customer satisfaction ($\alpha = 1.526$, $p<0.05$) and perceived quality ($\alpha = 1.560$, $p<0.10$), and the coefficient for front office onshore outsourcing is negative for customer satisfaction ($\alpha = -0.987$, $p<0.10$), while for manufacturing firms these coefficients are not statistically significant.

These findings are interesting, because they provide helpful insights on the impact of CRM and back office sourcing based on the nature of the firm's offering. For industries such as financial services, where customer service *is* the product, the provision of customer service from offshore does not appear to be a deterrent for customers as long as customers receive the service. However, for manufacturing industries such as consumer electronics, where customers are more likely to contact customer service when they experience a problem with the product, customers appear to be less tolerant of offshore personnel [14]. While our data set does not provide specific causes for the difference in customer satisfaction for manufactured products, it is possible that prior research showing that offshore personnel were able to process a much lower volume of customers than U.K.-based personnel could apply in this case, if offshore customer service takes longer to resolve a product problem compared with onshore customer service personnel [54]. Because most prior research did not account for the product vs. service setting, it is possible that prior research attributed negative customer perceptions of offshoring to a product setting where

our results do suggest that customers may be less tolerant of a delay. Our empirical results suggest that customers may be more tolerant of offshore customer service in a service setting where customer service directly enables customers to receive the service.

The results of our split-sample analysis for the first half (1998 – 2002) vs. second half (2003 – 2006) of our study timeframe are shown in Table 7. As discussed above, the first half of our timeframe includes the emergence of offshoring as a business practice, which becomes more mature during the second half of our timeframe. The results for customer satisfaction are shown in column 1 for the first half and column 2 for the second half, and the results for perceived quality are shown in column 3 for the first half and column 4 for the second half. Consistent with our main model, the coefficient for front office onshore outsourcing is negative in the first half and second half for customer satisfaction ($\alpha = -2.417$, $p<0.01$ first half; $\alpha = -1.326$, $p<0.05$ second half) and for perceived quality ($\alpha = -1.918$, $p<0.01$ first half; $\alpha = -0.963$, $p<0.05$ second half). Front office onshore outsourcing is the only sourcing practice with a negative coefficient for both customer satisfaction and perceived quality for both the first and second half. The fact that results for front office offshore outsourcing are no worse than front office onshore outsourcing supports the notion that if firms are going to take a risk by outsourcing customer service, the firms might as well pursue the lower cost of offshore outsourcing. Because most prior research did not account for front office onshore outsourcing, it is possible that prior research attributed negative customer reactions to offshoring when those reactions may have been the same for onshore outsourcing.

Another interesting insight from this split-sample analysis comes from the coefficient of back office offshore outsourcing, which is negative for customer satisfaction during the first half for customer satisfaction ($\alpha = -0.923$, $p<0.05$), but becomes statistically insignificant during the

second half. The null results during the second half could be viewed as an improvement over the negative results from the first half. If firms did see a performance improvement of back office offshore outsourcing over time, then perhaps this performance improvement may give firms the confidence to proceed with front office offshore outsourcing even if early results are negative. If firms expect that offshore performance could improve over time (as it did for back office offshore outsourcing), then this expectation along with the potential cost savings could support the rationale for firms to offshore CRM processes.

Why would firms offshore CRM when customer feedback is negative?

The empirical results described above help to resolve the conundrum of why firms would offshore CRM processes even when customers have negative feedback for CRM offshoring. Using these empirical results as a foundation, we can now identify other research-based explanations that offer added support. The first explanation is grounded in the customer segment that provided the most negative feedback for CRM offshoring, which tended to be of older age, less educated, and with lower household income [61]. If this segment does not represent the target customer for firms such as the *Fortune* 500 firms in the ACSI, then these firms may place less importance on feedback by this customer segment when they define their CRM sourcing strategies. Because most prior research found negative customer reactions using data from hypothetical scenarios and student experiments, firms may be less willing to consider findings based on this data for their actual CRM sourcing decisions.

A second potential explanation derives from the industrial and societal changes associated with offshoring. The offshoring of manufacturing began over 50 years ago [44], and norms have changed over time so that the majority of customers now accept the offshoring of manufacturing [62]. We may see a similar pattern for CRM offshoring. While customers may

not uniformly accept the concept of CRM offshoring now [26], over time customers may increase their acceptance of CRM offshoring. If firms view their relationships with customers over a long time horizon, and they believe that customers will gradually come to accept new ways of doing business (such as offshoring and self-service), then they would be willing to engage in new ways of serving customers despite any short-term negative customer reactions.

Country of Origin research shows that consumers evaluate the fit between their perceptions of a country and the products or services that are sourced from that country [63]. Since India now controls over half of the market for offshored business processes and IT, customers may eventually view India as a good fit for customer service just as they view Switzerland as a good fit for the manufacture of watches or Japan as a good fit for the manufacture of automobiles [9]. Similar to the explanation directly above, if firms believe that customers will eventually view global service locations more positively, then firms would be willing to provide service from global locations despite any short-term negative customer reactions. As a fourth and final explanation, with the advent of artificial intelligence and machine-learning [39], customer service is likely to move farther from human- and voice-based service, and closer to automated and algorithm-based service. In this case, the customer would be less likely to know the geographic location where algorithms are hosted and CRM services are provided, which may alleviate the tendency to evaluate customer service based on location. If artificial intelligence and machine learning will eventually render service location as a moot point, then firms should be even more willing to shift to global service locations to save costs knowing that service location will cease to be a consideration for customers.

Contributions, limitations and future research

This paper makes an important research contribution by leveraging research from the IS and Marketing disciplines to resolve a conundrum in the offshoring literature, to understand why

firms would offshore the CRM function even if customers provide negative feedback about offshoring. Empirically, we show that the negative association of front office *offshore* outsourcing with customer satisfaction and perceived quality is no worse than the impact of front office *onshore* outsourcing, which suggests that part of the reason customers may give negative feedback to offshoring is due to the firm boundary dimension rather than the geographic location dimension.

We make two additional contributions through our split-sample analyses. Our split-sample analysis based on firm type shows that the relationship of outsourcing and offshoring with perceived quality is *different for four of the five sourcing practices* between manufacturing firms and services firms. Our empirical analysis suggests that customers may be more accepting of offshore providers in a service setting when offshore customer service is required to deliver the service, but less accepting in a manufacturing setting where customers contact the service center because of a problem with a product. In those cases, customers may be focused on an immediate solution to their product problem, and offshore customer service agents may not be able to solve the physical problem or may do so in a less timely manner compared with onshore resources. From a managerial perspective, this means that the optimal CRM sourcing decision depends heavily on the nature of the firm's product or service.

Our split-sample analysis based on timeframe shows how customer attitudes have changed during the timeframe of this study, and provides a signal of how firms and managers may expect customer attitudes to develop in the future. Back office offshore outsourcing, which is a more mature sourcing practice compared with front office offshore outsourcing, had a negative association with customer satisfaction during the first half of the study, but 'improved' to a null association during the second half of the study. From a managerial perspective, if firms

and managers saw improvement in customer perceptions over time with this sourcing practice, then they may expect similar improvement with the practice of front office offshore outsourcing over time.

These findings are important to build on prior research. While prior research developed helpful theory and arguments, in most cases prior research did not have data or perform empirical analysis to account for the full range of scenarios for CRM sourcing. For example, most prior research did not account for the firm boundary of service providers, did not include onshore outsourcing in the analysis, did not account for the product or service offered by the firm, and did not account for the time dimension. As described above, we are able to contribute valuable research insights based on these scenarios.

These contributions are possible because of some strengths of our data set. We are able to compare multiple modes of front office sourcing [offshore outsourcing, offshore captive operations, onshore outsourcing] with multiple modes of back office sourcing [offshore outsourcing, offshore captive operations]. We are also able to apply data from the American Customer Satisfaction Index for actual customers of the firm's products and services, as opposed to hypothetical scenarios from mall-intercept studies or student data from classroom exercises in most prior research on this topic.

We also acknowledge some limitations of our data set. For example, the news reports for outsourcing or offshoring may have Type I 'false positive' errors where a news report indicates offshoring and the firm is not actually offshoring, or Type II ' false negative' errors where a firm is offshoring and no news report has been produced. We did make some attempt to address this limitation. India is widely heralded as the leading destination for business process and IT offshoring, with over 50% of the market [37]. We engaged NASSCOM® (India National

Association of Software and Service Companies) to verify whether the firms reported as offshoring to India during the timeframe of this study actually offshored to India. As the trade association for the IT and business process industry in India, NASSCOM has some knowledge of which firms have company-owned captive centers in India, and which firms are clients of IT and business process vendors in India. NASSCOM assigned two members of its research staff to record whether each ACSI firm offshored to India as of summer 2005. There was 80% agreement between the NASSCOM records and news reports on whether the ACSI firms were (not) offshoring to India at that point in time, indicating that the news reports have reasonable validity. While this verification step was not comprehensive (it only involved one country at one point in time), it does enhance the credibility of the sourcing variables in our data.

Similar to [25], we experienced difficulty in collecting offshoring data from news reports after 2006. The authors of [25] believe that firms intentionally restricted the release of offshoring and outsourcing information beginning around 2007 as one way to respond to unfavorable customer reactions. We also note that the global business process outsourcing (BPO) market began to consolidate in the late 2000's, making it increasingly difficult to tell the geographic location from news reports. For example, in October 2006 (right before the end of our study timeframe) Electronic Data Systems (EDS), a U.S.-based outsourcing provider, completed its acquisition of a 77% stake in Mphasis, an India-based BPO provider. In June 2006, Aditya Birla Group, an India-based BPO provider, acquired Minacs Worldwide, a Canada-based BPO provider. Outsourcing announcements beginning in 2007 that name one of these firms as the outsourcing provider would make it difficult to identify whether that work actually took place at a facility in the headquarters country (EDS in the U.S. or Aditya Birla in India) or at facility of the acquired company (Mphasis in India or Minacs in Canada).

Despite the challenges in gathering outsourcing and offshoring data as described above, including the fact that the U.S. Securities and Exchange Commission (SEC) still does not require U.S. publicly-traded firms to report their offshoring activities, we believe there are at least two opportunities for future research to extend and enrich the findings in this paper. One opportunity would be to perform an in-depth field study of one or more large firms to identify how their offshoring activities unfolded over time, including data that the firms collected on customer satisfaction with the offshoring activities, the manner in which firms incorporated the customer satisfaction data into their subsequent offshoring decisions, and the financial and operational implications of the firm's offshoring portfolio. Another opportunity would be to research the mechanisms and implications of offshoring as CRM transitions away from human- and voice-based processes to more digital service based on artificial intelligence and machine learning. Technical capabilities will continue to unfold, and customer expectations will continue to unfold as the millennial generation becomes more accustomed to digital customer service and self-service, which represents an opportunity for researchers to study ongoing changes in CRM.

While this paper has made an important empirical contribution to explain the conundrum in early offshoring research, further work is required to develop theory that would accommodate the conundrum. The Marketing discipline has established customer satisfaction as a desired end state, and numerous Business disciplines have established profitability as a desired end state. What happens when these two end states are in conflict? What takes precedence when the required investments in customer satisfaction could adversely impact profitability? We suggest that this theory is not solely the domain of the Marketing discipline. The IS discipline can contribute to this discussion, because the IS discipline has done significant research on large

upfront investments and ongoing operating costs. Research can explicate the theoretical mechanisms that would explain the conundrum.[1]

To conclude, our objective in this paper is to study the relationship of outsourcing and offshoring with customer satisfaction and perceived quality. We identify specific dimensions of interest, and we study these dimensions using American Customer Satisfaction Index data on 150 North American firms over a nine-year period. We find that while front office offshore outsourcing has a negative association with customer satisfaction and perceived quality, the relationship is no worse than the association with front office onshore outsourcing, suggesting that the *outsource* dimension rather than the *offshore* dimension could be problematic for customers. This is further supported by the finding that back office offshore captive operations actually has a positive relationship with perceived quality for services firms. Our findings are informative to managers who make sourcing decisions to configure their firms to compete effectively in the global marketplace.

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Table 1. Number of years that firms appear in longitudinal data

Number of Years	Number of Firms
9 (1998-2006)	102
8	2
7	0
6	13
5	9
4	16
3	8
Total Firms	150

Notes: 1. Maximum number of years is nine from 1998 – 2006 inclusive.
2. For firms that appear fewer than nine times, these firms were added to the American Customer Satisfaction Index after 1998. The firm appears in our dataset for the number of years that the firm is in the ACSI from 1998 – 2006 inclusive.

Table 2. Number of firms that began each sourcing practice in each year

Number of firms that began [A, B, C, D, E] in year	A. Front office offshore outsource	B. Front office offshore captive	C. Front office onshore outsource	D. Back office offshore outsource	E. Back office offshore captive
1998	0	0	17	19	3
1999	0	0	1	6	0
2000	0	0	2	8	2
2001	2	2	0	15	3
2002	4	0	6	10	2
2003	8	1	12	13	6
2004	12	1	5	11	3
2005	1	0	5	4	1
2006	5	0	3	3	4
Sum	32	4	51	89	24
Firms that did not (A, B, C, D, E)	118	146	109	61	126

Notes: 1. Start year for each sourcing practice based on information in news reports. If firm started a sourcing practice before 1998, we record the start year as the first year in our data set.
2. As discussed in Appendix B, we assume that once a firm begins a sourcing practice, the firm continues that sourcing practice for the duration of the timeframe in this study, unless a subsequent news report indicates that the firm discontinued that sourcing practice and/or the original news report indicates a fixed timeframe on the contract and there is no subsequent news report.

Table 3. Descriptive statistics for model variables

n=1,145

		Mean	Std. Dev.	Min	Max
1	Customer satisfaction	75.37	6.61	49.43	91.00
2	Perceived quality	81.20	6.20	57.00	94.00
3	Front office offshore outsourcing	0.10	0.30	0.00	1.00
4	Front office offshore captive	0.02	0.13	0.00	1.00
5	Front office onshore outsourcing	0.24	0.43	0.00	1.00
6	Back office offshore outsourcing	0.44	0.50	0.00	1.00
7	Back office offshore captive	0.09	0.29	0.00	1.00
8	Manufacturing	0.36	0.48	0.00	1.00
9	Firm size	34,472.53	54,148.65	66.56	344,992.00
10	Industry concentration	934.94	1,027.51	13.96	4,067.68
11	Time	8.39	2.55	4.00	12.00

Table 4. Correlation for model variables

		1	2	3	4	5	6	7	8	9	10
1	Customer satisfaction	1.00									
2	Perceived quality	0.95*	1.00								
3	Front office offshore outsourcing	–0.07*	–0.09*	1.00							
4	Front office offshore captive	–0.01	–0.02	0.39*	1.00						
5	Front office onshore outsourcing	0.06	0.05	0.31*	0.13*	1.00					
6	Back office offshore outsourcing	–0.01	–0.03	0.25*	0.15*	0.26*	1.00				
7	Back office offshore captive	0.11*	0.11*	0.28*	0.19*	0.27*	0.26*	1.00			
8	Manufacturing	0.60*	0.62*	0.01	0.13*	0.25*	0.18*	0.21*	1.00		
9	Firm size	0.11*	0.04	0.13*	0.05	0.39*	0.30*	0.30*	0.19*	1.00	
10	Industry concentration	0.04	–0.02	0.04	–0.05	0.25*	0.17*	0.07*	0.13*	0.39*	1.00
11	Time	–0.02	–0.04	0.28*	0.08*	0.14*	0.25*	0.15*	–0.10*	0.06*	–0.03

* Correlation significant at $p<0.05$

Table 5. Main model

Random effects generalized-least squares (GLS) regression

		(1)		(2)
		Customer satisfaction		Perceived quality
Front office offshore outsourcing	α	–1.252***	α	–0.847**
		(0.399)		(0.350)
Front office offshore captive	α	0.088	α	–0.589
		(0.903)		(0.792)
Front office onshore outsourcing	α	–0.624*	α	–0.655**
		(0.380)		(0.334)
Back office offshore outsourcing	α	–0.294	α	–0.177
		(0.258)		(0.226)
Back office offshore captive	α	0.078	α	0.568
		(0.417)		(0.366)
Manufacturing	α	8.565***	α	8.354***
		(0.930)		(0.835)
Firm size	α	0.000	α	–0.000
		(0.000)		(0.000)
Industry concentration	α	–0.000	α	–0.000*
		(0.000)		(0.000)
Time	α	0.190***	α	0.128***
		(0.035)		(0.030)
Constant	α	71.386***	α	77.790***
		(0.612)		(0.547)
N observations		1,145		1,145
N groups		150		150
Wald Chi square		123.61		128.16
Prob > Chi square		0.000		0.000
Overall R squared		0.377		0.414

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1% (all two-tailed)

Table 6. Split-sample analysis for services and manufacturing firms

Random effects GLS regression

	(1)	(2)	(3)	(4)
	Customer satisfaction		Perceived quality	
	Services	Mfg.	Services	Mfg.
Front office offshore outsourcing	α –0.597	α –1.660***	α –0.594	α –0.887*
	(0.581)	(0.542)	(0.507)	(0.496)
Front office offshore captive	α 4.022	α –0.588	α 3.292	α –1.479**
	(2.773)	(0.822)	(2.417)	(0.752)
Front office onshore outsourcing	α –0.987*	α –0.545	α –0.718	α –0.904*
	(0.534)	(0.520)	(0.465)	(0.475)
Back office offshore outsourcing	α –0.496	α –0.445	α –0.300	α –0.330
	(0.384)	(0.306)	(0.335)	(0.280)
Back office offshore captive	α 1.526**	α –0.747	α 1.560**	α –0.225
	(0.746)	(0.465)	(0.650)	(0.426)
Firm size	α 0.000	α 0.000	α –0.000	α 0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Industry concentration	α –0.001**	α 0.000	α –0.001**	α 0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Time	α 0.161***	α 0.265***	α 0.097**	α 0.207***
	(0.049)	(0.043)	(0.043)	(0.039)
Constant	α 71.858***	α 78.695***	α 78.292***	α 84.805***
	(0.699)	(0.700)	(0.610)	(0.639)
N observations	734	411	734	411
N groups	103	47	103	47
Wald Chi square	25.37	54.15	21.27	43.33
Prob > Chi square	0.001	0.000	0.007	0.000
Overall R squared	0.033	0.236	0.076	0.250

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1% (all two-tailed)

Table 7. Split-sample analysis for first half (1998 – 2002) and second half (2003 – 2006)

Random effects GLS regression

	(1)	(2)	(3)	(4)
	Customer satisfaction		Perceived quality	
	First half	Second half	First half	Second half
Front office offshore outsourcing	α –0.833	α –0.603	α –1.110	α –0.613
	(1.218)	(0.511)	(1.083)	(0.447)
Front office offshore captive	α –0.770	α 0.041	α –0.990	α –0.576
	(1.978)	(1.745)	(1.759)	(1.533)
Front office onshore outsourcing	α –2.417***	α –1.326**	α –1.918***	α –0.963**
	(0.827)	(0.554)	(0.742)	(0.486)
Back office offshore outsourcing	α –0.923**	α –0.390	α –0.544	α –0.404
	(0.420)	(0.454)	(0.374)	(0.399)
Back office offshore captive	α 0.199	α –0.269	α 0.522	α –0.283
	(0.962)	(0.704)	(0.860)	(0.617)
Manufacturing	α 9.123***	α 8.757***	α 8.891***	α 8.693***
	(0.943)	(0.935)	(0.865)	(0.827)
Firm size	α 0.000*	α 0.000	α 0.000	α –0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Industry concentration	α –0.000	α –0.000	α –0.000	α –0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Time	α 0.213***	α 0.116	α 0.003	α 0.153**
	(0.082)	(0.073)	(0.073)	(0.064)
Constant	α 70.655***	α 72.104***	α 78.440***	α 77.658***
	(0.811)	(0.902)	(0.735)	(0.792)
N observations	553	592	553	592
N groups	126	150	126	150
Wald Chi square	111.11	97.67	117.66	119.37
Prob > Chi square	0.000	0.000	0.000	0.000
Overall R squared	0.426	0.359	0.425	0.407

Standard errors in parentheses

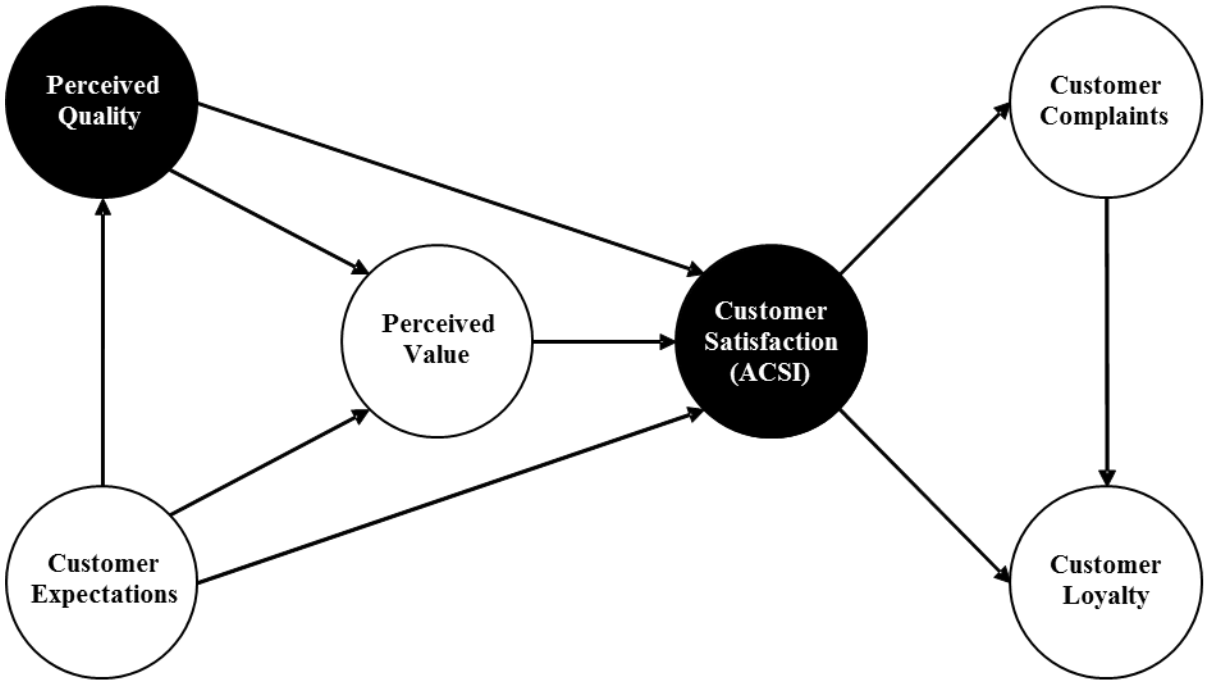
* significant at 10%; ** significant at 5%; *** significant at 1% (all two-tailed)

Appendix A. American Customer Satisfaction Index Measurement

Each year during the timeframe of this study, the American Customer Satisfaction Index (ACSI) surveyed about 50,000 customers who purchase products or services from approximately 200 private-sector organizations (250 customers from each organization) across a range of household consumer industries. Our analysis focuses on private sector firms that are headquartered in North America, and does not include government entities or foreign headquartered firms from the ACSI. Within each industry, companies are selected based on total sales, and the measured companies represent a significant proportion of industry market share. Total revenue of ACSI companies equates to about 40% of U.S. gross domestic product.

The ACSI contacts customers by random digit dialing, and asks each respondent questions on 15 measurement variables that are used as indicators of six latent constructs, including customer satisfaction and its antecedents and consequences (see Figure A1). ACSI is embedded in a cause-and-effect model, and a version of partial least squares (PLS) is used to estimate this model. PLS estimates weights for the survey measures to maximize the explained variance in customer loyalty as the ultimate dependent variable. These estimated weights are subsequently used to construct index values (0 – 100 scale) for ACSI and the other model constructs. The ACSI methodology ensures a uniform and comparable firm-level customer satisfaction measure across firms and industries. See [16] for further details.

Figure A1. American Customer Satisfaction Index Model



Appendix B. Process and Coding for Offshoring and Outsourcing Variables

The objective of this paper is to study the sourcing of front office and back office business functions related to continuing North American operations that firms headquartered in North America have traditionally performed in North America. The most frequently offshored front office functions are telephone customer service call center and e-mail customer contact center. The most frequently offshored back office functions are IT, HR, finance and accounting, and R&D. To be consistent with the research objective of this paper, the following items are <u>not</u> considered as offshoring for purposes of this paper:

- Offshore manufacturing is not considered as offshoring for this paper. Offshore manufacturing is now a long-standing management practice, and is extensively covered in prior literature [for example, see 29].
- When a North American firm establishes an international regional call center that is dedicated to receiving calls from customers of that region (for example, a European call center dedicated to European customers), that call center is not considered as offshoring for this paper.
- Similarly, when a North American firm establishes a call center in Latin America dedicated to receiving calls from North American Spanish-speaking customers (and not from English-speaking customers), that call center is not considered as offshoring for this paper.
- When Year 2000 (Y2K) remediation was the only service performed by an offshore IT firm for a North American client, that service is not considered as continuing back office offshoring for this paper. Y2K work was substantially completed by the end of 1999.

A company may have multiple business units. For example, some business units could serve household customers and other business units could serve corporate customers. Whenever possible, we look at the business unit that is offshoring to determine whether the business unit is selling mainline (not specialty) products and services to household customers that are the focus of the ACSI.

We generally assume that if a firm begins offshoring during a given year, that firm continues offshoring throughout the timeframe of this study (until 2006). One exception would be when a subsequent article indicates that offshoring was discontinued, in which case we code for the discontinuation of offshoring. Another exception would be when the news source lists a fixed end date for a contract, and there is no subsequent news source related to that sourcing practice.

ACSI firms were involved in some mergers and acquisitions during the 1998 – 2006 timeframe, including cases where two ACSI firms merged into one firm or one ACSI firm acquired another ACSI firm. We connect ACSI data for the largest pre-merger or pre-acquisition entity with ACSI data for the post-merger or post-acquisition entity, which enables us to achieve the highest-possible consistency and comparability of ACSI firms during the 1998 – 2006 timeframe.