Quantifying the Link Between Employee Engagement, and Customer Satisfaction and Retention in the Car Rental Industry[*]

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Abstract

In the retail service industry, employee engagement may play an important role in customer satisfaction and retention, as employees often interact directly with customers. This paper investigates the empirical link between employee engagement and customer satisfaction and retention by analyzing a unique data set from a large car rental company. Our analysis makes use of retirement-induced employee turnover as an exclusion restriction that is plausibly induced by employee age, thereby allowing for variation in employee engagement that is partially exogenous to common underlying factors that also impact customer satisfaction and retention. We show that there is a positive effect of employee engagement on customer satisfaction and retention. Further analysis of moderating effects highlight potential limits to employee engagement, as service disruptions in the form of car downgrades can dampen the positive effects of employee engagement. However, despite the dampened impact of employee engagement its overall effect remains positive indicating that employee engagement can be a key factor in building resilience to unforeseen service disruptions.

Keywords: Employee Engagement, Customer Satisfaction, Customer Retention, Car Rental Industry, Customer Loyalty, Customer Relationship Management, Retail Service Marketing

1 Introduction

Employee engagement may play an important role in improving the customer experience and, hence, retention. In fact, companies often pride themselves as having the most engaged employees (Smith, 2012), anticipating that this may yield positive returns to firm performance (Dotson and Allenby, 2010).[1] At the same time, keeping employees engaged might require costly investments on the firm's part, so understanding whether these firm-level efforts are indeed effective is important (Kumar and Pansari, 2015).

In the service industry, customers commonly interact with sales representatives, which then gives employees opportunities to add value to the customer experience at the point of consumption.[2] In this paper we study the link between customer satisfaction and retention, and location-level (i.e., group-level) employee engagement. Our empirical setting is the rental car industry. We believe that this industry serves as an important laboratory for service marketing, as rental companies still rely heavily on face-to-face interactions between front-line staff and customers, even in the age of digitization. Furthermore, this is an industry that relies heavily on customer relationship management (CRM), so our main outcome of interest, i.e., customer satisfaction, and the related measure of customer retention are a key determinants of their long-run success.[3] Finally, the car rental setting offers us a unique opportunity to study potential mechanisms related to the role of employee engagement under the presence of supply shortages. Being able to provide insights about these mechanisms is especially important as many retail sectors (e.g., car rentals) often have to deal with scarcity or stock outs due to supply chain disruptions.

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[1]For example, Howard Schultz, CEO of Starbucks has been reported to say, "We built the Starbucks brand first with our people, not with consumers. Because we believed that best way to meet and exceed the expectations of our customers was to hire and train great people, we invested in employees," (Wagner 2017). Some of the conceptual underpinnings for investing in employee engagement come in part from the "the happy-productive worker hypothesis" (see e.g., Herzberg, Mausner, and Snyderman, 1959, Barley and Kunda, 1992). However, the empirical evidence on this has been mixed (see e.g., Brayfield and Crockett, 1955, Vroom, 1964, Iaffaldano and Muchinsky, 1985, Staw and Barsade, 1993).

[2]At the point of customer contact, service employees represent the organization and the brand in the customer's eyes (Zeithaml, Bitner, and Gremler, 2009). Thus, these employees are a relevant factor in customer and service management (Rust and Chung, 2006), and play an important role in the firm's overall customer satisfaction. More generally, fostering healthy employee engagement may fall under a more general organizational management strategy (Beer, 2009; Pfeffer, 1998).

[3]There is considerable evidence that customer satisfaction and retention are key elements of CRM (Anderson and Sullivan, 1993; Bolton, 1998; Mittal and Kamakura, 2001; Li, Sun, and Wilcox, 2005).

Using a data-set from a large national car rental service chain, we investigate whether or not location-level employee engagement is linked to higher customer satisfaction and retention, two key performance metrics for CRM.[4] We establish the causal connection by employing an instrumental variables (IV) regression approach along with exploiting within location and cross time variation. Since employee engagement may be endogenous, we develop a location-time specific exclusion restriction through our IV approach. The instrument exploits variation in retirement-induced employee turnover, that might in turn correlate with subsequent employee engagement via the changing composition of employees. We construct this instrument by calculating the retirement-induced employee turnover rate last period, which provides partially exogenous variation in employee engagement due to age and retirement of employees. Our analysis reveals that employee engagement has a causal positive impact on both customer satisfaction and retention.

Having established this baseline result, we proceed by analyzing the potential limits to the positive impact of employee engagement on customer satisfaction and retention. In particular, we focus on how the effectiveness of employee engagement is impacted by service failure. One common disruption that car rental companies face are inventory shortages and scarcity, which often leads to customers driving car models that are different from the ones they had initially reserved. Using a novel feature of the car rental setting where a customer's choice (i.e., reservation car class) and consumption (i.e., driven car class) are observed, we are able to identify cases in which a customer faced a service disruption in the form of a downgrade. With the downgrade information, we explore the extent to which the employee engagement effect attenuates with service disruptions. The results show that the effectiveness of employee engagement is indeed dampened when a downgrade happens. However, the dampening does not completely negate the positive impact of employee engagement, which suggests that employee engagement may play an particularly important role in service recovery.

In summary, our research confirms the integral role of employee engagement in customer

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[4]Two other papers study a similar empirical setting as us. Yao, Yang, and Gatignon (2014) investigate the role of reservation gaps between the time of reservation and the time of consumption on upselling. In other work, Ni, Shen, and Zhu (2015) explore the potential tensions between upselling and customer satisfaction. In contrast we focus on the role of employee engagement on customer satisfaction, and retention.

satisfaction and retention. These findings complement and contribute to the past literature about CRM (Dotson and Allenby, 2010; Evanschitzky, Groening, Mittal, and Wünderlich, 2011; Evanschitzky, Wangenheim, and Wünderlich, 2012; Maxham, Netemeyer, and Lichtenstein, 2008; Netemeyer and Maxham, 2007; Kumar, 2016; Kumar and Pansari, 2016). Inspired by this past work (Loveman, 1998, Maxam and Netemeyer, 2003) our engagement scores are directly elicited from the employees *ex ante* and focus on the employee's engagement level. One advantage of an employee reported measure is that it would more likely capture engagement *per se* whereas a manager reported measure may capture an *ex post* outcome of engagement, rather than engagement itself. Another advantage of our data is that our estimation sample can be constructed such that employee engagement measures precede the date of the transactions. Most importantly, we account for the possibility that employee engagement is endogenously determined, which to the best of our knowledge hasn't been done in the literature.

2 Empirical Setting

2.1 Data Overview

Our analysis makes use of over 150,000 car rental transactions made by about 100,000 individual users. We focus on transactions made at 100 airport locations (in either Canada or United States), as only these can be matched to location-time specific employee surveys. Note that locations that are not in airports tend to be smaller, and as these locations have fewer employees, the surveys from these locations cannot be released to us due to privacy concerns. For similar confidentiality reasons, we do not have individual employee level engagement or other data. We see transactions taking place is virtually every U.S. state, and most Canadian provinces. Transactions are fairly evenly distributed across the days of the week, with a slightly greater percentage occurring on Monday. For a quick summary of the type of information we used to construct our data, we refer the reader to Table 1 before we describe in more detail below. In particular, this table highlights the level of temporal and cross-sectional granularity of different types of data we merge (described in the subsequent section).

Table 1: Information Used to Construct Data

Data type	Level of granularity	
	Temporal dimension	Cross-sectional dimension
Car rental information	5 surveys 2010-12	150,000 individual transactions
Employee engagement	5 surveys 2010-12	100 Rental locations

2.2 Matching Procedure for Merging Employee Engagement Information to Transactions Data

We primarily focus on car rental transactions that begin and end at the same location. Therefore, each transaction (t) has a location identifier which we can match with the employee rental location index m. However, matching based on the time dimension requires a few additional steps. Note that the employee engagement surveys were conducted up to October 1, 2010, between October 1, 2010 and May 1, 2011, between May 1, 2011 and November 1, 2011, between November 1, 2011 and April 1, 2012, and between April 1, 2012 and October 1, 2012. In the transactions data, we can identify the exact date of check-in. With this information, we use the following rules to match the transaction period to employee engagement survey period:

1. If date of check-in is after October 1, 2010 but before May 1, 2011, then transaction t lies in survey period $s =$ October 2010.

2. If date of check-in is after May 1, 2011 but before November 1, 2011, then transaction t lies in survey period $s =$ May 2011.

3. If date of check-in is after November 1, 2011 but before April 1, 2012, then transaction t lies in survey period $s =$ November 2011.

4. If date of check-in is after April 1, 2012 but before October 1, 2012, then transaction t lies in survey period $s =$ April 2012.

5. If date of check-in is after October 1, 2012, then transaction t lies in survey period $s =$ October 2012.

Table 2: Number of Observations in Merged Data Across Different Survey Periods

Survey group	Frequency	Percent	Cumulative
October 2010	47,894	29.27	29.27
May 2011	41,971	25.65	54.91
November 2011	33,087	20.22	75.13
April 2012	40,526	24.76	99.89
October 2012	172	0.11	100.00

Using these rules, we can then merge each transaction with the location-period specific employee engagement measures. It is worth noting that this data construction procedure implies that the measure of employee engagement is elicited before the occurrence of the customer transaction and any customer satisfaction outcomes to which it is related. An important reason for following this data construction procedure is a concern for reverse causality. In Table 2, we present the distribution of merged transaction observations across different employee survey time periods. We see that the observations are fairly well distributed from October 2010 to April 2012. There are relatively few observations pertaining to the October 2012 survey period, but that is due to the cut-off time of the company's data collection efforts.

Finally, we note that importantly, this data construction procedure controls for reverse causality in survey period s in contemporaneous customer satisfaction (NPS_{ms}) and employee engagement measures (EE_{ms}). However, in our empirical analysis as described in the main text, we still account for any potential endogeneity between customer satisfaction and employee engagement.

2.3   Transactions Data

In our sample, the average number of transactions that each location handles is close to 3,000, and ranges from as few as 44 to as many as 6974. Each transaction contain details about the trip and user characteristics. Our main variable of interest is the Net Promoter Score (NPS). In the data available to us, the NPS score is coded to take on one of three possible values, -1, 0, or 1, to represent "detractors," "neutrals" and "promoters" in measuring customer satisfaction with the brand. We consider focusing on the NPS measure for two

main reasons. First, this score has become a standard industry metric (Reichheld, 2003). Second, and most importantly, our key findings replicate when using alternative measures of customer satisfaction (e.g., staff courtesy, value for the money, and vehicle equipment condition). There are of course potential caveats of relying on NPS as a measure related to firm growth and performance (Keiningham, Cooil, Andreassen, and Aksoy, 2007), so our analysis uses a second outcome of interest, namely a proxy for customer loyalty in the form of repeat purchase or retention. Retention is an indicator variable that equals 1 if the customer makes a subsequent transaction following the initial one.

Table 3: Summary Statistics

Variable	Mean	Std. Dev.
Sales outcomes		
Net Promoter Score	0.50	0.75
Retention	0.14	0.34
Location-level engagement		
Employee engagement	3.89	0.41
User-trip characteristics		
Survey completed online	0.8045	0.3966
Reserved class	5.25	4.33
Customer tier	1.70	1.01
Phone reserve	0.11	0.31
Internet reserve	0.4521	0.4977
Business	0.44	0.50
Tour	0.0064	0.0799
Government segment	0.0146	0.1199
Weekend	0.19	0.39
American billing address	0.9519	0.214
Age	52.7263	11.5646
Duration	3.71	4.11

As mentioned earlier, each transaction can be linked to a number of user-trip characteristics. Table 3 shows that about 11 percent are booked over the phone, 45 percent are booked over the internet, 50 percent are for business purposes, 1 percent for tour purposes, and 19 percent over the weekend. Over 80 percent of the customer satisfaction responses are obtained via an online survey. Note also that over 95 percent of customers have an American billing address, and 1 percent belong to the government. The average age of the customers is around 53. Finally, the average car rental duration is 4 days.

2.4 Employee Engagement Data

As we are able to identify the location and time of each transaction, we can then match this information to aggregated employee survey results at the location-time level. It should be noted that we only have access to aggregate employee survey results and not individual employee level survey or other demographic information due to privacy concerns expressed by the firm. In total, there were over 33,000 surveys completed by the car rental company's employees from 2010 to 2012. Over the course of two years, 5 surveys were conducted by the car rental company, namely up to October 2010 (36,876 surveys), between October 2010 and May 2011 (127,544 surveys), between May 2011 and November 2011 (90,581 surveys), between November 2011 and April 2012 (111,477 surveys), and between April 2012 and October 2012 (600 surveys). The employee engagement survey is comprised of ten questions. For each question, the employee responses could range from 1 (completely disagree) to 5 (completely agree). We incorporate all of these questions in our summary employee engagement metric, as engagement is likely a composition of all of these dimensions (Kumar and Pansari, 2014, 2016). These questions include the following: (1) (employee) understands reasons for change by company, (2) customers benefit from changes made by company, (3) I know how my job contributes towards the company, (4) I am able to work more efficiently, (5) manager acts on (employee) suggestions, (6) discussed performance (with employee) in the last 6 months, (7) (provided with) skills to help develop (employee) career, (8) job helps employee to embrace transformation, (9) (company) strategies make the company successful in the long-run, and (10) (employee) would recommend company as a place to work.

Broadly speaking, these survey questions are consistent with industry reports about job satisfaction and engagement, as employees value respectful treatment of employees at all level, trust between employees and senior management, immediate supervisor's respect for ideas, opportunities to make use of skills and abilities at work, and the organization's financial stability (e.g., Society for Human Resource Management, 2015; Gallup Consulting, 2008). In fact, in some cases the questions mimic very closely the questions used in these studies conducted by industry, as well as those used in recent research articles (Kumar and Pansari, 2015).

As an aside, we note that it is well understood in the literature on survey design, measuring the subjective engagement state of an employee is fraught with problems. This is an important and worthwhile area of research but beyond the scope of this paper, as it has been for much of this literature. An alternative in the literature has been to adopt an external (but equally subjective) measure obtained through a rating assigned by a manager about employee performance *ex post* (interaction with customer). An exception is Maxham, Netemeyer, and Lichtenstein (2008) that obtains both internal self-reported measures of employee satisfaction and external manager reported measures of employee performance. Netemeyer and Maxham (2007) show that both self-reported and manager reported ratings of employee performance are correlated with customer satisfaction ratings, although, the former are more weakly linked. One implication of this finding for our research is that if anything it should make it less likely for us to find a positive link between employee engagement and customer satisfaction in our context, i.e., our direct employee engagement measures should bias the results against us instead of in our favor.

With the employee engagement metrics for each employee, we then aggregate this measure across all employees to the location and survey period level. Importantly, we construct an *ex ante* measure of employee engagement for a location that precedes the date of transactions to reduce the possibility of reverse causality.

To better understand the context of employee engagement, we note that firms often invest in employee engagement because the development of a strong service culture that contributes towards better business practices has been identified as a critical source of competitive advantage (Grönroos, 2007) and financial performance (Homburg, Hoyer, and Fassnacht, 2002) for companies. Furthermore, an important effect of a healthy service-focused culture may also an improvement in the company's ability to satisfy and retain its customers, leading to better CRM including and enhanced customer loyalty. Another argument for a healthy service culture is that the notion of fairness may trickle down from employee to customer (Masterson, 2001). In addition, employee empowerment serves as an important buffer in times of service failures (Chebat and Kollias, 2000). More generally, (perceived) investments in personnel are associated with higher profits (Schlesinger and Heskett, 1991). While much of the recent research on service and customer management has focussed on customer interac-

tions with computer-based systems (Ansari et. al., 2000; Ansari and Mela, 2003; Bodapati, 2004; Kamakura et. al, 2003; Li, Sun, and Wilcox, 2005; Rust and Huang, 2014; Ying, Feinberg, and Wedel, 2006), many firm-customer interactions still require the interpersonal contact most notably in retail services. It has been suggested that the reliance on automation, along with concurrent reductions of labor, need not lead to service productivity. In fact, there is evidence that service productivity or quality may be negatively associated with cost-reducing measures to improve production efficiency (Anderson, Fornell, and Rust, 1997; Oliva and Sterman, 2001; Rust and Huang, 2012, 2014).

3 Inferring the Impact of Employee Engagement

3.1 Main Empirical Specification

After merging the employee engagement and customer transaction information, we proceed by estimating the following regression

$$y_{ms} = \beta \text{EE}_{ms} + X_{ms} + \varepsilon_{ms} \tag{1}$$

Here, y_{ms}, represents an outcome of interest for a transaction at location m in survey period s. We consider two main outcome variables: (i) NPS and (ii) retention (i.e., repeat purchase). On the right hand side, the main variable of interest is the employee engagement measure associated with the location and time period of that transaction, which is represented by the variable EE_{ms}. As such, β measures the systematic differences of transactions across different ranges of employee engagement. Furthermore, all of the relevant trip and car characteristics are captured by the term X_{ms}, including categorical dummies for the type of transaction (e.g., hour check-in, rental duration, and day of check-in). Finally, let ε_{ms} be the regression error.

The possibility of unobserved heterogeneity (e.g., some locations are inherently better managed or have more resources) across rental locations is a relevant concern in our empirical setting, and ultimately introduces an endogeneity problem in the inference of the main independent variables of interest and location-specific employee engagement. Formally, this means that $\text{cov}(\text{EE}_{ms}, \varepsilon_{ms}) \neq 0$. Below, we propose an instrumental variables estimation

approach to address this important identification issue.

3.2 Addressing the Endogeneity of Employee Engagement

To establish credible identification, we need an exclusion restriction that is plausibly orthogonal to common unobserved factors that jointly impact both employee engagement and CRM outcomes like customer satisfaction and retention. In other words, an ideal exclusion restriction will be a variable that impacts employee engagement (EE_{ms}), but is unlikely to have an direct impact on unobserved drivers of CRM.

One candidate instrument for employee engagement is past retirement-induced employee turnover.[5] In our empirical context, it seems plausible that the changing composition of employees will have an impact on the rental location's employee engagement and morale. There could be various reasons for this including that the employees who complete the engagement surveys would by construction be different when turnover is high. At the same time, retirement-induced employee turnover might be an appropriate exclusion restriction as it's likely to be uncorrelated with underlying factors that impact the customer's experience with the retailer (as retirement is largely driven by the employee's age).

To construct our retirement-induced employee turnover metric, we make use of the fact that we observe employee IDs in the transactions data. Each employee is given a unique ID at the beginning of their tenure with the company. With these IDs, we can track the employees throughout our sample, and see how many unique IDs there are at each location at a given time period. These counts then help us calculate the flow and stock of (customer-facing) employees over time. Using a similar approach as Kahn and McEntarfer (2014), we then calculate the overall turnover rate:

$$R_{ms} = \frac{L_{ms} - N_{ms}}{N_{ms}}, \tag{2}$$

where L_{ms} is the number of employees that have left the firm in survey period s at location m, and N_{ms} is the number of new hires in survey period s at location m.

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[5]We refer readers to Sunder, Kumar, Goreczny, and Maurer (2016) for a recent study about the drivers behind salesperson turnover.

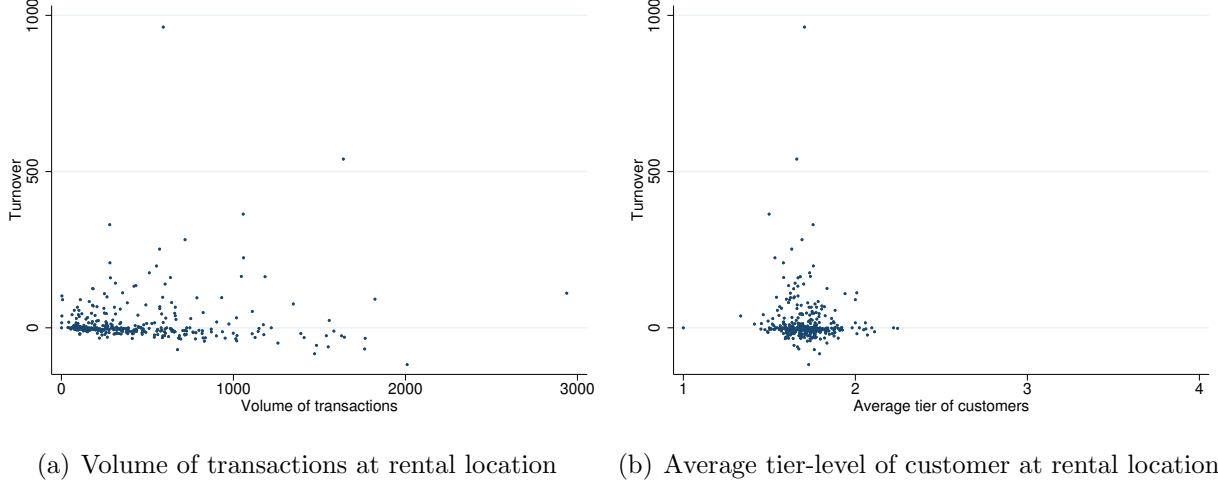(a) Volume of transactions at rental location   (b) Average tier-level of customer at rental location

Figure 1: Variation in Employee Turnover Across Location Types

This turnover rate R_{ms} is then incorporated in the construction of the eventual instrument, which we define below:

$$\tilde{R}_{ms} = R_{ms} \times LT_{ms}, \tag{3}$$

where LT_{ms} is a count for the number of longest-tenured employees (i.e., those who have been with the company for 10 or more years) at survey period s at location m. The construction of this exclusion restriction allows us to circumvent an operational challenge in implementation, in that there is no way to tell whether the in and out-flow of employee IDs in the customer transaction data are short or long-tenured employees. Therefore, the count for the longest-tenured employees serves as our best proxy for retirement-induced changes in employee composition.

Next we empirically examine whether the variation in our employee turnover metric is plausibly exogenous of unobserved location-specific heterogeneity in order to confirm that our proposed instrument is indeed a suitable exclusion restriction. Figure 1 provides scatter plots that suggest that our proposed instrument based on the augmented turnover metric exhibits some independent variation from underlying location-specific characteristics. The first panel in the figure confirms that the turnover metric does not systematically increase or decrease with the volume of transactions at the rental location, while the second panel in the figure confirms a similar pattern when comparing our turnover metric with the aver-

age tier-level of customers at the rental location. Furthermore, the correlation coefficients between the augmented turnover metric with the volume of transactions and the average tier-level of customers is 0.0535 (p-value = 0.3195) and -0.0801 (p-value = 0.1357) respectively, confirming a lack of correlation. In other words, our exclusion restriction $\tilde{R}_{ms}$ likely satisfies the following property, $\text{cov}(\tilde{R}_{ms}, \varepsilon_{ms}) = 0$.

Another issue we need to consider is the possibility that the main outcomes of interest exhibit persistence via carry-over effects (e.g., past and current NPS). To address this concern, our estimation sample will focus exclusively on first-time customers who have not used the car rental service previously. In other words, we will focus only on a sample that consists of the initial transaction associated with each user.

Having established this instrument, we then estimate the main specification (Equation (1)) using 2SLS. The first-stage regression can be written as follows:

$$EE_{ms} = \psi_1 \tilde{R}_{ms} + \psi_2 X_{ms} + \eta_{ms} \tag{4}$$

where our measure of retirement-induced employee turnover ($\tilde{R}_{ms}$) computed above (Equation (3)) serves as the IV and provides the main exclusion restriction for identification. Also, X_{ms} represents the relevant trip and car characteristics as before and η_{ms} is an independent regression error. Our first-stage regression results will help establish that our IV and in turn the associated exclusion restriction $\tilde{R}_{ms}$ should satisfy the following property, $\text{cov}(\tilde{R}_{ms}, \text{EE}_{ms}) \neq 0$.

3.3 Results

Before discussing the main findings, we begin by summarizing the key observations from the first-stage regression (see Table 4). First, our turnover metric appears to have a negative association with employee engagement. That is, a greater outflow of long-tenured employees is associated with lower engagement. Most importantly, the reported F-statistics in the table confirm that weak instruments are unlikely to be an issue. These first-stage results, combined with the earlier descriptive analysis in Figure 1, confirm that the retirement-induced employee turnover is indeed a suitable exclusion restriction that is (1) correlated with employee engagement and (2) uncorrelated with unobserved common factors that could

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impact CRM related outcomes of interest.

The results from the second-stage regression (see Table 5) provide us the main insights about the role of employee engagement on customer satisfaction and retention. In particular, employee engagement appears to have a positive (and statistically significant) impact on both customer satisfaction (i.e., NPS), as well as retention. These findings confirm that employee engagement indeed plays an important role in CRM outcomes, and that this effect is likely causal. Other variables also have an impact on customer satisfaction and retention. For instance, NPS is higher for individuals who completed the survey online, booked via phone/internet, travelled for business and on a weekend. The effect signs are largely the same for customer retention (with the exception of some variables that are no longer significant).

3.4 Potential Limits of Employee Engagement

We motivate this analysis by noting that marketing strategy in response to shortages and scarcity is not a new concept (Kotler 1974). However, the strategies that firms rely on have largely not changed much from the "classic" textbook approaches (Hanna, Kizilbash and Smart 1975), typically via a combination of demarketing, product mix adjustments, price changes, and channel management. In service retailing, we believe that these product-oriented strategies miss opportunities to leverage the human capital that these companies have in the form of their front-line service representatives. Tax and Brown (1998) provide some early insights about the importance of front-line employees as their role in service recovery performance, and our research aims to explore the extent to which employee engagement matters in these contexts. More generally, we view these findings as offering an exploratory discussion about the role of customer service as part of the customer coping mechanisms in times of service failure (e.g., Patterson et al. 2009; Roehm and Brady 2007; Strizhakova, Tsarenko and Ruth 2012).

To proceed with this analysis, we leverage a unique feature of our data. That is, we can observe what cars customers booked, what they ended up driving, and what they paid for. This choice (booked)-consumption mismatch might thus provide us scenarios in which customers are presented with service options that they had not initially intended to purchase. Using this data variation, we then study how the employee engagement effect changes for

Table 4: First-stage Regressions for IV Estimation

	Employee engagement
Turnover	-0.000236***
	(0.0000379)
Survey completed online	-0.0655***
	(0.00273)
Phone reserve	-0.00109
	(0.00396)
Internet reserve	-0.00228
	(0.00261)
Business	-0.00772**
	(0.00252)
Tour	-0.00904
	(0.0139)
Government segment	0.0113
	(0.00933)
Weekend	-0.00416
	(0.00283)
American billing address	0.126***
	(0.0106)
Age	0.000195*
	(0.0000968)
Duration	-0.000619
	(0.000398)
Constant	4.947***
	(0.0132)
Car class dummy	Yes
Hour check-in dummy	Yes
Rental duration dummy	Yes
Time dummy	Yes
Observations	110172
R^2	0.0212
F-statistic	33.25
Weak-instrument F test (p-value)	12.7216 (0.0007)

Clustered standard errors (by location) in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Impact of Employee Engagement on Customer NPS and Retention

	(1) NPS	(2) Retention
Employee engagement	1.420*	4.226***
	(0.692)	(1.185)
Survey completed online	0.124**	0.237**
	(0.0436)	(0.0749)
Phone reserve	0.0745***	-0.0218
	(0.0110)	(0.0188)
Internet reserve	0.0865***	0.0183
	(0.00728)	(0.0125)
Business	0.0283***	0.0526***
	(0.00754)	(0.0130)
Tour	-0.0330	-0.00874
	(0.0363)	(0.0605)
Government segment	-0.0992***	-0.0963*
	(0.0301)	(0.0486)
Weekend	0.0173*	0.0163
	(0.00807)	(0.0139)
American billing address	-0.173*	-0.504***
	(0.0865)	(0.149)
Age	0.00502***	-0.000605
	(0.000301)	(0.000517)
Duration	0.00463***	0.00192
	(0.00128)	(0.00223)
Car class dummy	Yes	Yes
Hour check-in dummy	Yes	Yes
Rental duration dummy	Yes	Yes
Time dummy	Yes	Yes
Observations	91497	91497
R^2	0.02	0.02

Clustered standard errors (by location) in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Exploration of Potential Limitation of Employee Engagement

	(1) NPS	(2) Retention
Employee engagement	1.451*	4.237***
	(0.698)	(1.191)
Employee engagement x Downgrade	-0.0953***	-0.0345*
	(0.00989)	(0.0155)
Survey completed online	0.126**	0.237**
	(0.0440)	(0.0752)
Phone reserve	0.0745***	-0.0218
	(0.0111)	(0.0189)
Internet reserve	0.0867***	0.0183
	(0.00733)	(0.0125)
Business	0.0299***	0.0532***
	(0.00763)	(0.0131)
Tour	-0.0340	-0.00907
	(0.0364)	(0.0606)
Government segment	-0.0989**	-0.0962*
	(0.0303)	(0.0487)
Weekend	0.0160*	0.0158
	(0.00810)	(0.0139)
American billing address	-0.174*	-0.505***
	(0.0872)	(0.150)
Age	0.00499***	-0.000618
	(0.000304)	(0.000521)
Duration	0.00448***	0.00187
	(0.00128)	(0.00223)
Car class dummy	Yes	Yes
Hour check-in dummy	Yes	Yes
Rental duration dummy	Yes	Yes
Time dummy	Yes	Yes
Observations	91497	91497
R^2	0.02	0.02

Clustered standard errors (by location) in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

customers who experienced no choice (booked)-consumption mismatch versus customers who did indeed experience a choice (booked)-consumption mismatch (i.e., downgrade of car class relative to what they had initially booked). Past research has shown that these mismatches become more prevalent when car classes become scarcer at the time the client has checked-in with the front desk (Sudhir and Yang, 2018), so we assert that these mismatches could be an imperfect proxy for shortages and scarcity that customers may face.

Table 6 presents the main findings from this analysis. For this specification, we consider a slightly modified version of our baseline specification that includes an interaction between employee engagement and downgrades. The downgrade indicator is defined based on whether or not the customer's driven car class is lower than the car class that was booked. This analysis shows that while employee engagement remains to be a positive force in both customer satisfaction and retention, its impact is dampened when the customer faces a downgrade situation. Although, the dampening appears more pronounced for customer satisfaction than retention, the results suggest that employee engagement could potentially overcome the negative effects of shortages and scarcity due to contemporaneous service issues. Ultimately, the effectiveness and resilience of employee engagement in customer satisfaction and retention might be limited by the presence of service disruptions, that may be well beyond the control of the front-line staff.

4   Conclusion

In summary, our paper's main contributions are the following. We confirm that location-level employee engagement is indeed positively associated with customer satisfaction and retention in the context of the car rental service industry. In particular, we use an "employee reported" in contrast with a "management reported" measure of employee engagement, and link that to customer satisfaction and retention. Also, we use an *ex ante* measure of employee engagement that precedes the date of transactions to reduce the possibility of reverse causality. Moreover, our findings suggest potential limits to employee engagement, as service disruptions can cause attrition to its positive impact on customer satisfaction and retention. Despite the dampened impact of employee engagement in the presence of service disruptions, its overall effect remains positive in these circumstances, which reinforce the

notion that employee engagement is a key factor in building resilience to these unforeseen disruptions.

We also contribute to the methodology of studying the impact of employee engagement on sales outcomes, as we provide suggestions for instruments (e.g., plausibly age and retirement induced employee turnover) that could be also adopted in other studies. The use of instruments is a contribution in itself and complements the past work that has largely focused on correlations based on survey data. As best stated by Maxham, Netemeyer, and Lichtenstein (p.164, 2008), "as with almost all studies based on survey data, the ability to infer causality is severely compromised. Thus, support for the value chain framework system of relationships we examined is purely correlational. Still, the sheer number of covariates/control variables we used in testing our models...hopefully lends credence to the robustness of our results."

Finally, the empirical link between employee turnover and engagement we rely on for our instrumental variables regression framework suggests an important managerial implication. That is, encouraging employees to stay with the company will not only have an impact on their engagement, but because of the link between engagement and customer satisfaction and retention, turnover will indirectly have an impact on the end product and customer experience as well. While it is common to account for the explicit costs of employee turnover (i.e., cost of finding and training new workers), our research suggests that turnover may lead to indirect costs associated with longer term customer loyalty and CRM (i.e., the link between employee engagement, customer satisfaction, and retention). That said, further investigation of this, and the effects of other more refined measures of employee engagement on customer outcomes would be worthwhile.

References

[1] Anderson, E., Fornell, C., and Rust, R. (1997), Customer Satisfaction, Productivity, and Profitability: Differences Between Goods and Services *Marketing Science*, 16, 129-145.

[2] Anderson E. and Sullivan, M. W. (1993), The Antecedents and Consequences of Customer Satisfaction for Firms *Marketing Science*, 12, 125-143.

[3] Ahearne, M., Jones, E., Rapp, A. and Mathieu, J. (2008), High Touch Through High Tech: The Impact of Salesperson Technology Usage on Sales Performance via Mediating Mechanisms *Management Science*, 54, 671-685.

[4] Ansari, A., Essegaier, S., and Kohil, R. (2000). Internet Recommendation Systems. *Journal of Marketing Research* 37, 363-373.

[5] Ansari, A., and Mela, C. (2003). E-Customization. *Journal of Marketing Research* 40, 131-145.

[6] Barley, S. and Kunda, G. (1992). Design and devotion: Surges of rational and normative ideologies of control in managerial disclosure, *Administrative Science Quarterly*, 37, 363-399.

[7] Beer, M. (2009). *High Commitment High Performance*, Jossey-Bass Irwin Press.

[8] Bertrand, M., Duflo, E., and Mullainathan, S. (2004). How much should we trust diferences-in-differences estimates? *Quarterly Journal of Economics* 119, 249-275.

[9] Biyalogorsky E., Gerstner, E., Weiss, D., and Xie, J. (2005). The Economics of Service Upgrades. *Journal of Service Research* 7, 234-244.

[10] Bodapati, A. (2004). Recommendation Systems with Purchase Data. *Journal of Marketing Research* 55, 77-93.

[11] Brayfield, A. and Crockett, W. (1955). Employee attitudes and employee performance, *Psychological Bulletin*, 52, 396-424.

[12] Bolton, R. N. (1998). A Dynamic Model of the Duration of the Customer's Relationship with Continuous Service Provider: The Role of Satisfaction *Marketing Science* 17, 45-65.

[13] Chebat, J-C., and Kollias, P. (2000). The Impact of Empowerment on Customer Contact Employees' Roles in Service Organizations. *Journal of Service Research* 3, 66-81.

[14] Dotson, J. and Allenby, G. (2010). Investigating the Strategic Influence of Customer and Employee Satisfaction on Firm Financial Performance. *Marketing Science* 29, 895-908.

[15] Evanschitzky, H., Groening, C., Mittal, V., and Wünderlich, N. (2011). How Employer and Employee Satisfaction Affect Customer Satisfaction: An Application to Franchise Services. *Journal of Service Research* 14, 136-148.

[16] Evanschitzky, H., Wangenheim, F., and Wünderlich, N. (2013). Perils of Managing the Service Profit Chain: The Role of Time Lags and Feedback Loops. *Journal of Retailing* 88, 356-366.

[17] Gallup Consulting. (2008). Q12 Meta-Analysis.

[18] Grönroos, C. (2007). *Service Management and Marketing: Customer Management in Service Competition* 3rd Edition, Wiley Press.

[19] Hanna, Nessim, A. H. Kizilbash, and Albert Smart (1975). "Marketing Strategy under Conditions of Economic Scarcity: How to respond progressively and productively to the changing business environment." emphJournal of Marketing 39.1: 63-67.

[20] Hauser, J., Simester, D., and Wernerfelt, B. (1994). Customer Satisfaction Incentives. *Marketing Science* 13, 327-350.

[21] Herzberg, F., Mausner, B., and Snyderman, B. (1959). *The motivation to work.* New York: Wiley.

[22] Heskett J., Jones, T., Loveman, G., Sasser, E., and Schlesinger, L. (1994). Putting the service-profit chain to work. *Harvard Business Review,* 72: 164-174.

[23] Homburg, C., Hoyer, W., and Fassnacht, M. (2002). Service Orientation of a Retailer's Business Strategy: Dimensions, Antecedents, and Performance Outcomes. *Journal of Marketing*, 66: 86-101.

[24] Horsky, D., and Nelson, P. (1996). Evaluation of Salesforce Size and Productivity Through Efficient Frontier Benchmarking. *Marketing Science*, 15: 1-21.

[25] Iaffaldano, M., and Muchinsky, P. (1985). Job satisfaction and job performance: a meta-analysis. *Psychological Bulletin*, 97, 251-273.

[26] James, G., Witten, D., Hastie, T., and Tibshirani, T. (2013). *An Introduction to Statistical Learning*, New York: Springer Press.

[27] Kahn, L., and McEntarfer, E. (2014). Employment Cyclicality and Firm Quality. NBER Working Paper 20698.

[28] Kamakura, W., and Russell, G. (1989). A Probabilitistic Choice Model for Model Segmentation and Elasticity Structure. *Journal of Marketing Research* 26, 379-390.

[29] Kamakura, W., Wedel, M., de Rosa, F., and Mazzon, J. (2003). Cross-Selling Through Database Marketing: A Mixed Data Factor Analyzer for Data Augmentation and Prediction. *International Journal of Research in Marketing* 20, 45-65.

[30] Kotler, Philip (1974). "Marketing during periods of shortage." *Journal of Marketing* 38.3: 20-29.

[31] Keiningham, T., Cooil, B., Andreassen, T-W, and Aksoy, L. (2007). A Longitudinal Examination of Net Promoter and Firm Revenue Growth. *Journal of Marketing* 71, 39-51.

[32] Kumar, V. (2016). Introduction: Is Customer Satisfaction (Ir)relevant as a Metric? *Journal of Marketing* 80, 108-109.

[33] Kumar, V. and Pansari, A. (2015). Measuring the Benefits of Employee Engagement. *MIT Sloan Management Review* 56, 67-72.

[34] Kumar, V. and Pansari, A. (2016). Competitive Advantage Through Engagement. *Journal of Marketing Research* 53, 497-514.

[35] Kumar, V., and Anita Pansari (2014). "The construct, measurement, and impact of employee engagement: A marketing perspective." *Customer Needs and Solutions* 1.1: 52-67.

[36] Lapré, M. and Tsikriktsis, N. (2006). Organizational Learning Curves for Customer Dissatisfaction: Heterogeneity Across Airlines. *Management Science* 52, 352-366.

[37] Li, K., and Bell, D. (2017). Estimation of average treatment effects with panel data. *Journal of Econometrics* 197, 65-75.

[38] Li, S., Sun, B., and Wilcox, R. (2005). Cross-Selling Sequentially Ordered Products: An Application to Consumer Banking Services. *Journal of Marketing Research* 42, 233-239.

[39] Loveman, G. (1998). Employee Satisfaction, Customer Loyalty, and Financial Performance: An Empirical Examination of the Service Profit Chain in Retail Banking. *Journal of Service Research* 1, 18-31.

[40] Mani, V., Kesavan, S., and Swaminathan, J. (2011). Understaffing in Retail Stores: Drivers and Consequences. Working paper, PSU.

[41] Masterson, S. (2001). A Trickle-Down Model of Organizational Justice: Relating Employees' and Customers' Perceptions of and Reactions to Fairness. *Journal of Applied Psychology* 86, 594-604.

[42] Maxham, J., and Netemeyer, R. (2003). Firms Reap What They Sow: The Effects of Shared Values and Perceived Organizational Justice on Customers' Evaluations of Complaint Handling. *Journal of Marketing* 67, 46-62.

[43] Maxham, J., Netemeyer, R., and Lichtenstein, D. (2008). The Retail Value Chain: Linking Employee Perceptions to Employee Performance, Customer Evaluations, and Store Performance. *Marketing Science* 27, 147-167.

[44] Mittal, V., and Kamakura, W. (2001). Satisfaction, Repurchase Intent, and Repurchase Behavior: Investigating the Moderating Effect of Customer Characteristics. *Journal of Marketing Research* 38, 131-142.

[45] Mittal, V., Anderson, E., Sayrak, A., and Tadikamalla, P. (2005). Dual Emphasis and the Long-Term Financial Impact of Customer Satisfaction. *Marketing Science* 24, 544-555.

[46] Netemeyer, R., and Maxham, J. (2007). Employee versus supervisor ratings of performance in the retail customer service sector: Differences in predictive validity for customer outcomes. *Journal of Retailing* 83, 131-145.

[47] Ni, J., Shen, Q., and Zhu, T. (2015). Upselling versus Upsetting Customers? A Model of Intrinsic and Extrinsic Incentives. Working paper, Johns Hopkins University.

[48] Oliva, R., and Sterman, J. (2001). Cutting Corners and Working Overtime: Quality Erosion in the Service Industry. *Management Science* 47, 894-914.

[49] Palmatier, R., Scheer, L., and Steenkamp, J-E. (2007). Customer Loyalty to Whom? Managing the Benefits and Risks of Salesperson-Owned Loyalty. *Journal of Marketing Research* 56, 185-199.

[50] Patterson, Paul G., et al. (2009). "Customer rage: triggers, tipping points, and take-outs." *California Management Review* 52.1: 6-28.

[51] Pfeffer, J. (1998). *The Human Equation: Building Profits by Putting People First*, Harvard Business Review Press.

[52] Reichheld, F. (2003). The One Number You Need. *Harvard Business Review* December 2003, 47-54.

[53] Roehm, Michelle L., and Michael K. Brady (2007). "Consumer responses to performance failures by high-equity brands." *Journal of Consumer Research* 34.4: 537-545.

[54] Rust, R., and Chung, T-S. (2006). Marketing Models of Service and Relationships. *Marketing Science* 25, 560-580.

[55] Rust, R., and Huang, M-H. (2012). Optimizing Service Productivity. *Journal of Marketing* 76, 47-66.

[56] Rust, R., and Huang, M-H. (2014). The Service Revolution and the Transformation of Marketing Science. *Marketing Science* 33, 206-221.

[57] Schlesinger, L., and Heskett, J. (1991). The Service-Driven Service Company. *Harvard Business Review* September-October, 1991.

[58] Smith, J. (2012). America's Happiest Companies. *Forbes*, December 10, 2012.

[59] Society for Human Resource Management. (2015). Employee Job Satisfaction and Engagement: Optimizing Organizational Culture for Success.

[60] Staw, B., and Barsade, S. (1993). Affect and managerial performance: a test of the sadder-but-wiser vs. happier-and-smarter hypothesis. *Administrative Science Quarterly*, 38, 304-331.

[61] Strizhakova, Yuliya, Yelena Tsarenko, and Julie A. Ruth (2012). "I'm mad and I can't get that service failure off my mind coping and rumination as mediators of anger effects on customer intentions." *Journal of Service Research* 15.4: 414-429.

[62] Sudhir, K., and Nathan Yang (2018). "The Value of Free Upgrades." Working paper.

[63] Sun, M., and Zhu, F. (2013). Ad Revenue and Content Commercialization: Evidence from Blogs. *Management Science*, forthcoming.

[64] Sundar, S., Kumar, V., Goreczny, A., and Maurer, T. (2016). Why do Salespeople Quit? An Empirical Examination of Own & Peer Effects on Salesperson Turnover Behavior. *Journal of Marketing Research*, forthcoming.

[65] Tax, Stephen S., and Stephen W. Brown (1998). "Recovering and learning from service failure." *MIT Sloan Management Review* 40.1 (1998): 75.

[66] Ton, Z., and Huckman, R. (2008). Managing the Impact of Employee Turnover on Performance: The Role of Process Conformance. *Organization Science* 19, 56-68.

[67] Vroom, V. H. (1964). *Work and Motivation*, John Wiley & Sons, New York.

[68] Wagner, R. (2017). Happy Employees Equal Happy Customers? Well, Yes, But It's Complicated. *Forbes*, February 27, 2017.

[69] Wiesman, D. (2010). The Effects of Performance Feedback and Social Reinforcement on Up-Selling at Fast-Food Restaurants. *Journal of Organizational Behavior Management* 26, 1-18.

[70] Yao, D., Yang, H., and Gatignon, H. (2014). Why Customers Upgrade Their Reserved Options: The Impact of the Reservation Gap. Working paper, NUS Business School.

[71] Ying, Y., Feinberg, F., and Wedel, M. (2004). Leveraging Missing Ratings to Improve Online Recommendation Systems. *Journal of Marketing Research* 61, 355-365.

[72] Zeithaml, V., Bitner, M-J., and Gremler, D. (2009). *Service Marketing: Integrating Customer Focus Across the Firm* 5th Edition, McGraw-Hill Irwin Press.