

Sales Productivity and Employee Engagement: Evidence from Upselling in the Car Rental Industry*

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Abstract

This research investigates whether or not employee engagement has an impact on upselling effectiveness in the car rental service industry, where upselling is a key performance metric for customer development. Our empirical strategy employs a series of simple empirical tests based on measures of engagement constructed using various sub-groups of employees and questions. The main results demonstrate that engagement by employees who actually interact with customers and focus about customer-centric issues have a markedly larger effect on sales productivity via upselling, as compared with the alternative engagement measures. Furthermore, we show that employee engagement has a greater impact on upselling effectiveness among transactions made by business and weekend users.

Keywords: Customer development; Customer relationship management; Direct marketing; Relationship marketing; Retail value chain; Service industry.

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1 Introduction

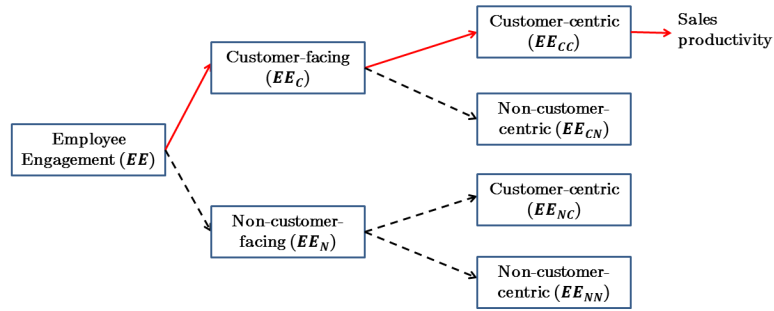
One key performance indicator for customer development¹ is a firm or brand’s ability to upsell customers; that is, convincing customers at (or close to) the point of consumption to choose a higher value alternative that is more profitable to the firm. While much of the recent focus has been on computer-based upselling systems á la automated recommendation systems (Ansari et. al., 2000; Ansari and Mela, 2003; Bodapati, 2004; Iacobucci, Arabie, and Bodapati, 2000; Kamakura et. al., 1991; Kamakura et. al, 2003; Knott, Hayes, and Neslin, 2002; Li, Sun, and Wilcox, 2005; Ying, Feinberg, and Wedel, 2006), many upselling scenarios still require the “personal touch,” most notably in retail services, such as the airline, car rental, hotel, and restaurant industries. In the service industry, customers often interact with sales representatives, which then give employees opportunities to recommend higher value options at the point of consumption. Given the face-to-face nature of these interactions, there in fact may be tangible benefits to employee engagement (Cooper, 2012);² yet little has been done to empirically uncover its true rate-of-return. We fill this void by studying the returns from engagement by using a large data-set from the car rental service industry, which allows us to connect transactions and various measures of employee engagement to assess the impact that engagement has on sales productivity via upselling. From a methodological perspective, we employ a series of empirical tests based on a variety of sub-groupings (refer to Figure 1) to illustrate the effect of employee engagement on upselling.

In our first set of tests, we consider sub-groups of transactions handled employees (within the same location and during the same time period) who differ depending on whether or not they directly face customers. Intuitively, engagement among employees who actually interact with customers and are concerned about customer-centric issues should have a markedly larger effect on sales productivity, which then forms the basis for our tests and regressions. These tests and regressions show that the marginal impact of engagement on upselling is more pronounced among employees who actually face customers (as compared with employees

¹Part customer relationship management (CRM). Key CRM strategies that impact customer life-cycle include customer acquisition, development, and retention. Refer to the literature review by Kamakura et. al. (2005) for more details.

²Some companies pride themselves as employing the most engaged workers (Smith, 2012), and many go through great lengths to maintain high levels of employee engagement.

Figure 1: Sub-Groups for Analyzing Impact of Engagement on Sales Productivity



who do not face customers). In our second set of tests and regressions, we consider further sub-groupings based on whether or not the engagement measures are constructed based on questions related to customer service issues. With these sub-groupings, our tests and regression show that the marginal impact of employee on upselling is most pronounced among employees who face customers and when engagement measures are based on customer-centric related issues.

We later investigate a potential mechanism behind the employee engagement effects. In particular, our analysis tests the validity of the retail value chain framework (Heskett et al., 1994), which posits customer satisfaction as an intermediate node in the link between employee engagement and sales. To test for this intermediate link, we repeat our baseline specifications except with a customer satisfaction measure as the main dependent variable. In this analysis, we find suggestive evidence in favor of such a link.

Our findings suggests that employee engagement may play an important role as a marketing mix intervention. Marketing mix interventions in general may have heterogeneous effects across different users; in particular, business versus casual customers, and weekend versus weekday customers. Motivated by these implications, we uncover asymmetric patterns across different types of users in the effect of employee engagement on upselling. In particular, we investigate whether or not engagement has differential effects between casual and business customers, and weekend and weekday customers. The effects we find across the different customer segments suggest that employee engagement has a larger impact on business and weekend customers.

Past research, as summarized in Table 1, has explored (subsets of) links within retail value

Table 1: Related Empirical Literature About Retail Value Chains

Study	Context	Type of data variation in employee engagement		
		Engagement	Customer-centric	Customer-facing
Ahearne et. al. (2013)	U.S.-based Fortune 500 company in B2B	Yes	No	No
Bolton (1998)	Cellular service	No	No	No
Chandrashekar et. al. (2007)	North American B2B	No	No	No
Denizci and Li (2009)	American Customer Satisfaction Index (ACSI)	No	No	No
Dotson and Allenby (2010)	Financial Services	Yes	No	No
Evanschitzky, Wangenheim, and Wunderlich (2012)	European franchise chain	Yes	No	No
Frey, Bayón, and Totzek (2013)	Professional services	Yes	No	No
Fornell, Rust, and Dekimpe (2010)	American Customer Satisfaction Index (ACSI)	No	No	No
Grewal, Chandrashekar, and Citrin (2010)	U.S. airlines	No	No	No
Jacobson and Mitzik (2009)	American Customer Satisfaction Index (ACSI)	No	No	No
Krishnan et. al. (1999)	Financial services	No	No	No
Lapr�e and Tsikriktsis (2006)	U.S. airlines	No	No	No
Loveman (1998)	Retail banking	Yes	No	No
Luo, Homburg, and Wieseke (2010)	American Customer Satisfaction Index (ACSI)	No	No	No
Mittal and Kamakura (2001)	Automobile purchase	No	No	No
Mittal et. al. (2005)	American Customer Satisfaction Index (ACSI)	No	No	No
Maxham, Netemeyer, and Lichtenstein (2008)	Large retail chain	Yes	Yes	No
Netemeyer and Maxham (2007)	B2B retail setting	Yes	Yes	No
Rust and Zahorik (1993)	Financial services	No	No	No
Seiders et. al. (2005)	Women’s apparel and home furnishing retailer	No	No	No
Sun and Kim (2013)	American Customer Satisfaction Index (ACSI)	No	No	No
Van Dolen et. al. (2002)	Retail store	No	No	No
Verhoef, Franses, and Hoekstra (2001)	Dutch insurance underwriter	No	No	No
Current (2013)	Car rental service	Yes	Yes	Yes

chains - the impact of employee engagement on customer satisfaction, customer satisfaction on firm sales and performance, or both. The most relevant studies to ours are those that look at the entire value chain, going from employee satisfaction to sales productivity. Some examples include Evanschitzky, Wangenheim, and Wunderlich (2012), Maxham, Netemeyer, and Lichtenstein (2008), Netemeyer and Maxham (2007), and Loveman (1998).

Maxham, Netemeyer, and Lichtenstein (2008) and Netemeyer and Maxham (2007) consider a categorization of perceptions among employees based on how they feel about their overall performance, performance towards customers (i.e., customer-centric), and performance towards the organization (i.e., non-customer-centric). An important distinction between our measures of customer-centric and non-customer-centric engagement and their seemingly related measures is that our categorized engagement scores are obtained from the employee’s introspection, as opposed to a rating assigned by his or her manager;³ consequently, their employee performance measures may capture an *ex post* outcome of engagement, rather than engagement in itself. In addition to these customer-centric and non-customer-centric categorizations, we have an additional dimension along the lines of variation in customer-facing versus non-customer facing employees, which ultimately helps us produce a more granular categorization of employee engagement.⁴

2 Data

Our analysis makes use of over 150,000 car rental transactions made by over 100,000 individual users. We focus on transactions made at around 100 airport locations (in either Canada or United States), as only these can be matched to location-time specific employee surveys.⁵ We see transactions taking place in 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 summary of the type of information we used to

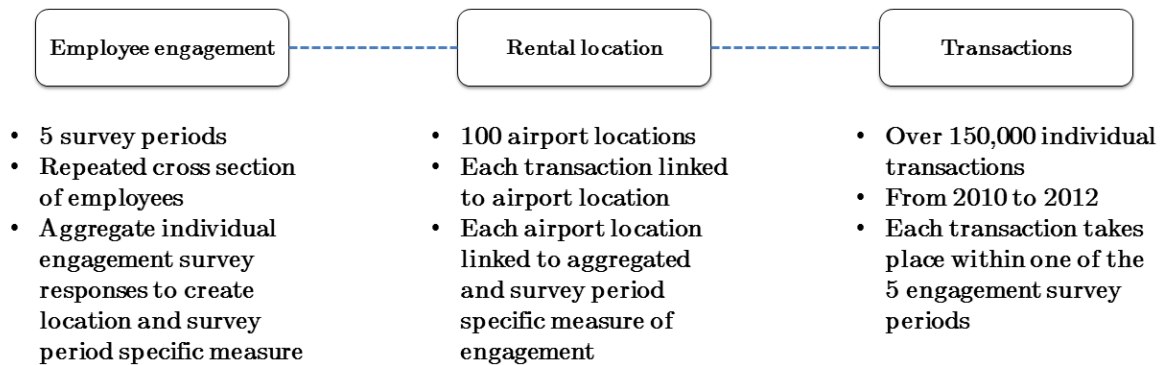
³Sample questions from Maxham, Netemeyer, and Lichtenstein’s (2008) surveys for managers include: 1) How often did this employee go above and beyond “the call of duty” when serving customers? 2) How often did this employee perform tasks that were not required, but that helped (name)?

⁴For example, in Maxham, Netemeyer, and Lichtenstein (2008), all of the retail employees in their sample interact with customers.

⁵Locations that are not in airports tend to be smaller, and as these locations have fewer employees, the surveys from these locations cannot be released due to privacy concerns.

construct our data, we refer the reader to Figure 2.⁶

Figure 2: Information Used to Construct 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. Users choose between 26 classes, where higher classes are of higher quality. Note that once the user arrives at the rental location to pick up the car keys, it is possible for the sales agent convince him or her to choose a different (and ideally) higher car class. If a user agrees to this higher and more expensive car class, we refer to it as an upsell. In our data, most upsells lie within 5 class levels. Other performance metrics one may be interested in include cross-selling outcomes, such as whether or not a customer chooses to add on GPS, satellite radio, and/or pre-paid fuel options. Furthermore, given a particular transaction, we can observe whether or not that customer makes a subsequent transaction, and if so, how many days it takes for the customer to make the next purchase. Our data also includes the Net Promoter Score (NPS), which is an industry standard metric that captures how enthusiastic customers feel towards the brand.⁷ This score can take on three possible values, -100, 0, or 100, which represent increasing levels of enthusiasm towards the brand.

Some of the user-trip characteristics include whether or not the reservation is an airport rental, was made over the phone, is for business purposes, and/or occurs over the weekend.

⁶Note that additional details about data and variable construction are provided in the Appendix.

⁷We refer the reader to Reichheld (2003) for more details.

Table 2: Summary Statistics for Data Used

Variable	Mean	Std. Dev.	N
<i>Sales outcomes</i>			
Upsell	0.0404	1.022	163650
GPS	0.1276	0.3337	163650
Sirius radio	0.0228	0.1493	163650
Prepaid fuel	0.0186	0.1349	163650
Repeat purchase	0.1354	0.3422	163650
Days between purchase	190.0709	150.1314	22122
NPS	50.0217	74.568	163650
<i>User-trip characteristics</i>			
Reserved class	5.2456	4.3302	163650
Customer tier	1.7029	1.0149	163650
Phone reserve	0.1069	0.309	163650
Business	0.4404	0.4964	163650
Weekend	0.193	0.3947	163650
Duration	3.7121	4.1087	163606
<i>Engagement</i>			
EE_C^H	0.5022	0.5	163650
EE_N^H	0.4772	0.4995	163650
EE_{CC}^H	0.5517	0.4973	163650
EE_{CN}^H	0.521	0.4996	163650
EE_{NC}^H	0.4947	0.5	163650
EE_{NN}^H	0.5027	0.5	163650

We can also identify how long each rental lasted. From Table 2 shows that about 11 percent are booked over the phone, 50 percent are for business purposes, and 19 percent over the weekend. The average car rental duration is 4 days.

Customers can be divided into tier groups, which we codify from 1 to 6.⁸ Users who are not affiliated to a tier are assigned with a 0. Although the exact qualitative description of each tier level is not available, we know that the higher tier levels are considered to be more “elite” or prestigious. Furthermore, the tier level assigned to users is largely a function of the number of rental transactions, number of rental days, a monthly or annual fee, or some combination of all three. Their exact benefits were not provided by the company, however, common perks include discounts, free upgrades, and rewards.

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. 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, 6 surveys were conducted by the car rental company,

⁸The codes have the following correspondence: Regular Gold (1), Five Star Gold (2), President’s Circle (3), Number 1 Club (4), Platinum Select (5), and VIP Platinum (6).

namely the time before/during October 2010 (36,876 surveys), after October 2010 and before May 2011 (127,544 surveys), after May 2011 and before November 2011 (90,581 surveys), after November 2011 and before April 2012 (111,477 surveys), and after April 2012 and before October 2012 (600 surveys). Note that for all of our empirical analysis, we use a dummy to indicate whether a location at a particular time has a high or low level of employee engagement, as determined using a median split. More details about these measures of employee engagement will be provided in the next section.

3 Employee Engagement and Sales Productivity

3.1 Engagement Among Customer-Facing Employees

The first sub-grouping we consider is engagement among employees that face customers directly ($EE_C \in \{EE_C^H, EE_C^L\}$) versus engagement among employees that do not face customers directly ($EE_N \in \{EE_N^H, EE_N^L\}$), where superscript H denotes engagement measures that are above the median level and L denotes engagement measures that are below the median level.⁹ One hypothesis based on this construction of employee engagement is that the impact of employee satisfaction should be most pronounced among those who actually interact with customers (i.e., customer-facing). Therefore, the differential impact of high versus low employee engagement on upselling should be higher among customer-facing employees (as compared to non-customer-facing employees). Customer-facing and non-customer-facing employees should face similar demand/supply-side shocks that jointly affect their productivity and workplace satisfaction. We refer the reader to the Appendix for comparisons of observable user-trip characteristics between different groups.

3.2 Engagement Type Among Customer-Facing Employees

More refined measures of employee satisfaction can be calculated using a further sub-grouping based on engagement measures constructed using survey questions that pertain to customer-centric issues that employees face. Therefore, we can consider four different subgroups. The first sub-grouping considered is engagement based on customer-centric issues among em-

⁹The median level is calculated using satisfaction measures from all locations over time.

Table 3: Results from Tests with Bootstrapped Standard Errors

Test	Difference	SE
$[Upsell EE_C^H - Upsell EE_C^L] - [Upsell EE_N^H - Upsell EE_N^L]$	0.014731	0.003339
$Upsell EE_{CC}^H - Upsell EE_{CC}^L$	0.013025	0.003586
$[Upsell EE_{CC}^H - Upsell EE_{CC}^L] - [Upsell EE_{CN}^H - Upsell EE_{CN}^L]$	0.004919	0.001819
$[Upsell EE_{CC}^H - Upsell EE_{CC}^L] - [Upsell EE_{NN}^H - Upsell EE_{NN}^L]$	0.017694	0.003623
$[Upsell EE_{CC}^H - Upsell EE_{CC}^L] - [Upsell EE_{NC}^H - Upsell EE_{NC}^L]$	0.018625	0.003334

ployees who face customers directly ($EE_{CC} \in \{EE_{CC}^H, EE_{CC}^L\}$). The second sub-grouping considered is engagement not based on customer-centric issues among employees who face customers directly ($EE_{CN} \in \{EE_{CN}^H, EE_{CN}^L\}$). The third sub-grouping considered is engagement based on customer-centric issues among employees who do not face customers directly ($EE_{NC} \in \{EE_{NC}^H, EE_{NC}^L\}$). Finally, the fourth sub-grouping considered is engagement not based on customer-centric issues among employees that do not face customers directly ($EE_{NN} \in \{EE_{NN}^H, EE_{NN}^L\}$). The main hypothesis would be that engagement based on customer-centric issues among employees that actually interact with customers would have the largest impact on upselling as compared to engagement based on non-customer-centric issues among these same employees; as a robustness check, one would expect customer-centric and customer-facing engagement to have a larger impact than the other two measures constructed for non-customer-facing engagement.

3.3 Preliminary Evidence

Table 3 summarizes the main findings from our non-parametric tests. First, our test that uses engagement measures from customer-facing and non-customer-facing employees suggests a positive relationship between engagement and sales productivity, as the positive impact of high engagement is more pronounced among employees that actually interact with customers.

When we further break-down the employee engagement measures based on whether or not they as based on customer-centric or non-customer-centric related issues, many of our tests confirm our hypotheses. In particular, we see that the differential impact of EE_{CC} on upselling is more pronounced than the differential impact of EE_{CN} , EE_{NC} , and EE_{NN} . That is, engagement based on customer-centric issues among employees that interact with

customers has a stronger impact on sales productivity as compared to engagement based on other measures. The key test here is the impact of EE_{CC} compared with the impact of EE_{CN} on sales productivity, as this test is based on customer-facing employee engagement within the same location and time period, but regarding different issues. Comparisons between EE_{CC} with EE_{NC} and EE_{NN} serve primarily as robustness checks.

4 Regression Analysis

4.1 Basic Specification

Building on our preliminary results, we now analyze the relationship between employee engagement and sales productivity via fixed effects regression. We consider a variety of specifications based on the most refined constructions of employee engagement (i.e., EE_{CC}^H , EE_{CN}^H , EE_{NC}^H , and EE_{NN}^H) that allow us to compare customer-centric and non-customer-centric engagement among customer-facing employees.

Our regressions use $Upsell_{mt}$ as the main dependent variable, which is the number of car class levels above the original choice, that a user is willing to pay out-of-pocket. User-trip specific variables, such as the original class reserved, customer tier level, whether or not the rental is from an airport, reserved over the phone, for business purposes, and/or occurs during a weekend, as well as the rental duration are represented by X_{mt} . The location fixed effect is captured by ω_m , and ε_{mt} is an i.i.d. shock. With this notation in place, we consider the following regression:

$$Upsell_{mt} = X_{mt}\beta + \gamma_1^3 \cdot EE_{mt,CC}^H + \gamma_2^3 \cdot EE_{mt,CN}^H + \gamma_3^3 \cdot EE_{mt,NC}^H + \gamma_4^3 \cdot EE_{mt,NN}^H + \omega_m + \varepsilon_{mt} \quad (1)$$

Here, we are comparing the customer-centric engagement measures for employees who face customers ($EE_{mt,CC}^H$), non-customer-centric engagement measures for employees who do face customers ($EE_{mt,CN}^H$), customer-centric engagement measures for employees who do not face customers ($EE_{mt,NC}^H$), and non-customer-centric engagement measures for employees who do not face customers ($EE_{mt,NN}^H$). The test that we are interested in this case is whether $\gamma_1^3 > 0$ and $\gamma_1^3 > \gamma_j^3$ for all $j \neq 1$.¹⁰

¹⁰Note that for all specifications, we employ block bootstrapping to obtain standard errors as suggested

4.2 Main Results

Table 4 presents the main results from our regression analysis. We first discuss the key drivers of upselling productivity, and then summarize the main findings. Column 1 displays the results for the specification with location-user controls, column 2 contains location fixed effects, and column 3 contains monthly dummies.

Our results show that the number of car class levels that can be upsold is negatively associated with the originally reserved class level. Furthermore, higher tiered customers, weekend rentals, and longer duration rentals are associated with larger upsells, although the effects are not statistically significant. In contrast, rentals booked over the phone and/or for business purposes are unlikely to upsold many class levels.

Our key findings pertain to the impact of different constructions of employee engagement on sales productivity. The main estimates are supplemented with Table 5, which provide us the key test statistics.

When location-user controls are included, engagement based on customer-centric issues among customer-facing employees has a positive and statistically significant effect. Note that the coefficient for EE_{CC}^H gets larger as we include more time and location controls, which suggests that unobserved location attributes are biasing our estimates downward.

To confirm that indeed the effect from EE_{CC}^H is larger than the effect from EE_{CN}^H , we consult our tests that compare their parameters; these tests show that indeed this is the case. As further robustness, we also see that EE_{CC}^H has a larger effect than EE_{NC}^H and EE_{NN}^H . Note that for all of these tests, we see the test statistics are large enough such that they are significant at the 5 percent level.

To get a sense of the magnitude of our estimates, recall that customers typically do not deviate much from the class they originally booked, as the average value for the degree of upselling is about 0.04. Therefore, effects of high engagement among customer-facing employees is about 50 percent of this average value.

for panel data by Bertrand, Duflo, and Mullainathan (2004).

Table 4: Regressions Using Degree of Upsell as Dependent Variable

	(1)	(2)	(3)
	Upsell	Upsell	Upsell
EE_{CC}^H	0.0258** (0.00797)	0.0263** (0.00880)	0.0268** (0.00870)
EE_{CN}^H	-0.00748 (0.00972)	-0.00740 (0.00968)	-0.00760 (0.00963)
EE_{NC}^H	-0.00978 (0.00719)	-0.00888 (0.00753)	-0.00855 (0.00756)
EE_{NN}^H	0.000821 (0.00743)	0.00181 (0.00799)	0.00159 (0.00792)
Reserved class	-0.0294*** (0.00376)	-0.0294*** (0.00376)	-0.0294*** (0.00376)
Customer tier	0.0229 (0.0167)	0.0229 (0.0167)	0.0228 (0.0167)
Phone reserve	-0.0803* (0.0341)	-0.0805* (0.0344)	-0.0802* (0.0344)
Business	-0.0943*** (0.0263)	-0.0939*** (0.0262)	-0.0940*** (0.0262)
Weekend	0.0236* (0.0119)	0.0235 (0.0120)	0.0235 (0.0120)
Duration	0.00242 (0.00143)	0.00237 (0.00143)	0.00237 (0.00143)
Constant	0.200*** (0.0302)	0.185*** (0.0281)	0.194*** (0.0288)
Observations	163606	163606	163606
R^2	0.01	0.02	0.02
FE	No	Yes	Yes
Time dummies	No	No	Yes

Bootstrapped standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Comparison Tests for Main Specification Using Estimated Parameters

Test	Statistic	P-value
$\gamma_1^3 \neq \gamma_2^3$	4.53	0.0333
$\gamma_1^3 \neq \gamma_3^3$	16.63	0.0000
$\gamma_1^3 \neq \gamma_4^3$	6.26	0.0124

4.3 Robustness Checks

In this section we check robustness of our results in a variety of ways. The first set of robustness checks are presented in Table 6.

The volume of transactions that a location handles may affect the employees' ability to satisfy customers' needs. Busy employees that receive a large number of customers may have to handle many requests at the same time. Therefore, despite high engagement levels *ex ante*, they may still be unable to generate significant upsells. For this robustness check, the relevant sub-samples in this case would be the sub-sample based on transactions at locations that handle many transactions (i.e., above median levels), and the sub-sample based on transactions at locations that handle few transactions (i.e., below median levels). Columns 1 and 2 show the positive relationship between customer-centric engagement among customer-facing employees and sales productivity persists across sub-samples.

Next, we investigate whether or not the presence of repeat customers may be biasing the results. Customers who repeatedly purchase from a particular location may have a specific preference for that location and/or its staff. Therefore, these customers may be more susceptible to upselling. Column 3 shows that when the repeat customers are not included, our results still hold.

Finally, one may be concerned about region specificities that could drive both engagement and upselling success. There may be region-specific culture and attitudes that make customers more willing to pay for higher car classes, and employees more satisfied with their jobs. The sample can be divided into 7 regions, so we consider a robustness check which includes dummies for these regions. In this specification, our finding that customer-centric engagement among customer-facing employees has the largest effect remains. Furthermore, its effect on its own is both positive and significant.

As an additional robustness check, we allow for the possibility of selection in the various employee engagement measures. In particular, certain types of employees may be selected into different positions. For instance, we might be concerned that certain types of employees (who happen to be engaged) are assigned customer-facing roles. To illustrate this point, we include Table 7, which provides a sample of job opportunities at the car rental company and

Table 6: Robustness Checks Using Different Specifications and Sub-Samples of Data

	(1) High volume location	(2) Low volume location	(3) No repeat customers	(4) Region dummies
EE_{CC}^H	0.0218* (0.00939)	0.439*** (0.0760)	0.0290*** (0.00799)	0.0263** (0.00880)
EE_{CN}^H	-0.00453 (0.0105)	-0.394*** (0.0621)	-0.00727 (0.0102)	-0.00740 (0.00968)
EE_{NC}^H	-0.00697 (0.00720)	-0.324*** (0.0679)	-0.00628 (0.0106)	-0.00888 (0.00753)
EE_{NN}^H	0.00177 (0.00574)	0.172 (0.112)	0.00722 (0.00887)	0.00181 (0.00799)
Reserved class	-0.0293*** (0.00436)	-0.0373*** (0.0110)	-0.0260*** (0.00161)	-0.0294*** (0.00376)
Customer tier	0.0234 (0.0173)	-0.0157 (0.0458)	0.0138*** (0.00372)	0.0229 (0.0167)
Phone reserve	-0.0816* (0.0319)	0.0216 (0.102)	-0.0610*** (0.0120)	-0.0805* (0.0344)
Business	-0.0924*** (0.0272)	-0.206 (0.111)	-0.0703*** (0.00470)	-0.0939*** (0.0262)
Weekend	0.0253*** (0.00650)	-0.110 (0.0856)	0.0255* (0.0104)	0.0235 (0.0120)
Duration	0.00239* (0.00102)	0.00210 (0.00564)	0.00330** (0.00114)	0.00237 (0.00143)
Constant	0.182*** (0.0318)	0.535** (0.194)	0.156*** (0.00813)	0.185*** (0.0281)
Observations	161418	2188	126168	163606
R^2	0.02	0.02	0.01	0.02
FE	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes

Bootstrapped standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Sample of Job Positions

Position	Description
Heavy mechanic	Basic understanding of engines, electrical systems, propane systems, hydraulics, track equipment, aerial equipment, and heavy trucks.
Field mechanic	In-depth understanding of engines, electrical systems, propane systems, hydraulics, track equipment, aerial equipment, and heavy trucks.
Lube technician	Over 20 years old, good driving record, and flexible hours.
Counter sales representative	Responsible for selling optional services, ensuring customer receives high quality service, setting and achieving personal sale goals, being friendly, greeting customers, adapting to changing sales environment, qualifying and processing customer rentals, providing solutions to customer inquiries and concerns, adhering to all company policies and procedures.
Body damage appraiser	Strong customer service skills, responsible for meeting and greeting body shop owners working on fleet, discovering new shops to add to vendor list, contacting body shops regarding damaged cars, completing administrative paperwork for the fleet, and ensuring quality control.
Utility worker	Required to have customer service skills, flexible work hours, 20 years old, and drivers license.
Vehicle service attendant	Responsible for vehicle preparation, driving and parking vehicles, checking vehicles for damage, checking vehicle status, ensuring that vehicles are clean, filling gasoline tank, cleaning exterior of vehicle, processing and standardization quotas, and able to work outdoors.

brief descriptions about these positions.¹¹ For example, the counter sales representatives are chosen based on their ability to deal with customers.

To address these concerns about selection, we consider the approach by Altonji, Elder, and Taber (2005), hereafter AET.¹² These specifications are essentially the same as the original ones, except we allow the employee engagement measures to depend on observable characteristics. The main assumption that this approach relies on is that *selection on observables is the same as selection on unobservables*. In addition to the user-trip characteristics we have used in the baseline specifications, we also include location specific characteristics such as the average tenure of customer-facing employees, average tenure of non-customer-facing employees, number of customer-facing managers, and number of non-customer-facing employees, average tenure of customer-facing managers, average tenure of non-customer-facing managers, average tenure of customer-facing non-managers, and average tenure of non-customer-facing non-managers. These additional variables may also have an impact on

¹¹We obtained these position details from car rental company's job opening repository.

¹²For another application of the AET approach in marketing research, we refer the reader to Sen, Shin, and Sudhir (2011) and Sun and Zhu (2013).

employee engagement.

Table 8: Summary Statistics for Customer-Facing and Non-Customer Facing Employees

Variable	Mean	Std. Dev.	N
Average tenure of customer-facing employees	5.086	1.576	451
Average tenure of non-customer-facing employees	5.731	1.954	444
Number of customer-facing employees	25.515	21.438	495
Number of non-customer-facing employees	18.085	18.089	495
Number of customer-facing managers	6.239	4.46	451
Number of non-customer-facing managers	1.797	2.16	444
Average tenure of customer-facing managers	5.612	2.193	488
Average tenure of non-customer-facing managers	7.328	2.831	326
Average tenure of customer-facing non-managers	4.775	1.999	495
Average tenure of non-customer-facing non-managers	5.48	2.145	480

Table 8 provides additional statistics about the composition of different employee types across locations. On average, there are about 26 customer-facing employees at a given location, and about 18 non-customer-facing employees. Customer-facing employees and non-customer-facing employees have similar tenures, both of which have about 5 years worth of work experience. Also, there are on average more customer-facing managers (about 6) than non-customer-facing managers (about 2) at each location.

The main results are provided in Table 9. A few observations are in order. First, the sign of the effects from service-based and customer-facing engagement measures remain positive. Second, we see that even when selection is accounted for via the AET approach, the effects from customer-centric engagement among customer-facing employees is largest relative to the other engagement measures.

Table 9: Estimates from the AET Approach

	Estimate	SE
EE_{CC}^H	0.009486***	(0.001270)
EE_{CN}^H	-0.003764	(0.002150)
EE_{NC}^H	-0.000909	(0.003909)
EE_{NN}^H	0.002782	(0.003323)
FE		Yes
Time dummies		Yes

4.4 Mechanism Related to Employee Engagement Effects

In this section we explore a potential mechanism behind the link between employee engagement and sales productivity. Under the retail value chain framework, one potential explanation is customer satisfaction. That is, employee engagement leads to higher customer satisfaction, which then leads to better sales outcomes. We are unfortunately unable to test directly for such a link, as the customer surveys are completed after each of the transactions in our data; therefore, inference that tries to investigate the impact of customer satisfaction on sales productivity may be misleading. Nevertheless, we explore the possibility that employee engagement has an impact on customer satisfaction. Evidence of such an effect would provide suggestive, but not direct, evidence in favor of the retail value chain.

To implement this test, we consider the same baseline specifications as before, except now we use a measure of customer satisfaction as the primary dependent variable. The measure we use to capture customer satisfaction is the NPS. Two specifications are considered. In the first specification, we do not include the degree of upsell as an explanatory variable, while in the second specification, we include the degree of upsell.

Table 10 presents the main results from this regression analysis. In both columns, our results point to a positive and statistically significant relationship between customer-centric engagement among customer-facing employees. So therefore, we see a link between employee engagement and customer satisfaction. Although the coefficient for EE_{CC}^H appears to be larger than the coefficients for alternative measures of engagement, Table 11 shows that the positive difference between these coefficients is not statistically significant for some comparisons.

We conjecture that this weaker test result is due to the fact that surveys are completed after car rentals. As rentals are on average nearly 4 days in length, the customer’s personal experience with the car rental employees may be imperfectly recalled. Furthermore, the NPS score may capture the customer’s experience towards all aspects of the rental that are unrelated to the employees they interacted with.

To evaluate this conjecture, we focus our attention on column 2, which shows the estimates from the specification that includes degree of upsell as an explanatory variable. Since

Table 10: Regressions Using NPS as Dependent Variable

	(1) NPS	(2) NPS
Upsell		1.330*** (0.358)
EE_{CC}^H	2.310*** (0.559)	2.272*** (0.555)
EE_{CN}^H	1.809 (1.999)	1.816 (1.995)
EE_{NC}^H	0.0429 (1.114)	0.0516 (1.112)
EE_{NN}^H	0.793 (0.942)	0.787 (0.942)
Reserved class	0.198** (0.0612)	0.236*** (0.0560)
Customer tier	1.615*** (0.274)	1.587*** (0.272)
Phone reserve	5.218*** (0.644)	5.321*** (0.624)
Business	-2.342*** (0.702)	-2.221** (0.693)
Weekend	1.332** (0.470)	1.299** (0.473)
Duration	0.227*** (0.0377)	0.223*** (0.0378)
Constant	44.60*** (1.280)	44.35*** (1.272)
Observations	163543	163543
FE	Yes	Yes
Time dummies	Yes	Yes
Bootstrapped standard errors in parentheses		
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$		

Table 11: Comparison Tests for Mechanism Behind Employee Engagement Effects

Test	Statistic	P-value
$\gamma_1^3 \neq \gamma_2^3$	0.04	0.8381
$\gamma_1^3 \neq \gamma_3^3$	8.02	0.0046
$\gamma_1^3 \neq \gamma_4^3$	1.81	0.1788

Table 12: Empirical Link between NPS and Customer Retention

	(1)	(2)
	Repeat purchase	Days between purchase
NPS	0.000232*** (0.0000149)	-0.0777** (0.0240)
Reserved class	-0.00163*** (0.000284)	1.560*** (0.412)
Customer tier	0.0515*** (0.00269)	-18.27*** (1.245)
Phone reserve	-0.00604 (0.00518)	-15.74** (5.702)
Business	0.0346*** (0.00327)	7.151 (4.612)
Weekend	-0.000153 (0.00201)	-0.937 (2.475)
Duration	-0.00168*** (0.000421)	-0.611* (0.295)
Constant	0.0319*** (0.00301)	222.0*** (5.481)
Observations	163543	22089
R^2	0.03	0.03
FE	Yes	Yes
Time dummies	Yes	Yes

Bootstrapped standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

the upselling event occurs before the customer surveys are issued, but after customers interact with front-end employees, we should expect upselling to have some effect on customer satisfaction. Our analysis confirms this pattern, as upselling is positively associated with the NPS measure of customer satisfaction.

As we have demonstrated an empirical relationship between employee engagement and NPS scores, we now explore the possibility of a link between customer satisfaction and loyalty. It is worthwhile looking at such a link as retention is observed after the surveys. Thus, our next set of regressions aim to determine whether or not satisfied customers are more likely to purchase again from the car rental company. We consider two different specifications. First, we consider a regression that uses repeat purchase as the dependent variable. Second,

we consider a regression that uses distance between purchases (among repeat purchasers) as the main dependent variable. In both of these regressions, we are primarily interested in the effect of NPS.

Table 12 shows us the main results from these regressions. The key findings are as follows. First, NPS has a positive relationship with repeat purchase propensity. That is, satisfied customers are more likely to continue with the car rental company. Furthermore, the spacing between purchases is more narrow for satisfied customers among those that purchased from the car rental company more than once. These results provide suggestive evidence that links customer satisfaction and loyalty, and thus, is consistent with intuition derived from retail value chains.

In summary, this section demonstrates that employee engagement is positively associated with customer satisfaction. Furthermore, we provide a link between upselling and customer satisfaction. Combined with our previous findings which provide evidence of a connection between employee engagement and upselling, our research provides suggestive evidence in favor of connections posited by the retail value chain framework; that is, employee engagement, customer satisfaction, and upselling are somehow intertwined. Providing further evidence in favor of retail value chains, we find a positive relationship between customer satisfaction and loyalty.

4.5 Asymmetric Effects of Employee Engagement

In this section, we explore whether or not employee engagement has asymmetric effects across different types of customers. One form of asymmetry may be generated by heterogeneity in car rental purpose, such as whether the car is rented for business purposes and whether the car is rented on the weekend. Uncovering this asymmetry is important since the firm may wish to concentrate its employee engagement efforts towards only the most receptive customers. Such concentration may be especially important if a car rental location experiences long line-ups that make it infeasible to be highly engaged towards all customers.

We focus our discussion on the estimates pertaining to employee engagement. Our first observation is that between casual and business users, the effect of customer-centric engagement among customer-facing employees has a larger positive effect on upselling effectiveness

Table 13: Employee Engagement Effects Across Different Types of Customers

	(1)	(2)	(3)	(4)
	Casual	Business	Weekday	Weekend
EE_{CC}^H	0.0242* (0.0116)	0.0321*** (0.00909)	0.0233* (0.0105)	0.0387*** (0.0116)
EE_{CN}^H	-0.000717 (0.0143)	-0.0183 (0.0121)	0.00145 (0.0112)	-0.0451 (0.0304)
EE_{NC}^H	-0.0228 (0.0150)	0.0106 (0.00870)	-0.00963 (0.00791)	-0.00434 (0.0136)
EE_{NN}^H	0.00332 (0.0156)	-0.000114 (0.00754)	0.00817 (0.0105)	-0.0276 (0.0210)
Constant	0.188*** (0.0224)	0.0820*** (0.00972)	0.174*** (0.0200)	0.256*** (0.0546)
Observations	91537	72069	132015	31591
R^2	0.02	0.01	0.02	0.01
Controls	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes

Bootstrapped standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

for business users. Second, we see that employee engagement effects are more pronounced for rentals that take place over the weekend. Therefore, our analysis suggests that employees should focus their marketing efforts towards business class users travelling on the weekend.

5 Discussion

A connection between employee engagement and sales productivity motivates one to explore potential resource allocation strategies a firm can take. We posit a number of managerial decisions for which resource allocation may be used to optimize instruments towards improving employee engagement, and ultimately, strengthening the links within a retail value chain.

A challenge that service representatives in the car rental industry may encounter are face-to-face complaints. For example, overbooking is a common feature in the service industries (Biyalogorsky et. al., 1999, 2005), and such events are likely to create tensions between the customer and company when there are inventory shortages. With such challenges, a car

rental representative may have a dual role, both as a salesperson and conflict diffuser. To what extent employee engagement matters towards these roles would be relevant information when deciding on how much emphasis will be placed on customer complaint management systems (Fornell and Wernerfelt, 1988; Tax, Brown, and Chandrashekar, 1998) in employee training programs.

Capital investments are often made towards employee training (Bapna et. al., 2012). While research has shown a positive relationship between training and productivity, less is known about the scope/specificity of motivation and training. Under our car rental industry setting, relevant questions about scope and specificity of engagement instruments such as motivation management via training include: 1) Should resources be spent towards improving engagement among a certain type of employee? 2) Should resources be spent towards improving all aspects of engagement, or just customer-centric issues?

Another resource allocation decision that a firm may consider is salesforce composition, where studies have shown that employee numbers have an impact on sales productivity (Horsky and Nelson, 1996; Mani, Kesavan, Swaminathan, 2011). A related issue in our setting would be the composition of customer-facing and non-customer-facing managers in car rental locations. There exists economic research that investigates the impact of corporate hierarchies (Bloom, Sadun, and Van Reenen, 2012; Guadalupe and Wulf, 2010), however, it is not yet clear whether certain types of managers have a positive effect on overall employee morale. Understanding these manager presence effects would help the firm assign managers to appropriate roles across locations.

Tenure may also be an important factor in an employee's engagement levels and overall contribution to the firm. Starbucks offers an example of a firm that is pro-active in keeping employees around, as they rank 47th in Fortune magazine's best place to work, and also enjoy some of the lowest employee turnover rates (30%) in the fast food industry (Moon and Quelch, 2006). Ultimately, lost employees will be associated with decreased productivity (Ton and Huckman, 2008). One possible explanation could be learning-by-doing effects that improve employees' ability to handle customer dissatisfaction (Lapr e and Tsikriktsis, 2006). Furthermore, salesperson-owned loyalty will further exacerbate inefficiencies from employee turnover (Palmatier, Scheer, and Steenkamp, 2007).

6 Conclusion

We provide evidence that employee engagement may have an impact on sales productivity under the context of the car rental service industry, as engagement based on customer-centric issues and among employees that directly face customers has a markedly stronger effect on upselling than all other constructions of employee engagement. Our analysis provides some evidence of a potential intermediary effect behind the employee engagement and sales productivity relationship is customer satisfaction, as customers tend to have higher NPS scores at locations with high levels of engagement among customer-facing employees. Finally, our findings suggest that employee engagement may yield higher returns towards customers travelling for business purposes, and on the weekend.

We see opportunities in structural analysis of the long-run impact of employee engagement. A potential link between future employee engagement and current successes in upselling may suggest long-run returns from having greater foresight about management resource allocation. One potential driver of workplace happiness and satisfaction is a sense of accomplishment (Tierney, 2011). Studies have shown customers to be strong motivational forces for the workforce via impact, appreciation, and empathy mechanisms (Grant, 2011). More recently, Frey, Bayón, and Totzek (2013) have shown that customer satisfaction affects employee satisfaction by affecting the perceived appreciation. The degree to which past success in sales acts as a motivator provides us a guide for determining how much effort should be allocated towards mechanisms that inform employees about their past successes. Therefore, policies about customer-facing managerial presence across locations will not only affect contemporaneous engagement, but also future engagement.

Fully modeling and estimating the evolution of employee sales productivity through this dynamic process in future research will be inherently difficult, largely because true location-specific productivity via engagement is not directly observable, and may be serially correlated over time. Fortunately, recent work by Blevins (2011), Blevins, Khwaja, and Yang (2012), and Gallant, Hong, and Khwaja (2011), that employ particle filter methods (i.e., sequential Monte Carlo) demonstrate that serial correlation can be incorporated into seemingly intractable dynamic structural models with very large action and state spaces. We see

these flexible methods as being promising for better understanding long-run dynamics in a structural manner that ultimately builds on the new empirical findings in our paper.

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A Appendix

A.1 Data Construction Details

In this section, we discuss how the different engagement measures are constructed, and then combined with individual transactions data.

A.1.1 Classification of Employee Engagement

Our analysis makes use of variation in terms of whether or not an employee faces a customer directly. About 69 percent of the employees surveyed face the customer directly, while the remaining 31 percent have no direct contact with customers. Figure 3 illustrates that there is variation in the number of customer-facing and non-customer-facing employees across all rental locations.

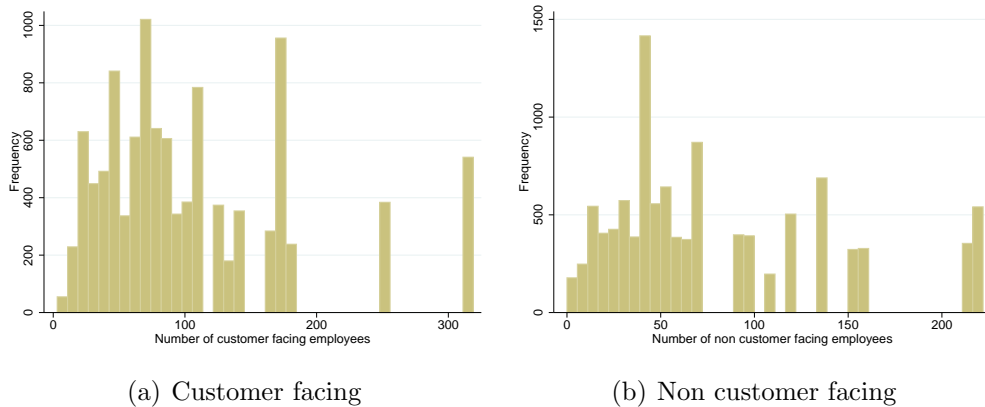


Figure 3: Variation in the Number of Customer-Facing and Non-Customer-Facing Employees Across Locations

Some of the questions can be categorized as being customer-centric or not.¹³ For these employee surveys, we interpret a customer-centric question in a similar manner as Borman and Motowidlo’s (1993) concept of extra-role performance toward customers. Analogously, we interpret a non-customer-centric question in a similar manner as Borman and Motowidlo’s (1993) concept of extra-role performance towards the organization. Customer-centric performance corresponds to the case in which an employee goes above and beyond their required

¹³Note that we confirmed with the car rental company via communication with Wharton Customer Analytics Initiative on October 10, 2013, that such a categorization of questions is appropriate and correct.

Table 14: List of Employee Engagement Survey Questions

Question	Customer-centric
Management is focused on the long-term success of the company	Yes
Our customers will benefit from the changes the company is making	Yes
I know how my job contributes to the success of our business strategies	Yes
I am able to work more efficiently today than I could a year ago	Yes
My manager acts on my suggestions	No
In the last six months, my supervisor and I discussed my job performance	No
I have opportunities to receive training which helps me develop my skills	No
The Company is doing a good job supporting employees through change	No
Our strategies will make us more successful over the long term	Yes
I would recommend this Company to a friend as a good place to work	No

duties to best represent the organization towards customers, while organization-based performance corresponds to the case in which an employee goes above and beyond their required duties to improve the organization in itself. Each of the questions and average scores are listed in Table 14.

A.1.2 Engagement Measures

Each survey question can range from 1 to 5. We define each survey response to question q for employee j in location m during survey period as R_{jqms} . As described in the body of our paper, we categorized each employee engagement survey question as being either customer-centric ($q \in Q_C$) or non-customer-centric ($q \in Q_N$). Furthermore, we know whether an employee faces customers directly ($j \in J_C$) or not ($j \in J_N$).

Using these variables, we can then construct the key location-time specific employee engagement measures as follows:

1. Overall engagement:

$$EE_{ms} = \sum_j \sum_q R_{jqms} \quad (2)$$

2. Engagement among customer-facing employees:

$$EE_{ms,C} = \sum_{j \in J_C} \sum_q R_{jqms} \quad (3)$$

3. Engagement among non-customer-facing employees:

$$EE_{ms,N} = \sum_{j \in J_N} \sum_q R_{jqms} \quad (4)$$

4. Customer-centric engagement among customer-facing employees:

$$EE_{ms,CC} = \sum_{j \in J_C} \sum_{q \in Q_C} R_{jqms} \quad (5)$$

5. Non-customer-centric engagement among customer-facing employees:

$$EE_{ms,CN} = \sum_{j \in J_C} \sum_{q \in Q_N} R_{jqms} \quad (6)$$

6. Customer-centric engagement among non-customer-facing employees:

$$EE_{ms,NC} = \sum_{j \in J_N} \sum_{q \in Q_C} R_{jqms} \quad (7)$$

7. Non-customer-centric engagement among non-customer-facing employees:

$$EE_{ms,NN} = \sum_{j \in J_N} \sum_{q \in Q_N} R_{jqms} \quad (8)$$

With these measures of engagement, we then proceed to match them to individual transactions.

A.1.3 Matching with Individual Transactions

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.

First, recall from an earlier section that the survey periods s are October 2010, May 2011, November 2011, April 2012, and October 2012. In the transactions data, we can identify the exact date of their check-in. Using this information, we use the following rules to match the transaction period to employee engagement survey period:

Table 15: 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

1. If date of check-in is after October 1, 2010 but before May 1, 2011, then transaction t lies in survey period $s = \text{October 2010}$.
2. If date of check-in is after May 1, 2011 but before November 1, 2011, then transaction t lies in survey period $s = \text{May 2011}$.
3. If date of check-in is after November 1, 2011 but before April 1, 2012, then transaction t lies in survey period $s = \text{November 2011}$.
4. If date of check-in is after April 1, 2012 but before October 1, 2012, then transaction t lies in survey period $s = \text{April 2012}$.
5. If date of check-in is after October 1, 2012, then transaction t lies in survey period $s = \text{October 2012}$.

Using these rules, we can then merge each transaction with the location-period specific employee engagement measures. Below, we present the distribution (Table 15) of merged transaction observations across different employee survey time periods. From the table, 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.

A.2 Additional Details for Engagement Sub-Groups

A.2.1 Comparison of Observable Characteristics Across Different Engagement Sub-Groups

In this section we confirm that the observable characteristics do not differ much depending on whether different measures of engagement are high or low. Tables 17, 18, 19, and 20

Table 16: List of Notation and Corresponding Variables

Variable	Description
Upsell	The difference between the class that a user is willing to pay and the class that was originally reserved
EE^H	High level of employee engagement
EE^L	Low level of employee engagement
EE_C^H	High level of employee engagement among employees who face customers
EE_C^L	Low level of employee engagement among employees who face customers
EE_N^H	High level of employee engagement among employees who do not face customers
EE_N^L	Low level of employee engagement among employees who do not face customers
EE_{CC}^H	High level of employee engagement on factors directly related to customers among customer facing employees (i.e., management focused on success, customers benefit from change, know how job contributes, able to work more efficiently, strategies make the company successful)
EE_{CC}^L	Low level of employee engagement on factors directly related to customers among customer facing employees (i.e., management focused on success, customers benefit from change, know how job contributes, able to work more efficiently, strategies make the company successful)
EE_{CN}^H	High level of employee engagement on factors not directly related to customers among customer facing employees (i.e., manager acts on suggestions, last 6 months discussed performance, new skills development, help employees embrace transformation, recommend the company)
EE_{CN}^L	Low level of employee engagement on factors not directly related to customers among customer facing employees (i.e., manager acts on suggestions, last 6 months discussed performance, new skills development, help employees embrace transformation, recommend the company)
EE_{NC}^H	High level of employee engagement on factors directly related to customers among non-customer facing employees (i.e., management focused on success, customers benefit from change, know how job contributes, able to work more efficiently, strategies make the company successful)
EE_{NC}^L	Low level of employee engagement on factors directly related to customers among non-customer facing employees (i.e., management focused on success, customers benefit from change, know how job contributes, able to work more efficiently, strategies make the company successful)
EE_{NN}^H	High level of employee engagement on factors not directly related to customers among non-customer facing employees (i.e., manager acts on suggestions, last 6 months discussed performance, new skills development, help employees embrace transformation, recommend the company)
EE_{NN}^L	Low level of employee engagement on factors not directly related to customers among non-customer facing employees (i.e., manager acts on suggestions, last 6 months discussed performance, new skills development, help employees embrace transformation, recommend the company)

Table 17: Distribution of User-Trip Characteristics Conditional on Different Values of EE_{CC}^H

Engagement	Variable	Mean	Std. Dev.
0	Reserved class	5.251005	4.36257
	Customer tier	1.708158	1.010417
	Phone reserve	.1067539	.3088022
	Business	.4423363	.4966671
	Weekend	.197601	.3981922
	Duration	3.694893	4.078258
1	Reserved class	5.241269	4.303803
	Customer tier	1.698654	1.018461
	Phone reserve	.107061	.3091925
	Business	.4387994	.4962431
	Weekend	.1893338	.3917757
	Duration	3.726096	4.133261

Table 18: Distribution of User-Trip Characteristics Conditional on Different Values of EE_{CN}^H

Engagement	Variable	Mean	Std. Dev.
0	Reserved class	5.295211	4.42437
	Customer tier	1.703768	1.013138
	Phone reserve	.1080905	.3104967
	Business	.4415089	.4965702
	Weekend	.1956167	.3966772
	Duration	3.698901	4.037018
1	Reserved class	5.200054	4.241364
	Customer tier	1.70213	1.016466
	Phone reserve	.1058502	.3076476
	Business	.4393516	.4963111
	Weekend	.1906711	.3928326
	Duration	3.72425	4.173531

provide us the summary statistics across different sub-samples based on different values of EE_{CC}^H , EE_{CN}^H , EE_{NC}^H , and EE_{NN}^H .

The tables confirm that the observable characteristics have similar means and standard deviations across different measures and values of engagement.

To get a sense of whether there are systematic differences in the distribution of high/low engagement with the number of employees, we present Tables 21 and 22. In Table 21, the rows represent whether or not the transactions take place at locations where total number of customer-facing employees is above the median level, while the columns represent whether or not the transactions take place at locations where EE_C is high. From these tabulations,

Table 19: Distribution of User-Trip Characteristics Conditional on Different Values of EE_{NC}^H

Engagement	Variable	Mean	Std. Dev.
0	Reserved class	5.298387	4.393252
	Customer tier	1.693935	1.005241
	Phone reserve	.1062178	.308118
	Business	.4446178	.4969263
	Weekend	.1968246	.397601
	Duration	3.697845	3.983957
1	Reserved class	5.191743	4.264254
	Customer tier	1.712089	1.024539
	Phone reserve	.107644	.3099322
	Business	.4360609	.495898
	Weekend	.1891738	.3916491
	Duration	3.726681	4.232363

Table 20: Distribution of User-Trip Characteristics Conditional on Different Values of EE_{NN}^H

Engagement	Variable	Mean	Std. Dev.
0	Reserved class	5.306965	4.408159
	Customer tier	1.691204	1.009206
	Phone reserve	.1062086	.3081063
	Business	.4407706	.4964825
	Weekend	.1974885	.3981065
	Duration	3.746273	4.025529
1	Reserved class	5.184956	4.250895
	Customer tier	1.714501	1.020318
	Phone reserve	.1076304	.3099149
	Business	.4400034	.4963904
	Weekend	.1886389	.3912239
	Duration	3.678297	4.189149

Table 21: Tabulation of Customer-Facing Engagement Scores (Columns) and Number of Customer-Facing Employees (Rows)

	Low	High	Total
Low	37,296	46,563	83,859
High	37,296	35,615	79,791
Total	81,472	82,178	163,650

Table 22: Tabulation of Non-Customer-Facing Engagement Scores (Columns) and Number of Non-Customer-Facing Employees (Rows)

	Low	High	Total
Low	39,305	42,652	81,957
High	46,253	35,440	81,693
Total	85,558	78,092	163,650

we see that the distribution of the number of transactions from locations where EE_C is high is invariant to the number of customer-facing employees. Similarly, in Table 22 the rows represent whether or not the total number of non-customer-facing employees is above the median level, while the columns represent whether or not EE_N is high. Similarly, the distribution of the number of transactions from locations where EE_N is high appears to be invariant to the number of non-customer-facing employees.

Next, we look at how length of employment varies between customer-facing and non-customer-facing employees. In the data, employee tenure is captured at discrete levels, that is, 0-2, 2-5, 5-10, and 10+ years.

Figure 4: Comparison of Tenure Across Different Groups

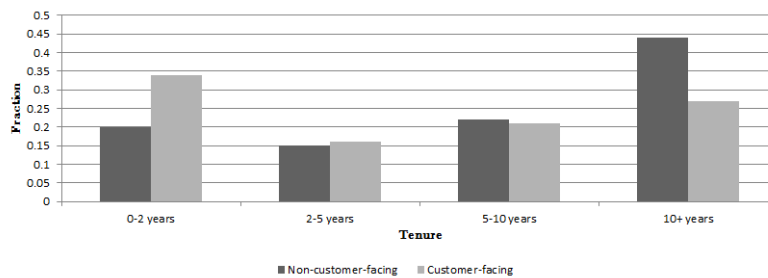


Figure 4 displays the two distributions. A few observations emerge. For both customer-facing and non-customer-facing employees, the percentage of employees with 2-5 or 5-10

Table 23: Variation in Transactions Taking Place at High and Low Levels of Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	38,580	42,145	80,725
High	23,336	59,589	82,925
Total	61,916	101,734	163,650

years of experience are similar (with difference in percentage points of no greater than 5). The customer-facing and non-customer-facing employees differ primarily in the proportion of employees with 0-2 or 10+ years of experience. The percentage of employees with 0-2 years of experience is roughly 15 points larger for customer-facing as opposed to non-customer-facing employees, while the percentage of employees with 10+ years experience is roughly 15 points larger for non-customer-facing employees. Therefore, customer-facing employees are disproportionately more inexperienced than non-customer-facing employees. Such an observation suggests that our estimates using customer-facing measures of employee engagement may yield conservative (i.e., lower bound) effects of engagement on sales productivity, as employees who actually interact with customers may have less experience with the corporation and idiosyncracies of the car rental industry than employees who do not interact with customers.

A.2.2 Variation in Engagement Measures Over Time

Table 23 shows that there is some temporal variation in the level of engagement. That is, we observe cases of transactions that take place at low engagement locations which were previously high engagement, low engagement locations which were previously low engagement, high engagement locations which were previously low engagement, and high engagement locations which were previously high engagement. There is however a greater number of observations for which the levels of engagement in the current and previous employee survey period are both high or low.

Tables 24 and 25 provide some evidence that there is temporal variation in high and low customer-facing (non-customer-facing) employee engagement. As is the case with the non-categorized employee engagement EE , we see that for both EE_C and EE_N , there are

Table 24: Variation in Transactions Taking Place at High and Low Levels of Customer-Facing Engagement in Current (Row) and Previous (Column) Period.

	Low	High	Total
Low	34,771	46,701	81,472
High	29,998	52,180	82,178
Total	64,769	98,881	163,650

Table 25: Variation in Transactions Taking Place at High and Low Levels of Non-Customer-Facing Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	37,909	47,649	85,558
High	22,239	55,853	78,092
Total	60,148	103,502	163,650

transactions that take place at low engagement locations which were previously high engagement, low engagement locations which were previously low engagement, high engagement locations which were previously low engagement, and high engagement locations which were previously high engagement.

Tables 26, 27, 28, and 29 provide some evidence that there is temporal variation in high and low customer-facing (non-customer-facing) and customer-centric (non-customer-centric) employee engagement. There is a slightly higher probability that a transaction takes place at locations that are of the same engagement levels in the current and previous survey periods.

Table 26: Variation in Transactions Taking Place at High and Low Levels of Customer-Facing and Customer-Centric Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	26,371	46,994	73,365
High	32,139	58,146	90,285
Total	58,510	105,140	163,650

Table 27: Variation in Transactions Taking Place at High and Low Levels of Customer-Facing and Non-Customer-Centric Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	36,733	41,655	78,388
High	24,257	61,005	85,262
Total	60,990	102,660	163,650

Table 28: Variation in Transactions Taking Place at High and Low Levels of Non-Customer-Facing and Customer-Centric Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	39,022	43,676	82,698
High	22,785	58,167	80,952
Total	61,807	101,843	163,650

Table 29: Variation in Transactions Taking Place at High and Low Levels of Non-Customer-Facing and Non-Customer-Centric Engagement in Current (Row) and Previous (Column) Period

	Low	High	Total
Low	34,618	46,769	81,387
High	22,236	60,027	82,263
Total	56,854	106,796	163,650