

# Upselling versus Upsetting Customers? A Model of Intrinsic and Extrinsic Incentives \*

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## Abstract

Upselling is a common practice in business that is associated with high profit margin. Yet empirical evidence suggests that upselling is negatively correlated with customer satisfaction. In this paper, we study the relationship between upselling and customer satisfaction in the framework of sales agents' incentive. On the one hand, sales representatives are motivated to upsell by the monetary incentive. On the other hand, sales representatives have the intrinsic motivation to achieve customer satisfaction, which is not tied to monetary reward. As exerting effort is costly, an agent optimally allocates efforts in the upselling practice and in serving customers to maximize personal utility. Using data from a national car rental company, we estimate a model of customers' decision to purchase add-on products and customers' satisfaction together with counter representatives' effort allocation decision. We find both monetary and intrinsic incentives are important for a sales agent's decision. We conduct counterfactual analysis to evaluate the implications of different incentive schemes on upselling, customer satisfaction and future business. We find that when doubling the commission rate for sales agents, the average upsell rate will increase more than doubled, but meanwhile the odds of customers choosing the firm in the future will decrease 5.5%.

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# 1 Introduction

Upselling or cross-selling is a common practice in many businesses, which refers to the practice of selling more expensive items, add-ons or other products or services to an existing customer. Salesperson in a car dealership may persuade a customer to buy a higher-end car than what she originally planned or try to sell her additional packages such as extended warranty. A bank agent may suggest a customer who opened a saving account to also invest in a financial product. Insurance agents often try to sell a higher premium plan to customers or induce customers to buy additional insurance products.

The benefit of upselling or cross-selling has been widely acknowledged in industry. Upselling is typically associated with higher profit margin. Cross-selling products or services to an existing customer expands revenue source without incurring new customer acquisition cost. In addition, cross-selling can increase the connection between sellers and buyers which leads to higher switching cost for customers (Kamakura et al. 2003). However, it is not uncommon to hear customers complaining about sales agents trying to upsell or sell additional products or services in the person-to-person encounter.

In our context of car rental industry, upselling and cross-selling refer to the practice of counter representatives getting customers to purchase additional product or services such as GPS, satellite radio and insurance.<sup>1</sup> We find empirical evidence that upselling rate in a market is negatively correlated with customer satisfaction reported post transaction. It points to the potential tradeoff between customer satisfaction and the upselling practice.<sup>2</sup> While upselling contributes to the immediate revenue for companies, customer satisfaction can have an impact on the performance of a firm in the long run. There is an extensive literature on the importance of customer satisfaction. Higher customer satisfaction is associated with higher loyalty (e.g. Anderson and Sullivan, 1993; Bolton, 1998), more repurchases (e.g., Mittal and Kamakura, 2001, Li et al. 2005) and long term economic return (e.g. Rust et al. 1995).

In this paper, we study the relationship between upselling and customer satisfaction. The negative correlation of the two may arise for multiple reasons. First, customers may be less satisfied with the transaction involving add-on purchase because of the extra

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<sup>1</sup>We do not consider car type upgrade in our analysis as the percentage of upgrade paid by customers is negligible in our data. Most car upgrades are free of charge.

<sup>2</sup>We use the term ‘upselling’ to refer to both up-selling and cross-selling in the following.

payment. Second, customers may regret being persuaded to buy the extra product or service post transaction. Kalra et al. (2003) indicated that a salesperson has an incentive to oversell the product by falsely claiming higher value about the add-on feature when a larger fraction of his compensation is based on sales commission. The exaggeration of the value of added features results in lower customer satisfaction. Third, such negative correlation between upselling and customer satisfaction may arise because agents' upselling effort crowds out the effort in purely serving customers. Our model allows for the first two sources of dissatisfaction and focuses on the third. Previous research supports the benefits of behavior-based evaluation, which evaluates employees on the basis of how they behave rather than the measurable outcomes (Oliver and Anderson 1994). However, the outcome-based compensation structure is more prevalent since the outcome, such as the number of successful upsells, is easier to measure objectively. Given the outcome-based compensation structure, sales agents are frequently rewarded based on short-term outcomes such as immediate sales results (Kalra and Shi 2001).

In the car rental setting, the sales agents are motivated to upsell by commission, which we call as extrinsic motivation or monetary incentive. On the other hand, sales agents may be naturally motivated to serve customers well, which we call as intrinsic motivation that is not related to immediate monetary reward. Our model allows sales agents to derive utility from both monetary reward due to upselling and personal satisfaction when customers are satisfied with the service provided.<sup>3</sup> Using lab experiments, Hossain et al. (2014) show that salespeople have intrinsic motivation to achieve high performance independent of compensation. Following these and the literature in the personnel economics (Lazear and Oyer 2013; Oyer and Schaefer 2011; Rebitzer and Taylor 2011), we assume that a sales agent's overall effort is motivated by both extrinsic and intrinsic incentives. While agent effort is not directly observable, the outcome of the effort in terms of upselling rate and customer satisfaction can be measured. We set up a model in which effort allocated to upselling can increase the probability of upsell success and the effort allocated to purely serving customers can increase customer satisfaction. When exerting effort is costly, an agent has to optimally allocate the effort in the upselling practice and

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<sup>3</sup> Fehr and Falk (2002) criticize the narrow view that agents are entirely motivated by monetary reward and emphasize the importance of non-pecuniary motives in shaping human behavior. Non-monetary based motivation has long been recognized in social psychology, e.g. Maslow (1943) and Bandura (1986).

in serving customers to achieve maximum utility. The tradeoff between upselling and customer satisfaction naturally arises in this framework.

We empirically study the relationship of upselling and customer satisfaction using a comprehensive data set from a national car rental company on car rental transactions and the associated customer satisfaction surveys over a two-year window. The car rental industry is suitable for our research question. First of all, upselling is very common in this industry and employees' compensation is highly dependent on their commissions through successful upsales.<sup>4</sup> Second, there is limited repeated interactions between a customer and a car rental agent. Therefore, it is less likely that an agent serves customer well out of the motivation to build a long term relationship with the customer to gain future payoff. The assumption that an agent's effort in improving customer satisfaction is driven by intrinsic incentive rather than monetary incentive is reasonable in this context. Third, We focus on car rental transactions in the airports, which are well defined car rental markets (Singh and Zhu 2008). The cross sectional variation in market characteristics and consumer demand, together with the employee satisfaction surveys collected from the matched airport markets and time period are crucial for model identification.

We estimate the determinants of customer decision to purchase add-ons and customer satisfaction of the transaction and identify the relative importance of the extrinsic and intrinsic motivation in driving agents' effort allocation based on the model. We find that while extra payment and post transaction regret do contribute to the lower satisfaction of transactions involving add-on purchase, a substantial part of the negative correlation between upselling and customer satisfaction is accounted for by agents' effort allocation driven by the extrinsic and intrinsic motivations. Since consumer satisfaction with previous transactions affects the probability of patronage in the next rental occasion, customer satisfaction has an impact on future business. We conduct counterfactual analysis to evaluate the short-run effect on upselling and long-term effect of customer satisfaction under different incentive schemes.

This paper investigates upselling and customer satisfaction in a unified framework. It addresses the important issue on the potential tradeoff for a firm between immediate profit from upselling and the long term profit from customer satisfaction. To the best of our knowledge, it is the first paper that tries to quantify such tradeoff. The paper

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<sup>4</sup>Source: <http://consumerist.com/2008/01/15/6-confessions-of-an-alamo-car-rental-agent/>

has important managerial implications given that upselling is widely popular business practice. It also offers insights on how to mitigate such conflict to achieve better outcome.

Our paper is related to the literature on customer satisfaction, customer loyalty and its long term impact (e.g. Winer 2001, Lewis 2004, Rust and Chung, 2006; Kumar et al. 2011; Schweidel et al, 2011). It is closely related to Anderson, et al. (1997) which finds that there is a negative correlation between changes in customer satisfaction and productivity in service industry. We document the negative correlation between upsell rate and customer satisfaction and investigate the tradeoff in the framework of sales agents incentive. The paper is also related to the literature on service effort and sales force incentive. An extensive theoretical literature in marketing and economics focuses on finding an optimal contract under various conditions (e.g., Godes 2004). Some recent empirical studies show how the employees' effort choices respond to incentives. Kim (2014) studies the effect of unobserved service effort on demand by estimating a demand model together with a firm's profit function which imbeds effort choice. Chung et al. (2013) investigate sales force effort in response to difference compensation schemes using the structural approach. We link sales effort to upsell rate and customer satisfaction as well as examine the effort allocation based on extrinsic and intrinsic motivations.

Our paper also contributes to the limited empirical research on non-monetary based incentive of agent or firm behavior (Jiang et al. 2014). For instance, Kolstad (2012) empirically shows that health care providers have the intrinsic motivation to perform well that is not related to profit by investigating the impact of surgery quality reporting. Hossain et al. (2014) estimate the level of intrinsic motivations under different reward and recognition regimes using lab experiment of sales contest. Ho et al.(2013) studies the implication of pricing strategy when a firm incorporates consumer surplus in addition to profit in its objective function. In our setting, we find that sales agents care about customer satisfaction in addition to monetary reward, although it carries less weight than monetary reward in driving effort.

The rest of the paper is organized as follows. Section 2 describes the data and provides model free evidence on the relationship between upselling and customer satisfaction. We present the model framework in Section 3 and empirically estimate the model in Section 4. We conduct counterfactual analysis in Section 5 and conclude the paper in Section 6.

## 2 Data

### 2.1 Data Description

The data set is mostly provided by a premium national car rental company, a major player in the retail car rental business. We complement the main data by collecting information from Expedia.com and Bureau of Transportation Statistics. There are four major pieces of information from the car rental company, including the individual consumer transaction information, customer satisfaction survey, employee satisfaction survey and the financial data for each car rental location.

We observe a sample of customer transactions over a two-year window from August 2010 to the end of September 2012 in various rental locations of US and Canada markets.<sup>5</sup> We focus on the car rental transactions that occurred in airports as they are well defined car rental markets and most transactions in the data occurred at airports. There are 159 airports and more than 313,000 transactions in our final data. For each transaction, we observe the location, the rental car checking out and returning time, the car type that the customer reserved, drove and paid for, the type of add-on products purchased and their price paid, the total rental expenditure, and some customer identity information including whether the customer is a member of the firm's loyalty program, age, etc. The average rental period is four days and the average rental expenditure including base car rental and extras after any discount is about \$178. The sample includes more customers who enrolled in the loyalty program. About half of the customers were on business trips while the other half were on leisure stay. The summary statistics of the main variables in the transactions are summarized in Table 1.

Each transaction is linked to a customer satisfaction survey which was conducted after the transaction was completed. Customers were asked to rate their satisfaction on different aspects of the rental in terms of their satisfaction with the car condition, billing as expected, speed of service, courtesy of staff etc. There is also a question asking customer to rate their likelihood to recommend the car rental company to their friends or colleagues on a scale from 0 to 9, with 0 meaning 'not at all likely' and 9 meaning 'extremely likely'. The average of this rating is 7.27 across all the survey responses. We use the answer to this question as our measure of consumer satisfaction in the empirical

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<sup>5</sup>The sample includes more than 25% of the customers during the time period.

setting.<sup>6</sup>

In addition to customer satisfaction survey, the car rental company also conducted five waves of employee engagement survey for each rental location during the time period, with four to six months in between waves. The survey respondents include both employees who have direct contact with customers and those who do not. We focus on the responses from employees who directly interact with the customers. We further classify them into managers and non-managers according to the company’s classification and focus on the effort allocation problem of non-manager employees with direct contact with customers.<sup>7</sup> The survey measures employees’ attitude toward the manager and their overall job satisfaction. The respondents rate on a scale from 1 to 5 on statements such as “My manager acts on my suggestions” and “I would recommend this company to a friend as a good place to work”. One thing to point out is that the employee survey is not directly linked to one particular transaction or customer survey, since the engagement survey does not identify individual employee identity. However, we are able to match the employee survey with the customer transaction and satisfaction at the market-time level.

We also have monthly financial data of the car rental company at the airport level, including information such as revenue and fleet count. The information allows us to have an estimate of the total number of car rental transactions that had occurred in each airport in each month. We further collected airport specific information, including monthly traffic measured as the number of passengers arriving at the airport, the number of car rental firms in each airport and the local tax rate.<sup>8</sup> We summarize the key variables across airports in Table 2. We observe significant variations across airports in our data. The average number of car rental transactions in a month vary substantially across small and big airports. The number of car rental companies also varies across airports. In some markets, the focal company is the monopoly while it faces many competitors in other markets. The average number of rental companies in an airport is about eight.

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<sup>6</sup>There is a question asking consumers to rate the “overall experience” on a scale from 0 to 9, which can be interpreted as overall satisfaction rating. As this question appeared in the customer survey starting only from the middle of the data period, we use the rating on “whether to recommend the company” as the measure of customer satisfaction. The correlation of the ratings on these two questions is 0.87.

<sup>7</sup> We use employee survey results from other employees as instruments which will be discussed in further details in the estimation section.

<sup>8</sup>The information on car rental firms in each airport is collected from Expedia.com. Airport related information is collected from Bureau of Transportation Statistics.

## 2.2 Preliminary Analysis

Upselling in this context refers to selling the following add-ons: GPS, fuel, insurance and satellite radio. For GPS and radio, we also observe whether the option is sold by counter representatives or not and only those sold by counter representatives are counted toward upselling. For each consumer, we observe the add-ons that he or she purchased (if any) and the associated price. We created a dummy variable ‘upsell’ which equals to 1 if a customer purchased at least one add-on product and 0 otherwise at the counter. The overall upsell rate is about 11% in our sample.

We first examine the relationship between add-on purchase and customer satisfaction. The correlation between upsell and customer satisfaction as measured by the rating on overall experience from customer survey is negative and significant ( $r = -0.04, p = 0.000$ ). we further run a regression with individual customer satisfaction as the dependent variable and upsell dummy as an independent variable, controlling for the prices one paid, car conditions, market conditions as well as observed personal characteristics. The regression results are in Table 3.

Model (1) includes all the basic control variables. The key variable that we are interested in is the effect of upselling on consumer satisfaction. We find that consumers who purchased add-ons at the counter are less satisfied than other consumers, holding everything else equal. The variable “Charge per day” includes both car rental fee and additional add-on expenditure calculated on a daily basis. As expected, it has a negative effect on overall satisfaction. We control for the number of car rental companies at the airport. The more outside options available to a consumer, the higher the expectation that one may have toward the focal firm. Indeed we find that more car rental firms make a customer less satisfied with the selected firm. We also control for how busy the rental counters in an airport might be by using the airport traffic as a proxy. Airports with larger traffic may indicate higher demand for car rental and longer waiting time for consumers. The estimation shows that it has a negative effect on consumer satisfaction as expected. We find that business travelers are less satisfied in general than the customers who rent cars for leisure purpose. Customers enrolled in the loyalty program are more satisfied. Older customers are more satisfied with the service than the young customers. We also include the full set of car class types to control for car characteristics and a dummy for



whether the car was checked out on weekends to capture the possible time effect.<sup>9</sup> To further control for the unobserved variation of vehicle and equipment conditions on overall customer satisfaction, we include the survey rating on “vehicle and equipment conditions” from the same individual. The result suggests that controlling for satisfaction derived from equipment, upselling itself decreases consumer satisfaction.

Note that the dummy for upsell indicates purchase of any of the four types of add-ons in the data. To clearly separate the effect of upselling practice from the value of add-on feature itself on customer satisfaction, in model (2) we use the dummy variable for GPS upselling instead of the overall upselling indicator. We also include the dummy for whether the consumer has GPS on his or her rented car, including cases where GPS is an integrated system in the car and the cases that the consumer reserved GPS before arriving at the counter to control for the value of GPS equipment. We find that while the GPS component itself increases customer satisfaction, GPS upselling practice has a significantly negative impact. In model (3), we revert to the overall indicator of upselling and control for whether the consumer had GPS or radio in his car. Again, the equipment dummies are positive while the upselling dummy is negative and significant. Comparing with model (1), we find that the coefficient in front of upsell dummy becomes more negative when we control for the effect of equipment per se. The empirical evidence strongly suggests that upsell practice decreases customer satisfaction.

The series of reduced form analysis above confirm that upselling has negative impact on customer satisfaction on average. The upsell dummy is negative and significant after controlling for the disutility caused by the additional payment. It suggests that there are other reasons other than the extra payment contributing to the negative correlation. One such reason could be the customers’ negative feeling toward the fact of being upsold on retrospect (when evaluating the transaction afterwards). This may happen, for example, because the counter representative exaggerated the value of the add-on products while the customer was unable to judge the value of the add-on features (Kalra et al. 2003). Another reason for the negative correlation of customer satisfaction and upsell could lie in the effort allocation by counter representatives. When more effort is allocated to the upselling practice, relatively less effort is devoted to customer service. In other words,

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<sup>9</sup>The main results do not change if we further control for the day of the week that a car was checked-out and checked-in and monthly time fixed effect.

the incentive to upsell may crowd out the effort to purely serve customers and therefore reduces customer satisfaction. We are not able to tease out these two effects in the reduced form analysis. However, we can check if the employee’s incentive or satisfaction does indeed correlate with customer satisfaction.

For the following analysis, we use two measures from employee engagement survey: “My manager acts on my suggestions” and “I would recommend this company to a friend as a good place to work”. The idea is that when an employee is more satisfied with the management and the company, he or she is likely to have a higher intrinsic motivation to work and to care about the long term success of the company. Since the employee survey is not linked to transaction and customer survey on a one-to-one basis, we take the average rating of each measure on the employee survey by airports and time period, then control for the market-time average employee rating in the customer satisfaction analysis.

Table 4 reports the regression results when we further control employee satisfaction to the original model specification (1) in Table 3 above. We find that both employee satisfaction measures are positively correlated with customer satisfaction. We argue that employee satisfaction is linked to customer satisfaction through service. By controlling for employee satisfaction in the model, we partially control for the unobserved service effort exerted by the counter representative. Another result to notice is that the magnitude of coefficient for the *upsell* dummy becomes smaller as the employee side measures are controlled. This suggests that part of the negative correlation between upselling and customer satisfaction is indeed driven by effort allocation. In the following section, we setup a model of employee effort choice to structurally account for such effort substitution between upselling and service.

### 3 Model

We first illustrate the sales representatives’ decisions on effort allocation, then focus on models of consumers’ add-on purchase and satisfaction.

### 3.1 Sales Representatives' Effort Choices

Sales representatives face customers directly. The person-to-person encounter provides the opportunity to sell add-on products or services to customers at the final point of transactions. According to the company, besides their base salary, counter representatives get commission and incentive to sell add-ons. The service of counter representative in the course of rental transactions is an important determinant of customer satisfaction yet it is not directly linked to employee compensation. In our model, we assume that counter representatives derive utility not only from monetary reward but also from personal fulfillment when customers are satisfied. Allocating more effort trying to persuade customers to purchase the add-ons increases the expected monetary return. On the other hand, allocating more effort in serving customers can increase customer satisfaction and therefore contribute to the sense of fulfillment. An agent's problem is to optimally allocate effort to maximize personal utility. We assume that a risk-neutral representative agent in market  $m$  at period  $t$  has the following utility function:

$$u_{mt}^e(e^{in}, e^{ex}) = k_1 E[UP_{mt}(e^{ex})] M_{mt} p_{mt}^a + k_2 E[SAT_{mt}(e^{ex}, e^{in})] M_{mt} - \gamma [(e^{in} + \theta e^{ex}) * M_{mt}]^2, \quad (1)$$

where

$$k_2 = k_{20} + k_{21} MG_{mt} \quad (2)$$

There are three parts in the utility function. The first part is the utility from upsell commission.  $E[UP_{mt}(e^{ex})]$  is the expected probability of successful upsell in market  $m$  at period  $t$ , which depends on the effort allocated to upsell denoted by  $e^{ex}$  ( $e^{ex} \geq 0$ ). This is the effort induced by monetary reward or extrinsic incentive.  $M_{mt}$  is the number of customers one serves during the period and  $p_{mt}^a$  is the add-on price. The parameter  $k_1$  is the commission rate, and  $k_1 p_{mt}^a$  is the dollar return for one successful upsell. Therefore, the first part captures the expected monetary reward given the choice of effort,  $e^{ex}$ . The second part captures personal fulfillment as a result of customer satisfaction. Brown and Lam (2008) report positive and significant relationship between employee job satisfaction and customer satisfaction through a meta-analysis. The parameter  $k_2$  is the weight of non-monetary job fulfillment in driving employee utility, which can be a function of a sales representative's attitude toward their managers,  $MG_{mt}$ . It is possible that a sales

representative is more intrinsically motivated if he or she is working in a supportive environment. The term  $E[SAT_{mt}(e^{ex}, e^{in})]$  is the average level of customer satisfaction in market  $m$  of period  $t$ , which is a function of effort allocation.  $e^{in}(e^{in} \geq 0)$  is the effort allocated to service, which is driven by non-monetary incentive or internal motivation. From the preliminary analysis above, we notice that upsell has a negative impact on customer satisfaction. Therefore, both  $e^{ex}$  (through upsell) and  $e^{in}$  may affect customer satisfaction. The component  $k_2 E[SAT_{mt}(e^{ex}, e^{in})] M_{mt}$  captures the total utility one derives from serving customers. The last part is the cost of exerting effort.  $\gamma$  is a cost parameter and  $\theta$  is a scaling parameter of  $e^{ex}$  and  $e^{in}$ . Total effort is a function of the number of customers served,  $M_{mt}$ . We assume a quadratic effort cost function on  $M_{mt}$ .

A counter representative's decision is to maximize his or her expected utility by choosing the effort level  $e^{ex}$  and  $e^{in}$  optimally. We assume that the effort allocation in upselling and service is not customer-specific. In other words, the agent decides the effort level given the expectation of the outcome but before the arrival of specific customers. The optimal choice of  $e^{ex}$  and  $e^{in}$  depends on the marginal return of upselling and serving customers in comparison to the marginal cost of exerting the effort. The first order conditions with regard to  $e^{ex}$  and  $e^{in}$  are:

$$\frac{\partial u_{mt}^e}{\partial e^{ex}} = k_1 \frac{\partial E(UP_{mt})}{\partial e^{ex}} * p_{mt}^a + k_2 \frac{\partial E(SAT_{mt})}{\partial e^{ex}} - 2\gamma\theta M_{mt} (e^{in} + \theta e^{ex}) = 0 \quad (3)$$

$$\frac{\partial u_{mt}^e}{\partial e^{in}} = k_2 \frac{\partial E(SAT_{mt})}{\partial e^{in}} - 2\gamma M_{mt} (e^{in} + \theta e^{ex}) = 0 \quad (4)$$

Note that the marginal return of upsell effort  $e^{ex}$  has two components. One is the positive effect on upsell probability and the resulting monetary reward. The other is the negative effect on customer satisfaction through upsell. In the following section, we introduce how the upsell probability and consumer satisfaction are determined.

### 3.2 Add-on Purchase

Consider a representative consumer at the rental counter. She decides whether to purchase any of the add-on products.<sup>10</sup> The customer can choose to purchase the add-on if the utility is above certain threshold, or not to purchase. We assume that the utility of

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<sup>10</sup> Although there are four types of add-ons in our dataset, we aggregate the decision as a binary choice to simplify the modeling.

add-on purchase for consumer  $i$  in market  $m$  at period  $t$  is the following:

$$u_{imt}^a = \alpha_0 + \alpha_X X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt} + \varepsilon_{imt} \quad (5)$$

where  $\alpha_0 + \alpha_X X_{mt}$  is the intrinsic utility from the add-on product, which may vary given the local condition,  $X_{mt}$ . For example, GPS may be more useful to navigate through a big city than a small city.  $p_{mt}^a$  is the add-on price at market  $m$  in period  $t$ . In the empirical analysis, we use the weighted price of add-on products as the measure of  $p_{mt}^a$ .  $\alpha_m^p$  is the price coefficient, which may vary across markets. Our data covers many airports where the intensity of competition varies. The company faces very few competitors in some markets and many competitors in others. As the focal company is a premium brand in the car rental market, one can imagine that the group of customers who choose the company despite the many cheaper choices available are different from the group of customers who are in the markets where the company is the monopoly or few other options are available. Presumably, the first group is less price sensitive as they self-select into the premium rental brand in a competitive market. To account for such potential selection issue, we allow the price coefficient to be a function of the market structure, that is,

$$\alpha_m^p = a_p + a_c N_m \quad (6)$$

where  $N_m$  is the number of rental companies in airport  $m$ .

The add-on purchase at the counter is also affected by the counter representative's upsell effort,  $e_{mt}^{ex}$ . It is observed by the customer when making the purchase decision. However, it is not directly observable to the econometrician. We use the log transformation to capture the idea of diminishing return of effort in driving upselling. We assume that there is also a market level unobserved demand shock  $\xi_{mt}$  that can shift consumer utility of add-on purchase. Finally,  $\varepsilon_{imt}$  is the idiosyncratic shock that follows extreme value distribution. The utility of not purchasing any add-ons is normalized to 0. Therefore, the probability that a representative customer would purchase an add-on product, or the probability of a successful upsell, is the following:

$$Prob(UP_{imt} = 1) = \frac{\exp(\alpha_0 + \alpha_X X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})}{1 + \exp(\alpha_0 + \alpha_X X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})} \quad (7)$$

Given the equation above, we can derive the marginal effect of upselling effort  $e^{ex}$  on upsell rate, which is:

$$\frac{\partial E(UP_{mt})}{\partial e^{ex}} = \frac{\exp(\alpha_0 + \alpha_X X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})}{[1 + \exp(\alpha_0 + \alpha_X X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})]^2} \frac{1}{e_{mt}^{ex}} \quad (8)$$

### 3.3 Customer Satisfaction

Customers evaluate their experiences after the rental transaction was fully completed. We model customer satisfaction as a function of the car and the equipment they got, the price paid, the market condition, their personal characteristics as well as the service effort from the counter representative. Let  $SAT_{imt}$  be the overall satisfaction of customer  $i$  toward a rental transaction in market  $m$  at period  $t$ , we have

$$SAT_{imt} = \beta_0 + \beta_1 UP_{imt} + \beta_m^p Rate_{imt} + \beta_w W_{imt} + \beta_x X_{mt} + \log(e_{mt}^{in}) + \nu_{imt} \quad (9)$$

The variable  $UP_{imt}$  is a dummy variable that equals 1 if the customer purchased any of the add-on products at the counter, i.e.  $u_{imt}^a > 0$  linking to equation (5). The variable  $Rate_{imt}$  is the rental charge per day, including both car rental fee and add-on purchase. The coefficient  $\beta_m^p$  captures the price effect on satisfaction. Since the customers in monopoly market versus in competitive market may have different level of price disutility due to selection, we allow the coefficient to vary across market:

$$\beta_m^p = b_0 + b_c N_m \quad (10)$$

The vector  $W_{imt}$  include a set of dummy variables for the car types that the customer got, vehicle and equipment conditions and customer's demographic information including the trip purpose and membership status. We control for the market condition in  $X_{mt}$ . Specifically, we control for the airport traffic and the number of car rental firms in airport  $m$  at period  $t$ , which we have shown to have an impact on customer satisfaction from the preliminary analysis.

In addition to the physical factors, customer satisfaction can also be affected by counter representative's effort in serving customers as denoted by  $e_{mt}^{in}$ . Again it is observed by customers but not the econometrician.  $\nu_{imt}$  is the idiosyncratic shock that affects a customer's overall experience.

We can derive the marginal effect of effort level  $e^{ex}$  and  $e^{in}$  on *expected* customer satisfaction of an average customer in market  $m$  at period  $t$ :

$$\frac{\partial E(SAT_{imt})}{\partial e^{ex}} = (\beta_1 + \beta_m^p p_{mt}^a) \frac{\partial E(UP_{mt})}{\partial e^{ex}} \quad (11)$$

$$\frac{\partial E(SAT_{imt})}{\partial e^{in}} = \frac{1}{e_{mt}^{in}} \quad (12)$$

where  $\frac{\partial E(UP_{mt})}{\partial e^{ex}}$  is given by equation 8. When  $\beta_1$  is negative, together with the negative effect of extra payment, upsell effort would have a negative impact on customer satisfaction.

## 4 Empirical Analysis

### 4.1 Estimation

The key structural parameters in the model are the weights of external incentive and internal motivation in driving employee effort as well as the cost of effort. We set the parameter  $k_1$  to be 0.1 in the estimation, which resembles the commission rate.<sup>11</sup> One can see from the set of first order conditions (equation 3 and 4) that  $k_1$ ,  $k_2$  and  $\gamma$  are not separately identifiable without fixing the scale of one parameter. For the number of consumers served in a month,  $M_{mt}$ , we use the observed number of transactions at airport  $m$  in month  $t$  in the main estimation. For the satisfaction with management  $MG_{mt}$ , we use the average rating of the question “My manager acts on my suggestion ” from the employee survey in market  $m$  at period  $t$  as the measurement.<sup>12</sup> Specifically, we only focus on the employee group that is non-manager and that faces customers directly as sales representatives are in this group.

The parameters on the customer side and employee side are simultaneously estimated using Generalized Method of Moments (GMM). The main idea is the following. The unobserved upsell effort  $e^{ex}$  in add-on purchase (equation 5) and service effort  $e^{in}$  that affects customer satisfaction (equation 9) can be derived from the employee’s optimal effort choice which is a function of the structural parameters. We then construct the moment conditions from the add-on purchase equation and satisfaction equation given the observed variables and the structurally recovered effort components. Specifically, given a set of guessed parameters, we first solve for the optimal level of upsell effort  $e_{mt}^{ex}$  and service effort  $e_{mt}^{in}$  for each market  $m$  at each time period  $t$ , using the first order conditions in equation 3 and 4.<sup>13</sup> Second, given the estimated  $e_{mt}^{ex}$  and the parameter

<sup>11</sup> Though the company cannot disclose the exact commission rate, they did not reject our assumption of 10%.

<sup>12</sup> Notice that the employee survey is done roughly quarterly instead of monthly. We assume that the rating is the same during the months for a given wave of survey.

<sup>13</sup> Note that given a market and a time period, the effort allocation is the same across consumers. The

values, we can recover the unobserved demand shock  $\xi_{mt}$  in the upsell decision (equation 7) by matching the observed upsell rate in each market at each period with the predicted rate. Similarly, we can recover  $\nu_{imt}$  in the satisfaction equation (9) given the recovered  $e_{mt}^{in}$ . We then construct the set of moment conditions by interacting the shocks with the instrumental variables including the exogenous variables which are uncorrelated with the shocks:

$$G_\xi \equiv E[\mathbf{Z}'_1 \xi(\theta)] = 0 \quad (13)$$

$$G_\nu \equiv E[\mathbf{Z}'_2 \nu(\theta)] = 0 \quad (14)$$

where  $\theta$  is the vector of parameters.

The first set of moment conditions  $G_\xi$  is derived from the add-on purchase equation (equation 7). There are two potentially endogenous variables in the equation. One is the price of the add-on products,  $p_{mt}^a$ , which can be correlated with demand shock  $\xi_{mt}$ . For example, the firm may price the add-on product higher when observing a higher demand shock. We use two instrumental variables for price. The first is the local airport tax rate. Tax rate varies across markets and is correlated with price but not correlated with unobserved consumer demand for add-on products. The second is a measure of the local public transportation. Public transportation offers an alternative to renting a car. The availability of this option is likely to affect the pricing strategy of the car rental company. However, it is not likely to be correlated with the demand shock of add-on purchase conditional on car rental. In practice, we use the percentage of people who use the public transportation in the local area from the census data as a proxy for the availability of public transportation. To check the validity of these two instruments, we run a regression with add-on price as the dependent variable and the two IVs as the independent variables. Both variables are highly significant and the F-statistics is 998.09 which is much bigger than the usual threshold of 10, indicating the validity of the instrument variables.

Another endogenous variable in the add-on purchase equation is  $\log(e_{mt}^{ex})$ . Note that the equilibrium choice of  $e^{ex}$  is a function of the demand shock  $\xi_{mt}$ , which can be seen 

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 model can potentially be extended to solve individual specific effort allocation. However, there are two challenges in this setting. First, employee satisfaction data is not linked to individual transaction and therefore only market level information can be used in the estimation. Second, the estimation would be much more complex as one needs to integrate all types of consumers in solving the optimal effort allocation problem. We provide the estimation details of the current model in the Appendix.



from equation 8. Therefore, the correlation between  $\log(e_{mt}^{ex})$  and  $\xi_{mt}$  exists by model construction. The instrumental variables we use come from employee survey. We use the average rating of the employees' satisfaction with management in market  $m$  at period  $t$  as the instruments. Specifically, we use the rating for the following three questions, "My manager acts on my suggestion", "The company is doing a good job supporting employees through change" and "Management is focused on the long-term success of the company." The ratings from the group of employees who are non-managers and do not have direct contact with customers are used as instruments. The reason is that the satisfaction of this employee group is correlated with the satisfaction of the focal employee group in our analysis, i.e. the non-manager and customer-facing group. Employee satisfaction will moderate effort level. However, the satisfaction level of the non-customer-facing employees is unlikely to be correlated with the unobserved demand shock for the add-on products.

$G_\nu$  includes the set of moments constructed from the satisfaction equation (equation 9). There are three explanatory variables that are potentially endogenous and we need to find appropriate instrumental variables to form the moment conditions. One endogenous variable is rental price rate. Customers who paid a high rental rate may have a high expectation of the experience which would affect their satisfaction. Although we have controlled for the type of car that one rented, the endogeneity of rental price may still exist. Again we use the local tax rate and ratio of public transportation as the IVs for rental price. The regression of rental rate on these two variables indicates that they are strong IVs. The F-statistics of the regression is 1704.9.

The upsell dummy,  $UP_{imt}$ , can also be endogenous. Consumers who purchased add-on product may have different taste or expectation that affect their overall evaluation. Finally, the service effort  $\log(e_{mt}^{in})$  might be correlated with the error term  $\nu_{imt}$  if the demand shock  $\xi_{mt}$  and  $\nu_{imt}$  is allowed to be correlated. This is because  $e_{mt}^{in}$  is also a function of the demand shock  $\xi_{mt}$  as upsell effort and service effort are closely linked. To deal with the endogeneity concern of upsell dummy and service effort, we resort to the employee satisfaction survey results again. As argued above, employees' satisfaction toward management will affect their morale and overall effort, including upsell effort that affect the upsell probability, and the service effort. We use the average ratings of the aforementioned three questions from the manager and non-customer-facing group as the

instruments. They are correlated with employee effort but not likely to correlate with the error term in consumer satisfaction,  $\nu_{imt}$ .

The vectors  $Z_1$  and  $Z_2$  include the exogenous variables and the relevant instrumental variables in each equation. The objective of the estimation is to find the set of parameters  $\hat{\theta}$  such that:

$$\hat{\theta} = \arg \min_{\theta} G(\theta)'^{-1}G(\theta) \quad (15)$$

where

$$G(\theta) = \begin{bmatrix} G_{\xi} \\ G_{\nu} \end{bmatrix}$$

The weighting matrix  $\Phi^{-1}$  is the variance-covariance matrix of the parameters estimated by first using identity matrix.

## 4.2 Empirical results

The parameter estimates of the employee utility function are presented at the upper panel of Table 5. Recall that we fix  $k_1$ , the commission rate, at 10% in our analysis. The estimated  $k_{20}$  is positive and significant. It implies that employees care about customer satisfaction, above and beyond any monetary reward. This empirical evidence suggests that the intrinsic motivation to serve customers exists. The positive estimate of  $k_{21}$  suggests that such intrinsic motivation can be moderated by management. Successful management as measured by employee satisfaction toward managers can effectively enhance one's motivation to serve customers better, or put effort to achieve non-monetary goals. The parameter  $\gamma$  is positive and significant, indicating that there is a cost of exerting effort. The scale parameter  $\theta$  being less than 1 is an indicator that the marginal cost of upsell effort is lower than service effort. The estimation also allows us to recover the unobserved upsell effort and service effort across market and over time. To examine how employee effort allocation varies by market structure, we regress the recovered extrinsic and intrinsic effort on the observed number of competitors in a given market and the market size. We find a significantly negative correlation that both effort levels decrease with the number of competitors. In other words, counter representatives exert less effort per customer in a more competitive market. This may happen for the following reasons. First, a more competitive market is associated with lower pricing in general. Given that the commission rate is the same across markets, lower pricing implies lower commission

of a successful upelling transaction. Therefore, the monetary incentive is lower. Second, a more competitive market is correlated with higher traffic and a larger number of customers. When facing a large number of customers, per-customer service effort can go down due to the convexity of effort cost.

We now focus on the estimation results from the customer side. The main results of add-on purchase decision are presented at the lower panel of Table 5. As expected, the main price effect is negative, suggesting that higher add-on price leads to lower probability of upsell in general. The interaction effect with the number of rental companies in the airport is positive. It implies that the customers of the focal firm is less price sensitive in a more competitive market. This result provides evidence of self-selection. Customers who choose the firm despite the price premium and the availability of cheaper choices are the less price sensitive ones. Finally, the demand for add-on products depends on the local conditions. We find that airport traffic has a positive effect on the demand for add-on products. Big airports are typically associated with large cities and heavy traffic, which makes add-ons such as GPS more useful. We discuss how the unobserved sales effort affect the probability of add-on purchase later.

Table 6 shows the results on customer satisfaction which controls for the unobserved service effort. The coefficient in front of “upsell” is still negative and significant, controlling for the unobserved service effect. It suggests that the negative correlation between upselling and customer satisfaction is not fully attributable to the effort allocation issue and that there exists real disutility toward being upsold at the counter. Such disutility could be due to the sales’ exaggeration of the add-on feature’s value or consumers’ other psychological effect post transaction. The main price effect is negative and significant after controlling for endogeneity. The interaction of price and the number of rental companies is again positive, suggesting that customers are less price sensitive or that price induces less disutility in more competitive markets due to self-selection. The results of other exogenous variables are similar to the regression results presented in Table 3.

### **4.3 Impact of satisfaction on future business**

Our empirical analysis shows that a higher upsell rate is associated with lower customer satisfaction. While upselling generates immediate revenue for the company, customer satisfaction could be important for long term business. To gauge such impact, we estimate

a simple model to quantify the impact of customer satisfaction in the last period on current period market share.

$$\ln\left(\frac{S_{mt}^F}{S_{mt}^0}\right) = \phi_0 + \phi_p Price_{mt} + \phi_s SAT_{m,t-1} + \phi_X X_{mt} + \varepsilon_{mt}^S \quad (16)$$

where  $S_{mt}^F$  is the focal firm's market share in market  $m$  at period  $t$  and  $S_{mt}^0$  is the share of outside option including renting a car from another company or not renting a car. This specification can be derived from a choice model of rental decision with a representative customer. We compute market share  $S_{mt}^F$  by comparing the total number of car rental transactions of the firm in airport  $m$  at period  $t$  from the firm's financial data to the total number of passengers arriving the airport during the period of the time from the Bureau of Transportation.  $Price_{mt}$  is the weighted average rental price in the market.  $SAT_{m,t-1}$  is the average customer satisfaction rating of the same airport in the last period. The parameter  $\phi_s$  captures the impact of lagged satisfaction on current market share. We control for the market characteristics including the number of car rental firms and the airport traffic in  $X_{mt}$ . We also include the set of month and year dummy variables to control for unobserved time effect.

We estimate the model using two-stage least square in which we instrument the endogenous variable  $Price_{mt}$  with local tax rate and public transportation ratio in the first stage. The result are reported in Table 7. We find that customer satisfaction in the past has a positive and significant impact on the current market share. The coefficient  $\phi_s$  is 0.1453. It suggests that increasing the customer satisfaction by 1 scale point can increase the odd of choosing the focal firm relative to the outside option by 15.64%.

Now we can further calculate the impact of upselling on future market share through customer satisfaction. Given the estimated impact of upselling on customer satisfaction above, for a typical consumer who experienced upselling in the last trip, the odds of choosing the company again in this market would decrease by 3% holding everything else equal.

## 5 Counterfactual Analysis

Our model links employee effort allocation decision with consumers' add-on purchases and satisfaction. The structural approach allows us to evaluate the implications of alternative

incentive schemes. In particular, we can conduct counterfactual analysis to examine employees' effort allocation and its impact on upsell rate and customer satisfaction when the company changes the monetary incentive, e.g. commission rate, or moderates employees' intrinsic motivation through management.

## 5.1 Change of Monetary Compensation

One important question is whether the company should increase the counter representatives' incentive to upsell. The add-on products have a much higher profit margin than the basic car rental service. Therefore, upselling contributes to immediate profit. However, our analysis above also shows that upselling has a negative impact on customer satisfaction, which in turn hurts the future business of the company. To evaluate the net effect, we conduct the following counterfactual analysis in which we raise the commission rate,  $k_1$ , from 10% to 20%.

Given the estimated parameters and the new  $k_1$ , we solve for the optimal level of upselling effort  $e^{ex}$  and service effort  $e^{in}$  in each market and time period. First of all, as expected, increasing the monetary incentive through  $k_1$ , the commission rate, promotes more upselling effort. The average upsell rate across market and time under the new incentive scheme would be 27.4%, more than doubling the current upsell rate of 11.2%. The incentive is more effective in stimulating upselling effort in less competitive markets.

In general, increased monetary incentive has a negative impact on customer satisfaction. First, service level decreases as employees are motivated to devote their time and effort to upselling. In this counterfactual analysis, we find that the average service effort devoted to each customer will decrease by 26% when commission is doubled. Second, higher upselling rate has a negative impact on customers' experience. Combining the two effects, we find that the average satisfaction rating across markets and time would decrease by 0.37 scale point. Using the results from equation 16, such decrease in customer satisfaction would lead to 5.5% decrease of the odds of choosing the firm next time on average.<sup>14</sup>

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<sup>14</sup>We have to point out that our analysis does not consider the competitors' responses. The result can be interpreted as the consequence of raising commission rate with the current market structure in the industry.

## 5.2 The Role of Management

Our empirical analysis shows that employees' satisfaction toward management can effectively enhance their intrinsic motivation to work. We now consider the case that employees' satisfaction toward management hypothetically increases by 25% scale point in each market.<sup>15</sup> Higher employee satisfaction may be achieved by better communication between managers and employees, improved management skills or employee supporting system.

In this case, we find that employees' service effort will increase by 9.6% on average across markets. Service effort will increase more in less competitive markets. Higher service effort will lead to an average increase of 0.09 scale point in customer satisfaction. Based on the relationship of customer satisfaction and future booking, this improvement in customer satisfaction can be translated into 1.3% increase in the odds of a customer to choose the firm. On the other hand, the effort allocated to upselling will decrease by 12.7%. Consequently, the upselling rate on average will drop from 11.2% to 10.0%. Note that we only predict the effect for the next period given the change in incentive scheme, as it is difficult to gauge the long term dynamic impact of the tradeoff between customer satisfaction and upselling rate.

## 6 Concluding Remarks

In this paper, we investigate the relationship between upselling and customer satisfaction from the perspective of the sales representative's effort allocation. Sales representatives are motivated to sell add-on products to customers to earn commission. Meanwhile, sales representatives have the intrinsic motivation to serve customers and care about customer satisfaction. Allocating more effort on upselling has a negative effect on customer satisfaction. First, it would crowd out the service effort in most cases. Second, more upselling generates disutility and hurts customer satisfaction. A sales representative chooses the optimal level of effort driven by both the monetary and intrinsic incentives. We find that such effort allocation can partially explain the negative correlation between upselling rate and customer satisfaction.

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<sup>15</sup>The satisfaction increase is capped by the maximum scale point on the survey. 25% increase implies that the average satisfaction rating with management with increase from 3.45 to 4.38.

This framework allows us to examine the implications of different incentive schemes and helps the firm to better understand the trade-off between short term profit gain from upselling and long term consequences of customer satisfaction. Our counterfactual analysis reveals that providing employees with higher monetary incentive to upsell would achieve higher upsell rate at the expense of future market share.

There are a few important questions that call for future research. First, one can further investigate the optimal incentive provision from the firm's perspective. There are two types of incentives in the model. One is monetary reward and the other is intrinsic motivation. The optimal incentive may consider the combination of both type of tools to achieve the best performance. Second, it is important to investigate how to mitigate the negative impact of upselling on customer satisfaction. Last but not least, it is interesting to extend the current framework and allow the interaction of monetary motivation and intrinsic incentive and to investigate its implication under different market structure.

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## Appendix

We simultaneously estimate customers' add-on purchase decision and customer satisfaction along with the agent's effort allocation. The key part of the estimation algorithm is to solve the optimal level of upselling effort  $e^{ex}$  and service effort  $e^{in}$  given a set of parameters. We provide details of this step below.

First, given equation (8), (11) and (12), the first order conditions (equation 3 and 4) of the sales agent's utility maximization problem can be expressed as:

$$\begin{aligned}\frac{\partial u_{it}^e}{\partial e^{ex}} &= [k_1 p_{mt}^a + k_2 \beta_1 + k_2 \beta_m^p p_{mt}^a] \frac{\exp(\alpha_0 + \alpha_x X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})}{[1 + \exp(\alpha_0 + \alpha_x X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})]^2} \frac{M_{mt}}{e_{mt}^{ex}} \\ &\quad - 2\gamma\theta M_{mt}^2 (e^{in} + \theta e^{ex}) = 0 \\ \frac{\partial u_{it}^e}{\partial e^{in}} &= \frac{k_2}{e^{in}} * M_{mt} - 2\gamma M_{mt}^2 (e^{in} + \theta e^{ex}) = 0\end{aligned}$$

Collecting terms, we can further derive that:

$$\begin{aligned}\frac{1}{e_{mt}^{in}} &= \frac{[k_1 p_{mt}^a + k_2 \beta_1 + k_2 \beta_m^p p_{mt}^a]}{\theta k_2 e_{mt}^{ex}} \frac{\exp(\alpha_0 + \alpha_x X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})}{[1 + \exp(\alpha_0 + \alpha_x X_{mt} + \alpha_m^p p_{mt}^a + \log(e_{mt}^{ex}) + \xi_{mt})]^2} \\ &= \frac{[k_1 p_{mt}^a + k_2 \beta_1 + k_2 \beta_m^p p_{mt}^a]}{\theta k_2 e_{mt}^{ex}} Prob(up_{mt}) * [1 - Prob(up_{mt})] \\ &\equiv \frac{D_{mt}}{\theta k_2 e_{mt}^{ex}}\end{aligned}\tag{17}$$

$$\frac{k_2}{2\gamma M_{mt}} = (e_{mt}^{in})^2 + \theta e_{mt}^{in} e_{mt}^{ex}\tag{18}$$

Note that  $e^{in}$  can be written as a function of  $e^{ex}$  by equation (17) above. Substitute equation (17) into (18), we have

$$e_{mt}^{ex} = \frac{D_{mt}}{\theta \sqrt{2\gamma M_{mt}(k_2 + D_{mt})}}\tag{19}$$

where

$$D_{mt} = [k_1 p_{mt}^a + k_2 \beta_1 + k_2 \beta_m^p p_{mt}^a] Prob(up_{mt}) * [1 - Prob(up_{mt})]\tag{20}$$

In the estimation, we use the empirical analog of upselling rate in market  $m$  at period  $t$  to replace  $Prob(up_{mt})$  in equation (20). The idea is that the true parameters and upsell effort should align the predicted successful upselling probability  $Prob(up_{mt})$  with the empirical observation.

We use GMM to estimate the parameters. The algorithm works as follows:

(1) Given data and parameter value, compute  $e_{mt}^{ex}$  according to equation 19. Then compute  $e_{mt}^{in}$  according to equation 17.

(2) Given the calculated  $e_{mt}^{ex}$  and  $e_{mt}^{in}$  and the parameter value, recover the unobserved demand shock  $\xi_{mt}$  in the upselling equation (7) and the unobserved shock  $\varepsilon_{imt}$  in the satisfaction equation (9).

(3) Interact the recovered  $\xi_{mt}$  and  $\varepsilon_{imt}$  with the respective instruments to form moment conditions.

Table 1: Summary Statistics of Transaction

	Obs.	Mean	Std.Dev.	Min	Max
Total rental days	313033	3.98	4.23	1	121
Total rental expense	313033	178.07	196.12	0	8008.47
Age	312818	50.42	12.45	18	111
Membership	313033	0.75	0.43	0	1
Business trip	313033	0.50	0.50	0	1
Upsell	313033	0.11	0.32	0	1
Overall satisfaction	305562	7.27	2.44	0	9

Table 2: Summary Statistics of Airports

	Number of airports	Mean	Std.Dev.	Min	Max
Average monthly transaction	159	6956.50	8520.80	194	47,860
Number of car rental companies	159	7.84	2.58	1	15
Average monthly traffic (in millions)	159	0.35	0.62	0.002	3.67
Tax rate	159	0.10	0.04	0	0.199

Table 3: Regression Analysis on Customer Satisfaction

	(1)	(2)	(3)
Upsell	-0.1431*** (0.0137)		-0.1635*** (0.0151)
Charge_per_day	-0.0047*** (0.0001)	-0.0048*** (0.0001)	-0.0047*** (0.0001)
Total_rent_days	0.0021** (0.0009)	0.0023** (0.0009)	0.0021** (0.0009)
Number_of_firms	-0.0302*** (0.0017)	-0.0311*** (0.0017)	-0.0303*** (0.0017)
Airport_traffic	-0.0475*** (0.0051)	-0.0476*** (0.0051)	-0.0478*** (0.0051)
Business	-0.0301*** (0.0081)	-0.0253*** (0.0081)	-0.0314*** (0.0081)
Member	0.6281*** (0.0107)	0.6406*** (0.0107)	0.6246*** (0.0108)
Age	0.0064*** (0.0003)	0.0065*** (0.0003)	0.0063*** (0.0003)
Weekend	-0.0144 (0.0090)	-0.0156* (0.0090)	-0.0141 (0.0090)
Veh equip condition	0.5353*** (0.0019)	0.5350*** (0.0019)	0.5353*** (0.0019)
Upsell_GPS		-0.3392*** (0.0405)	
GPS		0.0871*** (0.0180)	0.0401** (0.0168)
Radio			0.1022*** (0.0309)
Constant	3.6504*** (0.0628)	3.6227*** (0.0626)	3.6555*** (0.0628)
Car type dummies	Yes	Yes	Yes
R-sqr	0.314	0.314	0.314
Obs.	291992	291992	291992

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 4: Regression Analysis of Employee Satisfaction on Customer Satisfaction

	(1)	(2)
Upsell	-0.1297*** (0.0155)	-0.1298*** (0.0155)
Charge_per_day	-0.0046*** (0.0002)	-0.0046*** (0.0002)
Total_rent_days	0.0038*** (0.0011)	0.0038*** (0.0011)
Number_of_firms	-0.0097*** (0.0023)	-0.0107*** (0.0023)
Airport_traffic	-0.0321*** (0.0053)	-0.0328*** (0.0053)
Veh equip condition	0.5377*** (0.0022)	0.5378*** (0.0022)
Business	-0.0172* (0.0094)	-0.0167* (0.0094)
Member	0.7242*** (0.0130)	0.7240*** (0.0130)
Age	0.0063*** (0.0004)	0.0063*** (0.0004)
Weekend	-0.0043 (0.0105)	-0.0047 (0.0105)
Mgr_acts_on_sugg	0.0414*** (0.0069)	
Recommend_company		0.0386*** (0.0066)
Constant	2.9113*** (0.1218)	2.9273*** (0.1214)
Car type dummies	Yes	Yes
R-sqr	0.308	0.308
Obs.	229190	229190

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: Estimation Results

Employee model	
$k_{20}$	0.0646*** (0.0145)
$k_{21}$	0.0184** (0.0090)
$\gamma$	0.5613*** (0.0897)
$\theta$	0.1376*** (0.0472)
Upsell equation	
Constant	-2.9732*** (0.9562)
Airport_traffic	0.0914*** (0.0321)
Upsell price	-0.0055** (0.0024)
$\times$ Number of firms	0.0050*** (0.0011)

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



Table 6: Estimation Results Continue

Customer Satisfaction	
upsell	-0.1904*** (0.0826)
Charge_per_day	-0.0107** (0.0049)
× Number of firms	0.0005*** (0.0025)
Total_rent_days	0.0041*** (0.0017 )
Number_of_firms	-0.0056* (0.0029)
Airport_traffic	-0.0218** (0.0111)
Business	-0.0103** (0.0051)
Member	0.2825*** (0.1025)
Age	0.0116*** (0.0034)
Weekend	0.0006 (0.003)
Veh_equip_condition	0.5295*** (0.1876)
Constant	3.9054*** (1.2312)
Car type dummies	Yes

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 7: Impact of Satisfaction of Future Booking

Market Share	
Charge_per_day	-0.0743*** (0.0068)
Lagged_satisfaction	0.1453*** (0.0359)
Number_of_firms	-0.1659*** (0.0116)
Airport_traffic	-0.2875*** (0.0484)
Constant	-0.0412 (0.4785)
Month/year dummies	Yes
R-sqr	0.0736
Obs.	3822

Robust standard errors in parentheses

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$