

CAR RENTAL DOWNGRADES:
IMPACT ON CUSTOMER RETURN BOOKINGS

A Thesis

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by

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Abstract

This thesis examines how vehicle downgrades influence customer loyalty in the car-rental sector. Drawing on 81,672 Hertz airport rentals from 2,389 U.S. and Canadian locations (2011–2012), it links transaction records to counter notes that label each downgrade as firm-initiated, customer-requested, or unclear. Ordinary least squares models, incorporating airport fixed effects and customer-clustered errors, estimate the probability that a renter returns within 365 days. Results reveal that a clearly explained, firm-initiated downgrade raises repeat-booking likelihood by nearly seven percentage points, while customer-requested and unclear downgrades exhibit no significant effect. These findings provide large-scale behavioral evidence for justice theory and the service-recovery paradox, demonstrating that transparency and procedural fairness—rather than the occurrence of a service lapse itself—shape customer response. By replacing stated intentions with observed behavior, the study underscores the managerial value of clear frontline communication: a candid explanation at the moment of failure can transform operational friction into a loyalty-building opportunity.

Keywords: service recovery, customer loyalty, car-rental downgrades

Biographical Sketch

Ziqi Ding is a graduate student in the Master of Science program in Applied Economics and Management at Cornell University. With a strong academic foundation in risk management, statistics, and economic analysis, Ziqi's research interests lie at the intersection of data analytics, customer behavior, and strategic decision-making. Her recent work explores how operational service adjustments influence consumer retention in the car rental industry. Prior to her graduate studies, Ziqi earned her bachelor's degree from Pennsylvania State University and held several analytical roles in both the U.S. and China. Her professional and academic experiences reflect a continued commitment to evidence-based problem-solving in complex, real-world contexts.

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Finally, I would like to thank my parents and family for their steadfast support and encouragement, which gave me the confidence to persevere. I also remember my grandmother, who passed away in 2024; her enduring love and presence have been a source of comfort and inspiration, and I know she would have been proud to share this achievement.

Reflecting on this journey, I see that these two years have not only resulted in a thesis but also shaped who I am. I believe this experience has given me a solid foundation for any career path I choose. It has strengthened my ability to tackle challenges, communicate clearly, solve problems, and stay committed to my passions. I look forward to bringing this curiosity and dedication into the next phase of my career.

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1. Introduction

Service businesses rise or fall on the quality of customer experiences, and even a single lapse can damage years of trust. A clear example in the car rental industry is the downgrade—the moment when a customer reserves one vehicle class but receives a lower one. Although downgrades occurred in only about three percent of the 81,672 repeat rentals analyzed here, their visibility at the rental counter and the perceived loss of value make them significant triggers of dissatisfaction. Research on service recovery suggests that prompt and fair responses can restore customer satisfaction (Smith, Bolton, and Wagner 1999). In certain circumstances, effective recovery might even leave customers more satisfied than if no problem had occurred—a phenomenon known as the service recovery paradox (Bitner, Booms, and Tetreault 1990). However, later evidence indicates this paradox is rare and limited to specific contexts (Michel and Meuter 2008).

Justice theory refines these insights by dividing customer evaluations into distributive, procedural, and interpersonal fairness, emphasizing that these aspects affect customers differently (Tax, Brown, and Chandrashekar 1998). Recent field studies further suggest that customers with stronger emotional ties to brands respond more positively to fair remedies (Lim, Saha, and Das 2025). Additionally, experimental evidence highlights that customers reward firms when they observe clear organizational efforts to prevent recurring errors (Lunardo, Cusin, and Flacandji 2023). Despite these contributions, most service recovery studies still rely primarily on surveys or controlled experiments rather than real transactional data. Notable exceptions include Marinova and Singh (2014), who examine how service failures influence renewal choices among zoo members, and Dotzel, Thomas, and Yang (2024), who trace long-term impacts of early

failures in ride-hailing services. Nevertheless, the car rental context, characterized by higher monetary stakes and visibly apparent mismatches, remains largely unexplored.

This thesis addresses this gap by linking detailed administrative records from 2,389 airport rental locations with counter notes explaining each downgrade. Downgrades were categorized into three groups: customer-requested, firm-initiated, or unclear. The primary outcome examined was whether customers rented again within one year. Ordinary least squares regressions with airport fixed effects and customer-clustered errors reveal notable patterns. When rental staff clearly attributed a downgrade to unavoidable fleet shortages, customers often accepted the inconvenience and exhibited higher retention rates. In contrast, downgrades accompanied by vague or inconsistent explanations failed to improve retention. Downgrades initiated by customer requests had little effect on future renting behavior. Importantly, this thesis does not explore specific mechanisms, such as price concessions, that might explain these outcomes, rather than that, it emphasizes the overall role of clear and transparent communication.

These findings extend the service recovery literature in two ways. First, they provide large-scale transactional evidence that the clarity of explanations strongly influences whether a service failure strengthens or weakens customer loyalty. Second, they highlight the commercial value of transparency and visible organizational responsiveness. Clear communication about operational constraints can transform potential dissatisfaction into an opportunity to reinforce relationships. The remainder of the thesis proceeds as follows. The next section reviews theoretical perspectives on service failures, justice theory, and organizational learning, framing the research questions. Subsequent sections detail the data and empirical strategy, present the main results and robustness checks, discuss managerial implications, and conclude by addressing limitations and suggesting future research directions.

2. Literature Review

2.1 Service Failure and Recovery

Service failures are unavoidable in business, often triggering negative emotions that reduce customer satisfaction and loyalty. Effective recovery can mitigate dissatisfaction, and in some cases, might leave customers even more satisfied than if no issue had occurred—a phenomenon known as the service recovery paradox (SRP) (Bitner, Booms, & Tetreault, 1990; Michel & Meuter, 2008). However, the SRP does not always occur, prompting researchers to examine the specific conditions under which recovery leads to heightened satisfaction.

Two theoretical perspectives shed light on this phenomenon. The first perspective focuses on organizational learning. Lunardo, Cusin, and Flacandji (2023) suggest that customers experience greater post-recovery satisfaction primarily when they see tangible improvements implemented by a company to prevent future service failures. Immediate compensation alone was insufficient to generate the SRP in their experiments. Instead, customers needed to recognize genuine organizational changes following the failure. When customers see real action to fix a problem, they feel the company cares, which eases frustration and boosts satisfaction. The second perspective emphasizes fairness. According to fairness theory, customer evaluations following a service failure depend significantly on perceived distributive fairness (whether outcomes are fair) and procedural fairness (whether the resolution process itself is fair) (Hapsari et al., 2017; Sousa & Voss, 2009). Lim, Saha, and Das (2025) identified these two fairness dimensions as the most influential in recovery situations. Polite staff are welcome, but this alone rarely affects satisfaction. A clear and fair fix matters more. It avoids future downgrading and

strengthens the customer's link to the brand, helping long-term loyalty (Ali et al., 2023; Cambra-Fierro et al., 2016).

Applying these ideas to car-rental downgrades offers clear guidance. When staff explain that a forced downgrade is due to a genuine car shortage, customers can see the firm is learning and improving. A fair refund or similar concession then shows both process and outcome fairness. Top-tier renters, already close to the brand, may value this even more and become more loyal, as Lim et al. (2025) suggest. In short, clear and fair treatment can turn a downgrade from a setback into a chance to deepen customer ties. This thesis tests, with data, whether these steps do in fact boost repeat rentals and loyalty.

2.2 Consumer Retention and Loyalty

Olsen and Johnson (2003) describe two forms of customer evaluation. The first is transaction-specific, based on a single service episode. The second is cumulative, reflecting impressions formed over many interactions. Survey data from the banking sector show that these paths work in different ways. When a customer experiences an isolated service failure, perceived fairness directly shapes satisfaction and, in turn, future behavior (Smith, Bolton & Wagner, 1999). For customers with long, positive histories, overall satisfaction is the main driver of loyalty, so an occasional fairness lapse matters less. Conversely, customers who are already dissatisfied remain highly sensitive to fairness, even in a single encounter.

This distinction offers critical guidance for managing customer loyalty. Firms seeking to retain satisfied customers should reinforce overall relationship quality (Andreassen & Lervik, 1999). Conversely, addressing fairness issues becomes particularly crucial for customers whose satisfaction levels are already low (Smith & Bolton, 1998). Additionally, Olsen and Johnson

(2003) found that, as relationships mature, the drivers of loyalty broaden to include product quality, pricing, and ongoing service performance, rather than just single-visit factors (Johnson & Gustafsson, 2000). Methodologically, their analysis revealed that cumulative satisfaction scores explained substantially more variance in repurchase intentions than did individual transaction evaluations (Fornell et al., 1996; Johnson, Anderson, & Fornell, 1995). Thus, they advocate using cumulative data to assess long-term customer strategies and transaction data to handle immediate customer service issues.

These insights significantly inform this thesis. A forced car rental downgrade represents a transaction-specific fairness failure, while the decision to rent again reflects a broader judgment shaped by the customer's overall experience. The empirical strategy in this study aims to capture both dimensions by measuring how downgrades influence the likelihood of return. Olsen and Johnson's (2003) suggests that the impact of such failures may depend on the customer's existing relationship with the firm. Therefore, this study examines whether customers respond differently to downgrades in terms of their likelihood to rent again.

In extending Olsen and Johnson's approach, this thesis uses actual customer behavior rather than stated loyalty intentions from surveys. By linking detailed administrative records to downgrade reasons, it operationalizes their recommendation to connect theoretical loyalty constructs directly to real-world outcomes. Overall, their conceptual framework provides crucial theoretical underpinnings, differentiating clearly between immediate service failures and the broader satisfaction context that ultimately drives loyalty.

2.3 Empirical Methods

Recent literature on customer loyalty provides a solid empirical foundation for this thesis. Marinova and Singh (2014), for instance, investigated how customer decisions regarding service levels (renewing, upgrading, or downgrading) occur as a sequence of related choices. Their research on a large zoological society combined qualitative interviews and a comprehensive survey of nearly 3,000 members with archival renewal data. They analyzed this combined dataset using a multinomial logit model, explicitly separating the initial decision to renew membership from subsequent decisions about upgrading or downgrading service tiers. The results indicated perceived value and trust strongly increased upgrade likelihood, while having less impact—and sometimes even opposite effects—on decisions to downgrade service levels.

Dotzel, Thomas, and Yang (2024) applied similar logic using transactional data from over two million car rental interactions. Their empirical approach incorporated high-dimensional fixed effects for customers and frontline employees, enabling the researchers to isolate within-customer variation and account for unobserved heterogeneity. They found that repeated interactions with the same frontline agents significantly increased customer willingness to accept upsells and positively affected future spending behavior. Their methodological emphasis highlights the importance of panel data structures and granular transactional records for obtaining unbiased estimates of customer retention and loyalty outcomes.

These two studies inform the empirical approach adopted in this thesis. Both papers emphasize the sequential nature of customer decisions, suggesting that analyses should distinguish clearly between the decision to return and subsequent behaviors. Reflecting Marinova and Singh's methodology, this thesis treats customer retention (the decision to rent again within

one year) as the primary decision stage. Additionally, the relational context identified by both studies suggests that customer characteristics—such as membership tiers, brand affinity, and familiarity with frontline agents—could significantly moderate responses to service failures. The current analysis thus incorporates interaction terms involving customer loyalty tiers and booking purpose to examine potential differences in how customers respond to forced downgrades.

3. Methodology

3.1 Data

This study draws on the Hertz–Wharton Customer Analytics Initiative (WCAI) archive, a comprehensive longitudinal dataset combining transaction records, customer surveys, and outlet attributes for Hertz’s U.S. and Canadian operations. The full WCAI dataset includes nearly 900,000 post-rental survey responses, two semi-annual employee engagement surveys from more than 3,000 locations, and approximately 9.7 million transactions by repeat customers between August 2010 and September 2012. To specifically investigate airport based rental behavior, this analysis considers transactions from 2,389 airport locations and yields a final sample comprising 81,672 rental records from 33,436 anonymized repeat customers.

The prepared dataset includes essential variables for each rental: a unique customer identifier (`userid_mod`), checkout date (`datecheckout`), transaction ID, reserved and actual car-class codes (`numreserveclass` and `numdriveclass`), and categorical indicators for downgrade motives (`customer-requested`, `firm-initiated`, or `unclear`). The dataset also captures each customer's subsequent rental date to assess repeat rental behavior. Additionally, several control variables are included, such as rental duration (`days`), total rental price (`USD`), customer age

(years), loyalty tier (ranging from 0–7), and indicators for weekend pickup and business travel. Location fixed effects, representing each airport, control for stable differences in fleet availability, service quality, and local pricing. This structured dataset provides the transaction level detail necessary to investigate how different downgrade types influence customers’ likelihood of renting again within one year.

3.2 Empirical Strategy

The empirical analysis employs linear probability (OLS) regression models to estimate how vehicle-class downgrades affect customers’ probability of renting again within 365 days. For each rental transaction i , the dependent variable Y_i equals 1 if the customer returns to rent again within a year, and 0 otherwise. The baseline regression specification is:

$$Y(\text{retention rate})_i = \alpha + \beta \text{downgrade}_i + X'_i \gamma + \delta_{loc(i)} + \epsilon_i$$

In this model, the variable downgrade equals 1 if the actual vehicle class provided was lower than the class reserved, and 0 otherwise. A negative and significant coefficient (β) implies that downgrades generally reduce customer retention. To further distinguish the effects of different downgrade motivations, the single downgrade indicator is replaced by three distinct indicators: customer-requested, firm-initiated, and unclear downgrades. The expanded model is:

$$Y(\text{retention rate})_i = \beta_0 + \beta_1 \text{downgrade}_{customer_i} + \beta_2 \text{downgrade}_{firm_i} + \beta_3 \text{downgrade}_{other_i} + X'_i \gamma + \delta_{loc(i)} + \epsilon_i$$

Here, each indicator represents the impact of a particular downgrade category compared to rentals without downgrades. Control variables in X'_i include customer age, loyalty tier (categorized as low for tiers ≤ 2 and high for tiers ≥ 5), rental duration, total rental price, weekend pickup, and business trip indicators. Location fixed effects ($\delta_{loc(i)}$) control for persistent

differences across airports. Standard errors are clustered by customers to account for correlated observations from the same individual. The estimated coefficients β_1 , β_2 and β_3 indicate whether each downgrade type positively or negatively influences the likelihood of repeat renting. Negative coefficients suggest decreased loyalty, whereas positive or insignificant coefficients indicate neutral or improved retention. However, the analysis reflects conditional correlations rather than definitive causal relationships. Despite including robust controls, unobserved factors such as sudden vehicle shortages or competitor activities might still affect both downgrade occurrences and retention outcomes.

3.3 Hypothesis

Service downgrades are typically viewed as negative service failures, yet customer reactions may vary sharply depending on the underlying cause. In the car rental context, we distinguish two competing behavioural responses:

H1 (Negative response): proposes that customers view any downgrade—regardless of reason—as a failure to fulfill the rental agreement. Thus, all downgrade types are predicted to decrease the likelihood of repeat rentals, implying negative effects across the board (β_1 , β_2 and $\beta_3 < 0$), though magnitudes may vary by category.

H2 (Neutral or compensatory response): suggests that customers distinguish between downgrade scenarios based on the reason provided. Specifically, customer-requested downgrades, being voluntary, are unlikely to significantly affect future retention. Firm-initiated downgrades, clearly explained and potentially accompanied by compensation, may have a neutral or even positive effect by demonstrating transparency and responsiveness. Conversely, downgrades lacking clear explanations may cause uncertainty and lower customer loyalty. This

hypothesis highlights the importance of clear communication and fairness in mitigating the negative consequences of service failures and preserving customer relationships.

4. Results

For this section, it will present the empirical results on how service downgrades affect customer retention which proceeds in three steps. First, it summarizes key descriptive statistics for the analysis sample. Second, it reports baseline regression estimates for an aggregate downgrade indicator, shown both without and with airport fixed effects. Third, it breaks the downgrade indicator into three categories—customer-requested, firm-initiated, and unclear—and compares their effects on retention under the same two model specifications.

4.1 Descriptive Analysis

Table 1 provides descriptive statistics for the dataset. The average customer age is 52.46 years (SD = 11.80, range: 20–112). Mean rental duration is 4.22 days (SD = 6.30), with an average price of \$198.88 (SD = 225.78). The average reserved car class is 2.98 (SD = 1.94), and the average driven car class is 4.35 (SD = 2.33). Customers' loyalty tiers average 1.94 (SD = 1.10), with most customers (over 76%) concentrated in Tier 1 or Tier 2.

Figures 1–3 further illustrate distributions of reserved car classes, actual driven classes, and loyalty tiers. The most frequently reserved class is 2, comprising 42.6% of rentals. The most commonly driven class is 4, representing 35.2% of rentals. Out of 81,672 total rentals, 2,706 (3.3%) were downgraded. Among these downgraded cases, 236 (8.7%) were customer-initiated, 645 (23.8%) were firm-initiated, and 1,825 (67.5%) were classified as unclear (Table 2; Figure 4). Table 3 presents the top 10 tag comments from the datasets and their frequencies for each

downgrade type, which directly reflects how the study categorized downgrades into three types. This frequency-based summary of comments also provides transparency into the qualitative basis for the classification approach.

4.2 OLS Model (Aggregate Downgrade)

Table 4 presents regression results assessing the overall impact of a downgrade (without distinguishing specific reasons) on customer retention. The first regression (without fixed effects) reports a positive but statistically insignificant coefficient of 0.0159 (SE = 0.00974, $p > 0.10$). The second model adds airport location fixed effects and yields a similar insignificant coefficient of 0.0107 (SE = 0.00994, $p > 0.10$). These results imply that, when combining all downgrade types, there is no measurable overall effect on customer retention within one year.

Several control variables show statistically significant effects. Customers in both the low (Tier ≤ 2) and high loyalty tiers (Tier ≥ 5) exhibit reduced likelihood of returning compared to mid-tier customers. Notably, the negative impact of loyalty tier is less pronounced after controlling for location fixed effects. For low-tier customers, the coefficient decreases in magnitude from -0.0642 to -0.0491 , and for high-tier customers, from -0.0614 to -0.0353 which the latter also loses statistical significance. This suggests that a portion of the observed loyalty tier effect is attributable to differences across locations—possibly reflecting that some branches serve more high- or low-tier customers, who may have systematically different retention rates. Once location-specific factors are accounted for, the true within-location effect of loyalty tier membership on retention is smaller.

Older customers exhibit slightly lower retention rates, while longer rental durations modestly increase retention. Higher rental prices negatively influence retention. Including

location fixed effects reduces the magnitudes of these coefficients slightly but does not alter their overall significance or direction. To determine whether these different motives pull in opposing directions, the next regression splits the single downgrade indicator into three specific types—customer requested, firm induced, and unclear—allowing their distinct impacts on loyalty to surface.

4.3 OLS Model (Three Downgrade Type)

Table 5, Column (1), separates the downgrade variable into three categories: customer-requested, firm-initiated, and unclear reasons. This allows for an examination of how different downgrade motivations affect customer retention separately. Customer-requested downgrades have a small and statistically insignificant effect on retention (coefficient = 0.00374, SE = 0.0329, $p > 0.10$). Similarly, downgrades with unclear reasons also show no significant impact (coefficient = -0.000998 , SE = 0.0118, $p > 0.10$). In contrast, firm-initiated downgrades demonstrate a clear and statistically significant positive relationship with retention (coefficient = 0.0681, SE = 0.0194, $p < 0.001$). This result indicates that when the firm clearly communicates the reasons behind a downgrade, the likelihood of customers returning within a year increases by approximately 6.8 percentage points. Regarding control variables, both low-tier and high-tier customers exhibit lower retention rates compared to mid-tier customers. Older customers also show a modestly lower likelihood of returning. Each additional rental day slightly increases retention probabilities (coefficient = 0.00304, $p < 0.001$). Conversely, higher rental prices are negatively associated with retention (coefficient = -0.000131 , $p < 0.001$). Weekend and business-trip indicators show no consistent or significant relationship with retention.

Column (2) adds 2,389 airport location fixed effects to account for stable, unobserved differences across rental locations. After controlling for these location-specific factors, the results remain mostly consistent. Firm-initiated downgrades continue to significantly enhance retention (coefficient = 0.0673, SE = 0.0198, $p < 0.001$). Meanwhile, customer-requested downgrades (coefficient = -0.00623 , SE = 0.0337, $p > 0.10$) and unclear downgrades (coefficient = -0.00703 , SE = 0.0120, $p > 0.10$) still show no meaningful impact on retention. For the control variables, the inclusion of location fixed effects notably reduces the negative impact of loyalty tier, particularly for high-tier customers. The low-tier coefficient decreases from -0.0643 to -0.0491 (both significant at $p < 0.001$), indicating that part of the negative association between low loyalty status and retention is attributable to differences across locations. Most strikingly, the negative coefficient for high-tier customers drops from -0.0613 ($p < 0.001$) to -0.0353 (statistically insignificant), suggesting that much of the apparent retention penalty for high-tier members was driven by location-level factors rather than by loyalty status itself. This pattern mirrors the results from Table 4 and underscores the importance of controlling for location-specific effects when evaluating the impact of customer characteristics on retention.

Rental duration retains a small positive effect on retention (coefficient = 0.00107, $p < 0.05$), while higher rental prices continue to reduce retention likelihood slightly (coefficient = -0.0000751 , $p < 0.001$). Although the inclusion of location fixed effects leads to modest changes in the estimated effects of loyalty tiers—particularly reducing the negative association for high-tier customers—the overall interpretation remains consistent with earlier findings. Clearly communicated firm-initiated downgrades consistently improve customer retention, whereas customer-requested and ambiguous downgrade scenarios have no measurable effect on customer loyalty.

4.4 Summary

The regression analyses clearly indicate that not all downgrades are equally impactful. When firms transparently communicate operational constraints causing downgrades, customers appear to respond positively, showing higher retention rates in the following year. Conversely, customer-requested downgrades and downgrades lacking clear explanations do not significantly affect customer loyalty. The next section explores potential reasons behind these findings, emphasizing practical implications for management, such as the importance of clear communication and transparency during service recovery.

5. Discussion

5.1 Theoretical Interpretation

Our findings reveal that an overall “neutral” average masks two opposing forces. When a downgrade was driven by the firm and clearly explained, the chance a customer rented again rose by about 6.8 percentage points. In contrast, downgrades requested by customers—or downgrades given without a clear reason—showed no measurable effect on repeat business. This pattern lends strong support to Hypothesis 2, which posits that customer reactions hinge on the motive and transparency of the downgrade. At the same time, it challenges Hypothesis 1’s simpler claim that every service failure must harm loyalty.

The power of the firm-initiated downgrade to build loyalty is best explained through justice theory (Lim, Saha & Das, 2025). When the firm gives a clear operational reason for the downgrade, customers perceive procedural fairness because the process appears transparent and reasonable. A tangible gesture—such as a fee waiver or voucher—adds distributive fairness by

offering concrete recognition of the inconvenience (Adams, 1965; Estelami & De Maeyer, 2004). When both fairness dimensions are met, a potentially negative event can trigger the service recovery paradox, turning dissatisfaction into greater loyalty (Lunardo, Cusin & Flacandji, 2023).

This pattern contrasts with early service-recovery research that assumed any downgrade would damage loyalty (Bitner, Booms & Tetreault, 1990). Instead, our results confirm more recent meta-analytic evidence showing that recovery efforts succeed only when customers view the response as fair (Michel & Meuter, 2008). We also extend Marinova & Singh's (2014) insight that organizational signals matter: a well-explained, fairly handled downgrade not only prevents defection but can actually encourage return visits, converting a potential "value gap" into a loyalty asset.

In line with expectations, customer-requested downgrades have no measurable effect on future retention. Voluntary changes likely leave loyalty unchanged because they do not create a perceived fairness gap: the firm neither fails the customer nor offers compensatory value, so there is nothing to repair or reward. This underscores that not all voluntary service adjustments influence retention. It is also worth noting that while the inclusion of location fixed effects leads to slight changes in the estimated loyalty tier effects—particularly reducing the negative association for high-tier customers—the overall pattern of results remains consistent.

Methodologically, our regression design—with airport fixed effects and customer-clustered errors—isolates these effects from unobserved location heterogeneity and individual rental histories. Future studies should apply similar conditional models when assessing repeat behavior and explore whether other customer-initiated service changes likewise leave loyalty untouched.

5.2 Limitation&Future Research

This study faces two main limitations. First, our archival data from 2011–2012 omit factors such as individual brand loyalty, the tone of counter interactions, and small fee waivers. These omissions may affect how downgrades are managed and whether customers return. Second, the data do not indicate when the firm offered a price break (for example, a partial refund or voucher) alongside a downgrade. Without this detail, we cannot assess how the size or type of compensation influences retention.

Future research should link customer surveys and transactional records to capture perceptions of procedural and distributive fairness and record any compensation provided. Controlled experiments can then vary both the clarity of downgrade explanations and the magnitude or form of price breaks. Such designs would allow a deeper examination of how different compensation strategies affect customer loyalty. Finally, applying this framework to more recent datasets—including digital touchpoints like mobile check-in—will reveal whether these fairness and compensation dynamics persist in today’s technology-driven rental environment.

6. Conclusion

This thesis set out to ask a simple question: Do all service downgrades damage customer loyalty? The answer is no. By tracking more than 80,000 airport rentals and classifying each downgrade by its cause, we found a clear pattern. When the company explains a firm-initiated downgrade in plain terms, customers are more likely to rent again within a year. In fact, the retention rate rises by almost seven percentage points. Downgrades that customers request

themselves, and those with no clear reason, do not change future booking behavior. These findings tie the whole study together. They confirm justice theory, which says that customers judge a service failure by how fair and transparent the process feels. They also give field support to the service-recovery paradox: a well-managed failure can leave a customer more loyal than before.

Moreover, the thesis shows the value of linking administrative data with detailed event notes and of using fixed-effects models to rule out location bias. Practically, it tells managers to focus on clear, honest communication when problems arise. A straightforward explanation can turn a setback into evidence that the firm is trustworthy. In short, service downgrades are not always losses. Handled the right way, they become moments that strengthen the bond between company and customer, adding a new piece to the larger picture of how fairness and transparency drive loyalty.

References

- Adams, J.S. 1965. Inequity in social exchange. In *Advances in experimental social psychology*, 267–299. New York: Academic Press.
- Ali, M. A., Ting, D. H., Isha, A. S. N., Ahmad-Ur-Rehman, M., & Ali, S. (2023). Does service recovery matter? Relationships among perceived recovery justice, recovery satisfaction and customer affection and repurchase intentions: The moderating role of gender. *Journal of Asia Business Studies*, 17(2), 308–326. <https://doi.org/10.1108/JABS-02-2021-0060>
- Andreassen, T. W., & Lervik, L. (1999). Perceived relative attractiveness today and tomorrow as predictors of future repurchase intention. *Journal of Service Research*, 2(4), 164–172. <https://doi.org/10.1177/109467059922004>
- Bitner, M. J., Booms, B. H., & Tetreault, M. S. (1990). The service encounter: Diagnosing favorable and unfavorable incidents. *Journal of Marketing*, 54(1), 71–84. <https://doi.org/10.2307/1252174>
- Cambra-Fierro, J., Melero-Polo, I., & Sese, F. J. (2016). Can complaint-handling efforts promote customer engagement? *Service Business*, 10(4), 847–866. <https://doi.org/10.1007/s11628-015-0295-9>
- Dotzel, T., & Yang, N. (2024). Repeated customer interactions in service encounter cascades. *SSRN Electronic Journal*. Advance online publication. <https://doi.org/10.2139/ssrn.4137822>
- Estelami, Hooman & De Maeyer, Peter. (2004). Product category determinants of price knowledge for durable consumer goods. *Journal of Retailing*. 80. 129-137. 10.1016/j.jretai.2004.04.003.

Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J., & Bryant, B. E. (1996). The American Customer Satisfaction Index: Nature, purpose and findings. *Journal of Marketing*, 60(4), 7–18.

<https://doi.org/10.2307/1251898>

Hapsari, R., Clemes, M. D., & Dean, D. (2017). The impact of service quality, customer engagement and selected marketing constructs on airline passenger loyalty. *International Journal of Quality and Service Sciences*, 9(1), 21–40. <https://doi.org/10.1108/IJQSS-07-2016-0048>

Johnson, M. D., & Gustafsson, A. (2000). *Improving customer satisfaction, loyalty, and profit: An integrated measurement and management system*. Jossey-Bass.

Johnson, M. D., Anderson, E. W., & Fornell, C. (1995). Rational and adaptive performance expectations in a customer satisfaction framework. *Journal of Consumer Research*, 21(1), 128–140. <https://www.jstor.org/stable/2489725>

Lim, W. M., Saha, V., & Das, M. (2025). From service failure to brand loyalty: Evidence of service recovery paradox. *Journal of Brand Management*, 32, 257–281.

<https://doi.org/10.1057/s41262-025-00380-5>

Lunardo, R., Cusin, J., & Flacandji, M. (2023). A time(ly) perspective of the service recovery paradox: How organizational learning moderates follow-up recovery effects. *Journal of Business Research*, 166, Article 114088. <https://doi.org/10.1016/j.jbusres.2023.114088>

Marinova, D., & Singh, J. (2014). Consumer decision to upgrade or downgrade a service membership. *Journal of the Academy of Marketing Science*, 42(6), 596–618.

<https://doi.org/10.1007/s11747-014-0374-9>

Michel, S., & Meuter, M. L. (2008). The service recovery paradox: True but overrated? *International Journal of Service Industry Management*, 19(4), 441–457.

<https://doi.org/10.1108/09564230810891897>

Olsen, L. L., & Johnson, M. D. (2003). Service equity, satisfaction, and loyalty: From transaction-specific to cumulative evaluations. *Journal of Service Research*, 5(3), 184–195.

<https://doi.org/10.1177/1094670502238914>

Smith, A. K., & Bolton, R. N. (1998). An experimental investigation of ongoing customer reactions to service failure and recovery encounters: Paradox or peril? *Journal of Service Research*, 1(1), 65–81. <https://doi.org/10.1177/109467059800100106>

Smith, A. K., Bolton, R. N., & Wagner, J. (1999). A model of customer satisfaction with service encounters involving failure and recovery. *Journal of Marketing Research*, 36(3), 356–372.

<https://doi.org/10.1177/002224379903600305>

Sousa, R., & Voss, C. A. (2009). The effects of service failures and recovery on customer loyalty in e-services: An empirical investigation. *International Journal of Operations & Production Management*, 29(8), 834–864. <https://doi.org/10.1108/01443570910977715>

Tax, S. S., Brown, S. W., & Chandrashekar, M. (1998). Customer Evaluations of Service Complaint Experiences: Implications for Relationship Marketing. *Journal of Marketing*, 62(2), 60-76. <https://doi.org/10.1177/002224299806200205> (Original work published 1998)

Wharton Customer Analytics Initiative. (n.d.). *Customer and employee satisfaction in repeat retail transactions* (Data Key 2.0) Wharton School, University of Pennsylvania. Retrieved July 20, 2025, <http://wcai-web.wharton.upenn.edu> (restricted access)

Appendix

Table 1

Variable	Obs	Mean	Std. Dev.	Min	Max
age	81672	52.459	11.803	20	112
duration	81672	4.223	6.301	0	121
price	81672	198.88	225.78	0	4424.89
numreserveclass	81672	2.981	1.938	1	9
numdriveclass	81672	4.348	2.332	1	9
tier	81672	1.937	1.101	0	7

Table 2

Inferred reason for downgrade	Freq.	Percent	Cum.
Customer-requested	236	8.72	8.72
Company-likely	645	23.84	32.56
Unclear	1825	67.44	100.00
Total	2706	100.00	

Table 3

downgrade_type	tags	Frequency
Customer-Requested	Vehicle type/preference	51
Customer-Requested	Attitude/Helpful/Friendly* Vehicle type/preference	11
Customer-Requested	Pickup/Delivery* Speed of Service* Vehicle type/preference	6
Customer-Requested	Gold Service* Vehicle type/preference	5
Customer-Requested	Counter* Vehicle type/preference	4
Customer-Requested	Billing/Charges* Vehicle type/preference	4
Customer-Requested	Speed of Service* Vehicle type/preference	4
Customer-Requested	Pickup/Delivery* Vehicle type/preference	4
Customer-Requested	Odor* Vehicle type/preference	4
Customer-Requested	Attitude/Helpful/Friendly* Speed of Service* Vehicle type/preference	4
Company-Likely	Attitude/Helpful/Friendly* Speed of Service	50
Company-Likely	Attitude/Helpful/Friendly* Counter	34
Company-Likely	Speed of Service	22
Company-Likely	Pickup/Delivery	19
Company-Likely	Counter	19
Company-Likely	Attitude/Helpful/Friendly* Management	19
Company-Likely	Attitude/Helpful/Friendly* Pickup/Delivery	18
Company-Likely	Management	16
Company-Likely	Engine/Mechanical/Std. Equip. Condition	16
Company-Likely	Billing/Charges	15
Unclear	Attitude/Helpful/Friendly	398
Unclear	Gold Service	31
Unclear	Value for Money	21
Unclear	Attitude/Helpful/Friendly* Gold Service	16
Unclear	Other	14
Unclear	Unable to Tag	10
Unclear	Odor	10
Unclear	NeverLost	10
Unclear	Upgrade	9
Unclear	Attitude/Helpful/Friendly* Value for Money	8

Table 4

	(1) Retained within 1 year	(2) Retained within 1 year
1 if rental was a downgrade	0.0159 (0.00974)	0.0107 (0.00994)
Loyalty Tier <= 2	-0.0642*** (0.00550)	-0.0491*** (0.00447)
Loyalty Tier >= 5	-0.0614*** (0.0174)	-0.0353 (0.0182)
age	-0.000900*** (0.000151)	-0.000569*** (0.000131)
duration	0.00303*** (0.000448)	0.00106* (0.000445)
price	-0.000131*** (0.0000131)	-0.0000751*** (0.0000128)
weekend	-0.00550 (0.00383)	-0.00704 (0.00364)
business	-0.00812* (0.00369)	0.00557 (0.00373)
Location fixed effects	No	Yes

Standard errors in parentheses

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

Table 5

	(1) Retained within 1 year	(2) Retained within 1 year
downgrade_customer	0.00374 (0.0329)	-0.00623 (0.0337)
downgrade_firm	0.0681*** (0.0194)	0.0673*** (0.0198)
downgrade_other	-0.000998 (0.0118)	-0.00703 (0.0120)
Loyalty Tier <= 2	-0.0643*** (0.00550)	-0.0491*** (0.00447)
Loyalty Tier >= 5	-0.0613*** (0.0174)	-0.0353 (0.0182)
age	-0.000901*** (0.000151)	-0.000571*** (0.000131)
duration	0.00304*** (0.000448)	0.00107* (0.000445)
price	-0.000131*** (0.0000131)	-0.0000754*** (0.0000128)
weekend	-0.00546 (0.00383)	-0.00699 (0.00364)
business	-0.00813* (0.00369)	0.00557 (0.00373)
Location fixed effects	No	Yes

Standard errors in parentheses

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

Figure 1

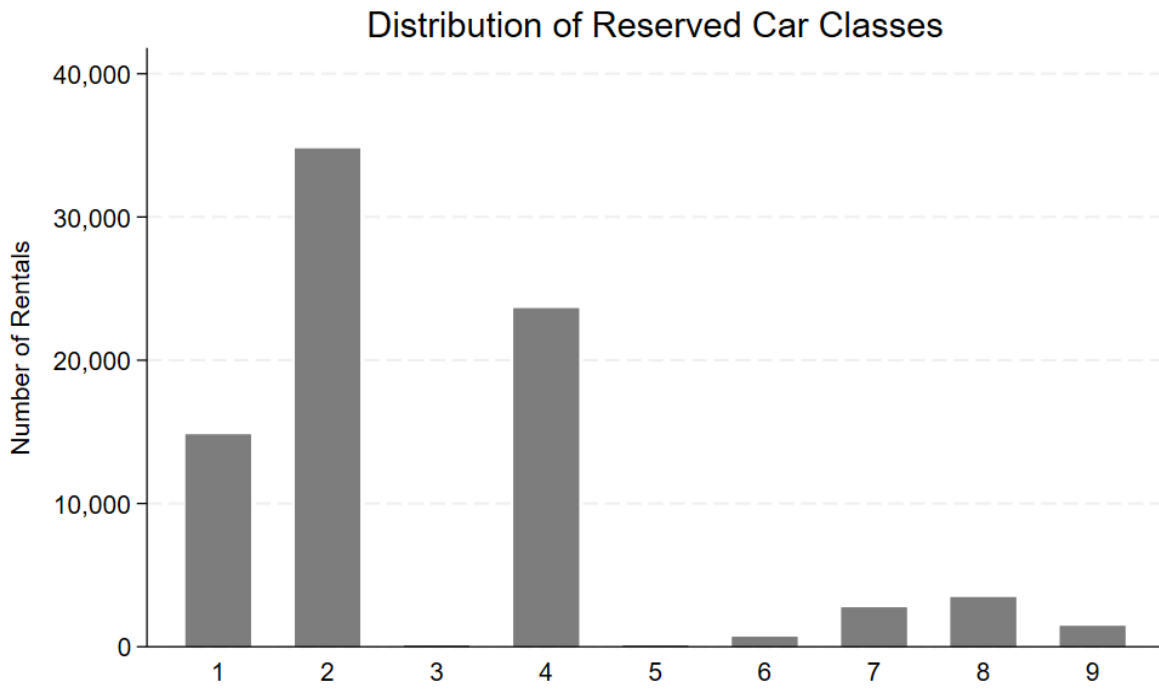


Figure 2

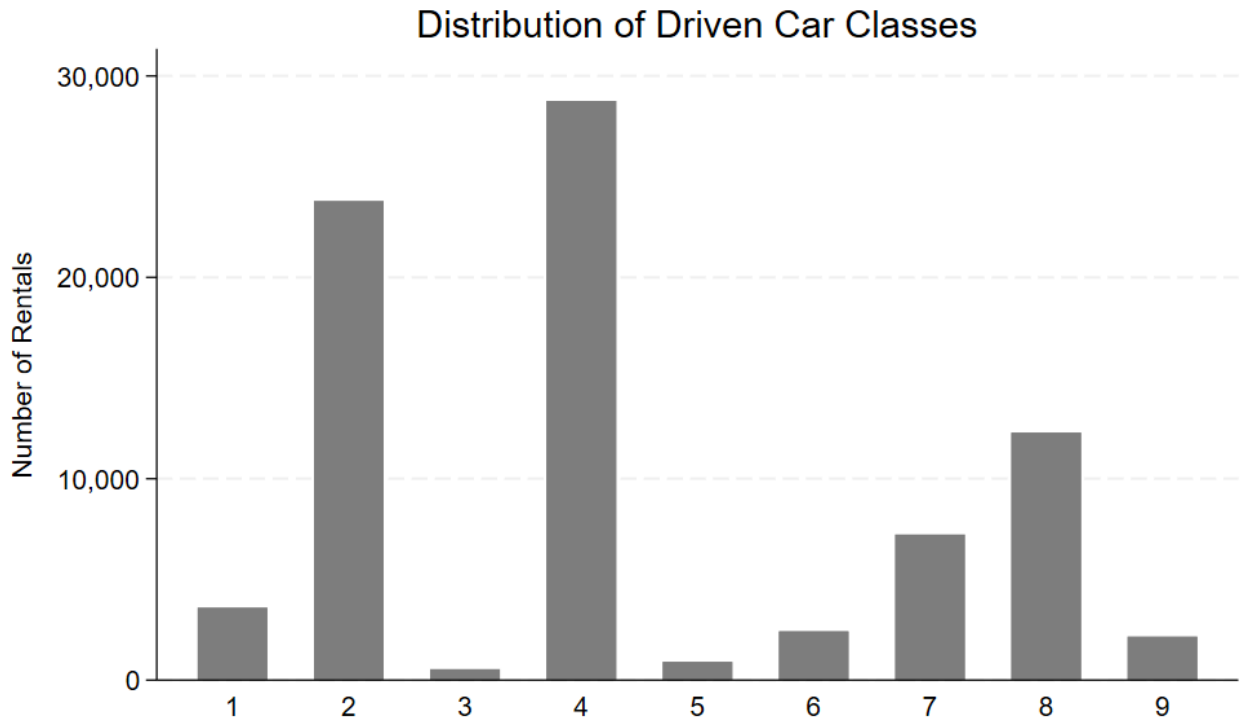


Figure 3

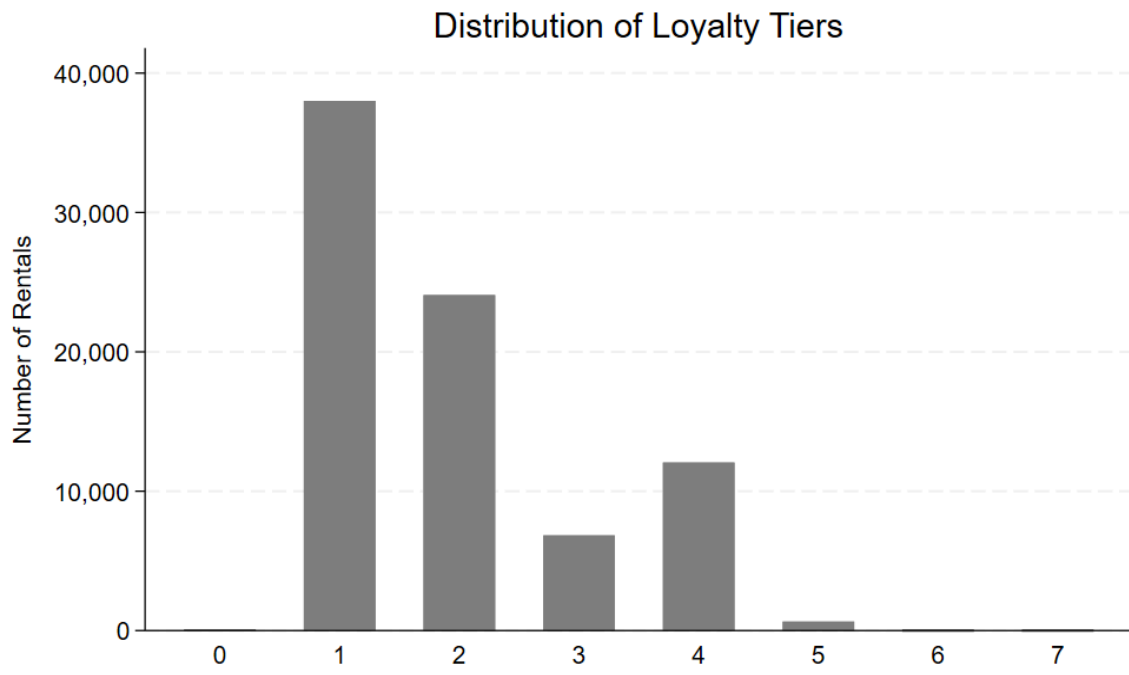


Figure 4

