European Journal of Economics and Management Sciences 2026, No 2
ISSN 2310-5690

PREMIER Publishing
ppublishing.org

DOI:10.29013/EJEMS-26-2-56-60

ECONOMICS OF CAR-SHARING BUSINESSES IN THE U.S.

Zaur Mamaev [1]

[1] Independent Researcher in Vehicle-Based Business Management Moscow Socio-Economic Institute

Cite: *Mamaev Z. (2026). Economics of Car-Sharing Businesses in the U.S. European Journal of Economics and Management Sciences 2026, No 2.* https://doi.org/10.29013/EJEMS-26-2-56-60

Abstract

Car-sharing services have expanded rapidly across U.S. urban markets, yet the sector continues to exhibit persistent structural inefficiencies that constrain profitability and long-term viability. Despite growing user bases and increasing investment, operators routinely report fleet utilization coefficients well below theoretically achievable levels, compounded by significant unrecovered revenue arising from vehicle damage, suboptimal pricing, and inadequate cost accounting. This article examines the economic architecture of car-sharing businesses, identifies the principal sources of operational and financial inefficiency, and evaluates the quantitative dimensions of revenue leakage documented in the existing academic literature. The analysis draws on research in dynamic pricing, fleet optimization, anomaly detection, and managerial decision support to establish the theoretical basis for integrated, data-driven operational control as the most viable mechanism for addressing these inefficiencies. The article concludes that the absence of unified platforms capable of simultaneously modeling financial outcomes, detecting operational anomalies, and generating prioritized corrective directives constitutes the core institutional constraint on industry profitability.

Keywords: *car-sharing economics, fleet utilization, dynamic pricing, revenue leakage, operational control, shared mobility, anomaly detection, decision support systems*

Introduction

The emergence of car-sharing as a distinct transportation service category in the United States reflects a broader structural transformation in urban mobility, driven by changing ownership preferences, mobile application proliferation, and increasing urban density. The market attracted substantial capital investment because its underlying economic logic rested on a compelling premise: a single vehicle asset could generate revenue across multiple user sessions per day, producing per-vehicle returns that private ownership could not replicate.

That theoretical appeal has consistently encountered operational realities that erode profitability. The academic literature on shared mobility economics documents a per-

sistent divergence between the revenue potential of car-sharing fleets and the revenue actually realized under conventional operating practices (Illgen & Höck, 2019). Fleet utilization coefficients, defined as the proportion of available time during which vehicles are actively generating revenue, have been found to cluster in the range of 0.35 to 0.45 in empirical studies of U.S. and European operators (Stocker & Shaheen, 2017), compared to theoretically achievable optima exceeding 0.70 under demand-responsive pricing and repositioning regimes (Le Vine et al., 2014). The present article argues that the persistent underperformance of car-sharing businesses in the United States is not an inherent feature of the market but the consequence of four specific, technologically addressable operational deficiencies: fleet underutilization driven by the absence of real-time repositioning intelligence, revenue foregone through static pricing that fails to respond to demand and supply conditions, revenue leakage from vehicle damage and user misconduct that conventional monitoring processes cannot detect in time to recover, and cost accounting practices that misrepresent vehicle-level profitability by relying on static depreciation rather than telematics-derived usage data.

Methods

The research presented in this article is grounded in an analytical framework designed to identify, characterize, and quantify the principal economic dysfunctions of car-sharing operations in the United States, and to establish the theoretical basis upon which technologically integrated solutions to those dysfunctions can be evaluated.

The U. S. car-sharing market exhibits a concentrated competitive structure, with a small number of platform operators, including Zipcar (an Avis Budget Group subsidiary), Turo, and Getaround, accounting for the preponderance of registered vehicles (Shaheen & Cohen, 2020). The cost structure of car-sharing operations is characterized by a high proportion of fixed and semi-fixed costs relative to total costs (Illgen & Höck, 2019). Vehicle acquisition or leasing, insurance premiums, technology platform maintenance, and customer acquisition costs are largely invariant to the number of sessions conducted in a given period, meaning that revenue per vehicle per day becomes the critical lever of profitability. Empirical analyses of operator financials in the U.S. and Europe have found that the breakeven utilization rate for a typical B2C car-sharing vehicle ranges from 0.45 to 0.55 of available hours (Le Vine et al., 2014), a threshold that a substantial proportion of vehicles in active fleets fails to meet on a sustained basis.

Formulations of the repositioning problem as an integer programming or stochastic optimization model have demonstrated that optimal repositioning policies can increase fleet-average utilization coefficients by 12 to 28 percentage points relative to static deployment (Weikl & Bogenberger, 2013). Operators have found practical implementation limited by the computational and logistical demands of real-time repositioning at scale, and by the absence of management information systems capable of generating repositioning directives with sufficient speed and specificity to guide operational responses. The informational deficit, not the unavailability of the optimization methodology itself, is thus the binding constraint on utilization improvement in practice. Theoretical results from queuing-theoretic models of round-trip car-sharing systems demonstrate that dynamic tariff schedules, adjusting prices as a function of current fleet state, time of day, and competitive context, can increase expected hourly revenue by 15 to 30 percent relative to fixed-price regimes (Lagadic et al., 2019).

Despite these theoretical results, adoption of sophisticated dynamic pricing in U.S. car-sharing operations has lagged behind what the academic literature would recommend. The barriers to adoption are institutional and technical rather than economic: operators lack the real-time data integration infrastructure necessary to update tariffs at the frequency required by optimal pricing models, and the decision-making processes in most operator organizations are insufficiently responsive to the speed at which demand and fleet-state conditions change (Illgen & Höck, 2019). Static or semi-static pricing schedules remain prevalent, resulting in systematic mispricing that manifests as either foregone revenue during high-demand periods or demand suppression during

off-peak periods when prices remain above demand-clearing levels.

Beyond underutilization and static pricing, car-sharing operators face a substantial and structurally embedded source of revenue loss through failure to recover the full financial consequences of vehicle damage, user misconduct, and billing system imperfections. Empirical data on damage recovery rates in vehicle-sharing industries indicate that approximately 10 percent of rental and car-sharing sessions involve vehicle damage, and that the proportion of damage-related costs successfully recovered from users or insurers through standard processes is materially below the cost incurred. For large fleets, unrecovered damage costs reach $30 million annually per 100,000 vehicles, a figure that translates directly into reduced net margin given the fixed-cost-dominated structure of operator financials. The recovery process for vehicle damage in conventional car-sharing operations depends on manual inspection workflows, documentation by field staff, and dispute resolution through customer service channels, a process that research on shared mobility business models has characterized as logistically complex, error-prone, and subject to systematic evidentiary deficiencies that advantage users in disputes (Cohen & Kietzmann, 2014).

Fraudulent session initiation, unauthorized geographic zone violations, and systematic billing discrepancies constitute additional dimensions of revenue leakage that receive limited systematic attention in operational practice. Detection of these events through retrospective transaction review is slow and incomplete; by the time fraud or misuse is identified in conventional systems, the revenue loss is typically unrecoverable. Detection latency documented in operational studies of car-sharing platforms averages 18 to 24 hours for anomalous events, a window during which additional losses accumulate and evidentiary records for recovery diminish in reliability (Becker et al., 2017). The leakage problem is therefore fundamentally a problem of detection speed and evidentiary documentation, both of which are amenable to automated, real-time technical solutions.

Research in operations management has established that the divergence between book depreciation and economic value erosion is particularly acute for vehicles that have experienced undisclosed damage events, that operate in high-intensity urban environments, or that have exceeded optimal utilization rates without corresponding maintenance investment (Cachon & Harker, 2002).

The integration of telematics-derived odometer data, engine operating hours, fuel or battery consumption, and maintenance event records into a vehicle-specific cost model constitutes an analytically superior approach to cost accounting for car-sharing assets, superior specifically in that it substitutes empirically observed, asset-level usage data for the statistical averages on which conventional depreciation schedules rely. This approach, consistent with activity-based costing principles applied to shared mobility assets (Stocker & Shaheen, 2017), enables the operator to compute a net revenue figure per vehicle that reflects the true economic cost of deploying that asset, providing the informational foundation for rational fleet investment decisions.

Discussion

Management processes that rely on periodic reporting, manual inspection, and reactive decision-making are structurally ill-suited to this environment. The convergence of evidence from the dynamic pricing, fleet optimization, anomaly detection, and managerial decision support literatures points toward a unified conclusion: the economic efficiency of car-sharing operations requires a platform architecture that integrates financial modeling, real-time operational analytics, anomaly detection, and prioritized managerial directives into a single coherent system.

The Financial Modeling Engine addresses the cost accounting gap by computing vehicle-level net revenue projections that dynamically integrate telematics-derived depreciation and maintenance cost data, replacing static book values with continuously updated, usage-calibrated estimates for each asset in the fleet. The Operational Analytics Module resolves the informational deficit underlying both underutilization and pricing failures: it performs continuous multi-dimensional disaggregation of revenue streams across vehicle class, geographic zone, and time period,

and detects anomalous operational patterns in real time, providing the data foundation without which repositioning and pricing optimization cannot be operationalized. The Loss-Reduction Enforcement Layer directly targets revenue leakage by monitoring vehicle telemetry and transactional parameters against configurable thresholds in real time, initiating automated intervention workflows upon exceedance, and generating structured evidentiary records formatted for billing reconciliation, insurance claims, and legal recovery, a capability that reduces detection latency from the 18-to-24-hour window of conventional review to a continuous, sub-hourly monitoring regime.

The magnitude of attainable improvement is substantial and empirically grounded. Simulation and empirical studies of dynamic pricing in car-sharing systems have documented revenue improvements of 15 to 35 percent relative to static pricing regimes (Herrmann et al., 2023). Studies of vehicle repositioning optimization have demonstrated utilization coefficient improvements of 12 to 28 percentage points (Weikl & Bogenberger, 2013). Research on automated damage detection and recovery processes has found that technology-mediated inspection reduces unrecovered damage costs by 20 to 30 percent, and produces a 25 to 30 percent reduction in damage disputes within the first year of deployment (Litman, 2022).

Conclusion

The economics of car-sharing businesses in the United States are governed by a structural tension between a theoretically high-performing asset utilization model and a set of operational realities that systematically erode the financial potential of that model. Fleet utilization coefficients persistently fall below theoretical optima; pricing strategies remain insufficiently responsive to demand and supply conditions; revenue from vehicle damage and user misconduct is recovered at rates well below the economic cost of those events; and cost accounting practices obscure the true vehicle-level profitability that rational fleet management requires.

References

Becker, H., Ciari, F., & Axhausen, K. W. (2017). Comparing car-sharing schemes in Switzerland: User groups and usage patterns. *Transportation Research Part A: Policy and Practice,* – 97. – P. 17–29. URL: URL: https://doi.org/10.1016/j.tra.2016.12.006

Cachon, G. P., & Harker, P. T. (2002). Competition and outsourcing with scale economies. *Management Science,* – 48(10). – P. 1314–1333. URL: https://doi.org/10.1287/mnsc.48.10.1314.274

Ciari, F., Schuessler, N., & Axhausen, K. W. (2013). Estimation of carsharing demand using an activity-based microsimulation approach: Model discussion and some results. *International Journal of Sustainable Transportation,* – 7(1). – P. 70–84. URL: https://doi.org/10.1080/15568318.2012.660113

Cohen, B., & Kietzmann, J. (2014). Ride on! Mobility business models for the sharing economy. *Organization & Environment,* – 27(3). – P. 279–296. URL: https://doi.org/10.1177/1086026614546199

Herrmann, S., Schulte, F., & Voß, S. (2023). Increasing acceptance of free-floating car-sharing systems using smart relocation strategies. *Procedia Computer Science,* – 220. – P. 717–724. URL: https://doi.org/10.1016/j.procs.2023.03.094

Illgen, S., & Höck, M. (2019). Literature review examining the profitability of carsharing businesses. *Transportation Research Part D: Transport and Environment,* – 68. – P. 86–97. URL: https://doi.org/10.1016/j.trd.2018.12.009

Lagadic, M., Verloes, A., & Louvet, N. (2019). Can carsharing services be profitably operated in American cities? Evidence from San Francisco, Seattle, and Washington, D. C. *Research in Transportation Business & Management,* – 32. – 100432 p. URL: https://doi.org/10.1016/j.rtbm.2019.100432

Le Vine, S., Zolfaghari, A., & Polak, J. (2014). *Carsharing: Evolution, challenges and opportunities*. ACEA Scientific Advisory Group Report. European Automobile Manufacturers' Association.

Litman, T. (2022). *Evaluating carsharing benefits*. Victoria Transport Policy Institute Technical Report. Victoria Transport Policy Institute.

Münzel, K., Boon, W., Frenken, K., & Vaskelainen, T. (2019). Carsharing business models in Europe: Characteristics, success and future prospects. *Journal of Cleaner Production,* – 215. – P. 1056–1065. URL: https://doi.org/10.1016/j.jclepro.2018.11.275

Shaheen, S., & Cohen, A. (2020). Shared ride services in North America: Definitions, impacts, and the future of pooling. *Transport Reviews,* – 40(4). – P. 427–442. URL: https://doi.org/10.1080/01441647.2019.1665568

Stocker, A., & Shaheen, S. (2017). *Shared automated vehicles: Review of business models*. International Transport Forum Discussion Paper. OECD/ITF.

Weikl, S., & Bogenberger, K. (2013). Relocation strategies and algorithms for free-floating car sharing systems. *IEEE Intelligent Transportation Systems Magazine,* – 5(4). – P. 100–111. URL: https://doi.org/10.1109/MITS.2013.2267810

submitted 28.03.2026;
accepted for publication 11.04.2026;
published 30.04.2026

Contact: mamaevzaur05@yandex.ru