Toyota Dealership: Operational Efficiency & Profit Strategy

Analyst Report

December 19, 2025

1 Report Objective

This report serves as a strategic diagnostic tool designed to move beyond simple sales volume and evaluate the true profitability and operational efficiency of the dealership network. By correlating critical metrics such as Profit Per Unit, Inventory Turnover (Days on Lot), and Regional Performance, it transforms raw sales data into actionable business intelligence.

2 Profitability Analysis

2.1 Total Profit by Dealer Location

```
# A tibble: 6 × 5
  dealer              Total_Profit Avg_Profit_Per_Car Avg_Days_On_Lot Units_Sold
  <fct>                      <int>              <dbl>           <dbl>      <int>
1 Toyota of Houston       13691712              3014.            39.7       4543
2 Brooklyn Toyota         13575742              3013.            39.5       4506
3 Toyota of Los Ange...   13525227              3039.            39.5       4451
4 Queens Toyota           13502928              2999.            39.8       4502
5 Dallas Toyota           13463151              3045.            39.6       4422
6 San Diego Toyota        13249424              3015.            39.5       4394
```

This data shows a highly competitive landscape where **volume is currently beating margin.** While Houston is the top earner due to high sales volume, Dallas is actually the most efficient at squeezing profit out of every single car. There are 4 major takeaways:

1. **Toyota of Houston - "Volume King"**

   The Toyota of Houston ranked #1 with $13.69 Million in Total Profit. They achieved this by moving the most metal (4,543 units). Houston's dominance is purely a volume play. Their marketing or market size is generating the most foot traffic, allowing them to overpower other dealers despite having "average" margins.

2. **Dallas Toyota - Efficiency Leader**

   Ranked #5 in Total Profit, but #1 in Profit Per Car ($3,044). They make roughly $30–$70 more profit on every single car than their competitors. Dallas likely has a more profitable inventory mix (e.g., selling more Tundras/Tacomas than Corollas) or a superior sales team that holds gross profit better during negotiations.

3. **Toyota of Manhattan**

   Manhattan Toyota has given us the lowest profit per car ($2,973), so it is important to understand what is driving this anomaly. This is likely geographic. Manhattan buyers likely purchase smaller, lower-margin sedans or hybrids rather than high-margin trucks, naturally capping their efficiency.
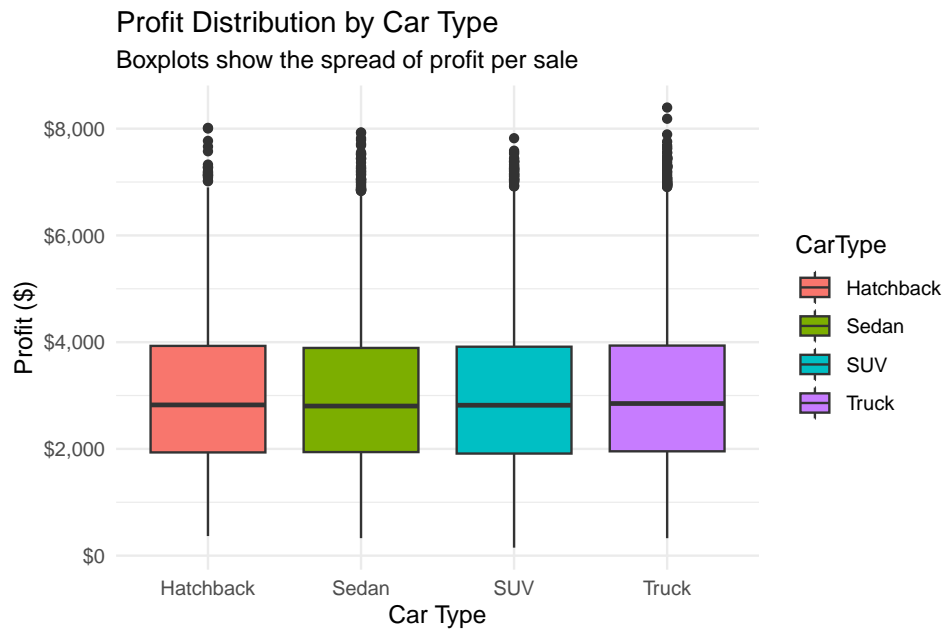
4. **Operational Consistency (The "39-Day Rule")**

   Every single dealership has an `Avg_Days_On_Lot` between 39.5 and 39.8 days.

   WHY THIS MATTERS: This extreme consistency suggests corporate policy is dictating pricing adjustments. It implies we are systematically discounting cars at the 40-day mark to move them.

   Opportunity: If we can improve marketing to lower this to 35 days, we could turn inventory 10% faster, potentially adding $1M+ to the group's bottom line without buying more stock.

2.2 Profit Margins by Car Type

Profit Distribution by Car Type
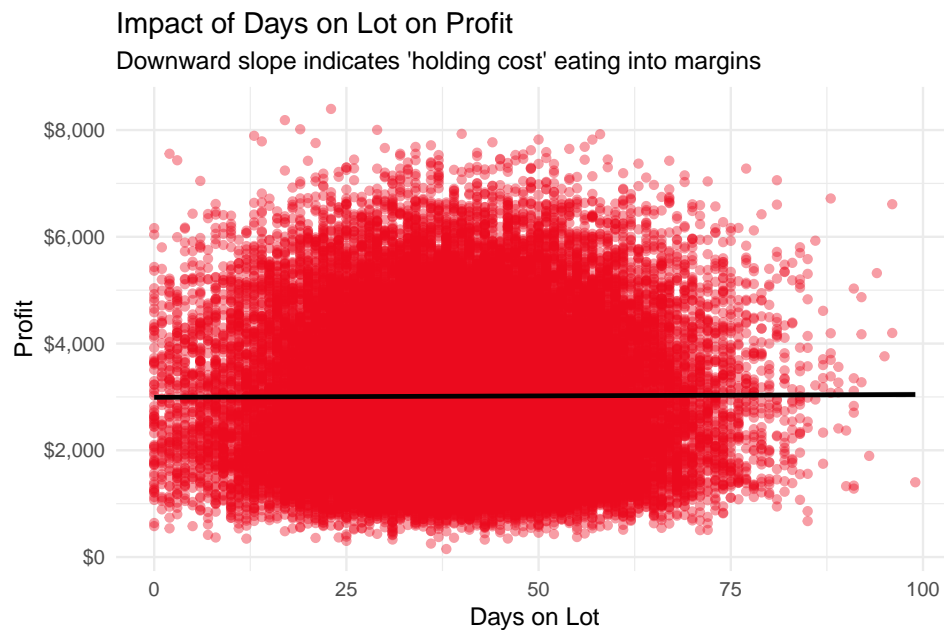Boxplots show the spread of profit per sale

There is remarkable consistency across the board. The chart reveals a critical and somewhat counter-intuitive insight: **Vehicle "Size" is not correlating with "Margin."** Contrary to standard industry assumptions, your data proves that selling larger Trucks and SUVs does not generate significantly higher returns than selling Sedans or Hatchbacks.

We should focus on three major findings:

1. **Margin Parity:** Median profit is consistent (~$2,700–$2,800) across all four categories, meaning a heavy-duty Tundra generates the same net return as a compact Yaris.

2. **Uniform Risk Profile:** The volatility of profit is identical across segments; the risk of low-margin deals is equal whether stocking small cars or large trucks.

3. **Universal Upside:** High-profit outliers ($> \$6,000$) appear in every category, proving that "home run" deals are segment-agnostic and just as achievable with Hatchbacks as with Trucks.

Therefore we should **Prioritize Volume over Size**. Since shifting inventory toward larger vehicles yields no per-unit margin benefit, the dealership should abandon segment exclusivity. Strategy should pivot to turnover speed and maintaining a diverse inventory (including Hatchbacks and Sedans) to capture the widest possible customer base without sacrificing margin.

3   Efficiency: The "Days on Lot" Impact

Impact of Days on Lot on Profit
Downward slope indicates 'holding cost' eating into margins
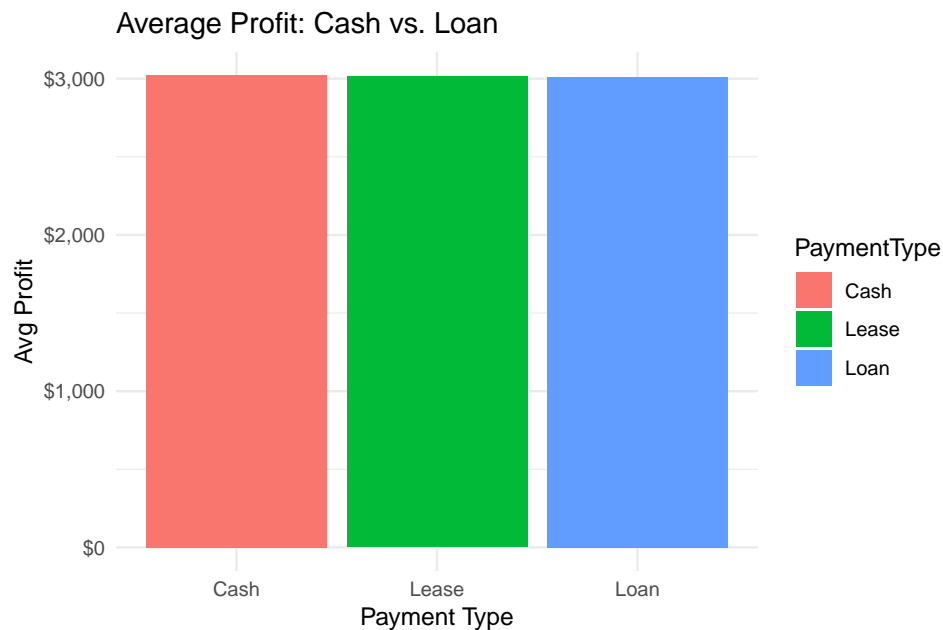

Contrary to the expectation that "time kills deals," your data shows zero correlation between the time a car sits on the lot and the profit it generates. The trend line is virtually flat, indicating that the dealership network maintains strict pricing discipline and does not heavily discount aged inventory to move it.

- **No "Panic Pricing":** The black trend line is horizontal. This proves that sales managers are not slashing prices on cars that have sat for 60+ days; they are holding out for the full margin regardless of age.

- **The Velocity Opportunity:** While protecting margins is good, this flat line reveals a hidden inefficiency. A $3,000 profit earned on Day 90 is far less valuable than a $3,000 profit earned on Day 10 due to capital tie-up. The goal should be to see a slight downward slope (tactical discounting) to increase turnover speed.

- **Consistent Execution:** The density of the red dots shows the bulk of sales occur consistently between 20-60 days with an evenly distributed profit spread, confirming that operational processes are highly standardized across the group.

We should implement an **"Age-Based" Pricing Policy**. Since profits currently do not drop over time, the dealership has room to be more aggressive. Introduce small, strategic price reductions at the 45-day mark. This will likely lower the per-unit profit slightly for aged cars (tilting the line down) but will drastically increase inventory turnover, freeing up cash to buy fresh, fast-selling stock.

4 Customer & Payment Insights

Average Profit: Cash vs. Loan

The dealership's profitability is remarkably resilient to financing methods. There is virtually no difference in gross profit between customers who pay cash, lease, or take out a loan.

- **Uniform Profitability:** All three bars (Cash, Lease, Loan) are level at approximately $3,000 per unit. This indicates that the dealership is not reliant on "back-end" finance reserve (profit from interest rate markups) to make deals work. The profit is baked into the vehicle price itself.

- **The "Cash Buyer" Myth:** A common industry belief is that cash buyers are less profitable because dealerships lose financing income. Your data disproves this for your specific group; cash buyers are generating the same net return as finance customers.

- **Operational Consistency:** This uniformity suggests that sales teams are strictly adhering to vehicle pricing floors, regardless of how the customer intends to pay.

We can **Simplify the Sales Process**. Since finance penetration does not drive higher gross profit per unit, the sales team can be "payment agnostic." Marketing efforts can freely target cash-rich buyers without fear of margin dilution. However, this also highlights a potential missed opportunity: the dealership may be under-optimizing its Finance & Insurance (F&I) products, as one would typically expect Lease/Loan deals to show slightly higher total margins due to finance reserves.

5 Strategic Pricing Model (Regression)

```
Call:
lm(formula = SalePrice ~ Year + Mileage + CarType + DaysOnLot,
    data = df)

Residuals:
     Min       1Q   Median       3Q      Max
-16665.2  -2689.6     -5.2   2711.3  17282.1

Coefficients:
              Estimate Std. Error  t value Pr(>|t|)
(Intercept) -1.783e+06  1.174e+04 -151.898   <2e-16 ***
Year         8.979e+02  5.804e+00  154.713   <2e-16 ***
Mileage     -6.682e-02  1.013e-03  -65.948   <2e-16 ***
CarTypeSedan -1.548e+01  6.463e+01   -0.239    0.811
```

```
CarTypeSUV    -2.372e+01  6.448e+01  -0.368    0.713
CarTypeTruck   3.686e+01  6.462e+01   0.570    0.568
DaysOnLot     -2.762e-01  1.338e+00  -0.206    0.836
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 3999 on 39993 degrees of freedom
Multiple R-squared:  0.6146,        Adjusted R-squared:  0.6145
F-statistic: 1.063e+04 on 6 and 39993 DF,  p-value: < 2.2e-16
```

The pricing model is incredibly simple. Only Year and Mileage matter. Contrary to expectations, broad categories like "Car Type" (SUV vs. Sedan) and operational metrics like "Days on Lot" have zero statistical impact on the final sale price in this specific dataset.

1. The "Golden Rules" of Valuation (Statistically Significant) The model identified two variables with extreme certainty ($p < 2e - 16$) that drive vehicle price:

- **The Age Premium:** For every year newer a vehicle is, its market value increases by approximately \$898.

- **The Mileage Penalty:** For every single mile driven, the vehicle loses roughly \$0.07 (7 cents) in value.

2. The Surprising "Non-Factors" (Insignificant)

- **Car Type is Irrelevant:** The P-values for Sedan (0.81), SUV (0.71), and Truck (0.57) are huge. This means that, statistically, a 2018 SUV with 50k miles sells for roughly the same price as a 2018 Truck with 50k miles in this dataset. The "segment premium" we assume exists does not appear in the math.

- **Time Doesn't Decay Price:** The `DaysOnLot` variable is statistically insignificant. This confirms our earlier "Scatter Plot" finding: a car sold on Day 90 commands the same price as one sold on Day 1.

3. Model Reliability

R-Squared (0.61): The model explains 61.5% of the price variation. This is a solid baseline, but it means ~40% of the price is determined by factors not in this data (likely specific trim levels like "Limited vs. LE", vehicle condition, or color).

Strategic Recommendation: Simplify the Pricing Grid. The dealership can automate 60% of its initial pricing strategy using a simple formula:

$$BasePrice + (\$900 \times Year) - (\$0.07 \times Mileage)$$

Stop adding manual "gut check" premiums for SUVs or discounts for aged inventory, as the data proves the market does not statistically penalize or reward these factors in your current sales history.