

Supplemental Analysis: An Economic Assessment of Trade-In Value Reduction Caused by Preventing Auto Dealers from Selling Passenger Vehicles with any Open Recall

Aggregated Monthly Holding Cost Evaluation

May 16, 2016

Summary

J.D. Power has developed a standard monthly cost estimate (the “Standard Monthly Cost Estimate”) that can be applied to used vehicles that are required to be grounded due to un-remedied or un-repaired open recalls. This analysis supplements the November 2015 study prepared by J.D. Power entitled “An Economic Assessment of Trade-In Value Reduction Caused by Preventing Auto Dealers from Selling Passenger Vehicles with any Open Recall” (the “2015 Open Recall Analysis”). This analysis provides franchised dealers a reasonable assessment of expenses and collateral value loss resulting from legislative proposals or automaker directives that require dealers to ground used vehicles pending recall completion. Shipping costs are not considered in this analysis since this cost is only applicable to out-of-brand trade-ins. The Standard Monthly Cost Estimate is based on the anticipated average wholesale finance expenses, vehicle depreciation, and storage and insurance costs.

More specifically, J.D. Power has created a monthly percentage range including a high, low, and average value that can be applied to any used vehicle restricted from sale by a recall. The percentages are intended to be applied to a current wholesale market value using either (i) the NADA Used Car Guide’s average trade-in value or a comparable third-party market value or (ii) an aggregate value representing the current market wholesale value of the affected vehicle. The following percentages were calculated based on the process described below and are designed to be applied to a wholesale benchmark value for each month a vehicle is grounded.

Estimate	Monthly Percentage Adjustment
High	3.46%
Average	2.43%
Low	1.40%

Background

J.D. Power’s 2015 Open Recall Analysis estimated the impact that the “Used Car Safety Recall Repair Act,” proposed by Senator Richard Blumenthal (D – Conn.), could have on vehicle trade-in values. The analysis studied vehicle recalls initiated in 2014 and estimated the average trade-in value reduction to be \$1,210. The reduction varied by model, the time of year the vehicle was returned to the market, and other economic variables which have a unique impact on the specific vehicle being analyzed.

This supplemental analysis follows the concept of the paper’s original calculation:

$$\text{Trade-in Value Change} = \left(\frac{RD(FR \times BegVal) + RD(DR \times BegVal) + RD(SI)}{2} \right) + SH$$

Where

RD = the repair delay period in days

FR = the daily interest rate to finance trade-in vehicle purchases

BegVal = the value of the given model at auction at the time the recall was received

DR = the daily depreciation rate

SI = the daily storage and insurance cost

SH = shipping costs (not applied to in-brand trade-ins)

The Standard Monthly Cost Estimate set out in this analysis will provide a standard monthly percentage adjustment intended to be applied to a current wholesale market value using either (i) the NADA Used Car Guide's average trade-in value or a comparable third party market value or (ii) an aggregate value representing the current market wholesale value of the affected vehicle. The resulting product would represent the estimated holding cost a dealer would face on any vehicle restricted from sale. This analysis provides high, low, and average estimates based on historical depreciation data.

Monthly Estimates - Analysis

For the reasons outlined below, to produce the Standard Monthly Cost Estimate, the original equation used in the 2015 Open Recall Analysis needs to be adjusted. In particular, the applicable equation needs to be restated as follows:

$$\text{Trade-in Value Adjustment} = \left(\left(\frac{FR}{12}\right) + (DR) + (SI)/\text{avg market price}\right) * \text{BegVal}$$

Where

FR = the annual interest rate to finance trade-in vehicle purchases

DR = the monthly depreciation rate

SI = the daily storage and insurance cost (converted to a monthly cost)

Avg market price = Average wholesale price of 0-8 year old vehicles¹ during CY 2015

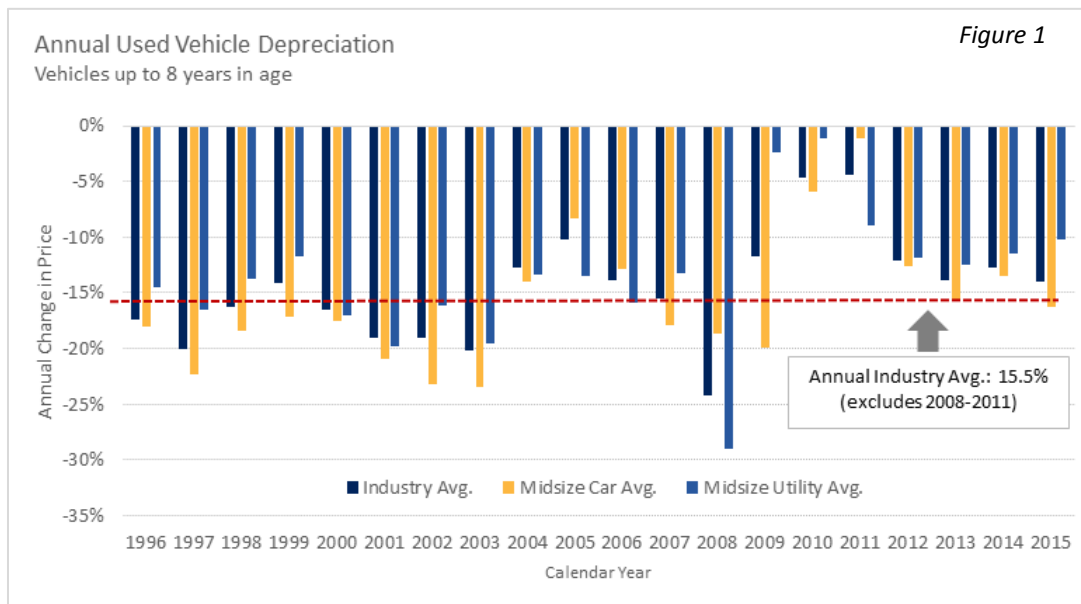
BegVal = the value of the given model at auction/wholesale at the time the recall was received (e.g., NADA Used Car Guide "Trade-in Value" or comparable third-party market value)

The Standard Monthly Cost Estimate includes the monthly wholesale floorplan costs of financing the purchase (from the consumer), the vehicle's depreciation, and storage and insurance costs. These costs represent the theoretical discounts a dealer would apply to a trade-in if the used car appraiser is perfectly rational, has full knowledge of internal costs, and has perfect information about the expected delay in remedying the recall (2015 Open Recall Analysis, pg. 14). The estimates included in this analysis approach the impacts at an aggregate level in order to make a reasonable assessment of the dealer's actual cost of the loss of value regardless of the vehicle involved. The percentages included therefore can be applied to any affected vehicle and are meant to be generalizations in order to facilitate potential reimbursement policies unbound by an unreasonably complicated methodology necessitating costly infrastructure changes. The following are the four main drivers of the projected vehicle holding costs:

1. **Wholesale floorplan.** The wholesale floorplan cost estimate is based on the cost of the capital used to purchase consumer trade-ins and is estimated as the prime-rate average over the last ten years, or 4.51% (2015 Open Recall Analysis, pg. 15). This figure was then divided by 12 to represent the monthly wholesale floorplan rate used for the trade-in value adjustment.
2. **Depreciation.** Depreciation costs in this analysis are estimated differently than in the 2015 Open Recall Analysis, which utilized actual depreciation rates for each individual vehicle analyzed. This analysis utilizes an average depreciation rate based on industry performance of

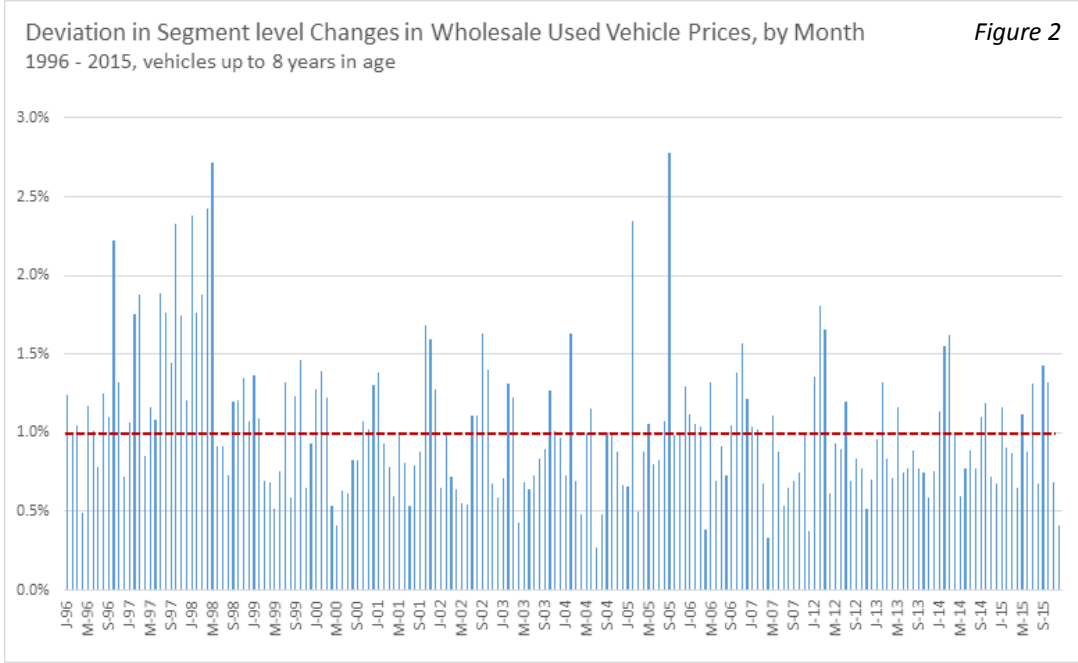
¹ 0-8 year old vehicles represent the best volume and mix of available wholesale and retail sales observations.

used vehicle prices from the past 20 years.² J.D. Power’s analysis determined that the average depreciation cost, including mileage, for used vehicles was approximately 15.5% per year over the 20-year period (Figure 1). This estimate was then adjusted to remove the effect of mileage (amounting to approximately 7.9% per year) so as to reflect only the time determinant of depreciation. This reduced the 15.5% annual rate to 7.6%. This figure was then divided by 12 to represent the monthly rate of depreciation used for the trade-in value adjustment.



3. **Storage and insurance.** J.D. Power’s original estimate of \$235 per unit per month for storage, vehicle quality deterioration, and insurance (J.D. Power 2015, pg. 15) is utilized in this analysis. These costs were derived from a survey of approximately 800 franchised dealer representatives. They have been expressed as monthly percentage by dividing the per month storage and insurance costs by \$16,499 which represents the average wholesale selling price of used vehicles up to eight years in age in the United States over the period from January 2015 to December 2015.
4. **Monthly deviation.** Finally, the high and low estimates included in this analysis are supported by the differences in depreciation for each vehicle segment. According to analysis of the 20-year period from 1996 to 2015, the general volatility in depreciation between segments is approximately 1% (Figure 2). Therefore, an upper and lower level tier of plus or minus 1% would cover the majority of volatility witnessed in segment depreciation during the past 20 years.

² Excludes 2008-2011 data due to the period’s highly irregular performance caused by the great recession and its aftereffects.



The difference in the monthly change in wholesale used vehicle price across segments averaged 1% nearly 70% of the time from 1996 - 2015. Excludes 2008-2011 due to the period's high degree of irregularity caused by the great recession and its aftereffects.

Results: Standard Monthly Cost Estimates

Based on this analysis, J.D. Power recommends that the following percentages be applied to the wholesale market value of a vehicle for each month the vehicle is impacted from grounding.

Data	Value
Annual Floorplan Rate	4.51%
Monthly Floorplan Rate	-0.38%
Annual Depreciation Less Mileage	-7.60%
Monthly Depreciation Less Mileage	-0.63%
Storage, Insurance, etc. per month	\$235
Avg. Used Vehicle Price	\$16,499
Monthly Storage and Insurance Percent	-1.42%
Monthly Deviation	1.03%

**Recommended Adjustments:
Standard Monthly Cost Estimates**

Monthly High: (-1.66) + (-1.42) + (-.38) =	-3.46%
Monthly Avg: (-0.63) + (-1.42) + (-.38) =	-2.43%
Monthly Low: 0.40 + (-1.42) + (-.38) =	-1.40%