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He holds a master’s degree in applied economics and econometrics from the University of Delaware and a bachelor’s degree in economics from Bloomsburg University.
BEV and PHEV Variety Growing Rapidly

Number of unique models, by model yr

Source: Moody’s Analytics
Wholesale Used BEV Prices Fall Fast

Avg. price-to-MSRP ratio by fuel type, by sale age in yrs

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Used EV Demand Drivers

What could lower demand for used electric vehicles?

» Automotive Industry Factors
  – Tax credits/rebates on new EVs
  – Changing consumer preferences

» Technological Factors
  – Range anxiety on older models
  – Innovation-driven obsolescence
  – Battery degradation

» Macroeconomic Factors
  – Low oil prices
Depreciation Accelerates After One Year

Avg. price-to-MSRP ratio by fuel type, by sale age in months

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
BEVs Sensitive to Initial Mileage Accrual

Avg. price-to-MSRP ratio, by mileage bucket, 3-yr-old vehicle sales

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
2017 Chevy Bolt Sunk 2016 Spark Prices

Avg. price-to-MSRP ratio, Chevrolet Spark, by monthly age

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Range Improvements Cannibalize Prices

EV est. avg. price-to-MSRP ratio by, sale age in months

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Luxury Brands Dominate EV Retention

Avg. price-to-MSRP ratio, by segment, by EV type, 1-yr-old sales, %

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Larger EVs Retain More Value
Avg. price-to-MSRP ratio, by segment, by EV type, 1-yr-old sales, %

- Compact Utility
- Entry Subcompact
- Intermediate Compact
- Intermediate Mid-Size
- Intermediate Subcompact
- Luxury Mid-Size Utility
- Luxury Sport
- Premium Luxury Large
- Upper Compact

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
EV SUVs Needed to Meet Demand

Share of U.S new truck/SUV sales, %

Sources: BLS, Moody’s Analytics
BEV Range Improving at Lower Cost

Model year avg. range and cost per electric mile

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Range Not Enough to Save Some BEVs

Est. avg. price-to-MSRP ratio, by range, by time

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Low Gas Prices Weigh on BEV Prices

Gasoline Prices in $ per gallon, Residual Value Difference in pp

Sources: OPIS, NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
High Gas Prices Are a Boon for BEVs

Est. avg. price-to-MSRP ratio, by gas price shock, by time

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Gas Price Pressures Will Continue
CPI: Urban Consumer - Gasoline (Index 1982-84=100, SA)

Sources: BLS, Moody’s Analytics
2015 BEV Model Years Underperformed

Avg. price-to-MSRP ratio by model yr, by sale age in yrs

Sources: NADA, Moody’s Analytics

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
BEV Residual Values to Strengthen

Est. avg. price-to-MSRP ratio, by model yr, by age in months

Assumption: 5,817 miles per year

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
PHEV Prices Improving With Time

Avg. price-to-MSRP ratio by model yr, by sale age in yrs

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit

Sources: NADA, Moody’s Analytics
PHEV Residual Outlook Is Favorable

Est. avg. price-to-MSRP ratio, by model yr, by age in months

Assumption: 8,357 miles per yr

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Bolt to Stand Out Among Compacts…

Est. price-to-MSRP ratio, by age in months

Sources: NADA, Moody’s Analytics AutoCycle

Assumption: 11,442 miles per yr

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
… And Also to Outperform Model S

Est. price-to-MSRP ratio, by age in months

Assumption: 11,442 miles per yr

Sources: NADA, Moody’s Analytics AutoCycle

Note: All EV MSRP values are adjusted for the $7,500 federal tax credit
Conclusion

EV residual values will be a mixed bag over the next few years

» Low oil prices will continue to put downward pressure on EV sales and prices

» PHEV vehicles will perform well while the BEV market matures

» Improvements in battery cost, quality, and range bode well for future model years, but early model years will obsolete quickly
  – However, basic subcompacts and sedans will still struggle with shifting consumer preferences

» High quality, mass-market cars such as the Bolt and Model 3 should do well on the used market

» Zero Emission Vehicle (ZEV) regulation will help develop EV markets overall, but removing the federal tax credit would slow things down
Q&A

For more economic insights in auto residual and lending risk visit moodysanalytics.com/auto