

FIRST PRINCIPLES CAPITAL MANAGEMENT

“There’s a new kid in town”

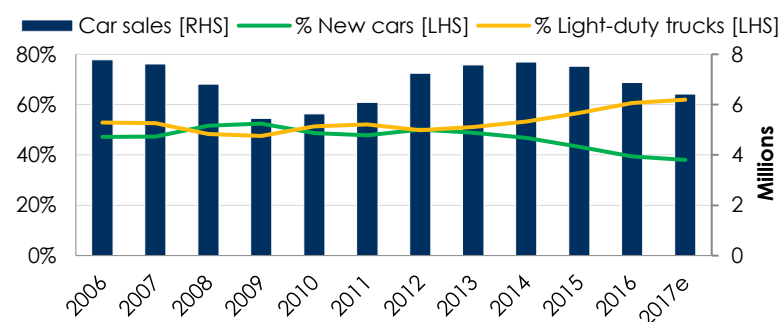
June 2017

Everybody is talking about Tesla these days, especially when it recently eclipsed General Motors and Ford as the most valuable US automotive manufacturer with a market capitalization near \$50 billion. Clearly, great expectations are built in for the new kid in town - Tesla's soon-to-be-launched electric passenger car - the Model 3. However, few are talking about the potential disruption in the ever-important financing side of the auto industry linked to this new car. That's because most assume that the US new vehicle market, with a record size of 17.5 million units in 2016 and where 85% of all new vehicles are financed, can easily absorb the production and financing needs of this new entrant. What most don't realize is that Tesla is effectively seeking to become a big electric fish in a much smaller and shrinking premium passenger-car pond. When the Model 3 jumps into the water, it will send shock waves that will impact to varying degree: new vehicle manufacturers, the used car market, most auto-finance companies, and the asset-backed securities (ABS) marketplace.

With the US economy near cyclical lows in unemployment, used car prices holding firm, and default and delinquencies among consumer borrowers performing reasonably well, the auto finance industry appears to be running on all cylinders - even if 2017 sales taper off as expected from last year's highs. Then how can one new 4-door sedan of an upstart electric-car manufacturer disrupt an industry that financed nearly \$500 billion in originations across 15 million transactions last year? Very quietly. Let's paint the picture.

While total new vehicle US sales peaked in 2016, over the past decade the new car segment (e.g., sedans) has been trending downwards both in terms of unit volume and as a percentage of total vehicle sales. For example, in 2012, new vehicle sales totaled 14.4 million units, split evenly between passenger cars and “light-duty trucks” (i.e., the industry's classification for trucks, SUVs, and crossovers). By comparison, 2017 new car sales are expected to be 800,000 units lower than 2012, and represent only 38% of today's new vehicle market. While demand for light-duty trucks trends ever higher, the demand for passenger cars has steadily fallen since 2014, with 2017 forecasted to be 6-7% below 2016's unit volume.

US new car sales [units] and as % of total vehicle sales



Source: nada.org

A confluence of factors has impacted the demand for new cars, including the precipitous fall in oil prices that commenced in Q4 2014, improved fuel-efficiency of larger SUVs and trucks, changing lifestyles and lifecycle needs, as well as a proliferation of smaller SUVs and crossover models designed to accommodate these changing consumer needs. Although the shift away from cars to light-duty trucks is partly a nomenclature issue, what's certain is the demand for traditional sedans has been in decline over the past decade and continues to wane.

Now, let's introduce more color onto our canvas.

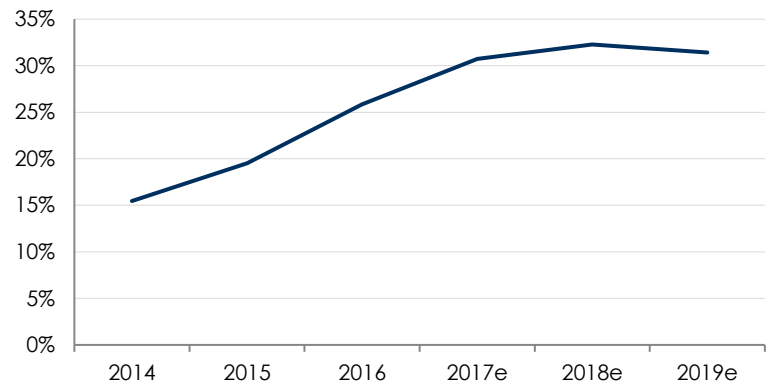
Since the Great Recession, the percentage of consumers leasing new vehicles has risen steadily from less than 20% in 2010 to 28.9% of new vehicles in 2016, according to Experian. The growing prevalence of leasing means that there is always a steady forward supply of off-lease vehicles entering the used car market as late-model or certified pre-owned (CPO) vehicles. For example, a great many of the new vehicles leased in years 2013, 2014, and 2015 will make their way back to dealer lots or to wholesale auctions in 2017, offering consumers ample choices. With leasing, both the rearview mirror and the road ahead matter. One cares about the past product mix (i.e., % of cars versus light-duty trucks) because it will impact the forward supply in the coming years, particularly when consumer preferences change.



Calendar year 2018 will be particularly noteworthy due to the large volume of new car leases originated in 2014, 2015, and 2016. Approximately 1.2 million more cars were sold in 2014 than are forecasted to be sold in 2017. We estimate that 2.1 million off-lease cars have the potential to make their way to the used car market in 2018, which, as a percentage of projected new passenger car sales, could reach near-term highs.

As the consumer continues to move towards SUVs, trucks, and crossovers, a steady stream of out-of-favor, off-lease passenger cars will be hitting the market in 2018 and 2019. Undoubtedly, this will put pressure on original equipment manufacturers (OEMs) to adjust either new vehicle product mix, pricing or both.

Off-lease potential used car supply as % of new car sales



Source: nada.org, Experian and FPCM

Now, let's splash on a heavy dose of disruption. Cue the Tesla Model 3.

To daily media coverage, Tesla has embarked on an ambitious production schedule for its third major product, the Model 3, which is a sedan that is a smaller and lower-priced version of its well-received zero-emission-vehicle (ZEV), the Model S sedan.

The base price of the Model 3 is expected to start at \$35,000, with general expectations of pricing to be in the low \$40s - approximately 18-24% higher than the 2016 median new vehicle price of \$34,449. As such, the Model 3 will be positioned as a premium product in the car marketplace, even though it will be less than half the price of a typical Tesla Model S or X.

In terms of production schedule, Tesla is moving full speed ahead and has recently stated the following:

- From Tesla's First Quarter 2017 Update: *"Preparations at our production facilities are on track to support the ramp of Model 3 production to 5,000 vehicles per week at some point in 2017, and to 10,000 vehicles per week at some point in 2018."*
- From Tesla's 2017 March 10-Q: *"We plan to build 500,000 vehicles in 2018."*
- Tesla has high degree of confidence they will achieve these production estimates based on verbiage associated with production-linked stock-option compensation awards where the company stated in its most recent 10-Q: *"Completion of the first Model 3 production vehicle and aggregate production of 300,000 vehicles . . . were considered probable of achievement."*

So, Tesla appears reasonably confident that it will manufacture more than 600,000 vehicles (predominantly premium sedans) over the next 18-20 months.

The question now is how disruptive will this incremental supply be on the broader new car and late-model used car markets. Can a new vehicle market of 16-17 million units easily absorb such a new entrant over such a short window? Well, it depends on the size of the target market for the Model 3.

To evaluate the potential size of the Model 3's market, let's first recognize that as a ZEV the Model 3 is fundamentally a niche vehicle based on today's industry metrics. However, that may change based on the level of disruption - because there may be, as Tesla is hoping for, a "Field of Dreams" effect in the marketplace. With reputedly more than 325,000 deposits on order for the Model 3, it's conceivable among potential buyers that "they will come." Also, let's assume as part of the announced 2018 500,000 vehicles that 150,000 are linked to Model S and X, and 350,000 are linked to the Model 3.

In considering the size of the new sedan's potential market, it's probably easier to eliminate sectors that logically would not be considered potential Model 3 buyers. In shopping for a new vehicle, product segmentation is critical: size matters, so does price, utility, safety, and fuel-efficiency (among many others). As an example, a buyer looking for a large SUV or pick-up truck with utility needs probably would not consider a Model 3 sedan. The same holds for tight-budget buyers of inexpensive subcompacts and vehicles with MSRPs below \$25,000. Likewise for shoppers of specialty vehicles including sports cars, convertibles, muscle-cars, and utility vans, etc.



Table I: Potential market demand for Tesla Model 3 among product segments

Price point	Vehicle type				
	Truck	SUV	Crossover	Sedan	Specialty
Under \$25,000	Very low	Very low	Very low	Very low	Very low
\$25,000-\$35,000	Very low	Low	Low/medium	Medium	Low
\$35,000-\$55,000	Very low	Low	Medium	High	Low
Over \$55,000	Very low	Very low	Medium	Medium/High	Very low

As we chip away at the various vehicle sectors in Table I, we observe what remains is a market focused primarily on premium sedans and crossovers. This is dominated by the well-capitalized foreign luxury manufacturers including BMW, Daimler (Mercedes Benz), Toyota (Lexus), VW (Audi), Honda (Acura), and Nissan (Infiniti). Indeed, Elon Musk, Tesla's Chairman & CEO, has made similar comments about the Model 3's potential competition.

How deep is this US market segment, and how will 350,000 new units go over in this sector? In short, not deep and not well. Once trucks, SUVs and economy models are eliminated from the potential buyer universe, we're left with a target market that is approximately 10-15% of the total vehicle landscape (i.e., 1.75 million – 2.5 million vehicles). And because this is the turf where the OEMs make much of their profits, there's the potential for a new George Lucas movie in the making entitled: Car Wars – the Force Awakens.

Table II: Tesla 2018 targets versus select 2016 US unit sales of luxury brands and car models

Select Luxury Brands	Units	Select Car Models	Units
Tesla 2018 (all models)	500,000	Toyota Camry 2016	388,618
Mercedes Benz 2016	340,237	Toyota Corolla 2016	378,210
Lexus 2016	331,228	Honda Civic 2016	366,927
BMW 2016	313,174	Tesla Model 3 2018	350,000
Audi 2016	210,213	Ford Fusion 2016	265,840
Cadillac 2016	170,006	Chevrolet Malibu 2016	227,881
Lincoln 2016	111,724	Toyota Prius 2016	136,632

Source: Manufacturer data releases

To appreciate the monumental task that the Tesla management team is trying to achieve, let's look at the number of units sold in 2016 among various luxury brands and popular car models in Table II. In under two years, Tesla seeks to become the number one US luxury brand - even if more than 30% of its production is exported. Plus, the Model 3 would be seeking to become a top dog among cars in the US, nipping at the heels of the perennially dominating Toyota Camry and Honda Civic. As a further point of comparison, many (including Tesla) have suggested that the BMW 3 series is the bullseye for the Model 3. In 2016, BMW Group sold globally 411,844 units of the 3 series, down 7.3% from 2015, with much of the decline occurring in the US market. To further reflect changing consumer tastes, BMW sold a total of 209,231 passenger cars in the US in 2016, down 14.5% from the prior year, while light trucks were up 2.7%. Tesla would be seeking to materially disrupt this well-established and well-financed US passenger car franchise, which is already under demand pressure.

Irrespective of whether Tesla can pull off this production achievement, what is certain is that we should expect material price deflation in this sector of the marketplace. Over the next two years, the consumer will have ample supply to choose from – whether it's an off-lease CPO, a new Model 3, or a well-subsidized new premium sedan of a foreign OEM seeking to maintain US market share. It will be a buyer's market for sure. Further, because the price war will be among the premium sector (e.g., \$35,000 and above), we should expect some trickle-down deflation across lower priced segments.



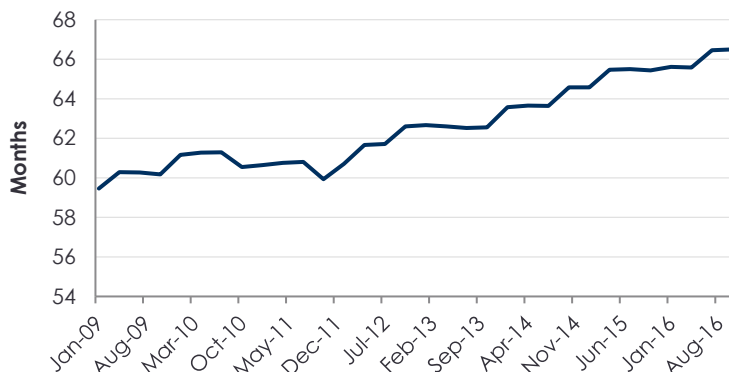
While deflation is certainly good for the consumer, it's not good for the auto finance industry, as it impacts the residual value (RV) of used vehicles, which serves as the collateral backing auto loan and lease transactions. Auto Lease Group (ALG), which is a leader in forecasting residual values in the North American auto market, is currently estimating that premium sedan 3-year residuals will be hit hard (e.g., 40% or lower), given the overhang of forward supply. However, we are reasonably confident that ALG's econometric models haven't captured the almost-binary impact of the soon-to-be Model 3 asteroid. If Tesla is successful, certain segments of the premium market could be negatively impacted well beyond the already-low forecasted RVs. The Model 3 could have the pricing effect of increasing the 2018 off-lease used car supply by 15-20%, something that most industry econometric models likely haven't captured.

With consumer default and delinquencies remaining low, the questions now are: 1) Can the auto finance market handle further declines in car residual values? and 2) Who will feel the financial pain?

In answering the first question, lower car RVs will certainly impact the loss severity of each default, but there is now the potential for each loss to be much worse than past cycles because the industry has slowly become more leveraged.

Since the Great Recession, the average maturity of a new car loan has extended from 59.5 months in early 2009 to more than 66.5 months in 2016 according to the Federal Reserve Bank of St. Louis. Experian estimates that the average loan is currently 68 months.

Average maturity of new car loans 2009-2016



Source: Federal Reserve Bank of St. Louis

Extending maturity slows principal amortization during a loan's life, essentially increasing leverage on a loan-to-value basis. For example, at the 36-month juncture, often a key RV benchmark, the average 68-month loan portfolio would have approximately 19% more principal outstanding than the average 59.5-month loan portfolio. As a rule of thumb, the longer the maturity of an auto loan portfolio, the more important is the volatility of the underlying auto collateral.

Now, let's combine 19% higher loan balances with potential Car Wars-induced RV declines of 3-6% (of MSRP). Suddenly loss severity grows significantly per default. In Table III, we can see scenarios where loan-loss severity can increase by multiples, merely due to a slower amortization schedule.

Table III: Potential loss amount under different loan maturity profiles

	59.5 month Average maturity	68 month Average maturity
Est. average MSRP	36,516	36,516
Average 2016 new car price	34,449	34,449
Loan to value at inception	104%	104%
Interest rate	3.00%	3.25%
Loan balance @ 36th month	14,843	17,681
36th month RV @ 42% of MSRP	15,337	15,337
Potential loss/(gain) amount @ 42%	(494)	2,344
36th month RV @ 37% of MSRP (e.g., Car Wars effect)	13,511	13,511
Potential loss amount @ 37%	1,332	4,170

If the Model 3 becomes a great success and triggers a massive price war, then where will these expected residual value losses show up? As always, the first loss will be borne by the major auto captive finance companies linked to lease buy-backs, as they are on the front lines of vehicle price volatility. For example, Ford recently announced loss provisions at Ford Credit of \$53 million, citing "higher severities primarily due to lower auction values," reflecting the recent supply trends. These types of losses among the major credit captives could get much worse when the Model 3 starts rolling off the assembly line. Don't be surprised if credit spreads of auto companies' unsecured debentures start to widen at this stage. Also, Tesla itself may not be immune to the price-war collateral damage, as it would be expected that the Model 3 will cannibalize the Model S used car market, potentially generating RV losses for Model S leases.



Will RV losses make their way to ABS investors? Probably not. Most senior-tranche ABS loan deals have more than sufficient overcollateralization and underlying vehicle diversification to handle materially higher loss severity within the passenger car segment. Yet, higher severity will amplify the rate of deterioration when the credit cycle starts to turn as default percentages increase, likely forcing investors to seek higher spreads in return for the deteriorating risk profile. However, since the spread duration of most ABS structures is relatively short, the downside on a mark-to-market basis will be limited. Nonetheless, most ABS transactions are durable enough to endure a premium sedan price war even during a downward credit cycle.

Thus, with certainty, the foreign OEM companies soon will be talking about the new kid in town, because they're going to feel the pain - first in terms of potentially lost new car sales to the Model 3; and then all major finance companies will be talking too when they see downward pressure on late-model residual values – potentially triggering losses. However, ABS investors over the near-term will treat the new Tesla entrant as just another Johnny come lately.

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Richard F. Dolan is the Chief Executive Officer of First Principles Capital Management, LLC (FPCM). FPCM is a wholly owned subsidiary of American International Group (AIG). Mr. Dolan is a member of the Investment Committee of AIG's pension and 401(k) plans.

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