CFA Institute

CFA Institute Research Challenge

hosted by

Local Challenge (CFA Society of Phoenix)

New Mexico State University

New Mexico State University

Student Research

January 31, 2020

Carvana Co.

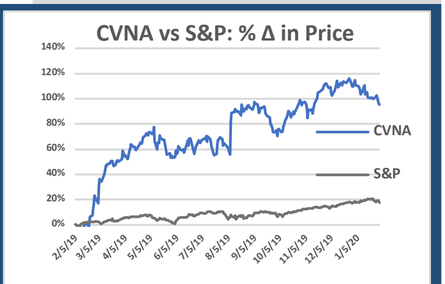
New York Stock Exchange (NYSE)

Sector: Consumer Discretionary
Industry: Automotive Retailers

Current Price: $79.25
Ticker: CVNA

Recommendation: **HOLD**
Target Price: **$87.33**

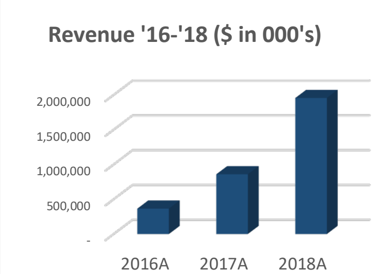
This report is published for educational purposes only by students competing in the CFA Institute Research Challenge.



Market Snapshot	
Ticker	CVNA
Exchange	NYSE
Closing Price (1/31/20)	$79.25
52-Week High	$99.14
52-Week Low	$29.95
TTM Total Return	113.32%
Market Cap	11.13B
Enterprise Value	12.41B
Diluted Shares Out	151,564,104
Beta	1.60
EV/TTM Sales	3.8x

Source: Bloomberg, Team Estimates

Valuation Summary	DCF	EV/Sales Multiple
Estimated Price	$74.65	$100.01
Weight	50%	50%
Target Price	**$87.33**	



Net Loss		
3/31/19	6/30/19	9/30/19
$ (82,596.00)	$ (64,059.00)	$ (92,244.00)

Source: Q3 Letter to Shareholders

Source: Company filing

Highlights

We initiate a **Hold** recommendation on Carvana based on a price target of $87.33. This is a potential 10.2% upside from its closing price of $79.25 as of January 31, 2020. Our recommendation is primarily driven by:

Strong Points

Highly Fragmented Industry Ripe for Disruption

The retail use auto industry is one of the largest, most fragmented industries in the retail space. The largest dealer has only 1.8% market share. Carvana aims to disrupt this industry by offering a "New Way to Buy a Car".

Proven Growth Strategy, Market Expansion Blueprint

Carvana has proven that it can grow and capture market share at a significant rate. Experiencing triple digit revenue growth for 23 straight quarters, Carvana currently services 158 markets with additional markets opening every month.

Strong Trends in Unit Economics in Mature Markets

Carvana's business model is proven to work. As of Q319, 14 mature markets are EBITDA positive with these markets being responsible for ~35% of revenue.

Concerns

Fundamentals

Since their inception in 2012, Carvana has yet to report a profit. As cash burn accelerates, Carvana frequently seeks outside capital, raising debt levels beyond its peers and issuing new shares with regularity.

Growth Premium Likely Reflected in Current Valuation

Carvana has grown at a rapid pace since its IPO, commanding an EV/Sales multiple far above its peers. At 3.8x TTM Sales, we feel that the appropriate growth premium is already priced into their current valuation.

Key Financials

	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E
Total Revenue	365	859	1,955	3,940	6,048	8,286	10,789	13,723
Gross Profit	19	68	197	503	849	1,227	1,694	2,251
GPU	1,023	1,169	1,501	2,846	3,270	3,434	3,598	3,662
EBITDA	(89)	(155)	(229)	(208)	(74)	115	320	784
FCF	(280)	(278)	(558)	(723)	(567)	(395)	(229)	96
Gross Margin	5.3%	7.9%	10.1%	12.8%	14.0%	14.8%	15.7%	16.4%
EBITDA Margin	-24.5%	-18.1%	-11.7%	-5.3%	-1.2%	1.4%	3.0%	5.7%

Business Description

Origins of the Company & Initial Public Offering
Carvana was founded in 2012 as an e-commerce platform for buying and selling used cars in the United States. Headquartered in Tempe, Arizona, Carvana operated as a private company for five years until its initial public offering on May 3, 2017. Carvana sold 15 million shares and raised approximately $225 million in their initial public offering. The IPO price for Carvana was $15 and as of January 31, 2020 closed at a price of $79.25.

Mission Statement & Key Features
Carvana's mission is "to change the way people buy cars" by playing on their unique business model and competitive advantage. They offer vehicle financing, car reviews, vehicle trade- ins, a 7-day return policy, certification of vehicles, and warranty coverage. Carvana boasts that a vehicle can be purchased from their website in "ten minutes".

Competitive Advantage
Carvana's competitive advantage relies on a vertical integration and fulfillment process. The various backward and forward supply chain processes include vehicle acquisition, inspection and reconditioning, e-commerce, vehicle financing, delivery and distributions, and product warranties.

This vertical integration creates a substantial barrier to entry for potential competitors. In order to attempt to enter this market, various resources would be necessary including investing large sums to buy vehicles, acquire land for storage and operations, in-house financing, and various distribution channels in order to be on the same playing field as Carvana. This complex vertical integration makes their business structure difficult to replicate.

Vertical Integration Process (Figure 2.1)

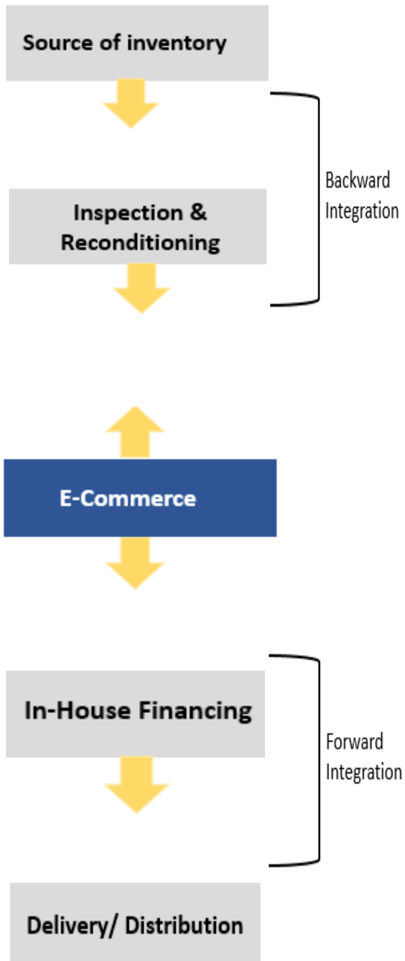


Figure 2.1

Source of inventory
Carvana acquires its vehicles through customer trade-ins, wholesale auctions, and off-lease rentals. A proprietary vehicle acquisition algorithm was developed for inventory optimization where approximately 31,600 vehicles are held in a centralized database.

Inspection and Reconditioning
The company inspects and reconditions vehicles to a consistent quality through the screening of year, mileage, and accident characteristics. This is done through a 150-point quality inspection.

E-Commerce
Carvana is fully operated through their website, which includes proprietary algorithms and patented technology that are used to capture 360-degree photos of all vehicles in inventory and relay pertinent details about the vehicles to customers. All vehicles in inventory are available for viewing on their website

In-house financing
Customers can access personalized financing with non-negotiable terms based on credit history, income, and vehicle purchase price. Utilizing proprietary algorithms for its vehicle financing platform that can pre-qualify loans in 2 minutes and quote instant offers for trade-in vehicles when customers input their license plate number and vehicle information into the website.

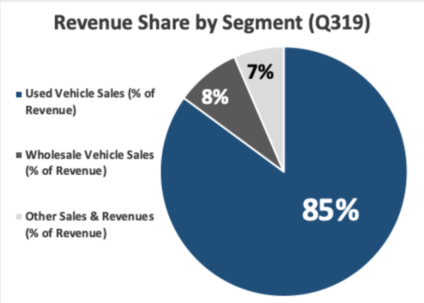


Figure 3.1

Delivery
Currently operating in 158 markets throughout the country, delivery services "as soon as the next day" are offered. Another distribution channel which adds brand recognition and marketing, offering a unique experience to customers are the 24 vending machines in large metropolitan areas.

Warranty
Each vehicle purchased is Carvana Certified with a 100 day or 4,189 miles from time of purchase limited warranty and a 7-day money back guarantee. Carvana offers two types of coverage for consumers to purchase; CarvanaCare and GAP Coverage (Appendix A-4).

Sources of Revenue
The main sources of revenue for Carvana are retail and wholesale vehicle unit sales. Additional revenue coming from financing, and ancillary products such as Vehicle Service Contracts and GAP waiver coverage (Figure 3.1).

Strategy
Carvana's strategies are focused on increasing retail vehicle unit sales, market penetration, and improving competitive positioning. Targeting a US population coverage of 95%, 2 million units sold per year, and a GPU of $3,800- $4,500.

Management & Corporate Governance

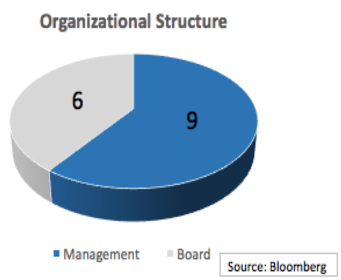


Figure 3.2

Organizational Structure
The majority of Carvana's Board of Directors must meet the requirement for independence as required by the NYSE. In order to be considered independent, the Director must disclose any other affiliations with other companies with the Board of Directors and their status is then determined. The Board of Directors must be diverse with respect to gender, professional experience, and ethnic backgrounds. (Figure 3.2)

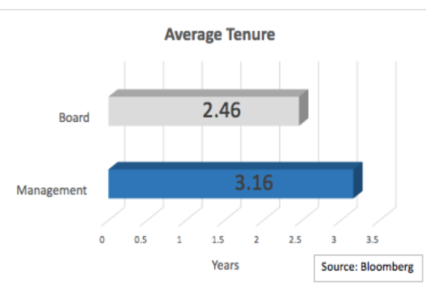


Figure 3.3

Carvana's Board of Directors is comprised of five males and one female (Figure 3.4) ranging from various professional backgrounds including accounting, media, and financial and consulting services. Three of the directors have previously worked in the auto retail business at either DriveTime or AutoNation.

Social Responsibility
Carvana's Code of Conduct states that they care about their communities and environment. Carvana encourages employees to take part in company-sponsored volunteer events. However, Carvana has been given a rating of 13 out of 100 on CSRHub (Appendix B-2) with regards to their Corporate Social Responsibility. This may be because Carvana is expanding at a rapid rate and may not have as much resources as they would like to make a lasting impact in their respective communities and environments.

Industry Overview & Competitive Positioning

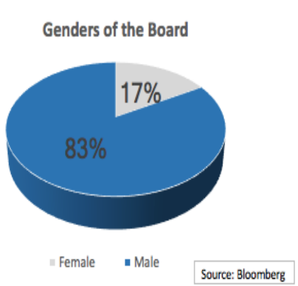


Figure 3.4

U.S. Demographics
In 2018, Carvana established operations in the largest city population wise of the US, New York (8.4M) and opened 6 new markets around the area in 2019 (Appendix C-1). Since 2017, the company operates in the 2nd and 3rd largest cities as well, Los Angeles (4M), and Chicago (2.7M), where they established two "vending machines", and one "vending machine" respectively. Targeting the high population density in those cities, as shown in Figure 4.1, the company still has new markets to enter in order to reach 95% of population coverage.

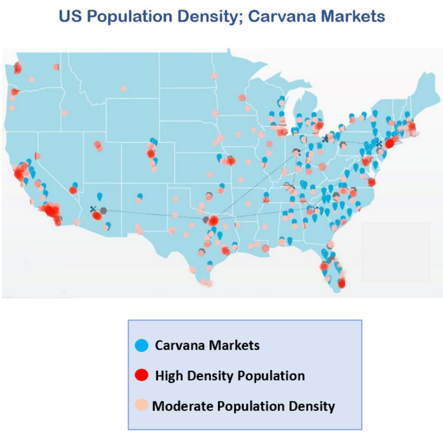


Figure 4.1

According to a Federal Reserve report the average age of car buyers in the United States has been steadily increasing since the 2000s. In the decade from 2000 to 2010 alone the age increased from around 43 to 49 years old. However, this can mostly be attributed to the Baby-boomer generation causing the US population to be ever aging. 77.4% of US residents are older than 18 years old, which is the minimum age to enter a legal contract like the purchase of a vehicle.

In the next four years over 600,000 Americans will reach an age where it is appropriate to be purchasing a car. This means, that in a relatively short amount of time, Carvana will have access to over half a million customers from a tech-savvy generation. Due to Carvana's positioning as a technology-oriented dealership, this growth in potential younger customers could be a strong asset, considering that their customer base skews slightly younger and higher income according to our Carvana Headquarter visit.

Global Economic Outlook

A macro overview of the global economy for 2020 indicates signs of economic stabilization after slowdown, 2019 presented the lowest world GDP growth since 2009 (Figure 4.2). Global GDP is expected to grow 0.4% in 2020 according to the most recent IMF report. Geopolitical tensions are an ongoing risk, but major conflicts like the US-China trade war, Brexit agreement and US-Iran conflict seem to have abated. Business investments and manufacturing sectors have weakened globally. Current monetary and fiscal policies are stimulative and supportive of economic growth and labor stabilization.

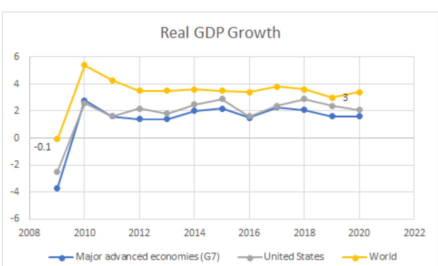


Figure 4.2

US Economic Growth

The US economy has shown stable real GDP growth since the last financial crisis. As mentioned in the Global Economic Outlook, the US economy in 2019 showed signs of a slowdown. However, we have seen real GDP growth of ~2% each quarter in 2019 (Figure 4.3). Personal consumption grew by 1.8% in Q4 of 2019, returning to a sustainable rate from Q3 where consumption increased by 3.2%. Personal consumption represents about two-thirds of US economic activity. Inflation maintained within the range of 2%, as targeted by the FOMC. Record low unemployment rates of 3.5% reflected Q4 of 2019, combined with an overall increase in disposable income for most of 2019.

The current level of interest rates encourages consumers to finance vehicles. The current Fed target interest rate ranges from 1.50%-1.75%. The presented economic indicators show positive signs for 2020, while the monetary policy remains stimulative and will continue to reflect moderate growth in the US economy.

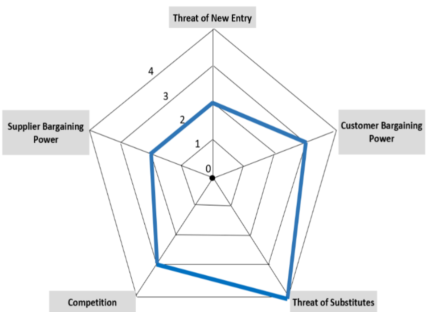
Annually	GDP	CPI	Unemployment
2019	2.1	2.29	3.7
2018	2.9	1.54	3.9
2017	2.4	1.69	4.3

Figure 4.3

Retail Auto Industry

The US auto-industry manufacturers over 17 million new cars a year. This number, however, has been decreasing from its peak of 17.6 million in 2016. Part of the decrease can be attributed to the consumer trend of purchasing more used than new vehicles. According to the National Automotive Dealer Association the price of the average new car is $36,642. The average used car price is $20,979 which is up 3.8% from 2018. The gap in prices between used and new cars is expanding. In addition to this, used cars are becoming more prevalent as the industry recovers from the Great Recession. This means consumers are tending to purchase more used cars than ever before.

A new trend for consumers is to lease vehicles rather than own them. If this trend continues, it could present a serious threat to car sales. However, over time this means that there may be an abundant supply of newer, low mile, vehicles of which could be capitalized. Over half of used car sales from dealerships consist of vehicles that are less than four years old. The average sales price for these vehicles is increasing, and if leasing continues, their availability will also increase.



Porter's Five Forces

0) No threat to Carvana Co.
1) Insignificant threat to Carvana Co.
2) Low threat to Carvana Co.
3) Moderate threat to Carvana Co.
4) High threat to Carvana Co.

Figure 5.1

Competitive Positioning
The auto-sales industry is extremely fragmented, with no single company in control of greater than or equal to 2% market share. This means Carvana faces a huge threat from a consumer's ability to switch to a different dealership. This fragmentation of the market offers some benefits to Carvana. The first is both suppliers and consumers have limited bargaining power. Carvana can easily switch from one supplier to another and they can easily find a variety of customers willing to purchase a vehicle. The fragmentation of the market also leads to little threat of new entry, because it is extremely difficult to capture a large share of the market. This combined with the amount of capital it would require starting nationwide dealership like Carvana leads almost no threat of new entry.

Investment Summary

We initiate a **Hold** recommendation on Carvana with a target price of $87.33 representing a 10.2% upside from the current price of $79.25. Our recommendation is the result of several valuation methodologies including Discounted Cash Flow analysis and Enterprise Value-to-Sales multiple relative valuation. We are confident that our valuation of Carvana is representative of our overall outlook for Carvana moving forward.

Highly Fragmented Industry Ripe for Disruption
According to company filings, the ~$760 billion a year vehicle market is one of the most fragmented and inefficient retail markets susceptible to significant disruption in the U.S. The largest dealer in this market only has 1.8% market share while the largest 100 dealers capture just 7%. However, the consolidation opportunity is just part of it. Consumers have increasingly expressed dislike of the traditional car buying process; pushy salesmen, unnecessary add-on services, and significant mark ups have led to consumers looking for a better experience. Enter Carvana: "The New Way to Buy a Car Online."

Differentiated, Innovative, Full-Service Business Model
Carvana differentiates from traditional auto dealers by offering an online-only platform with a level of efficiency unmatched by competitors. They offer a full-service customer experience with in-house financing, trade-ins, and fulfillment. Their proprietary algorithms decide financing terms and trade in value which enables the customer to complete their purchase minutes after they decide on the specific vehicle. Carvana customers also enjoy access to a larger and more diverse, centralized inventory of over 31,600 vehicles. These components of Carvana's business model create a unique value proposition that we feel is currently the best offering in the retail auto industry.

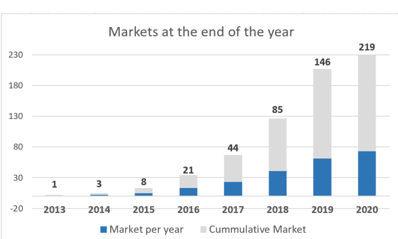


Figure 5.2

Proven Growth Strategy, Market Expansion Blueprint
Carvana has been expanding rapidly into new markets on their way to reach their goal of 95% population coverage in the United States (Figure 5.2). This market expansion strategy has proven to be successful and is less capital intensive than traditional dealers. This rapid expansion has led to Carvana realizing triple digit revenue growth for 23 straight quarters. GPU growth has trended positively over the years. Q319 total GPU ex-Gift was $2,996, progressing to their long-term target between $3,800-$4,500. (Source: Company filings)

Strong Trends in Unit Economics in Mature Markets
When looking at older markets, we see that the business model works. Specifically, the 2013, 2014, and 2015 cohorts are contribution positive. In their Q319 conference call, Carvana reported that 14 markets were EBITDA positive. These 14 markets are responsible for 35% of total sales. This trend is promising given that recent cohorts are ramping faster than older cohorts. If this trend continues, we are confident that profitability will be reached within the next few years.

Growth Premium Likely Reflected in Current Valuation

The high level of growth that Carvana has achieved since its IPO is relatively unprecedented in the retail auto industry. Given this growth history, Carvana has commanded a valuation at the higher end of its peer group in relation to fundamentals. Carvana's EV/TTM Sales is currently at 3.8x. Given this relatively high multiple, we feel that the growth premium appropriate when valuing Carvana is already priced in.

Financial Analysis

The table below shows Carvana's key financial ratios that currently reflect business performance. Cash Flow ratios are shown in Thousands.

	2015	2016	2017	2018
Liquidity				
Current Ratio	1.6837	1.4013	1.6002	2.0116
Cash Ratio	0.6092	0.1995	0.5643	0.2393
Financial Leverage				
Debt-to-Equity	1.0859	1.4874	2.8758	10.4019
Financial Leverage	0.9630	0.9629	0.9555	0.9106
Profitability				
Gross Profit Margin	0.0103	0.0526	0.0793	0.1006
Operating Profit Margin	-0.0307	-0.2550	-0.0732	-0.0316
Cash Flow				
Free Cash Flow	-67458	-279764	-278414	-558008
Operating Cash Flow	-24326	-246786	-117961	-271475
Expenses as a % of Sales				
COGS as % of Sales	98.97%	94.74%	92.07%	89.94%
SGA as % of Sales	28.13%	29.76%	26.01%	21.75%
Depr. & Amort. as % of Sales	2.15%	1.28%	1.35%	1.20%
Cap. Ex. as % of Sales	-10.70%	-10.83%	-9.14%	-7.35%

Cash Flow and Leverage

Carvana's key financial ratios demonstrate the fact that Carvana is still in their growth stage and that their ratios including operating profit margin and current ratio are improving year after year. Gross Profit Margin is calculated by subtracting the cost of goods sold from sales and dividing that value by sales. Carvana has been able to improve this ratio thanks to their rapid expansion which has led to an increase in their sales. Carvana has also been able to decrease their cost of goods by increasing their GPU on vehicle sales. The Operating Cash Flow demonstrates that Carvana's change in working capital is increasing at a quicker rate than their net income which is demonstrated by a negative value.

Expenses as a Percent of Sales

The largest expense being incurred every year by Carvana is the Cost of Goods Sold. This may be due to the fact that they purchase their inventory from auctions and customers and are still working towards increasing their GPU. Selling, General, and Administrative expense (SG&A) accounts for another large portion of their sales as a percent. An explanation for this is their need to keep growing their personnel to keep up with their growing business operations. The negative values shown in the capital expenditures as a percent of sales can once again be attributed to the fact the Carvana is growing so rapidly and must purchase assets such as inventory and office space to support this expansion.

How Carvana Measures Up to Biggest Competitor

Carvana is undoubtedly growing and expanding at a rate not seen by its competitors. This is reflected in their various financial ratios when compared to their closest competitor, CarMax. CarMax's key financial ratios (Appendix E-3). Although, the much more mature CarMax's ratios may appear favorable in comparison, we must recognize that they did not increase at nearly the same rate as Carvana. When CarMax first began, they were also innovative in their business model and wished to change the way people purchased used vehicles. We feel that Carvana is essentially bringing a "CarMax" type of offering into modern day business.

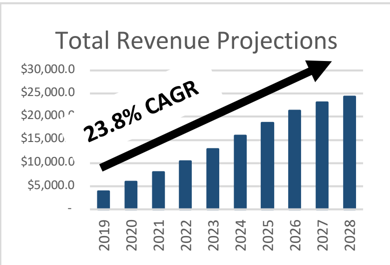


Figure 7.1

Raising Capital in Pursuit of Profitability

As Carvana continues to experience triple digit revenue growth, high levels of investment are needed to support that level of growth. This being the case, Carvana has been burning through cash fairly quickly. Because of this, it is necessary for Carvana to continue to raise capital from external sources until profitability is reached. In the past, Carvana has financed its expansion by issuing new shares and borrowing both in public and private markets. Given Carvana's current cash balance of ~$94 million, they will likely need to raise capital at least one more time before they reach profitability and are able to independently generate cash.

Valuation

We utilized two main methodologies to value Carvana. The methodologies used include a Discounted Cash Flow Valuation and a Relative Multiples Valuation. Using these methodologies, we arrived at our target price of $87.33, representing a potential 10.2% upside from Carvana's current price of $79.25.

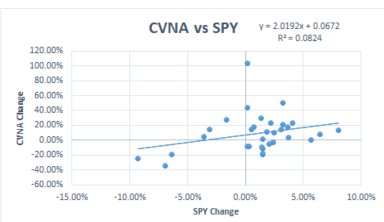


Figure 7.2

Discounted Cash Flow Valuation

Our DCF model is based on a 3-year historical period from 2016-2018, and a 10-year projection period from 2019-2028. The main assumptions driving the model can be seen in Appendix F-2.

Revenue Growth

When assuming revenue growth during our projection period, we take into account historical data & management guidance, analyst consensus estimates, and our personal outlook for Carvana's continued expansion and operations. (Figure 7.1) Each component of total revenue is individually forecasted to represent the shift that Carvana will undergo as the company matures and makes progress towards their goal of 95% population coverage. (Appendix F-6)

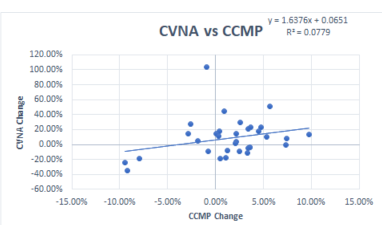


Figure 7.3

Terminal Growth Rate

We assume a long-term growth rate of 5% when calculating terminal value for Carvana. This terminal growth rate is at the higher end of the range between long term inflation ~3% and long-term GDP growth, ~5%. We are confident that this growth rate is representative of the massive opportunity available in the retail auto industry. The used vehicle industry is about twice the size of the new car market and has outpaced its growth historically.

Beta Calculations

Carvana's Beta Coefficient was calculated using a regression analysis. Monthly ending prices of the stock and indexes CVNA class A, S&P 500 index (SPY), NASDAQ index (CCMP), respectively were used for the analysis. The time period for the data was from 04/28/17 until 01/29/20. The regression of CVNA/SPY yielded a beta of 2.02, whereas the regression of CVNA/ CCMP resulted in a beta of 1.60.

The result was blended together with 90% SPY and 10% CCMP weighting, in order to create a beta with a wider exposure to the market. The blend offered a greater exposure to the market represented by the NASDAQ, while still being more conservative by leaning on the higher S&P 500 beta.

WACC Calculation	
Target Capital Structure	
Debt-to-Total Capitalization	10.8%
Equity-to-Total Capitalization	89.2%
Cost of Debt	
Cost of Debt	3.2%
Tax Rate	-%
After-tax Cost of Debt	**3.2%**
Cost of Equity	
Risk-free Rate (1)	1.5%
Market Risk Premium (2)	7.4%
Adjusted Beta	1.60
Cost of Equity	**13.4%**
(1) US 10-Year Treasury Yield, (2) Bloomberg US Country Risk Premium	
WACC	**12.3%**

Figure 8.1

Weighted Average Cost of Capital (WACC)

Based on our calculation of Carvana's weighted average cost of capital, we derived a discount rate of 12.3%. This calculation is based on a target capital structure of 10.8% debt and 89.2% equity [1]. Carvana's cost of debt is sourced from Bloomberg and cost of equity was calculated using CAPM. The risk-free rate is based on the yield of a 10-year US treasury. The market risk premium used is from Bloomberg's US Country Risk Premium. Carvana's beta was calculated from 90/10 composite from the SPY and IXIC respectively. These components resulted in a cost of equity of 13.4%, which yielded a WACC of 12.3%. (Appendix F-4)

EV/Sales Multiple Valuation

The second methodology used to value Carvana is a multiple of sales. We feel that the bulk of Carvana's current valuation is based on their significant sales growth. Using enterprise value in the numerator instead of market capitalization, we are able to factor net debt into the valuation.

EV/Sales Multiple Valuation			
($ in millions, except per share data)	**2019E**	**2020E**	**2021E**
Sales	3,940.3	6,048.3	8,286.2
2021E EV/Sales Multiple			2.5x
Implied EV			**20,715.46**
Discount Factor (2 yr)			0.79
PV of EV			16,434.64
Less: Total Debt			(1,166.3)
Less: Noncontrolling Interest			(205.6)
Plus: Cash and Cash Equivalents			94.9
Equity Value			**15,157.65**
Shares Outstanding			151.56
Implied Share Price			**$100.01**

Choosing an Accurate Peer Group

Carvana is not a traditional car dealer with high CapEx and operating expenses. Their online only platform and technology driven vertical integration make them more scalable than its brick and mortar peers. However, Carvana is still a car dealer. They will continually need to invest in inventory, reconditioning centers, and infrastructure. Given this unique business model, Carvana does not have an exact comparison and therefore should not be valued wholly based on one industry peer group. We decided the most accurate multiple to use would be somewhere between a mix of car dealers and e-commerce discretionary (Appendix F-7).

Federal Funds Rate			
Date	Last Price	Net Change	% Change
1/31/19	1.55	0	0%
2/28/19	1.55	-0.28	-15.30%
3/31/19	1.83	-0.21	-10.29%
4/30/19	2.04	-0.09	-4.23%
5/31/19	2.13	-0.27	-11.25%
6/30/19	2.4	0.02	0.84%
7/31/19	2.38	-0.01	-0.42%
8/31/19	2.39	-0.03	-1.24%
9/30/19	2.42	0.01	0.41%
10/31/19	2.41	0.01	0.42%
11/30/19	2.4	0	0.00%
12/31/19	2.4	0.13	5.73%

Source: Bloomberg

Figure 9.1

Base Case

Our base case DCF model revenue assumptions amount to a 10-year CAGR of ~24% and an estimated intrinsic value of ~$74. Using EV/Sales, our base case is a 2.5x multiple of 2021E sales resulting in a per share price of ~$100. Our target price for Carvana under our base case assumptions is $87.33, derived from a 50/50 blend of multiple valuation and DCF valuation.

Bull Case

Our bull case target price of ~$140 is the result of the same 50/50 methodology blend. However, in our bull case we assume a 3.5x multiple of our 2021 sales estimate, valuing Carvana at $164.68 on the basis of EV/Sales. Our DCF model revenue CAGR in our bull case is ~27%. Resulting in a per share price of estimated using our DCF model of ~$116.

Bear Case

Our bear case DCF valuation is driven by a 10-year revenue CAGR of 22.5%, yielding a price per share of ~$50. We utilized an EV/Sales multiple of 1.5x for the bear case resulting in a share price of ~$54. Blending these together, we arrive at our bear case target price of ~$52.

Valuation Summary					
Case	EV/Sales	DCF	Target Price	Current Price	% Upside/-Downside
Base	$100.01	$74.65	**$87.33**	$79.25	10.2%
Bull	$164.57	$116.79	**$140.68**	$79.25	77.5%
Bear	$54.82	$50.81	**$52.81**	$79.25	-33.4%

Investment Risks

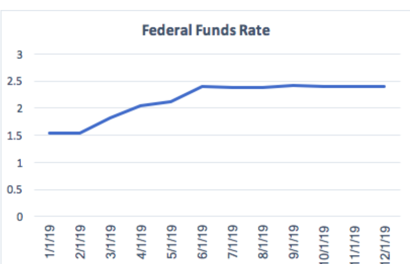


Figure 9.2

Regulatory Risk

Tariffs

In recent trade negotiations, the United States has discussed intentions to impose tariffs as high as 25% on imported automobiles and auto parts. This change in tariffs would affect Carvana's cost of operations in their reconditioning centers. The change would increase the cost of goods sold, leading to a decrease in gross profit per unit. Lower GPU would lead to Carvana raising the prices of their vehicles. The inventory selection at Carvana would be less diversified if foreign vehicles and vehicle parts become more expensive to import.

1 Month LIBOR Rate			
Date	Ask Price	Net Change	% Change
1/31/20	1.66188	-0.10062	-5.71%
12/31/19	1.7625	0.06537	3.85%
11/29/19	1.69713	-0.08775	-4.92%
10/31/19	1.78488	-0.23075	-11.45%
9/30/19	2.01563	-0.07337	-3.51%
8/30/19	2.089	-0.13525	-6.08%
7/31/19	2.22425	-0.17375	-7.25%
6/28/19	2.398	-0.0325	-1.34%
5/31/19	2.4305	-0.05	-2.02%
4/30/19	2.4805	-0.014	-0.56%
3/29/19	2.4945	0.00412	0.17%
2/28/19	2.49038	-0.02337	-0.93%

Source: Bloomberg

Figure 9.3

Taxes

Carvana is currently operating at a net loss. We project to be EBITDA positive in 2021 and free cash flow positive in 2023. Once Carvana accomplishes these milestones, they will begin paying taxes on their earnings at the corporate rate of 21%. This increase in expenses will have an effect on the cost of operations for the respective years.

Market Risk

Interest rate risk

According to the most recent 10-Q, Carvana had an outstanding balance of $243 million on September 30, 2019 in a short-term revolving facility referred to as the Floor Plan Facility. The Floor Plan Facility is used to finance used vehicle inventory. The Floor Plan Facility requires monthly interest payments based on the one-month LIBOR rate plus a spread dependent on the outstanding balance of the previous month. The interest rate on the Floor Plan Facility on December 31, 2018 was 5.90% on an outstanding balance of $197 million. As of September 30, 2019, the interest rate on the facility was approximately 5.42% on an outstanding balance of $243 million. This variability on the spread affects the interest rates on high amounts of this short-term debt obligation (Figure 9.3).

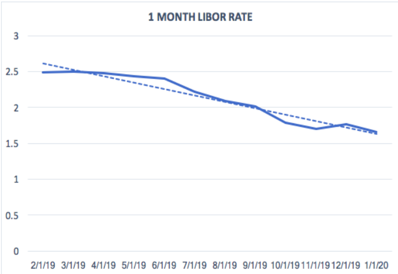


Figure 10.1

Interest rates are currently at historically low levels after three cuts by the Federal Reserve in 2019. According to the Wall Street Journal, interest rates are expected to remain low, due to a consensus from all ten panel members voting to keep the federal funds rate between a range of 1.5% and 1.75% (Appendix G-2).
Due to the federal reserve policy, modest economic growth, stow inflation, and negative interest rates in some parts of the world, Carvana is exposed to minimal interest rate risk on long term debt.

Economic Risk

Subprime auto loans

The automotive loan market issues subprime loans to consumers. With the quantity of these instruments increasing, an excess of these loans and an economic downturn could potentially lead to consumers being unable to pay their loan. Carvana's in house financing makes them susceptible to this risk.

Operational Risk

Seasonality

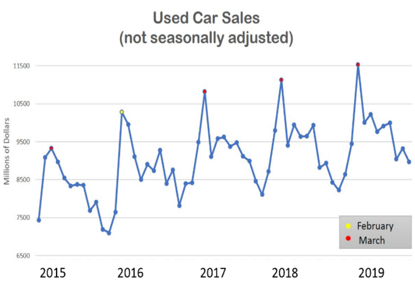


Figure 10.2

According to the U.S. Bureau of Labor Statistics, a trend in data revealed that the average household is holding their vehicles longer than they used to. Car purchases are the second largest purchase most consumers make. Quarterly results of operations such as revenues, gross profit, and cash flows are based on consumers' car buying patterns. The historical financial statements show the first quarter of each calendar year consistently has the highest growth rates. This is due to seasonal buying patterns. For example, consumers utilizing their income tax refunds for down payments on vehicle purchases (Figure 10.2).

Low credit rating

Carvana's credit rating in Bloomberg is listed as Caa2 for Moody's, CCC+ for Standard & Poor's, a CCC Composite. These ratings classify Carvana as a high yield, or junk bond. According to Moody's, obligations with these ratings are judged to be speculative of poor standing and are subject to very high credit risk. The expected recovery rate of principal and interest is 80% to 90% (Appendix G-4).

CVNA Credit Rating	
Moody's	Caa2
S&P's	CCC+
Composite	CCC

Source: Bloomberg

Figure 10.3

Profitability

Carvana has a current inability to generate positive cash flows. We project Carvana to reach profitability in 2023, when they become free cash flow positive. However, factors influence this projection. For example, profitability is reliant on market expansion, market penetration, and improving gross profit per unit.

Financing Dependency

Carvana's high financing dependency on institutions could be affected by economic downturns. The majority of Carvana's debt is financed through a relationship with Ally Financial. Carvana is reliant on this relationship for its line of revolving credit, and finance receivables sales agreements.

Table of Contents

Appendix A: Business Description

Recent News

Upcoming Event - Wednesday, 5:30 PM ET February 26, 2020 Q419 & FY end financial results and conference call.

1/31/2020 Launched two new markets in California; Chico and Yuba City. Carvana is now operating in 158 markets offering as soon as next day delivery services.

1/29/2020 Launched 24th vehicle vending machine in Miami, Florida.

Appendix A-1: Origins of the company and IPO

The Inception of Carvana

Ernie Garcia III worked at his father's company, DriveTime, for five years holding various roles before co-founding Carvana in 2012. Carvana began as a subsidiary of DriveTime in its development where they bought the majority of their inventory. They received technological assistance and other financial support including loans to help with business operations. To this day, Ernie Garcia II remains the largest shareholder of Carvana despite the fact that Carvana no longer purchases used vehicles from DriveTime.

Appendix A-2: Mission statement and key features

Appendix A-3: Competitive Advantage

Appendix A-4: Vertical integration process

CarvanaCare extension of the original warranty, covering costs in the event of needing repairs.

GAP Coverage coverture of what is still owed on the loan in the event of a total loss of the vehicle.

Appendix A-5: Sources of revenue

Appendix A-6: Strategy

Appendix B: Management and Corporate Governance

Appendix B-1: Organizational structure

Management				
Name	Title	Age	Tenure	Start Date
Ernest Garcia III	Chairman/President/CEO/Co-Founder	46	8	2012
Mark Jenkins	Chief Financial Officer	40	5.5	7/1/14
Bejamn Huston "Ben"	Chief Operating Officer/Co-Founder	36	8	2012
Daniel Gill	Chief Product Officer	36	4.8	3/1/15
Ryan Keeton	Chief Brand Officer/Co-Founder	36	8	2012
Stephen R Palmer	Chief Accounting Officer	42	0.5	7/29/19
Paul Breaux	VP/Secretary/General Counsel	42	4.4	8/1/15
Michael Levin "Mike"	VP: Investor Relations	35	2.2	11/28/17

Source: Bloomberg

Board Of Directors					
Member	Position on Board	Age	Tenure	Start Date	Current Occupation
Ernest Garcia III	Chairman	36	8	2012	CEO and Cofounder of Carvana.
Michael E Maroone	Lead Independent Director	67	2.7	5/3/17	CEO of Maroone USA LLC.
James Danforth Quayle "Dan"	Independent Director	72	2.7	5/3/17	Chairman at Cerberus Global Investments LLC.
Ira J Platt	Independent Director	55	2.7	5/3/17	President of Georgiana Venturs LLC.
Greg Sullivan	Independent Director	60	2.7	5/3/17	Founder and CEO of AFAR Media LLC.
Neha Parikh	Independent Director	-	0.8	4/22/19	President at Hotwire (Expedia Group).

Sources: Bloomberg and the Wall Street Journal

Committees		
Name	Title	Age
Audit		
Michael E Maroone	Member	67
Ira J Platt	Member	55
Greg Sullivan	Member	60
Compensation & Nominating		
Ira J Platt	Member	55
James Danforth Quayle "Dan"	Member	72
Greg Sullivan	Member	60

Source: Bloomberg

Garcia's most recent experience comes from DriveTime where he held various positions from 2007-2013. His roles at DriveTime include Financial Strategist, Managing Director of Corporate Finance, VP, Treasurer Director of Quantitative Analytics. While serving as Director of Quantitative Analytics, Garcia was in charge of the development of consumer credit scoring models which assisted with vehicles sales structures and optimization. Garcia has a B.S in Management Science and Engineering from Stanford University.

Jenkins was a professor in the Finance department at UPENN in the Wharton School of Business prior to working at Carvana. He taught courses on corporate restructuring, corporate credit, and leveraged finance at the undergraduate, MBA, and executive level. Jenkins has a PhD in economics from Stanford University and a B.S.E. from Duke University in Mathematics and Civil Engineering.

Huston co-founded a company known as Looterang and sat on the Board of Directors as the CEO. Huston also served as an associate at Latham and Watkins where he focused on regulatory affairs. Huston has a J.D. from Harvard Law School and a B.A. in American Studies from Stanford University.

Appendix B-2: Social responsibility

CSRHub is an organization that rates over 30,000 of the world's largest public and private companies on their Corporate Social Responsibility. Various factors including community involvement, charitable contributions, and employee volunteer involvement are taken into consideration when calculating a company's CSR score. These scores are taken from an aggregate of data retrieved from a company's CSR report and independent research.

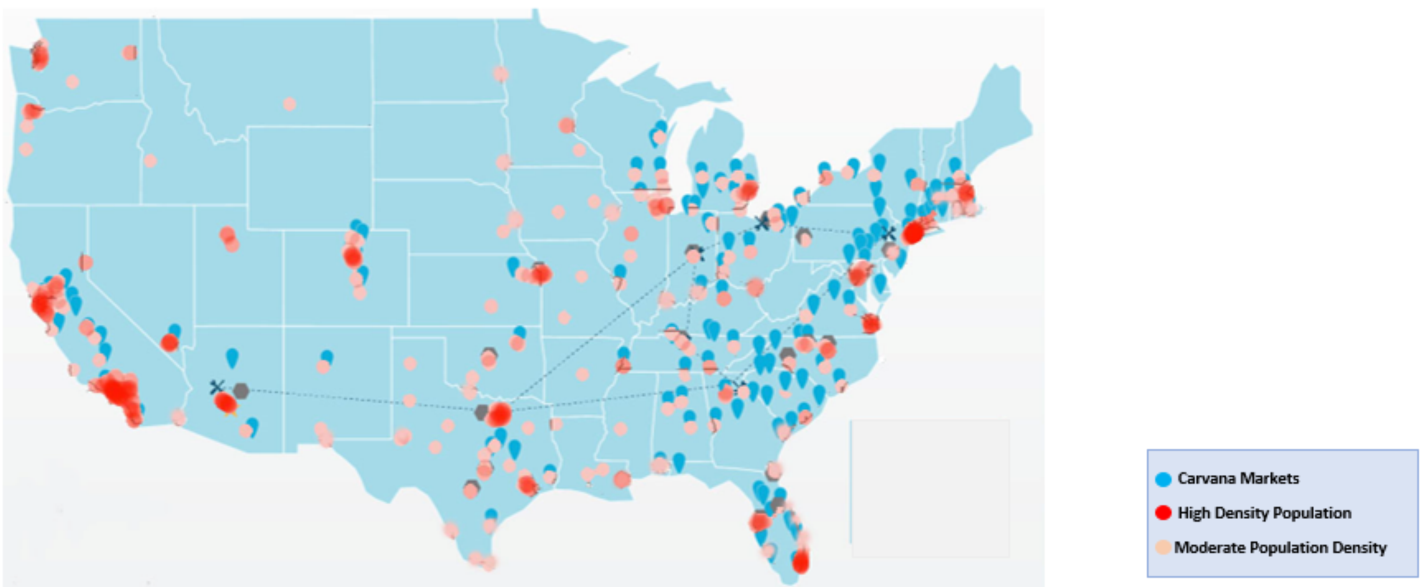
Appendix C: Industry Overview and Competitive Positioning

Appendix C-1: U.S Demographics

Markets opened in the New York area in 2019

Year	Location	State	Operation
2019	Westchester County	NY	New Market
2019	Rochester	NY	New Market
2019	Syracuse	NY	New Market
2019	Binghamton	NY	New Market
2019	Albany	NY	New Market
2018	New York	NY	New Market

US Population Density; Carvana Markets



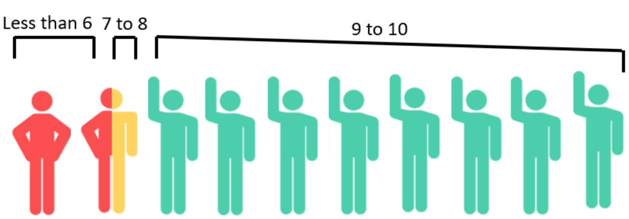
Appendix C-2: Global Economic Outlook

Appendix C-3: U.S Economic Outlook

Appendix C-4: Auto Car Industry

Appendix C-5: Competitive Positioning

<u>Net Promoter Score (NPS)</u>



This graph indicates is a visual representation of Carvana's Net Promoter Score or NPS. The scores range from -100 to +100; the higher the score the more desirable the company is to consumers. This information can be used to predict the potential growth of a company. NPS breaks down customers into three groups based on their satisfaction with their interaction with the company. The first group is labeled Promoters. These are people who rated their satisfaction anywhere from 9 to 10. These people are most likely to support the business. Next are the passives, who are rank the company between 7 and 8 in satisfaction.

These people are not likely to aid in company growth or deter it. Finally, the remainder who rated the company from 0 to 6 are Detractors. These customers are unhappy with their interaction and can actively hurt a company's reputation.

A score for a company is reached by subtracting the number of detractors from the promoters. If a company has 20% Detractors, 40% Passives, and 40% Promoters, the overall NPS would be 20%. Carvana scores extremely high. As of June 11, 2018, Carvana's NPS is 82%. This means that there are a substantial amount of promoters of Carvana willing and able to support the Carvana brand.

Porter's Five Forces

0) No threat to Carvana Co.
1) Insignificant threat to Carvana Co.
2) Low threat to Carvana Co.
3) Moderate threat to Carvana Co.
4) High threat to Carvana Co.

Threat of New Entry ***(Low)***

There is a low threat of a competitor entering the market with a similar business model to Carvana Co. The extensive amount of capital required to create a single car retailer that is expansive enough to reach the same size market as Carvana Co. is unrealistically extensive for most companies. In addition to this, the used car market is an extremely fragmented market. This means that any one new entry poses little threat to Carvana Co. on virtue of it being a difficult market in which to gain traction.

Customer Bargaining Power ***(Moderate)***

Customers have a lot of bargaining power considering relatively low switching costs. Around one third of Carvana Co.'s profits are developed in their captive financial arm. This means that a larger part of their profit could be affected by a customer's ability to finance their purchase from other lenders.

Threat of Substitutes ***(High)***

The fragmentation of the used car market means that there are a substantial number of substitutes from which customers can choose. In addition to actual companies, there are a myriad of private car sales making it a buyers' market. This presents a huge threat to Carvana Co. because they must compete with multiple agencies in price, location, consumer confidence, and convenience.

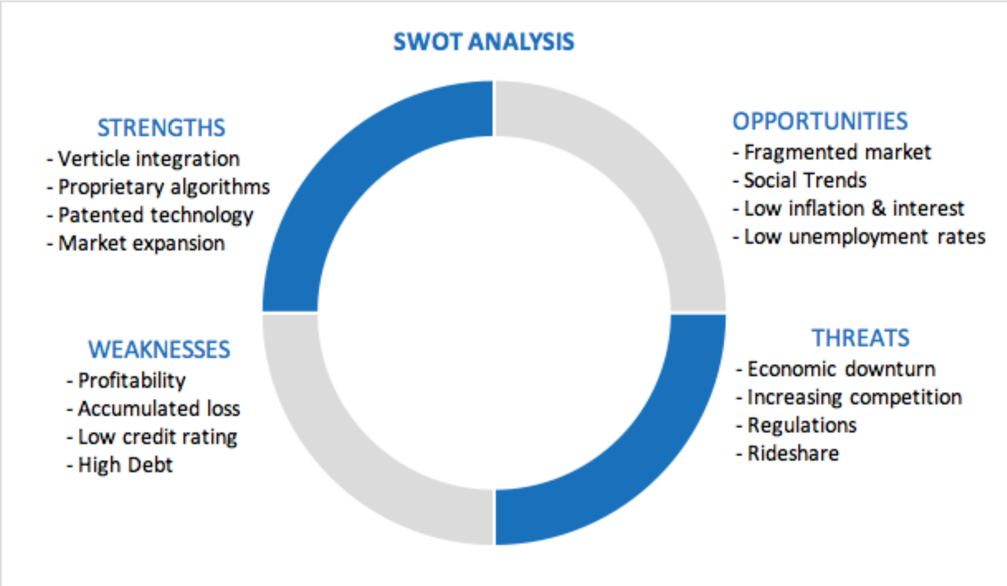
Competition ***(Moderate)***

There are many competitors in the used car industry all selling virtually identical inventory. This means that competition can be fierce and advertising campaigns can have huge impacts. Carvana Co. does have an advantage of having multiple times the inventory of almost all of its competitors. This means that in any given market Carvana Co. has a wider variety of vehicles than any local dealership. Giving them a large competitive advantage.

Supplier Bargaining Power ***(Low)***

The size of Carvana Co. means that it can rely on an entire nation of used car sales instead of a local inventory. This means that Carvana Co. is able to move from supplier to supplier to find the cheapest inventory. This means that no single supplier has a large impact on Carvana Co.'s supply.

SWOT Analysis



Appendix D: Investment Summary

Appendix D-1: Highly Fragmented Industry Ripe for Disruption

Appendix D-2: Differentiated, Innovative, Full-Service Business Model

Appendix D-3: Proven Growth Strategy, Market Expansion Blueprint

Appendix D-4: Strong Trends in Unit Economic in Mature Markets

Appendix D-5: Growth Premium Likely Reflected in Current Valuation

Appendix E: Financial Analysis

Appendix E-1: Cash Flow and Leverage

Appendix E-2: Favorable Demographic Trends

Appendix E-3: How Carvana Measures Up to Biggest Competitor

CarMax	2015	2016	2017	2018
Liquidity				
Current Ratio	2.5983	2.4590	2.5987	2.6076
Cash Ratio	0.0277	0.0372	0.0347	0.0379
Financial Leverage				
Debt-to-Equity	3.1809	3.9854	4.2369	4.2720
Financial Leverage	1.0259	1.0373	1.0594	1.0713
Profitability				
Gross Profit Margin	13.23%	13.33%	13.75%	13.60%
Operating Profit Margin	602.29%	988.20%	701.11%	67.72%

Appendix E-4: Raising Capital in Pursuit of Profitability

Appendix F: Valuation

Appendix F-1: Discounted Cash Flow Valuation

Appendix F-2: Assumptions

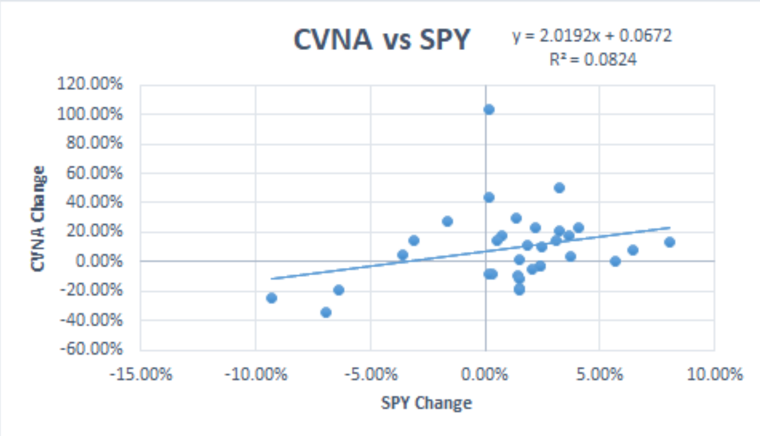
Carvana Co.
Income Statement & Cash Flow Assumptions
($ in millions, fiscal year ending December 31)

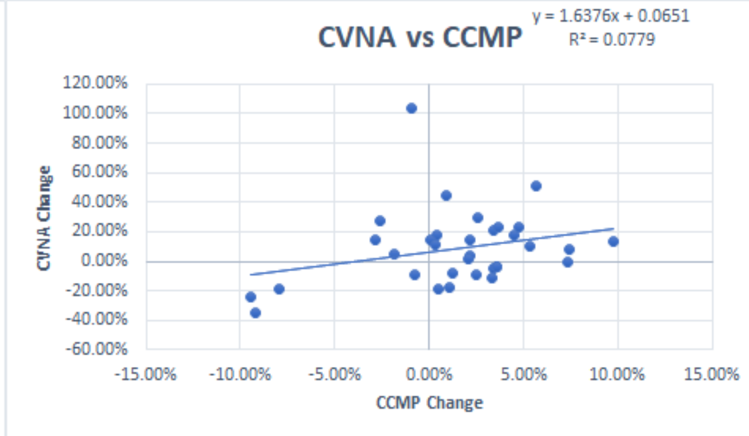
		Projection Period									
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Income Statement Assumptions											
Sales (% Growth)		101.5%	53.5%	37.0%	30.2%	27.2%	23.6%	18.9%	15.2%	10.4%	5.0%
Base	1	101.5%	53.5%	37.0%	30.2%	27.2%	23.6%	18.9%	15.2%	10.4%	5.0%
Bull	2	103.0%	67.4%	42.1%	34.6%	29.4%	25.1%	20.4%	16.7%	11.9%	5.0%
Bear	3	100.0%	52.0%	35.5%	28.7%	25.7%	22.1%	17.4%	13.7%	8.9%	5.0%
Cost of Goods Sold (% Sales)		87.2%	86.0%	85.2%	84.3%	83.6%	83.0%	83.0%	83.0%	83.0%	83.0%
Base	1	87.2%	86.0%	85.2%	84.3%	83.6%	83.0%	83.0%	83.0%	83.0%	83.0%
Bull	2	86.3%	85.1%	84.3%	83.4%	82.7%	82.1%	82.1%	82.1%	82.1%	82.1%
Bear	3	88.1%	86.9%	86.1%	85.2%	84.5%	83.9%	83.9%	83.9%	83.9%	83.9%
SG&A (% Sales)		18.1%	15.3%	13.4%	12.7%	10.7%	9.0%	7.4%	6.3%	5.2%	4.6%
Base	1	18.1%	15.3%	13.4%	12.7%	10.7%	9.0%	7.4%	6.3%	5.2%	4.6%
Bull	2	17.1%	14.3%	12.4%	11.7%	9.7%	8.0%	6.4%	5.3%	4.2%	3.6%
Bear	3	19.1%	16.3%	14.4%	13.7%	11.7%	10.0%	8.4%	7.3%	6.2%	5.6%
Depreciation & Amortization (% Sales)		1.0%	1.0%	0.9%	0.9%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
Base	1	1.0%	1.0%	0.9%	0.9%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
Bull	2	0.9%	0.9%	0.8%	0.8%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%
Bear	3	1.1%	1.1%	1.0%	1.0%	0.9%	0.9%	0.9%	0.8%	0.8%	0.8%
Cash Flow Statement Assumptions											
Capital Expenditures (% Sales)		4.5%	3.3%	2.4%	1.6%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Base	1	4.5%	3.3%	2.4%	1.6%	1.2%	1.2%	1.2%	1.2%	1.2%	1.2%
Bull	2	4.3%	3.1%	2.2%	1.4%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Bear	3	4.7%	3.5%	2.6%	1.8%	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%

Carvana Co.
Balance Sheet Assumptions
($ in millions, fiscal year ending December 31)

		Projection Period									
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
		2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Current Assets											
Days Sales Outstanding (DSO)		7.0	6.7	6.3	6.0	5.7	5.3	5.0	4.7	4.3	4.0
Base	1	7.0	6.7	6.3	6.0	5.7	5.3	5.0	4.7	4.3	4.0
Bull	2	6.5	6.2	5.8	5.5	5.2	4.8	4.5	4.2	3.8	3.5
Bear	3	7.5	7.2	6.8	6.5	6.2	5.8	5.5	5.2	4.8	4.5
Days Inventory Held (DIH)		90.0	87.8	85.6	83.3	81.1	78.9	76.7	74.4	72.2	70.0
Base	1	90.0	87.8	85.6	83.3	81.1	78.9	76.7	74.4	72.2	70.0
Bull	2	105.0	102.8	100.6	98.3	96.1	93.9	91.7	89.4	87.2	85.0
Bear	3	75.0	72.8	70.6	68.3	66.1	63.9	61.7	59.4	57.2	55.0
Prepaid and Other Current Assets (% Sales)		9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Base	1	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Bull	2	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%
Bear	3	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Current Liabilities											
Days Payable Outstanding		25.4	24.5	23.5	22.6	21.7	20.7	19.8	18.9	17.9	17.0
Base	1	25.4	24.5	23.5	22.6	21.7	20.7	19.8	18.9	17.9	17.0
Bull	2	22.9	22.0	21.0	20.1	19.2	18.2	17.3	16.4	15.4	14.5
Bear	3	27.9	27.0	26.0	25.1	24.2	23.2	22.3	21.4	20.4	19.5
Other Current Liabilities (% Sales)		11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	9.8%	9.5%	9.3%	9.0%
Base	1	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%	9.8%	9.5%	9.3%	9.0%
Bull	2	10.3%	10.0%	9.8%	9.5%	9.3%	9.0%	8.8%	8.5%	8.3%	8.0%
Bear	3	12.3%	12.0%	11.8%	11.5%	11.3%	11.0%	10.8%	10.5%	10.3%	10.0%

Appendix F-3: Beta Calculations





Appendix F-4: Weighted Average Cost of Capital
Appendix F-5: Terminal Growth Rate
Appendix F-6: Revenue Growth

Individual Revenue Segments

Used Vehicle Sales

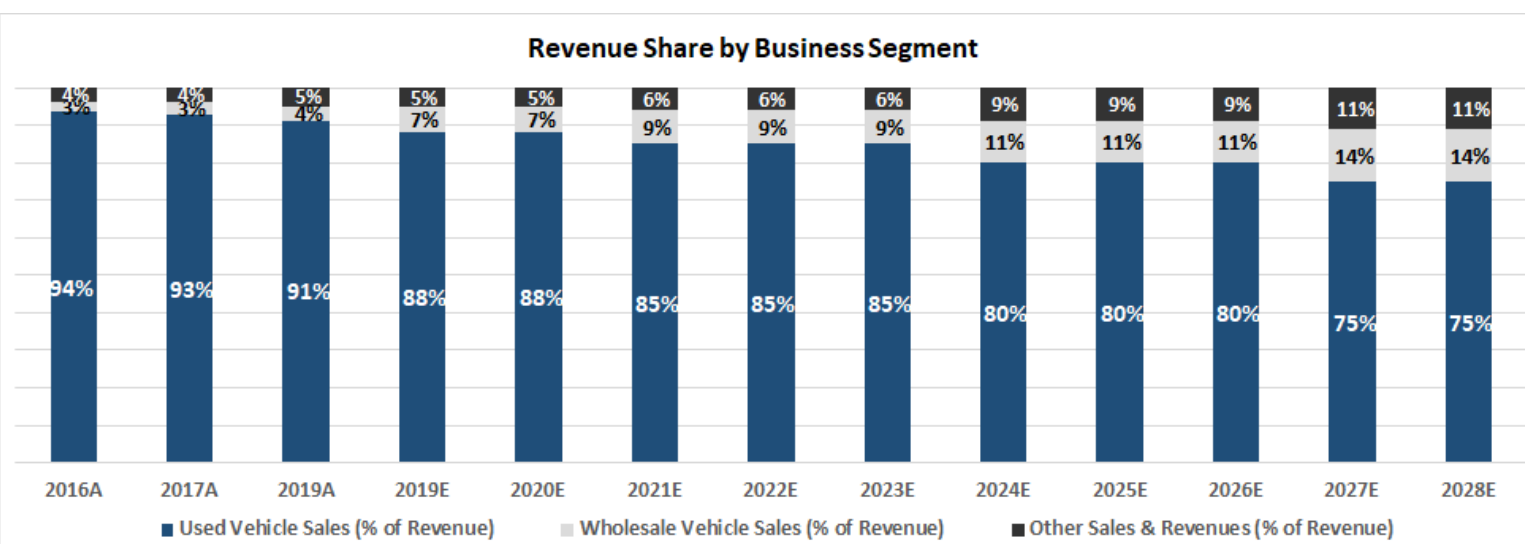
We expect used vehicle sales to decline as a percentage of total revenue as the other revenue segments mature and capture a larger share of total revenue.

Wholesale Vehicle Sales

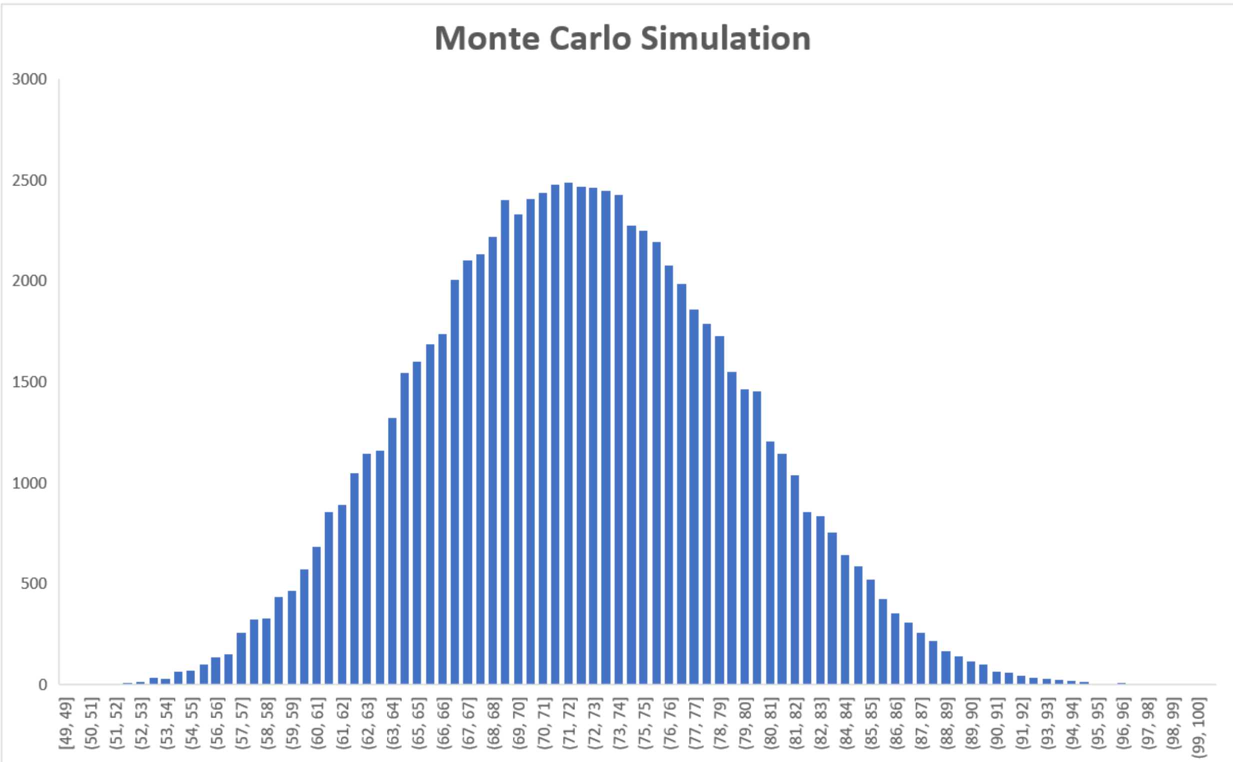
Most wholesale vehicle sales come from cars that are sourced from customers through trade in or sale to Carvana. Because Carvana has relatively high standards for its retail units, not all cars bought from customers fit that quality standard, leading to them being sold at auction. Carvana saw ~250% growth in cars sourced from customers in Q3, bringing the ratio of retail cars acquired from customers to 31% from 17% a year ago. As this offering continues to mature, Carvana will source more cars from consumers which will lead to wholesale vehicle sales increasing as a percentage of total revenue.

Other Sales & Revenue

We expect other sales and revenue to also increase as a percentage of revenue as Carvana increases its market penetration and strengthens its overall brand. The trend of increased efficiencies and more customers utilizing Carvana's captive finance arm is expected to continue, increasing the revenue share of this line item.



Appendix F-7: EV/Sales Multiple Valuation
Appendix F-8: Cases (scenarios)

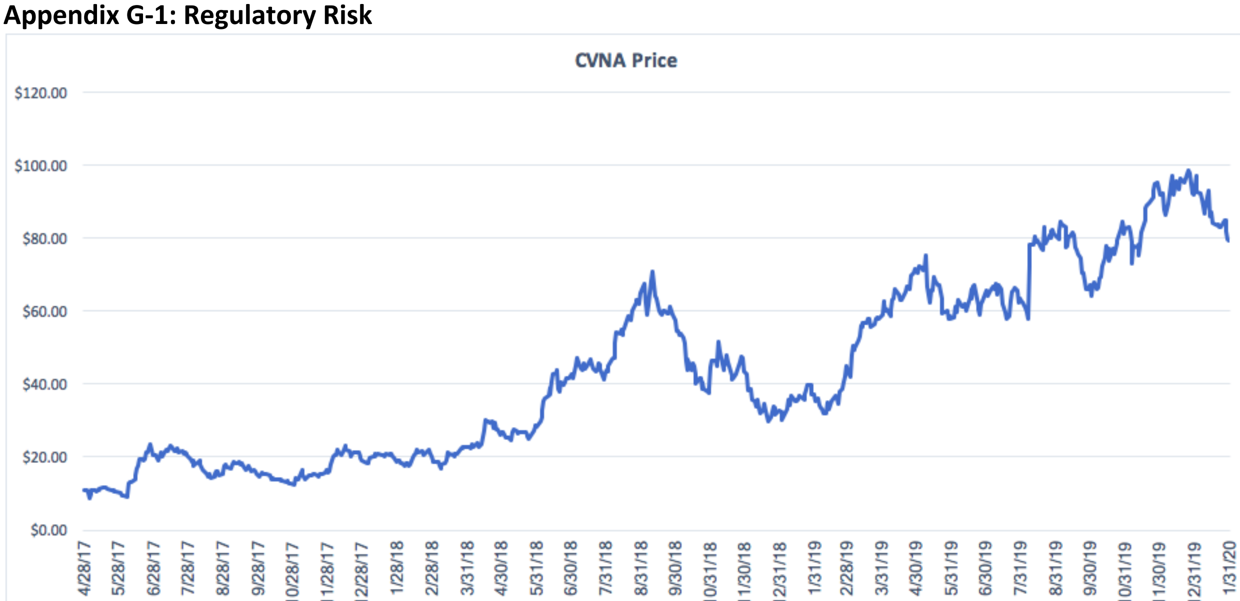


Percentile

25%	67.1069
50%	71.8731
75%	76.7573

A Monte Carlo Simulation was generated to understand the target price distribution given the 3 possible cases (base, bull, bear). 80,000 simulations were created by randomizing a change in the following assumptions: Revenue Growth, COGS (% Sales), SG&A (% Sales), Depreciation (% Sales), and Capex (% Sales). The results of the simulation showed a 75% probability that the target price will be within a range of $67.12- $76.75. The median for the calculation showed a target price of $71.87.

Appendix G: Investment Risks
Appendix G-1: Regulatory Risk



Appendix G-2: Market Risk

1 Month LIBOR Rate			
Date	Ask Price	Net Change	% Change
1/31/20	1.66188	-0.10062	-5.71%
12/31/19	1.7625	0.06537	3.85%
11/29/19	1.69713	-0.08775	-4.92%
10/31/19	1.78488	-0.23075	-11.45%
9/30/19	2.01563	-0.07337	-3.51%
8/30/19	2.089	-0.13525	-6.08%
7/31/19	2.22425	-0.17375	-7.25%
6/28/19	2.398	-0.0325	-1.34%
5/31/19	2.4305	-0.05	-2.02%
4/30/19	2.4805	-0.014	-0.56%
3/29/19	2.4945	0.00412	0.17%
2/28/19	2.49038	-0.02337	-0.93%

Source: Bloomberg

LIBOR is a benchmark rate that represents the interest rate at which banks offer to lend funds to one another in the international interbank market for short-term loans. LIBOR is an average value of the interest-rate which is calculated from estimates submitted by the leading global banks on a daily basis. It stands for London Interbank Offered Rate and serves as the first step to calculating interest rates on various loans throughout the world. Source: Bloomberg

2020 Federal Open Market Committee	
Name	Position
Jerome H. Powell	Board of Governors, Chairman
John C. Williams	New York, Vice Chairman
Michelle W. Bowman	Board of Governors
Lael Brainard	Board of Governors
Richard H. Clarida	Board of Governors
Patrick Harker	Philadelphia
Robert S. Kaplan	Dallas
Neel Kashkari	Minneapolis
Loretta J. Mester	Cleveland
Randal K. Quarles	Board of Governors

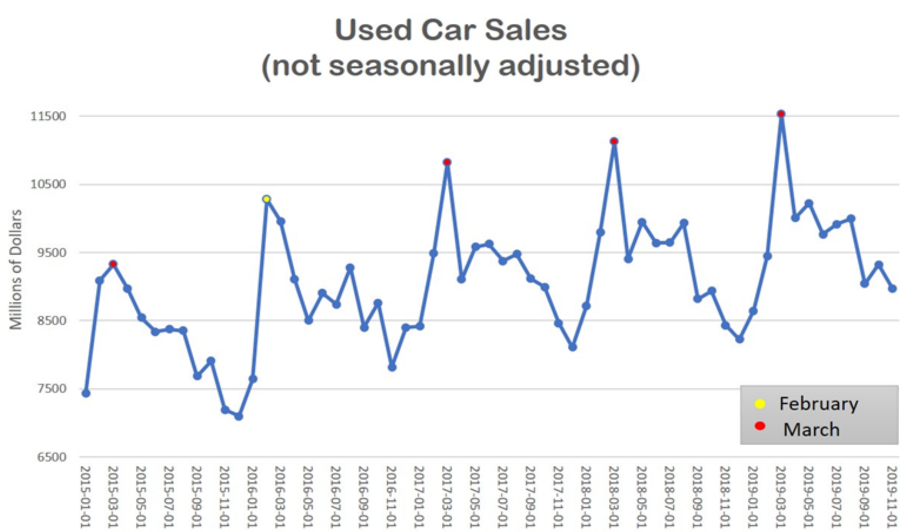
Source: Federal Reserve

FOMC Alternate Members	
Name	Position
Thomas I. Barkin	Richmond
Raphael W. Bostic	Atlanta
Mary C. Daly	San Francisco
Charles L. Evans	Chicago
Michael Strine	First Vice President, New York

Source: Federal Reserve

Appendix G-3: Economic Risk
Subprime loans are made to consumers who do not qualify for conventional loans due to a poor credit history.

Appendix G-4: Operational Risk



Credit Rating Descriptions

Moody's	S&P	Description of Rating
Investment Grade Bonds		
Aaa	AAA	Highest quality bonds with lowest degree of investment risk.
Aa1, Aa2, Aa3	AA+, AA, AA-	High qaulity bonds with slight long-term investment risk.
A1, A2, A3	A+, A, A-	Bonds with positive investment qualities.
Baa1, Baa2, Baa3	BBB+, BBB, BBB-	Medium grade bonds.
Non Investment Grade Bonds		
Ba1, Ba2, Ba3	BB+, BB, BB-	Moderate future security.
B1, B2, B3	B+, B, B-	Not considered attractive bonds.
Caaa1, Caa2, Caa3	CCC+, CCC, CCC-	Bonds of poor quality. Issuers at risk of default.
Ca	CC	Often in default.
C	C	Lowest rated bonds.
-	D	In default.

Source: Moody's

New Market and Vending Machine Launches

State	Market Launch	Vending Machine Launch
AL	**4**	**1**
2014	1	
2018	2	1
2019	1	
AZ	**4**	**1**
2017	2	
2018		1
2019	1	
2020	1	
CA	**19**	**2**
2017	2	

2018	5	
2019	7	2
2020	5	
CO	**5**	
2018	1	
2019	4	
CT	**4**	
2018	3	
2019	1	
DC		**1**
2018		1
FL	**15**	**4**
2016	4	
2017	1	1
2018		2
2019	10	
2020		1
GA	**6**	
2013	1	
2017	2	
2019	3	
IL	**2**	**1**
2017	1	
2019	1	1
IN	**4**	**1**
2016	1	
2018	1	1
2019	2	
KS	**2**	
2018	1	
2019	1	
KY	**2**	
2017	1	
2018	1	
MA	**4**	
2018	3	
2019	1	
MD	**2**	**1**
2016	1	
2017	1	
2018		1
MI	**7**	
2017	2	
2018	3	
2019	2	
MN	**4**	

2020	4	
MO		**1**
2019		1
NA	**1**	
2018	1	
NC	**8**	**3**
2015	1	
2016	1	
2017		1
2018	2	1
2019	4	1
NH	**1**	
2018	1	
NJ	**3**	
2017	1	
2019	2	
NM	**2**	
2017	1	
2020	1	
NV	**1**	
2017	1	
NY	**7**	
2018	1	
2019	6	
OH	**8**	**1**
2015	3	
2018	4	1
2019	1	
OK	**2**	**1**
2017	1	
2018	1	
2019		1
PA	**8**	**2**
2017	1	
2018	5	1
2019	2	1
PN	**1**	
2016	1	
RI	**1**	
2018	1	
SC	**7**	
2017	2	
2018	2	
2019	3	
TN	**4**	**1**
2016	2	

2017	2	
2019		1
TX	**9**	**3**
2014	1	
2015	1	
2016	2	
2017	1	3
2018	1	
2019	3	
VA	**6**	
2016	1	
2017	1	
2019	4	
WI	**5**	
2018	2	
2019	2	
2020	1	
(blank)		
(blank)		
Grand Total	**158**	**24**

Works Cited

About the author(s) Ben Ellencweig is a partner in McKinsey's Stamford office. "Used Cars, New Platforms: Accelerating Sales in a Digitally Disrupted Market." *McKinsey & Company*, www.mckinsey.com/industries/automotive-and-assembly/our-insights/used-cars-new-platforms-accelerating-sales-in-a-digitally-disrupted-market.

"Bureau of Labor Statistics Data." *U.S. Bureau of Labor Statistics*, U.S. Bureau of Labor Statistics, data.bls.gov/timeseries/LNS14000000.

Colias, Mike, and Nora Naughton. "Car Sales Boom Hit the Brakes in 2019." *The Wall Street Journal*, Dow Jones & Company, 3 Jan. 2020, www.wsj.com/articles/car-sales-boom-hit-the-brakes-in-2019-11578071698.

"Consumer Price Index: 2019 in Review." *U.S. Bureau of Labor Statistics*, U.S. Bureau of Labor Statistics, 16 Jan. 2020, www.bls.gov/opub/ted/2020/consumer-price-index-2019-in-review.htm.

Ellencweig Ben Ellencweig is a partner in McKinsey's Stamford office, Ben, et al. "Used Cars, New Platforms: Accelerating Sales in a Digitally Disrupted Market." *McKinsey & Company*, www.mckinsey.com/industries/automotive-and-assembly/our-insights/used-cars-new-platforms-accelerating-sales-in-a-digitally-disrupted-market.

"Federal Open Market Committee." *Board of Governors of the Federal Reserve System*, 29 Jan. 2020, www.federalreserve.gov/monetarypolicy/fomc.htm.

"Form 10-K" *Carvana, Co.,* 2019, https://otp.tools.investis.com/clients/us/carvana/SEC/sec-show.aspx?Type=html&FilingId=13258789&CIK=0001690820&Index=10000

"Form 10-Q" *Carvana, Co.,* 2019, https://otp.tools.investis.com/clients/us/carvana/SEC/sec-show.aspx?FilingId=13723864&Cik=0001690820&Type=PDF&hasPdf=1

"Gross Domestic Product, Third Quarter 2019 (Third Estimate); Corporate Profits, Third Quarter 2019 (Revised Estimate): U.S. Bureau of Economic Analysis (BEA)." *Gross Domestic Product, Third Quarter 2019 (Third Estimate); Corporate Profits, Third Quarter 2019 (Revised Estimate) | U.S. Bureau of Economic Analysis (BEA)*, www.bea.gov/news/2019/gross-domestic-product-third-quarter-2019-third-estimate-corporate-profits-third-quarter.

Hill, Charles W. L., et al. *Strategic Management Theory & Cases: An Integrated Approach*. Cengage Learning, Inc, 2019.

"Letter to Shareholders, Q3 2019" Carvana, Co., 2019, https://investors.carvana.com/~/media/Files/C/Carvana-IR/documents/events/q3-2019-cvna-shareholder-letter.pdf

“NADA Issues Analysis of Second Quarter 2019 Auto Sales.” *NADA*, www.nada.org/patrick-manzi-second-quarter-2019-auto-sales-economic-analysis/.

“Personal Income and Outlays, November 2019: U.S. Bureau of Economic Analysis (BEA).” *Personal Income and Outlays, November 2019 | U.S. Bureau of Economic Analysis (BEA)*, www.bea.gov/news/2019/personal-income-and-outlays-november-2019.

Ross, Stephen A., et al. *Fundamentals of Corporate Finance*. McGraw-Hill Education, 2019.

Timiraos, Nick. “Federal Reserve Holds Benchmark Rate Steady.” *The Wall Street Journal*, Dow Jones & Company, 30 Jan. 2020, www.wsj.com/articles/fed-likely-to-hold-interest-rates-steady-11580293802.

Tseng, Nin-Hai. “Why Car Companies Can't Win Young Adults.” *Fortune*, Fortune, 30 May 2014, fortune.com/2013/08/16/why-car-companies-cant-win-young-adults/.

“The US-China Trade War: A Timeline.” *China Briefing News*, 17 Jan. 2020, www.china-briefing.com/news/the-us-china-trade-war-a-timeline/.

“What Is Net Promoter?” *Net Promoter Network*, www.netpromoter.com/know/.

“World Economic Outlook Update, January 2020: Tentative Stabilization, Sluggish Recovery?” *IMF*, 1 Jan. 2020, www.imf.org/en/Publications/WEO/Issues/2020/01/20/weo-update-january2020.