VIEW FROM THE BUYSIDE

Carvana Stock Can Hit $200: Portfolio Manager

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Target price: $200.00

Recent price: $83.53

Timeframe: 2-5 years

Investment Thesis

- The U.S. used car industry is very large, highly fragmented, and due for disruption.
- Carvana (CVNA) created a vertically integrated, online platform for buying and selling cars that provides a more seamless customer experience, vast vehicle selection, and lower prices.
- The CEO is a company founder, and there is significant inside ownership.
- As Carvana builds its scale advantages, the self-reinforcing flywheel will continue to build, helping grow its inventory selection, logistics and transportation network, and data analytics.
- Current trends show Carvana quickly gaining significant market share. Once volumes and operating margins reach scale, and assuming reasonable market share, current valuation looks very attractive based on cash-flow potential.

Carvana's shares have been heavily shorted, and the company has been misunderstood by investors who focus on its overall net losses since inception. While Carvana does have operating losses, its e-commerce business model requires upfront capital investments before unit volumes reach scale and profitability. Short sellers overlook the attractive unit economics and strong growth trends/customer adoption. As Carvana's coverage is able to reach more consumers across the U.S. and offer greater inventory selection at more attractive prices, it is expected to continue to win market share from traditional bricks-and-mortar dealerships. It increasingly appears that Carvana will be the primary winner in the online car dealer market. At current market prices, shares look very attractive relative to the large market opportunity as Carvana continues to grow volumes and reach scale operating margins.

Company Background

Carvana is disrupting the used car industry through its online platform to buy and sell cars. By offering a better overall customer experience, wider vehicle selection, and lower prices, Carvana has rapidly grown volumes, improved gross profit per unit, and scaled fixed costs by establishing itself as the dominant e-commerce used automobile dealer. It is reasonable to expect the company to gain significant market share in the highly fragmented landscape and earn attractive profits. Founded in 2013 in Atlanta, Georgia, Carvana has grown to 146 markets, reaching 66% of the U.S. population, and is expected to sell ~175,000 retail units in 2019. It has become known for its car vending machines and last-mile delivery of a purchased car to customers' homes. Since launching just seven years ago, Carvana has disrupted the used car industry and has quickly grown to generate an estimated $4 billion in 2019 sales.

Used Car Industry

The U.S. automotive industry is very large, generating ~$1.2 trillion in sales during 2018, and makes up roughly 20% of the U.S. retail economy. According to Edmunds' Used Vehicle Market Report, there were $764 billion in 2017 used car sales. The market is highly fragmented with over 43,000 used car dealerships and nearly 18,000 franchise dealerships. The 100 largest dealerships make up only ~7% of the total market with CarMax being the largest used car dealer and having just under 2% market share. Carvana is expected to sell 175,000 used cars in 2019, making it the fourth-largest used car dealer.

Of the nearly 41 million used vehicles sold during 2017, ~70% were sold through car dealerships while ~30% were sold in private-party transactions.

The traditional bricks-and-mortar used car dealership model has been due for disruption. The majority of consumers have negative views toward used car dealerships. Buying a car is a significant and infrequent purchase for the average customer, combined with the highly fragmented industry, makes it likely that customers are not very familiar with their local used car dealership. There may be uncertainty surrounding the quality of the used car, the fair price (it's not uncommon for haggling over different parts of the transaction) and the whole process may take several hours of time spent at the dealership completing the transaction.

According to Mintel Group's June 2019 consumer survey of 1,100 prospective car buyers, over 40% do not enjoy going to dealerships. Fifty percent of consumers distrust car salespeople. Forty-seven percent of consumers dislike negotiating/haggling when buying a vehicle. Buyers are least satisfied with how long the purchase process takes at a used car dealership, and interactions with the financing department is the second-biggest pain point. According to the survey, buyers spend an average of nearly 40 minutes idle at the dealership, largely during the financing/paperwork process.

Additionally, most dealerships only hold about 50-200 cars on their lot. Therefore finding the right used car may be difficult at any single location. Nearly half of prospective used car customers expect to visit multiple dealerships to find the car they are looking for.

Carvana's Solution

Ernie Garcia III, the founder and CEO of Carvana, sought to fix the used car buying experience by removing the pain points. The traditional retail model provided an undifferentiated buying experience among dealerships.

A fragmented market makes it difficult for any single dealer to achieve scale, partially reflecting the high variable cost structure of the business and low barriers to entry. Most dealers acquire vehicles and fulfill sales the same way with similar cost and operating models across dealerships. Reliance on third-party lending adds incremental frictional costs and limits the dealer's ability to participate in the gross profit created through financing. Additionally, the value proposition customers receive at a traditional dealership is often clouded during the multiple steps that often occur within an automobile purchase that often requires haggling/negotiating with a salesperson.

Ernie believed it was possible to provide a better car buying experience by building a vertically integrated, used vehicle supply chain supported by software and data. What were variable costs in the traditional model, i.e., vast vehicle selection, providing extensive product information, personalized recommendations, and other sales support costs, largely shift to fixed costs in an e-commerce, software-driven model and thus shrink rapidly as a percent of sales as volumes grow. Additionally, costs that remain variable with an e-commerce model, such as: transportation/fulfillment, sourcing vehicle inventory, inspection and reconditioning vehicles, significantly improve with scale and the help of technology/data management.

Ernie focused on: 1) Improving the entire customer experience; 2) Offering a wide selection; and 3) Providing better value.

1. Customer Experience

There are many different parts of the used car sale that dealerships must get right to provide a smooth customer experience. It is very difficult to provide a seamless process if different parties control different parts of the operation, such as vehicle sourcing, reconditioning, pricing, sales, financing, trading, or delivery. Carvana wanted to integrate the entire customer-facing aspect of the business to make it seamless, transparent, and self-serviced, which would drive higher adoption. Carvana's motto is, "they sell cars, but they're not car salesmen."

- Customers can buy a car in under 10 minutes, have it delivered to their door for free, and have a seven-day test period where Carvana will pick up the car for free if the customer decides to return the car.
- 360-degree photography of each vehicle gives a potential customer enough confidence in the quality of the vehicle in a self-service way that doesn't require a used car salesperson or a trip to the dealership.
- Vehicle trade-in experience is simple, asking for limited information, no photography, no physical inspection, and provides vehicle pick up.
- Vending machines provide a unique fulfillment option for consumers and are a key part of Carvana's growth strategy. In addition to reducing variable fulfillment costs, vending machines offer customers a fun experience to pick up their purchased vehicle while simultaneously creating branding and marketing.
- Integrated lending provides a better customer experience, fewer frictional costs in time, information, and Carvana can share in the gross profit economics. Over 70% of people finance their vehicle through Carvana because it is seamlessly integrated into the customer experience.

2. Wide Selection

Based on a survey of people that visited Carvana's website and did not purchase from Carvana but from a dealership afterwards, the No. 1 reason for not buying from Carvana was "they did not find the car they were looking for." This suggests that the reason people do not buy on Carvana is not the online buying platform, financing terms, trade in value, etc. but the selection. Therefore, as Carvana expands its inventory selection, it should continue to drive increased customer conversion.

Physical dealerships are restricted to the inventory on their lot. If a dealer has multiple locations within a geographic region, it still needs to keep the most popular items in stock at each location in a very redundant way.

Carvana has a pooled national inventory of nearly 25,000 cars available to purchase on its website, compared with less than 200 on a traditional dealer lot and ~15,000 total dealer vehicles available for sale in the average regional market. In other words, Carvana has nearly twice the selection available than an entire region's dealer inventory.

In order for Carvana to provide the nationwide inventory to customers, it has built an internal hub and spoke logistics network and software system to be able to quickly and economically transport cars directly to the customer when they want it.

3. Better Value

By shifting much of the dealership's variable costs to fixed, Carvana's cost structure has much more attractive unit economics compared to the traditional used car dealer. Combined with integrating the lending in-house so Carvana can share in the financing gross profits, it is typically able to sell vehicles $1,000 – $1,500 below Kelley Blue Book's Suggested Retail Value or prices of comparable cars at other dealerships. It is also able to offer more money on vehicle trade-ins and still earn attractive gross profit per unit. Of course, when scaling to a nationwide online used automotive dealer, there are significant capital investments required and large fixed costs which incur operating losses until volumes reach scale. However, unit economics for each automobile sold are very attractive (see Management's Core Objects and Unit Economics section below).

It does not take long for prospective customers to discover they are able to buy the same type of car on Carvana for a lower price that can get delivered directly to their home with seamless and transparent financing.

Management's Core Objectives

The key differences between an online e-commerce company like Carvana and the traditional bricks-and-mortar used car dealership are between the variable and fixed costs of selling each incremental vehicle. Carvana's total fixed costs are significant relative to the average dealership. However, the fixed costs are relatively stable and as Carvana scales, fixed costs will become a smaller percent of total sales. The average dealership has difficulty scaling because of its high variable cost structure, providing few economies of scale and some diseconomies of scale when considering the loss of entrepreneurial drive when dealerships are no longer owner-operated.

It's a little difficult to compare Carvana to the publicly traded automobile dealers without breaking out the operating segments within each dealership because the average dealership has four profit centers: new car sales, used car sales, parts and services, and other ancillary products such as warranties and insurance. Each segment has different margins, with new car sales providing very little gross margin (~4%), used cars providing some gross margin (~6-7%), and selling parts, services, and ancillary products providing very high margins. Carvana only sells used vehicles and financing/ancillary products.

Overall, as Carvana scales it expects total fixed costs to decline as a percent of sales providing more attractive operating margins in the long term despite not offering higher margin parts and services.

Carvana loses money at its current volume of business. For the company to be successful it must continue to scale in order to benefit from its high operating leverage. Management outlined its "vision" and goals in the very first public quarterly letter to shareholders. Its core objectives are to:

- 1. Grow Retail Units and Revenue
- 2. Increase total gross profit per unit
- 3. Demonstrate operating leverage

1. Grow retail units and revenue

Total growth in retail units and revenue look very favorable. Retail units grew 113% in 2018 and are expected to grow 86% in 2019.

Total revenue grew 131% in 2018 and is expected to grow 100% in 2019 to ~$4 billion.

Carvana launched 22 new markets in the first three quarters of 2019, providing a total of 146 at the end of the third quarter. It does not expect to open any new markets during 4Q19 in order to focus on operational efforts and prepare the business for further growth in 2020.

In the bricks-and-mortar used car dealership model, launching a new market requires constructing a new dealership in that market and building a local inventory to fill the dealership lot. In the e-commerce model, launching a new market requires connecting the market to an existing inventory pool through a logistics network. This means new markets can be added by setting up an office, small support staff, a few single car haulers, initial marketing costs for an average cost of ~$500,000 vs. $10 million-$20 million for opening a traditional dealership.

Markets with vending machines see a significant boost in market share gains and cost an average of $5 million for a new location.

Carvana estimates it can now reach ~67% of the total U.S. population based on its current markets, up from 59% at the end of 2018. Management believes it can eventually serve 90%+ of the U.S. population in their markets over time and serve another 5% in smaller cities through delivery from nearby markets, ultimately bringing the total share of the population the company serves to 95%.

Part of Carvana's hub-and-spoke transportation/logistics network is inspection and reconditioning centers (IRCs). After Carvana acquires a vehicle, it transports it to an IRC where it undergoes a 150-point inspection and reconditioning process and then is stored as part of the nationally available inventory. A vehicle will remain at the IRC until it is purchased, at which point it will be delivered to a local market hub and finally delivered to the customer.

IRCs deliver economies of scale that are essential to the Carvana operating model and achieving their long-term margin goals. New IRCs create benefits in sales volumes and logistics expenses in nearby markets. After Carvana opens a new IRC, markets closest to it see an average logistics expense per unit typically fall 20% and sales grow more than twice as fast as comparable markets.

Carvana will complete its eighth IRC at the beginning of 2020, providing the ability to inspect and recondition ~400K vehicles at full capacity. It has five more sites where it expects to launch facilities in the near future.

Beyond opening new locations, Carvana will grow from increasing market penetration. As market share increases within a region, expense per unit declines.

2. Increase total gross profit per unit

While the highest priority during Carvana's growth phase is generating demand and building infrastructure to support growth in retail units, management's next priority is increasing gross profit per unit (GPU).

Gross profit consists of used vehicles, wholesale vehicles, and other ancillary products largely consisting of financing customer purchases.

Carvana is able to grow gross profit per unit by:

- A. Selling vehicles for higher prices
- B. Lowering COGS per unit
- C. Selling other products/services (Carvana Automotive Finance, vehicle service contracts, and GAP coverage)

A. Selling vehicles for higher prices. Carvana can improve sales prices by lowering average days to sale, i.e. improving inventory turnover. The average used car price declines by ~18% per year, or ~$10 per day on a $20,000 vehicle. This reduction in price over time is incorporated into Carvana's vehicle pricing.

Reduction in used vehicle prices over time means that average days to sale impacts the average selling price of vehicles. Average days to sale depends on the number of vehicles they hold in inventory and the number of customers Carvana attracts to purchase those vehicles. Decreasing the average number of days between vehicle acquisition and sale to customer lowers the depreciation cost of the vehicle over time and increases benefits from economies of scale due to their centralized online sales model.

Over time, Carvana's goal is to increase the number of markets and sales growth faster than their inventory size, which will decrease average days to sale as demand increases relative to supply.

B. Lowering COGS per unit. COGS consist of the costs to acquire the vehicle, reconditioning the vehicle, transportation costs with preparing the vehicle for resale, depreciation, and IRC overhead. While COGS is largely a variable cost, Carvana can improve COGS by lowering vehicle acquisition costs by purchasing more cars from customers and benefitting from some economies of scale with IRC overhead and transportation as utilization increases.

Source more cars from customers: Cars sourced from customers benefits retail GPU and wholesale GPU (where cars are sold to auctions because they don't meet retail standards) because they are more profitable than cars sourced from wholesale auctions (no auction fees and less competitive bidding process). Sourcing vehicles from customers typically provides $200 - $500 more in profit per unit compared to acquiring a vehicle through auction.

In 3Q19, Carvana grew total cars purchased from customers to 32,000 vehicles, or nearly 70% of retail units sold to customers. Of all the retail units sold, over 30% were sourced from customers, up from 17% in the prior quarter.

Increasing IRC volume/capacity: The more vehicles that an IRC serves, the lower the cost per vehicle as costs scale. Collectively the IRCs have the capacity to inspect and recondition 350K vehicles per year. More IRCs also lower transportation costs as distance and time to delivery decrease per unit sold.

C. Selling other products and services. Other sales revenues primarily consist of gains on the sales of automotive finance receivables Carvana originates, and to a lesser extent, sales commissions on vehicle service contracts (VSCs) and commissions from GAP waiver coverage. It's important to understand Carvana's automotive finance business since it makes up roughly half of gross profits and will likely continue to be a driver of profits going forward.

Carvana's Automotive Finance Platform

Automotive finance is a very large market and has historically been a very profitable space. The industry is estimated to have more than $1 trillion in outstanding receivables at the end of 2018. Carvana's vertically integrated auto lending model is improving traditional auto financing and unlocking significant incremental profit opportunities.

In auto lending there are three players that work together to finance a car:

- 1. Dealers: Acquire the customers, ensure vehicle quality, and arrange loan information for lenders.
- 2. Lenders: Underwrite the loan by pulling credit score and pricing the loan.
- 3. Investors: Own the loan and earn a risk-adjusted rate on the investment.

Lenders/underwriters do the most work and earn the most profits from the transaction. Dealers earn some profits and the investors will earn a risk adjusted profit from owning the loan over its life.

The most common way for the three players to interact in auto lending is through "indirect lending" where the dealer (car dealership) brings in the customer and then partners with lenders who compete and underwrite the loans. The lenders may partner with investors who will ultimately hold the credit risk. Lenders may also play the role of investors by holding the loans they underwrite until maturity, which is common with banks and credit unions.

The indirect model provides a system with limited price discovery. At traditional dealerships, sales managers and finance managers are typically paid a commission based on the profit of the entire bundled transaction of a used car (selling price, trade-in value of customers car, interest rate on loan, vehicle service contracts, etc.).

The lender/finance partner typically compensates the dealer through a fee based on the spread between the loan offer rate provided by the financial institution and the final loan rate the dealer negotiates with the customer. Dealers are incentivized to get the highest profit possible on the entire transaction and will adjust the pricing on the different elements of the transaction based on customer preferences, such as lowering the interest rate on a loan while increasing the selling price of the car.

When third-party lenders are used to underwrite the loan, they do not necessarily know the true market price/value of the vehicle. This impacts the loan-to-value, risk-adjusted interest rates, and overall creditworthiness of the loan.

CarMax uses a hybrid model (combines the dealer and the lender) which replaces some of the outside lenders with an in-house lending segment. For some customers, there's an in-house lender while for other customers there are outside lenders who then pair with investors.

Carvana's model is a fully integrated retail and financing platform which provides an integrated/seamless customer experience.

Like the other elements of Carvana's sales model/vehicle purchase, the financing element is transparent with no-haggle pricing. Customers fill out a credit application, instantly receive the credit terms and those same terms apply to all the cars on the Carvana website. This provides a seamless customer experience and strong loan economics.

It is almost impossible for multiple third-party lenders working with multiple local dealers to consistently ensure vehicle quality and underwriting information. By fully integrating, Carvana reduces frictional costs by removing dealer relationship management costs, reducing overhead, and automating the loan process under one roof. Not only does this provide strong loan performance by being able to certify vehicle quality, customer credit information, eliminating adverse selection, and optimizing loan pricing, it provides an easier customer experience since they only have to deal with one party for their entire automotive transaction.

There are two key ways to expand financing gross profits: strong loan performance and lower cost of funds. The loans Carvana underwrites perform better because their integrated process produces better data but also because Carvana's retail model is able to sell cars at a lower price compared to similar quality cars at traditional dealerships. Lower car prices lead to lower loan-to-value (LTV) ratios and lower monthly payments on the same-quality vehicle which leads to better performing loans.

Total GPU Opportunity

During Carvana's Investor Day in 2018, the company listed the potential drivers of gross profit growth totaling $1,250 - $2,550 in potential GPU expansion, which implied a GPU of $3,500 - $4,500 at scale. Management's long-term margin guidance of a gross margin of 15%-19% at scale would imply a gross profit of $2,800 - $3,600 on a $19,000 vehicle.

3. Demonstrate operating leverage

Management's third priority is to demonstrate operating leverage as the company continues to scale. The charts below show each SG&A line item as a percent of sales.

Compensation and benefits consists of: fulfillment and customer service advocates who do last-mile delivery, auto hauler drivers who transport cars from IRCs to local market hubs, technology & corporate expense who handle customer calls, title/registration, and corporate, R&D, finance, HR, senior management, etc. In the long-term, four-fifths of compensation & benefits will consist of fulfillment & customer service and one-fifth will consist of technology & corporate.

Advertising expense has historically declined as markets ramp up/mature with accumulated awareness and word of mouth.

Each new cohort reflects lower initial advertising expense per unit sold as new markets benefit from nearby advertising spend and quicker ramp up in unit sales.

Logistics and market occupancy costs decline with scale as capacity utilization increases, and adding more IRCs over time reduces freight times and distance between customers and the cars they purchase.

Unit Economics at Scale

Management provided long-term margin goals, reflecting SG&A costs declining to 6%-8% of sales vs. the 18.7% during 3Q19. At scale, management is targeting 8%-13.5% earnings before interest, taxes, depreciation, and amortization (Ebitda) margins and 7.5%-12.5% Ebit margins.

Gross profit per unit has consistently grown over time as unit volumes have increased while SG&A per unit has declined as fixed costs have scaled.

While Carvana is still scaling its high fixed-cost operating structure, the operating loss per vehicle has improved significantly and Carvana will be earning an operating profit per vehicle as unit volumes continue to grow.

As of 3Q19, 80% of Carvana's markets, accounting for 97% of retail unit sales, had greater gross profit than advertising and in-market operating expenses, and 14 markets, accounting for 35% of retail unit sales, were generating positive Ebitda after allocating for all centralized logistics and corporate expenses. Newer cohorts are reaching positive Ebitda faster than prior cohorts. For example, Atlanta reached positive Ebitda 21 quarters after launch while newer markets reach positive Ebitda in just 10-14 quarters.

In the last quarterly letter, management provided SG&A per Retail Unit by Cohort, which shows the operating leverage of Carvana's business model as unit volumes grow. The older cohorts (2013, 2014, and 2015) are still growing at high rates but are generating positive Ebitda. This indicates cohort expenses improved through increased scale and efficiency gains.

Assuming an average used vehicle sold for $19,000, Carvana would earn a gross profit of $2,800 - $3,600 and an operating income of $1,300 - $2,500 per a used vehicle.

Competitive Advantage/Barriers to Entry

Scale

Relative size is very important in e-commerce. Similar to what happened in the general merchandise e-commerce industry with Amazon dominating the U.S. space, once Carvana establishes itself as the leading online auto dealer and volumes pass a certain threshold, it will be very difficult for any competitor to scale.

Demand generates further demand. As Carvana moves into new markets, demand will increase, which enables Carvana to carry more inventory. A broader vehicle inventory further improves its offering across the entire market, enabling it to increase market share. Higher volumes and more inventory mean more IRCs and therefore shorter delivery times and lower transportation costs.

If one day Carvana has 100,000 vehicles available on their website while the second largest online car dealership has 20,000, Carvana is more likely to have the type of car a customer is looking for, sell it for a lower price, and deliver is faster. That drives more customers to purchase from Carvana, which helps them grow vehicle inventory further, which attracts more customers, etc.

Carvana is a business that becomes better as it gets bigger. Its value proposition only becomes stronger, which strengthens its relative advantage over competitors. Once the self-reinforcing flywheel begins rolling, it will be very difficult for traditional dealership or relatively smaller competitors to compete.

Data

Since the entire customer transaction happens digitally, Carvana is able to use its data and algorithms to help determine the vehicles it makes available to customers, the fair price of those vehicles, accurate trade in value to offer, the financing terms, and VSC and GAP waiver coverage options available. Algorithms establish prices for vehicles based on recommended initial retail price points as well as retail price markdowns for specific vehicle-based factors, including: sales history, consumer interest, and prevailing market prices. Data controls the logistics infrastructure, which enables the company to offer customers fast, specific and reliable delivery times. With financing, the more data Carvana accumulates the better they can underwrite loans.

Logistics Network

Third-party automobile haulers typically run at very low occupancy and indirect routes, therefore the average cost to ship a car on a per-mile basis is pretty high and often takes several weeks. By transporting vehicles in-house through its hub and spoke logistics network, Carvana is able to significantly lower the time and cost to ship a car, estimated to cost less than $0.20/mile versus a third party’s average $0.75-$1.00 per mile. As Carvana builds more IRCs/hubs, transportation costs and times will decline.

Competitors

Vroom: Currently the second-largest online automobile dealer with a similar model to Carvana is Vroom. Recent reports state Vroom has raised a total $721 million in capital with a potential company value over $1 billion. Vroom has one vehicle reconditioning center in Houston and also partners with third-party reconditioning facilities. With size being very important to its e-commerce platform, Vroom has a lot of room to make up, only having ~4,800 vehicles available for sale on its website.

CarMax: CarMax is probably the most comparable publicly traded company to Carvana since it does not offer parts & services like the traditional dealership, only selling used cars, and like Carvana, has a significant finance arm called CarMax Auto Finance (CAF). One of CarMax's primary differences is it still focuses on using a storefront and salesperson to provide an omnichannel sales and distribution strategy where customers can buy a car in one of its store locations or through a combination of online and in-store. CarMax has about 200 store fronts and a nationwide inventory of ~70,000 vehicles. While CarMax has extensive inventory available, the majority of customers purchase a car from the company's local storefront. In fiscal 2019, ~34% of vehicles sold were transferred between stores at the request of the customer. CarMax primarily uses third-party transportation providers for longer hauls, which puts it at a transportation cost disadvantage (see logistics network section above).

CarMax has been very successful competing with traditional dealerships by using customer-friendly sales practices and utilizing its extensive customer/pricing data. CarMax's salespeople receive the same commission regardless of the car they sell while salespeople at traditional dealerships earn commission by selling vehicles that earn the highest possible gross profit rather than selling customers the vehicle they actually want or need.

While CarMax has been successful historically (growing sales at a ~10% CAGR of the last cycle) and will likely continue to be successful in the foreseeable future relative to traditional used car dealerships, CarMax's current omnichannel store front and salesperson operating model, combined with higher transportation costs, give it a cost structure disadvantage to Carvana. Carvana's capital investments have largely gone towards its technology/online experience, centralized inventory, and logistics network while CarMax's capital investment has gone into opening specific markets and its salesforce . This provides Carvana with more attractive unit economics, helping it scale at a much faster rate.

Capital Requirements, Balance Sheet, and Liquidity

Obviously when a company is generating operating losses as it scales, it requires capital to fund those losses and the other investments in inventory, vending machines, and IRCs.

Since 2014 through 3Q19, Carvana used ~$2.2 billion in cash, financed through debt (~$1.1 billion) and issuing equity (~$1.2 billion).

Since Carvana went public it has issued two follow-on offerings and two notes offerings, raising both equity and debt. While capital raises are often looked down upon by investors, Carvana's dilution was fairly limited, especially considering the capital is helping support the Company's 100%+ growth rate.

Management stated the follow-on offering earlier this year provides Carvana the ability to be more aggressive in its growth and adds financial flexibility with high-yield debt replacing the sale-leaseback financing used to finance capex. The company does not expect to issue any more equity in the near-term and feel good about their current capital cushion.

At the end of 3Q19, Carvana had ~$650 million in liquidity.

Most of the inventory and capex related to IRCs, vending machines, and haulers have access to adequate financing, therefore liquidity will be required to fund the operating losses. The majority of Carvana's liquidity is needed to fund the operating losses until they scale to positive operating cash flow.

Based on current volumes, Carvana is using ~$50 - $80 million in cash a quarter. Operating losses should decline as fixed costs scale at which point the gross profit of each incremental vehicle sold should largely drop to the bottom line. With ~$650 million in liquidity available, Carvana has a good runway to fund expected operating losses and it is unlikely they will need to raise additional capital in the foreseeable future.

Management/Ownership

Ernie Garcia III is the founder and CEO of Carvana. Carvana was started as a subsidiary of DriveTime and was later spun out during the IPO in 2017. DriveTime is a used car dealer and finance company based in Tempe, Arizona that is owned and managed by Ernie's father, Ernie Garcia II. While working for DriveTime from 2007 to 2012, Ernie III came up with the idea for Carvana and his father encouraged him to start the Company.

Carvana went public in 2017 as an "up-C" corporate structure, which occurs when an existing LLC goes public through a newly formed corporation structured as a holding company that owns an interest in the LLC. The up-C structure allows the LLC to go public but maintain the LLC status and therefore the tax benefits of a partnership for the LLC owners as well as enable the owners to maintain more control of the business.

What really matters is Ernie Garcia III and Ernie Garcia II control 97% voting power in Carvana. They primarily own Class B shares in Carvana, which have 10-1 voting rights and can be converted into Class A shares which are the publicly traded shares. As of the last proxy, Ernie Garcia II's ownership in Carvana is worth ~$7.6 billion and Ernie Garcia III's ownership is worth ~$1.3 billion based on current market prices.

Market Size/Opportunity

Automotive retail is the largest consumer vertical in the United States with over $1 trillion in sales.

Despite its size, it is the most fragmented vertical with the largest player only having 2% market share. The largest players in each vertical typically have ~20% market share.

Of the ~$1 trillion in automotive retail sales, ~$764 billion was used car sales. There are roughly 270 million automobiles in the U.S. and the average consumer buys a car every 6.75 years, resulting in ~40 million used car transactions each year (270 million cars / 6.75 years).

One can argue that if there were lower friction costs in time, money, and frustration during the purchase of a used car, people would increase the frequency they buy and sell cars. If the average used car price were ~$1,000 - $1,500 cheaper for the same quality car, only took 10-15 minutes to purchase online, and would get delivered directly to your home, it's reasonable to expect the frequency with which people buy cars would increase.

If the average car owner bought a car every six years compared to the current average of 6.75 years, the total number of used car transactions would increase to 45 million, therefore increasing the total market by 13%. If the frequency fell to every five years, total transactions would increase to 54 million vehicles a year.

Carvana has grown at a rapid rate since launching in Atlanta in 2013. Atlanta reached an estimated 1.94% market share at the end of 2018; growing just under

30% that year. Nashville and Charlotte, the 2014 cohort, reached 1.11% market share and are grew over 50% that year. Newer markets have followed similar trends in market share gains.

Management estimates it can now reach ~67% of the total U.S. population based on the company's existing markets, up from 59% at the end of 2018, and it believes Carvana will ultimately be able to reach 95% of the U.S. population. Simply assuming that Carvana does not open up any more markets (highly unlikely) and the current cohorts follow similar market share gains as prior cohorts, Carvana could reach over 500,000 retail units within four years (see appendix 1). Current consensus estimates have Carvana reaching 500,000 units within three years, providing a 40% CAGR from 2019 expected units.

Management has outlined its goal of reaching 2 million units, or ~5% market share based on 40 million cars sold per year. At this volume, vehicles are expected to average 30 days to sale; meaning Carvana would require about 165,000 available cars on their website. That level of selection would be over 10x as many cars that are available from all dealers and private-party sellers in the average market.

We performed a sensitivity analysis reflecting potential market share of all U.S. used vehicle transactions and income per transaction based on management's long-term guidance.

Keeping total U.S. used vehicle transactions fixed at 40 million per year, 2.5% - 10.0% market share provides 1 – 4 million retail units sold. A 6.5%-14.0% EBIT margin on an average used vehicle price of $19,000 provides between ~$1,250 and $2,750 in EBIT. EBIT would range between $1.3 billion (2.5% market share and $1,250 EBIT) and $11 billion (10.0% market share and $2,750 EBIT).

Assuming interest expense remains ~2 and a 25% tax rate, net income would range between 3.5% and 9.5% of sales, or $650 - $1,775 per vehicle, providing a potential range between $650 million - $7.1 billion. Interest expense as a percent of sales will likely decline as Carvana's growth slows, margins scale, and free cash flow jumps helping lower interest costs on debt facilities, therefore net margins are likely conservative assuming Carvana reaches scale. It's expected that Carvana will likely continue to finance inventory levels with the asset-based Floor Plan Facility given the attractive financing for such operating activities.

If you put a market average P/E multiple of 18x earnings, market cap would range between $12 billion - $128 billion.

The next question is how fast can Carvana reach these volume levels. The first market, Atlanta, took six years to reach ~2% market share. With subsequent market cohorts following similar trends, Carvana could easily reach 500,000 units within three years, or by 2022. Management set a goal of reaching 2 million units or 5% market share.

If Carvana is the dominant online platform for buying and selling cars, and continues to offer a better customer experience, lower prices, and more selection than any alternatives, there really isn't a reason for the 5% market share ceiling. As Carvana builds out transportation/logistics infrastructure, IRCs, vending machines, and inventory levels, it's not unreasonable for Carvana to take 10% market share (4 million units) or even 20% (8 million units) one day.

If it takes 10 years for Carvana to reach 4 million units (10% market share) and they earn $1,215 per vehicle, putting an 18x multiple on those earnings (CarMax's current multiple on high single digits expected growth), provides an ~$87.5 billion market cap, or a 20% CAGR from today's price assuming nominal share dilution. If Carvana is still able to grow at a 20%+ rate at that time, it's reasonable to expect the market to place a higher multiple on those earnings. These scenarios are simply to put rough numbers on the total market opportunity and margin potential and are not at all comprehensive of potential outcomes.

What you can see is if Carvana is successful in winning market share from traditional bricks-and-mortar used car dealers by reducing frictional costs and reaches scale margins, there is significant potential upside. Shares look very attractive based on the current ~$13 billion market cap if Carvana is able to continue to gain market share, scale operating leverage, and increase its competitive advantages.

For the full report, including charts, risk factors, and an appendix, please go to SumZero.com.

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