Luxembourg, August 25th, 2019

Dear Limited Partners,

I am pleased to present you hereafter with my latest analyses about the Company Carvana (CVNA).

I will analyze the revenue and profitability growth potential of CVNA, always in an absolute and relative comparison to CarMax (KMX). Furthermore, I write about the opportunities and risks related to an investment in CVNA in a dynamic environment.

Given the characteristics of the used car sector, a low gross margin, the importance of bi-products and services, significant and challenging logistics; I think it is not useful to compare the company to a pure online retailer such as Wayfair (W) for example.

Furthermore, KMX is the largest and most profitable used car market seller in the US. CVNA's financial long-term outlook outperforms the KMX model by far.

Finally, both companies have a similar market capitalization, and the spread tends to get smaller (without price fluctuation) given that KMX repurchases shares and CVNA is increasing the outstanding amount.

To better understand the gross margin CVNA reports, I divided my analyses into three steps:

- Private Gross Margin;
- Reported Gross Margin;
- Real Direct Gross Margin.

Private Gross Margin

This is a purely imaginary margin. You can't manufacture your phone, ensure your house or build your car; but you might be able to perform some tasks CVNA sets forth.

A potential car seller faces different options:

- To sell their car to the local dealer;
- To sell their car over the internet by using one of the multiple internet sites;
- To sell their car online (CVNA model);
- To trade in their car online or offline.

The decision-making process runs mainly around three factors; money, time and convenience. CVNA wants to offer the most convenient choice of selling a car. You do not need to talk to salespeople or even leave your house. Let us assume that this private gross margin is around 15% (the absolute number is not essential). Included in this gross margin is a reconditioning and inspection, which would cost you money if you did it by yourself. Sometimes these services are not necessary or can be considered as a hobby, like washing your car.

You may save up to $3,000, considering the average car price of around $19,450 that CVNA sold (the mode price would be more interesting to know), or save a couple of workdays for many people buying $20,000 used cars. This vertical competition will cap the gross margin of used car dealers. We will see later in more detail that CVNA faces this competition in the buying and selling process. I conclude that there is no size effect on the purchasing price of cars. This is also one of the more critical reasons that the used car market is so fragmented.

Reported Gross Margin

Let us now compare the reported gross margin between CVNA and KMX. I choose to analyze the last quarter (Q2 2019) to take into account the fast-growing numbers of CVNA.

CARVANA CO. AND SUBSIDIARIES
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited)
(In thousands, except per share amounts)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Sales and operating revenues:				
Used vehicle sales, net	$ 855,785	$ 437,922	$ 1,539,614	$ 771,978
Wholesale vehicle sales	63,014	16,622	96,044	26,755
Other sales and revenues, including $13,989, $5,544, $24,562, and $9,655, respectively, from related parties	67,422	20,742	105,797	36,975
Net sales and operating revenues	986,221	475,286	1,741,455	835,708
Cost of sales, including $1,217 and $1,210, $2,490 and $2,257 respectively, to related parties	848,428	426,251	1,515,130	752,439
Gross profit	137,793	49,035	226,325	83,269

(10Q 2Q 2019 CVNA)

CVNA generated a gross profit of $137 million during Q2 2019. The reported gross margin was 13.9% compared to 13.8% for KMX.

	Three Months Ended May 31			
(In thousands except per share data)	2019	% [(1)]	2018	% [(1)]
SALES AND OPERATING REVENUES:				
Used vehicle sales	$ 4,540,657	84.6	$ 4,021,047	83.9
Wholesale vehicle sales	662,449	12.3	617,651	12.9
Other sales and revenues	163,212	3.0	153,894	3.2
NET SALES AND OPERATING REVENUES	5,366,318	100.0	4,792,592	100.0
COST OF SALES:				
Used vehicle cost of sales	4,043,824	75.4	3,581,609	74.7
Wholesale vehicle cost of sales	536,490	10.0	502,945	10.5
Other cost of sales	43,621	0.8	46,698	1.0
TOTAL COST OF SALES	4,623,935	86.2	4,131,252	86.2
GROSS PROFIT	742,383	13.8	661,340	13.8
CARMAX AUTO FINANCE INCOME	115,959	2.2	115,593	2.4

(10Q 2Q 2019 KMX)

However, KMX does not include the revenue of its finance branch (CarMax Auto Finance Income) into the calculation of its Gross Margin. By adding that income, we get a gross margin for KMX of around

16%. I believe that it is beneficial to make two more adaptations to be able to better understand and compare both business models.

Other sales and revenues

Of the $137 million of gross margin, $67 million are due to other sales and revenues. Of these other sales and revenues, 60% are from the sale of finance receivables. The rest is from selling GAP waiver coverage and commissions on VSC's. CVNA sold $1.181 billion worth of finance receivables in Q2, which amounts to 138% of Q2 revenues or 76% of half-year revenues. We deduct that around $300 million were taken from Q1. Keep in mind that finance receivables held for sale in the balance sheet only increased by $20 million.

Other sales and revenues, which primarily includes gains on the sales of automotive finance receivables we originate, sales commission on VSCs and sales of GAP waiver coverage totaled $67.4 million and $105.8 million during the three and six months ended June 30, 2019, respectively, and $20.7 million and $37.0 million during the three and six months ended June 30, 2018, respectively. We expect other sales and revenues to increase with retail units sold. We also expect other sales and revenues to increase as we improve our ability to monetize loans we originate, including through securitization transactions, and sell and offer attractive financing solutions and ancillary products to our customers. Other sales and revenues are 100% gross margin products for which gross profit equals revenue.

(10Q 2Q 2019 CVNA)

We understand that CVNA currently makes 50% of its Gross Margin from bi-products and services. This might not be a bad thing, but we have to consider that generating and at least, for now, selling finance receivables is as crucial as selling used cars. It is as much a finance company as it is a used car dealer. Of course, the sale of a car is a necessary condition for other sales and revenues, but the sale of such finance receivables is a necessary condition for the survival of CVNA. KMX could exist without its financial arm, but profit would be cut into two. KMX reports that 61% of the customers who purchased a retail used car purchased such a bi product.

Related Products and Services :
We provide customers with a range of other related products and services, including extended protection plan ("EPP") products and vehicle repair service. EPP products include extended service plans ("ESPs") and guaranteed asset protection ("GAP"), which is designed to cover the unpaid balance on an auto loan in the event of a total loss of the vehicle or unrecovered theft. Our ESP customers have access to vehicle repair service at each CarMax store and at thousands of independent and franchised service providers. We believe that the broad scope of our ESPs helps promote customer satisfaction and loyalty, and thus increases the likelihood of repeat and referral business. In fiscal 2019 , approximately 61% of the customers who purchased a retail used vehicle also purchased an ESP and approximately 18% purchased GAP.

(10K 2018 KMX)

If we consider that CVNA sold 44,000 used cars in Q2 2019, we get a gross profit per used vehicle of $1,440, up 22% Y/Y.

Per unit gross profit (incl. Gift): (2)					
Used vehicle gross profit	$	1,440	$	1,180	22.0

(10Q 2Q 2019 CVNA)

This is far below the 181% increase of total gross margin. Indeed, other sales and revenues increased by over 200%. KMX realized a gross profit per retail unit sold of $2,175! We know that in Q2, CVNA sold some receivables generated in Q1, so this makes it difficult to evaluate them on a quarterly basis.

	Years Ended February 28								
	2019			2018			2017		
		$ per unit (1)	% (2)		$ per unit (1)	% (2)		$ per unit (1)	% (2)
Used vehicle gross profit	**$**	**2,175**	**10.7**	$	2,173	10.9	$	2,163	10.9
Wholesale vehicle gross profit	**$**	**963**	**18.0**	$	961	18.0	$	926	17.4
Other gross profit	**$**	**562**	**69.3**	$	511	67.5	$	550	70.7
Total gross profit	**$**	**3,312**	**13.6**	$	3,228	13.6	$	3,252	13.8

(10K 2018 KMX)

KMX generates $700, or 50% more gross margin in the core business. By this I mean buying a car, inspecting and reconditioning it and selling it (costs related to the sale or outbound logistic as well as administrative and IT costs are all in SG&A that we analyze hereafter).

If I include the "other sales and revenues" into the gross margin per unit sold and the CAF income into KMX's gross margin per unit sold, KMX generates around $3,300 per unit and CVNA around $3,100. We understand why the management of CVNA prefers to put this total gross margin in the first line. The following Excel sheet shows how the percentage increase in these other sales and revenues of total revenues tends to increase over the last three years.

	Jun-16	Sep-16	Mar-17	Jun-17	Sep-17	Mar-18	Jun-18	Sep-18	Dec-19	Mar-19	Jun-19
Revenues											
Used vehicles	$ 80,488.00	$ 92,115.00	$ 148,382.00	$ 193,947.00	$ 208,113.00	$ 334,056.00	$ 437,922.00	$ 486,269.00	$ 526,798.00	$ 683,829.00	$ 855,785.00
Whole vehicles	$ 2,475.00	$ 2,870.00	$ 5,726.00	$ 7,818.00	$ 7,459.00	$ 10,133.00	$ 16,622.00	$ 21,440.00	$ 25,389.00	$ 33,030.00	$ 63,014.00
Total Dir Revenue	**$ 82,963.00**	**$ 94,985.00**	**$ 154,108.00**	**$ 201,765.00**	**$ 215,572.00**	**$ 344,189.00**	**$ 454,544.00**	**$ 507,709.00**	**$ 552,187.00**	**$ 716,859.00**	**$ 918,799.00**
Other revenues	$ 3,563.00	$ 3,859.00	$ 4,965.00	$ 7,600.00	$ 9,807.00	$ 16,233.00	$ 20,742.00	$ 23,212.00	$ 32,651.00	$ 38,375.00	$ 67,422.00
Total Revenue	$ 86,526.00	$ 98,844.00	$ 159,073.00	$ 209,365.00	$ 225,379.00	$ 360,422.00	$ 475,286.00	$ 530,921.00	$ 584,838.00	$ 755,234.00	$ 986,221.00
% of total revenues	**4.12%**	**3.90%**	**3.12%**	**3.63%**	**4.35%**	**4.50%**	**4.36%**	**4.37%**	**5.58%**	**5.08%**	**6.84%**
Gross Profit	$ 16,039.00	$ 6,766.00	$ 9,746.00	$ 16,039.00	$ 20,416.00	$ 34,234.00	$ 49,035.00	$ 57,306.00	$ 56,134.00	$ 88,532.00	$ 137,793.00
Part of Gross Margin	**22%**	**57%**	**51%**	**47%**	**48%**	**47%**	**42%**	**41%**	**58%**	**43%**	**49%**

(Personal Excel)

Why does CVNA generate such a profit of more than 3% on finance receivable? The price of finance receivables is based on the amount, interest, period and creditworthiness of the debtor. We know that KMX does not offer credit to clients under a particular credit rating but prefers to pay third party insurers. It could be that CVNA transfers parts of gross margin from direct gross margin to other sales and revenues, by selling cars for a lower price but requesting higher interest. If CVNA kept those finance receivables, it would have less Cash, and the Profit from the finance receivables would be dispersed throughout the different loans. The current loss would be much higher.

We can deduct that at this level, CVNA lacks profitability on its core business, but is very efficient by selling bi-products and services. The counterparties for the other sales and revenues (all of them) are very closely related companies, owned by the father of the current CEO and major shareholder of CVNA. The cherry on top of the cake is that these companies operate in the same sector as CVNA; they sell cars on credit.

After selling its finance receivables to DriveTime and Ally Financial (ALLY), CVNA started to sponsor and engage in securitization transactions to sell their finance receivables to a pool of investors. Who are the beneficial owners? It is difficult to get any information regarding beneficial owners in Delaware Trusts. Who are the debtors? For many potential customers, getting credit from one used car dealer is the most important necessary condition. At one point, it can even be considered as a sufficient condition. Does CVNA sell to desperate people?

Real Direct Gross Margin

We know that CVNA realized around 50% of its Gross Margin by bi-products and services (Direct Margin). We also know that KMX is more profitable regarding its Direct Margin ($1,400 to $2,100).

I believe that the Direct Gross Margin should be even lower in the case of CVNA. Indeed, the company distinguishes between inbound and outbound logistics costs. This adaption does not change anything in the overall conclusion, it just helps me to understand better the business model of CVNA.

Inbound logistic costs include all the related costs from the transfer of the vehicle from the purchase location (auction or private client) to an IRC. Outbound logistics costs include all the costs from the IRC to a vending machine or client.

The basic model for KMX did not have those outbound logistics costs because customers traded their vehicles in at the same places where they picked up a new one. After, we see that KMX adapted its business model this year by offering to client's access to the nationwide inventory as well as home delivery in the Atlanta market. Those outbound logistics costs are directly related to revenues; they cannot sell a car without delivering it. Rents might be fixed, but compensation and fuel are variable.

	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19		
Units sold	22570.00	25324.00	27750	36766	44000	**20%**	**95%**
Other Revenues	$20,742.00	$23,212.00	$32,651.00	$38,375.00	$67,422.00		
Total GPU	$2,173.00	$2,144.00	$2,131.00	$2,429.00	$3,132.00	**29%**	**44%**
Logistic costs	$7,826.00	$9,913.00	$11,140.00	$12,249.00	$13,643.00	**11%**	**74%**
Logistic costs per Ret unit	**$346.74**	**$391.45**	**$401.44**	**$333.16**	**$310.07**	**-7%**	**-11%**
Logistic costs per Total Unit			**$343.12**	**$281.80**	**$249.16**	**-12%**	
Real Total GPU	**$1,826.26**	**$1,752.55**	**$1,729.56**	**$2,095.84**	**$2,821.93**	**35%**	**55%**

(personal Excel)

CVNA managed to leverage outbound logistics costs by around 11% Y/Y. This seems encouraging, but I will later show that this is only a tiny step to the objective of a more efficient business model than KMX has.

How does the management plan to close the $700 on the direct gross margin?

Increasing Real Direct Gross Margin

As you can read from the extract below, the management of CVNA sees different possibilities to increase the profitability of the core business.

- *Reduce average days to sale.* Our goal is to increase both our number of markets and our sales at a faster rate than we increase our inventory size, which we believe would decrease average days to sale due to a relative increase in demand versus supply. Reductions in average days to sale lead to fewer vehicle price reductions, and therefore higher average selling prices, all other factors being equal. Higher average selling prices in turn lead to higher gross profit per unit sold, all other factors being equal.

- *Leverage existing IRC infrastructure.* As we scale, we intend to more fully utilize the capacity in our seven existing IRCs, which collectively have capacity to inspect and recondition more than 350,000 vehicles per year at full utilization.

- *Increase utilization on logistics network.* As we scale, we intend to more fully utilize our in-house logistics network to transport cars to our IRCs after acquisition from wholesale auctions or customers.

- *Increase conversion on existing products.* We plan to continue to improve our website to highlight the benefits of our complementary product offerings, including financing, VSCs, GAP waiver coverage and trade-ins.

- *Add new products and services.* We plan to utilize our online sales platform to offer additional complementary products and services to our customers.

- *Increase monetization of our finance receivables.* We plan to expand our base of financial partners who purchase the finance receivables originated on our platform to reduce our effective cost of funds. We also plan to continue selling finance receivables in securitization transactions.

- *Increase the purchase of vehicles from customers.* We plan to grow the number of vehicles that we purchase from our customers either as trade-ins or independent of a retail sale. This in turn will both grow our wholesale business and provide additional vehicles for our retail business, which are more profitable compared to the same vehicle acquired at auction.

- *Optimize purchasing and pricing.* We are constantly improving the ways in which we predict customer demand, value vehicles sight unseen and optimize what we pay to acquire those vehicles. We also regularly test different pricing of our products, including vehicle sticker prices, trade-in and independent vehicle offers and ancillary product prices, and we believe we can improve by further optimizing prices over time.

(10k 2018 CVNA)

I will focus on the most important and those related to cost savings. Indeed, most companies try to add products and hope to have their AWS moment.

Cost of sales

Components of cost of sales for both companies are:

- Buying Price;
- Buying Process;
- Transport the vehicle;
- Inspect and Recondition the vehicle (including parts, payroll, Labor and overhead costs associated with reconditioning and vehicle repair services).

Cost of Sales

Cost of sales includes the cost to acquire, recondition and transport vehicles associated with preparing them for resale. Vehicle acquisition costs are driven by the mix of vehicles we acquire, the source of those vehicles and supply-and-demand dynamics in the wholesale vehicle market. Reconditioning costs consist of direct costs, including parts, labor and third-party repair expenses directly attributable to specific vehicles, as well as indirect costs, such as IRC overhead. Transportation costs consist of costs incurred to transport the vehicles from the point of acquisition to the IRC. Beginning in the second half of 2018, the labor portion of reconditioning costs and transportation costs includes the expense related to the 100k Milestone Gift, as described above. Cost of sales also includes any necessary adjustments to reflect vehicle inventory at the lower of cost or net realizable value.

10K 2018 CVNA

(P) Cost of Sales

Cost of sales includes the cost to acquire vehicles and the reconditioning and transportation costs associated with preparing the vehicles for resale. It also includes payroll, fringe benefits, and parts, labor and overhead costs associated with reconditioning and vehicle repair services. The gross profit earned by our service department for used vehicle reconditioning service is a reduction of cost of sales. We maintain a reserve to eliminate the internal profit on vehicles that have not been sold.

10K 2018 KMX

We already know that CVNA does not include outbound logistics costs into its cost of sales. KMX is considering overhead real estate costs concerning inspection and reconditioning of the vehicle.

Buying Price

In their Q2 letter to shareholders, the management informs that gains in retail gross profit per unit were mainly driven by a higher number of customer sourced vehicles.

- Retail
  - Retail GPU (incl. Gift): $1,440 vs. $1,180 in Q2 2018
  - Retail GPU ex-Gift: $1,482 vs. $1,180 in Q2 2018
  - Gains in Retail GPU were primarily driven by a greater number of customer-sourced vehicles, incremental shipping revenue, and a reduction in average days to sale to 61 from 66
- Wholesale

(10Q 2Q 2019 CVNA)

KMX manages to purchase between 38% to 52% of its cars from customers.

Suppliers for Used Vehicles

We acquire a significant percentage of our retail used vehicle inventory directly from consumers through our appraisal process, as well as through local, regional and online auctions. While in any individual period conditions may vary, over the past 10 fiscal years, 38% to 52% of our retail inventory has been acquired through our appraisal process annually. We also acquire used vehicle inventory from wholesalers, franchised and independent dealers and fleet owners, such as leasing companies and rental companies. The used vehicle inventory we acquire directly from consumers through our appraisal process helps provide an inventory of makes and models that reflects consumer preferences in each market.

(10K 2018 KMX)

This number is much lower for CVNA. The more CVNA wants to increase its revenues, the more cars it needs to purchase. Therefore, the more it risks influencing prices on auctions if it does not manage to buy a considerable number of vehicles from private people. In general cars sourced from individuals are more profitable.

I believe that even if the business model of CVNA is successful in all other aspects such as

- Lower logistics costs in Gross Margin
- Lower SG/A
- The more profitable the financial arm,

the company will not succeed if it does not manage to increase the percentage of purchases from customers.

The management acknowledges that a large chunk of the advertising budget is destinated to convince people not to buy, but to sell a car. In this low margin market, the profit is made at the buying step. If you buy an excellent car at too high of a price, you risk being not profitable. This is the vast difference from companies that sell goods purchased from suppliers (like W). Indeed, you sign a master contract with your supplier and renegotiate prices on a monthly or annual basis.

In Europe, the private company Auto1 has been spending for years now vast amounts on advertising trying to convince you to sell your car to them. Their business model is based on a fast and simple and transparent offer. However, they work together with a couple of hundred independent dealers that inspect the car before a possible purchase. That company afterward sells their cars to dealers and not private customers. Given the omnipresent ads of this company for many years now, I deduct that at least private individuals are not jumping on this new offer.

I think it is challenging to forecast the number of people willing to sell their cars online. Selling a car is giving something away in exchange for money. You have to invest some time and engage in paperwork. It is a less appealing task, in my opinion than buying a car and getting it the next day. Internet buyers are often very impulsive, the whole process needs to be fast and simple. The one-click button from AMZN is a great invention for them. In my opinion, the store-based business has an advantage in sourcing cars from individuals. Furthermore, the average car age tends to increase and is now at around twelve years what decreases the potential given that CVNA as a pure online player cannot buy and sell too old cars. (no test drive, difficult return, high logistic costs)

I assume that KMX will have a price advantage for at least five more years but follow carefully CVNA's efforts during the next quarters' CVNA's to increase that number.

Buying Process

CVNA emphasizes that their buying process is highly automatized. I believe that this might be true for cars bought at auctions. However, buying a car from a private consumer is more difficult to forecast and also to plan and optimize.

KMX manages to purchase around half of its inventory from private clients. Clients drop their cars off at KMX stores, and after going through their appraisal process, KMX decides to make a binding offer. CVNA delegates a lot of these tasks to the counterparty, which might increase productivity, but also increases the risk of error or even fraud. A car is a complex product made up of around 30,000 pieces.

After spending some time reading through forums, I noticed how vital the Call Center is for CVNA and I realized how costly it is in terms of IT and labor to give the customer a fast and easy way to sell his car online. Any error in the buying process is expensive. Returning a 2,700-pound car is different than returning a shirt. The whole process needs to go fast, and the customer wants their cash or new car as soon as possible.

Transportation of the vehicle

Cars bought at auctions have to be delivered to the nearest IRC, or production store in KMX's case. KMX has 98 production stores; this is ten times more than CVNA has IRCs.

	Production Stores	Non-production Stores
Store count	98	105
Store location size	generally 10 - 25 acres	generally 4 - 12 acres
Stores located in small MSAs	11	35

(10K 2018 KMX)

I deduct that CVNA needs to transport the cars over a longer distance than KMX. I do not think this has an essential impact on the scenario of an auction. The company can organize transportation by using big haulers and make a one-stop trip.

Picking up a car from a private customer is different. Since AMZN, the notion of the last mile is well-known and companies around the world are trying to avoid this last mile. The last mile can cost up to 80% of the total shipping. The more markets the company opens the more the distances increase given that the number of IRC is limited to be able to sell the asset-light business model. You can't forecast where and when a client is offering their car. Furthermore, those individuals want a fast and easy process; the more time the process takes the higher the risk to lose the client to the local dealer.

Picking up a car will always be a labor and equipment intensive process. The fact that the truck and driver are the only nonvirtual contacts a potential client has, limits the capacity of putting pressure on those costs. In logistics, fast, simple and non-predictable means expensive and CVNA faces it from the supplier and client-side.

Inspection and Reconditioning process

We distinguish between the labor force and costs related to the IRC and production sites. A car needs to be inspected and reconditioned by a human.

CVNA management says that current IRCs could handle up to 350,000 used cars per year. I believe that they mean that their infrastructure can handle that many, but not employees. That makes around 40,000 cars per IRC. Last year KMX sold 750,000 vehicles, which makes approximately 7,500 cars per production store, or six times less. As we will see more in detail later, occupancy costs in SG&A are about 20% of total SG&A or 1.8% of revenues for KMX. We do not know the exact allocation KMX applies.

This is, without doubt, an advantage, especially during harsher economic times. The question is, how much can they save on this? I will elaborate more on this later on.

It is essential to mention the special treatment CVNA gets. The company leases following IRCs from related parties:

1. Blue Mound: Drivetime
2. Delanco: Drivetime
3. Winder: Drivetime
4. Cleveland: Drivetime
5. Nashville (Drivetime leases Nashville from an unrelated party)
6. Tolleson: Verde

So, six out of the nine IRCs are leased from a company owned by the father of the current CEO and principal shareholder of CVNA. The company can increase the surface only in case of need. Given the beforementioned affirmation of the management, we assume that they are currently renting out enough place to recondition 350,000 cars per year and that they do not have the potential to increase their surface and rent. If growth continues at this pace, CVNA will soon need to buy or rent new IRCs. I do not believe that the company gets this special treatment.

What can I conclude regarding the overall Gross Margin? It is challenging to take a precise quantitative conclusion. However, I do not think it is that important given the relative valuation of CVNA compared to KMX. We can focus on broader trends. Currently, CVNA is underperforming KMX and only catching up a little bit by its higher income on finance receivables. Remember that KMX's direct gross margin is $700 per unit sold, or 50% higher than CVNA's.

CVNA will be able to save on real estate costs. However, if I consider the SG&A costs related to stores, I have to deduct that the improvement in efficiency is limited for CVNA. On the other side the company has a much more complicated logistic system. Especially considering that the company has to pick up even more cars from customers, I don't see a high potential of leverage here.

Furthermore, I believe that the crucial variable is the number of cars that CVNA manages to buy from private customers. If the company manages to equal KMX's numbers, it will be a simple tradeoff between inbound logistics costs and higher costs of KMX's production sites.

Finally, I do not think CVNA's finance solution is more profitable. KMX could also just securitize and sell its finance receivables. It may be that CVNA's car prices are lower so that the company can charge higher interest and thereby transfer some profit from its core business. However, I did not find any proof of continuous lower prices. It could also just be that CVNA finds investors that are willing to accept a considerably lower interest than CVNA charged to its customers. In a perfectly transparent market, this would, however, be difficult conceivable because CVNA clients would not accept an over the market interest. We don't have a lot of information on the receivables as well as the beneficial owners of the trust. The management also recently decided to define the 5% credit risk of the securitized receivables it keeps in its balance sheet as level 3 assets.

SG&A

In the following table, you see current (Q2 2019) costs per component for CVNA and KMX and their relative value in revenues.

		CVNA Q2		CVNA LT Forecast		KMX	KMX applied to CVNA	
		Jun-19				Jun-19		
Compensation and benefits (1)	Same	$ 54,184.00	5%	3%	$ 24,655.53	$ 270,900.00	5%	$ 49,785.96
Advertising	Same	$ 50,367.00	5%	2%	$ 14,793.32	$ 41,900.00	1%	$ 7,700.37
Market occupancy (2) (Store Occupancy)		$ 4,720.00	0.5%	0.2%	$ 1,972.44	$ 96,600.00	1.8%	$ 17,753.13
Other (4)		$ 57,514.00	6%	2%	$ 19,724.42	$ 80,300.00	1%	$ 14,757.52
Logistics (3)	Not KMX	$ 13,643.00	1.4%	1.0%	$ 9,862.21		0%	$ -
Total		**$ 181,843.00**	**18%**	**7%**	**$ 71,007.91**	**$ 489,700.00**	**9%**	**$ 89,996.98**

(Personal Excel)

Now consider those numbers in the context of the following graph.

LONG TERM FINANCIAL GOALS

	FY 2016	FY 2017	FY 2018	Q2 2019	Long Term Target
YoY Revenue Growth	180%	135%	128%	108%	–
Gross Margin (incl. Gift / ex. Gift)	5.3%	7.9%	10.1% / 10.3%	14.0% / 14.2%	15 – 19%
Advertising	7.4%	6.5%	5.7%	5.1%	1.0 – 1.5%
SG&A ex. Advertising and D&A (incl. Gift / ex. Gift)	21.1%	18.2%	14.9% / 14.5%	12.4% / 12.3 %	4.5 – 5.5%
D&A	1.3%	1.3%	1.2%	0.9%	0.5 – 1.0%
SG&A Total as % of Revenue (incl. Gift / ex. Gift)	29.8%	26.0%	21.7% / 21.3%	18.4% / 18.3%	6 – 8%
Net Loss Margin (incl. Gift / ex. Gift)	(25.5)%	(19.1)%	(13.0)% / (12.4)%	(6.5)% / (6.2)%	–
EBITDA Margin (ex. Gift)	(23.2%)	(16.9%)	(9.9%)	(3.3%)	8 – 13.5%

Note: Figures for FY2016-FY2018 and Q2 2019 are actual as reported in our financial statements.

(Presentation www.carvana.com)

We notice that CVNA wants to evolve from being one timeless efficient than KMX (18% to 9%), to become one time more efficient (5% advertising excluded).

Compensation and benefits

For both companies, compensation costs run presently at 5% of revenues. As mentioned before, labor cost related to inspecting and reconditioning is included in the cost of sales. SG&A compensation and benefits concern mostly outbound logistic, selling, administrative, and IT staff. We know that CVNA's business model is based on lowering real estate exposure and avoiding to hire sales.

CVNA currently employs around 4,000 people versus about 25,000 for KMX. We have to put this in the context of five times lower 2019 projected revenues for CVNA. Compensation and benefits regarding IRC are not included in the compensation and benefits. In other words the company has been hiring massive upfront for the Call Center, outbound logistics, administrative tasks, IT. To reach the long term financial goal of SG&A amounting to 5% of revenues, the company has to cut these costs at least by half relative to revenues. In other words the company needs to be able to sell twice as many cars with the current number of employees. Upfront hiring must be massive.

Or maybe the business model of CVNA is not as profitable as planned. We know that the process of buying a car from CVNA must be efficient and comfortable. Why do online retail companies offer a 24 hour delivery for goods we keep during the years? Many purchases are based on fast-changing emotions and the online retail market knows that it has to react fast against the omnipresence of physical stores. Buying a car is more complicated than buying a toothbrush. Some paperwork has to be analysed by the company and checked for errors. The potential of mistakes from the company but also from the client (supplier) in the process is much higher. Errors mean delay and need for help. At any stage of the sales process the potential customer needs to be able to get fast and easy help. CVNA cannot afford to put its leads into a waiting line or employe low qualified persons. I conclude that the lack of sales employees is at least partially compensated by the need of a well-performing call center, as well as higher IT and administrative expenses.

The problem is that as long as the market does not request a profit the company might tend to justify a further increase in compensation costs on the need for fast growth.

Market Occupancy (CVNA) / Store Occupancy (KMX)

These costs do not include anything related to IRC. It mainly concerns the occupancy costs of the vending machines and, for KMX, the costs related to the stores that are not included in Gross Margin.They amount to 4.7 MUSD for CVNA versus 96.9 MUSD for KMX. Those costs should be non existent for a real online retailer. Remember the critics AMZN got when they purchased Wholesale? You can call them vending machines; they are a cost factor. Of course, there are not directly linked employees, but the company has to build them, rent the land, and the IT costs are probably higher than for a general store.

CVNA currently operates nineteen vending machines. This gives us operating costs, in Q2, of around $250,000 per vending machine. Whereas the KMX store costs about $500,000 (of course the standard deviation can be high) per store per quarter.

Vending machines / Stores	19	203
Per revenue	$ 51,906.37	$ 26,435.06
Costs per unit	$ 250.00	$ 500.00
Same revenue CVNA KMX	103	203
Total Costs	$ 25,846.14	$ 101,500.00

(personal Excel)

CVNA operates one vending machine for $50 million of revenues, twice the numbers of KMX. If we increase this number linearly to match KMX's revenue numbers, CVNA will operate around 100 vending machines for 25% of the costs of KMX. CVNA might save up to $75 million on market occupancy costs, or about 1.3% of total revenues. Of course, one can argue that CVNA will leverage those vending machines even more. However, I do not think this is the case. A vending machine is a marketing tool and to some size, helps to decrease outbound logistics.

KMX generates a net margin of 4.5%, saving 1.3% is incredible. However, all other factors stay the same. The 1.3% saving potential in net margin does not justify the current valuation of CVNA. The more vending machines CVNA will open the closer its business model to the one of KMX, however with one huge disadvantage that vending machines cannot help to improve the ratio of cars purchased from customers.

Logistics

CVNA is delivering cars for free in markets or against a fee off markets. Customers also face the option to pick up their cars at vending machines.

(3) Logistics includes fuel, maintenance and depreciation related to operating our own transportation fleet and third party transportation fees, except the portion related to inbound transportation, which is included in cost of sales.

(10Q Q2 2019 CVNA)

The outbound logistics costs per car amount to $310 per car in Q2 2019.

	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19		
Units sold	22570.00	25324.00	27750	36766	44000	**20%**	**95%**
Other Revenues	$20,742.00	$23,212.00	$32,651.00	$38,375.00	$67,422.00		
Total GPU	$2,173.00	$2,144.00	$2,131.00	$2,429.00	$3,132.00	**29%**	**44%**
Logistic costs	$7,826.00	$9,913.00	$11,140.00	$12,249.00	$13,643.00	**11%**	**74%**
Logistic costs per Ret unit	**$346.74**	**$391.45**	**$401.44**	**$333.16**	**$310.07**	**-7%**	**-11%**
Logistic costs per Total Unit			**$343.12**	**$281.80**	**$249.16**	**-12%**	
Real Total GPU	**$1,826.26**	**$1,752.55**	**$1,729.56**	**$2,095.84**	**$2,821.93**	**35%**	**55%**

(personal Excel Sheet)

If I adjust this number to KMX's revenues, I get $75 million of outbound logistics costs or 1.4% of revenues. I do not consider logistics for wholesale vehicles that should also be slightly higher for CVNA. This completely offsets the potential gain in market occupancy costs.

It is not wrong to fall back to a more asset-intensive (old way of buying cars) model. Indeed, building an old-fashioned offline model this fast is a huge accomplishment. However, it kills the dream of a more efficient way to sell cars and would probably have a significant negative effect on the stock price.

The last mile is the most expensive mile, given that among other facts, it is more difficult to leverage. By leverage, I mean transporting the maximum numbers of cars on a truck to a certain point. Even if the cost of transportation can be divided by ten cars during 99% of a 100-mile trip, this quickly decreases during the last mile. The more cars a truck can transport, the more expensive the last car will be. The CVNA business model foresees that every vehicle gets delivered by a branded delivery truck driven by a CVNA employee. If we add the time pressure and the important number of markets the company wants to cover, we can conclude that CVNA is paying a lot for that last mile (and is paying twice of what we saw before).

- ***Logistics and fulfillment.*** We transport vehicles purchased by our customers to their local market for home delivery or pick up. In markets where we have launched operations, delivery to the customer is completed by a Carvana employee in a branded delivery truck. In a subset of these markets, customers have the option of picking up their car at one of our vending machines. These vending machines are multi-story glass towers where our customers deposit a token into a coin slot and an automated platform delivers the purchased vehicle to a garage bay where the customer is waiting. Our vending machines provide an attractive and unique customer pick up experience, developing brand awareness while lowering our variable vehicle-delivery expense. Our logistics and fulfillment operations are supported by our proprietary vehicle-transportation management system, which optimizes the scheduling of transport routes and delivery slots.

(10K 2018 CVNA)

I think CVNA can further leverage outbound logistics costs mainly because it is currently building up logistic capacities. It has to buy equipment (amortization) and pay third-party delivery services. Third-party logistics companies are running on low margins and are efficiently managed. To gain more than the net margin of one of those companies is, however, going to be difficult.

I do not think that CVNA can leverage this number enough. To leverage costs by 1% of revenues, CVNA needs to decrease the logistic costs per retail unit sold by $165, or by more than 50%!

	Mar-16	Jun-16	Sep-16	Dec-16	Mar-17	Jun-17	Sep-17	Dec-17	Mar-18	Jun-18	Sep-18	Dec-18	Mar-19	Jun-19
Units sold	3783.00	4355.00	5023.00	5600.00	8334.00	10682.00	11719.00	13517.00	18464.00	22570.00	25324.00	27750	36766	44000
Other Revenues										$20,742.00	$23,212.00	$32,651.00	$38,375.00	$67,422.00
Total GPU	$1,046.00	$1,386.00	$1,347.00	$1,184.00	$1,169.00	$1,501.00	$1,742.00	$1,619.00	$1,854.00	$2,173.00	$2,144.00	$2,131.00	$2,429.00	$3,132.00
Logistic costs	$1,431.00	$1,832.00	$2,252.00	$2,835.00	$2,808.00	$3,116.00	$3,905.00	$4,555.00	$6,318.00	$7,826.00	$9,913.00	$11,140.00	$12,249.00	$13,643.00
LC per unit	**$378.27**	**$420.67**	**$448.34**	**$506.25**	**$336.93**	**$291.71**	**$333.22**	**$336.98**	**$342.18**	**$346.74**	**$391.45**	**$401.44**	**$333.16**	**$310.07**

(personal Excel table)

As you can see in this Excel table above, the company managed to decrease those unit costs by around 30% over the last three years.

KMX tries to offer an as a large as possible selection of inventory by making its nationwide inventory of 70,000 cars available to its local clients. Upon request, the company will move any vehicle in their inventory. Currently, around 34% of cars sold are transferred by customer request. This means that 66% were bought locally without additional outbound logistics costs for KMX!

We maximize customer choice by offering a large selection of inventory on our lots and by making our nationwide inventory of approximately 70,000 retail vehicles as of February 28, 2019 , available for viewing on carmax.com, as well as our mobile apps. Upon request by a customer, we will transfer virtually any used vehicle in our inventory. This gives CarMax customers access to a much larger selection of vehicles than any traditional auto retailer. In fiscal 2019 , approximately 34% of our vehicles sold were transferred at customer request.

(10K 2018 KMX)

CVNA, on the other hand, needs to move every car, given that consumers cannot pick up cars at IRCs even if vending machines are sometimes close to IRCs. This is a considerable disadvantage for CVNA. I believe that reducing those outbound logistic numbers has the same importance as increasing the purchase from consumers in the gross margin, meaning they are necessary for the survival of this business model. If CVNA starts implementing more smaller logistic centers, the dream of an asset lighter model will be softened.

Advertising

Advertising costs in Q2 2019 are around $50 million, up 88% Y/Y and 27% Q/Q. To put this abstract number into context, in Q2 2019, KMX spent $40 million and generated 5.5 times higher revenues. CVNA pays around $550,000 per day for advertising to sell around 490 used cars a day, or $1,100 per retail car sold. Compared to KMX, there is a 4% potential for decreasing this cost factor.

I believe that the company can leverage this number considerably. The need for advertising is less to create a brand and more to convince people of a new way to buy and sell a car. By how much could advertising costs fall? CVNA has less brand exposure through stores and has fewer salespeople. The advantage of hiring a salesperson to an IT guy is that a salesperson helps create a brand and future turnover.

Furthermore, we are in a dynamic world where competition reacts. If this new form of buying and selling used cars proves to be more demanded and more efficient, the competition will adapt their business models and increase advertisement spending. Therefore, advertisement spending will rise again, but this time, more brand orientated. Management forecasts advertising costs of around 1% to 1.5% in the long-term future, meaning no productivity gain versus the KMX model. I do not believe they can match that during the next five years.

Other

Other costs amount to 6% of revenues for CVNA and 1% for KMX.

(4) Other costs include all other selling, general and administrative expenses such as IT expenses, corporate occupancy, professional services and insurance, limited warranty and title and registration.

(10Q Q2 2019 CVNA)

IT expenses are especially of relevance. We acknowledge that CVNA's business model is currently more focused on IT than KMX. KMX also needs a well-working Internet site. However, I believe the main difference lies in IT for its logistic system, its call center, and fully automated vending machines. I also think that the CVNA business model will be more administrative heavy because the nonprofessional counterparty is performing more tasks that require a cost-intensive control and correction.

Overall, I forecast in the best-case 5-year scenario SG&A of 10% per revenue compared to the 9% per revenue for KMX, in addition to the forecasted lower gross margin.

		CVNA Q2		CVNA LT Forecast		KMX		KMX applied to CVNA	My forecast	
		Jun-19				Jun-19				
Compensation and benefits (1)	Same	$ 54,184.00	5%	3%	$ 24,655.53	$ 270,900.00	5%	$ 49,785.96	4.0%	$ 39,448.84
Advertising	Same	$ 50,367.00	5%	2%	$ 14,793.32	$ 41,900.00	1%	$ 7,700.37	2.0%	$ 19,724.42
Market occupancy (2) (Store Occupancy)		$ 4,720.00	0.5%	0.2%	$ 1,972.44	$ 96,600.00	1.8%	$ 17,753.13	0.3%	$ 2,958.66
Other (4)		$ 57,514.00	6%	2%	$ 19,724.42	$ 80,300.00	1%	$ 14,757.52	2.5%	$ 24,655.53
Logistics (3)	Not KMX	$ 13,643.00	1.4%	1.0%	$ 9,862.21		0%	$ -	1.2%	$ 11,834.65
Total		**$ 181,843.00**	**18%**	**7%**	**$ 71,007.91**	**$ 489,700.00**	**9%**	**$ 89,996.98**	**10.0%**	$ 98,622.10

(Personal Excel Sheet)

So why are CVNA 3.5 times 2019 sales and KMX just around 0.75 sales, or 5 times less?

If you believe that my cost calculation is nuts, you furthermore need to think that KMX (or any other public listed lower-valued company) cannot react accordingly and adapt its business model during the years CVNA is catching up revenue. Or you believe that the period of catch up is less risky and/or cost-intensive than the downsizing or modifying the business model. One could also argue that CVNA is fairly valued and KMX just cheap, but why not just buy KMX then.

CVNA has, at least in the eyes of its shareholders, a reasonable justification of these losses. This means that it is smarter to grow fast than grow slow and generate profit during the growing process with the goal to maximize the sum of all profits and losses at a given point in the future. Keep in mind we know that CVNA is paying high interest for the capital; it needs to grow so fast.

Justification of losses

A fast-growing young company like CVNA cannot blame its losses on lousy market conditions. The more common explanation is the necessity of fast growth. This fast growth is sometimes the optimum decision in the case of Blitzscaling, for example.

Moat

A moat in business refers to the ability to maintain competitive advantages over its competitors to protect its long-term profits and market share from competing firms. To have a future competitive advantage, CVNA needs to invest and/or create a very strong brand and/ or lock-in clients.

Capex

Do current investments of CVNA show that the company creates a moat, that CVNA builds future high barriers for new market entrants?

Cash Flows from Investing Activities:		
Purchases of property and equipment, including $6,282 and $0, respectively, from related parties	(88,137)	(73,425)
Principal payments received on beneficial interest in securitization	1,108	—
Business acquisitions, net of cash acquired	—	(6,670)
Net cash used in investing activities	(87,029)	(80,095)

(10Q CVNA 2019)

During the first six months of 2019, Capex was around 5% of revenues.

(in thousands)		
		June 30, 2019
ASSETS		
Current assets:		
Cash and cash equivalents	$	40,200
Restricted cash		2,196
Accounts receivable, net		42,128
Finance receivables held for sale, net		177,705
Vehicle inventory		606,534
Beneficial interests in securitizations		45,192
Other current assets		43,587
Total current assets		957,542
Property and equipment, net		392,240
Operating lease right-of-use assets, including $42,019 and $0, respectively, from leases with related parties		91,607
Intangible assets, net		8,096
Goodwill		9,353
Other assets, including $3,470 and $1,895, respectively, due from related parties		15,566
Total assets	$	1,474,404

(10Q CVNA 2019)

As you can read from the table above, the company invested about $400 million into its IRCs and has the goodwill of around $8 million. Building up a nine-IRC network is not a difficult task. However, I understand that CVNA is in a unique position because it can benefit from the existing network of Drivetime. However if the company manages to leverage logistic costs at an important scale, it might acquire some knowledge that can be considered as a moat.

Is it necessary to open so many markets that fast and create the necessity of more IRCs? Why could it not be done in a slower and more profitable manner? I do not think that the company is more productive by operating more IRCs. There are also no non-IRC related significant costs that would need to be leveraged fast (IT costs are not substantial enough). A larger inventory decreases day of sales, or in other words, it is more efficient to match offer and demand. Is this a good reason to scale the business model that fast considering that managing a fast-growing company efficiently in a very low gross margin sector is riskier.

The Silicon Valley notion of “Blitzscaling” means rapidly building up a company to serve a large market to become the first mover at scale to justify losses. It is mostly about Software that has a natural affinity with Blitzscaling because the marginal costs of serving any size market are virtually zero. Even if the business model of CVNA is based on some software, it is only a tiny part of their overall costs, and there is no IT knowledge that could not be replicated in the short term of time.

The more straightforward answer is probably the ease of issuing new class A common shares. The management gets a free Call Option on its business.

We know that CVNA rents 6 of its 9 IRC from DriveTime. To put this into context, CVNA got spin-off from Drivetime in 2017. The economic spin-off never happened.

			Operating Leases (1)		
	Capital Leases	Other Real Estate Financing Transactions (3)	Related Party (2)	Non-Related Party	Total
2019	$ 3,779	$ 3,566	$ 6,461	$ 8,306	$ 14,767
2020	3,779	3,575	6,716	8,202	14,918
2021	3,779	3,583	6,869	7,387	14,256
2022	3,779	3,609	7,020	6,580	13,600
2023	3,275	3,837	7,140	5,330	12,470
Thereafter	—	62,081	36,770	38,402	75,172
Total minimum lease payments	$ 18,391	$ 80,251	$ 70,976	$ 74,207	$ 145,183
Less amounts representing interest	(2,237)				
	$ 16,154				

(10Q CVNA 2019)

On a contractual basis, CVNA owes around $70 million to those related parties. Why are Drivetime and Verde renting out all those places to CVNA? Where does that space come from? Is their business not working? Could we even consider those IRCs as moat given that the related company sells used cars on credit?

The fast growth of CVNA mostly likely pushes competitors to react quicker and more decisively. But is that good or bad for CVNA? I conclude that CVNA does not build a fortress with a moat to protect itself from future online competition but has to face them on a large open field.

Brand

Does CNVA manage to build up a brand by spending $550,000 per day on advertising? In other words, do customers choose CVNA over a competitor offering the same product, as we often see it in the food industry? Cars are not fungible assets. They exist in different brands, models, options, exterior, interior colors, mileage, etc. For every variable, the consumer must make a difficult trade-off if he compares two cars that distinguish themselves only by a few options. I believe that a well-known brand drives internet visits. However, I do not think that a potential client buys or sells without comparing offers from other competitors, online and offline.

In my opinion, the car itself is more important than the internet site you are buying it from. The value of getting the possibility to make an offer is a precious asset, especially in a market with multiple competitors. However, this advantage is closely related to the size of the offered cars and prices. I conclude that CVNA creates a brand name, but the value is limited. Furthermore, given that competition is likely to increase, CVNA has to keep advertising spending at a high level.

Lock-in clients

Used car sale cycles are longer than most other sale cycles of products sold over the internet. You probably buy an electrical device from Amazon (AMZN) or piece of furniture from Wayfair (W) more often than you do a car from a car dealer. You get into a habit of buying something the same way at the same place. The one-button click purchase invention by AMZN would not produce the same effect for selling used cars. Facebook (FB) users are locked in. I tend to use Uber (UBER) in any city I travel even if there are competitors. I even believe that even Netflix (NFLX) or Wayfair (W) has a particular lock-in. But given the longer sales cycle and the higher stakes, you will probably put a more conscious effort in a buying decision with pondering different alternatives than buying a new toothbrush.

Reaction of competition

Is selling cars online a disruptive innovation? CVNA is adding a new sales channel by delivering cars at home as well as a new way to sell your car online and get it picked up. I do not think that there is any disruption at this point because of the effect on market-leading companies. For years, large and small dealers have already been adapting their online offer due to new software improving the offering of their bi-products. They have given customers access to more data and transparency by reducing for example haggling in the car selling process. They simplified the often hazardous and intransparent financing process. In general, they slowly start offering all the services and products CVNA is offering. On the other hand, most are resilient to provide home delivery or pick up your car. Is this because they can't react?

Let me briefly compare it to the related car manufacturer market. I have been short for some time on companies causing the disruption (like TESLA) and companies suffering from the disruption (BMW, CONTINENTAL, OSRAM, SIXT). Switching from an ICE engine to an electrical motor is a complicated task. Car manufacturers have to acquire new know-how (electrical engineering vs. mechanical engineering) and have to invent and built new production lines and new supplier networks. Furthermore, they face a fast and uncontrolled devaluation of their main assets in the balance sheet (at least for German car malfunction). Finally, they tend to offer the two technologies that are very costly (EV and ICE) because they are uncertain about the future evolution of electric cars. What is essential is that the disruptive innovative companies like Tesla (TSLA) suffer as much as the oldfashioned companies, from the lower gross margin, higher research, and development spending, faster technology advancement (more rapid depreciation of assets), higher advertising need and much more. Many technical experts think that the potential profit from an electric car (after-sales) is much more limited than for an ICE car.

The future competition will need IRCs combined with logistic know-how, as well as inventory. If the demand for this all in one offer with home delivery as well as home pick up is impressive, and the business model is profitable, companies like KMX who own a large inventory are perfectly positioned to compete. KMX has plenty of time to adapt its sales channel to a multichannel one. As we saw before, overhead costs related to stores do not play an essential role in the overall business model. But why should they react fast? Why should they offer nationwide delivery? They plan to open thirteen new stores in 2019 because their stores are profitable, and they assume those new ones will be depreciable over many years. In the case of such a new service or product, it is necessary to tradeoff between reacting too late and responding too early and risk weakening a good business. Afterward it will be challenging to take a product or service away. It is worth reading articles like the one from the Wall Street Journal from 1996: Wall Street Whiz Finds Niche Selling Books on the Internet (https://www.wsj.com/articles/SB832204437381952500) about technology companies during the end of the 90s. It makes it easier to understand how difficult it was to forecast the success of AMZN. Was it possible for competition (and investors) to predict the AWS cash machine? CVNA proved that there exists a demand for the all-inclusive online offer, but there will also be people that want to kick the tires for a long time. And it is definitely easier and faster to scale up the online business than it is for CVNA to build up a network of stores. KMX does not operate huge factories that would need to be closed but could react by closing slowly non-performing stores. So why offer nationwide home delivery or pick up if CVNA did not manage for it to be profitable and your business model is working.

We should not forget the increasing potential competition from car manufacturers. Their sector currently gets shaken by several significant trends. These include the before-mentioned electrification, ride-hailing, autonomous driving and a younger generation that is less willing to spend a substantial amount of money on an asset that is not often used. The market is changing and shrinking. This pushes those companies into other territories, among others, used car market sales and financing.

Regarding the lucrative business of finance receivables, competition tends to increase. The financial department of KMX finances 43% of the used cars sold. The market gets more and more crowded by banks, specialized lenders, and used car dealers such as KMX and CVNA. Progress in software and data solutions make it possible for smaller independent used car dealers to sell a competitive finance package. If competition increases, prices will come down and inhibiting thresholds of selling cars to low creditworthy customers increases. Currently, KMX does not give credit to customers under a certain credit rating but prefers to pay a fee to third party insurers.

CVNA did not, at least until now, cause a disruption of the used car market. Nevertheless, I believe that there are risks that the market gets disrupted in the long future (maybe the same future CVNA wants to sell 2 million cars). Electric cars have fewer moving parts, and the main component is the battery, composed mostly of commodities. Buying a used electric car is different from buying a used ICE car. The IRC aspect changes completely and companies like CVNA or KMX have less added value to give. In a much more mature electric car market, the effect on the prices of used ICE cars is disastrous. Even if CVNA keeps its cars on average for only two months, the risk of very fast asset depreciation combined with a more difficult forecast of what asset to buy might cause real disruption.

Investment case

Hereafter, I consider the most optimistic forecast for the furthest year in the future. Wolfe Research forecasts $17.5 billion of revenues in 2023. If I consider that KMX increases its revenues by 6% (average analyst estimation) it takes CVNA another five years to generate the same amount of revenues

	CVNA			KMX		
	CVNA revenues		Cvna	KMX revenues	KMX growth	
Years		Growth	abolsut			
2019	$ 3,750.00		$ 1,915.00	$ 19,000.00		
2020	$ 6,375.00	70%	$ 2,625.00	$ 20,140.00	6%	$ 1,140.00
2021	$ 9,881.25	55%	$ 3,506.25	$ 21,348.40	6%	$ 1,208.40
2022	$ 13,833.75	40%	$ 3,952.50	$ 22,629.30	6%	$ 1,280.90
2023	$ 18,675.56	35%	$ 4,841.81	$ 23,987.06	6%	$ 1,357.76
2024	$ 24,278.23	30%	$ 5,602.67	$ 25,426.29	6%	$ 1,439.22
2025	$ 29,133.88	20%	$ 4,855.65	$ 26,951.86	6%	$ 1,525.58
2026	$ 33,503.96	15%	$ 4,370.08	$ 28,568.97	6%	$ 1,617.11
2027	$ 36,854.36	10%	$ 3,350.40	$ 30,283.11	6%	$ 1,714.14
2028	$ 40,539.79	10%	$ 3,685.44	$ 32,100.10	6%	$ 1,816.99
2029	$ 44,593.77	10%	$ 4,053.98	$ 34,026.11	6%	$ 1,926.01

(personal Excel sheet)

CVNA currently covers around 80% of the US population. (CVNA's 10k 2018 mentions that 85 markets collectively represent approximately 58.6%. In the first 6 months the company opened 52 more markets). During the last quarter, the company opened more markets than at any time before. Are the first clients in new markets low hanging fruits? What triggers me is that the company on the one side sells its low asset business and says that its IRCs are ready to handle 350,000 cars a year. On the other hand, it penetrates faster and faster into new markets and spends more on advertising than planned, which is to some degree a direct effect. Does that mean that demand is not high enough? A software-based asset-light business only has a few limits regarding growth. The answer is probably a mixture of demand and the difficulty of scaling up as a logistic company.

To achieve this objective, the company has to increase its revenues up to 100% faster in absolute terms than it did during the year 2019. Furthermore, CVNA needs to find twelve times (to match KMX ratio) more people that sell their cars online during the next years. In 2018, there were around 40 million transactions of used cars in the US or 25 million for vehicles between 0 and 10 years. Selling older cars increases the risk of costly returns and decreases the price and thus the possible gross margin without reducing the logistic costs.

Many cars are already sold over the internet nowadays, but I think the "all-in" offer, including home delivery and pick up is still very limited. Jeff Bezos was hesitant to decide to start with books or music. Twenty-five years later AMZN still does not offer the prime membership (free delivery) for used cars. So, what is the potential market penetration of those cars? The 2 million cars CVNA wants to sell (is a forecast without time span a valuable forecast ore more a carrot?) equal a market penetration of around 8%. Furthermore, if we consider that 30% of computers and electronics are sold online, we get a market share of 33%.

There are many studies (among other https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/used-cars-new-platforms-accelerating-sales-in-a-digitally-disrupted-market) that examined the barriers and potential for the online purchase of cars. I deduct that over half of people want to test drive a car, or/and see the car the in-person or/and can a possibility to easily return the car. Of course, new generations have different buying behavior, but I think we can agree that selling a used car over the internet is more complicated than a book or computer. To push online sales retailers are trying to facilitate as much as possible returning a product even if it ends up in generating losses. The very important confidence aspect is directly linked with the potential of returning the product and getting your money back. For many online retailers, more than one-third of the products are returned, for free. For cars this is difficult and maybe even impossible. Cars have to be returned to an IRC to get reinspected.

I doubt therefore that an all in one online offer will have a similar market penetration as computers and electronics.

As I wrote before, many independent dealers supported by modern software companies, larger dealers like AN and KMX are introducing fully or at least partially online offers. However, they are with good reason reluctant to offer free at-home delivery or pickup.

The stock prices of CVNA and KMX are currently trading in a very close range, around $80. KMX has 10% more outstanding shares. Hereafter, I assume a price increase of 15% a year over the next five years. I consider this 100% higher performance over average market performance the minimum, even the most bullish investor should request to offset the higher risk.

Years 2018	$ 1,785.00	Growth	Absolut growth	Net Margin	Net Profit	P/E without Dilution	Profit per share (interest included)	PE $ 80.00	Stock increase 15%	PE
2019	$ 3,750.00		$ 1,965.00	0.0%	$ -					
2020	$ 6,375.00	70%	$ 2,625.00	1.0%	$ 63.75	$ 196.08	$ 0.43	$ 188.24	$ 92.00	216
2021	$ 9,881.25	55%	$ 3,506.25	2.0%	$ 197.63	$ 63.25	$ 1.32	$ 60.72	$ 105.80	80
2022	$ 13,833.75	40%	$ 3,952.50	2.5%	$ 345.84	$ 36.14	$ 2.31	$ 34.70	$ 121.67	53
2023	$ 18,675.56	35%	$ 4,841.81	3.5%	$ 653.64	$ 19.12	$ 4.36	$ 18.36	$ 139.92	32
2024	$ 24,278.23	30%	**$ 5,602.67**	**4.5%**	**$ 1,092.52**	**$ 11.44**	$ 7.28	$ 10.98	$ 160.91	22
2025	$ 29,133.88	20%	$ 4,855.65	4.5%	$ 1,311.02	$ 9.53	$ 8.74	$ 9.15	$ 185.04	21
2026	$ 33,503.96	15%	$ 4,370.08	5.0%	$ 1,675.20	$ 7.46	$ 11.17	$ 7.16	$ 212.80	19
2027	$ 36,854.36	10%	$ 3,350.40	5.0%	$ 1,842.72	$ 6.78	$ 12.28	$ 6.51	$ 244.72	20
2028	$ 40,539.79	10%	$ 3,685.44	5.0%	$ 2,026.99	$ 6.17	$ 13.51	$ 5.92	$ 281.43	21
2029	$ 44,593.77	10%	$ 4,053.98	5.0%	$ 2,229.69	$ 5.61	$ 14.86	$ 5.38	$ 323.64	22

If the company manages to increase profitability during the following years to attain a 4.5% net margin in 2024, price-earnings will be 22 in 2024, and the company has a market capitalization of a minimum $25 billion.

KMX, the industry overachiever, is trading currently at a P/E of 17. What will be the P/E of the whole sector? A 10% revenue increase in 2024 amounts to around 2.5 BUSD, taking into account that the overall used car market is not at all growing, this means that somebody else is losing the 2.5 BUSD of revenues per year. Online-based competitors will offer the same services of giving credit and home delivery and pick up (if proven profitable) without owning the car (eBay Motors, TrueCar, etc.). KMX is planning to open fifteen new shops in 2019, an increase of 7.5%. The company has been increasing its market share for years now and is only valued at the current P/E of 17. However, the company will increase its revenues by $1.5 billion in 2019, around the same amount that CVNA did. Why does this higher percentage increase create such a hype? Does it say anything about the potential increase in absolute numbers five years ahead of now? How would the KMX stock react to the news that the company is, in addition to the local access of its four times larger inventory, offering nationwide home delivery, by being profitable besides the higher investments?

In short, buying or not selling the class A common Stock of CVNA is a bet on:

- An even faster revenue increase (absolute) over at least five years;
- A fast-growing number of people willing to sell their car online;

- CVNA managing to decrease its SG&A by 75% relative to revenues;
- No appropriate (size and profit) reaction of competition (otherwise, why would the competition be relatively lower-valued?).

The last condition defines a possible investment. The used car market is very fragmented, which means that no larger company managed to acquire a substantial market share. KMX estimates their market share in the under 10-year-old cars at around 3.3%. This keeps the dream intact that CVNA manages to do it and will be the dominant company of the overall used car market in the long-term future.

Conclusion

I do not think CVNA is an innovative tech company. The main novelty they introduced is home delivery and pick up, a service that is far more linked to old fashioned trucks and drivers than high tech software. CVNA did not change the very competitive low margin environment of the used car market. On the contrary, by offering the clients more logistic services, it even worsened the overall profitability.

I further do not think that this new service will cause any disruption to the used car market business. Indeed, competition is not forced to react abruptly, but can slowly adapt its business by analyzing if it is worth doing so in terms of demand and profitability. Selling online and delivering the product for free at home might sound technical even 23 years after the invention of the internet, but it is more about logistics.

There are also big question marks about future demand, an especially offer of online sold cars, considering that CVNA has to grow much faster during the next years to justify its current valuation.

Finally, I believe that the combination of the complex legal structure, non-transparent financial transactions, complicated controllable transactions between closely related companies, the huge insider selling, the low moral standard of some closely associated persons make this company uninvestable.

I hope you liked reading as much as I liked writing it.

Marc Daubenfeld