A High Price For A Non-Scalable Business Model

GLACIER CAPITAL

Luxembourg, October 9th, 2018

Dear Limited Partners,

I am pleased to present you here after an analysis of CARVANA.

Introduction

CARVANA (CVNA) first took my attention in September last year. I found the idea of disrupting the used car market very compelling and after reading a few articles about the company I decided to put it on my watchlist. The stock was trading under 20 USD at that time.

A couple of month ago I gave it a closer look, especially after noticing that it was the best performing stock on my watchlist, now trading at around 60 USD.

Did I, and maybe do I still miss something? Or is it may be an interesting stock to sell short?

Business Model

CVNA is a spinoff of Drivetime, the former Ugly Duckling company. The story around that company and its main shareholder is worth reading

(How An Ex-Con Became A Billionaire From Used Cars).

CVNA operates in the used car market. This market is very fragmented, top 100 Used Auto Retailers own 7% of market share.

CVNA's business model is rather straightforward – the company buys used cars mainly at auctions, reconditions them, and sells them to consumers over the Internet nationwide.

When a consumer purchases a car, CVNA will either deliver that car "straight to your driveway" or the purchaser can pick up the car from a CVNA Vending Machine.

CVNA estimates also that consumers do not like to interact with car sales people, they judge them often as not being honest.

Hereafter, you find an explanation of the CVNA CEO, Mister Garcia, during the last earnings conference call on September 7.

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Ernest C. Garcia - *Carvana Co. - Founder, President, CEO & Chairman*

Sure, I'll try to be brief there. So we sell cars online, is kind of the briefest description. And what that basically means, we're vertically integrated, we're buying cars, we own them in our inventory, we ship them to 1 of 4, soon to be 5, reconditioning centers, where we put about $1,000 of parts and labor in every car. We then photograph the, list them on our site. Customers can go through the entire purchase process, including getting approved for financing, getting a trade-in value, applying that to their financing, signing contracts, scheduling delivery online. We then have our own logistics network that delivers cars to customers -- all the way to customers' doors through 2 steps: one is kind of a multi-car haulers that go from inspection centers to city; and then one is single-car haulers, with uniformed employees that go from city to customer's door. And that's a business model. We think the opportunity is enormous. We are in the trillion-dollar, roughly, automotive retail market. The used market alone, I believe, is something in the order of $700 billion or something like that. The largest player has a sub-2% market share. The largest 100 players combined have 7% combined market share. So we think there's just a huge opportunity for us to have this new offering for consumers and continue to grow it.

In summary, CVNA:

1. Acquires cars in auctions from retail clients and mainly based on algorithms and over the internet; Variables are model, date, price and location where it can be sold
2. Transports those cars to the best located fulfilling center in relation with purchasing and probable sale location; main variable is sale location
3. Sells those cars over internet; main variable is matching offer with demand
4. Delivers the cars by next day or customers can pick them up at one of their 7 sales center/ vending machines; the main variable is location of the car before being sold

CVNA differentiates itself to established companies like CARMAX (KMX) at the level of its distribution channels. KMX, that has a market share of around 1.7 % of the 739 BUSD U.S. used vehicle sales market (2016). It is selling its cars through around 200 stores; where CVNA's business model is internet based in combination with 7 sales centers and 4 Inspection and Reconditioning centers (IRC), serving around 44 markets.

KMX customers pick up their car at a local store whereas CVNA delivers the car for free the next day. The higher costs of logistics are saved on stores and employees.

In fact, in accordance to point 3 and 4, CVNA does not need to put in place sales centers in a new market, but just needs to open its internet site for a new region.

The vending machines (pictured below) are used as marketing tools in new markets.

CVNA can, in principal, penetrate new markets much faster and at lower costs because they do not need to rent or buy stores and hire local staff.

This business model also makes the penetration at first view much cheaper. This is because there is no high CAPEX, apart from marketing expenses and maybe a vending machine.

CVNA is using this fast-lower cost market entry to expand rapidly. On September 20th, the management announced that it is now also delivering cars to NYC.

It wants to use a nationwide offer to match local demand by minimizing transportation costs. The company pretends that its business model will be more efficient (demand matches offer), more flexible (easier to penetrate new markets) and finally more profitable (less CAPEX and overhead costs) than the old-fashioned way of selling cars through local dealers.

Before analyzing the business model of the company in detail, I will briefly go through the valuation to understand how the market valuates it.

Valuation

I value CVNA, hereafter, relative to market (as to say discounting interest) and relative to KMX.

I consider KMX as the main peer, even if the distribution model differs. I weigh the fact that both companies acquire the ownership of cars higher than the closeness to more internet-based companies such as CARGURUS (CARG), that only occur as an intermediary.

KMX is the largest used car sales company in the US with a market capitalization of roughly 14 BUSD compared to CVNS's 8 BUSD.

- Sales

Price to Sales ratio is around seven times higher than the one of KMX.

Three Months Ended June 30,			Six Months Ended June 30,		
2018	2017	Change	2018	2017	Change
(dollars in thousands, except per unit amounts)					

Per unit selling prices:						
Used vehicles	$ 19,403	$ 18,156	6.9 %	$ 18,813	$ 18,002	4.5 %
Wholesale vehicles	$ 4,544	$ 4,948	(8.2)%	$ 4,459	$ 4,722	(5.6)%

CVNA average selling price is 19.403 USD compared to an average selling price of 20.005 USD for KMX.

This is a difference of 602 USD or 3.1%.

Average Selling Prices

	Three Months Ended August 31			Six Months Ended August 31		
	2018	2017	Change	2018	2017	Change
Used vehicles	$ 20,005	$ 19,667	1.7 %	$ 20,036	$ 19,570	2.4 %
Wholesale vehicles	$ 4,955	$ 4,957	— %	$ 5,076	$ 5,034	0.8 %

During the last quarter, CVNA sold 22,570 vehicles. This is 680 more than KMX to generate the same revenues.

The price of used cars is especially for CVNA an important factor. The logistic costs are independent to the price of the car; however, the gross margin is in principle dependent on the price. Unfortunately, the company only publishes the average price. The statistical mode price would give us more information.

- Profitability

CVNA generated in Q2 2018 a Gross Profit of 83 MUSD or 9.9% of Sales. KMX generated a Gross Margin of about 12%.

The company is loss making, EBITDA is negative at around 8.8%.

- Inventory

At the end of Q2 2018, CVNA owned 302 MUSD worth of cars to generate revenues of 772 MUSD during the first six month.

KMX needs 2.357 BUSD worth of inventory to generate 9 BUSD, which is a three times higher inventory turnover than for CVNA.

It is understandable that CVNA uses the good economic environment and “easy money” to rapidly build up its brand and revenues, and therefore is not maximizing the inventory level to current revenues.

Therefor I do not take any conclusion on the lower inventory turnover of CVNA at this stage.

- Cash Flow

Operating Cash Flow was -179.485 MUSD compared to the total net loss of 103.922 MUSD. The difference is largely due to the increase of inventory from 11.668 MUSD to 74.817 MUSD during the same period.

Investing Cash Flow increased from 42.579 MUSD to 80.095 MUSD.

Financial Cash Flow amounts to 290.005 MUSD, up from 209.189 MUSD due mainly to proceeds from issuance of common stock (172.287 MUSD). Operating Cash flow plus capex added it up to 259 MUSD.

At the end of Q2, CVNA had 199.192 MUSD in Cash on its balance sheet.

If CVNA wants to continue growing at this pace it needs to raise capital during the next 6 months.

- Leverage

CVNA already accumulated a lot of it despite its young existence. However, the debt to equity level is still lower than the ones of its competitors, even if we must admit that its equity is by far more volatile. The main source of debt for used car companies is its inventory, composed of tangible easy liquidable assets.

CVNA issued a new Note due in 2023 that bears an interest rate of 8.875%.

Currently, I do not see debt as the main issue. It might be a necessary condition (and even sufficient) for future trouble ahead, but currently CVNA seems to have no issues acquiring new money.

At this stage it is not necessary to go deeper into valuation of the company. In fact, we can conclude that CVNA is high valued compared to the general market, or peers like KMX.

The crunch question, of course, is if I do believe that CVNA justifies this high valuation.

The equation of success

How could CVNA justify its current market capitalization of about 8 BUSD in relation with sales of 475 MUSD during Q2 and an EBITDA margin of -8.8%?

Investors in the company of CVNA probably solved the following equation.

Succes (X)= Demand + Money + Profit + Competition

1. Is there a large enough demand for buying cars over the internet to justify CVNA current valuation?

Growth rates are impressive. Revenue increased by more than 100% YOY and GPU increased from 672 USD to 2,173 USD.

As previously described, CVNA sells cars over the Internet. This means that customers do not need to go into a shop to choose a car or even later to pick it up. They can also sell their car without needing to go to a local car dealer. Everything is done online.

CVNA has shown with its impressive growth rates that there is a demand for this internet-based car purchase.

CEO Ernie Gracie stated during the last conference call:

> way to dramatically reduce cost? That then we believe will lead to a way better customer experience. And so we looked at that and we said, "Okay, if we can basically put good pictures online, if we can get customers comfortable that there's a 7-day return policy, if we can take advantage of this fact that 52% of U.S. car buyers are test driving either 1 or 0 cars." And so they kind of recognize this anyway. There's not like a ton of value in that physical touch point. Then we think that we can get consumers to get comfortable buying a car online and all these benefits will kind of flow from that. So I think that was the premise. And I believe that that's kind of playing out. Now I think it takes time to get customers comfortable with anything different. I think you have to invest in a brand that starts to represent trust for customers, and that's something that we're definitely doing.

CVNS spent 26.782 MUSD in advertising during last quarter. By how much these expenses help to build up a sustainable business, meaning that customers are coming back without need of being bought again is uncertain at this point.

I assume that CVNA does not seem to be confronted, in the short and midterm, by any demand restraints.

2. Is CVNA able to match the quantitative offer of that demand to justify the current valuation?

The answer to this question depends on two necessary conditions:

- The economic and monetary environment
- The ability to keep investors in stock and debt on the leash by showing them that their model might be profitable in the future

As mentioned before, CVNA needs more capital to finance its growth. A worsening economic or monetary environment may put an end to this story. However, this is out of the scope of this article.
We will focus on the second condition that is closely connected to the next question.

3. Is CVNA able to generate a future (midterm) profit of around 500 MUSD per year to justify its current valuation?

The difference here is that I consider more the quantified fact of the profit (how much profit) and before (question 2) considered more the qualitative result of the Profit and Loss Account (Profit or Loss).

The used car market, per say, is a very low margin business. Experienced companies like KMX generate a gross margin of around 12%, which is lower than many technology companies' and even industrial companies' net margin.

Why is it a low margin business?

The main factor is that there is high competition in buying and selling used cars, with low market entry boarders. No market participant has the market power to increase used car sale prices, and purchase prices are also independent from companies such as CVNA and KMX. This also explains why the market is so fragmented and so many small independent car dealers can survive. Size does not procure you a determinant advantage in price.

Therefore, I assume that the level of gross margin is capped somewhere around its current levels and cannot be changed by modern technology, at least not past a certain very low level.

We should have closer look at cost of sales.

CVNA defines cost of sales in its annual 10 Q report:

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. 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. Cost of sales also includes any necessary adjustments to reflect vehicle inventory at the lower of cost or net realizable value.

In addition to the purchase price, CVNA includes other elements such as the reconditioning, inspection and the transfer of the car from the buying location to the reconditioning location.

The company is not publishing details of the cost of sales component. Therefore, it is difficult to determine what the percentage of inbound logistic, inspection and reconditioning costs is.

Let us conclude **Gross Margin= (selling price – buying price) + (inbound logistic costs) + (reconditioning costs) + (inventory and financing costs: days to sale)**

I assume that the first variable is the most important and as we stated before is mostly capped by market conditions.

The most known metric for used car sales companies is the Profit Per Unit metric (GPU). I want to underline that there are several gross profits per unit lines as you can see in the following extract of the last quarterly report of CVNA.

Unit sales information:						
Used vehicle unit sales	22,570	10,682	111.3 %	41,034	19,016	115.8 %
Wholesale vehicle unit sales	3,658	1,580	131.5 %	6,000	2,868	109.2 %
Per unit selling prices:						
Used vehicles	$ 19,403	$ 18,156	6.9 %	$ 18,813	$ 18,002	4.5 %
Wholesale vehicles	$ 4,544	$ 4,948	(8.2)%	$ 4,459	$ 4,722	(5.6)%
Per unit gross profit: [2]						
Used vehicle gross profit	$ 1,180	$ 765	54.2 %	$ 1,055	$ 673	56.8 %
Wholesale vehicle gross profit	$ 452	$ 169	167.5 %	$ 501	$ 147	240.8 %
Other gross profit	$ 919	$ 711	29.3 %	$ 901	$ 661	36.3 %
Total gross profit	$ 2,173	$ 1,501	44.8 %	$ 2,029	$ 1,356	49.6 %

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CVNA management prefers to focus investors' attention to the highest, as to say the Total GPU.

It adds up currently to 2,173 USD.

If we compare that number to KMX's Total GPU we note that there is a lot of room to go.

Gross Profit per Unit

	Three Months Ended August 31				Six Months Ended Augu			
	2018		2017		2018		2017	
	$ per unit [1]	% [2]	$ per unit [1]	% [2]	$ per unit [1]	% [2]	$ per unit [1]	
Used vehicle gross profit	$ 2,179	10.8	$ 2,178	11.0	$ 2,197	10.9	$ 2,195	
Wholesale vehicle gross profit	$ 919	17.7	$ 950	18.3	$ 964	18.1	$ 981	
Other gross profit	$ 562	68.0	$ 530	68.1	$ 551	68.8	$ 553	
Total gross profit	$ 3,305	13.7	$ 3,247	13.8	$ 3,319	13.7	$ 3,286	

In fact, KMX generates a total GPU 3.305 USD.

But where does this large difference between Total GPU and used vehicles gross profit come from?

In the following extract you can see that there is revenue line called "other sales and revenues".

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	2017	2018	2017
Sales and operating revenues:				
Used vehicle sales, net	$ 437,922	$ 193,947	$ 771,978	$ 342,329
Wholesale vehicle sales	16,622	7,818	26,755	13,544
Other sales and revenues, including $5,544, $1,898, $9,655 and $3,656, respectively, from related parties	20,742	7,600	36,975	12,565
Net sales and operating revenues	475,286	209,365	835,708	368,438
Cost of sales	426,251	193,326	752,439	342,653
Gross profit	49,035	16,039	83,269	25,785
Selling, general and administrative expenses	95,652	52,011	178,838	97,919
Interest expense, including $0, $1,241, $0 and $1,382, respectively, to related parties	4,165	2,507	7,706	4,566
Other expense, net	468	391	647	609
Net loss before income taxes	(51,250)	(38,870)	(103,922)	(77,309)
Income tax provision	—	—	—	—
Net loss	(51,250)	(38,870)	(103,922)	(77,309)

From a revenue point of view, they seem not remarkable, as they represent only around 4 % of total sales.

However, given that those revenues are generated by the sale of automotive finance receivables to third parties, commissions received on vehicle service contracts (VSC) and sales of Guaranteed Asset Protection (GAP) waiver coverage on vehicles customers bought and

financed with CVNA and have by there no direct link to any cost, they can be considered 100 % Gross Margin revenues.

From a 4% part of sales, those third-party related revenues represent 42 % of Total Gross Margin.

There comes the before seen large difference between Total GPU of 2,173 and used vehicles GPU USD of 1,180 USD.

Especially the sale of automotive finance receivables to third parties depend mostly on independent conditions such as duration, credit rating and the overall economic situation (growth and interest).

Third party investors (among others, Drivetime) buy those contracts currently at premiums chasing the yield but might change their opinion fast and in an unpredictable manner.

The if and at what price CVNA might sell those receivables in the future is not sure as it even acknowledges in the 2017 10K.

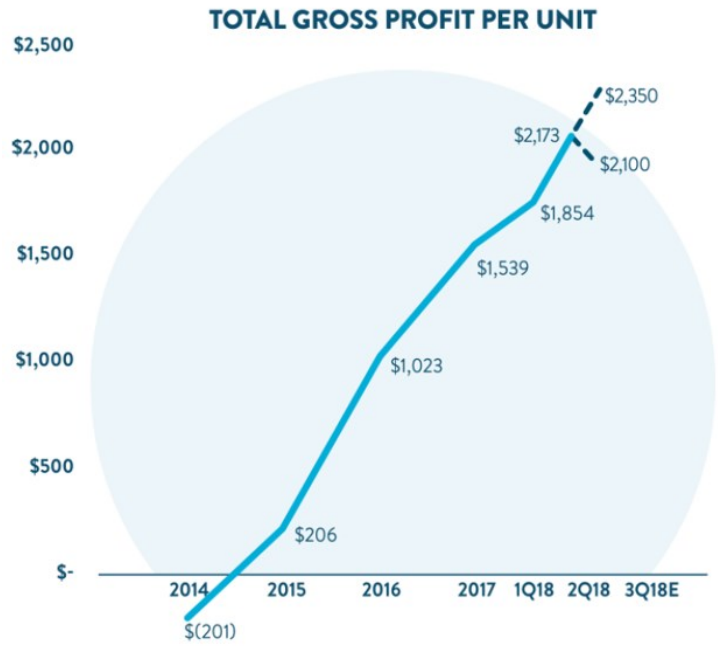
Our ability to sell automotive finance receivables and generate gains on sales of these finance receivables may decline in the future; any material reduction could harm our business, results of operations and financial condition.

We provide financing to customers and typically sell the receivables related to the financing contract to third-party investors or, in limited instances, DriveTime. For example, we entered into agreements in November 2017 pursuant to which third-party purchasers increased their commitment, agreeing to purchase an additional aggregate $1.4 billion of automotive finance receivables we originate. We may exceed our capacity to sell automotive finance receivables under these agreements prior to the end of the fourth quarter of 2018. As we use the available capacity under each agreement, we plan to enter into new arrangements to sell additional vehicle finance receivables. If we reach our capacity under these or future arrangements, and we cannot replace them with new arrangements, we may be unable to generate adequate liquidity and our business, financial condition and results of operations may be adversely affected.

Maybe this situation comes already at the end of Q4 2018 as CVNA states: “we may exceed our capacity to sell automotive finance receivables under these agreements prior to the end of the fourth quarter of 2018”.

Finally, it is also important to note that those other revenues represent around 5% of revenue in the case of KMX. In other words, how does CVNA want to improve, as the management mentioned several times, that number considerably if a company as KMX is not able to increase it much higher relatively to revenue? Might it be easier to generate those other revenues over the internet? To be honest, I am not able to answer this question for the moment. I just assume if this would be the case, KMX would react accordingly.

As we can see in the chart hereafter CVNA was able to improve the Total GPU considerably during the last quarters.



The midterm objective is 3,000 USD total GPU, about 10 % lower than total GPU realized by KMX. On the longer term the management even wants to achieve a higher Total GPU than KMX does.

However, I believe that CVNA:

- Will have difficulties to achieve the midterm objective of 3.000 total GPU;
- Will never achieve a better total GPU than KMX.

I base this believe on following facts:

1. Scale and experience in purchase (even if only a minimal effect and limited in time at least for scale and the value added by experience has a concave curve)
2. Matching offer and demand (no local presence)
3. Inbound logistic costs (distance between purchasing location and IRC)
4. Outbound logistic costs (distance between IRC (stocking location) and delivery location)

I will focus my attention on number 3 and 4 given that 1 and 2 are softer facts.

In order to sell a car, CVNA needs to:

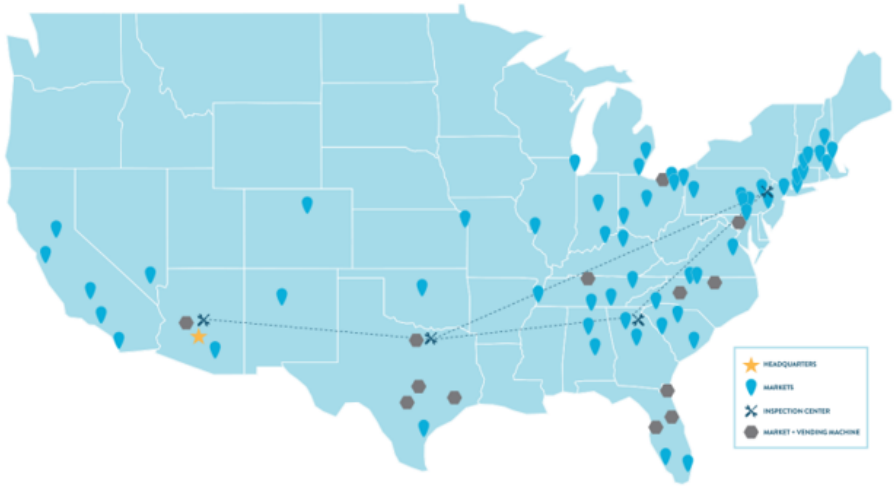
1. Purchase a car (location 1)
2. Do an IR (location 2)
3. Stock the car (location 3 or maybe location 2)
4. Deliver the car (location 3 or 4)

A High Price For A Non-Scalable Business Model

CVNA acquires a substantial majority of its vehicles through large and liquid national used car market auctions. The remainder is acquired directly from customers, vehicle finance, leasing companies and rental companies.

CVNA currently has 7 market and vending machines and 4 IRC, serving 44 markets. To be able to offer a wide range of cars for attractive prices, CVNA also purchases cars outside those market and vending machines and fulfillment centers. This ability to push cars from one market into another is the main advantage big players like KMX, and now CVNA, have compared to small independent players. However, the other side of the coin is that inbound logistic costs increase, because CVNA must transfer those cars to its IRC centers.

On the following map, you see the current markets CVNA operates in (blue dots). The brown dots are presenting its vending and sales centers. The crosses represent its IRC.



*Represents facilities and markets as of August 8, 2018

It is logical if CVNA wants to serve the same markets as KMX does, it has to transport the cars it purchased in public auctions over a longer distance to have them inspected and reconditioned. Given that inbound costs are integrated in cost of sales we do not have more information about the exact impact on gross margin.

On the other side we do have this information on outbound costs, as to say the costs the company bears to deliver the cars to clients.

I think that outbound costs are of an even higher importance for us given that management controls them less. Indeed, management knows where it buys a car and where this car is inspected and reconditioned and maybe stocked, but it does not know the exact location of where this car is delivered, especially if the company comes under pressure to generate high growth rates.

This seems surprising to me that management does not include outbound logistic costs into its gross margin calculation, but it gives us the opportunity to analyze in detail these outbound logistic numbers, given that they are mentioned explicitly in the SG&A.

CARVANA CO. AND SUBSIDIARIES
COMPONENTS OF SG&A
(Unaudited)

	Three Months Ended				
	Jun 30, 2017	Sep 30, 2017	Dec 31, 2017	Mar 31, 2018	Jun 30, 2018
	(in thousands)				
Compensation and benefits [1]	$ 18,789	$ 19,404	$ 22,219	$ 24,987	$ 29,251
Advertising expense	12,385	15,475	16,398	25,009	26,782
Market occupancy costs [2]	1,424	1,734	2,081	2,510	2,618
Logistics [3]	3,116	3,905	4,555	6,318	7,826
Other costs [4]	16,297	18,158	21,552	24,362	29,175
Total	$ 52,011	$ 58,676	$ 66,805	$ 83,186	$ 95,652

(1) Compensation and benefits includes all payroll and related costs, including benefits, payroll taxes and equity-based compensation, except those related to preparing vehicles for sale, which are included in cost of sales.
(2) Market occupancy costs includes rent, utilities, security, repairs and maintenance and depreciation of buildings and improvements, including vending machines and fulfillment centers, excluding the portion related to reconditioning vehicles, which is included in cost of sales, and excluding the portion related to corporate occupancy.
(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.
(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.

Customers of KMX pick their cars up at one of the 200 stores. In other words the costs of these stores help KMX to save money on delivering the cars to the clients.

The cost related to the stores are not in direct relation with revenues. Revenues can increase without that costs of stores increase and vice versa. This is however not possible at the level of CVNA. A car cannot be sold over internet if it is not delivered. In order words, KMX can increase its revenues without opening a new store, but CVNA is not able to increase its revenues without increasing its outbound logistic costs (except by a few vending machines). It seems therefore logical that KMX does not integrate the costs of its stores into gross margin.

Why does the management not add them into sales, because it does change the profitability of the company?

Maybe even more important than overall profitability is for many investors the Total GPU metric. As we mentioned before the management of CVNA understands this importance and likes to show potential investors the past development of those GPU metric.

How big is that positive impact on the GPU metric?

Gross margin in Q2 2018 was composed of:

- 28.293 MUSD related to direct sales. The GPU for used vehicles amounts to 1,180 USD in Q2 2018. If we add outbound logistic costs of 7.862 MUSD to that component, the GPU for used vehicle will decrease from 1,180 USD to 832 USD per car, a decrease of 30%.

- 20.742 MUSD indirect 100% gross margin sales related to third parties. Total GPU will decrease form 2,173 USD to 1,824 USD, a decrease of 16% and even more far away of the objective of 3.000 USD or the 3.305 USD generated by KMX.

In other words, it costs CVNA on average 349 USD to deliver a car to a final client (in practice even more because we do not know the number of clients that choose to pick up their cars).

The outbound logistic costs represent around 1.7% of the average selling price of used cars. At first sight, this does not look too high compared to other products, for example, shipping a television. However, it is more appropriate to consider the average gross margin than the selling price and remember even KMX is not able to generate a gross margin over 12%.

I believe that the management had a second reason to leave those costs out of the gross margin calculation.

Outbound logistic costs added up to 7.8 MUSD in Q2 2018 compared to 3.1 MUSD a year earlier. This is an increase of 151%. Revenues increased over the same period by 127%.

Does that mean that outbound logistic costs are not leverageable?

We saw before that a car needs to be transported to up to 4 different location before the sale is concluded, that gross margins are low and logistics costs per car high.

We know the higher the inventory, the better the offer, the higher the inbound logistic costs. The more markets the company operates in, the higher the number of potential clients but the higher the logistic costs.

KMX currently operates with 200 stores around 4 BUSD per quarter. CVNA has 4 IRC and 7 vending machines and sales center for about 440 MUSD per quarter. One store generates on average 20 MUSD per quarter, whereas revenues divided by sales and IRC equals to 40 MUSD. That does not sound like disruption. Yes, CVNA invested into the future.

Its current facilities are able to inspect and recondition 200,000 cars per year. Does CVNA find the cars and customers close enough to the existing IRC to be profitable?

The problematic about the business model of CVNA is the fact that the management wants to match offer and demand between markets, centralize recondition and inspection, not invest into stores, but on the other hand the business model is limited from the offer side by the free delivery, that is however a necessary condition for the high demand.

The effect of the free delivery of cars is a geographical range inside the one CVNA must operate to be profitable. If that geographical range is not large enough the company is limited to act in the market where an IRC is located. To generate profitable turnover growth, it will be forced to open more IRC and risks to fall again in the old-fashioned business model it is supposed to disrupt.

What does it help to have the capacity to inspect and recondition 200,000 cars a year, if you can't transport and/or delivery on profitable way between markets? If the company needs local demand and offer it cannot not be considered as disruptive but just as a large local car dealer. The objective was to match nationwide demand and offer, to buy a cabriolet during the winder in New York City and ship and sell it in Florida.

It is difficult to take a definitive quantitative or qualitative conclusion out of this. However, we can assume that CVNA starts in the most promising markets and serves the most profitable clients first. I believe that over the long-term logistic cost might even increase because the company must go further away from its IRC to buy and sell cars.

To come back to initial question. I do not believe that CVNA can leverage logistic costs in that way that it is able to generate a profit of 500 MUSD in the midterm future (5 years).

However maybe they could do so by decreasing advertising expenses?

The fastest way to reduce costs is by decreasing its advertising expenses that amounted to 26.782 MUSD in Q2 2018, or 54% of total gross margin and even 100% of used vehicle car margin. Those costs are 3.4 times higher than the outbound logistic costs.

KMX spent 1.17% of revenues in advertising last quarter. CVNA currently spends 5.6 %. Or in absolute numbers, CVNA spends about half of what KMX does.

In Q2, CVNA generated a loss of 51.250 MUSD, a loss of around 2,270 USD per used car unit sold.

If CVNA reduces those marketing costs to 0 its still faces a loss of 24.468 MUSD.

CVNA does not have the local human workforce to build and maintain a brand. It seems logical that advertising costs of CVNA must be higher in relation to revenues than for KMX.

However, advertising costs cannot not stay at a level of 5% of revenues for a company that generates a gross margin of roughly 8%.

The question is if it is on the longer-term worth spending so much in advertising, or in other words, does CVNA lock in its clients.

The average frequency of buying a used car is smaller than that of buying clothes, books, a cellphone or maybe even a TV. I believe that the probability is high that next time you buy a car you switch the company based on simple reasons, for example, the last advertisement you saw. You will be constantly confronted by offers of local car dealers, by other internet-based offers. How high is the probability that you switch, especially if the exact model how you like it is not available?

Many internet-based companies can sell the same TV the same pair of choses, but not exactly the exact car you want regarding age, mileage, color, options.

So, what is the value of these advertising costs? Remember that the company generates currently losses, the advertising costs must be seen as investment into the future.

I understand that advertising costs are an important factor to the internet-based model of CVNA. However, they have to be considered in relation with the cars offered by CVNA. I also conclude that they have to be considerably higher than for a local based dealer as for example KMX.

A High Price For A Non-Scalable Business Model

GLACIER CAPITAL

An interesting task is to apply current KMX used vehicles sales into to the CVNA business model and compare the costs.

Let us start with a little reminder of the difference in size between the two companies.

Q2 2018 Comparaison			
	CVNA	KMX	Factor
Revenues	$ 475,268.00	$ 4,766,035.00	10.02809994
Used vehicles	22570	196880	8.723083739
Wholesale Vehicles	3658	120866	33.04155276
Pourcentage Wholesale to Used	16.21%	61.39%	
Used vehicle price	$ 19,403.00	$ 20,005.00	3.10%
Wholesale vehicle price	$ 4,544.00	$ 4,955.00	9.04%
Other gross profit	$ 20,742.00	$ 162,677.00	
	4.36%	3.41%	
Inventory	$ 302,989.00	$ 2,357,000.00	7.7791603

I assume that:

- Wholesale vehicles sales increase 9-fold
- Compensation and benefits increase only 4.5 times
- Store occupancy only increases 4.5 times
- Advertising expenses increases 4 times

	KMX	CVNA	Factor	CVNA --> KMX	Difference
			9		
Compensation and benefits	$ 238,882.00	$ 29,251.00	4.5	$ 131,629.50	($107,252.50)
Store occupancy costs	$ 90,762.00	$ 2,618.00	4.5	$ 11,781.00	($78,981.00)
Advertising expense	$ 46,684.00	$ 26,782.00	4	$ 107,128.00	$60,444.00
Other overhead costs	$ 77,227.00	$ 29,175.00	2.5	$ 72,937.50	($4,289.50)
Outbound logistic costs	$ -	$ 7,826.00	10	$ 78,260.00	$78,260.00
Total	$ 453,555.00	$ 95,652.00		$ 401,736.00	($51,819.00)
Inbound Logistic	$ 19,688.00	$ 7,899.50		$ 68,908.00	$ 49,220.00
Total	$ 473,243.00			$ 470,644.00	($2,599.00)
					-0.05%

Compensation and benefits would decrease by 107 MUSD in the CVNA business model. This is mainly due to the more centralized logistics, less stores and employees. In the same context, occupancy decreases by 79 MUSD.

I assume that advertising expenses need to be higher because the lack of local presence and less salespeople.

CVNA needs to deliver the car to its customer. Those costs are currently amounting to 7,826 USD and I assume that they increase at least linearly to the number of cars sold (first markets and client are the best ones).

I consider as a cost the difference in inbound logistic compared to KMX. I assume that those inbound costs are about 350 USD per unit compared to 100 USD per unit for KMX. The difference in costs would add up to 49 MUSD.

GPU used vehicles	$ 2,179.00	$ 1,180.00	$ 1,929.00
Inbound logistic	$ 100.00	$ 350.00	$ 350.00
Total	$ 19,688,000.00	$ 7,899,500.00	$ 68,908,000.00

This simplified model should just give us an idea about the difference cost structure and show that CVNA does not have the more profitable business model. To show this, the model does not need to go into details such as different ratios wholesale vehicles over used vehicles sold or the different WACC of the two companies.

We have to remember that CVNA has over half of KMX market capitalization and only generates 1/10th of its revenues. With unsustainable growth rates at around 100% (in relation to the marketing and logistic spending) per year, it takes another four years to match revenues. During those four years, CVNA needs lots of cash and might risk going through a recession.

I conclude that CVNA is not able in the next five years to generate this revenue increase in a profitable way that justifies the current valuation.

4. What is the reaction of the competition?

Last but not least, we should not analyze a company in a static market environment. Competition reacts against new market intruders and this by far more often in a successful manner than not. The difference is that successful new market intruders are more covered by the news.

Here we can read the answer of the CEO of KMX.

Armintas Sinkevicius - *Morgan Stanley, Research Division - Associate*

I can appreciate, having been down in Virginia, the capabilities that you have in-house and continue to develop and that you can transport cars the same way as Carvana can. But I'm curious, what do you think it will take for the market to realize that your capabilities are similar? Do you think it'll be the launch of the bundle offers? Or just curious on your thoughts there.

William D. Nash - *CarMax, Inc. - President, CEO & Director*

Yes. I don't know. I mean, we're focused on making sure that we deliver this omnichannel. We understand that customers want to do more online. And like I said earlier, the complexity of this involved with the used cars, we feel like there's points in that process where the customers want -- wants assistance, so that's where our focus. Our focus on -- is on right now delivering the omnichannel, and we'll see how the market responds after that.

I concluded before that the CVNA business model does not help to save costs. Why should KMX switch?

There are cases where an Internet-based sale is cheaper, but I do not think it is scalable. That is why the KMX omnichannel approach is the better business model.

KMX did not lose any ground until now. This business is different to the one of Amazon (AMZN), Netflix (NFLX) and even Wayfair (W). those companies have information on their clients that can be beneficial for both parties and can be considered as a lock in.

The fact that a company does not react to a new intruder does not always mean that it can't, but that it does not want to.

Conclusion

Considering the facts that:

1. Cars are expensive to move around because of size and weight
2. There is a distance limit in how far you can transport a car
3. Costumers' frequency purchase is low
4. Value of cars (+/- 20,000 USD) is high relative to margin (high inventory risk for low margin)
5. Cars do need an inspection before getting sold (one more logistic step)
6. Confidence is an important factor (7-day return guarantee might be more expensive than free return shipping for clothes)

To come back to the title of this article I do not think that the company can scale the business over a certain a level that would match its current valuation. In fact, at one point, it is more efficient to open another IRC or sales point than transporting cars back and forth. By doing this, the company's business model becomes closer to the one of KMX and should also be valued the same. I do not agree with current buyers or holders to pay six times sales for this company.

Other facts to consider:

1. CVNA is not only operating a low margin business, the used car market business is also very conjunctural
2. CVNA is not only selling cars, but also financing cars, which emphasizes the first point even more
3. CVNA will probably need more cash in an economic worsening situation, or in a situation with increasing interest rates, or even worse, in an economic environment presenting both elements
4. Management has, at least to say, a doubtful background (Forbes article)
5. The company might be tempted to finance more and more high-risk clients (in relation with fact number 4)

I took a 1% short position in the company at 61 USD to show skin in the game. My experience tells me that even a small position helps me further analyze a company and make it easier to change opinions, if necessary.

At this point, it is not a conviction short. I hope to get more information for free in the near future so that I can increase my position in case my opinion gets more defined.

I will especially follow these metrics during the next quarterly results:

- GPU's
- Outbound logistic / Revenue
- Inventory turnover

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- Advertising Expenses / Revenue
- Average car sales price

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

Marc Daubenfeld

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