KerrisdaleCapital

June 2023

Carvana Co. (CVNA)

Running on Empty

We are short shares of Carvana Co. (CVNA), a $4bn market cap online platform for buying and selling used cars. Originally hyped up as an innovative disruptor, Carvana is now recognized to be just a poorly run auto retailer struggling under the challenges of a severe industry downturn and the unsustainable burden of $6.5bn in debt. While many have shared concerns over Carvana's business before, we voice ours at a time when shares have risen 165% in only a month on misguided optimism for profits that amount to little more than buffing the paint job on a totaled car.

Over its history of burning billions of dollars of investor capital to manufacture topline growth, Carvana has never generated sustainable profits or free cash flow. Even during the pandemic, when Carvana was virtually the only online option for scores of desperate car buyers willing to pay any price, the company failed to turn an annual profit. As the prospect of bankruptcy loomed, last year management began slashing costs, shrinking its operations and finessing working capital to try to generate positive free cash flow, and still failed. The company is pursuing a last-ditch attempt to sell markets on a new narrative, but ultimately, the business can't escape the following reality: 1) whether a small local dealer or a tech-driven online platform, flipping used cars is a tough, capital-intensive business with lousy margins and, 2) any company can grow quickly and take share if run irresponsibly on costs, especially if capital markets are willing to foot the bill. Rather than representing true disruptive change, Carvana is a flawed player, armed with tools no better than the competition it seeks to disrupt and led by a management team which lacks seasoned automotive, operational experience. Carvana didn't make money even when cars sold themselves, interest rates were low and used car prices were skyrocketing. Today, none of that is true anymore, and the company has no hope but to eventually restructure its massive debt load.

Carvana's fundamental fate was sealed last May. In an epic blunder, Carvana management misread the sustainability of pandemic-induced industry conditions and issued billions in high yield debt to finance the purchase of additional capacity, just as macro and industry conditions began choking demand. All these conditions persist today with few signs of improvement. Against this backdrop, Carvana pivoted abruptly from all-out growth to finally focusing on profitability, but it's too little, too late. Carvana's aggressive cost cuts may succeed in slowing the rate of cash burn, but with over $700m in annual interest expense and capex, it simply cannot generate enough profit to stop the negative cash flow.

As the year progresses, cash and liquidity will dwindle further, and Carvana will be staring at over $250m in interest payments in the 4th quarter alone, its seasonally slowest period. After repeated attempts to improve liquidity through a bond exchange failed, last week the company conveniently pre-announced "better than expected" 2Q EBITDA, not because of sustainable, fundamental improvement in its core business, but primarily due to large one-time loan sales – a move which reeks of pumping shares ahead of a potential equity offering.

Despite the stock's fall from all-time highs, Carvana shares are worthless. Comparisons to tech/e-commerce platforms are nonsensical. Carvana should be valued like any other publicly traded auto retailer, and specifically one that is poorly capitalized and more cyclical due to a lack of diversification and subprime exposure. We view the equity as a zero and investing at current levels is a worse deal than buying a clunker from a slick used car salesman.

Table of Contents

EXECUTIVE SUMMARY 3

COMPANY BACKGROUND 4

RECENT RESULTS ARE MORE HYPE THAN SUSTAINABLE IMPROVEMENT 7

Liquidity Position is More Dire than Management Portrays, Key 4Q Bond Payments Loom 10

CARVANA CANNOT SHRINK TO SURVIVE LONG-TERM 13

Death (Delayed) by a Thousand Cuts 13

CARVANA LACKS RESOURCES TO NAVIGATE CURRENT MARKET ENVIRONMENT 16

Management Lacks Auto Industry Experience 16

Unreliable Data in an Uncertain Market 16

CARVANA IS NEITHER DISRUPTIVE NOR DIFFERENTIATED, AND COMPETITION HAS CAUGHT UP 17

VALUATION 19

CONCLUSION 19

APPENDIX I: CURRENT USED CAR MARKET CONDITIONS 20

APPENDIX II: TRADING COMPARABLES 22

FULL LEGAL DISCLAIMER 23

Executive Summary

Shares have risen on misplaced optimism regarding profitability. 1H23 results are not indicative of normalized profitability. 1Q23 was heavily distorted by unusual inventory and pricing adjustments following a disastrous 4Q22, and the recent 2Q23 pre-announced "beat" was all due to the pull-forward of loan sales which are unsustainable in the coming quarters. We believe investors should be highly skeptical of results from a company looking to sell markets on a new narrative in order to raise equity capital to stave off the threat of bankruptcy.

Liquidity is thin and investors bear rising risk of dilution. Of Carvana's touted $1.5bn in cash and revolving facility availability, only ~$500m is cash on hand available to pay for debt interest expense; the rest is available only to finance vehicle inventory and its auto lending arm. Furthermore, issuing secured debt or conducting a sale leaseback of real estate, particularly the ADESA assets, bears underappreciated risks and involves incurring more debt and interest costs at a time when Carvana is supposed to be slashing both. Carvana is engaged in a protracted fight with a concentrated, coordinated group of bondholders that collectively owns 90% of the bonds. A distressed debt exchange that would have modestly reduced the face amount of debt and avoided equity dilution was met with immediate opposition from the group and ultimately failed. The ongoing standoff, particularly as we approach 4Q23 when $255m in bond interest payments are due, increases the risk that Carvana will look to take advantage of the recent rise in its share price to issue equity.

Slashing costs is not a viable strategy to outrun balance sheet and liquidity issues. At the pace of current unit sales, Carvana would need to generate $2,300+ in EBITDA per retail unit sold to cover $700m in interest expense and capex (~300,000 vehicles x $2,300 in EBITDA per vehicle = $700m in EBITDA). This is unrealistic. After slashing costs, and benefitting from significant abnormal valuation allowances, in 1Q23 Carvana still lost *$303 in negative adj. EBTIDA per retail car sold*. The vast majority of expense reductions have also come from advertising (contributing to a ~50% decline in website traffic) and headcount reductions – areas that would have to be reinvested in if Carvana were to ever resume meaningful growth. Carvana needs much more profit as well as much more growth – not just one or the other – but doesn't have the liquidity, capital structure, management capability or business operations to achieve much of either.

Carvana lacks the tools and talent to navigate an uncertain used car market. According to multiple former employees with experience building and operating the data platforms Carvana uses to manage inventory, Carvana's data analytics are fundamentally flawed. The system is simply too slow, overly reliant on historical data, and not equipped to capture myriad macro changes to drive reliable decisions in anything but stable, predictable environments. Those flaws were exposed by the pandemic and its aftermath and are compounded by a management team lacking in seasoned automotive and logistics experience. Rather than building a company that harnesses technology to smooth out the challenge of operating during challenging times in the used car industry, Carvana built one that amplifies them.

Carvana's competitive differentiation is gone. According to several Carvana senior executives we interviewed, many of the differentiated, consumer friendly offerings that helped Carvana rapidly gain share are no longer unique. Combined with no longer being able to jam credit markets with the bill for irresponsible cost management, topline growth going forward will resemble that of any other large dealership. Multiple online competitors provide no-haggle offers, fast payments, and flexible delivery options. At the same time, Carvana has had to adopt the less consumer friendly practices of traditional dealers it once targeted for disintermediation to generate better profits. Over the past year Carvana has curtailed vehicle selection and reduced convenience by charging a higher delivery fee when a customer wishes to purchase a vehicle that is further away. We believe Carvana should not be valued as anything other than what it is: a poorly positioned, poorly capitalized auto retailer.

Company Background

Capitalization and Financial Summary

$ Millions except per share data	
CVNA share price	$19.07
Class A common shares	106
Class B common shares	83
Total shares outstanding	189
Market capitalization	**$3,606**
Floor plan facility	543
Finance receivables and beneficial interests	1,421
Transportation fleet	358
Real estate financing and other	488
Total asset-based financing	2,810
5.625% senior unsecured notes due 2025	500
5.875% senior unsecured notes due 2027	600
5.500% senior unsecured notes due 2028	600
4.875% senior unsecured notes due 2029	750
10.250% senior unecured notes due 2030	3,275
Total senior notes	5,725
NPV of operating leases	476
Total debt	**9,011**
Less: unrestricted cash	(488)
Less: floor plan debt	(543)
Less: finance receivables	(1,421)
Adj. net debt	**6,559**
Adj. enterprise value	**$10,165**

Financial Summary ($ mm)	**2020A**	**2021A**	**2022A**	**2023E**	**2024E**
Retail units	243,111	425,237	412,296	299,080	322,508
Wholesale units	55,204	170,056	193,260	138,564	144,895
Total revenue	5,587	12,814	13,604	9,801	10,307
Gross profit (GAAP)	794	1,929	1,246	1,423	1,625
Margin	*14%*	*15%*	*9%*	*15%*	*16%*
Adj. EBITDA (incl. SBC)	(282)	(45)	(1,140)	(27)	112
Cash interest expense	95	152	423	658	664
Total capex	(360)	(557)	(512)	(132)	(134)
FCF (CFO-capex)	(1,089)	(3,151)	(1,836)	(747)	(395)
Valuation					
EV / Sales	1.8x	0.8x	0.7x	1.0x	1.0x
EV / Gross Profit	12.8x	5.3x	8.2x	7.1x	6.3x
EV / EBITDA	NA	NA	NA	NA	90.4x

Source: Kerrisdale analysis and estimates, Carvana SEC filings.

Co-founded by CEO Ernest Garcia III in 2012, Carvana is an online used car dealer premised on offering consumers a wide selection of vehicles, transparent pricing, and a no pressure transaction experience. The company was incubated under DriveTime Automotive, a used car retailer founded by Garcia's father, Ernest Garcia II, which sells and offers financing to used car buyers with subprime credit.

On Carvana's platform, shoppers can research generally lower-priced used cars (~$23k ASP), obtain financing, and schedule delivery using desktop or mobile devices. Alternatively, customers looking to sell or trade-in their vehicle can quickly obtain a purchase offer by answering a few basic questions, without needing to provide photos or service records.

As of 1Q23, Carvana had a national vehicle inventory pool of ~41k website units. The company inspects and reconditions (to a questionable degree) all owned vehicles offered for resale utilizing in-house logistics to deliver cars directly to customers. Customers in certain markets can also pick up their vehicle at one of Carvana's 33 car vending machines – multi-story glass towers that store purchased vehicles – a silly marketing ploy emblematic of how the company lit investor capital on fire during the tech bubble.

The used car market is large and fragmented. Though it represented the lowest mark in a decade, there were an estimated 36.2 million used vehicle transactions in 2022. As of 2021, the top 100 used car retailers collectively held 11% market share, with the largest commanding only 2.3%. The competitive landscape is crowded and brutally competitive, with legions of mom-and-pop dealers, well-funded public roll-ups like AutoNation, Lithia Motors and Asbury Automotive, and used car retailing pureplay CarMax viciously battling to eke out thin margins. While Carvana management tries to paint its peers as old-fashioned slow movers, the reality is that the industry is overrun not only by scrappy local players constantly sacrificing profit to guard market share, but also sophisticated multibillion dollar behemoths actively building out their own data analytics and software capabilities to adopt the most cutting-edge tech-enabled industry standards.

An important feature of Carvana's business model is making loans directly to customers. While Carvana does offer 3rd party financing as an option, roughly 80% of customers use Carvana's in-house financing. Carvana provides financing to customers of all types of credit, with no minimum credit score or credit history requirements. 99% of applicants who are 18 and have annual income of at least $10k are approved for financing in minutes. Carvana does not typically hold loans on its balance sheet and sells finance receivables in whole loans to financing partners (primarily Ally Financial) and through securitization transactions.

Carvana depends heavily on the sale of these finance receivable for a substantial portion of gross profit and EBITDA. In 2022, Carvana originated $7.2bn in finance receivables and booked $411m (33% of total gross profit) from gains on loan sales (included in other sales and revenues). In 2022, Carvana generated *negative* $1.1bn in EBITDA (incl. SBC). In Carvana's best financial year, 2021, Carvana booked $711m (37% of total gross profit) from gains on loan sales while still posting negative EBITDA (incl SBC) of -$45m. There is relatively little cost associated with making and selling loans versus the advertising, customer service, nationwide logistics network, and corporate overhead associated with selling used cars. In terms of profitability (or lack thereof), Carvana has historically made money selling used car *loans* at a premium while losing a tremendous amount selling used cars.

Since inception, Carvana has never generated positive cash flow or operating profits on an annual basis. Carvana's core operations and expansion has been fueled through low-cost borrowing, leveraging its balance sheet as it burns through cash.

In May 2022, Carvana completed the acquisition of the U.S.-based physical auction business of ADESA from KAR for $2.2bn in cash. In 2Q22 the company issued $3.275bn in 10.25% senior unsecured notes to finance the acquisition and for general corporate purposes. The ADESA acquisition added 56 auction locations with 6.5 million square feet of buildings on more than 4,000 acres of land, significantly expanding the company's inspection and reconditioning capacity (3.2m units if fully built out) broadening geographic reach and improving logistics costs by shortening delivery distances. 2023 consensus estimates currently stand at 318k for retail units and 153k for wholesale units.

The ADESA acquisition was consummated at the peak of the market in early 2022. As used car demand exceeded supply during the pandemic (with stimulus checks, rising home / equity wealth, and a temporary shift in wallet share towards local transportation driving demand, while curtailed new car production limited supply), and inflation heated up across the entire economy, average used car prices witnessed a +40% rise versus pre-pandemic levels. The ripple effect of reduced new vehicle production (the ultimate source of used cars), along with a significant increase in the number of leased cars purchased outright by lessees, had caused used car inventories to fall to levels not seen in over a decade, particularly for lower-priced cars, Carvana's sweet spot.

Then, in March 2022, macro and market conditions changed. The Fed began aggressively raising rates to combat inflation and used car loan rates followed suit. Vehicle affordability fell, and used vehicle sales across the industry slowed and ended down -11% y/y in 2022. The used car market continues to experience challenges related to affordability and supply of vehicles, against a backdrop of souring consumer sentiment and rising recessionary fears. (See: Appendix I).

Last spring, after misjudging the outlook for used car demand and making the disastrous decision to purchase additional logistics capacity with billions in high yield debt just as the used car market began rolling over, Carvana attempted to pivot from its historical focus on rapid growth to improving profitability. In fact, on the day the ADESA acquisition closed, Carvana announced plans to lay off 12% of its workforce. We estimate the effect of cost reductions, implementation of less consumer friendly changes to boost profitability, and drastic declines in vehicle affordability will result in 2Q23 total revenue down -33% and retail units down -34% y/y. Over the past year, Carvana has aggressively cut inventory -55%, slashed advertising expenses -64%, and fired over 20% of its workforce in a bid to staunch cash flow bleed and preserve declining liquidity.

In March 2023, Carvana began attempts to restructure its liabilities, offering to exchange existing senior unsecured notes into a maximum of $1bn of new 2nd lien, 9% cash / 12% PIK, secured notes due 2028 at a discount. After twice extending the deadline for the offer, the exchange was cancelled on June 1st. In April, a Bloomberg article leaked details of counterproposals from bondholders involving new equity issuance and/or "substantial" debt-for-equity swaps. Carvana has apparently not engaged formally on any restructuring proposals from bondholders to date.

Carvana management likes to say that it currently has access to $1.5bn in total committed liquidity (excluding unpledged real estate assets). In reality, of this amount, only $488m as of 1Q23 is cash on hand with the balance primarily short-term revolving capacity ***available only*** for financing vehicle inventory and funding customer loans. Carvana's interest costs and capex total over $700m.

Carvana is a "controlled company" with a dual-class share structure. Class A shares hold economic interest and carry one vote. Class B are effectively similar but enjoy 10:1 super voting rights and are 100% owned by the Garcias (Ernest the CEO and his father). The Garcias together have approximately 88% voting power.

Recent Results are More Hype Than Sustainable Improvement

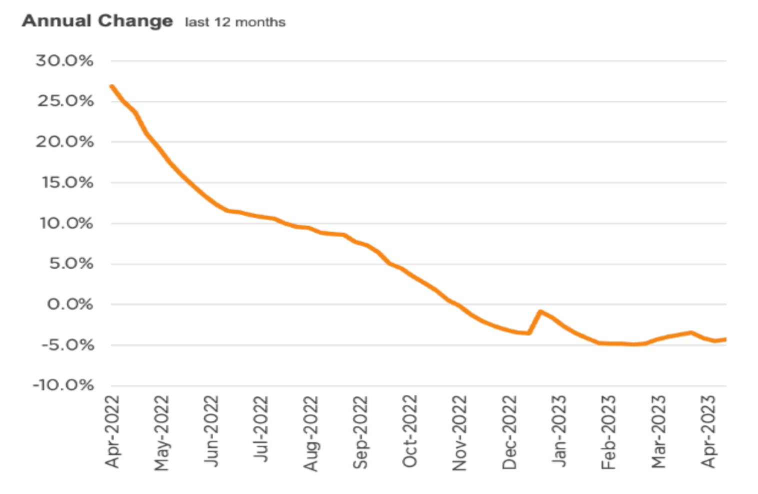
In the past month, Carvana shares have soared 165% in response to perceived positive changes in Carvana's business that in reality do not represent material, sustainable improvements in Carvana's fundamental outlook. 1H23 results (both reported 1Q23 and recently pre-announced 2Q23) should not be treated by investors as indicative of normalized operations because they are heavily distorted by abnormal, one-time events. An S&P upgrade of securitizations sponsored by Carvana on June 1st drove a +22% one-day gain – a particularly absurd move as the ratings action was based on the performance of customer auto loans which Carvana does not hold on its balance sheet. S&P did not upgrade Carvana's debt, it upgraded Carvana's *customers'* debt.

Rather than expressing wild optimism on Carvana's prospects (even if it's largely a function of retail/meme day-trading attempts to manufacture a short squeeze, which is in and of itself silly since the cost to borrow Carvana's stock has been below 10% for months), we believe investors should be skeptical of quarterly results from a company that has been forced to act contrary to normal corporate objectives and deliberately shrink to stay alive. On conference calls, management spins these efforts as an opportunity to "improve efficiency" but we believe in actuality, the company has been guided since the spring of last year by the first order principle of preserving liquidity to stave off insolvency. Interpreting the company's quarterly results while it operates under these abnormal priorities, much less extrapolating them to predict how the company will perform under more normal ones, is a futile undertaking.

Case in point: while 1Q23 headline results appear to be driven by Carvana's pivot toward better unit profitability, sequential improvement in EBITDA and key metrics such as non-GAAP GPU were heavily distorted by transient, abnormal pricing dynamics and the delayed timing of loan sales.

In 4Q22, Carvana reported total non-GAAP GPU of $2,667. This metric was negatively affected by $701 in total retail and wholesale inventory valuation adjustments. In plainer English, Carvana booked losses from mistakenly carrying far too many stagnating, aging vehicles in inventory as sales slowed and industry-wide prices fell in the back half of last year. In 1Q23, these inventory valuation allowances (measured based on market observations at quarter end) swung sharply to an $800 benefit as the rate of retail depreciation stabilized (top chart below) and wholesale prices began the year unusually strong (bottom chart below). In recent weeks wholesale and retail pricing have both weakened slightly and the spread between the two has converged.

Average Used Vehicle List Price – Annual Change



Source: Cox Automotive, May 12, 2023

Retail and Wholesale Price Index

Source: Cox Automotive Auto Market Report, June 6, 2023

In addition to these unusual q/q inventory and pricing changes, 4Q22 total non-GAAP GPU was lowered by $483 due to a quirk in timing of loan sales, with a shift in receivables sales from year end into 1Q23. If one normalizes for these impacts, 1Q23 GPU would have come in at roughly $4,000 versus the $4,796 reported, and 4Q22 GPU would have come in at $3,851, meaning that, sequentially, 1Q23 GPU was up only slightly Q/Q.

1Q23 Total Non-GAAP GPU
Normalized for Unusual Items

	4Q22	1Q23
Reported:	$2,667	$4,796
Add/subtract: retail valuation adjustment	598	(593)
Add/subtract: wholesale valuation adjustment and impact of abnormal market pricing	103	(200)
Add: shift in timing of loan sale	483	
Normalized total non-GAAP GPU	**$3,851**	**$4,003**

Source: Kerrisdale analysis. Carvana 4Q22 and 1Q23 earnings call transcripts.

At an investor conference last week, Carvana provided an update to its 2Q23 guidance highlighted by raising total GPU to $6,000+ (up 1,000 from $5,000+ prior) and adjusted EBITDA of at least $50m from simply "positive" before. Financial articles celebrated the seemingly impressive "record profits" and shares closed +56% on the day. But these metrics are heavily, if not entirely, driven by transient, one-time factors and *not* a function of improving industry or Carvana fundamentals.

Carvana's profit "beat" was driven by substantially higher than guided loan sales in the quarter. As Garcia clarified in remarks made after the posting of the updated guidance, "there was uncertainty around how much we were relying on additional receivable sales, and there was uncertainty about how much we would sell in receivables. That's the biggest change that is leading to this [updated guidance] and flowing that through speaks to the majority of the change in our GPU line item."

Carvana's updated guidance reflects an accelerated unwind of an unusually large backlog of finance receivables entering the quarter (~$1.2bn). Carvana typically sells receivables roughly in line with the pace at which it originates loans, but due largely to macro and credit market volatility (the demise of Silicon Valley Bank and the regional banking crises), in 4Q23 and 1Q23 the company delayed its normal sales cadence. With credit conditions having stabilized, Carvana has now reduced this backlog faster than originally anticipated/estimated, selling $2bn of loan principal with nearly a month left in the quarter. We estimate loan originations will total ~$1.3-$1.4bn in 2Q23 (in line with consensus), meaning Carvana will end 2Q having substantially worked down its receivables backlog ($1.3bn in originations less $2bn+ in loan sales implies $700m+ reduction in backlog). Assuming Carvana sells ~$1bn more in loans in the quarter than street estimates / normalized origination level and ~7% gain on sale margin, would account for ~$70m more in adjusted EBITDA (versus just "positive" as previously guided) and drive virtually all of the $1,000 improvement in GPU.

There are few lower quality ways to "beat" than pulling forward used car loan sales. This tactic is certainly unlikely to be repeated in the second half of the year. Strip away this benefit and for all of Carvana's aggressive cost cutting, it still generates little to no EBITDA on the core buying and selling of used cars. Carvana did not update its outlook for crucial items such as retail units (still expected to decline sequentially) or for lowering SG&A expense (to remain similar to 1Q23).

Tellingly, when Garcia was asked point blank whether there was improvement in the GPU of the "vehicles themselves" rather than a one-time pop to its financing arm's GPU, Garcia demurred from offering further color, and apologized for being "immediately evasive." Rather than sending shares skyrocketing on record profits, we think investors should see the pre-announcement as a desperate attempt to juice the stock ahead of a possible equity offering.

Liquidity Position is More Dire than Management Portrays, Key 4Q Bond Payments Loom

Even after giving credit to the company for improved EBITDA, we estimate Carvana will burn roughly $440m in cash from 2Q-4Q 2023. Investors increasingly bear the risk of Carvana raising equity to improve liquidity which becomes particularly thin as the year ends. Nov 1st looms as a key date when $168m in coupon payments are due on the 2030 notes (the single largest payment in a quarter when $255m is due, see table below). We note that analysts unaccustomed to distressed scenarios often model interest expense only on a GAAP basis, rather than accounting for the semi-annual timing of Carvana's cash interest payments when viewing its sources and uses of liquidity.

Debt and Interest Schedule

	Maturity	Rate/ Coupon	Px	$ Amt	Interest (Ann.)	1Q	2Q	3Q	4Q
12-month floor plan facility ($2.2bn)	9/22/2023	7.550%		543	41	10	10	10	10
18-month floor plan facility (2.0bn)	3/22/2024								
Finance receivables facilities		6.180%		1,160	72	18	18	18	18
Notes payable (equipment financing)		7.900%		2	0	0	0	0	0
Financing of beneficial interests in securitization		4.000%		261	10	3	3	3	3
Real estate financing transactions		4.000%		486	19	5	5	5	5
Transportation fleet		4.000%		358	14	4	4	4	4
Asset-backed total		**5.589%**		**2,810**	**157**	**39**	**39**	**39**	**39**
Senior unsecured notes	10/1/2025	5.625%	90	500	28		14		14
Senior unsecured notes	4/15/2027	5.875%	70	600	35		18		18
Senior unsecured notes	10/1/2028	5.500%	59	600	33		17		17
Senior unsecured notes	9/1/2029	4.875%	57	750	37	18		18	
Senior unsecured notes	5/1/2030	10.250%	82	3,275	336		168		168
Total		**7.331%**		**8,535**	**626**	**58**	**255**	**58**	**255**

Source: Kerrisdale analysis, Carvana SEC filings, bond pricing per Bloomberg. Kerrisdale assumed interest rates for financing of beneficial interests in securitizations, real estate financing, and financing transportation fleet.

Against this interest schedule, management habitually casts its liquidity in a more flattering light than deserved. On the most recent earnings call, for example, Garcia described "$3.5bn in total liquidity resources, including $1.5bn in cash and revolver availability and $2bn in unpledged real estate, including $1bn from real estate acquired with ADESA."

We find this is misleading for several important reasons.

First, of Carvana's reported ~$1.5bn in "cash and revolver availability" in 1Q23, only $488m was cash on hand. $1bn is available through two short-term revolving facilities: the vehicle inventory floor plan revolver and finance receivables revolver. Carvana does not break out the split between the two but based on conversations with industry participants, we estimate the vast majority, ~$900m of the $1bn, is represented by the floor plan facility. These facilities are **only available** as short-term financing for vehicle inventory and issued auto loans: when vehicles are sold and proceeds from securitized auto loans received, these revolvers are quickly paid down. These facilities should not be misconstrued as revolving credit lines available without restriction for general corporate purposes, like making debt service payments or capital expenditures.

Furthermore, as footnoted nelow, this $1bn of revolver availability *excludes* the impact of additional restricted cash deposits required under the facilities. When Carvana borrows under these revolvers, part of the proceeds must be set aside to finance the facilities' interest payments and as cushion to repay the revolvers as liquidity becomes more dire. We estimate these restricted cash deposits lower stated availability by at least $125m.

(Over)stated Committed Liquidity Resources

	March 31, 2023	December 31, 2022
	(in millions)	
Cash and cash equivalents	$ 488	$ 434
Availability under short-term revolving facilities [(1)]	1,001	1,314
Committed liquidity resources available	$ 1,489	$ 1,748
Unpledged real estate not included above [(2)]	1,973	1,971
Unpledged beneficial interests in securitizations	65	69
Total liquidity resources	$ 3,527	$ 3,788

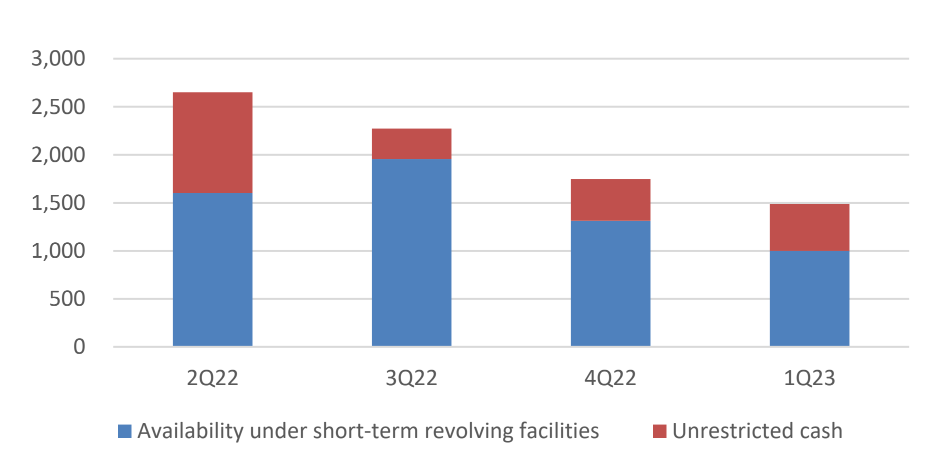
(1) Based on pledging all eligible vehicles and finance receivables under the available capacity in our floor plan and finance receivable facilities, excluding the impact to restricted cash requirements. We updated the calculation of availability under short-term revolving facilities at December 31, 2022 to reflect the available inventory borrowing base at the end of the day on Friday, December 30, 2022, inclusive of a draw made on the floor plan facility on the last business day of the year.

Source: Carvana 1Q23 SEC form 10-Q.

The floor plan facility can only be used for the (very) short-term financing of used vehicle inventory. Amounts borrowed bear an effective interest expense of 7.55% and must be repaid 10 days after the vehicle is sold. The majority of the committed liquidity Carvana represents as "available" is *not* available for its most pressing concern: servicing its debt.

The facility also includes certain criteria for what vehicles are eligible to be borrowed against which may complicate Carvana's stated inventory management strategy. Per the inventory agreement, the criteria includes cars that must be within the 11 previous model years and have less than 150,000 miles. Carvana has described wanting to increase its vehicle sourcing from customers (versus auctions) as these cars are generally more profitable. The problem is, according to S&P, the average used car on the road is now 12.5 years old, up more than three months from last year's average and the sixth year in a row the average age of cars on US roads has risen. This means there are incrementally fewer cars that are floor plan eligible within Carvana's preferred sourcing channel.

Carvana has also drastically reduced the size of its inventory to reduce sales cycles and avoid the risk of declining car prices. As its 4Q shareholder letter explains, however, "purchasing fewer retail vehicles means fewer low age units are added to the website which other things being equal, *increases the average age of our inventory*." [emphasis added]. Carvana does not disclose the average age of its vehicles (itself a red flag given the metric's importance) but using third party data providers, we have found a material change in the age of Carvana's cars on its website. In 1Q20 nearly 90% of the vehicles listed on Carvana's website were between 2 and 7 years old. That figure has dropped to 63% as of 1Q23. In sum, floor plan financing, which again should not be misconstrued as a source of funds for debt service, is being drained by the reduction and aging mix of Carvana's vehicle inventory.



Source: Carvana SEC filings.

Amounts drawn on the finance receivables facility are used to fund intra-quarter receivables (i.e., loans to customers to purchase cars) for loan origination purposes and must be paid down in a short time frame. Like the floor plan revolver, the finance receivables facility cannot be used for general operations.

To shore up liquidity Carvana has dangled monetizing $2bn in unpledged real estate assets (including $1bn of real estate acquired with ADESA) through the issuance of new asset-backed or secured financing. This too is a problematic way to both portray and address liquidity. First, it is unclear whether the assumptions underlying the reported value of those assets are still valid and the market value of the real estate is worth what Carvana claims on its books. Second, even if Carvana holds unpledged real estate worth $2bn (much of which is industrial in nature and are more or less parking lots beside suburban highways) does not mean Carvana can easily borrow up to $2bn against it. We were advised from an expert in real estate asset-backed financing underwriting that the loan-to-value would likely be 50-60%, and that there would need to be material cash escrowed to fund debt service. In short, $2bn in unpledged real estate most assuredly is not the same thing as $2bn in actual liquidity.

Lastly, let's discuss the $1bn in ADESA assets – recall, these assets are unpledged because Carvana redesignated them to an unrestricted subsidiary as a coercive tactic in the now failed exchange. Bondholders were surely displeased by this value conveyance (they formed a group partly to defend against just such a potential) and attempts to borrow against the assets bear the risk of litigation. Any potential lender conducting due diligence on such a meaningfully sized portfolio (both in terms of facilities and dollar value) would naturally need to get comfortable with the risk of the company being sued for fraudulent conveyance, complicating the feasibility of tapping into this source of "liquidity." As well, we can only imagine what sort of usurious interest rate a lender will require to issue new debt maturing *after* $1bn+ of unsecured bonds, knowing that proceeds will be used to service lower priority debt of a company with an unproven underlying business plan that could soon file for bankruptcy.

Ultimately, new asset-based or secured financing has mixed implications for shareholders. Raising new financing may extend the runway but would saddle the company with even more interest costs at a time when it is supposedly trying to reduce expenses. The new financing would also pin its sliver of equity behind even more debt.

Last but not least, the bigger picture issue is that the company's debt load and liquidity concerns are combined with the even more damning problem Carvana faces – its underlying business model is fundamentally broken and it's highly questionable whether management can right-size operations to generate sustainable profitability in any scenario. It's not at all clear whether ongoing unlevered profitability can even be achieved. Presently, retail units sold are declining, and Carvana in 1Q23 reported negative "Adjusted" EBITDA, which doesn't fully capture the outflows needed for its capital-intensive operations (Carvana spends material amounts on leased trucks, buildings and land on an ongoing basis as part of its business). Even upon success of achieving sustainable profitability, the ultimate profit margin for the business remains thin. Absent a return to debt-fueled irresponsible expansion, growth will not resemble prior years and need to remain measured to maintain positive cash flow, resulting in valuation multiples that are permanently reset lower. As we discussed in our introduction, Carvana is simply a poorly run auto retailer. It lacks a material competitive moat and is just another player in a tough competitive landscape comprised of numerous well-funded competitors with deeper operational expertise, more sound business models and both the capital and management wherewithal to pursue the same tech-enabled approaches that Carvana highlights in investor pitches.

Carvana Cannot Shrink to Survive Long-Term

After a disastrous 2022, Carvana pivoted from a previous focus on growth toward generating better unit economics. By implementing aggressive cost-cutting measures Carvana has now guided that it will be able to eke out positive EBITDA in the coming quarter, but to what end?

The strategy has bought Carvana time, but the company cannot shrink its way to surviving an over-levered balance sheet. Based on the company's own plans and public comments, it cannot realistically generate sufficient cash flow to cover fixed charges at the current level of unit sales. On Carvana's 3Q22 earnings call, Garcia stated the company could cover interest expense assuming "long-term EBITDA targets even at today's units." But this was prior to further rate hikes, excludes $100m in capex and "today's units" was in reference to annual retail unit sales of 400,000, not the ~300,000 that the company is now on course for. Carvana needs to generate substantial profitability as well as growth, not either/or.

Management has outlined a 3-step plan to 1) generate positive Adjusted EBITDA, 2) drive positive unit economics, and 3) only after completing the first two steps, return to topline growth. It has taken the company a year to accomplish step 1. Unless all the cyclical (and perhaps structural) issues that have brought the used car market to its knees miraculously improve within the next few months, Carvana simply can't return to growth fast enough to outrun balance sheet concerns.

Furthermore, even if macro conditions improve, any resumption of growth would almost certainly require Carvana to once again increase inventory, reincur logistics costs, run more shifts at reconditioning centers, and out-shout competitors by advertising. Positive operational cash flow isn't happening anytime soon if the company decides to try growing again.

Death (Delayed) by a Thousand Cuts

We believe no feasible way exists for Carvana to eliminate cash burn at current levels of retail unit demand. When Carvana first provided details of its pivot to profitability last August, it included a simplified top-down definition for Adjusted EBITDA: Total GPU (Gross Profit per Unit) less SG&A per Retail Unit (both excluding D&A and SBC), which is effectively Adjusted EBITDA per Retail Unit, multiplied against the number of Retail Units sold (p. 11 of presentation). Carvana then provided a table (see below) which depicted various levels of SG&A per Retail Units Sold needed to cover $700m in fixed charges ($600m in annual interest expense plus $100m in capex) under different assumptions for total GPU and annual retail units.

Unit Economics Needed for Cash Flow Breakeven

Bridge to Positive Core Free Cash Flow

The table below shows the level of SG&A per retail unit sold ex D&A and SBC, including ADESA SG&A expenses, that generates positive core free cash flow under a range of retail unit and total GPU scenarios.[1] We intend to use various levers to manage to these levels of per unit SG&A.

300,000	Consolidated Total GPU ex D&A ex SBC	500,000	600,000	700,000	800,000	900,000	1,000,000
	$4,000	$2,600	$2,833	$3,000	$3,125	$3,222	$3,300
	$4,250	$2,850	$3,083	$3,250	$3,375	$3,472	$3,550
	$4,500	$3,100	$3,333	$3,500	$3,625	$3,722	$3,800
	$4,750	$3,350	$3,583	$3,750	$3,875	$3,972	$4,050
Carvana is ~here but at higher SG&A	$5,000	$3,600	$3,833	$4,000	$4,125	$4,222	$4,300
	$5,250	$3,850	$4,083	$4,250	$4,375	$4,472	$4,550
	$5,500	$4,100	$4,333	$4,500	$4,625	$4,722	$4,800

Annual retail units sold

All cells show SG&A per retail unit sold ex D&A and SBC, including ADESA SG&A expenses, that generates positive core free cash flow in a given scenario.

Source: Update on Carvana Operating Plan, August 2022

For example, as indicated in the blue oval above, assuming Carvana sold 700,000 retail vehicles, generated $5,000 in total GPU (which is effectively Carvana's guide for 2Q23 excluding the outsized effect of loan sales in the quarter), and lowered SG&A per retail unit to $4,000, Carvana would generate $700m in EBITDA (700,000 x ($5,000-$4,000)), enough to cover its fixed charges. Unfortunately, consensus expectations for Carvana are closer to ~300,000 retail units this year, a level so low that it is literally not on the page – it's *40% below* the lower boundary of the table.

At current unit levels, Carvana would need to generate $2,300+ in EBITDA per retail unit sold to cover fixed charges (~300,000 vehicles x $2,300 in EBITDA per vehicle = $700m in EBITDA). $2,300 is *twice* CarMax's EBITDA profitability per retail unit and wholly unrealistic. Carvana has expressed mid-term goals of reaching ~$2,900-$3,100 in SG&A per retail unit. Yet last quarter, non-GAAP SG&A per retail unit sold came in at $5,111, still 65% above the high end of mid-term goals despite a year of significant cost-cutting.

While SG&A declined nearly $1,000 per unit y/y in 1Q23, 81% of that came from reducing advertising expenses. Unit cost improvements from all other items were muted by comparison.

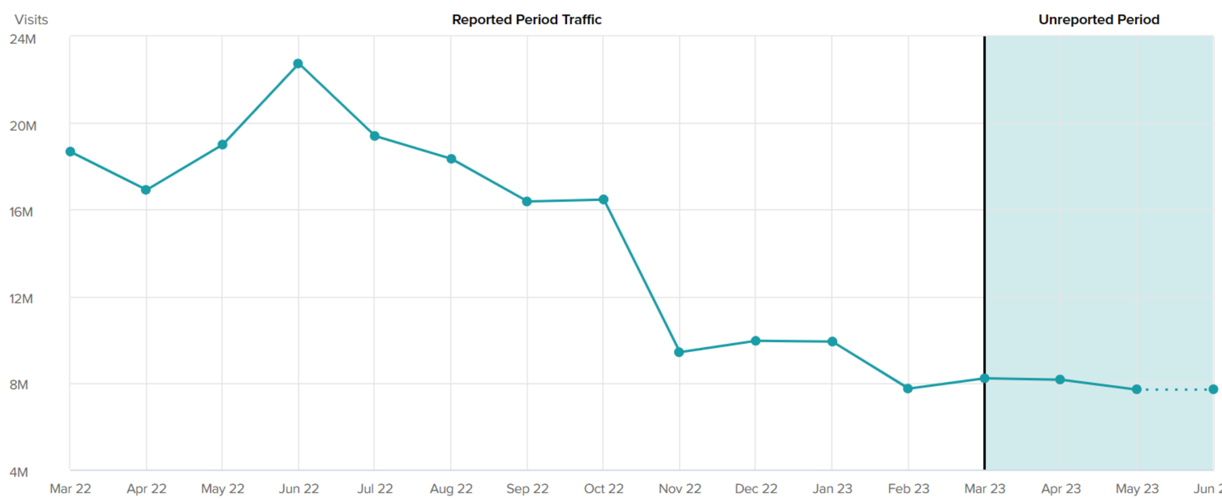
Contribution to SG&A per Retail Unit by Segment

	1Q22A	1Q23A	$ Chg.	Contribution
Advertising	$1,474	$707	($767)	81%
Other Overhead	$2,443	$2,322	($121)	13%
Logistics	$532	$442	($91)	10%
Compensation & Benefits	$2,244	$2,234	($10)	1%
Market Occupancy	$219	$265	$46	-5%
Total SG&A (GAAP) per Retail Unit Sold	$6,912	$5,969	($942)	

Source: Kerrisdale analysis and Carvana SEC filings.

Cutting advertising is a quick and easy way to boost EBITDA and unit economics as the full impact on unit sales lags the near instantaneous reduction in cost. The ultimate impact of Carvana's advertising pullback remains to be seen, particularly as we enter the seasonally slower second half of the year, but shareholders should be keeping an eye on monthly unique visitors which have dropped by half since the year ago period.

Carvana Website Traffic - Monthly Unique Visitors



Source: Tipranks.com (underlying data provided by SEMrush)

Carvana Lacks Resources to Navigate Current Market Environment

Management Lacks Auto Industry Experience

> *"There's not a depth of auto experience in the Carvana executive team…Everything they're experiencing is for the first time…**they don't know what they haven't seen yet."*** *[emphasis added]*
>
> — Former Carvana senior manager

Based on multiple interviews with former Carvana employees, a concerning lack of fundamental automotive and logistics know-how at the senior management level contributed to poor execution as market dynamics shifted in late 2021.

Scan Carvana's 2018 analyst day slide deck and it includes logos for Google, Microsoft, Cisco and a dozen other tech companies when outlining the experience of senior managers, but remarkably not a single auto company. According to a former Carvana executive, CEO Ernest Garcia III is intelligent and motivated, but "an eternal optimist" who was born into the role thanks to his father's business and not a "dyed-in-the-wool" operator. Carvana's complex nationwide hub and spoke network of trucks, IRCs, vending machines, and newly added ADESA facilities is overseen by COO Benjamin Huston, a former corporate lawyer with no prior background in logistics. A different former Carvana employee in logistics described to us a general inability to attract and retain professionals capable of leading a scaled network as particularly problematic, even before massive recent layoffs. CFO Mark Jenkins had a largely academic career before joining the company.

Unreliable Data in an Uncertain Market

Data-driven, predictive modeling drives nearly all of the core operating functions of Carvana. Models are used to optimize inventory and purchasing decisions based on demand signals, pricing is refined based on assumed attach-rates for financial products, reconditioning costs are predicted based on mileage, etc. Carvana's business is built on a belief that centralized data and predictive analytics can outperform the inefficiencies of more local, physical observation-based processes.

For example, Carvana's models may notice a pick-up in demand for 10-year-old Honda Civics, see depleting inventory of the vehicle, and spit out an algorithm to adjust pricing strategy accordingly. The concept is a powerful one but like all models, it is only as good as the data it relies on and (as mentioned above) the people at the controls.

There are several structural problems with Carvana's data-driven approach that the pandemic and its aftermath has laid bare. First, it has an inherent adverse selection problem. Consumers who sell to Carvana have more information about their driving behavior and the true quality of a vehicle than any statistical model. The model also isn't agile enough to react to changes in market conditions that may occur between when it recommends acquiring a vehicle and the time it takes to recondition and list it on the website. If, for example, suddenly there's a surge in consumers accepting offers on their 10-year-old Civics, the model may not predict in time that the company *shouldn't* be buying them at that particular price to avoid building too much inventory. Lastly, there is no macroeconomic feedback loop built into the model capable of predicting something like the effect of 500bps of interest rate hikes within a relatively short period of time.

These qualities mean that despite Carvana's promotion of its technology and data, the company's predictive analytics only work when (big surprise) things are easy to predict and analyze. In other times – when an executive team lacking in auto industry experience needs a quick, effective algorithm to guide decisions – we believe that these models produce flawed, delayed underreactions.

When there is a surprise to the upside, like what was seen after the initial shock of the pandemic, this underreaction results in delayed, slapdash scaling up of operational and logistics to meet unexpected demand. A serious problem, but at least one that can be spun to the market as addressable. When the environment swings unexpectedly badly, the consequences are disastrous – massive amounts of unneeded logistics capacity is bought and inventory goes unsold for far too long before being written off. Ironically, rather than building a business that uses technology to smooth out the challenges of operating in the used car industry, we believe Carvana built one that amplified it.

Going forward, another problem with Carvana's data-reliant business model is that, much like its executives, it is imbued with limited, relevant experience. From 2014-2021, Carvana sold just over 1 million retail vehicles. 765k of these cars, however, were sold from 2H19 until the end of 2021, meaning the vast bulk of Carvana's internal data comes from the abnormal used market conditions of the pandemic. How useful and predictive this data is in the current fragile and uncertain market remains to be seen.

Carvana is Neither Disruptive nor Differentiated, and Competition Has Caught Up

> *"Because we do have a differentiated customer offering that customers love. Our NPS [Net Promoter Score] is high."*
>
> — Ernie Garcia III, CEO Carvana, 1Q23 earnings conference call

> ***"What <u>were</u> our differentiators early on, are no longer differentiators at all****. Like, everyone will deliver a car to you now, everyone has a return policy...Everything that made Carvana what it was…* ***CarMax? They've already caught up."***
>
> *"We did just become everyone else…* ***It [NPS] is <u>horrible</u>****…Even when they were reporting on it,* ***<u>it was just smoke and mirrors</u>****. You're asking people, 'how was the experience?' right after they've been given the car. But you register a car 45 days later and they were failing on registering like 40% of vehicles so yeah, you ask someone the day after they've gotten this cool car, but in 45 days they can't legally drive it. They haven't found issues that may have been missed in the inspection process when you're asking them 'how was the experience?'* ***but <u>when you actually take the NPS 45 days later you're worse than a lot of folks.</u>"*** *[emphasis added]*

— Former Carvana executive

Many of the consumer-friendly offerings that helped Carvana rapidly gain share are no longer unique. For example, all of the "Three reasons to sell to Carvana" provided in e-mails to potential customers: firm no-haggle offer, fast payment, and multiple delivery options are now offered by multiple online competitors. Vroom, Shift, Driveway, AutoNation, CarBravo, and CarMax all have easy to navigate websites that provide a similar buying and selling experience to Carvana (literally, all of them have some version of "Shop, Sell/Trade, Finance" dropdown menus across the top of their sites and a search bar for make, model or keyword).

All ask nearly identical questions regarding the condition and trim of the vehicle when providing an instant appraisal and offer conveniences such as flexible pick-up and delivery. Most provide a firm offer based on various dataset and algorithms adjusted for perceived market interest (CarMax is an exception and generally requires a physical inspection), and all offer guaranteed money back return policies (typically 7 days or 200-400 miles, whichever comes first, while CarMax is the most generous at 30 days or 1,500 miles).

At the same time that traditional brick-and-mortar auto retailers have encroached on Carvana's online turf with competitive "omni-channel" strategies, Carvana has had to adopt the less consumer friendly practices of dealers it once derided, in order to generate more profit. Over the past year, Carvana has dramatically narrowed the size and breadth of inventory (reducing customer selection) and added return fees, incentivized pick-ups, and begun charging a higher delivery fee when a customer wishes to purchase a vehicle that is further away (reducing customer convenience).

This blurring of once distinct competitive positioning extends to Carvana's business model itself. A guiding maxim of Carvana's strategy has historically been "centralized inventory and distributed demand." (ie. B. Riley Conference October 2018, Citi Global Tech Conference September 2017). In theory, with transactions taking place online and the benefit of less costly physical storefront infrastructure, Carvana could utilize a centralized hub and spoke logistics network to serve a distributed customer base. In doing so, Carvana would fundamentally change the used car customer experience from a strictly local one to one that scaled nationwide. Carvana's consistent inability to generate cash and the logistical headaches encountered during 2021 proved that at the very least, Carvana's version of this model does not scale effectively or seamlessly. The acquisition of ADESA was an acknowledgement of these shortcomings. Far more brick-and-mortar infrastructure (over $2.2bn worth) was needed to properly scale, physically reduce the distance to its customers, and improve profitability by lowering logistics costs. In effect, Carvana needed to look and act more like a local dealership group.

While the ADESA acquisition was overpriced and disastrously timed, the strategic logic of extending the network to be more local was long overdue. There's a reason why the used car market exists as a highly local, fractured industry. To succeed in a cutthroat, low margin retail business, particularly through downturns, it behooves a company to have a granular understanding of the nuances that drive purchase and sale decisions, i.e., a *decentralized* model of local dealers making quick, locally driven decisions. Importantly, this model allows for better, proactive decision making around inventory management, and lowers the risk associated with concentrated bad decisions (a lesson Carvana learned the hard way with its poor approach to inventory last year).

Valuation

> *"Two dynamics around Carvana which are less understood…one is, you have to think of them as just a dealership. Can they grow? Yeah,* ***if they want to grow responsibly they have to grow like a dealership****…they confused people for a while by [talking about their tech and website] but* ***98% of what they do is dealership stuff so don't get confused.*** *The other dynamic is they're a subprime dealership…by serving that audience, it's actually* ***a much more volatile boom/bust cycle than the rest of the car market."*** *[emphasis added]*
>
> — Former Carvana senior executive

Given little separates Carvana from industry peers in terms of future growth rate, consumer experience, and increasingly hybrid business models, we believe Carvana should be valued on the same basis as other auto retailers – only one that is not as diversified (no exposure to new cars or aftermarket parts and service), more exposed to the boom/bust cyclicality of subprime credit, with zero track record of generating profits, and operating with heightened financial risk despite a business model that should require it to operate with less. This is not merely our biased approach to thinking about Carvana's intrinsic value – it's what every former Carvana executive we interviewed advised.

Using peer multiples for EV / Sales of ~.45x and EV / Gross Profit of 3.0x returns an enterprise value for Carvana of less than $5bn, insufficient to cover the debt, implying limited to no value with the balance sheet as presently constituted. Carvana equity is worth $0. (see: Appendix II - Trading Comparables).

Conclusion

> *"And I think, we want to be careful to not be overconfident in our precise reads of what's going on, because I do think the environment is incredibly unique and therefore, like your certainty around assessing exactly what's happening should just be a little lower than it otherwise would be."*
>
> — Ernest Garcia III, CEO Carvana at Wells Fargo TMT Virtual Summit, December 1, 2021

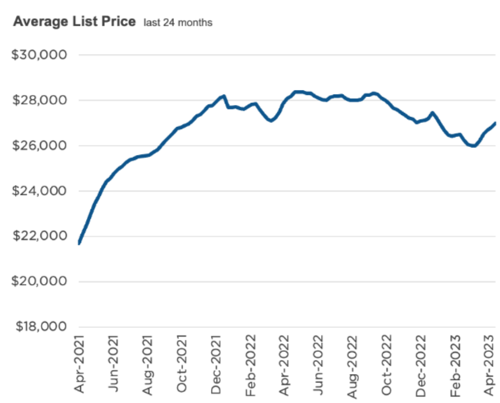
The most unfortunate aspect of Carvana's current predicament – fortunes wasted, reputations tarnished, *thousands* of jobs lost – is none of it had to happen. Garcia sensed the prevailing market environment was not to be trusted, and yet armed with limited operational chops and reliant on a flawed business model, he made the poor decision to plow ahead and borrow even more money in the hope of attaining yet more growth. Carvana's business is flawed to begin with, but that singular decision is why a cyclical downturn created a solvency crisis.

We have no doubt that the buying of used cars online will continue to improve and represent a growing proportion of the overall market. The beneficiary simply won't be Carvana 1.0. The fundamental reason to not own shares is that Carvana cannot exist, let alone thrive, in its current form. A posterchild for the excesses and fantasyland thinking of the tech bubble, we believe its equity is a donut, or, better put, a big round tire.

Appendix I: Current Used Car Market Conditions

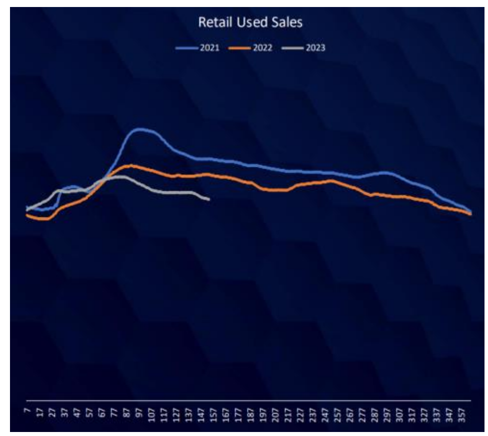
According to leading auto industry research provider, Cox Automotive, it may be several more years before the number of used car sales returns to pre-pandemic levels. Key issues such as affordability and supply constraints arising from the new vehicle production hole caused by the pandemic look set to "persist for some time." Although off peaks set a year ago, the rate of used price decline has recently stabilized at levels still ~30% above pre-pandemic ranges. After starting the year modestly ahead of last year's pace, industry retail used vehicle sales recently inflected negatively falling -8% y/y in April and are now trending down -11% year-to-date.

Average Used Vehicle List Price



Source: Cox Automotive, May 12, 2023

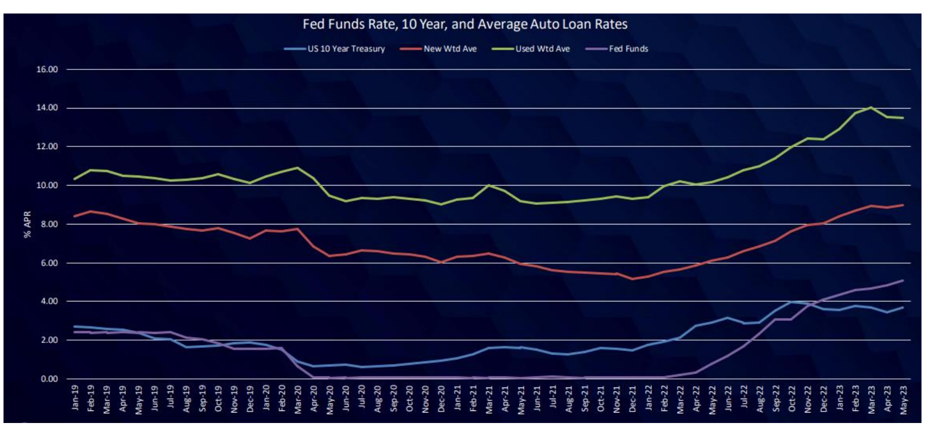
Retail Used Sales



Source: Cox Automotive Auto Market Report, June 6, 2023

According to Cox, the average auto loan rate for a used vehicle in May stood at a whopping 13.55%. Credit application data, across all channels and all lender types, indicate access to auto credit continued to tighten and auto loan performance declined y/y. Delinquencies that were 60 or more days are up 18.6% from a year ago and the highest April figure since 2006.

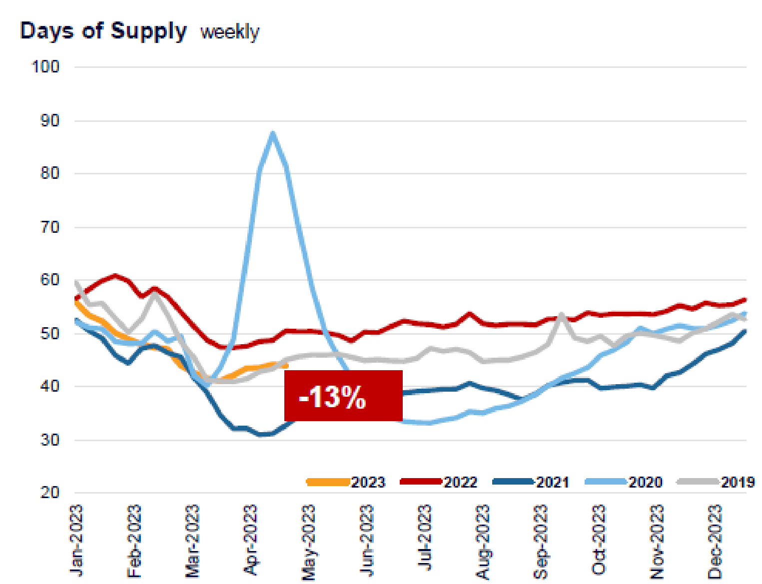
Average Auto Loan Rates



Source: Cox Automotive Auto Market Report, May 23, 2023

Used days' supply are down 8 days to 44 y/y (-13%). Of particular relevance to Carvana given its customer base skews toward sub-prime and lower priced car buyers, the lower the price point the tighter the inventory. Days' supply for vehicles under $10k was just 31. Days' supply for vehicles priced between $10-$15k and $15-$20k were 37 and 40, respectively. Gradual normalization in new vehicle production will only modestly alleviate this situation in the coming months as automakers continue to tilt their production schedules to more expensive vehicles targeted at higher income, higher credit score buyers.

Days of Supply



Source: *Cox Automotive, May 12, 2023*

These used market dynamics present an inventory management headache for every used car retailer but particularly for Carvana which, relative to scaled industry peers, skews toward lower income and lower credit quality customers. In order to help drive profitable unit sales and avoid the mistake of writing down aging inventory (again), Carvana must do a better job of acquiring more affordable vehicles. However, as just described, later model, relatively inexpensive vehicles are in particularly short supply. Unless Carvana gives on price, enhances customer convenience, or outshouts the competition with advertising – all of which Carvana has pulled back on in order to enhance profitability – attracting potential customers with the right car, at the right time, and for the right price is becoming more difficult.

Several leading indicators for consumer sentiment and discretionary spending also portend further weakness for used vehicle sales in 2H23:

1. Consumer confidence decreased in April to the lowest level since July '22, driven by a decline in expectations. For 13 of the last 14 months, the expectation index has remained below 80 – the level associated with recession. According to the Conference Board, "overall purchasing plans for homes, autos, appliances, and vacations all pulled back in April." Plans to purchase a vehicle in the next 6 months declined to the lowest level since November 2021.
2. April monthly credit card spending data from KeyBanc saw broad based weakness in discretionary categories such as home furnishings, mattresses, and electronics.

3. According to the Federal Reserve, credit card debt grew by $17.6bn in March, the highest growth rate in a year. For the first time since 2001, credit card debt didn't fall q/q in 1Q23 thanks to high interest rates and inflation.

Appendix II: Trading Comparables

Carvana Trading Comparable

			EV / Sales		EV / Gross Profit		EV / EBITDA		'24E FCF	
	Mkt. Cap.	TEV	2023E	2024E	2023E	2024E	2023E	2024E	Yield	Div. Yield
Penske	$10,340	$14,361	0.5x	0.5x	3.0x	3.0x	8.7x	9.6x	10%	1.8%
Asbury	$4,872	$8,140	0.5x	0.5x	2.6x	2.6x	7.3x	7.6x	13%	N.A.
Sonic	$1,621	$5,131	0.4x	0.3x	2.2x	2.2x	8.8x	8.4x	10%	2.5%
Lithia Motors	$7,063	$15,002	0.5x	0.5x	2.9x	2.9x	8.9x	8.7x	6%	0.8%
AutoNation	$6,475	$10,945	0.4x	0.4x	2.1x	2.1x	6.1x	6.6x	13%	N.A.
CarMax	$12,468	$14,936	0.6x	0.5x	5.3x	5.3x	17.8x	14.2x	6%	N.A.
		Mean	0.5x	0.5x	3.0x	3.0x	9.6x	9.2x	10%	1.7%
		Median	0.5x	0.5x	2.8x	2.8x	8.8x	8.6x	10%	1.8%
Carvana	$3,606	$10,165	1.0x	1.0x	7.1x	6.3x	NM	90.4x	NM	N.A.

Source: Kerrisdale analysis, Bloomberg consensus estimates.

Full Legal Disclaimer

As of the publication date of this report, Kerrisdale Capital Management LLC and its affiliates (collectively "Kerrisdale") have short positions in and put options on the stock of Carvana Co. (“CVNA”). In addition, others that contributed research to this report and others that we have shared our research with (collectively with Kerrisdale, the “Authors”) likewise may have short positions in the stock of CVNA. The Authors stand to realize gains in the event that the price of the stock decreases. Following publication of the report, the Authors may transact in the securities of the company covered herein. All content in this report represents the opinions of Kerrisdale. The Authors have obtained all information herein from sources they believe to be accurate and reliable. However, such information is presented “as is,” without warranty of any kind – whether express or implied. The Authors make no representation, express or implied, as to the accuracy, timeliness, or completeness of any such information or with regard to the results obtained from its use. All expressions of opinion are subject to change without notice, and the Authors do not undertake to update or supplement this report or any information contained herein. This report is not a recommendation to short shares of any company, including CVNA, and is only a discussion of why Kerrisdale is short CVNA.

This document is for informational purposes only and it is not intended as an official confirmation of any transaction. All market prices, data and other information are not warranted as to completeness or accuracy and are subject to change without notice. The information included in this document is based upon selected public market data and reflects prevailing conditions and the Authors’ views as of this date, all of which are accordingly subject to change. The Authors’ opinions and estimates constitute a best efforts judgment and should be regarded as indicative, preliminary and for illustrative purposes only.

Any investment involves substantial risks, including, but not limited to, pricing volatility, inadequate liquidity, and the potential complete loss of principal. This report’s estimated fundamental value only represents a best efforts estimate of the potential fundamental valuation of a specific security, and is not expressed as, or implied as, assessments of the quality of a security, a summary of past performance, or an actionable investment strategy for an investor.

This document does not in any way constitute an offer or solicitation of an offer to buy or sell any investment, security, or commodity discussed herein or of any of the affiliates of the Authors. Also, this document does not in any way constitute an offer or solicitation of an offer to buy or sell any security in any jurisdiction in which such an offer would be unlawful under the securities laws of such jurisdiction. To the best of the Authors’ abilities and beliefs, all information contained herein is accurate and reliable. The Authors reserve the rights for their affiliates, officers, and employees to hold cash or derivative positions in any company discussed in this document at any time. As of the original publication date of this document, investors should assume that the Authors are short shares of CVNA and stand to potentially realize gains in the event that the market valuation of the company’s common equity is lower than prior to the original publication date. These affiliates, officers, and individuals shall have no obligation to inform any investor or viewer of this report about their historical, current, and future trading activities. In addition, the Authors may benefit from any change in the valuation of any other companies, securities, or commodities discussed in this document. Analysts who prepared this report are compensated based upon (among other factors) the overall profitability of the Authors’ operations and their affiliates. The compensation structure for the Authors’ analysts is generally a derivative of their effectiveness in generating and communicating new investment ideas and the performance of recommended strategies for the Authors. This could represent a potential conflict of interest in the statements and opinions in the Authors' documents.

The information contained in this document may include, or incorporate by reference, forward-looking statements, which would include any statements that are not statements of historical fact. Any or all of the Authors' forward-looking assumptions, expectations, projections, intentions or beliefs about future events may turn out to be wrong. These forward-looking statements can be affected by inaccurate assumptions or by known or unknown risks, uncertainties and other factors, most of which are beyond the Authors' control. Investors should conduct independent due diligence, with assistance from professional financial, legal and tax experts, on all securities, companies, and commodities discussed in this document and develop a stand-alone judgment of the relevant markets prior to making any investment decision.