READING THE METER

A look inside a cleaner, safer, smarter auto industry.

ALLIANCE FOR AUTOMOTIVE INNOVATION

Contents – November 23, 2022

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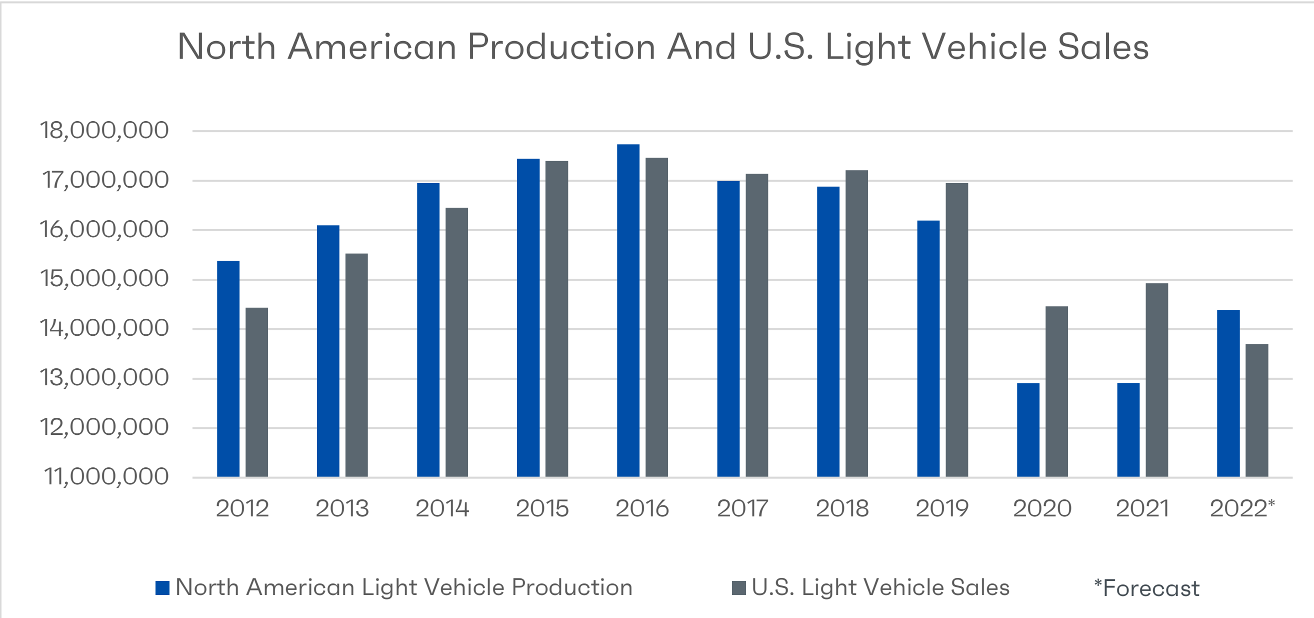
Cleaner. Safer. Smarter.

Forecast Meter

Sales & Production Summary and Forecast (Updated 11/23)

2021-2022 Sales,[1] Extended Sales Forecast[2] and Production Forecasts[3]		
	U.S. Sales & Forecasts	**North American Production**
January '21	1,094,689 (-3.6% YoY)	1,175,940 (-14.0% YoY)
February '21	1,180,506 (-5.3% YoY)	1,120,200 (-22.9% YoY)
March '21	1,581,067 (+59.7% YoY)	1,376,904 (31% YoY)
April '21	1,512,186 (+111.4 YoY)	1,094,891 (-21% YoY)
May '21	1,577,941 (+41% YoY)	729,879 (+271% YoY)
June '21	1,296,517 (+17% YoY)	1,107,958 (-1.9% YoY)
July '21	1,288,494 (-7.9% YoY)	926,035 (3% YoY)
August '21	1,090,446 (-11% YoY)	1,113,327 (-19% YoY)
September '21	1,006,875 (-25% YoY)	907,470 (-33.4% YoY)
October '21	1,046,282 (-20% YoY)	1,140,383 (-22.1% YoY)
November '21	1,001,351, (-20% YoY)	1,168,245 (-9% YoY)
December'21	1,194,313 (-22.9% YoY)	1,029,501 (-13.8% YoY)
January '22	991,156 (-10% YoY)	1,111,390 (-4% YoY)
February '22	1,052,524 (-11.8% YoY)	1,112,429 (-1% YoY)
March '22	1,246,336 (-22% YoY)	1,350,102 (-.1% YoY)
April '22	1,226,950 (-22% YoY)	1,177,851 (+8% YoY)
May '22	1,104,993 (-23.8% YoY)	1,215,000 (+20.4% YoY)
June '22	1,126,724 (-16.8% YoY)	1,259,515 (+13.8% YoY)
July '22	1,129,371 (-8.4% YoY)	977,485 (+7% YoY)
August '22	1,128,200 (-.7% YoY)	1,413,262 (+29 %)
September '22	1,112,245 (+3.9% YoY)	1,258,501 (+38% YoY)
October '22	1,151,774 (+13.8% YoY)	1,299,707 (+12.4% YoY)
1st Quarter '22	14.01 million-unit SAAR	3,458,480 (-1.4% YoY)
2nd Quarter '22	13.4 million-unit SAAR	3,584,093 (+13.2% YoY)
3rd Quarter '22	3,358,116 (-.9% YoY	3,636,418 (+24.6% YoY)
2021 Full Year	14,926,933 (+3.1% YoY)	12,919,000 (+4% YoY) (U.S. 8,871,661)
2022 Full Year Estimate	13.8 million units (WardsIntelligence)	14,386,000 (+11.4% YoY)



U.S. Light Vehicle Sales Outlook (Updated 11/23)

Wards Intelligence Outlook (11/23) [4]**:** "U.S. light-vehicle sales in November are tracking toward a downturn from the prior month on an annualized basis, as higher interest rates, rising prices and talk of recession, combined with still historically low, albeit rising, inventory, is keeping some consumers out of the market. November's forecast seasonally adjusted annual rate of 14.5 million units, though down from October's 14.9 million, is well above year-ago's 13.1 million and puts the fourth quarter on track to solidly outdo Q2 and Q3's 13.3 million and 13.4 million, respectively.

"The slide from the prior month's results is not unexpected. October's results were a 9-month high but included temporary boosts from delayed deliveries of vehicles over the summer caused by the supply-chain shortages and delivery logjams.

"However, there could be upside to November's outlook depending on how much automakers and/or dealers want to up the ante with month-end deals in the post-Thanksgiving holiday period - or, in lieu of spiffs, dealers could ease up on the number of vehicles they have been demanding prices for above the manufacturer suggested retail prices.

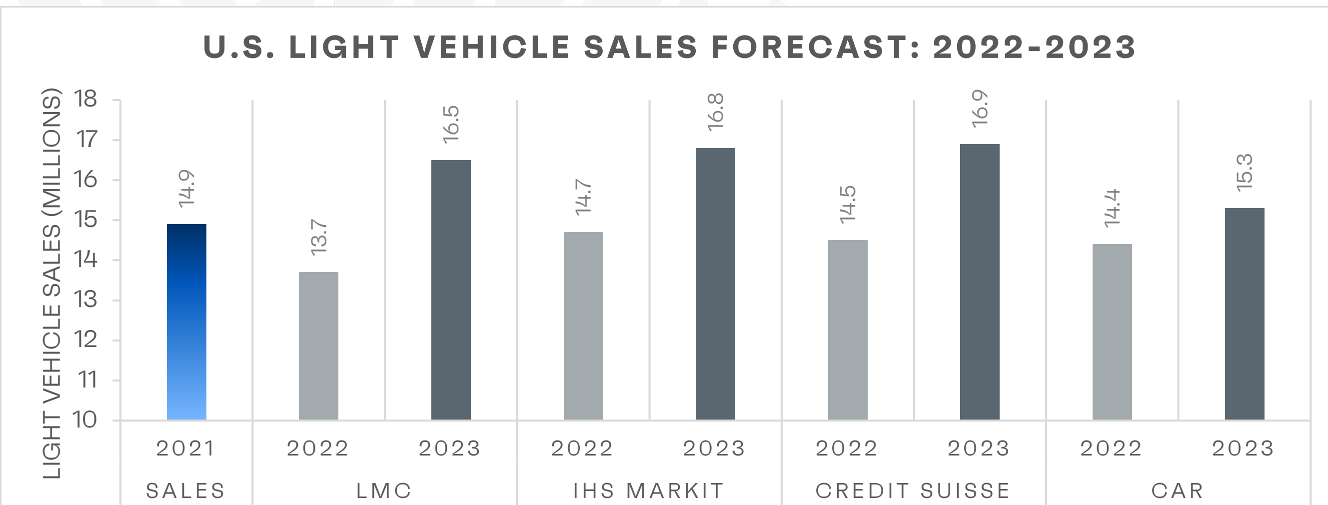
"November's forecast volume is 1.147 million units, equal a daily selling rate over the month's 25 selling days of 45,880, 8.5% above year-ago's 42,267 – 24 selling days.

"Inventory is forecast to rise month-to-month for the fourth straight period in November, totaling 1.65 million units, 58% above year-ago and an any-month high since April 2021's 1.97 million."

WardsIntelligence Outlook for 2022[5]: "Sales could weaken over the last two months of the year from October. Wards Intelligence partner LMC Automotive has lowered its outlook for entire-2022 100,000 units to 13.7 million. The cut comes from a revised outlook calling for stiffer economic headwinds. Sales in 2023 are forecast for a significant gain but to a tepid 15.1 million units.

To meet the 12-month forecast, the fourth-quarter SAAR must total 14.2 million units, an improvement on Q2's 13.3 million and Q3's 13.4 million, but also meaning total November-December results will weaken from October's outlook, if that holds firm."

Credit Suisse Outlook For 2022 (7/6)[6]: "We reduce our 2022 US auto sales forecast to 14.5mn from 15.1mn prior. The central theme of the US auto sales market YTD (and for that matter over the past year) has been historic inventory constraints limiting sales volume. Indeed, 1H22 SAAR ended at 13.8mn, and to meet our prior forecast would have required an overly-challenging 2H ramp. Given inventory constraints are likely to linger in 2H, even if easing, we reduce our forecast; our revised forecast implies 2H SAAR of ~15.0mn, which is still below the normalized SAAR we would expect of 16-17mn."



North American Production & Inventory Outlook (Updated 11/23)

Wards Intelligence Production Outlook (11/23) [7]: "The revised projection for the fourth quarter is 3.687 million units, a cut of 96,900 from month-ago's outlook. The Q4 total is 9.2% above like-2021's 3.375 million units. Light-vehicle output in Q4 is tracking to 3.550 million units, 9.6% above October-December 2021.

"Despite the solid year-over-year increase, the Q4 projection is 5.4% below pre-pandemic-2019's total. Production is not likely to get back to pre-Covid levels until late-2023.

"For the year production is tracking to 14.774 million units, 10.2% above 2021's 13.407 million. Light vehicles are projected to total 14.235 million units in 2022, also up 10.2%.

"**Wards Intelligence Inventory Outlook (11/3)[8]:** "U.S. light-vehicle inventory ended October up 7.8% from the prior month, creating more potential for sales in the final two months of the year to improve on, or at least maintain, last month's long-time high results. . . . However, inventory is expected to continue rising in November, including for more affordable vehicles. The inventory mix remains weighted toward high-priced vehicles, but the overall increase means lower-priced models are rising in availability, which could pull more consumers into the market – and probably did in October - that previously were put off by steadily escalating prices.

"Inventory of the largest segment in sales, CUV, is up 56.9% from the same year-ago month, with the bread-and-butter subsegment, Middle CUV, up 111%. Until last month when Middle CUV accounted for 20% of the market, a dearth of inventory compared with higher margin vehicles, especially pickups and SUVs, pushed the sub-segment below its pre-pandemic market-share norms in most months over the past two years.

"Luxury-priced CUVs still dominate inventory in the CUV segment but rising inventory for Middle CUV bodes well for meeting more of the pent-up demand built up since March 2020 when the pandemic first impacted the U.S. market."

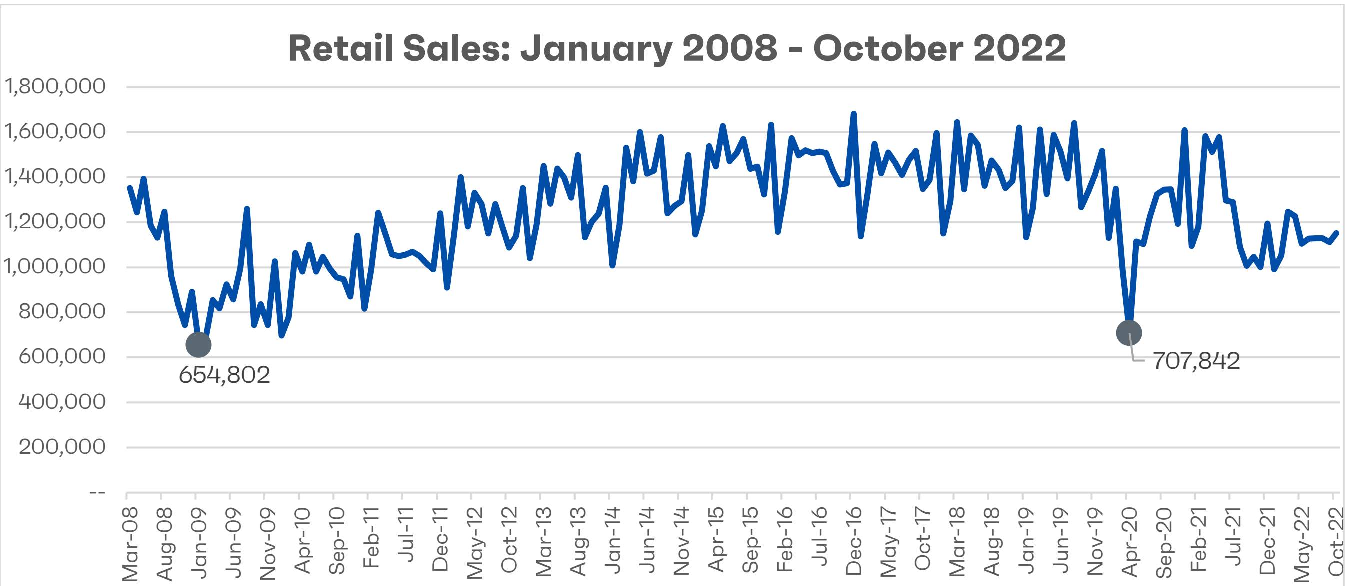
S&P Global Mobility Outlook[9]: "North America: The outlook for North America light vehicle production was reduced by 109,000 units and by 234,000 units for 2022 and 2023, respectively (and was reduced by 53,000 units for 2024). The outlook for North America light vehicle production for 2022 was reduced 0.7% to 14.47 million units on continued supply chain, labor and logistic issues. A recent uptick in unplanned downtime relating to a broad array of supply chain issues has curbed production with manufacturers still challenged to produce vehicles at normal operating patterns. The near-term production forecast continues to be derived from automakers' ability to produce remaining divorced from economic, demand and inventory conditions amid ongoing supply chain issues. Concerns surrounding ongoing supply chain challenges and demand destruction amid recessionary fears results in the outlook for 2023 being revised down 1.5% to 15.39 million units. With the outlook for US demand sharply reduced, inventory creation has entered its formative stage and is projected to reach 2.0 million units by the end of 2023. Following reductions last month due to production constraints extending into 2024 along with the effects of demand destruction, the outlook for 2024 was revised down a further 0.3% to 16.16 million units. Greater demand destruction amid a recessionary outlook results in the risk for additional cuts to the outlook for 2024 with output in 2023 serving as an inventory restocking buffer."

Market Meter

U.S. Light Vehicle Sales (Updated 11/4)

Monthly Sales (Updated 11/3)

This chart helps to put into context the monthly retail sales due to the COVID pandemic and showing the relative drop in sales compared to the 2008 financial crisis.



October Sales (Updated 11/3)

WardsIntelligence [10]: "U.S. light-vehicle sales in October posted a 9-month-best seasonally adjusted annual rate, while volume recorded a hefty increase over the year-ago month.

"The uptick comes after inventory entered the month at a long-time high, which also likely was the main cause of a month-to-month decline in average vehicle transaction prices. In fact, increased availability led to market-penetration gains of cars and non-luxury CUVs, which helped bring down the average price of all vehicles for a third straight month.

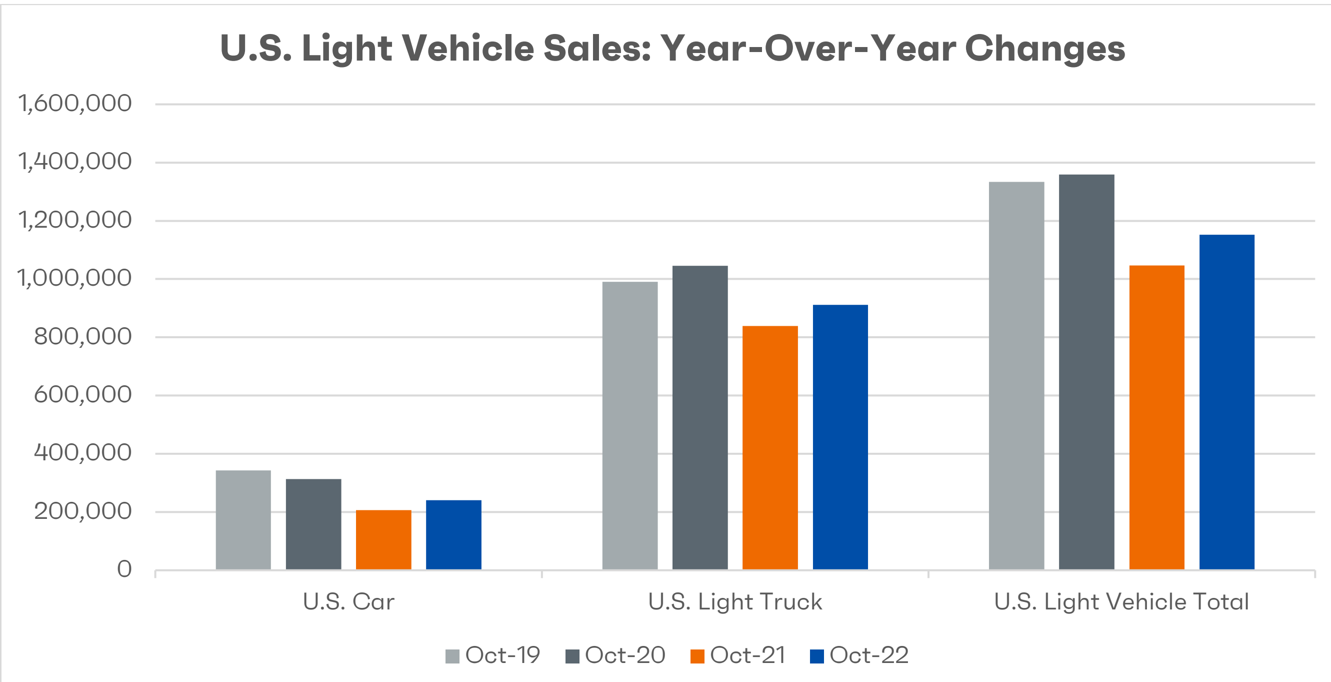
"October's SAAR of 14.9 million units was the highest since January's 15.1 million, and well above Q3's 13.3 million and same-month 2021's 13.2 million. It also marked a huge month-to-month gain from September's 13.6 million units.

"Raw volume totaled 1.15 million units, up 9.6% from like-2021. October's daily selling rate over 26 selling days was 44,299, 13.8% above same-month 2021's 38,926 – 27 selling days. After 14 straight declines through August, the DSR was up year-over-year for a second consecutive month in October.

"Greater product availability and apparent easing on price increases likely were behind the improvement.

"Also propping deliveries in October were some vehicles stuck in the pipeline over the summer due to issues with shipping, which were counted in inventory but not available for customer delivery until last month. Also, some dealers were able to deliver a major portion of the partially-built vehicles – those built but waiting for a microchip – which automakers stockpiled over the summer. Those vehicles were not counted in inventory until becoming a saleable unit.

"Another dynamic that might have slightly boosted volume was delayed purchases from September when Hurricane Ian halted deliveries in much of Florida and the states surrounding it at the end of the month, putting a small dent in last month's results."



<u>Fleet Sales (Updated 11/3)</u>

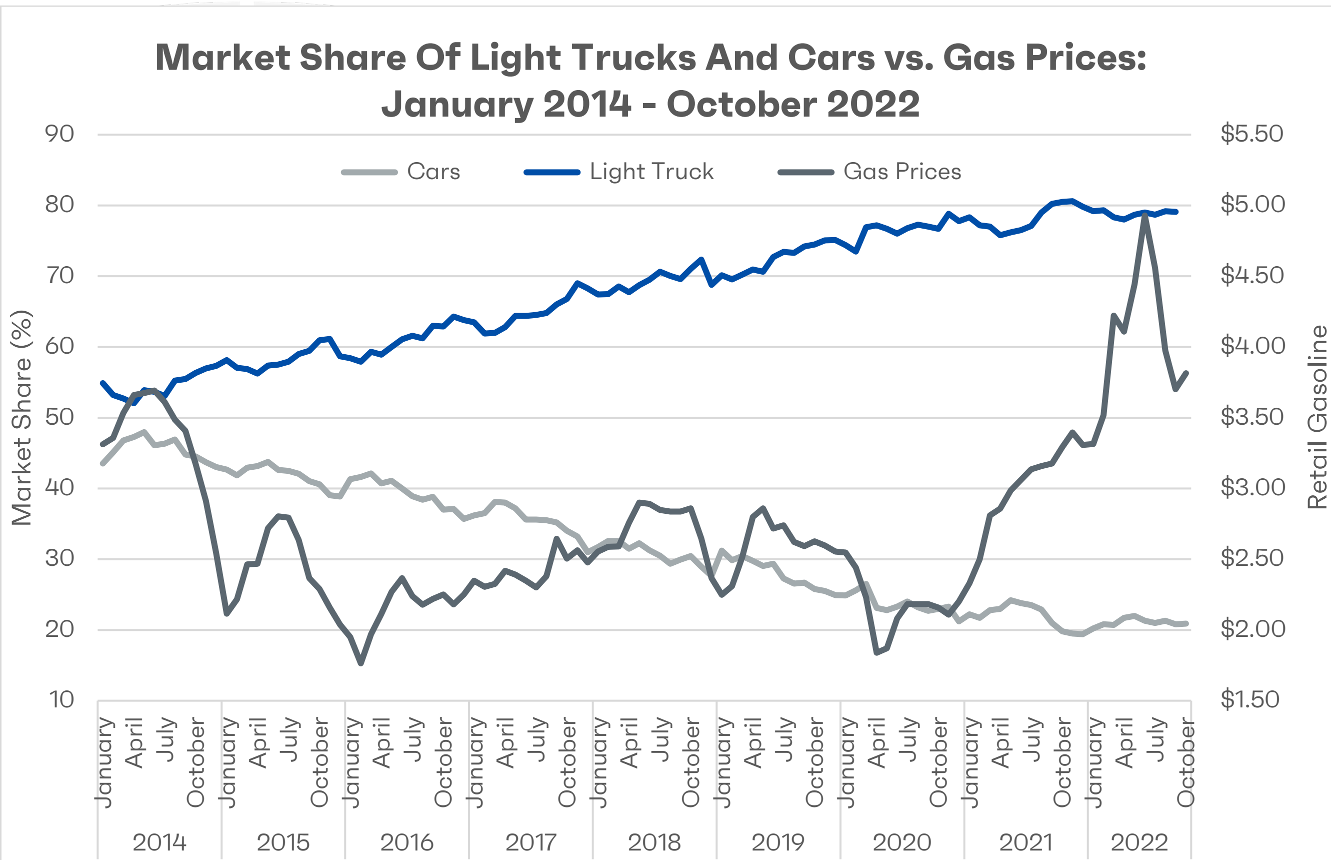
TrueCar [11]: "Fleet sales for October 2022 are expected to be up 64% from a year ago and up 11% from September 2022 when adjusted for the same number of selling days."

J.D. Power [12]: "Fleet sales are expected to total 149,700 units in October, up 41.6% from October 2021 on a selling day adjusted basis. Fleet volume is expected to account for 13% of total light-vehicle sales, up from 11% a year ago."

Segments vs. Gas Prices (Updated 11/4)

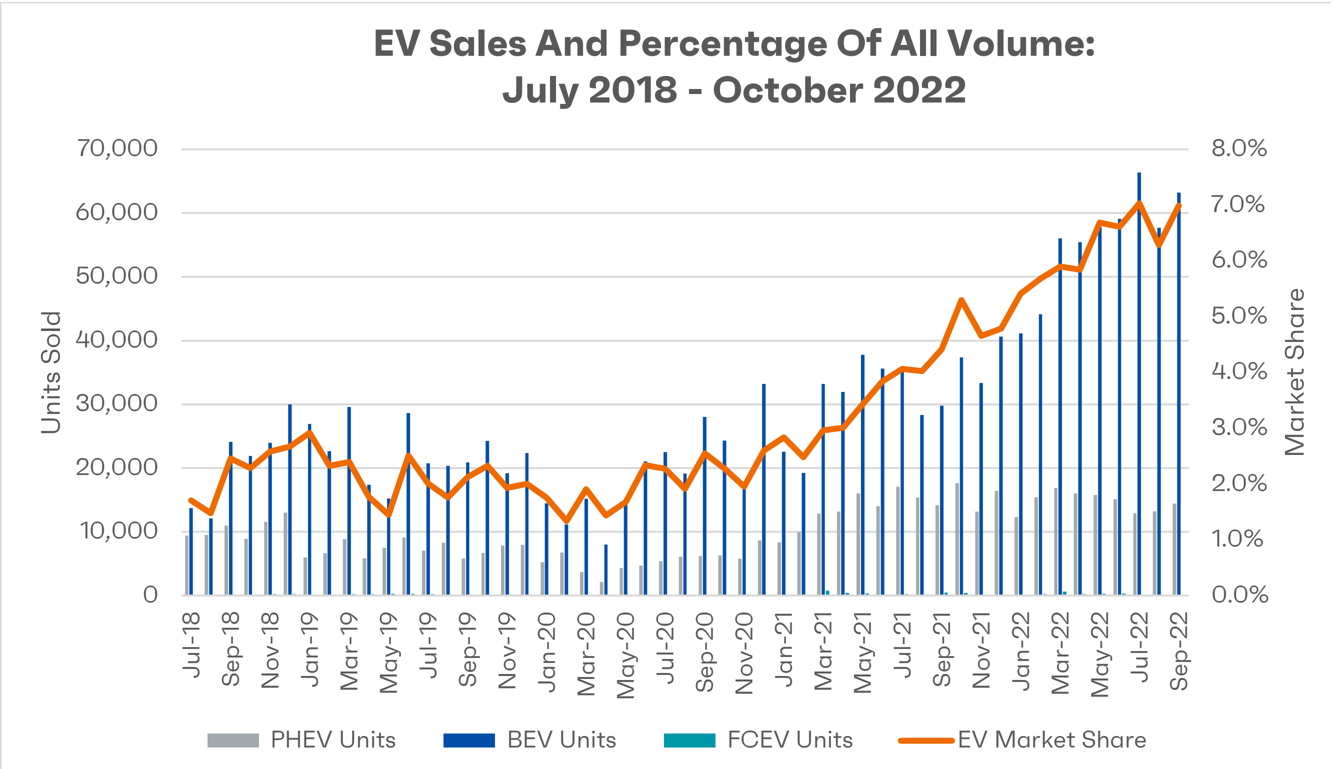
Monthly Sales For September: Light trucks accounted for nearly 79 percent of sales in October, a 1 pp decrease in market share from a year ago. Compared to the same period in 2021, sales of cars are up nearly 34,000, and down more than 102,000 from October 2019, when cars comprised 26% of the market as opposed to the 21% of the market passenger cars have now.

Historic Perspective: The upward trend in the popularity of light trucks over cars has been steady since 2013, when only 2% of annual market share separated the two segments [13] and gas was over $3.00 [14] a gallon. As fuel prices dropped below the $3.00 mark in mid-September 2014, light truck sales began to take off. Gas prices since have averaged only $2.80 a gallon (through August 2022) and when combined with increased fuel economy for light trucks, an increase of 4 mpg since 2013, the perfect conditions existed to continue fueling light truck market growth. [15]



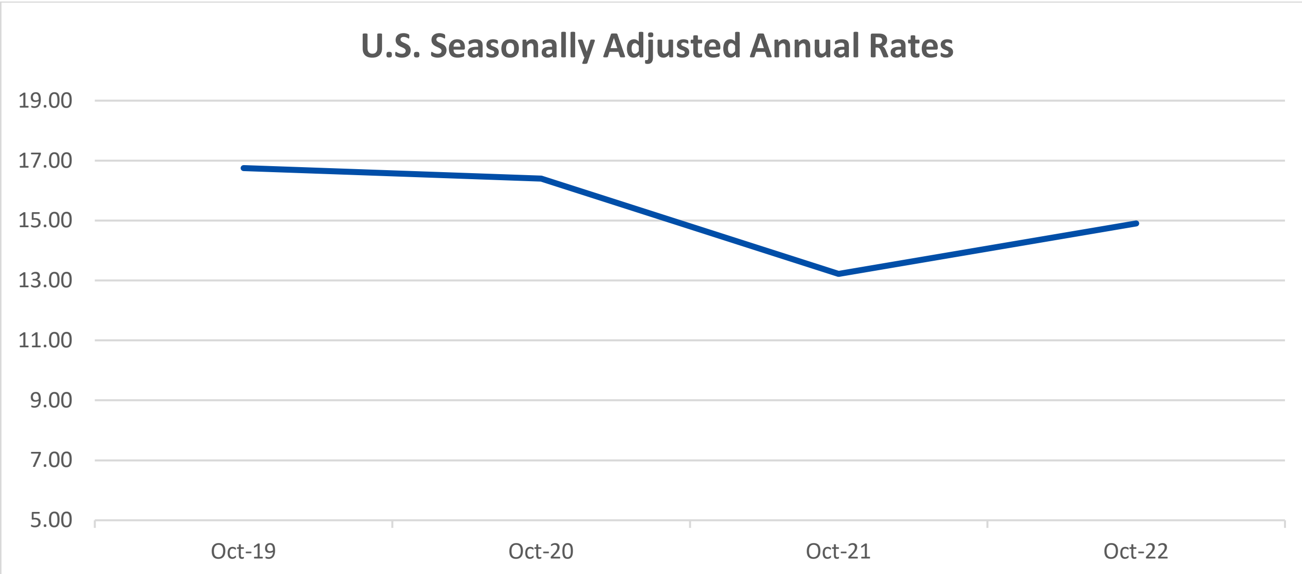
EV Powertrain Sales (Updated 11/4)

Sales of electric vehicles (BEV, PHEV, & Fuel Cell) accounted for 7.5% of total vehicle sales in October 2022 (86,102 units), the highest by market share and volume to date. October's EV market share is up 2.2 pp from a year ago and up 0.5 pp from September 2022. Sales of battery electric vehicles led the way for ZEVs, accounting for 6.1% of total sales, up 2.5 pp from October 2021. Plug-in hybrids accounted for 1.3%, down 0.34 pp than the same time last year. [16]



Seasonally Adjusted Annual Rates (Updated 11/4)

WardsIntelligence: "U.S. light-vehicle sales in October posted a 9-month-best seasonally adjusted annual rate, while volume recorded a hefty increase over the year-ago month. . . . October's SAAR of 14.9 million units was the highest since January's 15.1 million, and well above Q3's 13.3 million and same-month 2021's 13.2 million. It also marked a huge month-to-month gain from September's 13.6 million units."[17]



Average Transaction Price (Updated 11/23)

Kelley Blue Book (October) (Updated 11/23) [18]**:** "The average price paid for a new vehicle in the United States in October 2022 was up from September and remains above the $48,000 mark, according to data released today by Kelley Blue Book, a Cox Automotive company.

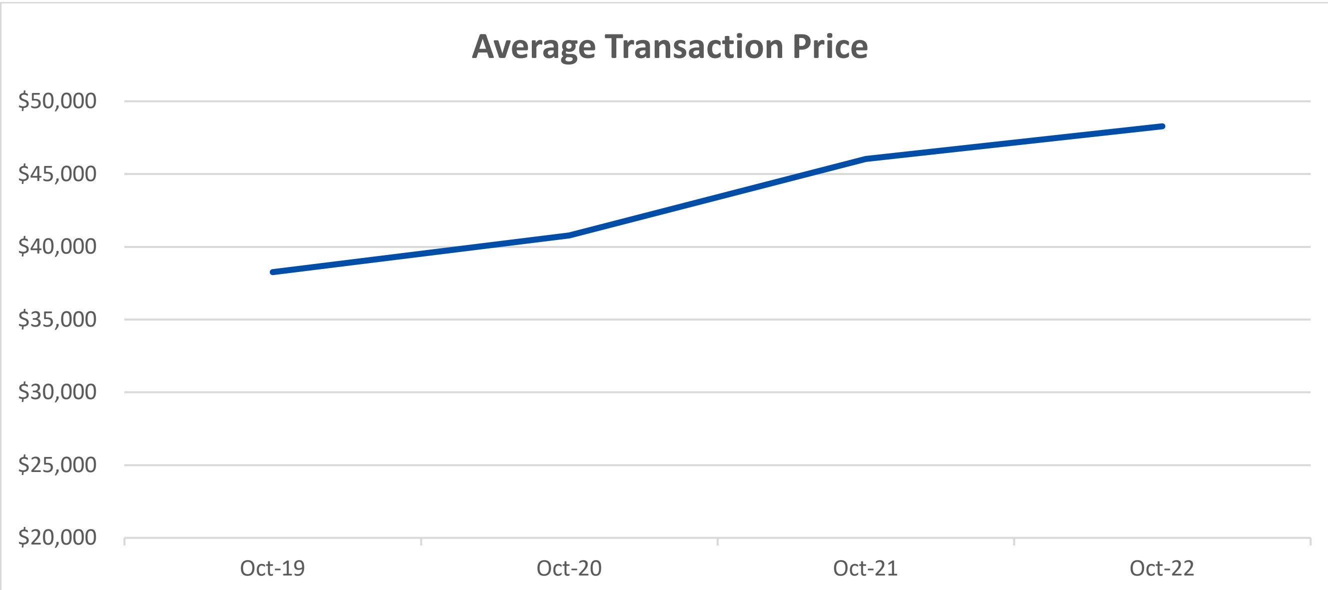
"The Kelley Blue Book new-vehicle average transaction price (ATP) increased to $48,281 in October, slightly lower than the revised all-time high of $48,301 set in August. October 2022 prices rose 0.2% ($187) month over month from September and were up 3.8% ($1,775) year over year from October 2021.

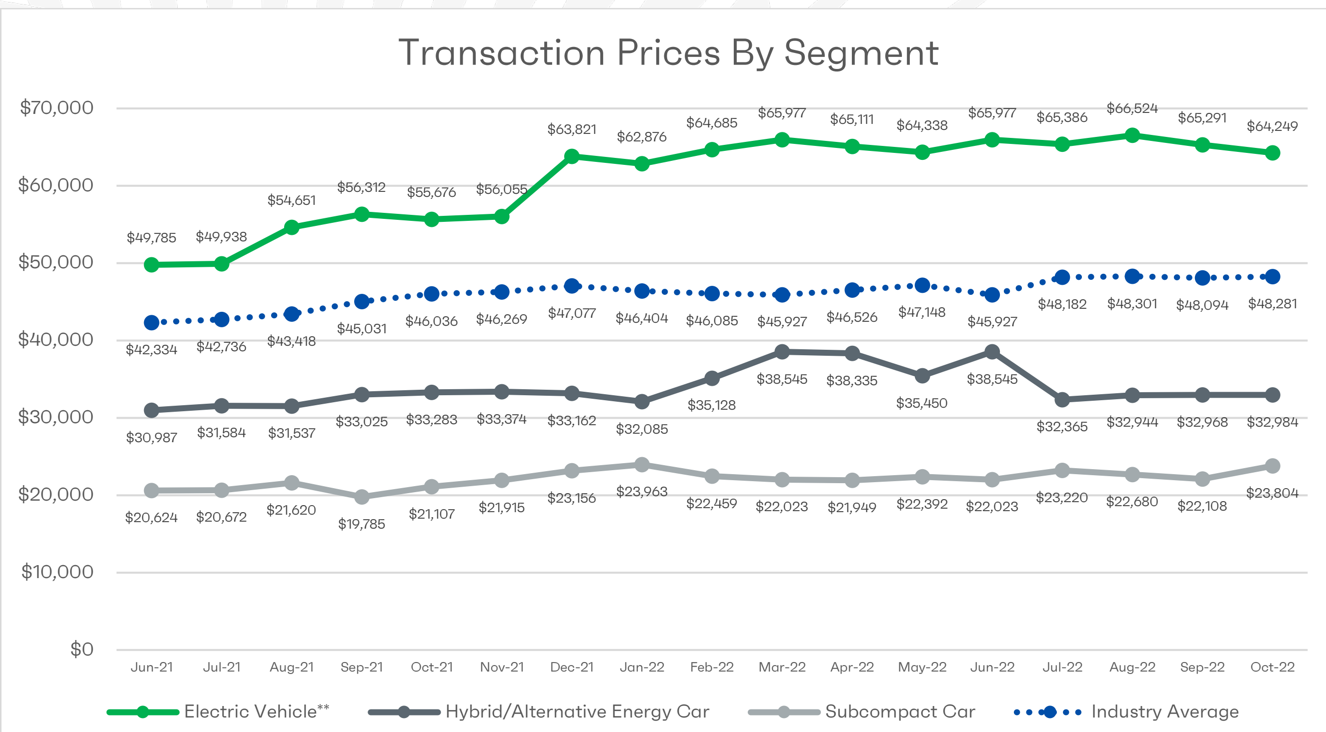
"According to Kelley Blue Book calculations, October marks a record 17th straight month that new-vehicle ATPs were higher than the average manufacturer's suggested retail price (MSRP), also known as the sticker price.

"Strong luxury vehicle sales have been a primary reason for overall elevated new-vehicle prices. Luxury vehicle share remains historically high, slightly decreasing to 17.8% of total sales in October from 17.9% in September. The high share of luxury sales helps to push the overall industry ATP higher.

"The average price paid for a new EV declined in October by $2,286 (or down 2.3%) compared to September but was up by 7% compared to a year ago in October 2021. The average new EV price was $64,249, according to Kelley Blue Book estimates, well above the industry average and aligning more with luxury prices versus mainstream prices."

J.D. Power (Updated 11/4) [19]**:** "For October, new-vehicle prices remain at record levels, with the average transaction price expected to reach $45,599—a record for October and a 2.7% increase from a year ago. The increase in sales volume and near record level transaction prices are resulting in buyers being on track to spend nearly $46.0 billion on new vehicles this month—the highest level ever for the month of October and a 10.9% increase from October 2021."



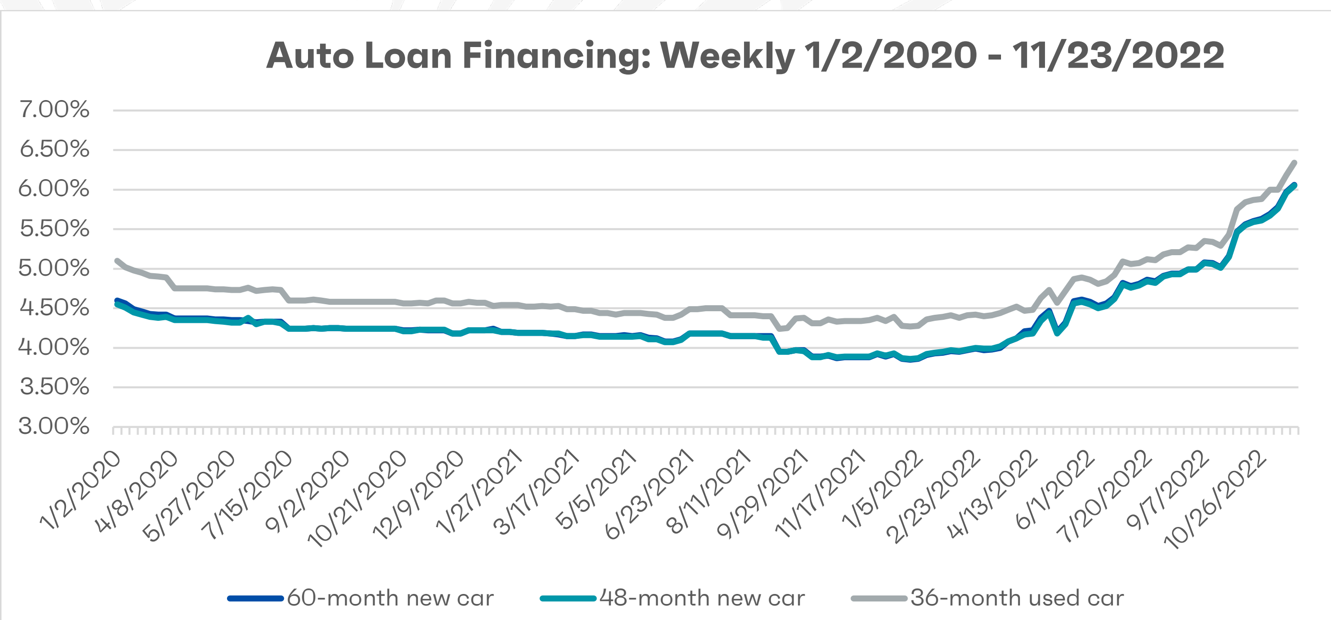


Auto Loan Financing (Updated 11/23)

JD Power (10/6)[20]: "Elevated pricing coupled with interest rate hikes are inflating monthly loan payments. After breaking the $700 level for the first time ever in July, the average monthly finance payment in October is on pace to be $711, up $47 from October 2021. That translates to an 7.0% increase in monthly payments from a year ago. The average interest rate for new-vehicle loans is expected to increase 199 basis points from a year ago to 6.03%."

Interest Rates (updated 11/23): Interest rates increased 0.09 pp for the 60-month, 48-month, and 0.16 pp for the 36-month used car. Rates now stand at 6.06%, 6.05%, and 6.34%, respectively. Since the beginning of 2020, 60-month rates are up 1.46 pp, and are up 2.18 pp since the same time a year ago.[21]

Dates	60-month new car	48-month new car	36-month used car
1/2/2020	4.60%	4.55%	5.10%
11/23/2021	3.88%	3.89%	4.35%
11/16/2022	5.97%	5.96%	6.18%
11/22/2022	6.06%	6.05%	6.34%
One Week Change	0.09%	0.09%	0.16%
Two Week Change	0.28%	0.29%	0.34%
Change since 1/3/20	1.46%	1.50%	1.24%
One Year Change	2.18%	2.16%	1.99%

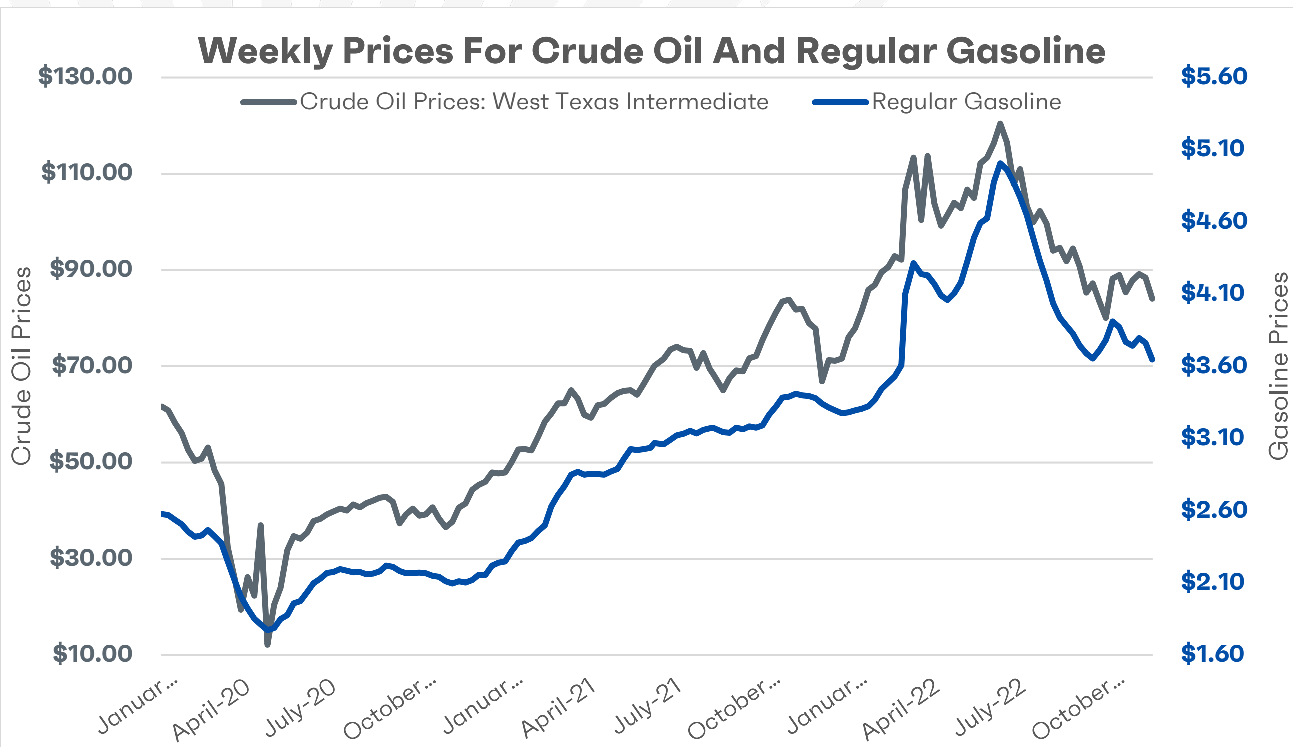


Crude Oil and Gas Prices (Updated 11/23)

EIA Outlook For Gasoline (11/23) [22]**:** "After falling for three straight months, U.S. retail gasoline prices increased in October. We expect gasoline prices to resume their decline in November, as refiners increase production to meet distillate demand and gasoline inventories begin increasing. Rising gasoline production contributes to inventory builds in our forecast that will return gasoline stocks to levels within the five-year range by early 2023. The U.S. average retail price in our forecast falls from $3.82/gal in October 2022 to $3.60/gal in February 2023, with the largest price decrease on the West Coast. Following this decrease, we expect U.S. retail gasoline prices to remain relatively flat for the rest of 2023.

EIA Outlook For Oil (11/23) [23]**:** "Growth in OPEC and non-OPEC oil production—most notably production in the United States keeps the Brent crude oil price in our forecast lower on an annual average basis in 2023 than in 2022. However, we expect the Brent crude oil price will begin rising in 2H23."

Gas And Oil Remain High: Oil prices, as benchmarked at West Texas Intermediate, fell $4.40 to $84.02 at the end of November. Since election day 2020, oil prices are $47.42 a barrel higher. Gas prices fell $0.03 to $3.65. Gas is 41% higher than the beginning of 2020. [24]



Production Meter

U.S. Light Vehicle Production (Updated 11/23)

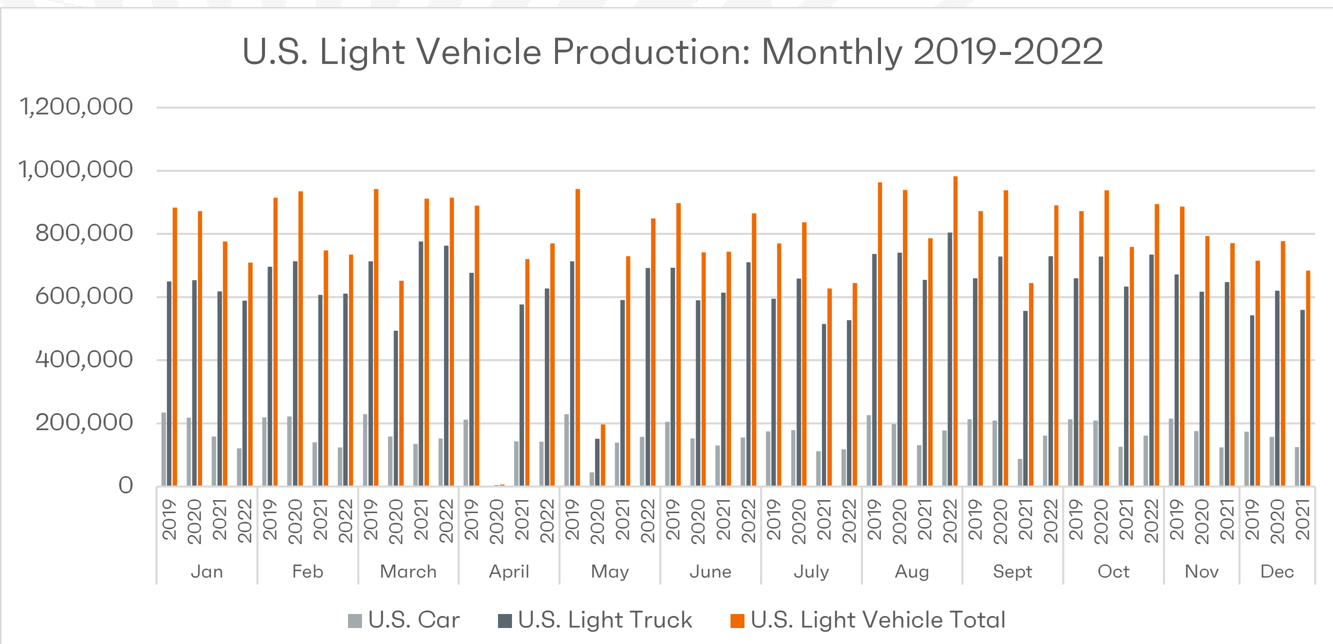
WardsIntelligence (Updated 11/23)[25]: "Production of cars and trucks – including medium-/heavy-duty – rose 12.4% year-over-year in October, the ninth straight increase. However, production was over 99,000 units below expectations, somewhat a setback after the volatility caused by the pandemic and supply-chain disruptions seemed to have largely subsided.

"Output in October totaled 1.300 million units, down from September's 1.315 million and August's 1.449 million. Excluding the big trucks, light vehicles totaled 1.251 million units, up 12.7% from same-month 2021.

"The October shortfall from what production was tracking at for the period a month ago won't stop inventory from rising again at the end of November – unless sales far exceed expectations."

Monthly Production (Upodated 11/23)

U.S. Light vehicle production for October 2022 increased month-over-month by less than 1 percent, totaling 894,941 vehicles (160,968 cars, 733,973 light trucks), year-over-year, production is up 15.2 percent from 2021. [26]



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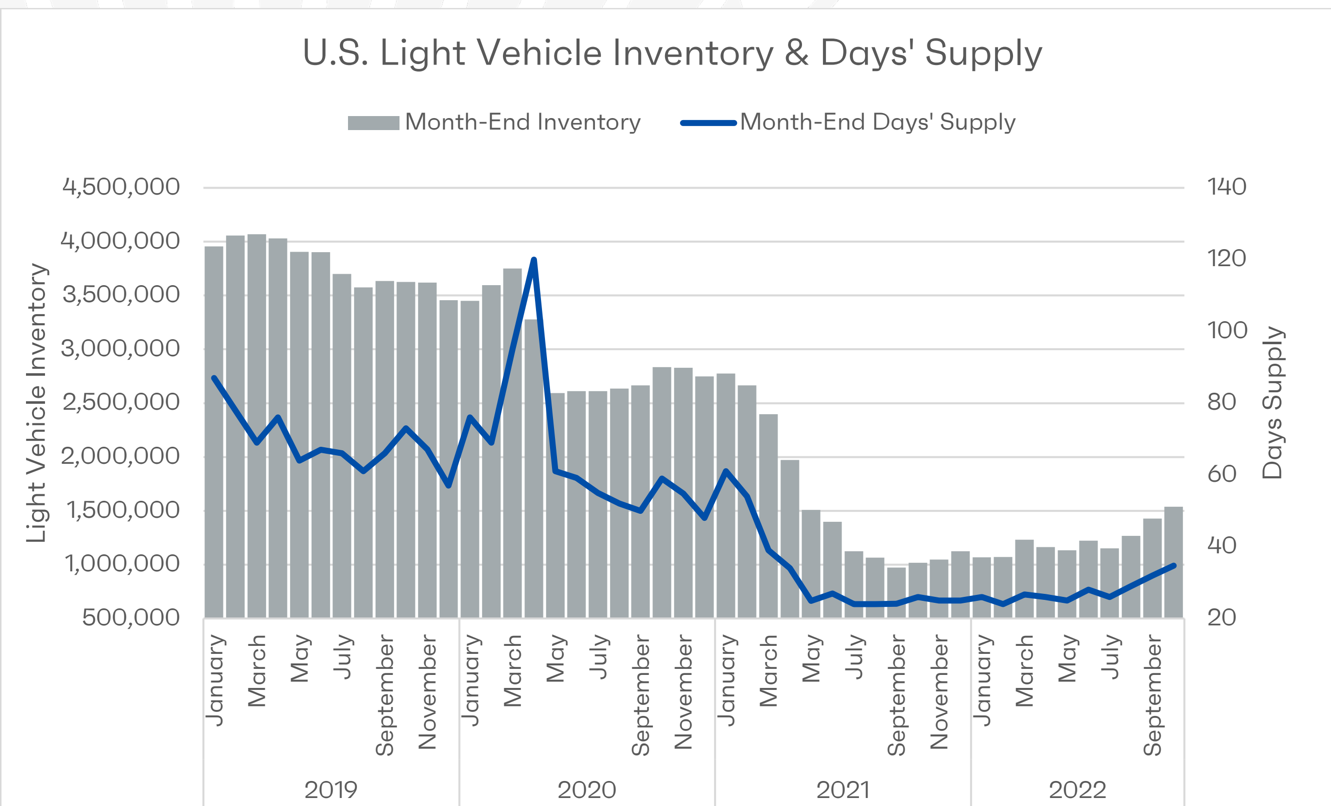
U.S. Light Vehicle Inventory and Days' Supply (Updated 11/4)

WardsIntelligence Inventory Update (9/7)[27]: "U.S. light-vehicle inventory ended October up 7.8% from the prior month, creating more potential for sales in the final two months of the year to improve on, or at least maintain, last month's long-time high results.

"The total was the third straight month-to-month gain after a stretch beginning in February 2021 when supply-chain disruptions, and their negative impact on production, caused a decline in nearly every month.

"Oct. 31 inventory of light vehicles on dealer lots or in transit totaled 1.54 million units. The total was 51.3% above like-2021's 1.02 million units, and highest for any month since 1.97 million in April 2021. October's total remains a far cry from the 3.75 million units typical for the month prior to the start of the pandemic in 2020, but represents more confirmation supply-chain disruptions, though still a problem, are improving.

"Days' supply increased to 35 from September's 32 and was well above October 2021's 26."

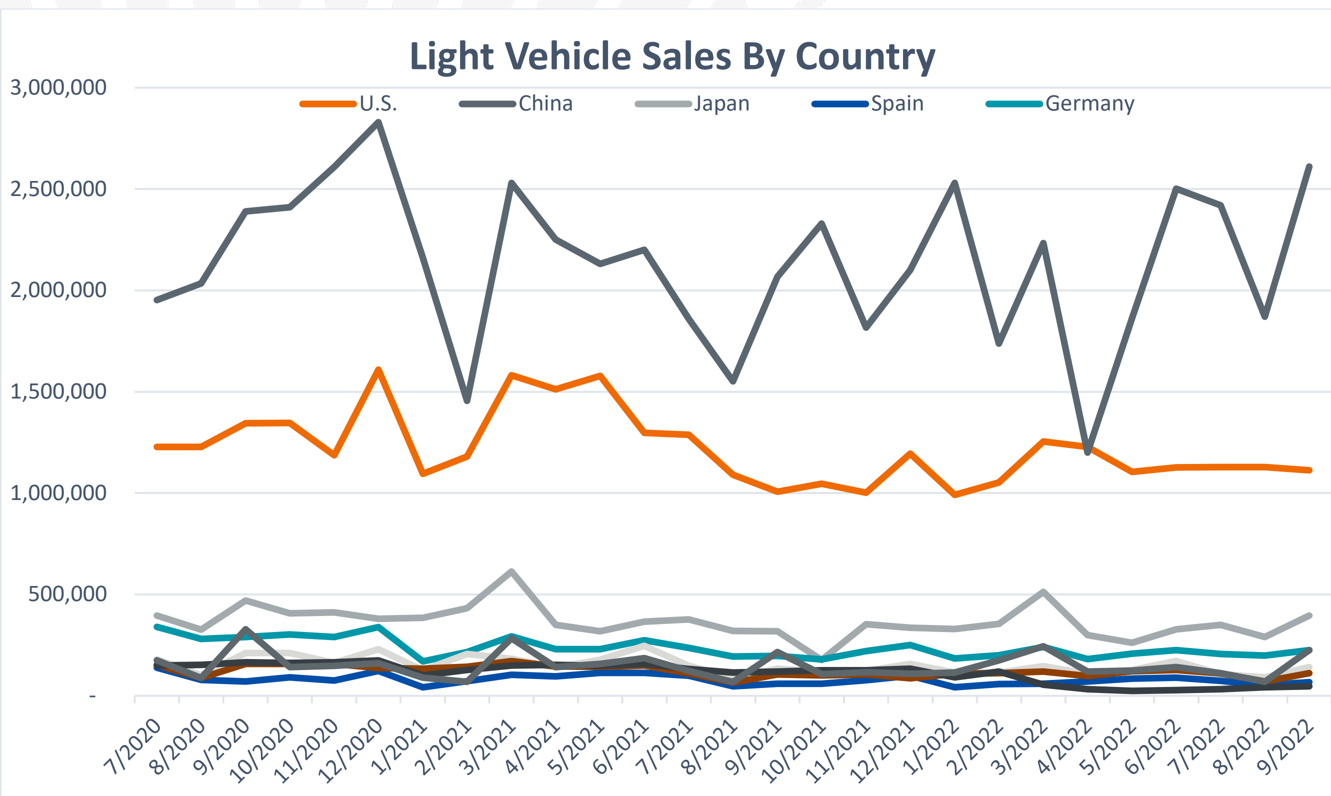


Global Meter

Global Light Vehicle Sales (Updated 11/4)

Wards Intelligence [28]: “Sales recorded year-over-year growth in nearly all global markets in September, with the lone regional holdout, Europe, almost flat with year-ago numbers. Global sales in September, including light vehicles and medium-/heavy-duty trucks, totaled 7.53 million units, up 17.3% from same-month 2021, and10.2% above the prior month’s 6.83 million. September’s data includes some preliminary estimates and August’s total includes revisions. Light-vehicle volume totaled 7.27 million units, 17.6% above September 2021’s 6.18 million. Regionally, the biggest gains were in Asia/Pacific, with volume for all vehicles up 28.9% year-over-year. In A/P, September sales in China, the biggest global market, were up 24.7% year-over-year. Deliveries in India, the second largest market in A/P, was up a whopping 98.4%.

“Calendar year-to-date global volume for all vehicles through September was 61.14 million units, 3.3% below like-2021’s 63.21 million. Light-vehicle sales were down 2.3% to 58.93 million. In its most recent revision in September, Wards Intelligence partner LMC Automotive forecasted global light-vehicle sales of 81.49 million units in 2022, up slightly from 2021’s 81.44 million.”



Global Light Vehicle Production (Updated 11/23)

S&P Global Mobility Forecast (11/23) [29]**:** "The ongoing theme of near-term supply chain pressures transitioning to demand-oriented concerns continues to prevail and influence the general automotive outlook. When digging deeper, it is important to note the continued production strength in Greater China and South Asia supporting the forecast for 2022 while potentially deeper and extended demand destruction, due to deteriorating economic fundamentals, impacts the forecast in 2023 and beyond. Further, as many markets shift to greater levels of electrification, we expect vehicle pricing to be pressured to the upside, presenting a headwind to demand in the intermediate-to-longer term. The November 2022 forecast update reflects upgrades for this year for Greater China on the continuing strength of demand stimulus and South Asia as the region benefits from a stabilized supply chain supporting efforts to clear order backlogs. However, the forecast also reflects important near-to-intermediate term downward revisions particularly focused on North America, Europe and even Greater China, among other regions. While semiconductor availability remains an important consideration and continues to impact operations, demand destruction is expected to play a more fundamental role and accelerate in 2023 and 2024 in several key markets, impacting production through the intermediate-term and influencing the magnitude/need for inventory restocking. The more noteworthy regional adjustments with the latest forecast update are detailed below:

"Europe: The outlook for Europe light vehicle production was reduced by 52,000 units and by 48,000 units for 2022 and 2023, respectively (and reduced by 43,000 units for 2024). The near-term outlook for Europe through 2022 continues to be influenced by supply-side challenges, particularly with semiconductor supplies which are improving, yet not as strongly as previously expected. This is expected to remain a factor for production going into 2023. However, we continue to forecast sequential improvement, with volumes climbing to 4.1 million units in Q4-2022 (versus 4.0 in Q2-2022), 4.2 million units in Q1-2023 and 4.3 million units in Q2 2023. We expect the pace to slow in the second half of 2023 as the need to rebuild inventory and fulfill residual pent-up demand is offset by still challenging macroeconomic conditions that will have a lingering impact on the market. Overall forecast revisions for 2023 and 2024 were focused primarily on developments in Russia as Hyundai is now expected to exit the market in the near-term.

"Greater China: The outlook for Greater China light vehicle production was increased by 286,000 units for 2022 and was reduced by 294,000 for 2023 (and was reduced by 51,000 units for 2024). Despite expanding COVID restrictions after Golden Week, mainland China passenger vehicle production continued to exhibit strength, growing 13% year-on-year in October, driven particularly by solid demand for NEVs. Conversely, light commercial vehicle production declined by 36% year-on-year, constrained by economic headwinds and demand destruction. Export activity, particularly for NEVs, remains a key strength supporting production in the region. Full-year 2022 production for the region now stands at 26.7 million units representing year-over-year growth of 7.5%. Given an expected payback effect relative to strong production results in 2022, the outlook for 2023 was reduced and now stands at 26.4 million units for the broader region. Meanwhile, the production outlook for 2024 was reduced due to economic and geopolitical uncertainties impacting the market. Consequently, Greater China light vehicle production is expected to contract by 1.3% in 2023 and post a gain of 5.4% in 2024.

"Japan/Korea: Full-year 2022 Japan production was upgraded by 16,000 units relative to last month. Toyota was boosted by 47,000 units due to stronger production actuals in the third quarter of this year. On the other hand, Nissan was downgraded by 25,000 units due to volatile operations related to labor shortages and other plant-level challenges. Long-term production volumes for Japan were upgraded by an average of 26,000 units per year. This was primarily related to the timing of three BEV models for Mazda advancing one year relative to the prior month forecast. Full-year 2022 South Korea production was increased by 16,000 units relative to the previous forecast. While exports have been steadily increasing, domestic demand has also maintained an upward trend recently further supporting production. The upward trajectory is expected to continue in the near-term with improved supply of semiconductors. As a result, production in 2023 and 2024 was increased by 20,000 units and 51,000 units, respectively, compared to last month. In the long-term, South Korea production was modestly reduced by about 10,000 units primarily due to the removal of Arrival and Edison Motors from the forecast.

"North America: The outlook for North America light vehicle production was reduced by 190,000 units and by 322,000 units for 2022 and 2023, respectively (and was reduced by 273,000 units for 2024). With a sudden resurgence in short-lead downtime, the outlook for North America light vehicle production for 2022 was cut 1.3% to 14.28 million units as supply chain, labor, and logistics issues hinder production. Semiconductor related production losses in the fourth quarter are on pace for the highest losses since fourth quarter 2021, totaling nearly 300,000 units. With production in the region facing increasing volatility, production as measured on a seasonally adjusted annual rate (SAAR) basis totaled an estimated 13.80 million units in October 2022, up 14.2% from a year ago but also disappointingly the lowest level since February 2022 when chip related issues were more prominent. Concerns surrounding ongoing supply chain volatility, most notably for semiconductors, and demand destruction amid recessionary fears results in the outlook for 2023 being cut 2.1 % to 15.07 million units. With the outlook for US demand sharply reduced, inventory creation has entered its formative stages and is projected to reach 2.0 million units by the end of 2023. Further cuts extend into 2024 amid the effects of demand destruction with production revised down 1.7% to 15.89 million units.

"South America: The outlook for South America light vehicle production was increased by 6,000 units and reduced by 15,000 units for 2022 and 2023, respectively (and reduced by 15,000 units for 2024). The outlook for 2022 was upgraded slightly based on observed strength with Argentina production as momentum does not appear as impacted by the uncertain conditions influencing the broader region. The downgrades implemented for 2023 and 2024, while fairly modest, were focused primarily on Brazil and reflect the ongoing dynamic market environment given challenging macroeconomic conditions.

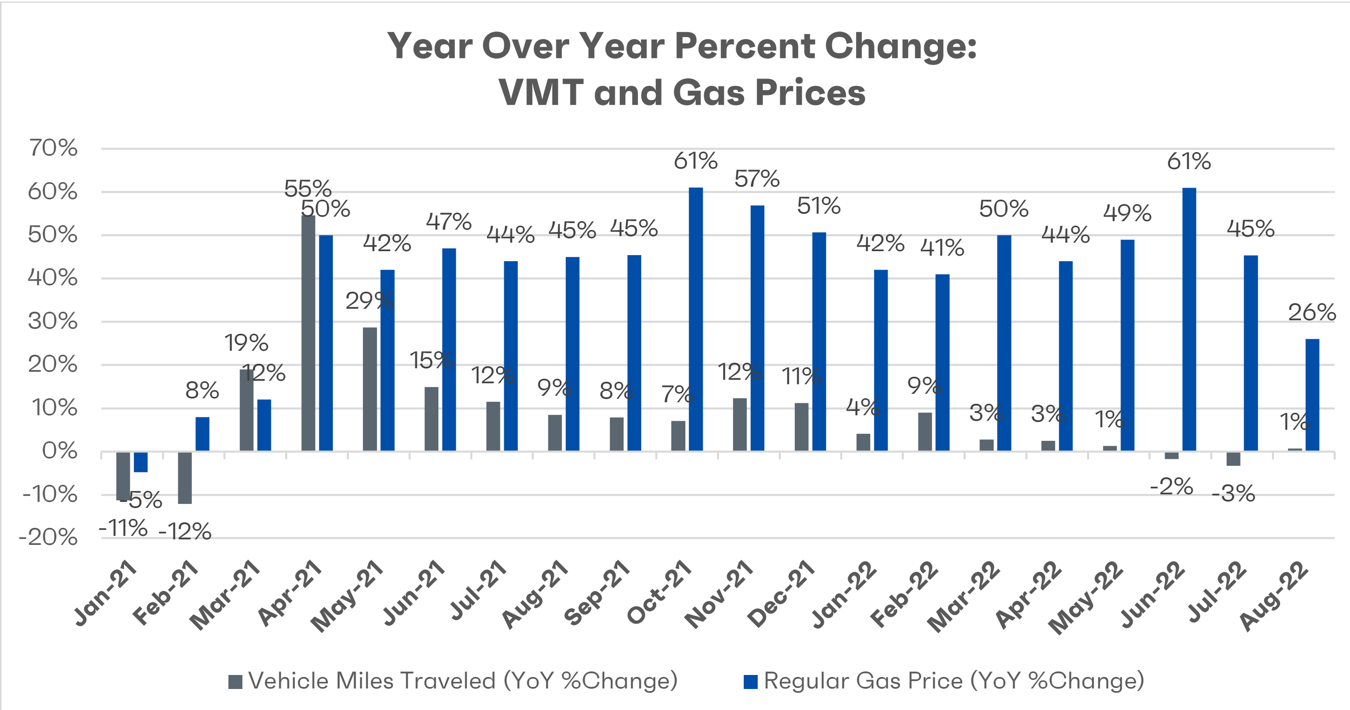
"South Asia: The outlook for South Asia light vehicle production was increased by 144,000 units and reduced by 22,000 units for 2022 and 2023, respectively (and was increased by 66,000 units for 2024). The upgraded outlook for 2022 was largely driven by stronger actual production for the ASEAN and Indian markets as recorded in September and October on easing supply chain pressures. Automakers in the region continue to ramp-up production in a bid to fulfill large backlogs which may extend into 2023. However, we continue to monitor the lagging demand impact of deteriorating economic fundamentals and broader geopolitical concerns. The outlook for 2023 was downgraded rather modestly owing to growing economic headwinds and the potential to weaken vehicle demand for the broader region."

Recovery Meter

Roadway Travel (Updated 10/20)

According to the U.S. Department of Transportation, seasonally-adjusted vehicle miles traveled in August increase 0.7% from the same time a year ago. The cumulative travel estimate for 2022 is 2,163.7 billion vehicle miles. [30]

- Travel on all roads and streets changed by +0.7% (+1.9 billion vehicle miles) for August 2022 as compared with August 2021. Travel for the month is estimated to be 289.3 billion vehicle miles.
- The seasonally adjusted vehicle miles traveled for August 2022 is 271.7 billion miles, a 0.10% (0.3 billion vehicle miles) change over August 2021. It also represents a 1.5% change (4.0 billion vehicle miles) compared with July 2022.
- Cumulative Travel for 2022 changed by +1.7% (+36.1 billion vehicle miles). The cumulative estimate for the year is 2,163.7 billion vehicle miles of travel.



Economic News (Updated 11/23)

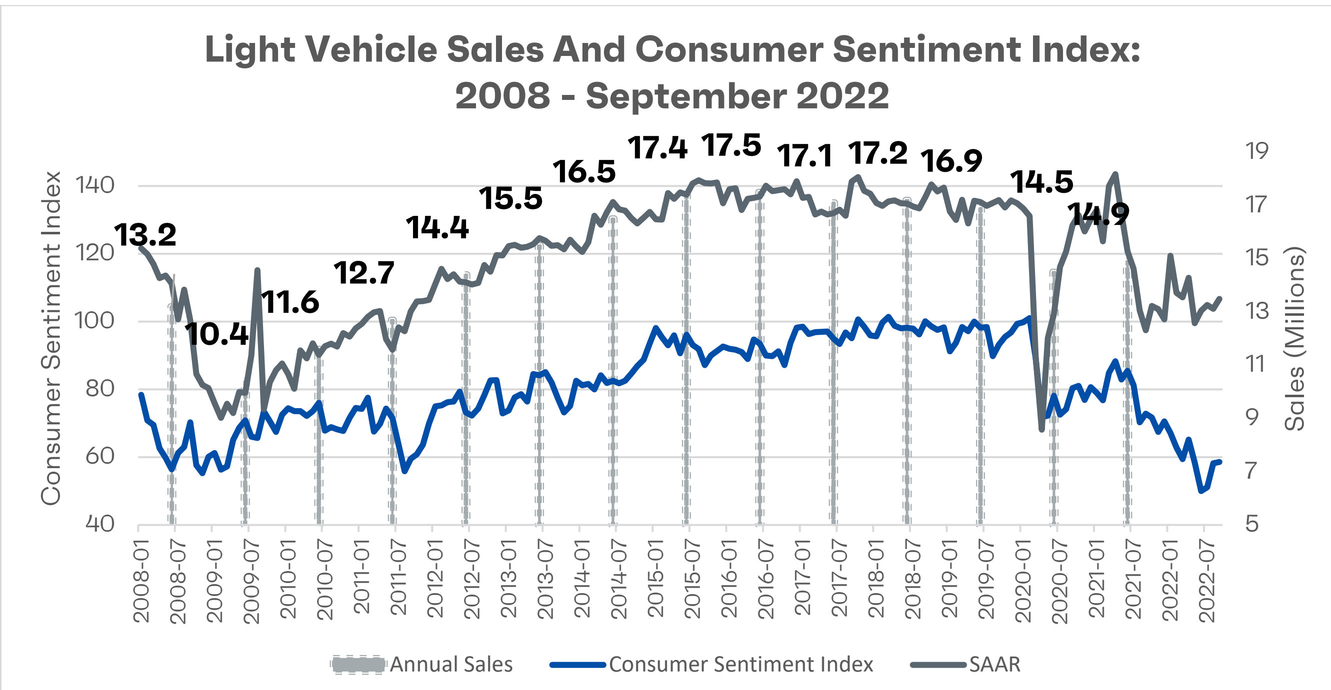
Manufacturing Gained 32,000 Jobs In October, With Motor Vehicles And Parts Gaining 4,800.[31] "Manufacturing employment increased 32,000 jobs in October, with durable goods industries leading the way. Durable goods added 23,000 jobs last month, according to a breakdown by industry issued today by the U.S. Bureau of Labor Statistics. Among the industries posting gains was motor vehicles and parts, up 4,800 jobs. The auto industry is gradually recovering from a shortage of computer chips, which has hampered production."

The ISM Index Fell Slightly In October; Lowest Reading Since Pandemic Recovery. "Manufacturing economic activity fell in October and is getting close to contraction, the Institute for Supply Management said today. The Tempe, Ariz.-based group's manufacturing index, known as the PMI, reached 50.2 percent last month. That was down from 50.9 percent in September. The October index reading was also the lowest since manufacturing began to recover from the COVID-19 pandemic in 2020."[32]

Consumer Confidence and Sales (Updated 11/23)

Surveys of Consumers Director Joanne Hsu[33]: "Consumer sentiment fell 5% below October, offsetting about one-third of the gains posted since the historic low in June. Along with the ongoing impact of inflation, consumer attitudes have also been weighed down by rising borrowing costs, declining asset values, and weakening labor market expectations. Buying conditions for durables, which had markedly improved last month, decreased most sharply in November, falling back 19% to its September level on the basis of high interest rates and continued high prices. Long-term business conditions declined a more modest 6%, while short-term business conditions and personal finances were essentially unchanged.

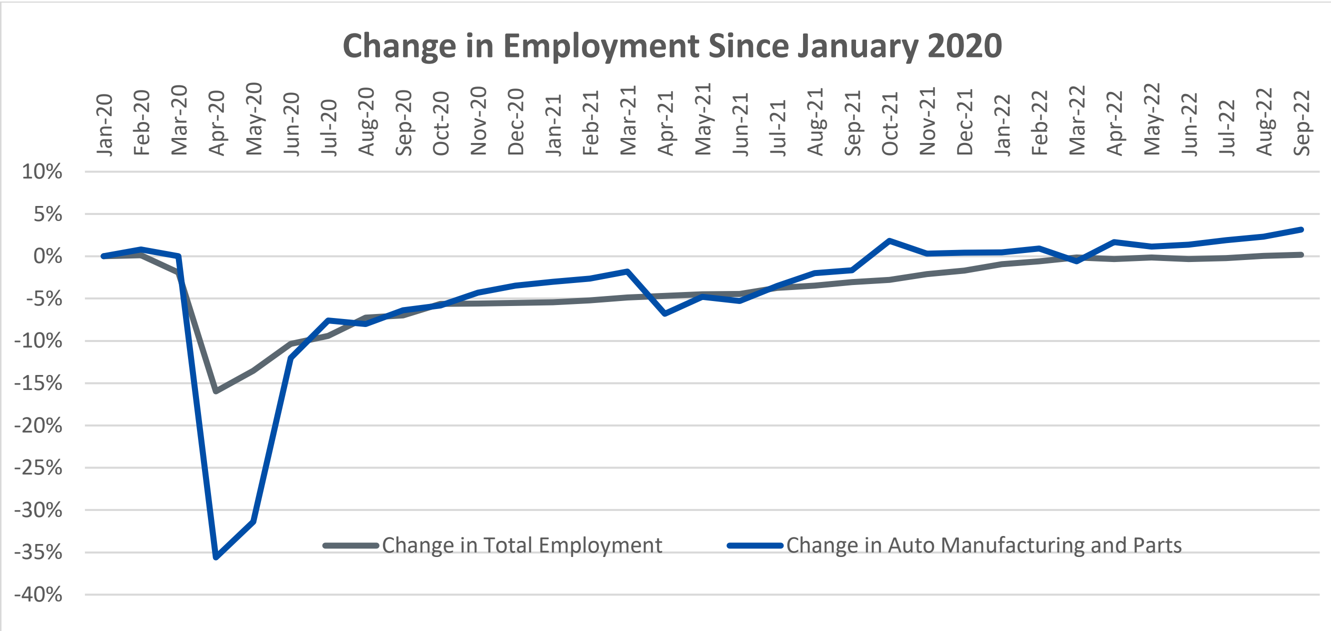
"Inflation expectations were also little changed from October. The median expected year-ahead inflation rate was 4.9%, down slightly from 5.0% last month. Long run inflation expectations, currently at 3.0%, have remained in the narrow (albeit elevated) 2.9-3.1% range for 15 of the last 16 months. Uncertainty over these expectations remained at an elevated level, indicating that the general stability of these expectations may not necessarily endure."



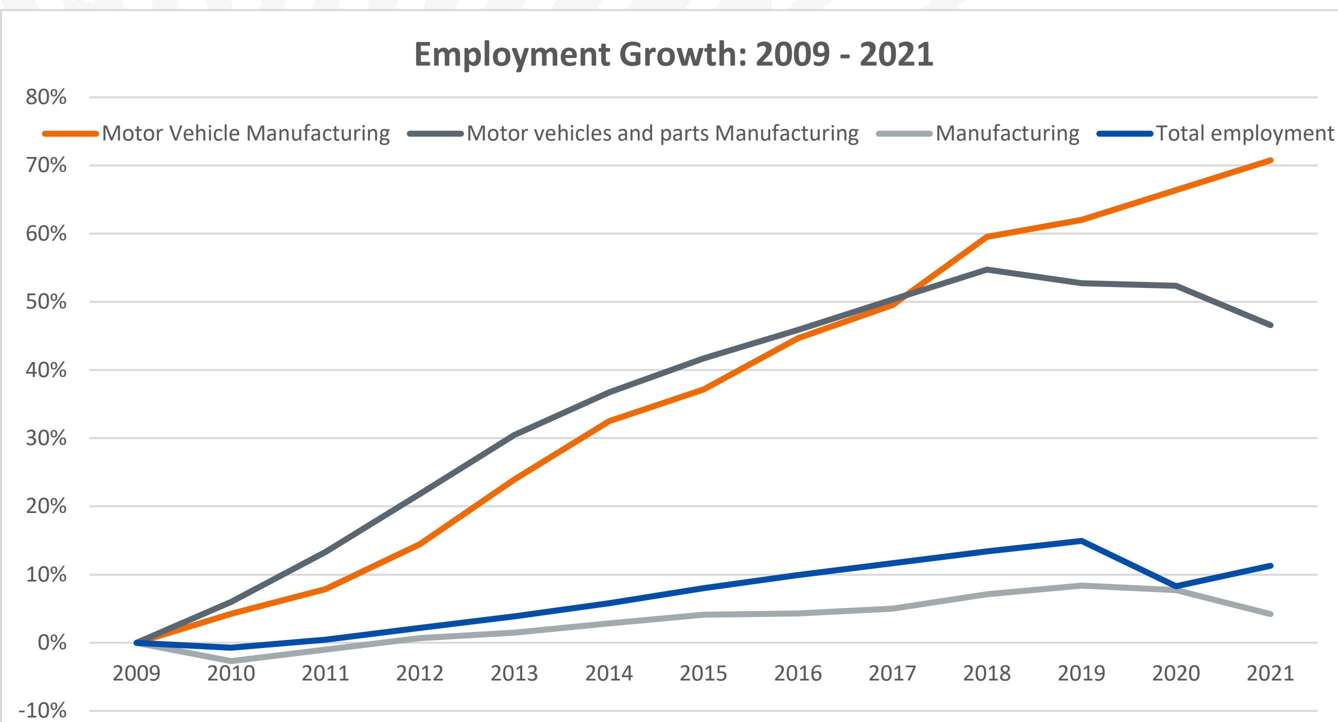
Employment (Updated 11/23)

Motor Vehicle And Parts Manufacturing Gained 4,800 Jobs In October.[34]

After a loss of nearly 350,000 employees (about 35% of the workforce) in the height of the pandemic, employment in the Automobile Manufacturing and Parts sectors raced back but is now fighting losses due to supply chain disruptions with semiconductors. [35]



After the recession in 2009, the auto industry was credited with being on the leading edge of the recovery, which began a ripple effect through other parts of the country.[36] Additionally, the chart below shows how the recovery of jobs in motor vehicle manufacturing alone and motor vehicle and parts manufacturing far outpaced the recovery of manufacturing and total jobs.



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