ECONOMIC VIEWPOINT

The U.S. Auto Industry's Problems

By Francis Généreux, Senior Economist

The COVID-19 pandemic hit the U.S. auto industry hard. Production remains hobbled by a number of factors, including a shortage of electronic parts. Meanwhile, demand for vehicles has rebounded thanks to government measures to support household income and easy financing terms. The imbalance led to some shortages and put pressure on prices. The situation should be temporary, but structural factors will continue to shape the auto industry in the coming years.

The Beginning of the Pandemic Was Challenging

The COVID-19 pandemic pummelled the U.S. auto industry, along with many other sectors. However, the initial shock hit this industry harder than other parts of the economy (graph 1). In the first two months of the first wave, March and April, sales at motor vehicle and parts dealers pulled back 35.4%. Auto sector production plunged 83.5%, with industry layoffs totalling 359,900 over March and April of 2020, for a decrease of 36.5%.

After bottoming out in April, auto sector activity started to recover as of May. Despite the rebound, new vehicle sales fell 14.9% over 2020 as a whole, the worst annual performance since 2009 (graph 2). Production (including parts) declined 15.1% from 2019 to 2020.

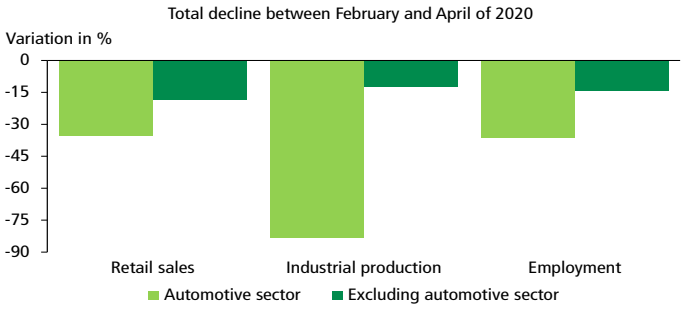
Demand for Vehicles Rebounded Sharply

The rebound that started in May 2020 was rapid. The number of new vehicles sold went from a low of 8,701,000 units in April 2020 to more than 16,000,000 in September (graph 3 on page 2). In value terms, retail sales by dealers had outstripped their pre-pandemic level as of June.

The divergence between the number of new vehicles sold and retail sales is primarily due to the type of vehicle sold. 2020 saw increased momentum in the already broadly positive trend toward the purchase of light trucks (including sport utility vehicles) (graph 4 on page 2). As these trucks cost more than passenger vehicles, the value of sales increased more quickly than the number of vehicles sold. This trend persisted in the early months of 2021. Compared with the end of 2019, sales of passenger vehicles remain low or even negative for vehicles

GRAPH 1

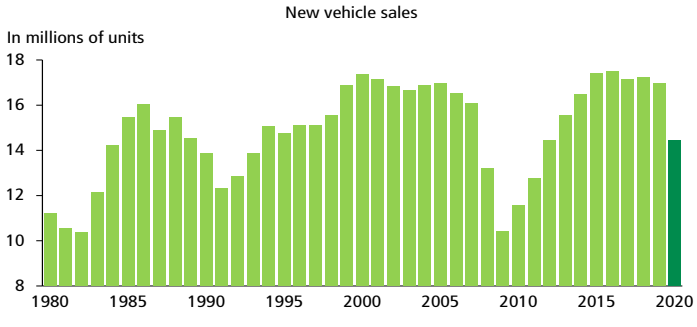
The early months of the pandemic were especially tough for the auto industry



Sources: U.S. Census Bureau, Federal Reserve Board, Bureau of Labor Statistics and Desjardins, Economic Studies

GRAPH 2

A tough 2020 for new vehicle sales



Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

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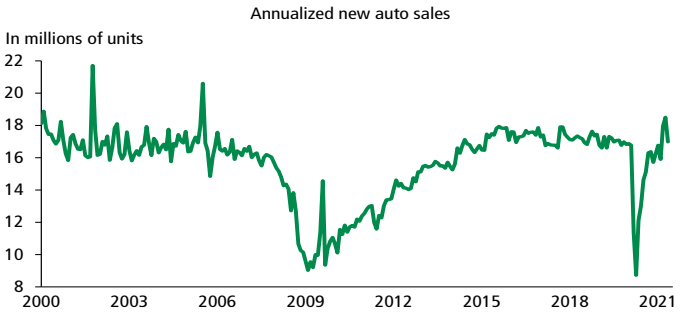
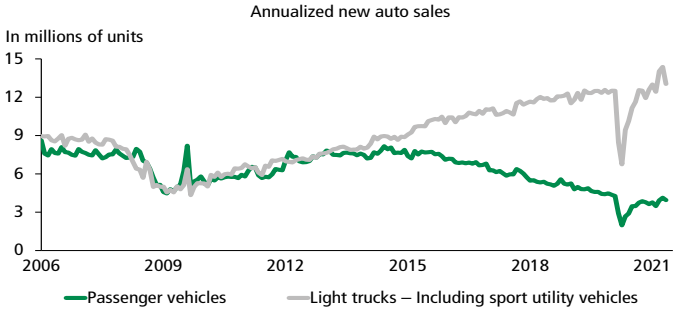
GRAPH 3
Motor vehicle sales bounced back quickly in the United States



Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

GRAPH 4
The market for larger vehicles rebounded more



Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

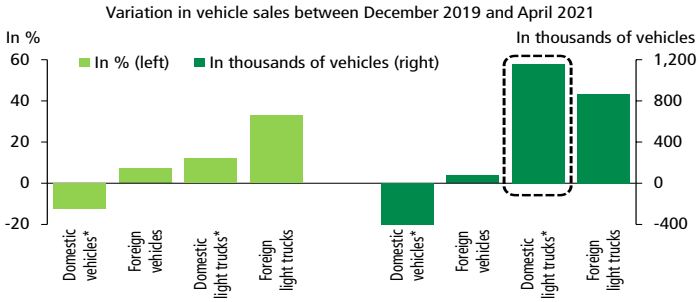
produced in North America. Meanwhile, light trucks have gone up substantially (graph 5).

Why Have Sales of Motor Vehicles, Especially Trucks, Rebounded?

First, there is the **catchup effect**. The lockdown measures introduced by many U.S. states at the start of the pandemic temporarily halted economic activity, including vehicle purchases. The reopening at the end of April 2020 led to some catching up on sales that were "lost" during the lockdown, which were in addition to the usual sales.

Second, there was the **income effect**. As of April 2020, U.S. households' disposable income jumped substantially. The increase occurred because of the support measures provided by the federal government, including an amount of US$1,200 that went to adults up to a certain level of income, and US$500 per child. Weekly jobless benefits were also boosted by US$600 for several months. Much of the amounts were saved, although they were also used for consumption. Amounts this sizable, allocated all at once, were used for such things as an initial down payment on vehicle financing. The second and third rounds of federal assistance came in December 2020 and March 2021,

GRAPH 5
In terms of volume, light trucks built in North America rebounded the most



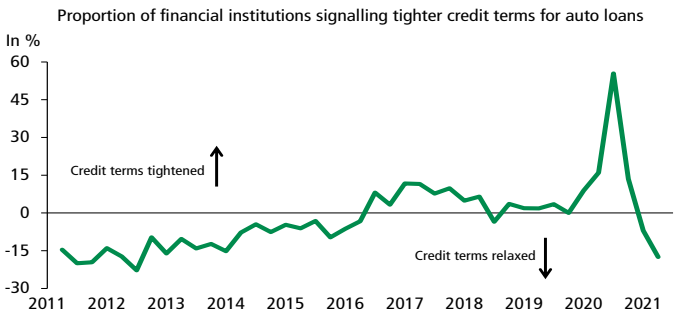
* Includes imports from Canada and Mexico.
Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

with individual assistance totalling US$2,000, along with new enhancements to jobless benefits and tax relief for families.

Third, the pandemic forced a change in **consumer habits**. Public health measures primarily hit the service industries, like food services and tourism. As U.S. households could no longer use these services, the amounts "saved" due to their absence were steered toward goods, including automobiles.

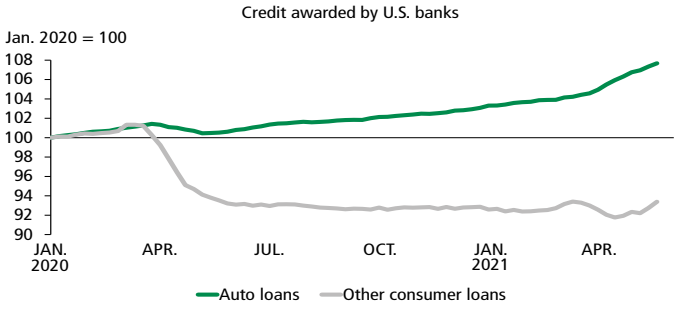
Fourth, **easy access to credit** favoured the purchase of durable goods, including automobile purchases. At the very start of the pandemic, the Federal Reserve (Fed) responded strongly to prevent a bank credit crunch. Key rates fell to almost 0%, and the Fed provided liquidity to financial institutions by buying government and mortgage securities. It also introduced several measures to support banks to keep them from limiting credit, particularly toward small and medium-sized businesses. These measures put a quick halt to the tightening of credit conditions for auto loans seen in mid-2020 (graph 6). Financial institutions are now in the process of relaxing these conditions, and automobile loans have even been accelerating recently, although other types of consumer loans remain depressed (graph 7 on page 3).

GRAPH 6
Easier credit terms supported auto sales



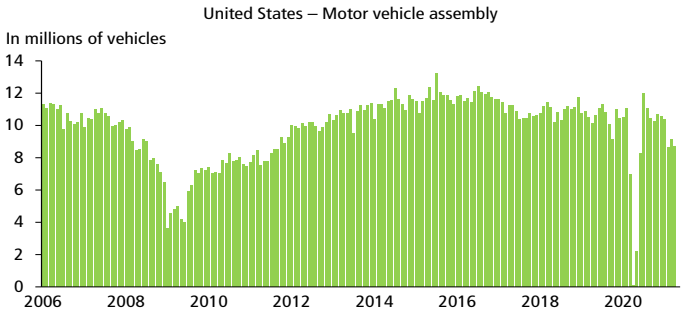
Sources: Federal Reserve Board and Desjardins, Economic Studies

GRAPH 7
The rise in auto loans recently accelerated



Sources: Federal Reserve Board, *The Wall Street Journal* and Desjardins, Economic Studies

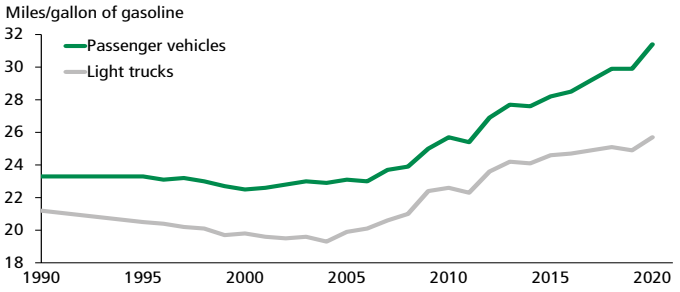
GRAPH 9
Motor vehicle assembly stopped almost entirely in April 2020



Sources: Federal Reserve Board and Desjardins, Economic Studies

Fifth, more specifically for trucks, the **drop in gasoline prices** added to the enthusiasm for light trucks and sport utility vehicles, to the detriment of smaller vehicles. Prices at the pump fell 33.6% between the start of 2020 and the low point in April 2020. Light trucks have become more energy efficient (miles per gallon of gasoline) in the last few decades, but they are still much less efficient than cars (graph 8). A substantial drop in gasoline prices is therefore one factor favouring the purchase of light trucks. Whether the recent rise in gasoline prices (+75.2% from April 2020 to May 2021) will end up curbing the enthusiasm remains to be seen.

GRAPH 8
Vehicles have become more energy efficient, but light trucks guzzle more gasoline



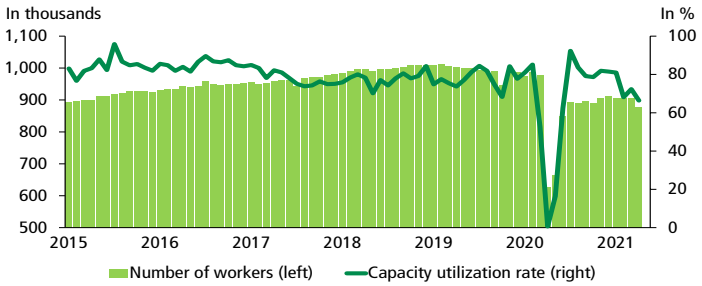
Sources: U.S. Department of Energy and Desjardins, Economic Studies

The Supply of Vehicles Has Improved, but Constraints Persist

New vehicle production dropped abruptly in the spring of 2020. In fact, it halted almost completely: on an annualized basis, car and light truck assembly went from 11,083,900 vehicles in February 2020 to just 68,500 in April (graph 9). This is by far its lowest point since monthly data was first compiled in 1977. Production of new vehicles remained relatively low in May, and returned to a situation similar to the pre-pandemic period within a few months. Nonetheless, over the whole year, the number of new vehicles produced in the United States in 2020 was 17.9% below the 2019 level. The decline was not as steep for parts (-13.8%).

The supply of new vehicles did not keep pace, however. While the number of cars and light trucks sold rose 14.9% from the last quarter of 2020 to April 2021, assembly pulled back 17.8%. New vehicle production is therefore still facing an entrenched issue. This is reflected in the auto industry's low production capacity utilization rate: it was just 66.4% in April 2021, compared with nearly 80% before the pandemic. Moreover, the industry is still short 107,700 workers to reach its February 2020 employment level (graph 10).

GRAPH 10
Despite strong demand for vehicles, the auto industry is not really operating at full capacity



Sources: Bureau of Labor Statistics, Federal Reserve Board and Desjardins, Economic Studies

Semiconductor Supply Problem

The main constraint to more robust motor vehicle production is the shortage of electronic parts, i.e., semiconductors. Electronic parts have become more and more essential to building new vehicles, which have sometimes been described as "computers on wheels." Semiconductors are needed for numerous functions in today's automobiles, including integrating electronic devices,

driver assistance, safety features and vehicle performance. A standard vehicle can contain more than US$330 in semiconductors; this amount ranges from US$1,000 to US$3,500 for a hybrid vehicle.

However, semiconductors have become in short supply in the last year, for several reasons. Clearly, the pandemic triggered disruptions in production. It also altered demand for electronic parts, particularly because of the shift to telework, online purchasing, and the general consumption of goods (including a wide array of goods with electronic components) to the detriment of services.

Other disruptions unrelated to the pandemic also created problems in semiconductor deliveries, such as two fires at Japanese semiconductor plants, last October and last March. February's poor weather in Texas also limited U.S. semiconductor production.

In the auto industry, however, the main reason for the current part shortages seems to stem from some short-sightedness by automakers at the start of the pandemic. In response to plunging sales and plant closures, automakers slashed their semiconductor orders. The annual variation in semiconductor sales associated with the auto industry fell to -30% in April and May of 2020. Suppliers therefore turned to other sectors of activity where semiconductors were in demand.

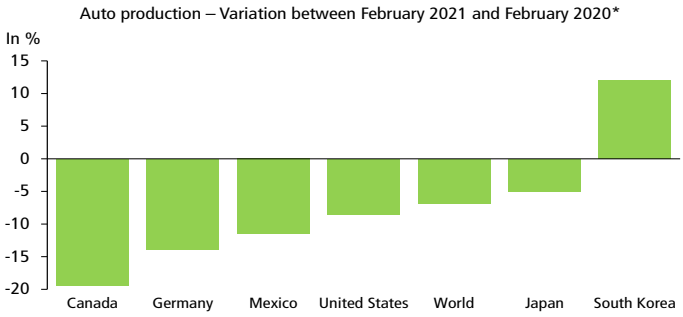
As we saw earlier, however, new vehicle sales rebounded fairly quickly and have kept up a good pace since then. The available inventories of the semiconductors needed to make vehicles therefore melted quickly. Slow lead times in this industry (up to 26 weeks) mean that the problem is persisting. The annoying situation could last several more quarters.

The semiconductor problem and the constraints it creates for automakers go beyond U.S. manufacturers. The situation is generalized worldwide. Some manufacturers are doing better than others, depending on where they get their supply from and how they managed orders at the start of the pandemic. Because of the public health measures still in place in some countries and because of the semiconductor shortage, auto production is still moving at a snail's pace in most countries that export vehicles to the United States (graph 11). U.S. auto and parts imports rebounded after the crisis at the start of the pandemic, but not enough to make up for weak U.S. production, and it is down sharply (-9.4%) since the end of 2020 (graph 12).

Inventories Plunge

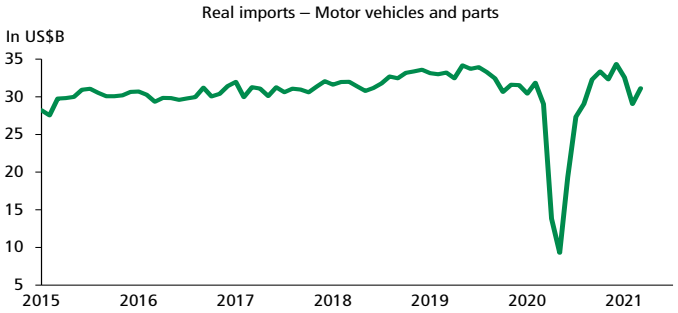
Strong U.S. demand for vehicles and weak U.S. and global production in the last year are creating a major imbalance in the auto industry. The imbalance is primarily being reflected in a drop in inventories at businesses within the industry, and particularly in dealer inventories (graph 13). Total vehicle and parts inventories are down 19.8% from their cyclical peak in August 2019. The inventory-to-sales ratio has tumbled to its lowest point since monthly data was first published in 1992 (graph 14 on page 5). Looking only at dealers, the ratio is at its lowest point since the summer of 1985, when a strike by auto workers substantially disrupted production. Excluding that event, the ratio is the lowest it has been since data was first compiled in 1967.

GRAPH 11
The drop in new vehicle production is fairly widespread



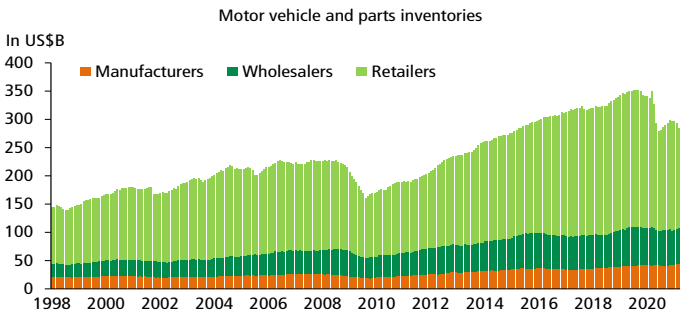
* 3-month average.
Sources: Wards, German Association of the Automotive Industry and Desjardins, Economic Studies

GRAPH 12
Imports associated with the auto industry are not offsetting weak domestic production



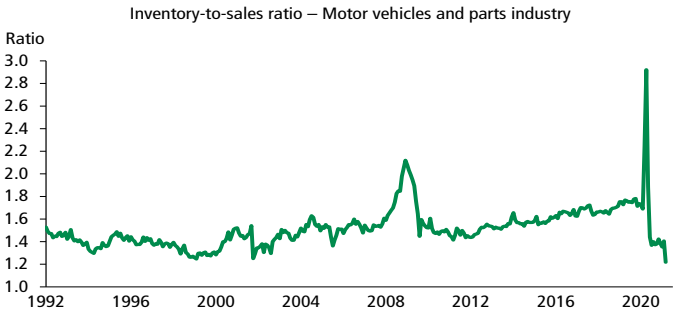
Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

GRAPH 13
Strong demand for vehicles and production problems triggered a drop in inventories



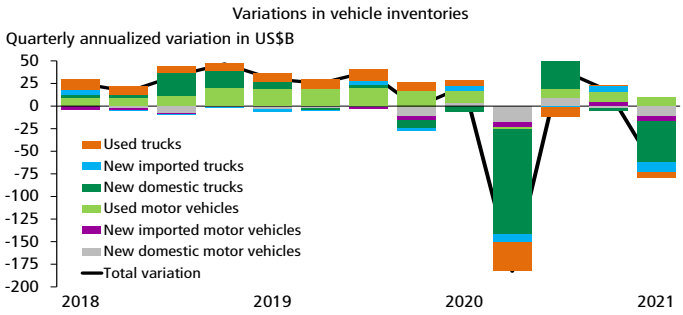
Sources: U.S. Census Bureau and Desjardins, Economic Studies

GRAPH 14
Auto industry inventories fell to a new low



Sources: U.S. Census Bureau and Desjardins, Economic Studies

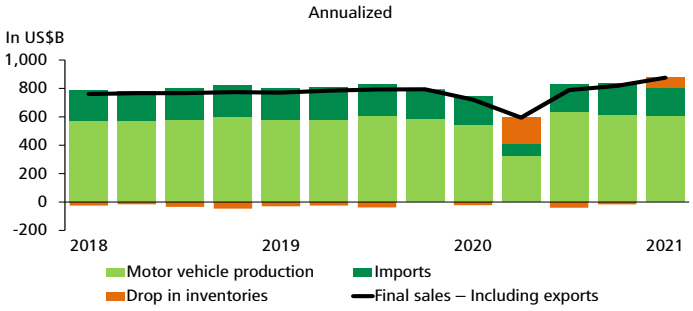
GRAPH 16
Inventories primarily fell for trucks



Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

Looking only at vehicles, it is clear that the imbalance between production and demand mainly hit inventories in the spring of 2020 and the first quarter of 2021 (graph 15). Between these two periods, inventories managed to tick up as domestic assembly and imports resumed. However, the increase is very small compared with the declines.

GRAPH 15
To meet the demand for vehicles, inventories had to dwindle in the spring of 2020 and early 2021



Sources: Bureau of Economic Analysis and Desjardins, Economic Studies

Supply and demand diverged in sectors with the strongest vehicle sales, of course. As we saw earlier, the award goes to domestic light trucks. This is the niche in which inventories fell the most, both at the start of the pandemic and more recently (graph 16). The shortage of new domestic light trucks then led to a substantial drop in inventories of imported trucks, as well as used trucks.

The Disruptions Also Affect the Used Vehicle Market

The scarcity of new vehicles has had an impact on vehicle resales. First, there is the substitution effect: buyers who can't get the new vehicle they want turn to used models. The pressures on prices for certain highly sought-after new models also factored into substitution.

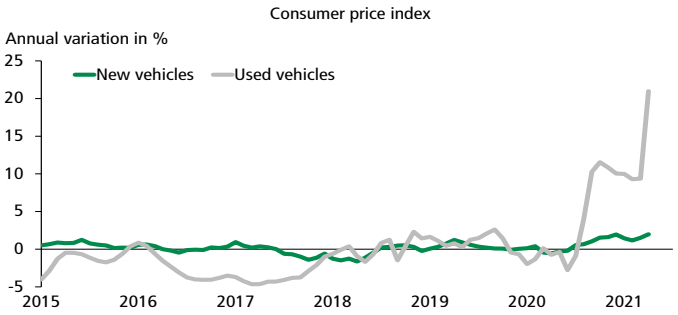
Second, consumer behaviour also affects the supply of vehicles. The drop in sales at the start of the pandemic meant that fewer buyers traded in their current vehicles, decreasing the number of vehicles available to wholesalers and dealers of used vehicles. The increase in households' disposable income also led to some households deciding to acquire a second vehicle, without selling the vehicle they already owned.

Third, business behaviour has also changed. Businesses that own auto fleets decided to keep their vehicles longer during the pandemic, shrinking the supply in the used vehicle market. At the start of the pandemic, this effect was partially reduced by auto rental companies, whose business dropped substantially during the pandemic and therefore sold off a large portion of their fleets during the last year. However, the recovery is now prompting them to buy vehicles again, intensifying the issue of excess demand for new vehicles. It also cause them to hold onto the vehicles they already own for longer.

These factors led to a substantial decrease in the inventory of used vehicles available for resale. Some companies say that, in one year, their existing inventory has gone from the equivalent of 120 days of sales to just 40 days.

This situation is naturally putting substantial pressure on used vehicle prices. In April, the average price at which a used vehicle was sold went over US$25,000 for the first time. In terms of its annual variation, the increase was 21.0% in April, according to the U.S. consumer price index (CPI) (graph 17 on page 6). April's gain was big enough to affect the variation in broader indexes. The CPI for goods excluding food and energy climbed a monthly 2.0% in April, its biggest increase since the data was first published in 1957. Nearly three quarters of this increase comes from the monthly rise in used auto prices. Of the total CPI's monthly 0.8% increase in April, over one third comes from used vehicle prices.

GRAPH 17
The shortage has consequences for motor vehicle prices, particularly used vehicles



Sources: Bureau of Labor Statistics and Desjardins, Economic Studies

An Example of Temporary Disruptions...

The pressures the auto market is putting on inflation could be concerning for Fed officials. Instead, however, it seems to be a good example of what they consider to be "supply bottlenecks [that] will likely hinder the quick expansion of production in some industries in the next few months and raise some costs". The Fed perceives these constraints as temporary, as the supply will, sooner or later, adjust to demand and pressures on inventories and prices will ease.

In this sense, the impact of the semiconductor shortage should eventually dissipate. Once this problem is over and given its low production capacity utilization rate, the U.S. auto market has room to grow more quickly without generating long-term pressure on prices. The end of the pandemic should also help workers return to the assembly lines. Production should also resume in other countries, and imports will also help supply to meet demand better. Demand could also evolve differently in the coming quarters. The recent price increases should help subdue it. In fact, this effect and the scarcity of certain models are considered causes behind the monthly decline of 8.2% of new vehicle sales in May 2021. An eventual rise in interest rates could also help curb demand. The recent increase in gas prices could also cool the trend toward bigger vehicles. The new vehicle market should normalize, which, sooner or later, will put the used auto market into a sounder situation.

... but More Structural Factors Will Influence the Auto Market

The temporary factors we mentioned created major disruptions in the auto industry. However, other factors are expected to change the industry even more profoundly. These include the desire for greater connectivity capabilities for new vehicles, and the development of autonomous cars and trucks. However, the main change that is looming is, hands down, the trend toward electrifying transportation. The movement has already started: the first boom came with hybrid vehicles and, more recently, fully electric vehicles. We can expect the supply of electric cars and even light trucks to grow leaps and bounds in the coming years. The U.S. vehicle fleet will have to change substantially to hit greenhouse gas emission reduction targets. Through the infrastructure plan proposed at the end of March, but not yet adopted, the Biden administration wants to support and speed up vehicle electrification, earmarking US$174B for it. The transition to electric vehicles will also require a change in automakers' supply chains; several are announcing major investments in that area, for battery production, for example. The situation seems conducive to a change in how the auto industry does things, particularly by repatriating the production of parts and materials. The disruptions of 2020 and 2021 have no doubt taught them an important lesson on this matter.