

New Car Prices Under Supply Constraints: Competition or Collusion?

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In a recent article appearing in the MONTHLY LABOR REVIEW, Michael Havlin studies new car prices and dealer margins during the Covid Pandemic.¹ For automobile retailers (among many other sectors), the Covid Pandemic was a perfect storm: demand surged as Americans avoided public transportation and spent extra income provided by government stimulus while supply tanked as factories shut down and parts were unavailable due to the collapse of the global supply-chain. Having been hit with two “black swan” events simultaneously, new (and used) car prices increased. This is Economics 101.

Havlin’s analysis of new car prices is straightforward, though at risk of misinterpretation. New car retail prices rose faster than the wholesale prices from the automobile manufacturers, thus much of the price increase is in the form of increased retail margins. For the most part, this is to be expected, given the long-term relationships between retailers and manufacturers (tempering price increases at the wholesale level) and the sale of existing inventory priced at pre-Covid levels.

But Havlin’s claim that increased dealership margins contributed to “overall consumer inflation” is a fallacy that mixes cause with effect. Inflation is a general increase in prices caused by excessive growth in the money supply, not automobile dealers. In the short term, market rigidities can contribute to price and margin increases. The high prices we see currently are the consequence of Covid-related supply-chain

shocks (likely a temporary concern) and extraordinary steps by the Federal Reserve and other central banks (a long-term, inflationary concern). Margin increases are almost certainly a temporary effect of supply constraints and demand increases, not pricing power. And given the highly competitive nature of automobile retailing, there is evidence those margins are already shrinking.

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As shown in this PERSPECTIVE, highly competitive industries—like automobile retailing—respond to positive demand-side and negative supply-side shocks in predictable ways. Prices will rise and, under some conditions, margins along with them. Margins may rise because of supply shocks, but they do so in competitive markets without collusion among producers. Also, under supply constraints, competitive and monopoly prices are difficult to distinguish and may be identical. Economic theory provides some guidance on distinguishing between the two. Also, this

analysis shows why a focus on retail margins is misplaced under supply constraints. The key issue is whether sales are below the competitive, supply-constrained level. For new car sales, the answer is “no.” Also, margins on used cars, which are free from the long-term manufacturer-retailer relationship, are stable over time, indicating competition among auto retailers is alive and well.

While the economic theory outlined here certainly applies to automobile retailing, it also applies to other industries facing supply-shortages during the Covid Pandemic, as well as the disease-based supply-shocks in egg production.² While my analysis focuses on automobile retailing, it should also help policymakers and advocates better understand the economic fundamentals underlying the present climate of rising prices and to avoid fallacious arguments rooted in economic ignorance or political theatrics.

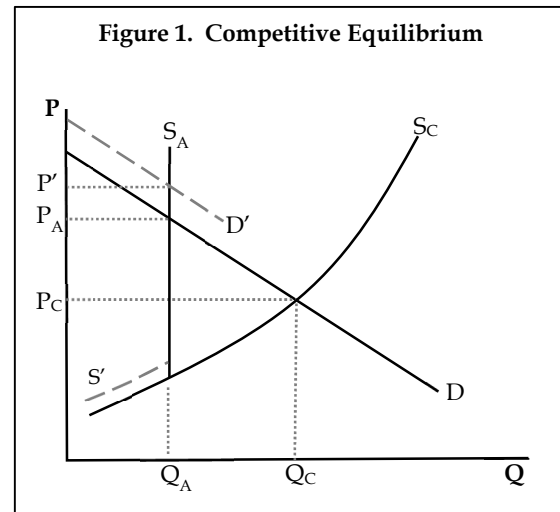
Theoretical Argument

After the onset of the Covid Pandemic, the automobile industry experienced three shocks: (1) a *positive* demand shock for automobiles from Americans avoiding public transportation; (2) a *positive* demand shock from economic stimulus; and (3) a *negative* supply shock from reduced manufacturing, plant shutdowns, and a lack of parts (*i.e.*, semiconductors) from the collapse of supply-chains. Considering these shocks, Havlin looks to pricing data to evaluate how market outcomes responded.

Havlin’s analysis is straightforward. He takes retail, new automobile prices (P) to be the sum of wholesale price (C , cost) and retail margins (M): $P = M + C$. A change in prices is thus $\Delta P = \Delta M + \Delta C$. With data on P and C , Havlin attempts to decompose ΔP into its constituent parts, ΔM and ΔC . Since the change in wholesale price, measured as the Producer Price Index (“PPI”) for new cars, was much smaller than the change in retail prices, measured as the Consumer Price Index (“CPI”) for new vehicles, Havlin concludes

that much of the retail price increase is due to increased retail margins. Evidence from financial statements of publicly-traded car dealers provided in Havlin supports that conclusion, with average margins rising from about 5% in 2019 to 13% in 2022.

Does this finding suggest there is a competitive problem in automobile manufacturing? No. Following the analysis in Kaserman and Beard (2000), say you have a competitive market in equilibrium that faces a supply constraint (the negative supply shock).³ Figure 1 illustrates the outcome using a simple supply-demand graph. Absent a supply constraint, the supply curve is S_C and demand is D , with an equilibrium price-quantity pair P_C, Q_C .



This simple scenario is not the reality of the present day, where many industries face severe supply shortages. Consider a supply constraint on the market, indicated by the supply curve labeled S_A . Now, the price-quantity pair is P_A, Q_A , where $Q_A < Q_C$. The price P_A , which exceeds P_C , clears the market under the constraint. Downstream firms may earn a larger profit than in the unconstrained case. Higher prices and profits are not an indicator of a lack of competition, however, but a consequence of the supply constraint.

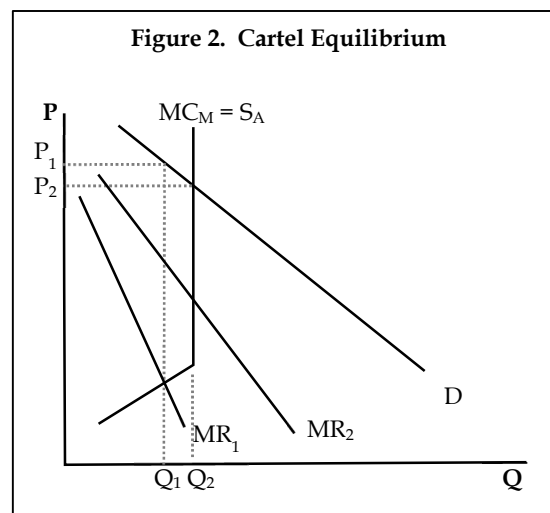
Under supply constraint, it may be that input prices may rise along with the constraint, which

is indicated by the dashed supply curve labeled S' . Note, however, that the input price increase does not affect the price P_A or quantity Q_A (unless the input price increase is quite large), though it may reduce seller profits. The price P_A is the result of the quantity constraint. Thus, whether manufacturers increased prices to retailers may not have affected prices, though such increases would have affected margins.

It was government spending and Covid avoidance, not automobile dealers, that contributed to rising prices—car prices are merely a symptom of supply-chain issues and Covid-related demand shocks.

Adding to the higher prices for automobiles (and across the economy broadly) was the government's massive Covid-related spending and the desire of Americans to avoid public transportation (two positive demand shocks).⁴ Also, due to Covid, many Americans avoided public transportation, also stimulating the demand for automobiles. A higher demand for cars, illustrated by the demand curve D' in Figure 1, increases prices to P' under the supply constraint, though the quantity is unaffected.⁵ *It was government spending and Covid avoidance, not automobile dealers, that contributed to rising prices—car prices are merely a symptom of supply-chain issues and Covid-related demand shocks.*

When prices and profits rise, especially in the current environment, the tendency of some policymakers and ideological advocates is to point to seller market power or collusion. Such claims erroneously point to the symptoms rather than the disease. Nonetheless, it is worth evaluating such claims more formally.



In Figure 2 the cartel equilibrium is illustrated with demand curve D and industry marginal cost curve $MC_M = S_A$. Here, firms act in concert to behave like a monopolist. When the marginal revenue curve intersects the marginal cost curve in its vertical portion (MR_2), the equilibrium is price-quantity pair P_2, Q_2 . Note that this equilibrium under cartel behavior is identical to that of the competitive equilibrium ($P_2, Q_2 = P_A, Q_A$); price and quantity are determined by the intersection of the demand and the supply curves. Thus, the claims that high prices and profits in the current environment are “collusive” is misguided. High prices and profits under a supply-constraint are entirely consistent with competitive behavior where firms have no special pricing power.

Alternately, if the marginal revenue curve intersects the marginal cost curve in its increasing segment (MC_1), then the price-quantity pair is P_1, Q_1 . Price now exceeds the competitive price (P_A or P_2) and the quantity is below the competitive quantity. Consequently, the difference between the competitive and collusive outcome, to the extent they can be, may be determined by a comparison of the quantity sold in relation to the quantity constraint. In automobile retailing, the empirical question is whether dealerships are raising prices and holding onto inventory? I turn to that question now.

Collusion or Competition?

The above analysis reveals that the question regarding any “collusive” behavior may be answered by determining whether all available supply is sold, which is the non-collusive outcome. Anyone that has recently shopped for a car, or even driven by a car dealership, knows that inventories are at historical lows, with dealership lots looking like a professional football stadium on a Tuesday. Buyers waiting on cars, and dealers pre-selling cars, is strong evidence that supply is constrained. Also, prior to Covid, dealerships sought to maintain about 60-day supply of inventory, permitting a variety of colors and models for customers to choose from. In recent years, some dealerships were involuntarily down to a 7-day supply.⁶ Supply is extremely tight; dealers have been up against the wall with no ability to sell more cars. Thus, there is no evidence of collusion.

Another piece of evidence regarding the competitiveness of the industry is margins on used cars, where used car prices rose much faster than new car prices. Unlike the long-term manufacturer-dealership relationship, used car sales are a one-shot transaction, so the wholesale price is more responsive to market fluctuations. Margins of used-cars for AutoNation, a large publicly-traded new car dealer, are stable over the 2018-2022 period, as shown in Table 1.⁷ Higher margins for new cars were largely a consequence of forbearance on the behalf of the manufacturers that maintained stable pricing.

Table 1. Used Car Margins, AutoNation

Year	Revenue	Gross Margin	Margin
2018	4,807.6	327.6	6.8%
2019	5,160.3	346.8	6.7%
2020	5,260.8	414.5	7.9%
2021	8,062.4	622.3	7.7%
2022	9,020.9	538.3	6.0%

The causes of higher new car prices are obvious—prices rose in response to multiple shocks all pushing prices higher. Table 2 summarizes the

percent change in several relevant factors between January-2019 through March-2020 (Pre-Covid) and April-2020 through December-2022.⁸

Anyone that has recently shopped for a car, or even driven by a car dealership, knows that inventories are at historical lows, with dealership lots looking like a professional football stadium on a Tuesday.

As for the shocks affecting the industry, personal savings (a measure of demand stimulus) increased by 36.7%. On the supply side, unfilled orders for automobiles and parts increased by 23.9%; domestic inventories fell by 60.3%; and domestic production of automobiles fell by 32.7%. This is a perfect storm for higher prices, even in a competitive market.

Table 2. A Perfect Storm

Item	Change (%)
Personal Savings	+36.7%
Unfilled Orders	+23.9%
Inventories (Domestic)	-60.3%
Production (Domestic)	-32.7%
New Auto CPI	+8.5%
New Auto PPI	+3.1%
CPI-All Goods	+7.4%

In response, new automobile prices rose 8.5% while the overall CPI rose 7.4%, a relatively small difference given the extreme shocks felt by the automobile industry. Between the periods, wholesale prices rose 3.1%. It is this spread between the new car CPI and PPI (5.4 percentage points) that interests Havlin.

When a competitive market sees a positive demand shock and negative supply shock, prices rise, and firms may realize higher profits. This result is expected even when firms act independently; it is not an indictment against the actions of competitive firms nor an indicator of

collusion. Auto dealers are selling cars faster than they can get them from manufacturers, sometimes causing long delays between purchase and delivery. Thus, there is no indication of collusion or coordination among auto dealers.

A Strategic Argument?

Havlin makes no explicit assertion about collusion in automobile retailing, but he hints that dealers may have acted in a way to drive up prices and margins. According to Havlin,

Instead of relying on manufacturer supplies to meet consumer demand, dealerships drew down their existing inventories. As a result, backward demand transmission from consumer-demand increases was insufficient to generate demand increases for manufactures, and dealerships absorbed the existing demand through markup increases and inventory drawdowns.⁹

The statement may be read as implying that dealers reduced demand for newly manufactured vehicles to restrict supply. This would be an incorrect interpretation of market conditions.

First, as acknowledged by Havlin, manufacturers were in no position to increase supply. As Havlin observes,

when new-vehicle orders recovered, manufacturers failed to fill them because of global supply-chain disruptions.¹⁰

Dealers' inventories fell not because of some strategic plan to increase profits by reducing orders but because the inventories could not be replenished due to inadequate manufacturing capacity. Dealers could not "rely[] on manufacturer supplies to meet consumer demand" simply because manufacturers could not meet that demand. Dealers were scrambling for more cars.

Second, if margins are high because demand is high, then dealers want to sell *more* cars — there is

no incentive to draw down inventories and not order more cars. Indeed, in a high-demand climate, dealers want as many cars as they can get.

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Third, under existing accounting practices, an empty lot is a tax liability.¹¹ Dealers are taxed on a last-in-first-out inventory accounting method ("LIFO"). Thus, a decline in the market value of a dealership's inventory due to lack of available cars could result in sizable, and ideally avoided, tax liabilities. In fact, such concerns have led the automobile dealers to seek relief from LIFO requirements because of supply disruptions.

Conclusion

A recent analysis of automobile prices by Havlin outlines the troubles faced by auto dealers selling new cars—a dual "black swan" event of high demand and supply constraints. Basic economic reasoning indicates these shocks will put upward pressure on prices and margins. Even in highly competitive markets, such as automobile retailing, when demand is high and supply is restricted, prices rise, and margins may follow. This is how markets work. Used car prices, also affected by comparable market shocks, rose by far more than new cars did.

Economic theory also points to a test for collusion, a distinction based on the relationship between the quantity sold and the supply constraint. Automobile dealerships are selling every car they can get their hands on, which is consistent with competitive rather than collusive activity. Hopefully, the supply constraints in automobile manufacturing will soon ease, with

prices and margins returning to traditional levels. Whether the inflationary pressures caused by increases in the money supply will ease is another question.

NOTES:

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¹ M. Havlin, *Automotive Dealerships 2019–22: Dealer Markup Increases Drive New-Vehicle Consumer Inflation*, MONTHLY LABOR REVIEW, U.S. Bureau of Labor Statistics (April 2023) (available at: <https://stats.bls.gov/opub/mlr/2023/article/automotive-dealerships-markups.htm>).

² See, e.g., *Avian Influenza Outbreaks Reduced Egg Production, Driving Prices to Record Highs in 2022*, U.S. Department of Agriculture (January 11, 2023) (available at: <https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=105576>).

³ T.R. Beard and D.L. Kaserman, *Testing for Collusion During Periods of Input Supply Disruptions: The Case of Allocations*, 45 ANTITRUST BULLETIN 213-226 (2000).

⁴ People often buy physical goods (like cars) with unexpected income, such as tax returns. See, e.g., A. Goodman-Bacon and L. McGranahan, *How Do EITC Recipients Spend their Refunds?* 32 ECONOMIC PERSPECTIVES: FEDERAL RESERVE BANK OF CHICAGO (2008) (available at: <https://www.chicagofed.org/-/media/publications/economic-perspectives/2008/ep-2qtr2008-part2-goodman-et-al-pdf.pdf>).

⁵ Havlin, *supra* n. 1 (“Shortly after stimulus checks were issued in two rounds in late 2020 and early 2021 (the first stimulus round occurred in April 2020), dealership sales surged in March and April of 2021, and monthly sales continued to remain above their pandemic lows during the remainder of 2021.”).

⁶ S. Tucker, *The New Car Shortage Started To Ease in November*, KBB.COM (December 14, 2022) (available at: <https://www.kbb.com/car-news/the-new-car-shortage-started-to-ease-in-november>).

⁷ Data available at: <https://investors.autonation.com/financials/annual-reports/default.aspx>.

⁸ Data available at: <https://fred.stlouisfed.org>.

⁹ Havlin, *supra* n. 1.

¹⁰ *Id.*

¹¹ L. Weiss, *Lawmakers Seek Tax Break for Car Dealers Facing Supply Troubles*, ROLL CALL (March 28, 2022) (available at: <https://rollcall.com/2022/04/28/lawmakers-seek-tax-break-for-car-dealers-facing-supply-troubles>).