

Cass Freight Index[®] Report

August 2019



Economic Outlook from Freight's Perspective

Dropping Another -3.0% in August, Negative Volume Nine Months in a Row

More Signs of Contraction - When Will the GDP Turn Negative?

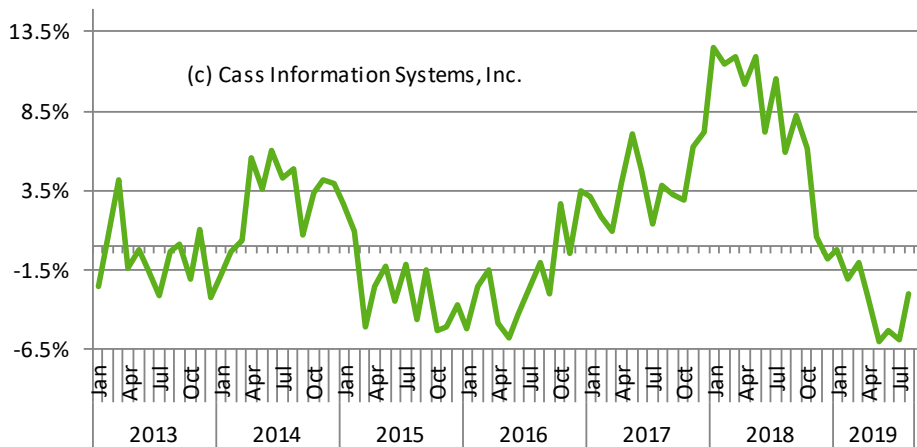
	August 2019	Year-over-year change	2 year stacked change	Month-to-month change
Shipments	1.190	-3.0%	2.8%	1.6%
Expenditures	2.840	-2.6%	13.6%	-0.7%

Continued deterioration in the Cass Freight Shipments Index concerns us:

- When the December 2018 Cass Shipments Index was negative for the first time in 24 months, we dismissed the decline as reflective of a tough comparison. In January and February 2019, we again made rationalizations. When March was also negative (-1.0%), we warned that we were preparing to “change tack” in our outlook; when April was down (-3.2%), we said, “we see material and growing downside risk to the economic outlook.”
- With the -3.0% drop in August, following the -5.9% drop in July, -5.3% drop in June, and the -6.0% drop in May, we repeat our message from last three months: **the shipments index has gone from “warning of a potential slowdown” to “signaling an economic contraction.”**
- We acknowledge that: all of these negative percentages are against extremely tough comparisons, and the Cass Shipments Index has gone negative before without being followed by a negative GDP. However, weakness in demand is being seen across most modes of transportation, both domestically and internationally, with many experiencing increases in the rates of decline.
- We know that freight flows are a leading indicator, so by definition there is a lag between what they are predicting and when the outcome is reported. Nevertheless, **we see a growing risk that GDP will go negative by year's end.**
- The weakness in spot market pricing for many transportation services, especially trucking, is consistent with the negative Cass Shipments Index and, along with airfreight and railroad volume data, strengthens our concerns about the economy and the risk of ongoing trade policy disputes. Weakness in commodity prices, and the ongoing decline in interest rates, have all joined the chorus of signals calling for an economic contraction.

Cass Freight Index™ - Shipments

YOY Percentage Change



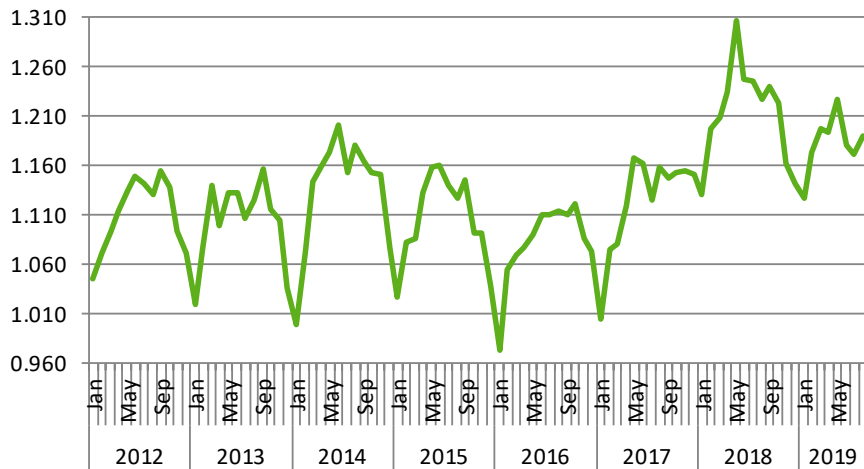
We should note that the Cass Freight Index was one of the first freight flow indicators to turn positive (in October 2016) and confirm our prediction of a recovery in the U.S. economy. As we try to navigate the ebb and flow of the economy, we don't pretend to have any 'secret sauce' or incredibly complex models that have exhaustively analyzed every data point available. Instead, we place our trust in the simple notion that the movement of tangible goods is the heartbeat of the economy, and that tracking the volume and velocity of those goods has proven to be one of the most reliable methods of predicting change because of the adequate amount of forewarning that exists. Beyond our concern that the Cass Freight Shipments Index is negative on a YoY basis for the ninth month in a row:

- We are concerned about the increasingly severe declines in international airfreight volumes (especially in Asia) and the ongoing swoon in railroad volumes, especially in auto and building materials;
- We see the weakness in spot market pricing for transportation services, especially in trucking, as consistent with and a confirmation of the negative trend in the Cass Shipments Index;
- As volumes of chemical shipments have lost momentum, our concerns of the global slowdown spreading to the U.S. and the trade dispute reaching a 'point of no return' from an economic perspective grow.

Bottom line, more and more data are indicating that this is the beginning of an economic contraction. If a contraction occurs, then the Cass Shipments Index will have been one of the first early indicators once again.

Cass Freight Index™ - Shipments

Nominal Index Value = 100 January 1990



August, following the pattern established over the previous three months, was a month of mixed signals throughout most of the U.S. and global financial markets. After equity, bond, and commodity valuations fell in the fall of 2018, to “correction levels” in December, they staged recoveries that were equally impressive, but suggest different futures for the economy:

- **Equity markets still believe in stronger economy** - Last year, the Dow Jones fell as low as 21,792 in December before rallying throughout the first four months of 2019 (getting back above 26,000 by the end of April). It has since oscillated in a range, both falling as low as 24,815 but also establishing a new all-time record close of 27,349 on July 23rd; it is now 27,182 and after it appeared to be rotating into more defensive/less cyclical names during August, it has spent most of September second guessing that rotation and being overly fascinated with IPOs.
- **Debt markets signal weaker economy** - The 10-year Treasury yield, after peaking at 3.24% on November 8, 2018, steadily fell to as low as 1.47% (end of August, beginning of September) before a very slight recovery to the current 1.79%. Fed rate cuts and lower economic growth are the headlines, but we maintain ‘technology has killed inflation;’
- **WTI Crude Oil fell from >\$75 a barrel in October 2018 to as low as \$42.53 in December** before rallying throughout the first four months of 2019 back above \$60. Then, in a manner not dissimilar to the equity markets, oil has oscillated

in a range between \$52 and \$65. The current price of \$55 coincides with a world economy that is still operating and is high enough to encourage some ongoing U.S. fracking activity in the coming months.

What stayed the same? Large multi-national companies lowered guidance and blamed slowing rates of activity on Europe and Asia. Trade talks with China continued without resolution, as incrementally more negative indications that the Chinese economy is starting to suffer are coming out at an ever-increasing pace.

What changed? The consensus outlook by prognosticators went from “there is no way 2019 growth can surpass 2018” to “perhaps not at the scorching pace of 2018, but growth at an above-average pace is still attainable in 2019.”

The storm clouds on the economic horizon (all of which have gotten worse since our last report):

1. **The tariffs—and threats of even higher tariffs—**

- a. **With China**, the world’s second largest economy (even though the latest headlines and tweets keep suggesting there will be a resolution). Tariffs have throttled export volumes in many areas of the U.S. economy, most notably agriculture exports and other select raw materials. We maintain hope that there will be a resolution; that there will be a trade deal because both China and the U.S. have to reach one. But the Asian airfreight volumes continue to suggest a growing risk that one or more of the Asian economies (China, South Korea, Singapore) is already sliding into recession. *The current civil unrest in Hong Kong only increases the risk of an economic contraction and is consistent with the popular reaction of citizens who are more challenged/not as prosperous as is commonly believed (i.e., are the Hong Kong and Chinese economies as strong as they report them to be, or as weak as international airfreight volumes suggest?).*
- b. **With Mexico**. The threat of tariffs, and then the recession, sent shock waves through many supply chains. Border transit times going Northbound and Southbound have gone from less than 30 minutes to more than two days in some cases. Even before the tweets about tariffs, border inspections had become increasingly more stringent. Mexico is our third biggest trading partner, and over 80% of their exports are to the U.S. Disruptions in trade between our countries are harmful to our economy and capable of producing a recession in Mexico.

Risk has gotten worse.

2. The decline in WTI crude in December '18 to as low as \$42.50 a barrel. This did not fall below the marginal cost of production for fracked crude in almost all areas of the U.S., but it made it less profitable and significantly lowered the incentive to drill ever more holes, effectively slowing the rate of growth in the industrial economy. Crude's rally (WTI was above \$65 in April) offered us reprieve, and suggested better demand from an economy that was stronger than the freight flows. Then, the decline to just above \$50 in early June suggested that the global economic demand for oil is more in line with freight flows. At the current price of \$55 it is neither agreeing with the equity market's outlook or the outlook suggested by freight flows. ***Risk is abstaining from making a vote (at least for now).***

3. Consistent with disappointing housing starts (down -3.1% YTD) and lackluster auto sales (down as much as -4.8% in April and -1.2% YTD), **spot pricing in transportation has declined dramatically.** Especially in trucking, spot pricing has reached levels below contract that will drive weakness in contract pricing and eliminate, or at least significantly reduce, all capital investment other than maintenance cap ex. ***This puts further downward pressure on growth in coming periods.***

4. Yes, but...
 - a. The 1Q '19 U.S. GDP was an increase of 3.1% and 2Q '19 U.S. GDP was an increase of 2.0%, both of which seem much stronger than the Cass Shipments Index or underlying freight volumes, and would suggest that our concerns about the economy might be too pessimistic.

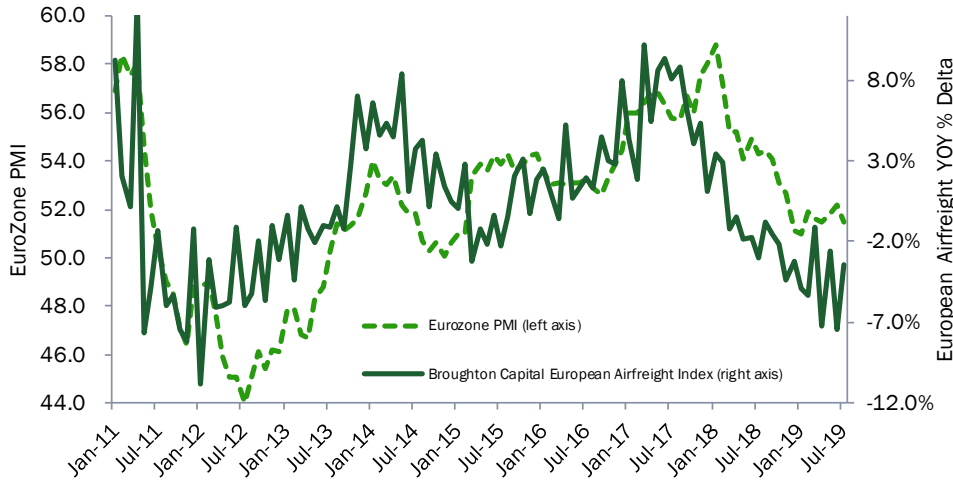
 - b. "Too pessimistic" until we dissect what drove the increases:
 - i. 1Q rate of 3.1% - Increases in inventory contributed 0.53 percentage points, while more exports (0.49) and fewer imports (0.23) contributed 0.72 percentage points. ***Not including these adjustments*** (which we view as antiquated parts of the calculation that may have been appropriate 80 years ago when our method of calculating GDP was developed, but are no longer relevant in our modern economy), ***GDP increased by 1.8%.***

 - ii. 2Q rate of 2.0% - Government consumption expenditures drove 0.77 percentage points of the increase (the largest contribution from this line item since Q1 and Q2 '09 when the

government was frantically doing everything it could to stabilize markets and stimulate the economy, and government consumption expenditures contributed 0.92 and 1.22 respectively). Counter to the trend in Q1, inventories fell and subtracted -0.91 from the calculation, but for reasons we've already explained, increases in inventory may have represented the 'building up' or store-housing of economic value in our economy in the 1930's when the GDP calculation methodology was created, but it is no longer relevant in our modern economy. More importantly, this figure runs counter to those who claim that there has been a 'pull-forward' in goods shipments by companies trying to 'get ahead of' the tariffs. Tariffs do seem to have stalled trade, as declining exports subtracted -0.71 percentage points from the GDP calculation. This is a troubling trend if it continues, but even more concerning was the -1.11 percentage points subtracted by the drop in gross private domestic investment. Continued decreases in gross private investment tend to lower potential rates of growth in future periods throughout the economy, while increases in gross private investment tend to increase the potential rates of growth in future periods. ***Not including the government stimulation adjustments, the core rate of growth was 1.23%***, while several trends such as declining exports and declining private investment provide their own bearish indications.

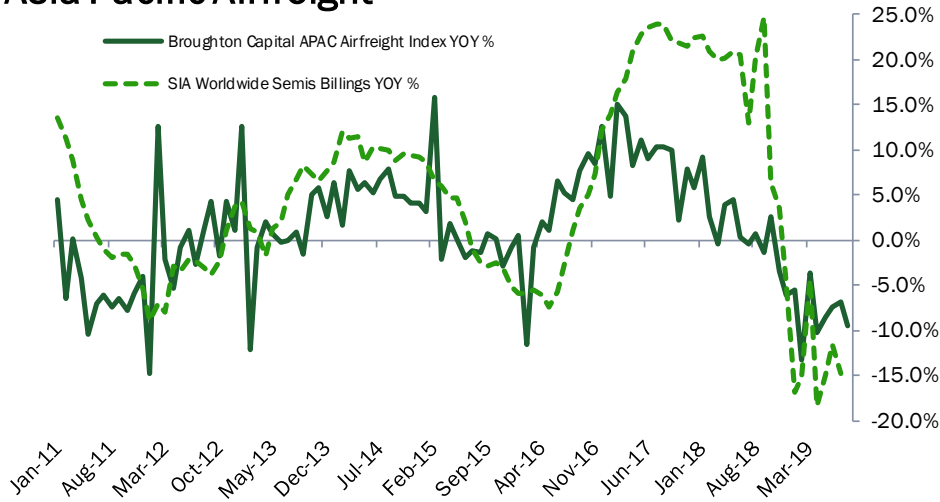
Airfreight volumes in Europe continue to suggest that the region's economy continues to cool. Airfreight volumes in Asia suggest that the region is on the verge of, or is already entering, a recession. As we've highlighted before, when trade tariffs slow the rate of growth for our global trading partners, it poses a real threat to the U.S. rate of economic growth.

European Airfreight vs. EuroZone PMI



European airfreight volumes have been negative since March 2018, but only by small single-digit margins (-1% to -3%), until November 2018. Unfortunately, since then, volumes have started to further deteriorate. Our European Airfreight Index was down a concerning -7.2% in April, only down -2.6% in May, dropped -7.5% in June, and the July index fell -5.8%, and consistent with the deteriorating Eurozone PMI. While the -6.9% July overall drop in London airfreight volume suggests that economic headwinds from Brexit remain, particularly since the largest rates of decline (down -11% to -25%) are being experienced in the lanes between (to and from) London and other EU airports. Although the European data is by itself distressing, it's the Asian data that has become the most alarming.

Asia Pacific Airfreight

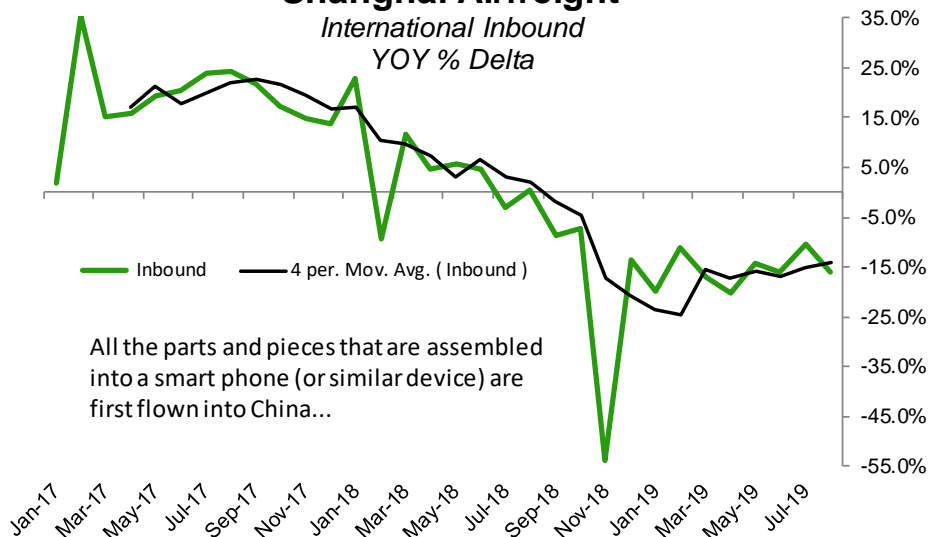


Asian airfreight volumes were essentially flat from June to October 2018, but have since deteriorated at an accelerating pace (November -3.5%, December -6.1%, January -5.4%, February -13.2%, March -3.6%, -10.2% in April, -8.5% in May, -7.4% in June, -6.8% July, and preliminary August -9.4%).

If the overall volume wasn't distressing enough, the volumes of the three largest airports (Hong Kong, Shanghai, and Incheon) are experiencing the highest rates of contraction.

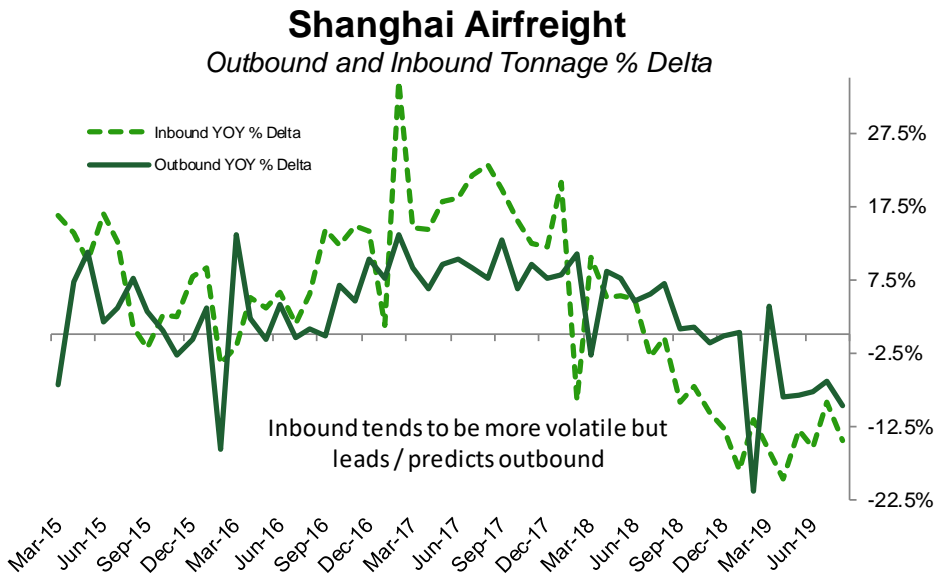
Shanghai Airfreight

*International Inbound
YOY % Delta*

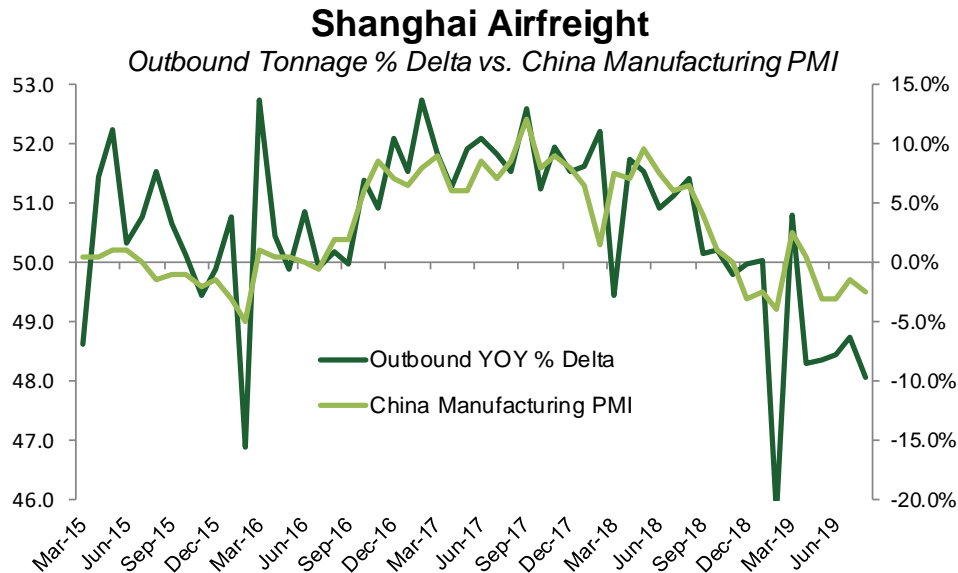


All the parts and pieces that are assembled into a smart phone (or similar device) are first flown into China...

Even more alarming, the inbound volumes for Shanghai have plummeted. This concerns us since it is the inbound shipment of high value/low density parts and pieces that are assembled into the high-value tech devices that are shipped to the rest of the world. Hence, in markets such as Shanghai, the inbound volumes predict the outbound volumes and the strength of the high-tech manufacturing economy.



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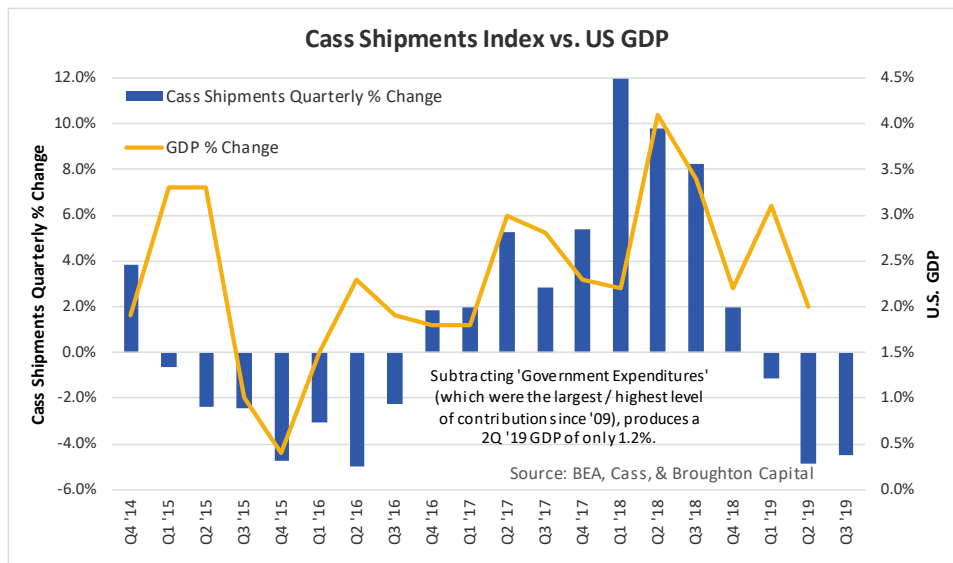
The outbound volumes tend to predict the overall Chinese Manufacturing PMI, which has now been below 50 for four months (May, June, July, and August). With the current level of civil unrest, leading to Hong Kong airport flight delays and cancellations, we can't imagine the data getting better until the civil unrest subsides.

While we acknowledge the need to review the terms of trade with our global partners on an ongoing basis, we also know our economic history. The data underlying economic history is clear: the more unrestricted and robust global trade is, the more prosperous the global population becomes. Open markets of free trade are the greatest method to efficiently allocate resources and ensure that the best quality goods made by the most efficient producers are available to everyone. Unrestricted global trade lifts hundreds of millions, even billions, of the world's population out of poverty. 'Protectionism,' like so many government regulations and programs, frequently produces results that are the exact opposite of the intended outcome.

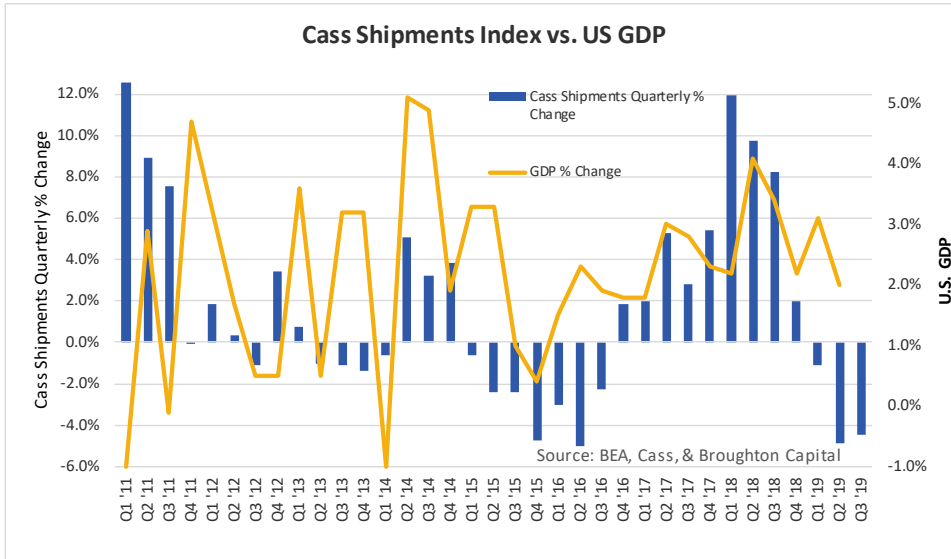
Whether it is a result of contagion or trade disputes, there is growing evidence from freight flows that the economy is beginning to contract. The freight markets, or more accurately goods flow, have a well-earned reputation for predictive value without the anchoring biases that are found in many models which attempt to predict the broader economy. As is our custom, we will look at the specific freight flows that are signaling continued growth in specific segments of the economy. Each of these data sets supports our assertion that the Cass Shipments Index is indicative of economic retrenchment bordering on contraction. Our confidence in this outlook is emboldened by the knowledge that since the end of World War II (the period for which we have reliable data) there has never been an economic contraction without there first being a

contraction in freight flows. Conversely, during the same period, there has never been an economic expansion without there first being an expansion in freight flows. **Bottom line: the volume of freight in multiple modes is materially slowing and suggests an increasingly bearish economic outlook for the U.S. domestic economy.**

At first glance, the GDP for the 1st and 2nd quarter seems very inconsistent with overall freight volumes. Using the Cass Shipments Index as a predictive proxy, we did not expect the BEA to report 3.2% as its initial estimate or 3.1% as its revision in Q1; or 2.1% as its initial estimate or 2.0% as its revision in in Q2. As we have already explained, dissecting the contributing factors explains much of the disparity, and should point out that freight flows are a leading indicator. It often takes two to three quarters for the trends in freight to become reported economic statistics.



Although we also subdivide the economy via multiple other data feeds that represent smaller segments of freight flows, **the Cass Freight Shipments and Expenditures Indexes are two of the strongest proxies for what is happening in the overall U.S. freight markets, and as a result they are strong predictive indicators for the U.S. economy.** *We understand that there are other broad proxies for freight flows, but they are either less frequent (only once a quarter) or less timely (reported >4 weeks after the month ended).*



Based on the trend since the beginning of the year, but especially the data over the last four months, the Cass Shipments Index is signaling that GDP may be negative, or at least come close to being negative, in Q3. If it does not, since reported GDP often lags the economic activity represented by freight flows, continued weakness in the Cass Shipments Index at the current magnitude should result in a negative Q4 GDP.

Other reasons the reported economic results in coming months are poised to be lower in 2019 (still expanding, but at a percentage rate less than in early 2018):

- lapping increasingly difficult comparisons;
- while infrastructure in many industries was showing signs of being at or near full capacity, recent slowdowns in demand have changed this from a concern that limited growth to a data point of evidence that the economy may be contracting;
- infrastructure in most modes of transportation was at or near full capacity, but the declines in volume and rapid retreat in spot pricing have changed this from a concern about the limits of possible growth to another data point of evidence that the economy may be contracting;
- unemployment low enough to make growing the active workforce incredibly challenging.

Hence, further large percentage increases in the short term are increasingly difficult without significant investments in equipment and technology. Setting aside all the

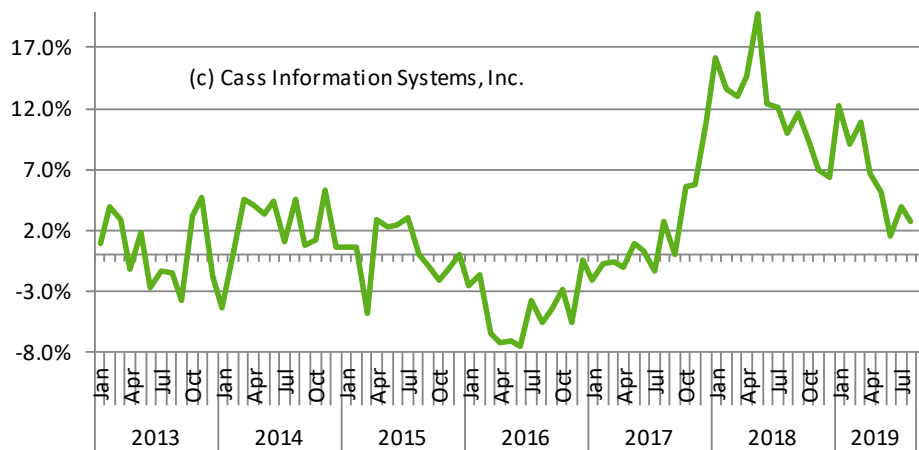
intricacies about the limitations on the rate of growth that's possible (on top of already strong growth), the Cass Shipments Index has been negative long enough and by a magnitude significant enough to become an indication of economic contraction.

Transportation Continues to be a Leading Indicator

Over the last several months, we have been pointing out that despite the YoY contraction in shipments, the 2-year stacked rate was still bullish and reflective of how much economic growth had occurred in 2017 and 2018; albeit increasingly less bullish as even the 2-year stacked rate trended lower.

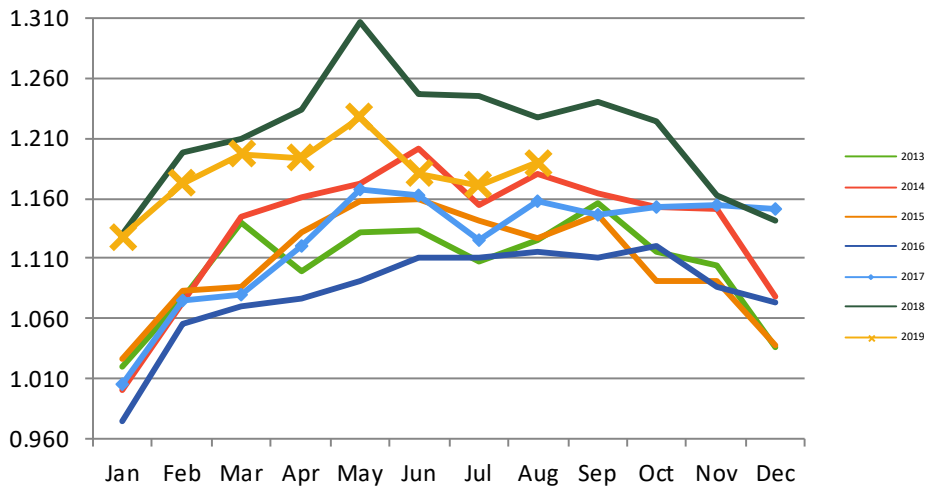
Cass Freight Index™ - Shipments

Two Year Percentage Change



Viewing the percentage change on a 2-year basis loses the predictive value of the index but provides perspective on how strong the recent expansion has been. With the 2-year stacked rate for June falling to a mere 1.5%, the trajectory on a nominal basis led us to predict “that even the 2-year stacked will fall negative next month,” but then July modestly bucked the trend rising back to 4.0%, before settling back to 2.8% in August. We still see this as headed into negative territory in coming months. *Simply put, after a large surge in activity, we have given it all back.*

Cass Freight Index™ - Shipments



2018 was an extraordinarily strong year for transportation and the economy. Every month from March to October exceeded the highest point in 2014 (a very strong year), while February was roughly equal to the peak month in 2014 (June 2014 - 1.201 vs February 2018 - 1.198), which is astonishing given the typical seasonality of freight (February is usually the weakest month of the year and June is usually the strongest month of the year). Point being, 2014 was the strongest freight year until 2018, and in 2018 the weakest freight month was roughly equal to the peak month of the previous peak year. Unfortunately, June 2019 shipment volume was not only below 2018, but fell below 2014. July and August 2019 were slightly better than 2014, but still well below 2018.

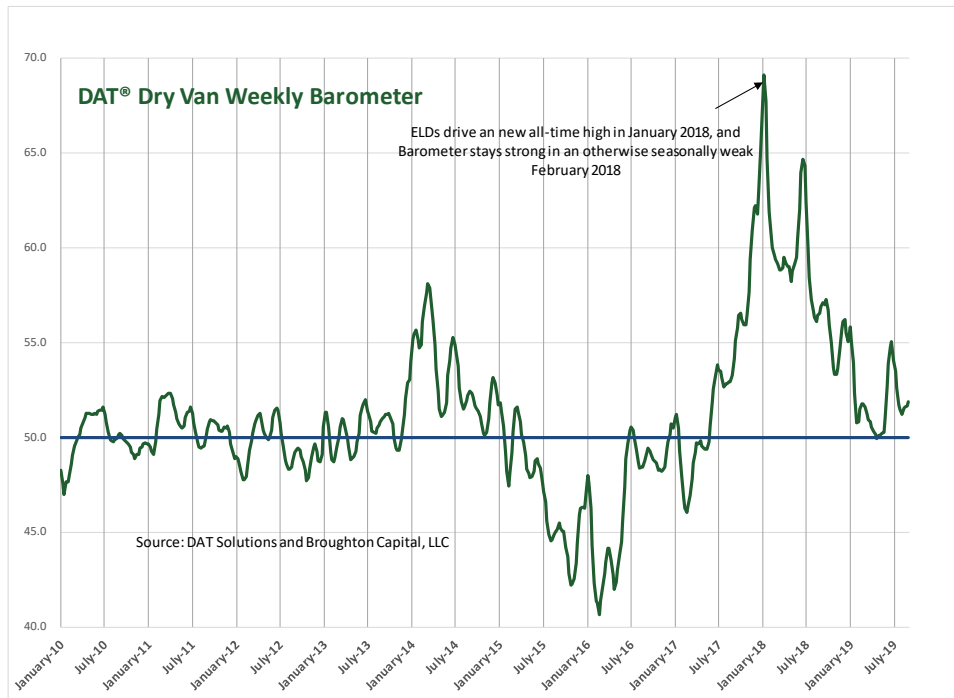
Understanding the Drivers of Shipment Volume Demand

As we have regularly explained, overall freight volumes are one of the most reliable predictors of the overall economy, and the Cass Shipments Index is one of the most dependable measurements of overall freight volumes in the U.S. To better understand the segments from which this freight volume is derived, we believe that there is value in separating the economy into three parts: industrial, consumer, and technology.

We also see value in pointing out that there is a value-to-density spectrum of these goods. On one end, the industrial goods flow has the most tonnage but the least value per ton (coal, grain, lumber, ore, steel); while on the other end, the technology goods flow has the least tonnage but the most value per ton (microprocessors, smartphones);

with the consumer goods flow in the middle of this spectrum from both a tonnage and value per ton perspective.

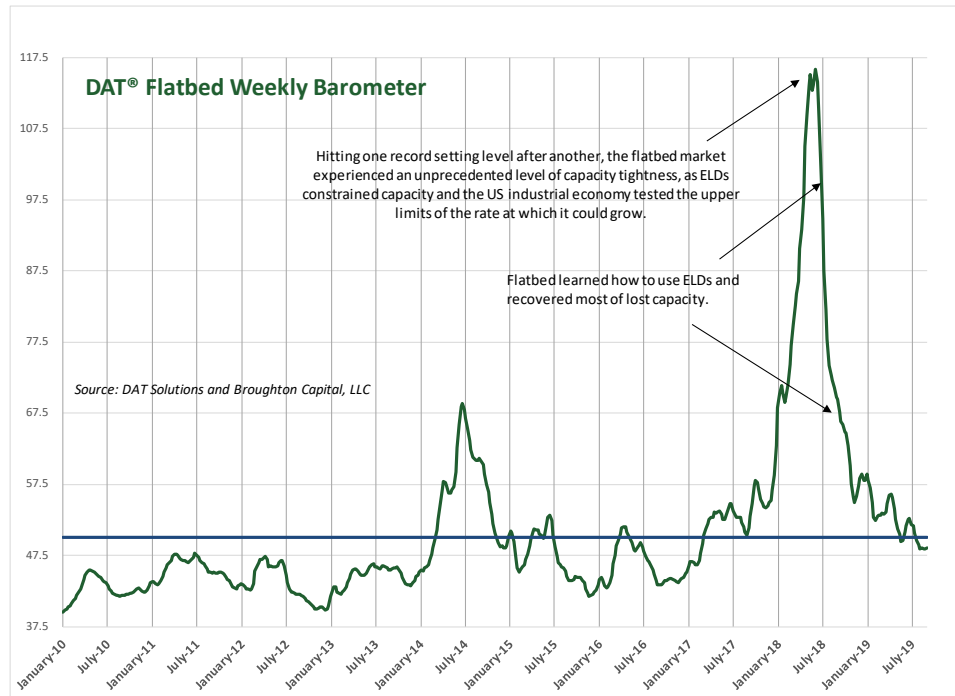
The Consumer Economy - We should note that dry van trucking volume has historically been a fairly reliable predictor of retail sales (container volume serves a similar role). When studied using the DAT Dry Van Barometer, current demand is at levels in line with capacity, which suggests that the consumer economy is still relatively healthy and that retail sales are not contracting. That said, this is a period that seasonally should be seeing much stronger volumes, which makes us cautious about the outlook for demand in September and October.



Key Takeaway - *the DAT Dry Van Barometer is a real-time indication of demand and capacity. We see the current level as an indication that the consumer economy is not contracting, but not expanding as strongly as it should at this point of the year.*

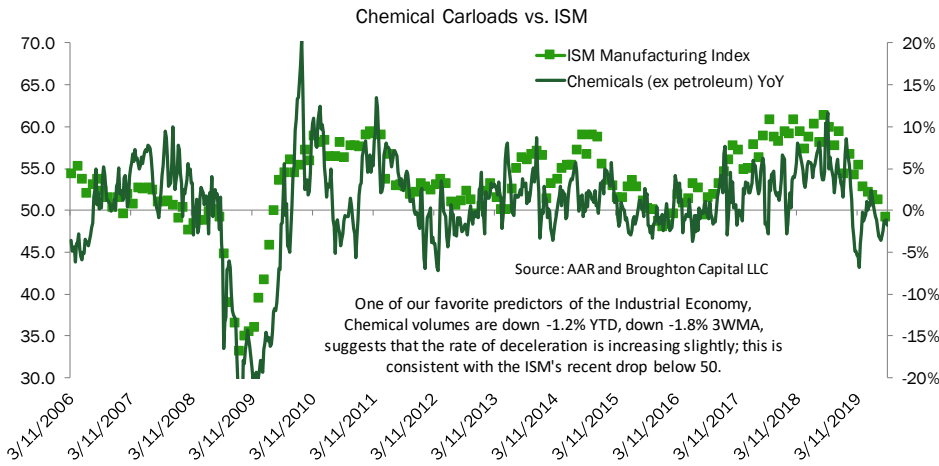
The Industrial Economy - With the surge in the price of WTI crude back above \$45 a barrel in October of 2016, the industrial economy's rate of deceleration first eased and then began a steady improvement led by the fracking of DUCs (drilled uncompleted wells), first in the fields with a lower marginal production cost (i.e., Permian and Eagle Ford) and now with oil back above \$50 a barrel (WTI is \$55 a barrel as we write this) the U.S. oil industry is fracking new wells in all the major shale fields. We would note that

indications of accelerating strength were coming from several modes of transportation, but the slowdown in housing and auto are now collectively producing visible weakness in flatbed trucking, which we view as a key heavy industrial indicator.



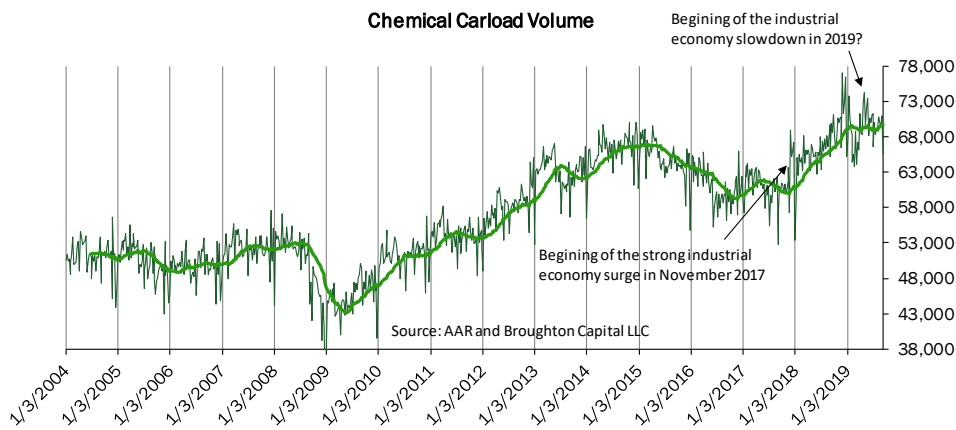
The DAT Flatbed Barometer indicating that capacity exceeds demand is a negative sign for the U.S. industrial economy. In line with recent rail volumes, it has started to suggest a more bearish outlook.

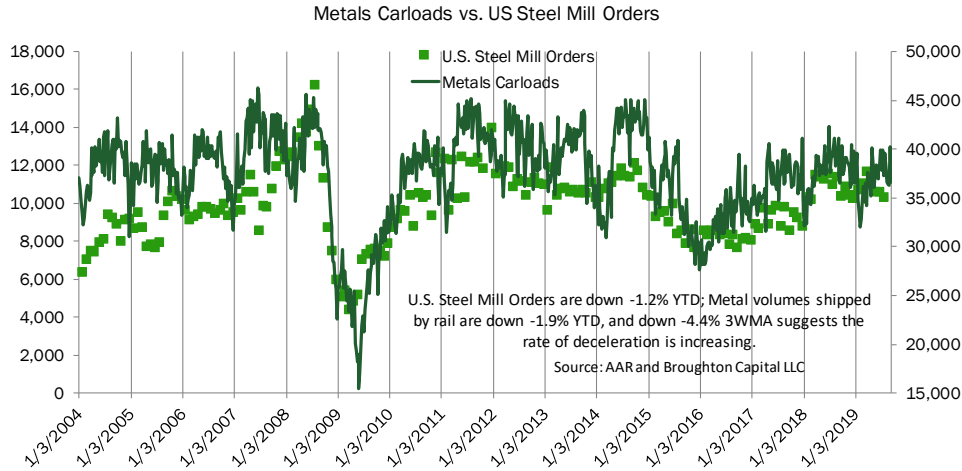
Recent data from the rail industry raised concern about the Industrial economy. We have asserted for years that one of the best predictive indicators of U.S. domestic industrial activity is the chemical carload volume moved via railroad. Our assertion is simple: it is almost impossible to manufacture, or even assemble, anything in mass quantity without chemicals. As a result, there has historically been a very tight relationship between the railroad chemical carload volume and the ISM Manufacturing Index.



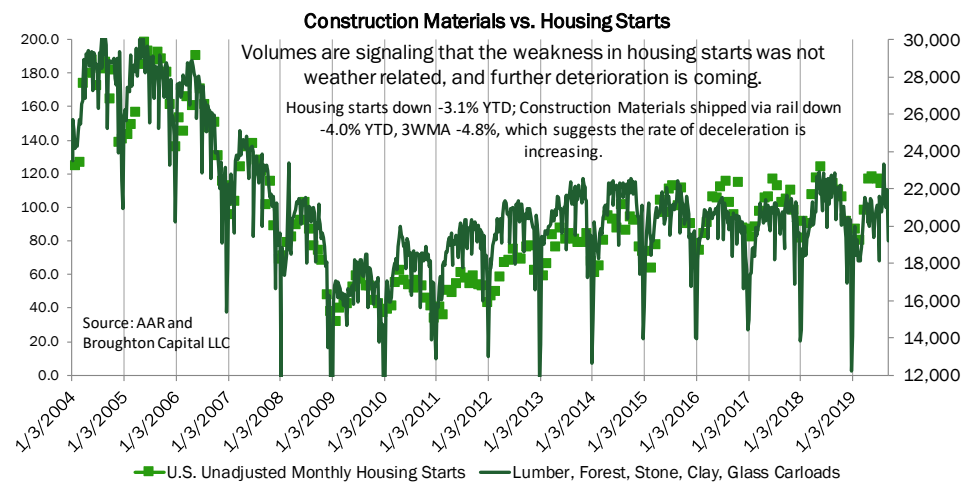
We should note that, after reaching strong volume increases (up 5.0% to 8.5% YoY in January and early February), the last half of February through early April dropped to levels >5.0% below on a YoY basis, severe enough and for a long-enough period of time to add merit to a more bearish forecast. Volumes in the weeks and months since then have brought the full year down to -1.2% YTD. Since the 3-week moving average (3WMA) is now down -1.8%, it appears that the rate of deceleration is increasing slightly.

Potentially resulting from the absence of trade agreements and ongoing trade talks (which we assert are the primary cause for the slowdowns in international airfreight), this suggests that the global slowdown is spreading to the U.S. industrial economy.

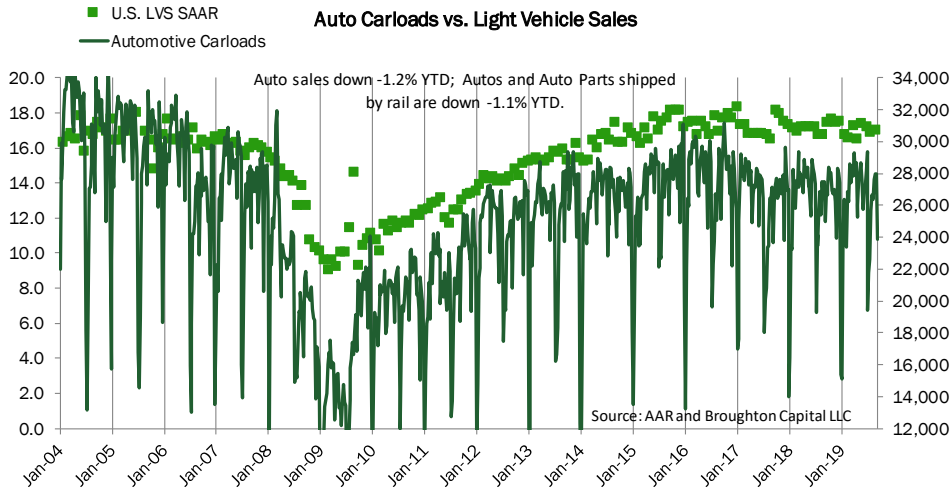




Earlier in the year, it appeared that somehow the steel industry was immune to the trade disputes. Unfortunately, this indicator of the U.S. industrial economy is now down -1.9% YTD, down -4.2% on a 9-week moving average (9WMA), and down -4.5% on a 3-week moving average (3WMA). Yet another mode in which the rate of deceleration is increasing. Among the many industries that U.S. steel mills serve, the construction industry is approximately 40% of the demand, while the auto industry is approximately 25% of the demand.



Similar to auto sales, housing starts drive activity in both the industrial and consumer economies. The volume of home-building materials that are moved via rail (down -4.0% YTD, down -4.8% on a 3-week moving average (3WMA), also suggests that a more bearish outlook for both the industrial and consumer economies is warranted. This is also consistent with housing starts (down -3.1% YTD), despite ultra-low mortgage rates.



The auto industry is certainly not immune to the trade talks and is adding merit to taking a more bearish outlook for both the industrial economy and consumer in the U.S. The volume of autos and auto parts that are being shipped via rail is down -1.1% YTD, but only down -0.7% on a 9-week moving average (9WMA), and actually up 0.6% on a 3-week moving average (3WMA), which suggests a less bearish outlook than the chemical, steel, and housing industries. No surprise after looking at the chart above, auto sales are down -1.2% YTD.

Enough About Volume and Demand, What About Pricing?

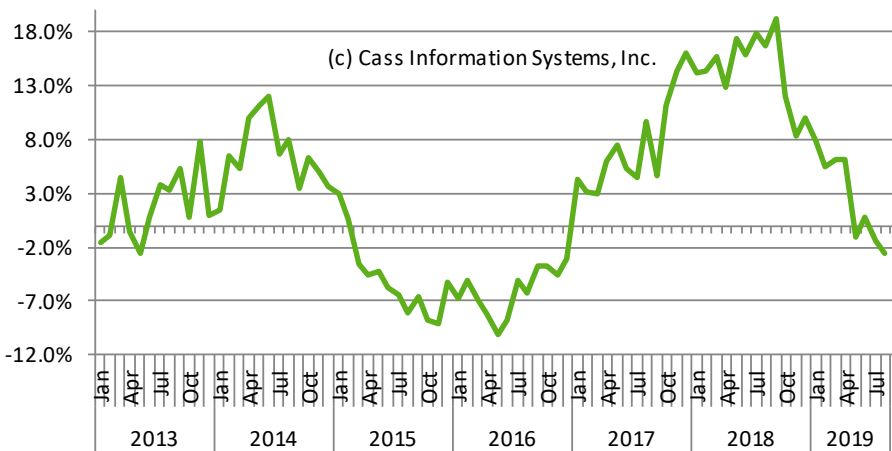
The Cass Freight Expenditures Index (measuring the total amount spent on freight) was signalling continued, overall pricing power for those in the marketplace who move freight. With demand no longer exceeding capacity in most modes of transportation for several months, it is not surprising that realized pricing power has gone negative. Unfortunately, the weakness in spot market pricing (especially in trucking) and the decline in fuel prices suggest that realized pricing will be under increasing amounts of pressure and is at risk of staying negative through the end of the year.

With the Cass Freight Expenditures Index going negative (down -1.0%) in May, only barely positive in June (up 0.9%), before falling negative again in July and August (down -1.4% and -2.6% respectively) concerns about inflation are being replaced by concerns about contract pricing and cancellation of transportation equipment orders. We continue to point out four factors:

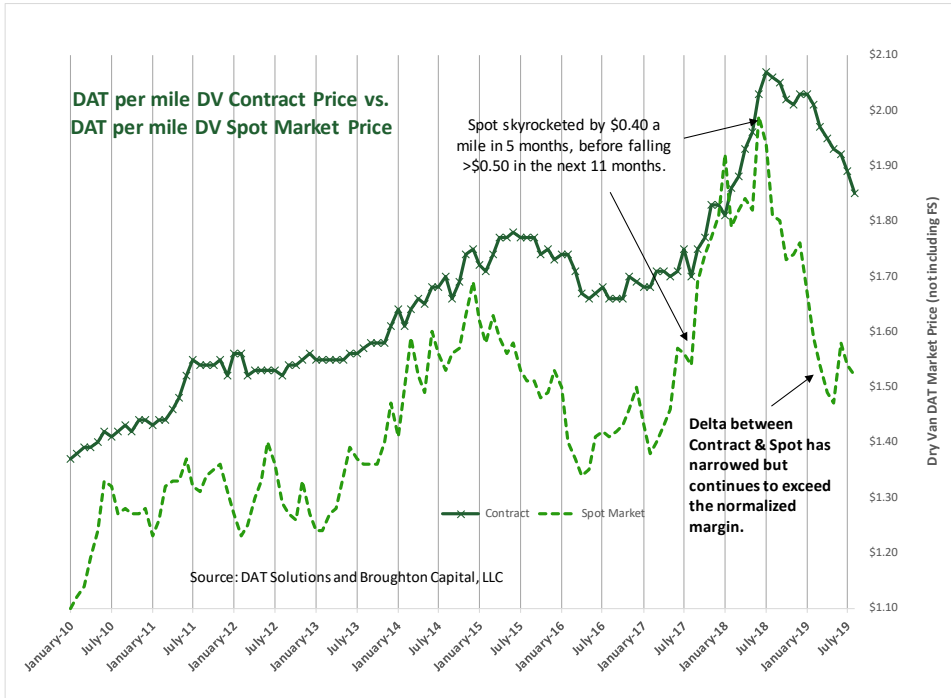
1. Almost all modes of transportation used their pricing power to create capacity, which first dampened and has now killed pricing power;

2. Spot pricing (not including fuel surcharge) in all three modes of truckload freight (dry van, reefer, and flatbed) has been falling for 12 months. Spot pricing, using dry van rates as a proxy, fell dramatically from its peak in June 2018 (more than \$0.50 a mile) to at one point in May falling to more than 30.0% below contract pricing (a level we declared unsustainable). The highly discounted pricing available in the spot market has attracted an increased amount of demand, which has deteriorated pricing in the contract market (which is down \$0.22 a mile or -10.6% in the last 14 months), and has begun to close the gap between contract and spot;
3. The cost of fuel (and resulting fuel surcharge) is included in the Cass Expenditures Index. Since the cost of diesel has been negative over the last 3 months on a YoY basis (down -5.4% June, down -5.8% in July, down -6.6% in August), it is increasing the negative amount of pricing reported;
4. Whether driven by capacity addition/creation or lower fuel surcharges (or a combination of both, which is our best guess) the Expenditures Index has continued to decline: the August 2019 Index is down -5.0% from its peak in September 2018.

Cass Freight Index™ - Expenditures
YOY Percentage Change



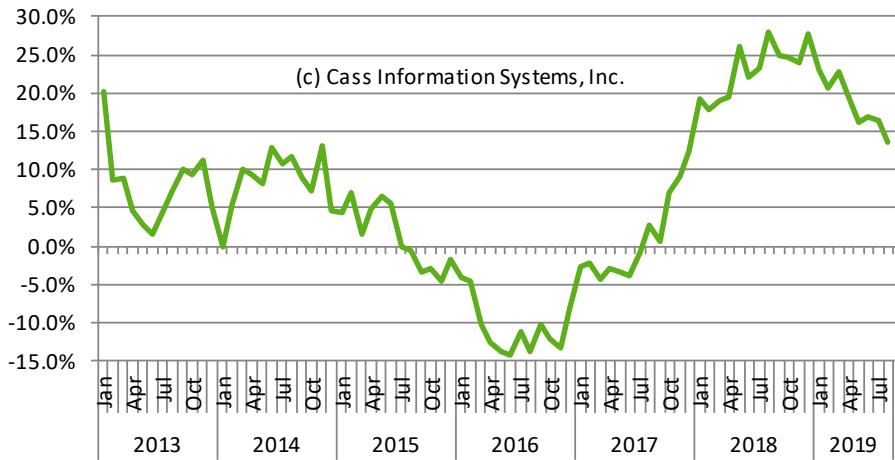
With all the strength in demand in 2017 and 2018, it followed that the Cass Freight Expenditures Index also posted strong percentage increases throughout 2017 that continued throughout 2018 and into 2019. As we commented on the Shipments Index, we have to go back to the easy comparisons of 2009-2010 to find such large percentage increases. The current comparisons are anything but easy, but the July -1.4% and August -2.6% decreases are not indicative of an economy that expanding.



After making several references to the weakness in spot pricing for trucking, we should probably show our readers some of the data and provide some explanation. The current discount of spot to contract pricing, in all modes of truckload (dry van is illustrated above), is large enough for shippers to increase the number of loads that they ‘put out into the spot market.’ This decreases demand in the contract market and increases demand in the spot market. We expect this marketplace behavior to continue until the spot market price firms up and begins to increase, or the contract price falls enough to materially narrow the gap, probably a degree of both. All of the Cass pricing indexes (Expenditures, Truckload Linehaul, and Intermodal) represent a mixture of both spot and contract pricing, as they are based on freight bills paid. Shippers flex the amount that they use the spot market. Understandably, data suggests that they are currently increasing the amount that they use the spot market.

Cass Freight Index™ - Expenditures

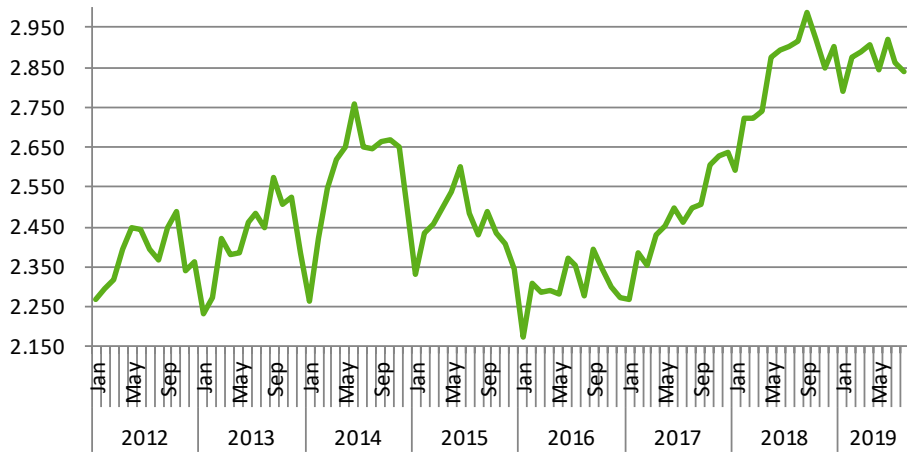
Two Year Percentage Change



While the rate of the Cass Freight Expenditures Index percentage increase had been declining in recent months, this was in part because the current and recent monthly increases were on top of strong double-digit increases from October 2017 through October 2018. Viewed another way that provides more perspective, the two-year stacked increase (2018 vs. 2016) in expenditures was 24.8% in September, 24.6% in October, 23.9% in November, 27.7% in December, 23.1% in January, 20.6% in February, 22.7% in March, 19.8% in April, 16.1% in May, 16.9% in June, 16.3% in July, and 13.6% in August. Point being, even the 2-year stacked has established a steady pattern of decline.

Cass Freight Index™ - Expenditures

Nominal Index Value = 100 January 1990



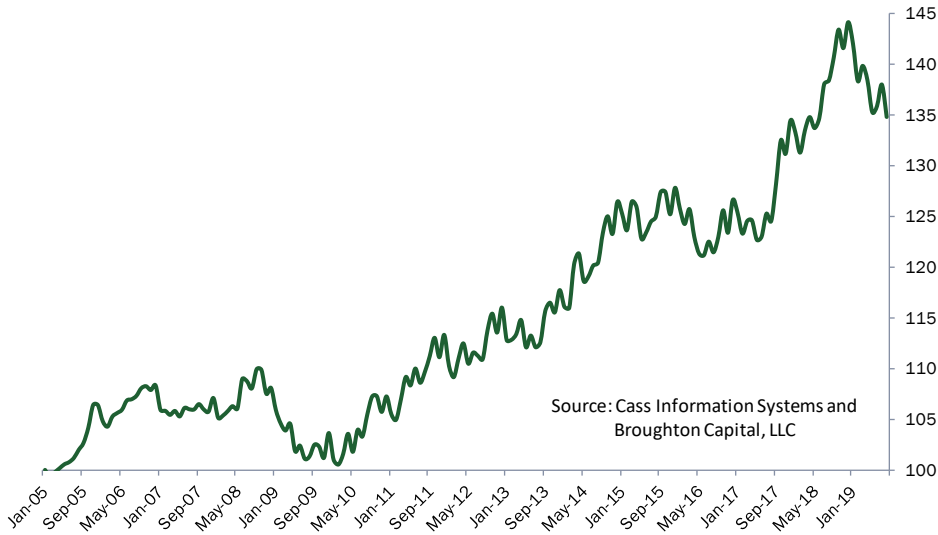
Viewing the Cass Freight Expenditures Index on nominal basis shows how positive the trajectory has been over the last two years. It also illustrates that despite the sequential decline from last year's peak and the current weakness in spot pricing, overall realized pricing continues to be at relatively robust levels. On a nominal basis, the Index first exceeded the all-time high established back in June 2014 and has then stayed near record levels. To put the strength of the underlying pricing in perspective, we should remind readers that the price of oil was at or above \$100 a barrel throughout most of 2014, vs. the price today of ~\$60 a barrel.

Putting it all in Perspective - the Background Story

Expenditures (or the total amount spent on freight) turned positive for the first time in 23 months in January 2017, albeit against an easy comparison. Not since 2011—when the economy was still climbing out of the recession—had this index been so low. Our Expenditures Index in January 2016 was the worst in five years, as demand had weakened and crude oil had fallen below \$30 a barrel. Since fuel surcharges are included in the Expenditures Index, the price of diesel fuel was a positive bias in 2017 (fuel was up as much as 75% on a YoY basis, on average up 15.0%) and continued to be in the 2018 data (on average up 19.9%), albeit to an ever-lesser degree by the end of the year.

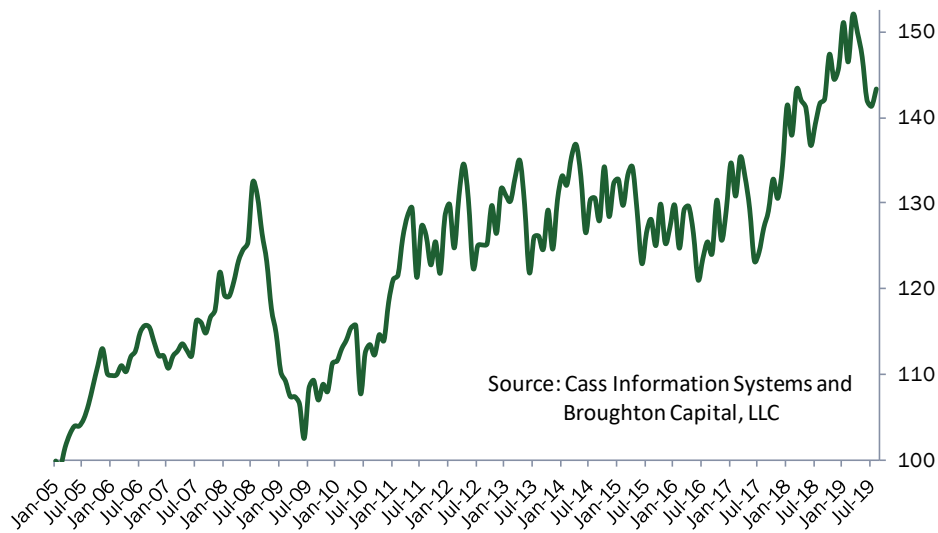
After being a positive bias throughout 2017 and 2018, diesel (at \$2.971 a gallon on a national average basis, down -8.6% YoY as we write this) is poised to continue to be a negative bias in coming months of 2019. This only adds to the softness we are seeing, in realized pricing power, for truckers and intermodal shippers.

Cass Truckload Linehaul Index



As we have been warning it would, the proprietary Cass Truckload Linehaul Index® (which measures realized pricing for Dry Van and does not include fuel) has gone negative (-2.6%) on a YoY basis in the month of August to 134.8, and we predict will remain negative in coming months.

Cass Intermodal Price Index

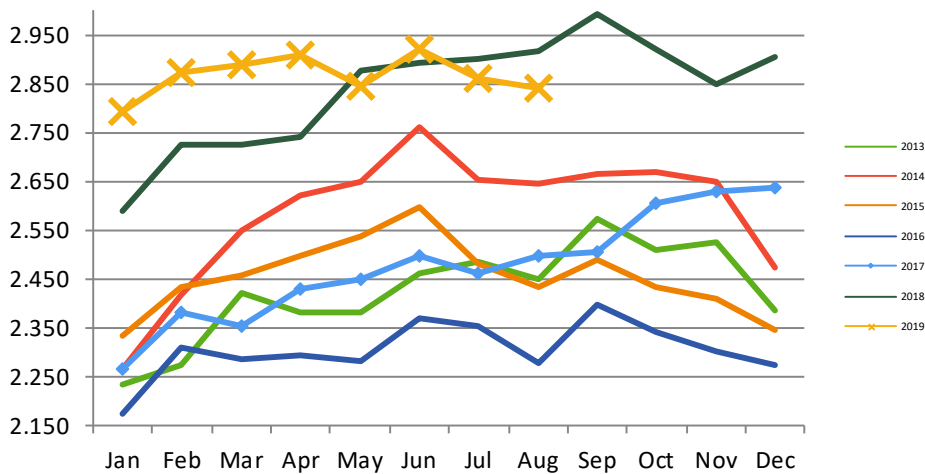


The proprietary Cass Intermodal Price Index® (which does include fuel), increased 1.2% in August to 143.3, but is also showing signs of significant sequential retreat. Similar to

our warnings about the Truckload Index earlier in the year, we are now predicting the Intermodal Pricing Index will also go negative in October, perhaps as early as September.

(See those reports [here](#) for more details on the data and the underlying trends.)

Cass Freight Index™ - Expenditures



Like the Cass Freight Shipments Index, the Cass Freight Expenditures Index, when viewed on a nominal YoY stacked basis, highlights that:

- the monthly Expenditures Index exceeded all previous levels for each month respectively throughout 2018;
- beginning in May 2018, it even exceeded all previous levels in any month of any year;
- January, February, March, and April of 2019 were not only well above January, February, March, and April of 2018, but were above the peak of 2014. Since oil was markedly higher in 2013 and 2014 (and hence included a much larger fuel surcharge), this data was encouraging, but the decline over the last several months is beginning to concern us.

We'd remind readers of two fundamental rules for marketplaces: volume leads pricing, and the long-term value of a commodity is the marginal cost of producing it.

- Repeatedly, we have watched in a host of different markets that volume goes up before pricing starts to improve and volume goes down before pricing starts to weaken. Even in markets as basic as the weather, the number of hours of

sunshine (sunrise to sunset) starts to decline long before the temperature starts to fall. Volume leads pricing.

- Especially to the extent that pricing materially exceeds the marginal cost of creating capacity, market participants will invest heavily in the exact activities which kill pricing power in commodity markets (i.e. expansion of capacity with the belief that the current pricing power will endure for an extended period of time). Transportation may not be a pure commodity marketplace, and we appreciate that there are segments where customers are more motivated by the speed and reliability of the service than the price, but overall, transportation is a commodity-like industry. Significant increases in price are used to attract new workers (drivers, pilots, etc.), buy newer, more efficient equipment (with larger capacity when available), and purchase ever more sophisticated technology to increase asset utilization. Pricing power will continue until capacity is expanded enough to meet demand. As capacity eventually grows faster than demand, because participants in commodity markets (especially if the participants are highly fragmented) always overshoot, pricing will fall. Pricing continues to fall until it is below the cost of adding incremental capacity, at which point the incentive to add any incremental capacity is gone, and pricing stabilizes as long as demand holds steady. If pricing continues to fall dramatically - because too much capacity was created or because demand has contracted - capacity will be destroyed or at least idled until pricing stabilizes. This process may create significant oscillations in pricing above and below the marginal cost of creating capacity in the short term, but those increases and decreases in pricing will be around the marginal cost of production.

About the Cass Freight Index

The Cass Freight Index represents monthly levels of shipment activity, in terms of volume of shipments and expenditures for freight shipments. Cass Information Systems processes more than \$28 billion in annual freight payables on behalf of its clients. The Cass Freight Index is based upon the domestic freight shipments of hundreds of Cass clients representing a broad spectrum of industries. The index uses January 1990 as its base month.

Visit <http://www.cassinfo.com/frtindex.html> or call 314-506-5500 to get detailed information about the Cass Freight Index, including historical data.

About the Author: Donald Broughton

Founder and Managing Partner of Broughton Capital, a deep-data driven quantamental economic and equity research firm.

Prior to starting Broughton Capital, Mr. Broughton spent nine years as the Chief Market Strategist and Senior Transportation Analyst for Avondale Partners. Before that, Mr. Broughton spent over twelve years at A.G. Edwards. At A.G. Edwards, in addition to being the Senior Transportation Analyst, he was the Group Leader of the Industrial Analysts and served on the firm's Investment Strategy Committee. Prior to going to Wall Street, Mr. Broughton spent eight years in various distribution and operations management roles in the beverage industry, including serving as the Corporate Manager of Distribution for Dr. Pepper/Seven-Up companies and Chief Operating Officer for Bevmark Concepts.

Many in the transportation industry know him for his quarterly tracking of trucking bankruptcies. He is also known for his development of a 'Value to Density Spectrum' study of the tangible goods flow and its economic ramifications.

Broughton's equity research has earned acclaim and is regularly quoted by The Wall Street Journal, Bloomberg, Fortune, Forbes, and numerous other national media outlets. He is a frequent guest on CNBC, Nightly Business Report, CNN, Fox, NPR and other broadcast media.

His stock-picking performance has been repeatedly recognized by The Wall Street Journal, which has ranked him in its "Best on the Street" survey for his picks in both the cargo and railroad industry groups. Forbes has highlighted his performance in its "When Picky Analysts Pick" series. He has been ranked by Zacks Investment Research and Starmine as a 5-Star Analyst (their highest ranking) based on the historical performance of his recommendations.

Beginning in mid-2006, Broughton published reports warning of an impending economic slowdown and by early 2007 published reports explaining why a recession was coming. In early 2009, as the world became convinced that the 'sky was falling' he upgraded large cap industrials and names such as FedEx and Union Pacific. More recently, in July of 2010 and again in September 2011 his "Blue Car Report" explained why fears of a double dip were severely overblown and outlined why the market would have significant rallies by the end of those years. In the fall of 2015, he began predicting that the decline in the price of oil would lead to a contraction in the U.S. industrial economy, and in the third quarter of 2016 predicted that the U.S. industrial and consumer economy were about to be dramatically better.

Broughton is currently expressing growing concern about the deceleration in the European and Asian freight flows, and sees a growing risk of recession in many of the European and Asian countries. He believes the U.S. economy may be entering a period of contraction, and believes that it is imperative that agreements are reached with our major trading partners as quickly as is prudently possible.

That said, he believes that the potential for growth in the U.S. economy in coming years, especially the industrial economy and the tech economy, is dramatically underestimated. He predicts the U.S. tech economy will continue to expand and dominate the global tech economy; and the U.S. tech economy is already beginning to drive a renaissance of productivity and precision in the U.S. industrial economy that will ultimately restore it to global dominance.

Other indexes published by Cass and Donald Broughton:

Cass Truckload Linehaul Index® - measures fluctuations in U.S. truckload linehaul rates

Cass Intermodal Price Index® - measures fluctuations in U.S. domestic intermodal costs

Visit <http://bit.ly/s9iniq> to view or subscribe.

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