MORNING BRIEFING
August 23, 2018

Trucks & Batteries

See the collection of the individual charts linked below.

(1) Charles Dow is bullish. (2) Railroads are chugging along. (3) Truck freight index is off the charts again. (4) The next new new thing might be good old batteries. (5) The race to make more and better batteries is charged up. (6) The Tesla connection. (7) Solid-state batteries.

Transportation: Flying Higher. Investors who are getting jittery about the S&P 500's record levels on Tuesday can take some solace in the strong performance of the Dow Jones Transportation Average (DJTA), which also hit a new high on Tuesday. When the companies that are moving stuff are doing well, it's often a confirming signal of health for the broader economy. Now if the Dow Jones Industrial Average (DJIA) would just rise another 3.1% and take out the 26616.71 high it hit on January 26, even the spirit of Charles Dow would rejoice (*Fig. 1*).

Over the past year through Tuesday's close, the DJTA has risen 24.3%, outperforming both the DJIA, up 17.9%, and the S&P 500, up 16.7%. Much of the credit goes to the railroads, which have had stellar results. Railcar loadings excluding coal are at record highs (*Fig. 2*). And the shares of CSX, Norfolk Southern, and Union Pacific have each appreciated more than 40% over the past year.

The volume of goods being moved around by trucks is also off the charts, thanks to the strong economy and the continued move toward Internet shopping (*Fig. 3*). This multi-year surge in activity has led to capacity constraints in rails and trucking, which have boosted cargo rates in land-based shipping. The PPI for truck transportation of freight is up 8.2% y/y through July (*Fig. 4*).

"Freight rates have been climbing in recent months, making it harder and more costly for shippers to book transportation at a time of year when demand is typically lighter. U.S. trucking and rail-freight spending rose 17.3% in May compared with the same month in 2017, according to the Cass Information Systems Inc.," a 6/17 *WSJ* article reported. Companies have complained about the jump in shipping rates in their conference calls, and they're looking for ways to ameliorate the situation.

Conversely, there's still overcapacity in the market for shipping products via sea. Excess shipping capacity has pushed down freight rates, encouraged mergers, and caused ship owners to scrap vessels. A global trade war would only add to the shipping industry's list of woes. Economically, however, all looks well, as the activity at US West Coast ports remains at all-time highs (*Fig. 5*).

In a nod to Charles Dow, let's take a look at some of the fundamentals in the largest transportation industries:

(1) *Riding the rails*. The S&P 500 Railroad industry is expected to increase revenue by 6.9% this year and 4.4% in 2019. Strong revenue growth plus corporate tax-rate cuts are expected to result in 38.9% earnings growth this year and 12.2% earnings growth in 2019 (*Fig. 6* and *Fig. 7*). The Railroad industry's forward P/E, at 17.9 as of August 16, is at the high end of the range in which it has traded

since 1995 (*Fig. 8*).

(2) *Trucking along*. The S&P 500 Trucking industry stock price index has gained 27.3% y/y, a move that appears to be supported by fundamentals (*Fig. 9*). Revenue in the S&P 500 Trucking industry is expected to jump 19.5% this year and 10.6% in 2019 (*Fig. 10*). Earnings are expected to soar 51.3% this year and 18.0% next year (*Fig. 11*). Here too, the industry's forward P/E appears to be stretched at 20.0 (*Fig. 12*).

(3) *Recovering from turbulence*. Airline industry stocks haven't fared quite as well, tethered by investor concern about added capacity and high oil prices. But they have rallied in recent weeks as the price of oil has backed off, leaving the S&P 500 Airline industry stock price index up 11.3% y/y (*Fig. 13*).

Analysts are forecasting good, but more subdued, results out of the S&P 500 Airline industry, with revenue expected to increase 6.4% this year and 5.2% in 2019 (*Fig. 14*). The industry's earnings are forecast to grow 7.4% in 2018 and 21.4% next year (*Fig. 15*). Airlines have among the more reasonable forward P/Es among the transport industries, at 9.5 (*Fig. 16*).

Technology: Building Better Batteries. Speculation surrounding Tesla and Elon Musk has filled newspaper headlines for days. Will the company go private or will it stay public? Did Musk's tweets break SEC rules? Will he give up his tweeting habit? Unfortunately, this is all a distraction for what's arguably one of the country's most important companies.

Tesla's ability to produce industry-leading batteries for both automobiles and electricity storage is important if the US hopes to maintain its auto industry market share. China and a number of other countries are aggressively pushing consumers toward the use of electric vehicles (EVs) and away from the gas-powered cars. And the companies or countries that develop the best batteries are going to win the race.

"China is developing its own plan to eventually ban sales of new combustion-engine vehicles; it's already established ambitious quotas for the production of electric vehicles and hybrids. BNEF forecasts that these and other policies will push electric-vehicle sales in China to 2.5 million in 2020, up from nearly 800,000 last year, quadrupling battery demand," according to a 6/13 article in *MIT Review*.

Other countries already have taken that major step. Norway will ban the sale of new gas- and diesel-powered cars by 2025, India by 2030, Scotland by 2032, and France and the UK by 2040. Last year, roughly a third of Norway's cars were either electric or plug-in models, followed by Hong Kong's just over 20%.

US electric vehicle sales last year were well below 5% of new car sales, or almost 200,000 cars. That said, EV sales are growing fast, up 25% y/y last year, when overall auto sales were down, according to a 1/4 article in *ARS Technica*.

The key to dominating the electronic vehicle market is coming up with the most powerful, safest, least expensive battery. Let's take a look at some of the recent advancements in the battery industry:

(1) *Battery 101*. A battery has an anode, or a negative electrode, made out of graphite, which stores lithium ions when a battery is charged. As the ions move to the cathode, the battery's energy gets used. In between the anode and cathode is an electrolyte solution.

To increase the power of lithium-ion batteries, scientists have experimented with the materials used. "Most of the improvements in battery life so far have been made by manufacturers creating cathodes out of some combination of nickel, manganese, and cobalt. The crystal structures of these metals, when combined together, store lithium ions more efficiently. They also make the ions' movement through the cathode to the anode easier than other materials. All the while, however, anodes have basically all been made with the same material: graphite, a form of carbon," explains an 8/16 article in *Quartz*.

(2) *Enter silicon*. Sila Nanotechnologies is a private company with a CEO, Gene Berdichevsky, who hails from Tesla. Sila aims to use silicon as an anode material because "it can bond with 25 times more lithium ions than graphite," a 4/11 article in *MIT Technology Review* explained.

Silicon hasn't been used in the past because the lithium ions make it swell and "crumble during charging." But Sila believes it has come up with a rigid silicon that overcomes that problem. Sila believes its battery can improve upon the energy density of current batteries by 20% and will ultimately produce a 40% improvement.

Sila expects to see its battery materials in consumer products next year and to be in some of BMW's electric cars by 2023. Companies including Enovix and Enevate are also developing batteries that use silicon in anodes.

(2) *The Holy Grail.* Another way to increase the power of the battery is to replace the liquid electrolyte inside a battery with solids. Henrik Fisker, founder of an electric car startup that went bankrupt, claims to have created a solid-state battery.

Fisker says his battery uses thin-film technology used in making solar cells inside of each solid-state battery, according to an 8/19 article in *CleanTechnica*. As a result, the battery has 27 times more surface area than conventional cells, twice as much energy density as a conventional battery, and is much longer lasting. He has put this battery in his new car, the Fisker Emotion, which he claims can recharge in just nine minutes.

Another company, Ionic Materials, has created a polymer to replace the electrolyte, according to a 5/29 article in *IEEE Spectrum*. The polymer can conduct lithium ions at room temperature, and the material is low cost, flexible, and durable. It's hoped that the new material will make batteries less prone to fires and more powerful. It's also hoped that it will enable batteries to be made of materials besides cobalt.

The US government is pushing scientists to develop batteries that use little or no cobalt, which is an increasingly expensive metal mostly found in the Democratic Republic of the Congo, where activists say workers often "toil in inhumane conditions," an 8/19 article in *Axios* explains.

The Department of Energy is funding three-year research efforts to reduce the use of cobalt in batteries at Argonne National Laboratory and Lawrence Berkeley National Laboratory. Argonne scientists are attempting to swap cobalt with nickel or manganese, and at Berkeley scientists are experimenting with using disordered rock salt.

(3) *Chinese look to grow.* According to many accounts, China aims to be the Detroit of the electric vehicle industry. China's financial incentives to buyers of electric vehicles in 2016 and 2017 may have totaled 83 billion yuan, according to a 2/1 article in Bloomberg Businessweek. But there's a catch: "Carmakers seeking to qualify (for subsidies) choose domestic battery suppliers because of concerns that models built with foreign brands will be ineligible, even thought there isn't a written rule banning non-Chinese suppliers," the article states.

Earlier this year, China announced plans to refocus its subsidies. It raised the minimum distance that a car must run on a single charge in order to qualify for a subsidy to 150 kilometers, up from 100 kilometers. Those cars that can run for more than 400 km saw their subsidies increased. BYD Co. warned investors to expect a drop in Q1 profit, which it attributed to the reduction in subsidies.

The country long has said that its subsidies will decrease each year until they end in 2020. China will introduce a quota program next year that "will mandate that all automakers will have to ensure that a certain percentage of their output is composed of new-energy vehicles," a 7/12 Caixin article reported.

China also has been ensuring that it has access to the materials needed to make batteries. The above Bloomberg Businessweek article continued: "China is securing supplies of key materials such as lithium, nickel and rare earths, and its mining companies are estimated to be responsible for 62 percent of the global supply of cobalt, the Cleveland-based Institute for Energy Economics and Financial Analysis said in a January report."

Amid this supportive government backdrop, Chinese companies are rapidly expanding battery production. Chinese company Contemporary Amperex Technology (CATL) did an $850.6 million IPO in June that soared 44% on its debut, making it one of the highest-valued companies on the ChiNex stock exchange. CATL was expected to use the proceeds to help fund its 24 gigawatt-hour capacity increase, bringing the company's total capacity to 88 gigawatt hours by 2020.

That will make it larger than Tesla's US Gigafactory, which has capacity for 35 GWh. However, Tesla is also planning to build a plant in China. Chinese company BYD, in which Berkshire Hathaway is an investor, is also planning to build a battery factory next year, with annual capacity of 24 gigawatt-hours by 2019. That would bring the company's total battery-making capacity to 48 GWh in 2019 and 60 GWh in 2020.

"Lithium battery production in China rose 31 percent last year to hit 1.18 billion units. However, experts have warned of the risks of overcapacity, with 102 firms now producing as many as 335 types of electric, hybrid and fuel cell vehicles throughout the country," a 6/10 Reuters article reported.

CALENDARS

US. Thurs: Jobless Claims 215k, C-PMI, M-PMI, & NM-PMI Flash Estimates 55.6/55.1/56.0, New Home Sales 649k, FHFA Price Index 0.4%, Kansas City Manufacturing Index 23, EIA Natural Gas Report, Jackson Hole Annual Economic Symposium. **Fri:** Durable Goods Orders Total, Ex Transportation, and Core Capital Goods -0.8%/0.5%/0.5%, Baker-Hughes Rig Count, Jackson Hole Annual Economic Symposium, Jerome Powell Delivers His First Jackson Hole Speech As Fed chairman. (Econoday estimates)

Global. Thurs: Eurozone Consumer Confidence -0.7, Eurozone, Germany, and France C-PMI Flash Estimates 54.4/55.1/54.6, Eurozone Germany, and France M-PMI Flash Estimates 55.2/56.5/53.4, Eurozone, Germany, and France NM-PMI Flash Estimates 54,4/54.3/55.1, Japan M-PMI Flash Estimate, Japan CPI Total, Core, and Core-Core 1.0%/0.9%/0.3% y/y, ECB Account July 26 Monetary Policy Meeting. **Fri:** Germany GDP, Mexico GDP -0.1%q/q/2.8%y/y. (DailyFX estimates)

STRATEGY INDICATORS

Stock Market Sentiment Indicators (*link*): Our Bull/Bear Ratio (BBR) climbed for the second week this week to 3.15; it rose above 3.00 last week for the first time in nine weeks. Both bullish sentiment and the correction count moved up for the second week, after showing little movement the previous three weeks. Bullish sentiment climbed 2.8ppts (to 57.7% from 54.9%) over the two-week period, while the correction count fell -2.5ppts (24.0 from 26.5); it was the highest reading for the former and the lowest reading for the latter since the final week of January. Seven weeks ago, bullish sentiment was at 47.1%, while the correction count was at 34.3%. Meanwhile, bearish sentiment was little changed at 18.3% this week from 18.4% last week; it has fluctuated in a narrow band between 17.6% and 18.8% the past 12 weeks. The AAII Ratio advanced for the second week last week to 55.4%, after falling the prior three weeks from 59.6% to 47.6%. Bearish sentiment fell from 32.1% to 29.1% over the two-week period, while bullish sentiment dipped to 36.2% last week after rising the prior week from 29.1% to 36.2%.

YRI Weekly Leading Index (*link*): Our Weekly Leading Index (WLI)—a good coincident indicator that can confirm or raise doubts about stock market swings—is just shy of a new record high. Our WLI, which is the average of our Boom-Bust Barometer (BBB) and Bloomberg's Weekly Consumer Comfort Index (WCCI), climbed 1.9% during the six weeks ending August 11, just 0.5% below early May's record high. Our BBB has slumped -1.0% during the two weeks ending August 11 after rebounding 2.4% the prior four weeks; it's 3.8% below its record high. Jobless claims—one of the components of our BBB—rose for the first time in six weeks, to 215,500 (4-wa), after falling the previous five weeks from 224,750 to 214,500; it's not far from its recent low of 213,500 13 weeks ago, which was the lowest reading since December 13, 1969. Meanwhile, the CRB raw industrial spot price index, another BBB component, continued to fall, though has moved up in recent sessions. The WCCI increased for the ninth time in ten weeks, by a total of 13.3%, to a new cyclical high.

AC World ex-US MSCI (*link*): This index is down 6.2% ytd in dollar terms after rising 24.1% in 2017 and 1.7% in 2016. In local-currency terms, the index is down 2.9% ytd compared to gains of 15.3% and 4.1% for all of 2017 and 2016, respectively. The index's US-dollar price index is down 12.3% since its cyclical high on January 26 and has been in a correction since mid-June, but its local-currency price index is down only 6.9% from its record high on January 26 after being down as much as 9.5% on March 26. Local-currency forward revenues rose 0.7% m/m and has risen 14.1% from a five-year low in March 2016 to record highs since May for the first time since October 2014. Local-currency forward earnings also rose 0.7% m/m, but has performed better since its six-year low in March 2016—rising 33.7% to its first record highs since September 2008 beginning four months ago in April. Revenues are expected to rise 6.5% in 2018 and 4.7% in 2019 following an 8.7% gain in 2017, and earnings are expected to rise 9.7% (2018) and 9.1% (2019) after surging 21.9% (2017). Analysts are forecasting STRG of 5.5%, up from 5.4% a month ago. Their STRG forecast compares to a seven-year high of 6.8% in March 2017 and is up from a cyclical low of 2.3% in March 2016. Their STEG forecast of 9.3% is down from 9.4% a month earlier and compares to a four-year-high forecast of 14.1% in March 2017 and a seven-year low forecast of 6.3% in January 2016. The implied profit margin is expected to rise to 8.1% in 2018 and 8.4% in 2019 from 7.8% in 2017. The forward profit margin forecast of 8.3% is at a nine-year high now. NERI was negative in August for a fifth straight month following six positive readings, but was steady m/m at -1.5%, up from a 20-month low of -2.3% in June. That compares to a 76-month high of 2.7% in May 2017 and a 51-month low of -11.3% in March 2016. The forward P/E of 12.8 is at a 29-month low. That compares to a recent 31-month high of 14.8 in January, a six-year high of 15.3 in April 2015, and a cyclical bottom of 12.3 in January 2016. The index's current 13% discount to the World P/E matches its record-low discount of March 2017.

EMU MSCI (*link*): The EMU's MSCI price index has dropped 5.4% ytd in dollar terms after rising 25.3% in 2017 and falling 1.2% in 2016. In euro terms, the price index is down just 1.4% ytd following gains of 10.2% in 2017 and 1.8% in 2016. The index's US-dollar price index is down 12.3% since its cyclical high on January 25 and has been in a correction since late May, but its local-currency price index is down only 6.1% from its record high on January 26 after being down as much as 9.5% on March 26. Euro-based forward revenues rose 0.5% m/m to its highest level since October 2013 and 5.2% above its six-year low in May 2016, but remains 6.0% below its record high (September 2008). Euro-based forward earnings had stalled from 2011 to 2016, but rose 0.8% m/m to its highest level since November 2008. Although it has improved 23.5% from its 23-month low in June 2016, it remains 16.7% below its record high in January 2008. Analysts expect revenues to rise 3.3% in 2018 and 3.8% in 2019 after a 5.0% gain in 2017, and think earnings will rise 6.8% (2018) and 9.9% (2019) following a 13.6% increase in 2017. Forecasted STRG of 3.7% is up m/m from 3.5%, which compares to a six-year high of 5.0% in April 2017 and a cyclical low of 2.0% in May 2016. Forecasted STEG of 9.0% is up m/m from 8.7%, which compares to a 78-month high forecast of 21.0% during February 2017 and a seven-year low of 5.7% in April 2016. STEG had been higher than LTEG (currently 10.6%) from July 2016 to May 2017, but is trailing now. The forward profit margin edged up m/m to a nine-year high of 7.9% from 7.8%, which is up from a cyclical bottom of 6.2% in May 2013. The implied profit margin is expected to improve to 7.6% in 2018 and 8.0% in 2019 from 7.3% in 2017. NERI was positive in August for a second month following 11 straight negative readings through June, and improved to a 13-month high of 1.1% from 0.1%. However, that NERI reading is down from an 11-year high of 8.1% in May 2017 and compares to a 24-month low of -13.2% in April 2016. The P/E of 13.2 is at a 13-month low, down from a nine-month high of 14.9 in January. That compares to a 13-year high of 16.4 in April 2015 and a 30-month low of 12.2 in February 2016. The current valuation represents a 10% discount to the World MSCI's P/E now, up from an 11% discount in March and a record-low 25% discount during 2011. But the current reading is still well below the 1% premium during April 2015—the post-euro-inception record high.

Emerging Markets MSCI (*link*): The EM MSCI price index is down 9.9% ytd in US dollar terms after surging 34.3% in 2017 and rising 8.6% in 2016. In local-currency terms, EM has slipped 5.0% ytd compared to gains of 27.8% (2017) and 7.1% (2016). The index's US-dollar price index is down 17.9% since its cyclical high on January 25 and has been in a correction since early February. On August 16, the US-dollar price index had been down as much as 19.8% from its cyclical high, nearly falling into a bear market. Its local-currency price index has been in a correction since June 19, and is now down 12.1% from its record high on January 26 after being down as much as 13.9% on August 16. Local-currency forward revenues rose 0.3% m/m and is up 18.0% from a four-year low in June 2016, but down 1.3% from its record high in June, which was its first since November 2014. Local-currency forward earnings was unchanged m/m, but has fared substantially better with a 39.1% gain from its six-year low in April 2016. However, it has dropped 0.8% from its record high in June, which was its first since January 2014. Revenues are expected to rise 10.3% in 2018 and 7.7% in 2019, down from a 12.1% gain in 2017. That's expected to lead to an earnings gain of 15.1% in 2018 and 11.5% in 2019, which follows a 22.0% surge in 2017. Forecasted STRG was steady at 8.7% in August, but that's down from a four-year high of 9.6% in January 2017. STEG tumbled to a 20-month low of 12.7% in August from 13.4% in July, and is down from a cyclical peak of 17.5% in March 2017 and below LTEG (17.9%) again. The implied profit margin is expected to improve to 7.1% in 2018 and 7.3% in 2019 from 6.8% in 2017. The forward profit margin remained steady m/m at 7.2%, but is down from a six-year high of 7.4% in May. It remains 3.1ppts below its 10.3% record high in December 2007 and compares to a record low of 6.0% in February 2016. NERI was negative for a sixth month in August, but edged up to -3.6% from -3.7% and is up from a 24-month low of -3.8% in June. NERI had been positive for only three months through January after 80 months of negative readings through October, and compares to an 83-month low of -10.2% in March 2016. Emerging Markets' forward P/E was down to a 30-month low of 11.1 in August from 11.3 in July and an eight-year high of 13.1 in January. The index is trading at a 24% discount to the World MSCI P/E, its lowest reading in eight months, and compares to a 10-year-low 30% discount in August 2016.

MSCI World & Region Net Earnings Revisions (*link*): Analysts' recent earnings revisions through August now point toward improving optimism about profits across Europe, but the emerging market regions remain weak. Powered by the US, in the lead among regions, the AC World MSCI's NERI was positive for a 19th month in August, but fell to an 11-month low of 1.1% from 1.3% in July. That's down from a 93-month high of 7.1% in February. The US was positive for a 16th straight month as its NERI fell to an eight-month low of 7.6% from 8.2% in July, and is down from a corporate-tax-rate-cut-boosted record high of 21.8% in March. NERI for the various European indexes was mostly positive in August, for a second month following 11 straight negative readings, but EM regions outside Europe remained in negative territory for a seventh straight month. August's scores among the regional MSCIs: US (7.6% in August, down from 8.2% in July), Europe ex-UK (1.4 [13-month high], 0.7), EMU (1.1 [13-month high], 0.1), AC World (1.1, 1.3), Europe (1.0 [13-month high], 0.6), EAFE (0.6, 0.2), AC World ex-US (-1.5, -1.5), EM Eastern Europe (-1.6 [28-month low], 0.5), EM Latin America (-2.2, -2.5 [nine-month low]), Emerging Markets (-3.6, -3.7), and EM Asia (-3.7, -4.0).

MSCI Countries Net Earnings Revisions (*link*): NERI was positive for 17/44 MSCI countries in August, up from 16 in July, which was the lowest count since October 2017. NERI improved m/m in August for 21/44 countries, down from 30/44 countries improving in July, which was the highest count since May 2017. Among the countries with improving NERI in August, Israel was at a 161-month high, followed by Portugal (36-month high), the UK (15), France (14), the Netherlands (14), Mexico (14), and these four countries at 13-month highs: Finland, Ireland, Denmark, and Germany. On the flip side, Argentina's was at a 33-month low, followed by those of Poland (28-month low), China (24), Malaysia (23), Hong Kong (21), Singapore (22), and Turkey (20). The 22-month positive NERI streak for Hong Kong is now the best among countries, followed by the positive streaks of the Czech Republic (15-months), Canada (11), and Russia (11). South Africa's NERI has been negative for 51 straight months, followed by the negative streaks of New Zealand (27-months), Mexico (22), Pakistan (21), Denmark (13), and Germany (13). NERI turned positive in August for five countries: Israel (first positive reading in 17 months), Ireland (13), the Netherlands (13), Japan (4), and Chile (2). Four countries slipped back into negative territory this month; among them, Turkey was negative for the first time in 22 months, followed by Switzerland (first time in 12 months), Spain (4), and Australia (3). The highest NERI readings in August: Israel (13.9%), Austria (10.5), Sweden (7.8), the United States (7.6), Portugal (7.5), Finland (7.0), and the Czech Republic (6.4). The weakest NERIs occurred this month in Pakistan (-11.7), Malaysia (23-month low of -11.4), Argentina (33-month low of -9.3), Indonesia (-8.0), and Singapore (22-month low of -7.9).

US ECONOMIC INDICATORS

Existing Home Sales (*link*): Existing home sales retreated for the fourth month in July to their slowest pace in over two years, with affordability a big issue. Existing home sales—tabulated when a purchase contract closes—fell -0.7% last month, and -4.6% the past four months, to 5.34mu (saar). On an annual basis, this result represented the fifth straight month of decline, down -1.5% y/y. According to NAR's chief economist, Lawrence Yun, "Too many would-be buyers are either being priced out, or are deciding to postpone their search until more homes in their price range come onto the market." The median existing-home price for all housing types in July was $269,600, up 4.5% from July 2017 ($258,100). July's price increase marks the 77th straight month of y/y gains. Regionally, sales fell m/m everywhere but the West last month, while on a y/y basis, sales fell in all four regions: West (-4.0% y/y), Northeast (-1.5), Midwest (-0.8), and the South (-0.4). Single-family sales contracted -4.8% during the four months ending July to 4.75mu (saar), while multi-family sales sank -4.8% to a five-month low of 590,000 (saar) after no change in June and a 1.6% gain in May. The number of existing single-family homes on the market at the end of July was little changed at 1.71mu; it had climbed the prior six months from 1.29mu to 1.72mu. According to Yun, "Listings continue to go under contract in under month, which highlights the feedback from Realtors® that buyers are swiftly snatching up moderately-priced properties. … Existing supply is still not at a healthy level, and new home construction is not keeping up to meet demand."

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