Ship to Shore: Mapping the Global Supply Chain with Panjiva Shipping Data in Xpressfeed

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While financial data tells us "*how* a company *has done,*" shipping data provides a closer-to-real time indicator of "*what* a company *is doing.*" The chart below shows shipping (import) trends leading earnings call sentiment trends for auto parts maker LCI Industries. Since shipments began to trend up, LCI has reported three consecutive quarters of positive earnings surprises.

LCI Industries: Industry-Relative Import Growth vs. Earnings Call Sentiment, 2017-2019
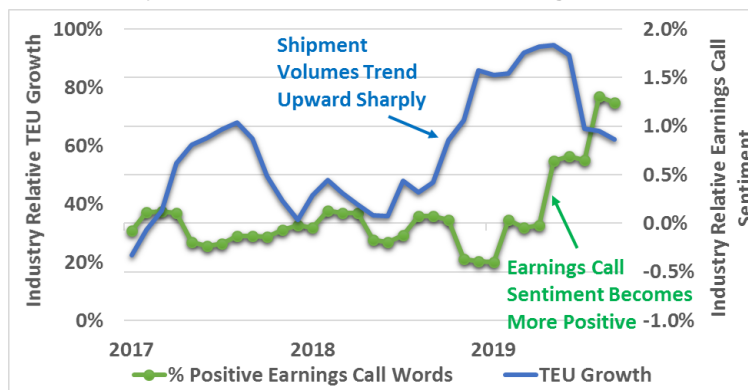
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

World merchandise trade accounted for an estimated $19.7 trillion in 2018[1], about 90% of which is by sea. Panjiva's shipping data comprises 1.6+ billion records across 16 country-level datasets and allows investors to track trends, identify anomalies, and assess risks for companies engaged in international trade. Panjiva has developed processes to parse, clean, and impute missing values within this "ocean of data." This paper illustrates how to find investment insights in Panjiva's US seaborne and Mexican datasets using the US auto parts industry as a case study. It also provides SQL queries needed to recreate the use cases covered. Findings include:

- **Shipment trends often lead fundamentals: Growth in shipments (imports) amid flat or declining fundamentals, and vice versa, signals potential financial trend reversal.** For example, industry-adjusted shipment trends for LCI Industries began to move sharply upward in July 2018, well before operating cash flow growth turned positive in May 2019 (Figure 4).

- **Growth in the number of suppliers and types of products imported can also signal strengthening demand and/or product line diversification.** For example, Borg Warner saw strong increases in the number of suppliers and products imported, despite flat shipment trends, and has reported a string of positive earnings surprises (Figure 2).

- **Industry-level shipping trends can act as leading indicators** of changes in industry fundamentals or as confirmations that existing trends are still in place (Figure 9).

- **Tracking *industry-level* product line trends can identify companies with significant exposures** to positive or negative product trends (Figure 11), and hence pinpoint companies with potential promise or risk.

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[1] *World Trade Statistical Review 2019*, World Trade Organization (www.wto.org).

Introduction

Investment management use cases for shipping data include trend confirmation (shipments vs. fundamentals, estimates, etc.); trend divergence (supply chain trends not yet reflected in financials); anomaly detection; risk assessment; and commodity and country-level demand forecasting.

Panjiva (in Xpressfeed) in a Box	
Countries currently providing data	14
Countries with shipments	230
Total records	1.6 billion
Shippers	563,000
Consignees	480,000
Ultimate parents	511,000
Publicly traded parents	29,000

Data as of 10/15/2019.

Shipping data exists because of two ubiquitous dynamics: global trade and taxes. [2] Governments worldwide require customs declarations (bills of lading) for all cross-border trade. Panjiva ingests over 200 million such records annually, representing over 40% of global trade.[3] Panjiva collects data from 14 active countries,[4] including the US, India, Mexico, Brazil, and several other Latin American countries. US import data begins in 2007. (See Appendix A for descriptions of all datasets and histories.) Panjiva uses natural language processing to resolve all similar names for a business (often thousands) into one country-level entity. The data gathered is primarily *seaborne*, but some countries in the Panjiva dataset (e.g., Mexico, India) track all modes of transportation.

Supply chain data captures business-to-business transactions, often well before results appear in financial statements. However, using trade data effectively requires domain knowledge: shipping data is rich in particular industries and sparse in others (Appendix A). Also, a certain percentage of US companies redact identifying information, called "manifest confidentiality."

Measuring economic impact may also present challenges. Most countries report tariff values, but the US and Brazil do not. A simple count of shipments can provide a good starting point for analysis. For container shipments, Panjiva imputes twenty-foot equivalent units (TEUs), based on container size, goods shipped, weight, etc. Most trade records provide weight, which Panjiva corrects for a variety of errors (e.g., misplaced decimals, wrong units) and standardizes to metric equivalents. Weight is often the best option for measuring commodity shipments and for products like autos, which are typically not containerized.

Trade data is messy and unstructured, and is often free-text in nature. In the US, product codes are removed by Customs. Panjiva imputes these codes from text descriptions. These Harmonized Commodity Description and Coding System (or HS) codes, specified by the World Customs Organization, are standardized at six digits and used globally. Used in 2-digit (product), 4-digit (classification), or 6-digit (detail) form, HS codes allow for standard comparisons of shipments across the world.

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[2] Until 1913, the US government had no income tax, relying entirely on customs duties for revenue.
[3] The assumptions in this analysis are calculated using proprietary algorithms in addition to 2016 Global Merchandise Trade by Value data reported to UN Comtrade, the International Trade Statistics database, by the participating governments. Using a factor between 1 and 0.46, we have made these assumptions as of August 28, 2018, to calculate the global merchandise traded by dollar value coverage. Based on availability of the underlying data, these assumptions are subject to change.
[4] Panjiva also provides historical data for two countries: China and Bolivia.

1. Company-Level Analysis

Shipping data informs company-level investment analysis in three complementary ways:

- Shipment vs. fundamental trend analysis, to identify cases where shipment trends may be leading indicators of a change in fundamentals.

- Supply chain/product code analysis, to highlight cases where supply chain changes may indicate operational expansion or contraction.

- Coverage analysis, to determine whether a relationship between shipments and company financials is likely.

This section will cover shipment vs. fundamental trend analysis (section 1.1), changes in the number of suppliers/product codes (1.2), and industry-adjusted trend analysis (1.3). It ends with two company case studies: LCI Industries and Cooper Standard (1.4-1.5), and a brief discussion of coverage analysis (1.6).

1.1 Shipment vs. Fundamental Trend Analysis

> *Positive import trends amid flat or declining fundamentals – and vice versa – signal potential financial trend reversal. Lower latency and higher frequency of observation means that shipping data often precedes financial data.*

Companies with rapidly-rising shipment growth but lagging financials, may see future financial results trend up. Figure 1 shows that **LCI Industries** (LCII) has seen 67% growth in 12-month average twenty-foot equivalent units (TEUs, horizontal axis). At the same time, trailing 12-month net income is down 6% (vertical axis). This "trend divergence" indicates that shipments for LCII may be leading financials upward (we confirm this in Section 1.4). **Note:** The word "shipments" in this paper refers to *imports into the US* by the company under discussion.

Conversely, companies with declining shipments but flat or rising financials, may see future financial results trend down. Cooper-Standard Holdings (CPS) has seen shipment declines of 31% over the past 12 months. However, CPS' net income is flat for the past 12 months. This negative trend-divergence may portend deteriorating fundamentals for CPS (we confirm this in Section 1.5).

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 1 shows the year-to-year changes in 12-month average TEUs (horizontal axis) versus the year-to-year changes in trailing 12-month net income[5] (vertical axis). Bubble size equals the sum of 12-month TEUs. Company names colored in **blue** and **red** are discussed in the text.

[5] Income before extraordinary items.

Figure 1. US Auto Parts Makers Year-to-Year Growth in TEUs (Imports) vs. Year-to-Year Growth in Net Income, Bubble Size Equals the 12-Month Sum of TEUs[6]
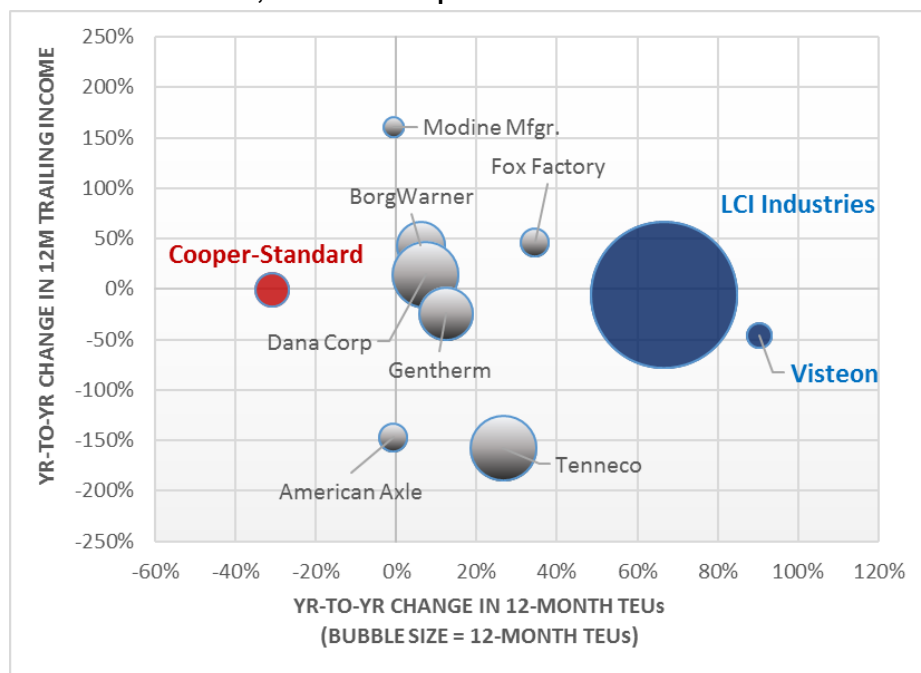
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Figure 1 also shows that **Visteon Corp.** has strong positive shipment trends (+90%) amid negative income growth – a trend divergence even more pronounced than that of LCI Industries. On October 24th, 2019, Visteon shares rose 12% as the company reported a positive earnings surprise and raised full-year guidance slightly.

1.2 Health & Vitality of the Supply Chain

> *Investors should also look for growth (decline) in the number of a company's suppliers and in products imported, which can signal purchasing to meet increased (decreased) demand and/or product line diversification (contraction).*

Companies with strong growth in the number of suppliers and/or products imported are likely seeing rising end-market demand, which can translate into improved financial results. LCI Industries (LCII) saw a 29% increase in suppliers and an 18% increase in products imported based on HS codes (Figure 2), as of August 2019. LCII has posted positive earnings surprises for three of the past four quarters, and positive revenue surprises for two of the past four quarters. In their fiscal third quarter earnings call (Nov. 5, 2019) management noted "further [execution] on our diversification strategy . . . has driven continued outperformance."

Borg Warner (BWA) also stands out with a 59% increase in unique products imported (as determined by HS codes) and an 84% rise in suppliers (12-month average suppliers rose from

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[6] Note: A greater than 100% decline in net income signifiies a shift from a profit to a loss.

19 to 35). BWA reported positive EPS surprises for three of the past four quarters, including a 13% positive surprise in the quarter ended September 2019, and positive revenue surprises for all four most recent quarters. Although BWA did not significantly increase its shipment count (Figure 1), it does appear to be diversifying its product lines.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

> Figure 2 shows the year-to-year growth in 12-month average product codes imported (vertical axis) and in 12-month average number of suppliers (horizontal axis). Company names colored in **blue** and **red** are discussed in the text.

Figure 2. US Auto Part Maker, Year-to-Year Changes in 12-Month Average Number of Suppliers and HS (Product) Codes, US Imports and Mexican Exports to the US, Sep 2018 – Aug 2019
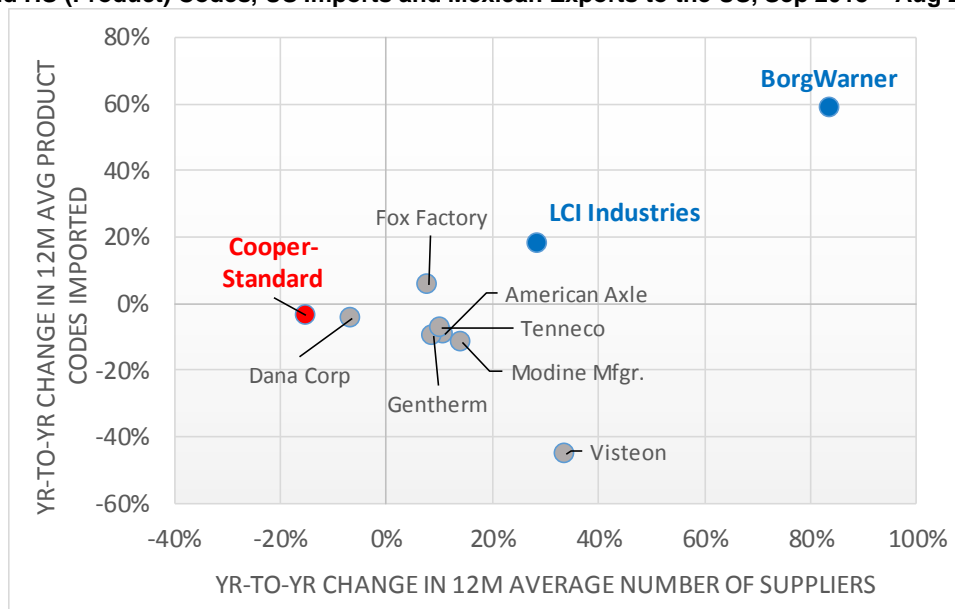
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Companies with significant declines in the number of suppliers and/or products imported may be experiencing slowing end-market demand. Cooper-Standard Holdings (CPS) saw a 15% year-to-year decrease in the number of suppliers and a 3% decrease in products imported. CPS has seen negative EPS surprises for three of the past four quarters, as well as negative revenue surprises. In a November 6, 2019 conference call, CPS management noted production declines due to weak end-market sales of light vehicles globally.

1.3 Industry-Adjusted Shipment vs. Fundamental Analysis

Comparison of industry-adjusted shipment and fundamental trends can highlight intra-industry opportunities or risks: shipment leaders with lagging fundamentals (potential opportunities) or shipment laggards with leading fundamentals (potential risks).
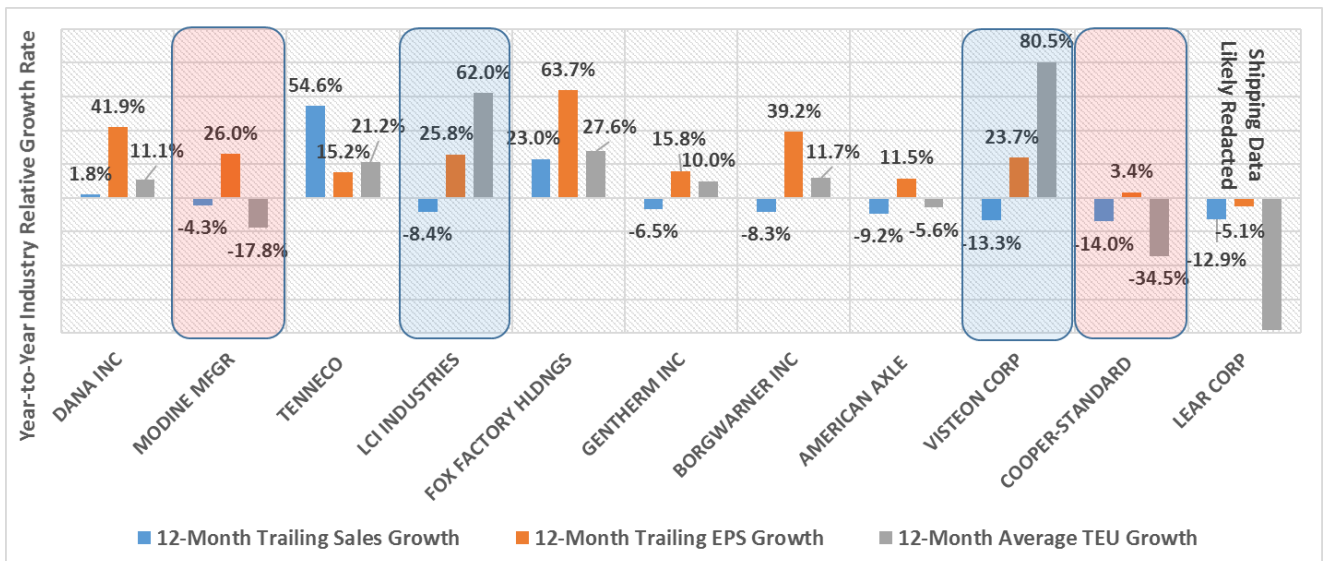
Positive industry-adjusted shipment trends amid negative industry-adjusted fundamentals signal a potential trend reversal for fundamentals versus peers. Visteon Corp. (VC) and **LCI Industries** (LCII) have the two strongest industry-relative TEU growth rates, of 81% and 62%, respectively (Figure 3). However, both companies have below-industry sales growth rates (-13% for VC and -8% for LCII). This indicates sales trends may be ripe for reversal. As noted above, both of these companies have reported recent positive earnings surprises.

Negative industry-adjusted shipment trends amid positive industry-adjusted fundamentals signal potential for a negative reversal in fundamentals versus peers. Modine Manufacturing (MOD) and **Cooper-Standard** (CPS) have positive fundamental trends, with EPS growth of 26% and 3.4% respectively, but negative industry-relative shipping growth (-18% for MOD and -35% for CPS). CPS has had a string of recent negative surprises. MOD has also seen negative EPS and revenue surprises over the past three quarters. On its most recent earnings call (Nov. 8, 2019) MOD's management cited an ongoing automotive segment slowdown which had spread to the commercial vehicle and off-highway segments during the quarter. MOD shares sold off sharply on the news.

Figure 3 shows industry-adjusted year-to-year growth in fundamentals (sales and EPS) and shipments (TEUs) for several US auto parts makers.

Blue shading shows cases where shipments are leading peers but concurrent fundamentals (sales) are lagging. **Red shading** shows cases where shipments are lagging peers but concurrent fundamentals (income) are leading. Highlighted companies are discussed in the text.

Figure 3. US Auto Parts Makers, Industry-Adjusted Trends in Sales, EPS, and TEU Growth, US Seaborne Imports and Mexican non-Seaborne Exports to the US, Year-to-Year Comparisons as of Sep 2019

Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

1.4 Case Study: LCI Industries

Positive industry-adjusted shipment trends foreshadowed positive cash flow trends for LCI Industries. They also preceded improvements in industry-relative earnings call transcript sentiment and stock price.

Figures 4 illustrates how shipment trends can lead reported financials. Industry-adjusted TEU growth for LCII **(green line)** begins to trend sharply upward in July 2018 and metric ton growth **(yellow line)** follows in October 2018. However, industry-adjusted cash flow growth **(blue bars)** does not turn sharply positive until May 2019.

As previously discussed, LCII has also seen growth in the number of its suppliers and the number of products imported (Figure 2) and is leading its industry in shipping volume growth (Figure 3). We'll also see below that LCI has the broadest "shipment coverage" in its industry (Figure 8), indicating the likelihood of a good relationship between shipping trends and financial results.
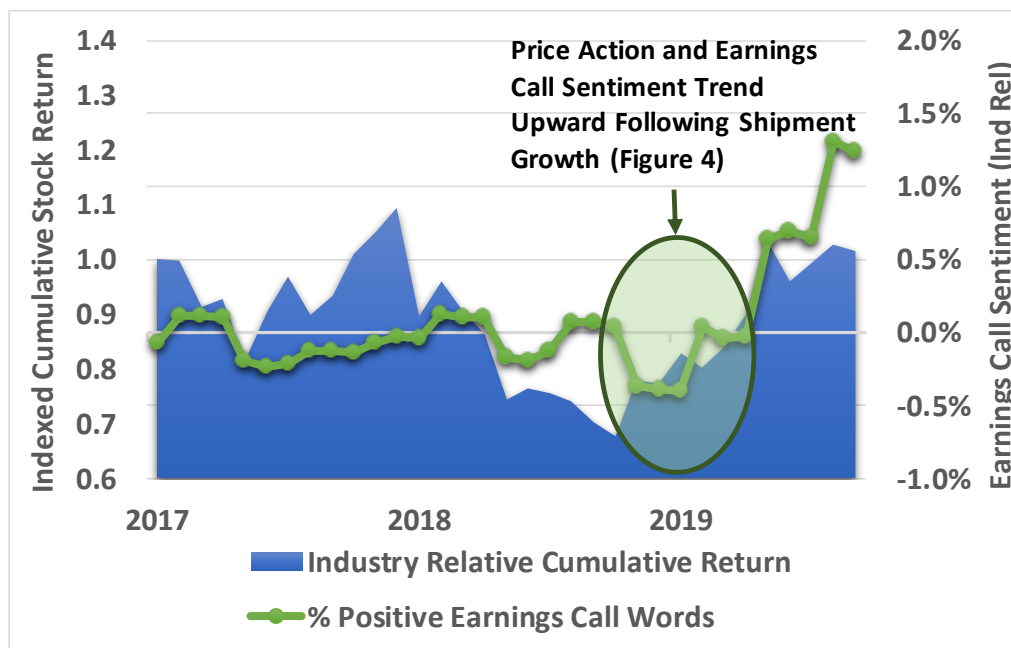
Figure 4. LCI Industries: Industry-Adjusted Shipment (TEUs & Metric Tons) and Operating Cash Flow Growth, US Imports and Mexican Exports, Jan 2017-Sep 2019
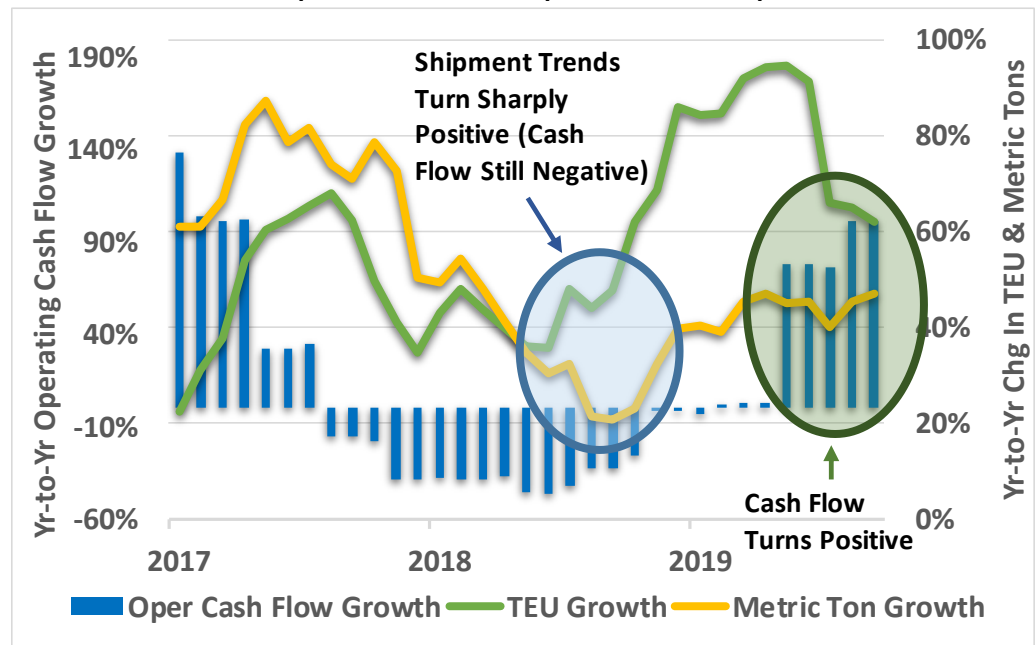
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Figure 5 shows LCI's industry-adjusted stock returns (blue shading) and earnings transcript percent positivity (green line) both trending up in early 2019. Since shipment trends often precede reported financial results, we note that shipment trends can also precede <u>sentiment</u> trends, since changes in sentiment often relate to reported financials.

Figure 5. LCI Industries: Industry-Adjusted Cumulative Stock Return and Earnings Call Sentiment, US Imports and Mexican Exports, Jan 2017-Sep 2019

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 10/15/2019.

1.5 Case Study: Cooper-Standard Holdings

Negative industry-adjusted shipment trends preceded negative cash flow trends for Cooper-Standard, and the peak in shipment trends coincided with the peak in industry-adjusted stock price trends.

Figure 6 shows shipment trends for Cooper-Standard (CPS) leading cash flows trends back into negative territory. TEU and metric ton growth **(green line** and **yellow line)** for CPS turned negative beginning in October 2018, with industry-relative TEUs eventually trending down by 35% year-to-year by September 2019. Operating cash flow growth **(blue bars)**, which is slightly negative in late 2018, turns down sharply in February 2019, as Q4 2018 financial results are reported.

CPS has also seen declines in the number of its suppliers and in product codes imported (Figure 2) and is the industry laggard in shipping volume growth (Figure 3). Like LCI, CPS has broad "shipment coverage" (Figure 8), in terms of the TEUs-to-inventory ratio, indicating a greater likelihood of a relationship between shipments and financials.
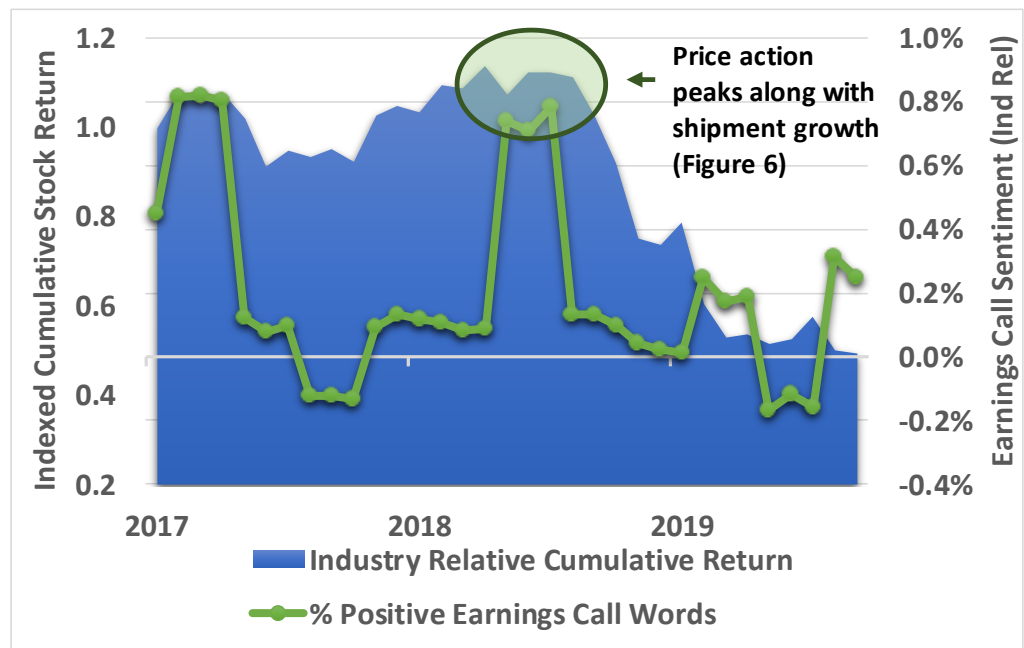
Figure 6. Cooper-Standard Holdings: Industry-Adjusted Shipment (TEUs & Metric Tons) and Operating Cash Flow Growth, US Imports and Mexican Exports, Jan 2017-Sep 2019
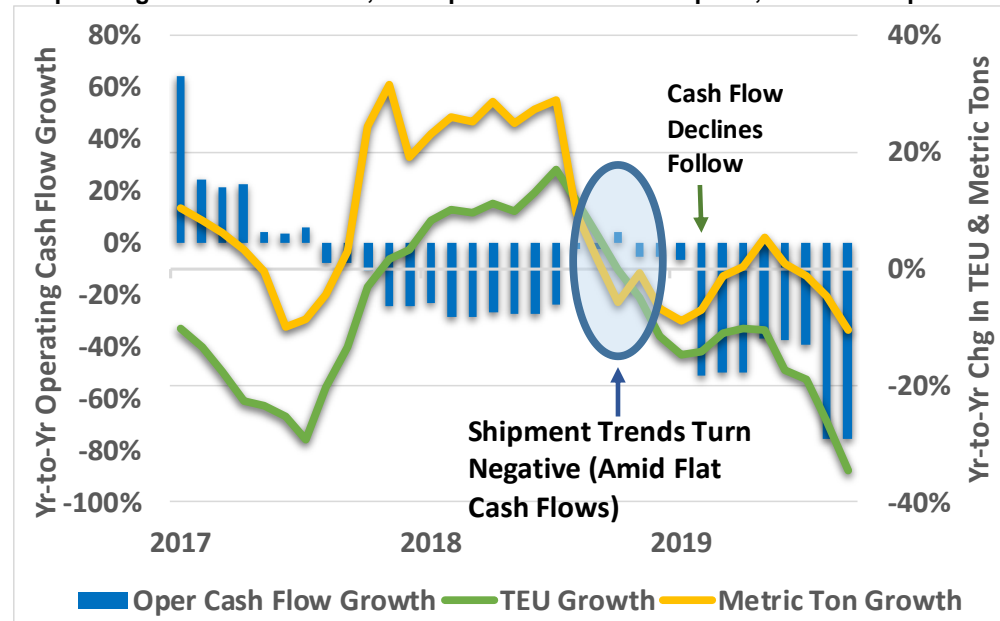
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Figure 7 shows CPS's industry-adjusted stock returns (blue shading) trending downward beginning in October 2018, in tandem with shipment trends. Industry-relative earnings call sentiment **(green line)** has no definite trend in this case.

Figure 7. Cooper-Standard Holdings: Industry-Adjusted Cumulative Stock Return and Earnings Call Sentiment, US Imports and Mexican Exports, Jan 2017-Sep 2019

Source: S&P Global Market Intelligence Quantamental Research. All returns and indices are unmanaged, statistical composites and their returns do not include payment of any sales charges or fees an investor would pay to purchase the securities they represent. Such costs would lower performance. It is not possible to invest directly in an index. Past performance is not a guarantee of future results. Data as of 10/15/2019.

1.6 Estimating Shipment Coverage

> *Not all companies have extensive international supply chains. Coverage analysis—e.g., the ratio of TEUs to inventory—tells us where shipment data may have the strongest relationship with reported financials.*

Comparing imports (TEUs) to inventory (or to the cost of goods sold) provides insight into which companies are good candidates for additional analysis. Higher (lower) values of TEUs relative to inventories indicate that a company is more (less) dependent on seaborne imports. We would expect a closer relationship between shipment data and fundamentals for companies that have higher TEU-to-inventory ratios than for companies with lower ratios.

We note that this approach is not without its challenges as the actual "value" of a TEU will vary by company, product type, product mix, etc. However, Figure 8 suggests that we should have higher confidence in the relationship between shipments and fundamentals for companies such as LCI Industries, Gentherm, and Cooper-Standard, given their relatively high TEU-to-inventory ratios, than for companies such as American Axle and Modine Manufacturing.

The rectangle size in Figure 8 represents the magnitude of a company's 12-month TEUs-to-inventory ratio relative to those of the rest of the industry. Higher levels of shipments relative to inventories suggest a stronger relationship between shipping and financial trends.

Figure 8. US Auto Parts Makers by TEUs to Inventories, 12-month Average of US Import and Mexican Export Data, as of September 2019
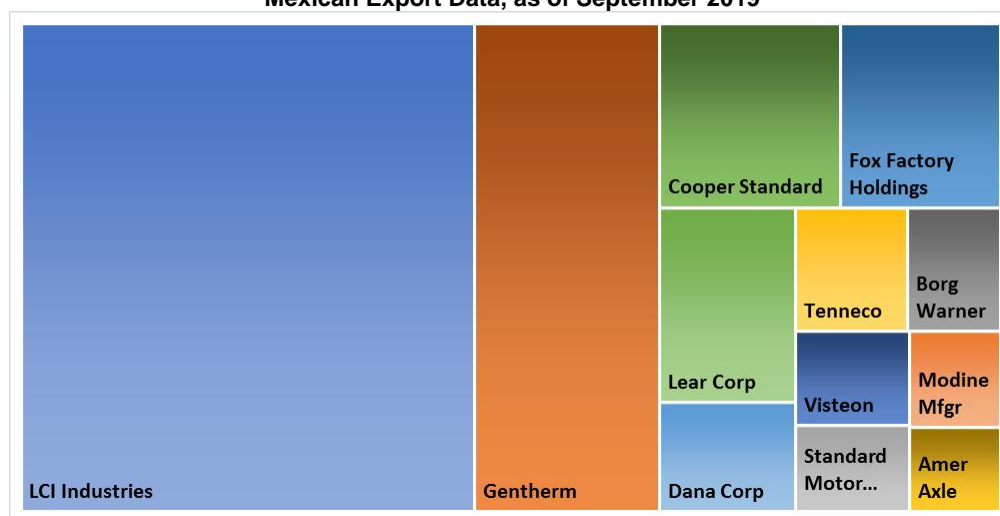
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

2. Industry Analysis

By aggregating shipping data to the industry level, using GICS classifications, we can identify industries with fundamental risk or promise (2.1) and assess the scope of international supply chains by industry (2.2).

2.1 Industry-Level Trend Analysis

> *Industry-level shipping trends can act as a leading indicator of changes in industry fundamentals or as confirmations that those trends are still in place.*

Industry aggregation allows investors to identify industries with fundamental risk or potential. As an example of fundamental risk, the Footwear industry (Figure 9) outperformed the Russell 3000 by 12% for the six months ended September 2019, but shipments declined by 23% over the same period. In terms of opportunities, Leisure Products underperformed the Russell 3000 by 6% over the six month period, but saw shipments rise by 19%. (Note that imports do not forecast *sales* for consignees, but rather what companies <u>want</u> to sell.)

See <u>Appendix B</u> for relevant SQL code. Also, the <u>Panjiva.com Xpressfeed Page</u> has additional code examples.

Figure 9 shows industry trends over the past six months (year-to-year growth in TEUs) for industries with both robust shipping data and a substantial number of companies (see Figure 10 for industry selection). Boxed industries are discussed in the text.

Figure 9. Select Global GICS Industries: Year-to-Year Growth in 3-Month Average TEUs, 6-Month Trend and Current Value, US Imports and Mexican Exports, Apr 2019 – Sep 2019

GICS Subindustry	6-Month Trend	Sep 2019 Value
Air Freight & Logistics		37.33%
Home Furnishings		21.22%
Auto Parts & Equipment		19.53%
Leisure Products		18.71%
Aerospace & Defense		15.62%
Apparel Retail		13.72%
Building Products		8.67%
Trading Companies & Distributors		1.51%
Industrial Conglomerates		-1.00%
Specialty Chemicals		-2.30%
Electrical Components & Equipment		-6.78%
Apparel, Accessories & Luxury Goods		-7.61%
Industrial Machinery		-12.73%
Construction Machinery & Heavy Trucks		-19.82%
Health Care Equipment		-20.75%
Footwear		-23.35%
Distributors		-44.42%
Homefurnishing Retail		-64.91%

Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

2.2 Industry-Level Coverage

> *Some industries have robust shipping data, others do not. Coverage analysis reveals industries with the largest global supply chains and hence the most potential for shipping analysis.*

As with company analysis, industry analysis involves knowing *where* to look at shipping data as well as knowing *what* to look for. Figure 10 shows the top 25 GICS subindustries by TEU count for US Imports in 2018 (excluding the Air Freight & Logistics industry, which logged a massive 830,000 TEUs for the year). Automotive, the largest US sector by trade dollar value according to Census data, is well-represented in shipping data. Automobile parts makers (Figure 2, **red box**), which are covered in this paper, have a robust international supply chain, with a significant volume of imports from 25 different countries.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 10. Where's the Data? Top 25 GICS Industries by TEUs and Shipments, 2018 US Imports
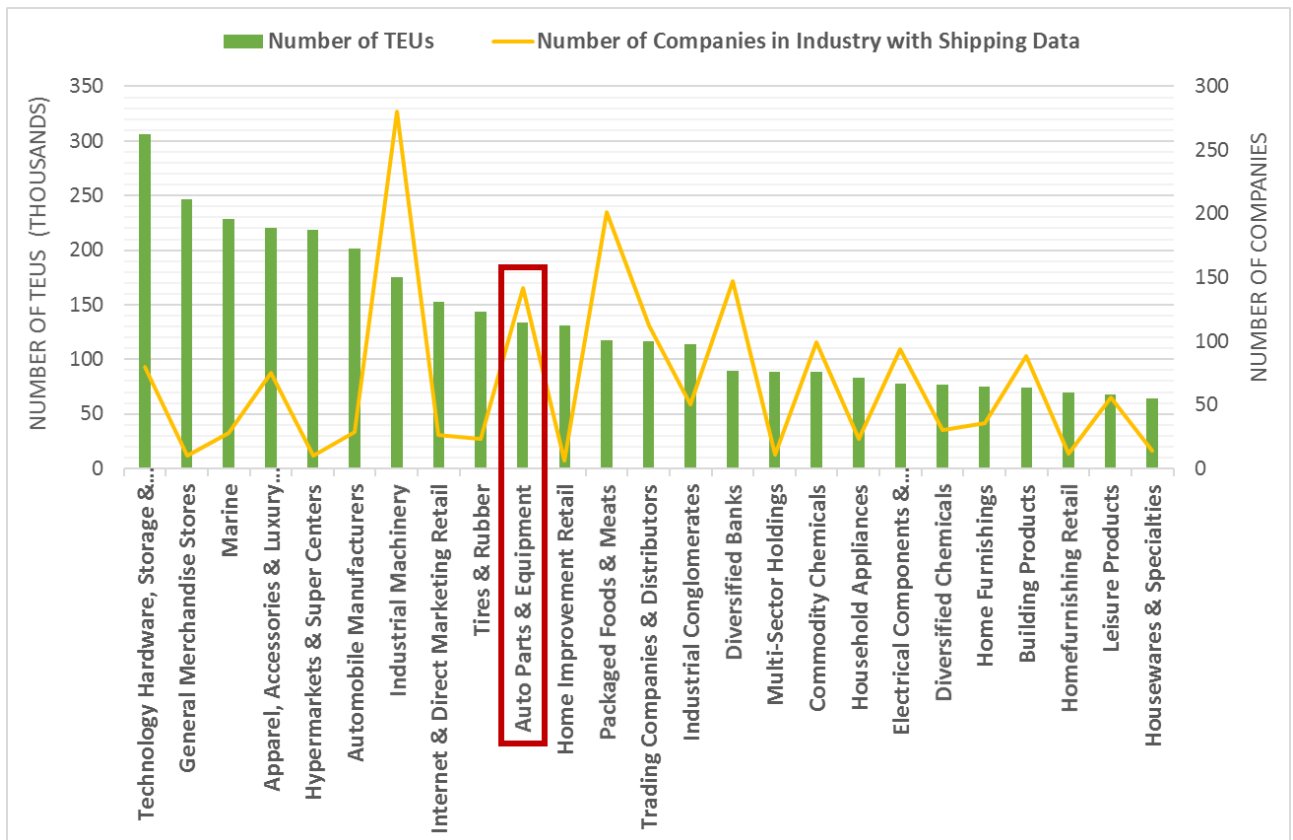
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

3. Product (Harmonized System) Code Analysis

Product line analysis allows the mapping of favorable or unfavorable industry-level trends to company-level product exposures, through HS code aggregation (3.1).[7] This section also shows how to characterize an industry by product code, to track specific industry import trends (3.2).

3.1 Product Line Trend Analysis

Tracking specific product-line trends can provide a read on the health of the industry and allows identification of companies with significant import exposure to positive or negative product trends.

Mapping company exposures to positive or negative industry product trends can help identify company-level opportunities or risks. For example, 18% of auto parts manufacturer Cooper-Standard's imports and 24% of Fox Factory Holding's imports come from engine parts, meaning that a significant portion of imports for these companies comes from products with negative shipment trends (Figure 11), a potential negative for future company performance.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 11 shows specific product line trends for four key imports for auto parts makers. Shipment trends for engines and belts are positive, while shipment trends for engine *parts* and fuel supplies are negative.

Figure 11. Auto Part Product Line Trends, US Imports and Mexican Exports, Sep 2018 – Aug 2019
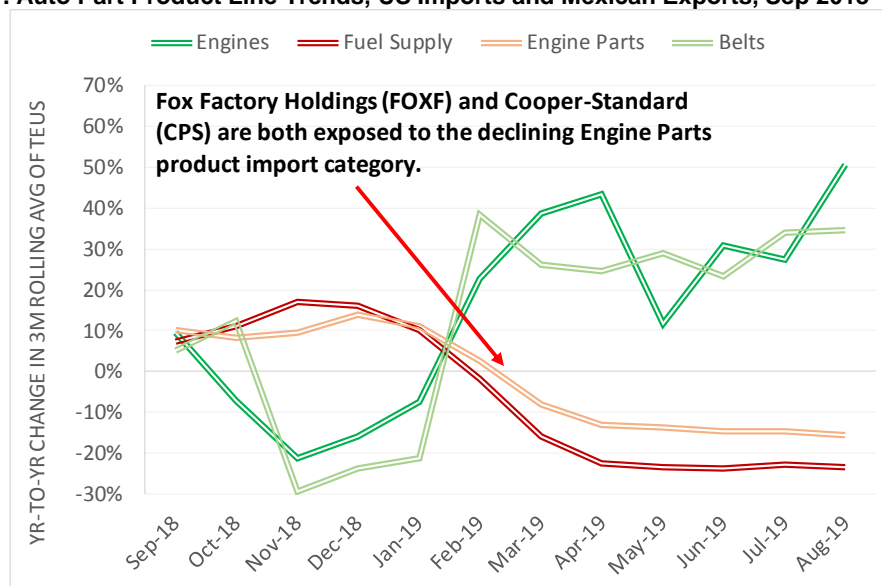
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

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[7] As noted in the introduction, Harmonized System (HS) codes are used internationally to identify specific products, for tariff purposes, at the six-digit level. Additional digits are added by specific countries for domestic needs.

3.2 Industry Import Analysis

> *HS code characterization allows the researcher to identify the key products imports (HS codes) for an industry, enabling the identification of companies diversifying into new product lines or those exposed to expansion/contraction in particular product lines.*

Figure 12 shows total auto parts maker imports into the US by product code, allowing investors to track individual product categories for a given company or the industry as a whole. Note that most of this characterization was done at the HS4 level, but that the Auto Parts, Not Elsewhere Specified code (8708) was broken out into its HS6 components – e.g., Body Parts (870829), Brakes (870830), etc. – for further refinement.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 12. Global Auto Parts Makers' US Imports by 4- and 6-Digit Product Code, US Imports and Mexican Exports for 2018 (Top 25 Products Imported)
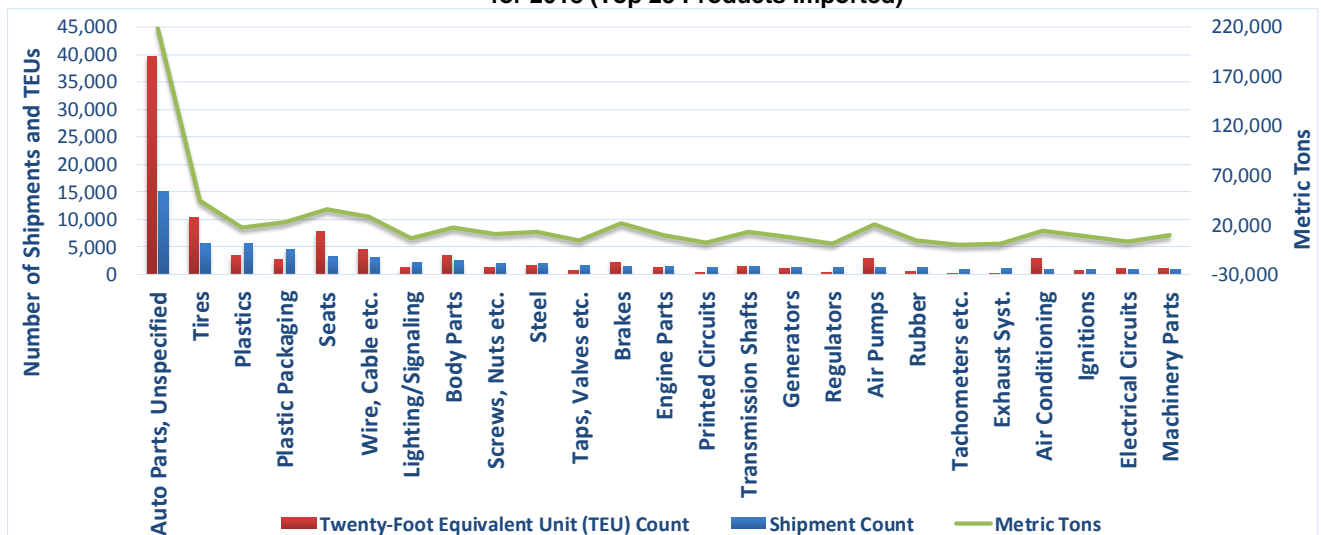
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

4. Country-Level Analysis

> *Shipment data can be used to forecast country-level trends before the release of economic data. Country-level shipment trends can in turn be used to identify publicly-traded suppliers within the country of interest.*

In the ongoing trade war between the US and China, other export-oriented countries in Asia have become the winners. Figure 13 shows ASEAN vs. Chinese shipments (exports) to US auto parts makers (left chart) and then zooms in on Thai and Vietnamese shipments to US auto parts makers (right chart).

In terms of automobiles and related components[8], ASEAN countries in general[9] overtook China in twenty-foot equivalent unit (TEU) container shipments in 2019 (left chart). Auto-related imports from Vietnam surged 136% year-to-year in the first 9 months of 2019 (right chart – albeit from a low level), while Thai imports rose 39%.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 13 shows shipments (TEUs) to US auto parts makers from ASEAN countries vs. China (left chart), and the same for two specific ASEAN countries: Thailand and Vietnam (right chart).

Figure 13. US Automotive and Auto Parts Imports by Region of Origin, ASEAN Countries vs. China (Left) and Thailand vs. Vietnam (Right), Jan 2016 – Sep 2019
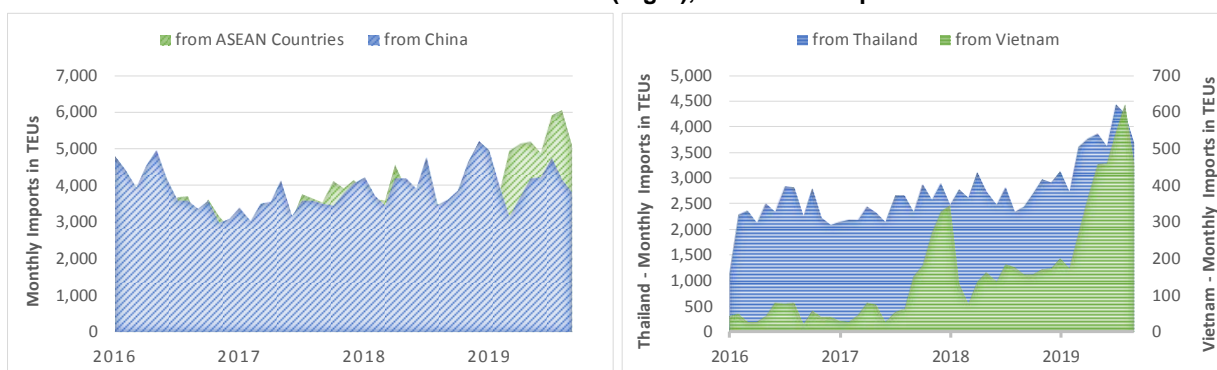
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Country-level analysis can help identify company-level investment ideas. Since shipments from ASEAN automotive suppliers are rising, Figure 14 lists publicly traded ASEAN companies that supply the US auto parts industry. Shipment data shown is year-to-date for 2019.

See Appendix B for relevant SQL code. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 14. Publicly Traded ASEAN Suppliers to US Auto Parts Makers, 2019 Shipments

Country	Ticker	Company Name	TEUs	MetricTons
Indonesia	IDX:IMASA	PT Multistrada Arah Sarana Tbk	807,300	4,222,915
Thailand	SET:DELTA	Delta Electronics (Thailand) Public Company Limited	6,619	23,712
Singapore	SGX:BHQ	Sunningdale Tech Ltd	4,719	9,227
Malaysia	KLSE:APM	APM Automotive Holdings Berhad	450	6,930
Malaysia	KLSE:SAB	Southern Acids (M) Berhad	242	2,187
Indonesia	IDX:IKBI	PT Sumi Indo Kabel Tbk	222	137
Indonesia	IDX:PSDN	PT Prasidha Aneka Niaga Tbk	N/A	496,054

Source: S&P Global Market Intelligence Quantamental Research. Data as of 11/30/2019.

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[8] Covers three GICS subindustries: Auto Parts & Equipment, Tires & Rubber, and Automobile Manufacturers.
[9] The largest ASEAN members include Indonesia, Malaysia, the Phillipines, Singapore, Thailand and Vietnam.

4. Combining Datasets: US Imports and Mexico Exports

Combining Panjiva datasets broadens the "shipping picture" for a given country. In the US, combining seaborne import data with Mexican truck and rail export data gives a more complete picture than seaborne imports alone.

Since Mexican customs forms capture *all forms* of transportation in and out of the country, the combination of US imports and Mexican (non-seaborne) exports to the US is a natural one. Figure 15 shows that Mexican rail and truck traffic[10] to the US amounts to about 14% of shipments and 3% of TEUs for total US imports (left pane) and 36% of shipments and 3% of TEUs for the Auto Parts industry (right pane). Note that most Figures shown in this report combine both US and Mexican data.

See Appendix B for relevant SQL data. Also, the Panjiva.com Xpressfeed Page has additional code examples.

Figure 15. US Seaborne Imports vs. Mexican non-Seaborne Exports to the US by Shipments and TEUs, All Industries (left pane) vs. Auto Parts Makers (right pane) in 2018
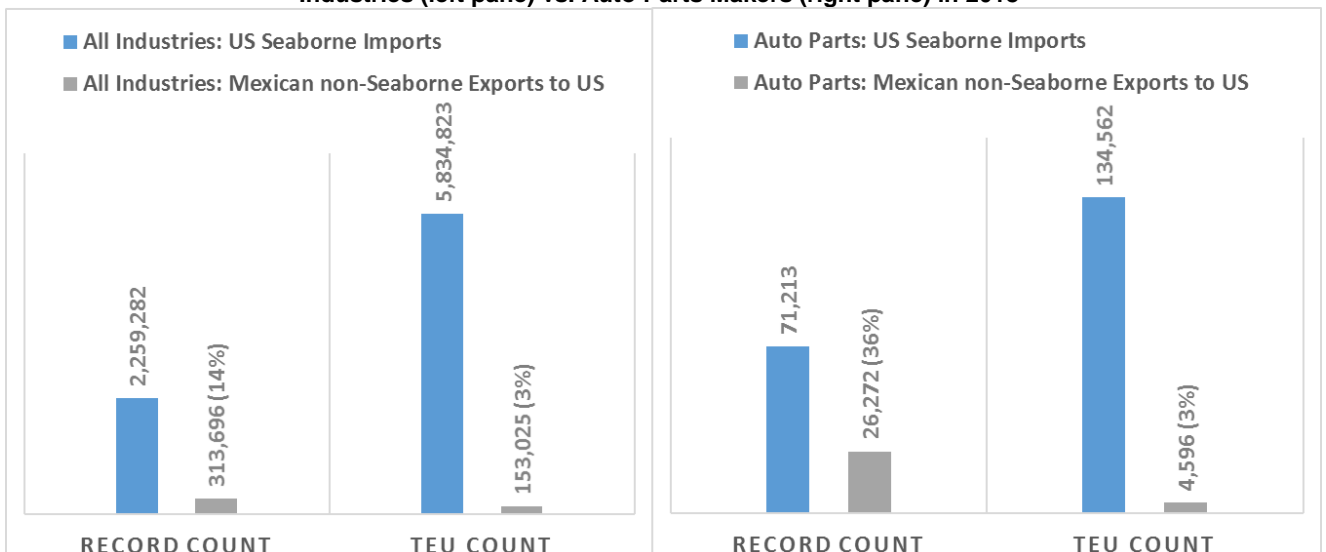
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Figure 16 shows the breakdown of Mexican export data by truck, rail, and air. Unlike the US, Mexico does not redact tariff values, and all shipment records contain values in US dollars.[11]

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[10] Mexico also captures air freight, but such shipments are insignificant in terms of *volume,* although they may be significant in terms of value.
[11] Note that dollar values represent amounts taxed for tariff purposes, so dollar values may be underreported. US dollar values are also available in the Brazil and India datasets, as well as many other LatAm datasets.

Figure 16. Mexican Exports to the US by Mode of Transportation and Value, All Industries in 2018
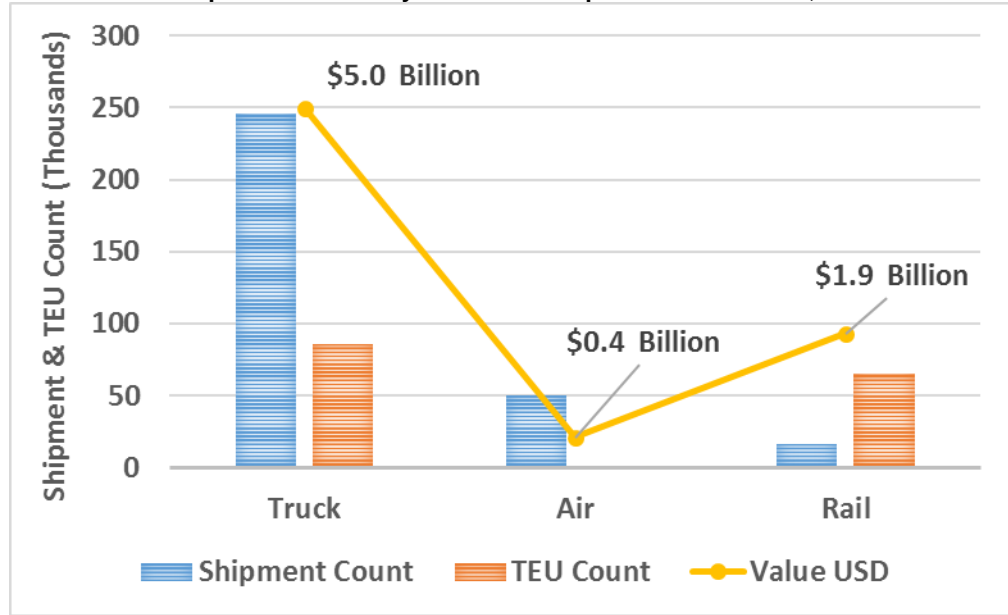
Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

Conclusion

While financial data tells us *how* a firm has done, shipping data provides a closer-to-real-time assessment of *what* a firm is doing (operational data). In its raw form, trade data is messy, unstructured, and error prone. However, when properly resolved, cleansed, and linked, supply chain data provides insights into the trillions of dollars of merchandise that flow across borders annually. Company-level shipment trends can lead fundamentals, highlighting cases where shipping trends may signal positive or negative financial trend reversal. Assessing the health & vitality of the supply chain, through analysis of growth in the number of suppliers and unique products imported, can also provide important clues to future company fundamentals. Industry-level shipping trends can act as leading indicators of changes in industry fundamentals or as confirmations that existing trends are still in place. Also, industry-level *product-line* trends can provide insight into company prospects, by mapping industry trends for a specific product to individual company exposures to that product.

APPENDIX A: Data Characterization

1. Panjiva Database Descriptions

Dataset	History	Latency	Updated	Transit Modes	Total Records	Ultimate Parents
United States Trade Data	July 2007 - Present	1-7 Days	Daily	Maritime	142 million	336,000
The world's largest consumer market, leading global imports across all major categories, and providing insight into over 200 country trading partners globally.						
Mexico Trade Data	Jan 2011 - Present	1-2 Months	Monthly	All Modes	548 million	170,000
Top participant in the global trade landscape, with an economy of $2.2 trillion and membership to 10 free trade						
India Trade Data	Jan 2016 - Present	1-2 Months	Monthly	All Modes	239 million	105,000
One of world's fastest-growing economies, global supplier of pharmaceuticals, rice, apparel, and the world's leading exporter of beef. Includes dollar values, imports and exports across all modes of transportation.						
Brazil Trade Data	Jul 2004 -Present	1-2 Months	Monthly	Maritime	8.8 million	23,200
The largest economy in Latin America, Brazil has an estimated US$21.8 trillion worth of natural resources and trades internationally across several industries.						
China Trade Data	2011 - 2018	N/A	N/A	All Modes	264 million	34,000
World's largest manufacturing economy, with aggregate dollar values for imports and exports. Historical data through 2018 only.						
Chile Trade Data	Jan 2009 - Present	1-3 Months	Monthly	All Modes	42 million	3,300
Chile is the 5th largest economy in South America, known for its wine production and the world's largest copper producer, and a leading exporter of chemical wood pulp, grapes, and pearls.						
Colombia Trade Data	Feb 2007 - Present	2-3 Months	Monthly	All Modes	45 million	72,600
South America's 3rd largest economy by GDP (PPP), one of the most comprehensize shipping data sources including foreign company names, dollar values, weights, and HS codes across all modes of transportation. Also, a major coffee exporter.						
Costa Rica Trade Data	Jan 2014 - Present	updates vary	updates vary	All Modes	60 million	195
Cost Rica is the third largest economy in Central America by GDP (PPP). Major exports include bananas, pineapples, medical instruments, and electronics. Does not include foreign trading partner names.						
Ecuador Trade Data	Jan 2014-Present	2-3 Months	Monthly	Maritime	1.8 million	17,700
Ecuador's maritime trade accounts for roughly 85% of its imports and 70% of exports. Ecuador is the world's largest exporter of bananas and a major exporter of shrimp and canned fish.						
Panama Trade Data	Jan 2009 - Present	updates vary	updates vary	All Modes	20 million	480
Panama is the second largest economy in Central America by GDP (PPP). Major exports include fruits and scrap metal. Does not include foreign trading partner names.						
Paraguay Trade Data	Jan 2014 - Present	1-2 Months	Monthly	All Modes	5.6 million	12,100
Paraguay is the 10th largest economy in South America by GDP (PPP). It relies heavily on agriculture: it is the world's 4th largest soy exporter, and is a large exporter of beef and corn, which comprise 22% of the country's total exports.						
Peru Trade Data	Mar 2011 - Present	1-10 Days	Weekly	All Modes	166 milllion	1,700
Peru is the 6th largest economy in South America by GDP (PPP), and one of its fastest growing economies. Its economy is mainly based on agriculture, fishing and metals & is the world's 2nd largest copper and 10th largest gold exporter.						
Venezuela Trade Data	Jan 2014 - Present	3-6 Months	Quarterly	All Modes	2.3 million	352
Venezuela is known worldwide for its energy exports, with petroleum accounting for more than 50% of its GDP and 95% of total exports. Does not include foreign trading partner names.						
Uruguay Trade Data	Jan 2003 - Present	1-7 Days	Daily	All Modes	26 million	481
Uraguay is South America's 2nd largest economy by GDP per capital. Uraguay's economy is primarily agriculturally-based, and is a top exporter of beef, soybeans, rice, and wool.						
Sri Lanka Trade Data	Jan 2016 - Present	2-3 Months	Monthly	Air & Maritime	9.1 million	29,500
Sri Lanka is located directly in the path of East-West shipping lanes, positioning the country's manufacturing industry as a regional and global hub. The US, UK, India, Germany and Italy account for 50% of Sri Lanka's exports.						

Source: S&P Global Market Intelligence Panjiva and Quantamental Research. Record counts and ultimate parent counts as of 10/15/2019.

2. Record Counts by GICS Subindustry, All Databases and History (Partial List)

GIC	GICS Subindustry	Global Shipments
25102010	Automobile Manufacturers	16,045,983
25101010	Auto Parts & Equipment	11,140,868
20106020	Industrial Machinery	10,577,674
20104010	Electrical Components & Equipment	8,754,348
20106010	Construction Machinery & Heavy Trucks	7,756,319
20105010	Industrial Conglomerates	6,044,024
20301010	Air Freight & Logistics	4,972,318
20107010	Trading Companies & Distributors	4,909,456
45202030	Technology Hardware, Storage & Peripherals	4,544,332
20102010	Building Products	3,714,709
30202030	Packaged Foods & Meats	3,626,772
45203015	Electronic Components	3,237,425
45203020	Electronic Manufacturing Services	3,095,205
35101010	Health Care Equipment	2,791,804
25102020	Motorcycle Manufacturers	2,414,071
35202010	Pharmaceuticals	2,407,778
15101050	Specialty Chemicals	2,246,036
15104050	Steel	1,995,968
30301010	Household Products	1,987,962
20106015	Agricultural & Farm Machinery	1,888,441
25101020	Tires & Rubber	1,707,581
30101040	Hypermarkets & Super Centers	1,687,035
15101010	Commodity Chemicals	1,683,338
30302010	Personal Products	1,670,159
25203010	Apparel, Accessories & Luxury Goods	1,642,290
25201010	Consumer Electronics	1,516,945
45201020	Communications Equipment	1,390,227
20101010	Aerospace & Defense	1,351,997
40201030	Multi-Sector Holdings	1,227,879
45203010	Electronic Equipment & Instruments	1,154,130
15101020	Diversified Chemicals	1,139,796
25203030	Textiles	1,135,559
10101020	Oil & Gas Equipment & Services	1,035,803
15103020	Paper Packaging	961,856
25504050	Automotive Retail	920,760
25202010	Leisure Products	855,883
25504010	Apparel Retail	841,327
25201040	Household Appliances	757,455
25201020	Home Furnishings	748,661
10102010	Integrated Oil & Gas	675,461
35203010	Life Sciences Tools & Services	657,151
15105020	Paper Products	642,371
45102010	IT Consulting & Other Services	584,970
15103010	Metal & Glass Containers	576,287
20103010	Construction & Engineering	559,674
20201060	Office Services & Supplies	520,790
45301020	Semiconductors	508,985
45203030	Technology Distributors	492,046
20104020	Heavy Electrical Equipment	474,838
15104020	Diversified Metals & Mining	400,732
25201050	Housewares & Specialties	400,613

Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019. Note: Global shipments have not been de-duplicated across Panjiva databases.

3. Record Counts by HS-4 Product Codes, All Databases and History (Partial List)

HSCode	Description	RecordCount
8708	Motor vehicles, parts and accessories	71,929,039
3926	Articles of plastics	42,572,149
7318	Screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter-pins, washers	41,447,176
8536	Electrical apparatus for switching, protecting electrical circuits	36,028,169
9901	Ethyl alcohol, ethyl tertiary-butyl ether	28,288,069
4016	Articles of vulcanised rubber other than hard rubber	23,370,799
7326	Iron or steel	22,855,765
8544	Insulated wire, cable and other electric conductors, optical fibre cables	22,834,764
3923	Plastic articles for the conveyance or packing of goods	21,928,241
8481	Taps, cocks, valves and similar appliances for pipes, boiler shells	20,930,576
9403	Furniture and parts thereof	19,375,128
8483	Transmission shafts (including cam and crank)	18,142,769
4202	Trunks, suit, camera, jewellery, cutlery cases	17,378,845
6204	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, women's or girls'	16,855,521
8421	Centrifuges, including centrifugal dryers	15,744,549
8517	Line telephony or line telegraphy apparatus	15,082,055
9401	Seats (not those of heading no. 9402)	14,852,955
8504	Electric transformers, static converters and inductors	14,727,460
8538	Electrical apparatus	14,425,408
6109	T-shirts, singlets and other vests, knitted or crocheted	12,441,151
9503	Toys, other	12,162,726
9405	Lamps, light fittings	11,520,653
8482	Ball or roller bearings	11,386,730
8471	Automatic data processing machines and units	11,098,080
8703	Motor cars and other motor vehicles	10,959,722
8409	Parts suitable for use solely or principally with the engines	10,834,924
8413	Pumps for liquids	10,803,643
9018	Instruments and appliances used in medical, surgical, dental or veterinary sciences	10,515,600
8302	Base metal mountings, fittings and similar articles for furniture, doors, staircases	10,303,805
8431	Machinery parts	10,274,864
8541	Diodes, transistors, similar semiconductor devices	9,814,676
8542	Electronic integrated circuits and microassemblies	9,756,353
6110	Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted	9,396,069
6104	Suits, ensembles, jackets, dresses, skirts, divided skirts, trousers, women's or girls'	9,384,306
7307	Tube or pipe fittings, of iron or steel	9,353,435
4819	Cartons, boxes, cases, bags and the like, of paper, paperboard, cellulose wadding or fib	9,331,112
8207	Tools, for hand tools, or for machine tools	9,196,340
8414	Air or vacuum pumps, air or other gas compressors and fans	9,171,866
3917	Tubes, pipes and hoses and fittings thereof	8,799,033
3304	Cosmetic and toilet preparations, beauty, make-up and skin care preparations	8,726,844
8443	Printing machinery, machines for uses ancillary to printing	8,252,334
3919	Self-adhesive plates, sheets, film, foil, tape, strip and other flat shapes	7,958,177
6203	Suits, ensembles, jackets, blazers, trousers, men's or boys'	7,799,959
4011	New pneumatic tyres, of rubber	7,737,950

Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019. Note: Global shipments have not been de-duplicated Panjiva databases.

4. Record Counts by Country of Origin, US Imports, All History (Partial List)

Country of Origin	Record Count	% Total
China	43,436,420	34.78%
Hong Kong	9,570,835	7.66%
Taiwan	7,383,704	5.91%
South Korea	5,403,205	4.33%
Germany	4,641,207	3.72%
India	4,155,962	3.33%
Italy	3,937,923	3.15%
Japan	3,753,701	3.01%
Vietnam	2,861,681	2.29%
Singapore	2,160,760	1.73%
United States	2,006,541	1.61%
France	1,900,197	1.52%
Thailand	1,789,727	1.43%
United Kingdom	1,755,892	1.41%
Brazil	1,729,611	1.38%
Spain	1,666,062	1.33%
Mexico	1,631,641	1.31%
Canada	1,392,411	1.11%
Indonesia	1,265,633	1.01%
Belgium	1,169,739	0.94%
Netherlands	1,142,599	0.91%
Malaysia	1,138,666	0.91%
Guatemala	948,314	0.76%
Chile	851,084	0.68%
Honduras	831,780	0.67%
Sri Lanka	770,919	0.62%
Turkey	730,841	0.59%
Pakistan	711,006	0.57%
Bangladesh	671,256	0.54%
Australia	637,091	0.51%
Dominican Republic	634,523	0.51%
Switzerland	615,432	0.49%
Costa Rica	613,241	0.49%
Colombia	580,802	0.47%
Peru	532,581	0.43%
Ecuador	503,648	0.40%
Panama	494,521	0.40%
New Zealand	469,855	0.38%
Philippines	453,793	0.36%
Sweden	438,256	0.35%
Israel	404,975	0.32%
Poland	401,114	0.32%
Argentina	386,628	0.31%
Oman	363,681	0.29%
Austria	341,747	0.27%
Portugal	315,699	0.25%
Egypt	279,024	0.22%
Denmark	269,297	0.22%
South Africa	250,852	0.20%

Source: S&P Global Market Intelligence Quantamental Research. Data as of 10/15/2019.

APPENDIX B: Code Library

1. Linking Panjiva Consignees to CIQ Ultimate Parents

Displays the number of US import shipments by consignee for each subsidary of an ultimate parent (Berkshire Hathaway as an example).

> **Note:** Panjiva consignees and shippers are linked to Capital IQ subsidiaries through the CIQ companyId. This connection is established within the Panjiva cross reference table (panjivaCompanyCrossRef). The query then links subsidiaries to an ultimate parent (the subsidiary could also be the ultimate parent) through the Capital IQ ultimate parent table (ciqCompanyUltimateParent), using the CIQ ultimateParentCompanyId.

```sql
SELECT c.companyId AS ParentID
    , c.companyName AS ParentName
    , c2.companyId AS SubsidiaryID
    , c2.companyName AS SubsidiaryName
    , conPanjivaId AS ConsigneeID
    , conName AS ConsigneeName
    , COUNT(panjivaRecordId) AS Records
FROM xfl_ciq..ciqCompany c                  -- begin with all CIQ companies
JOIN xfl_ciq..ciqCompanyUltimateParent cup  -- link ultimate parent table
  ON cup.ultimateParentCompanyId = c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr -- Panjiva/CIQ cross ref table
  ON ccr.companyId = cup.companyId
JOIN xfl_ciq..ciqCompany c2                  -- provides subsidiary name
  ON c2.companyId = ccr.companyId
JOIN xfl_panjiva..panjivaUSImport2018 imp   -- link US import data
  ON imp.conPanjivaId = ccr.identifierValue
WHERE c.companyId = 255251                   -- Berkshire Hathaway
GROUP BY c.companyId, c.companyName, c2.companyId , c2.companyName,
    conPanjivaId, conName            -- group by parent, subsidiary, consignee
ORDER BY COUNT(panjivaRecordId) DESC         -- order by record count
```

Due to space limitations, only partial results are displayed below.

ParentID	ParentName	SubsidiaryID	SubsidiaryName	ConsigneeID	ConsigneeName	Records
255251	Berkshire Hathaway Inc.	274298	Garan, Incorporated	27812430	Garan Inc.	4672
255251	Berkshire Hathaway Inc.	923955	RC Willey Home Furnishings, Inc.	27813975	R.C. Willey Furniture	2794
255251	Berkshire Hathaway Inc.	7865955	H. H. Brown Retail, Inc.	44237672	H H Brown Shoe	1035
255251	Berkshire Hathaway Inc.	286187	The Lubrizol Corporation	27820375	The Lubrizol Corp.	564
255251	Berkshire Hathaway Inc.	4212232	Lubrizol Advanced Materials Internati	27822439	Lubrizol Advanced Materials In	523
255251	Berkshire Hathaway Inc.	793786	Jordan's Furniture, Inc.	33515904	Jordan's Furniture	470
255251	Berkshire Hathaway Inc.	4717278	Campbell Hausfeld Company	27820049	Campbell Hausfeld	442
255251	Berkshire Hathaway Inc.	4282935	Mouser Electronics, Inc.	33482372	Mouser Electronics	404
255251	Berkshire Hathaway Inc.	4180176	Union Underwear Company, Inc.	27962802	Union Underwear Co. Inc.	335
255251	Berkshire Hathaway Inc.	33950	Russell Brands, LLC	27818156	Russell Brands Llc	325
255251	Berkshire Hathaway Inc.	25837	Brooks Sports, Inc.	28203920	Brooks Sports Inc.	315
255251	Berkshire Hathaway Inc.	2881080	BNSF Logistics, LLC	27877316	Bnsf Logistics	303
255251	Berkshire Hathaway Inc.	40457423	Charter Brokerage LLC	28147852	Charter Brokerage Llc	282
255251	Berkshire Hathaway Inc.	5094391	Perfection Hy-Test Co., Inc.	45984081	Perfection Hy Test Co.	281
255251	Berkshire Hathaway Inc.	154056	Johns Manville Corporation	27818662	Johns Manville	256
255251	Berkshire Hathaway Inc.	4301433	Wells Lamont LLC	27875988	Wells Lamont	234
255251	Berkshire Hathaway Inc.	4258416	PCC Specialty Products, Inc.	27948778	Pcc Specialty Products Inc	231

2. Time Series Analysis of Shipments by Ultimate Parent

Displays the number of shipment records, TEUs, and metric tons by company over time, for companies in the US auto parts manufacturing industry. Incorporates both US and Mexican import data.

```sql
SELECT c.companyID, c.companyName
  , DATEPART(YEAR,shpmtDate) AS Year_
  , DATEPART(MONTH, shpmtDate) AS Month_
  , COUNT(imp.panjivaRecordId) AS RecordCount
  , SUM(imp.volumeTEU) AS TEUCount
  , SUM(imp.weightT) AS MetricTons
FROM xfl_ciq..ciqCompany c                       -- begin with all CIQ companies
  JOIN xfl_ciq..ciqCompanyIndustry ci
    ON ci.companyId = c.companyId                 -- link to industry ID table
  JOIN xfl_ciq..ciqSubTypeToGICS stg
    ON stg.subTypeId = ci.industryId              -- link to GICs table
  JOIN xfl_ciq..ciqCompanyUltimateParent cup
    ON cup.ultimateParentCompanyId = c.companyId  -- link ultimate parent table
  JOIN xfl_panjiva..panjivaCompanyCrossRef ccr
    ON ccr.companyId = cup.companyId              -- link Panjiva/CIQ cross ref table
  JOIN(     -- join all relevant US Import (top) and Mexican export (bottom) tables
  SELECT conPanjivaID, panjivaRecordId, arrivalDate AS shpmtDate, volumeTEU, weightT
    FROM xfl_panjiva..panjivaUSImport2019
    UNION
  SELECT conPanjivaID, panjivaRecordId, arrivalDate AS shpmtDate, volumeTEU, weightT
    FROM xfl_panjiva..panjivaUSImport2018
    UNION
  SELECT conPanjivaID, panjivaRecordId, arrivalDate AS shpmtDate, volumeTEU, weightT
    FROM xfl_panjiva..panjivaUSImport2017
    UNION
 SELECT conPanjivaID, panjivaRecordId, shpmtDate, volumeTEU, grossWeightT AS weightT
    FROM xfl_panjiva..panjivaMXExport2019
    WHERE itemDestination = 'United States' and transportMethod != 'Maritime'
    UNION
 SELECT conPanjivaID, panjivaRecordId, shpmtDate, volumeTEU, grossWeightT AS weightT
    FROM xfl_panjiva..panjivaMXExport2018
    WHERE itemDestination = 'United States' and transportMethod != 'Maritime'
    UNION
 SELECT conPanjivaID, panjivaRecordId, shpmtDate, volumeTEU, grossWeightT AS weightT
    FROM xfl_panjiva..panjivaMXExport2017
    WHERE itemDestination = 'United States' and transportMethod != 'Maritime'
   ) AS imp ON imp.conPanjivaId = ccr.identifierValue
WHERE stg.GIC = 25101010               -- GICS auto parts/eqpmt makers only
  AND c.countryID = 213                -- US Companies Only
  AND shpmtDate > '2017-08-31'         -- Get two full years of data
  AND shpmtDate <= '2019-08-31'
GROUP BY c.companyId, c.companyName, DATEPART(YEAR,shpmtDate),
DATEPART(MONTH,shpmtDate)
ORDER BY 2, 3, 4
```

Due to space limitations, only partial results are displayed below.

companyID	companyName	Year_	Month_	RecordCount	TEUCount	MetricTons
24704	American Axle & Manufacturing Holdings, Inc.	2017	9	33	20.51653527	331.648888
24704	American Axle & Manufacturing Holdings, Inc.	2017	10	40	26.60757536	355.351329
24704	American Axle & Manufacturing Holdings, Inc.	2017	11	40	25.27428918	303.907121
24704	American Axle & Manufacturing Holdings, Inc.	2017	12	41	22.21409073	323.275998
24704	American Axle & Manufacturing Holdings, Inc.	2018	1	54	26.87200973	392.230107
24704	American Axle & Manufacturing Holdings, Inc.	2018	2	34	23.91716473	264.713812
24704	American Axle & Manufacturing Holdings, Inc.	2018	3	49	28.009414	324.843454
24704	American Axle & Manufacturing Holdings, Inc.	2018	4	53	23.46208327	294.644916
24704	American Axle & Manufacturing Holdings, Inc.	2018	5	93	46.758298	594.868278
24704	American Axle & Manufacturing Holdings, Inc.	2018	6	69	51.27680009	582.044801
24704	American Axle & Manufacturing Holdings, Inc.	2018	7	62	29.17703055	381.198336
24704	American Axle & Manufacturing Holdings, Inc.	2018	8	43	27.06089091	371.9718
24704	American Axle & Manufacturing Holdings, Inc.	2018	9	58	33.89721455	484.85836
24704	American Axle & Manufacturing Holdings, Inc.	2018	10	43	24.63498818	334.20087
24704	American Axle & Manufacturing Holdings, Inc.	2018	11	27	20.84643382	285.720772
24704	American Axle & Manufacturing Holdings, Inc.	2018	12	25	15.4	227.22
24704	American Axle & Manufacturing Holdings, Inc.	2019	1	37	27.80960364	367.93564
24704	American Axle & Manufacturing Holdings, Inc.	2019	2	34	24.87300909	349.1411
24704	American Axle & Manufacturing Holdings, Inc.	2019	3	36	35.94970455	438.14375
24704	American Axle & Manufacturing Holdings, Inc.	2019	4	32	28.83032636	336.11559
24704	American Axle & Manufacturing Holdings, Inc.	2019	5	32	22.97222727	252.1325
24704	American Axle & Manufacturing Holdings, Inc.	2019	6	39	43.03149691	491.150466
24704	American Axle & Manufacturing Holdings, Inc.	2019	7	44	34.233	396.046
24704	American Axle & Manufacturing Holdings, Inc.	2019	8	44	34.82786364	452.3885
25708	BorgWarner Inc.	2017	9	57	80.99817091	979.80488

3. Health of the Supply Chain: Trends in Supplier Count and Product Count

Displays the number of unique suppliers and unique HS codes for a given ultimate parent on a monthly basis.

```
SELECT c.companyId, c.companyName AS CompanyName
    , DATEPART(YEAR, imp.arrivalDate) AS Year_
    , DATEPART(MONTH, imp.arrivalDate) AS Month_
    , COUNT(DISTINCT imp.shpPanjivaId) AS UniqueSuppliers
    , COUNT(DISTINCT spl.value) AS UniqueHSCodes
FROM xfl_ciq..ciqCompany c
JOIN xfl_ciq..ciqCompanyUltimateParent cup ON cup.ultimateParentCompanyId =
c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr ON ccr.companyId = cup.companyId
JOIN (                          -- join US import and HS code tables
    SELECT conPanjivaId, shpPanjivaId, arrivalDate, hsCode
    FROM xfl_panjiva..panjivaUSImport2019 imp2019
    JOIN xfl_panjiva..panjivaUSImpHSCode2019 h2019
    ON h2019.panjivaRecordId = imp2019.panjivaRecordId
    UNION
    SELECT conPanjivaId, shpPanjivaId, arrivalDate, hsCode
    FROM xfl_panjiva..panjivaUSImport2018 imp2018
    JOIN xfl_panjiva..panjivaUSImpHSCode2018 h2018
    ON h2018.panjivaRecordId = imp2018.panjivaRecordId
    ) AS imp ON imp.conPanjivaId = ccr.identifierValue
```

```
    CROSS APPLY STRING_SPLIT(REPLACE(REPLACE(imp.hscode,'.',''),' ',''),';') spl
      -- evaluate shipments containing multiple HS codes for product analysis
WHERE c.companyID = 266112          -- Deere
GROUP BY c.companyId, c.companyName, DATEPART(YEAR, imp.arrivalDate),
DATEPART(MONTH, imp.arrivalDate)  -- group by industry, year & month
ORDER BY 1, 3 DESC, 4 DESC              -- order by industry, year & month
```

Due to space limitations, only partial results are displayed below.

companyId	CompanyName	Year_	Month_	UniqueSuppliers	UniqueHSCodes
266112	Deere & Company	2019	9	109	107
266112	Deere & Company	2019	8	123	103
266112	Deere & Company	2019	7	105	127
266112	Deere & Company	2019	6	133	104
266112	Deere & Company	2019	5	140	121
266112	Deere & Company	2019	4	140	115
266112	Deere & Company	2019	3	139	124
266112	Deere & Company	2019	2	109	206
266112	Deere & Company	2019	1	146	132
266112	Deere & Company	2018	12	161	158
266112	Deere & Company	2018	11	141	135
266112	Deere & Company	2018	10	178	369
266112	Deere & Company	2018	9	152	160
266112	Deere & Company	2018	8	188	169
266112	Deere & Company	2018	7	176	183
266112	Deere & Company	2018	6	202	174
266112	Deere & Company	2018	5	216	181
266112	Deere & Company	2018	4	197	272
266112	Deere & Company	2018	3	213	176
266112	Deere & Company	2018	2	181	146
266112	Deere & Company	2018	1	188	151

4. Classifying Shipments by GICS Subindustry

Adds industry and GICS tables to display TEU counts and weights by GICS subindustry.

```
SELECT stg.GIC, subTypeValue AS Subindustry
    , ROUND(SUM(imp.volumeTEU),0) AS TEUCount
    , ROUND(SUM(imp.weightT),0) AS MetricTons
FROM xfl_ciq..ciqCompany c                    -- begin with all CIQ companies
JOIN xfl_ciq..ciqCompanyIndustry ci           -- link to industry ID table
  ON ci.companyId = c.companyId
JOIN xfl_ciq..ciqSubTypeToGICS stg            -- link to GICS table
  ON stg.subTypeId = ci.industryId
JOIN xfl_ciq..ciqSubType st                   -- link subType for industry name
  ON st.subTypeId = stg.subTypeId
JOIN xfl_ciq..ciqCompanyUltimateParent cup -- link ultimate parent table
  ON cup.ultimateParentCompanyId = c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr -- link Panjiva/CIQ cross ref table
  ON ccr.companyId = cup.companyId
JOIN xfl_panjiva..panjivaUSImport2018 imp    -- link 2018 US import table
  ON imp.conPanjivaId = ccr.identifierValue
GROUP BY stg.GIC, subTypeValue               -- group by industry
ORDER BY 3 DESC                              -- order by TEU count
```

Due to space limitations, only partial results are displayed below.

GIC	Subindustry	TEUCount	MetricTons
20301010	Air Freight and Logistics	834159	5284242
45202030	Technology Hardware, Storage and Peripher	306548	1048706
25503020	General Merchandise Stores	246458	1026388
20303010	Marine	228820	921188
25203010	Apparel, Accessories and Luxury Goods	221921	1079986
30101040	Hypermarkets and Super Centers	218617	1321332
25102010	Automobile Manufacturers	203700	5202136
20106020	Industrial Machinery	176420	1595266
25502020	Internet and Direct Marketing Retail	153987	722593
25101020	Tires and Rubber	143725	1002420
25101010	Auto Parts and Equipment	134565	875708
25504030	Home Improvement Retail	130809	746368
30202030	Packaged Foods and Meats	122271	2000161
20107010	Trading Companies and Distributors	117533	4279687
20105010	Industrial Conglomerates	115483	5940075
40101010	Diversified Banks	90164	10190768
15101010	Commodity Chemicals	89004	2375662
40201030	Multi-Sector Holdings	88839	1328488
25201040	Household Appliances	83578	416337
20104010	Electrical Components and Equipment	78249	606315
15101020	Diversified Chemicals	77718	1841977
20102010	Building Products	76115	872227
25201020	Home Furnishings	74974	486348
25504060	Homefurnishing Retail	69920	226293
25202010	Leisure Products	68345	831423

5. Classifying Shipments by HS (Product) Code

Displays the number of shipments that contain a specific product (HS code) and parses shipments that contain multiple codes.

HS code stands for the Harmonized Commodity Description and Coding System used by the World Customs Organization to standardize product codes for tariff purposes internationally. A shipment may contain a single product code or multiple codes separated by semicolons. To split records with multiple HS codes, we use the STRING_SPLIT function. Since one product code may occur multiple times in a single record, DISTINCT must be used when counting record IDs. For the same reason, this query will not work when summing TEUs or weights.

Note: Although US import and export tables have separate associated HS code tables, for all other country datasets HS codes are included in the import and export tables themselves.

```sql
SELECT spl.value AS HSCode
     , hsc.hsCodeDescription AS HSCodeDescription
     , COUNT(DISTINCT imp.panjivaRecordId) AS Shipments
FROM xfl_ciq..ciqCompany c                       -- begin with all CIQ companies
JOIN xfl_ciq..ciqCompanyUltimateParent cup       -- link ultimate parent table
  ON cup.ultimateParentCompanyId = c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr     -- Panjiva/CIQ cross ref table
  ON ccr.companyId = cup.companyId
JOIN xfl_panjiva..panjivaUSImport2018 imp        -- link 2018 US import table
  ON imp.conPanjivaId = ccr.identifierValue
JOIN xfl_panjiva..panjivaUSImpHSCode2018 h       -- link corresp. HS code table
  ON h.panjivaRecordId = imp.panjivaRecordId
  CROSS APPLY STRING_SPLIT(REPLACE(REPLACE(h.hscode,'.',''),' ',''),';') spl
  -- splits records with multiple HS codes by separator (semicolon)
JOIN xfl_panjiva..panjivaHSClassification hsc    -- provides HS code text desc
  ON hsc.hsCode = spl.value
GROUP BY spl.value, hsc.hsCodeDescription        -- group by HS Code
ORDER BY 3 DESC                                  -- order by record count
```

Due to space limitations, only partial results are displayed below.

HSCode	HSCodeDescription	Shipments
870899	Vehicle parts and accessories; n.e.c. in heading no. 8708	211816
950300	Tricycles, scooters, pedal cars and similar wheeled toys; dolls' carriages; dolls; other	160720
940360	Furniture; wooden, other than for office, kitchen or bedroom use	157103
392690	Plastics; other articles n.e.c. in chapter 39	108281
940161	Seats; with wooden frames, upholstered, (excluding medical, surgical, dental, veterina	71411
940320	Furniture; metal, other than for office use	70849
401110	Rubber; new pneumatic tyres, of a kind used on motor cars (including station wagons	63187
640299	Footwear; n.e.c. in heading no. 6402, (other than just covering the ankle), with outer	60326
732690	Iron or steel; articles n.e.c. in heading 7326	54468
220421	Wine; still, in containers holding 2 litres or less	50860
630790	Textiles; made up articles (including dress patterns), n.e.c. in chapter 63, n.e.c. in hea	47174
392410	Plastics; tableware and kitchenware	42078
940490	Bedding and similar furnishing articles; n.e.c. in heading no. 9404 (e.g. quilts, eiderdo	40240
610910	T-shirts, singlets and other vests; of cotton, knitted or crocheted	38791
940179	Seats; with metal frames, not upholstered, (excluding medical, surgical, dental, veteri	38626
950510	Christmas festivity articles	37564
940350	Furniture; wooden, for bedroom use	37196
731815	Iron or steel; threaded screws and bolts n.e.c. in item no. 7318.1, whether or not wit	36827
611020	Jerseys, pullovers, cardigans, waistcoats and similar articles; of cotton, knitted or cro	35823
640399	Footwear; n.e.c. in heading no. 6403, (not covering the ankle), outer soles of rubber,	35105
420292	Cases and containers; n.e.c. in heading 4202, with outer surface of sheeting of plastic	34141
611030	Jerseys, pullovers, cardigans, waistcoats and similar articles; of man-made fibres, knit	31687
870829	Vehicles; parts and accessories, of bodies, other than safety seat belts	30865
940540	Lamps and light fittings; electric, n.e.c. in heading no. 9405	30768
392310	Plastics; boxes, cases, crates and similar articles for the conveyance or packing of goo	30132
848180	Taps, cocks, valves and similar appliances; for pipes, boiler shells, tanks, vats or the li	29238

6. Time-Series Analysis by Product (HS-6) Code

Displays TEU counts and weight in metric tons by month and year for specific HS codes. The query does not parse records containing multiple HS codes, due to duplicate problems that will affect TEU and weight summarization.

```sql
SELECT LEFT(REPLACE(REPLACE(imp.hscode,'.',''),' ',''),6) AS HSCode
    , DATEPART(YEAR, arrivalDate) AS YEAR_
    , DATEPART(MONTH, arrivalDate) AS MONTH_
    , ROUND(SUM(imp.volumeTEU),0) AS TEUCount
    , ROUND(SUM(imp.weightT),0) AS MetricTons
FROM xfl_ciq..ciqCompany c
JOIN xfl_ciq..ciqCompanyUltimateParent cup ON cup.ultimateParentCompanyId =
c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr ON ccr.companyId = cup.companyId
JOIN (               -- link 2019 and 2018 US import table with HS code table
      SELECT conPanjivaId, volumeTEU, weightT, arrivalDate, hsCode
      FROM xfl_panjiva..panjivaUSImport2019 imp2019
      JOIN xfl_panjiva..panjivaUSImpHSCode2019 h2019
        ON h2019.panjivaRecordId = imp2019.panjivaRecordId
      UNION
      SELECT conPanjivaId, volumeTEU, weightT, arrivalDate, hsCode
      FROM xfl_panjiva..panjivaUSImport2018 imp2018
      JOIN xfl_panjiva..panjivaUSImpHSCode2018 h2018
        ON h2018.panjivaRecordId = imp2018.panjivaRecordId
    ) imp ON imp.conPanjivaId = ccr.identifierValue
WHERE LEFT(REPLACE(REPLACE(imp.hscode,'.',''),' ',''),6)
      IN ('020220', '520512',)                    -- meat cuts, cotton yarn
GROUP BY DATEPART(YEAR, arrivalDate), DATEPART(MONTH, arrivalDate),
  LEFT(REPLACE(REPLACE(imp.hscode,'.',''),' ',''),6)
   -- group by year, month, and HS code
ORDER BY 1, 2, 3 ASC                              -- order by record count
```

Due to space limitations, only partial results are displayed below.

HSCode	YEAR_	MONTH_	TEUCount	MetricTons
20220	2018	1	0	7
20220	2018	2	7	128
20220	2018	3	6	64
20220	2018	4	2	30
20220	2018	5	4	61
20220	2018	6	6	83
20220	2018	7	6	73
20220	2018	8	2	18
20220	2018	9	26	214
20220	2018	10	1	17
20220	2018	11	17	164
20220	2018	12	13	168
20220	2019	1	34	440
20220	2019	2	12	141
20220	2019	3	14	192
20220	2019	4	17	211

7. Country Analysis with US Import Data

Displays the number of shipment records and TEUs imported into the US by country (includes ASEAN member countries as an example).

```sql
SELECT shpmtOrigin AS OriginCountry
     , COUNT(panjivaRecordId) AS RecordCount
     , ROUND(SUM(volumeTEU),0) AS TEUCount
FROM xfl_panjiva..panjivaUSImport2018
WHERE shpmtOrigin IN ('Indonesia', 'Malaysia', 'Philippines', 'Singapore',
'Thailand', 'Vietnam', 'Laos', 'Cambodia', 'Myanmar')  -- ASEAN member countries
GROUP BY shpmtOrigin                                    -- group by origin country
ORDER BY 2 DESC                                         -- order by record count
```

Sample Output

OriginCountry	RecordCount	TEUCount
Vietnam	403773	907261
Thailand	192477	521751
Singapore	173008	344476
Indonesia	127779	281165
Malaysia	93502	247246
Philippines	32388	88356
Cambodia	15552	33745
Myanmar	2978	4162
Laos	224	384

8. Identifying Publicly-Traded Suppliers to a Specific US Industry – by Country

This query identifies ASEAN-country based suppliers to US automotive companies. It employs the ciqSecurity and ciqTradingItem tables to narrow the list to only publicly-traded suppliers.

```sql
SELECT shpmtOrigin, ti2.tradingItemId, ti2.tickerSymbol, c2.companyId,
c2.companyName
  , DATEPART(YEAR, arrivalDate) AS Year_
  , SUM(imp.volumeTEU) AS TEUCount
  , SUM(imp.weightT) AS MetricTons
FROM xfl_ciq..ciqCompany c           -- begin with all CIQ companies
  JOIN xfl_ciq..ciqCompanyIndustry ci
    ON ci.companyId = c.companyId    -- link to industry ID table
  JOIN xfl_ciq..ciqSubTypeToGICS stg
    ON stg.subTypeId = ci.industryId -- link to GICs table
  JOIN xfl_ciq..ciqCompanyUltimateParent cup
    ON cup.ultimateParentCompanyId = c.companyId -- link ultimate parent table
  JOIN xfl_panjiva..panjivaCompanyCrossRef ccr
    ON ccr.companyId = cup.companyId -- link consignee to company tables
  JOIN(                              -- join all relevant US Import tables
    SELECT conPanjivaId, shpPanjivaID, shpName, panjivaRecordId, arrivalDate,
        volumeTEU, weightT, shpmtOrigin
    FROM xfl_panjiva..panjivaUSImport2019
        ) AS imp ON imp.conPanjivaId = ccr.identifierValue
  JOIN xfl_panjiva..panjivaCompanyCrossRef ccr2
    ON ccr2.identifierValue = imp.shpPanjivaId --link suppliers to cross ref tbl
  JOIN xfl_ciq..ciqCompany c2
```

```
        ON c2.companyId = ccr2.companyId         -- link suppliers to company table
    JOIN xfl_ciq..ciqCompanyUltimateParent cup2
        ON cup2.ultimateParentCompanyId = c.companyId -- link supp to ult parent
    JOIN xfl_ciq..ciqSecurity s2              -- link supplier to primary security
        ON s2.companyId = c2.companyId and s2.primaryFlag = 1
    JOIN xfl_ciq..ciqTradingItem ti2 -- link security to primary ticker
    ON ti2.securityId = s2.securityId and ti2.primaryFlag = 1
WHERE 1 = 1
    AND stg.GIC IN (25101010,25101020,25102010) -- GICS automotive cos.
    AND shpmtOrigin IN ('Indonesia', 'Malaysia', 'Philippines', 'Singapore',
'Thailand', 'Vietnam') -- only shipments from ASEAN member countries
    AND datepart(year,arrivalDate) = 2019
    AND ti2.tickerSymbol IS NOT NULL -- supplier must be publicly traded
GROUP BY shpmtOrigin, ti2.tradingItemId, ti2.tickerSymbol, c2.companyId,
c2.companyName, datepart(year,arrivalDate) -- group by arrival year and month
ORDER BY 4,5,6                              -- order by year and month
```

shpmtOrigin	tradingItemId	tickerSymbol	companyId	companyName	Year_	TEUCount	MetricTons
Malaysia	20217832	SAB	879393	Southern Acids (M) Berhad	2019	242	2186.712
Thailand	20213609	DELTA	882013	Delta Electronics (Thailand) Public Company Limited	2019	6618.61	23711.967
Indonesia	20165101	IKBI	4509295	PT Sumi Indo Kabel Tbk	2019	222	137.418
Malaysia	20215739	APM	6464907	APM Automotive Holdings Berhad	2019	450	6930.35
Singapore	20191502	BDV	7658469	Fischer Tech Ltd	2019	276	386.676
Indonesia	20166477	PSDN	8521127	PT Prasidha Aneka Niaga Tbk	2019	NULL	496054.08
Singapore	20194575	S09	9950879	Sunningdale Precision Industries Ltd	2019	4718.52	9227.124
Indonesia	22594109	MASA	22580579	PT Multistrada Arah Sarana Tbk	2019	796950	4168774.995

9. Combining Country Datasets: US Imports and Mexican Exports

Adds Mexican rail and truck export data to US maritime import data to get a more complete picture of US imports. Note that field names must be standardized across the two datasets.

```
SELECT stg.GIC, st.subTypeValue AS Subindustry
    , DATEPART(YEAR, shpmtDate) AS Year_
    , DATEPART(MONTH, shpmtDate) AS Month_
    , ROUND(SUM(imp.volumeTEU),0) AS TEUCount
FROM xfl_ciq..ciqCompany c
JOIN xfl_ciq..ciqCompanyIndustry ci ON ci.companyId = c.companyId
JOIN xfl_ciq..ciqSubTypeToGICS stg ON stg.subTypeId = ci.industryId
JOIN xfl_ciq..ciqSubType st ON st.subTypeId = stg.subTypeId
JOIN xfl_ciq..ciqCompanyUltimateParent cup ON cup.ultimateParentCompanyId =
c.companyId
JOIN xfl_panjiva..panjivaCompanyCrossRef ccr ON ccr.companyId = cup.companyId
JOIN (              -- join 2019 US import and MX export tables
    SELECT conPanjivaID, arrivalDate AS shpmtDate, volumeTEU, weightT
    FROM xfl_panjiva..panjivaUSImport2019
    UNION
    SELECT conPanjivaID, shpmtDate, volumeTEU, grossWeightT AS weightT
    FROM xfl_panjiva..panjivaMXExport2019
    WHERE itemDestination = 'United States' and transportMethod != 'Maritime'
      -- only select US shipments that are not shipped by sea
    ) AS imp ON imp.conPanjivaId = ccr.identifierValue
WHERE stg.GIC IN (20301010, 45202030)         -- select GICS subindustries
GROUP BY stg.GIC, st.subTypeValue, DATEPART(YEAR, shpmtDate), DATEPART(MONTH,
shpmtDate)    -- group by industry code, industry name, year & month
ORDER BY 1, 3, 4
```

GIC	Subindustry	Year_	Month_	TEUCount
20301010	Air Freight and Logistics	2019	1	67106
20301010	Air Freight and Logistics	2019	2	66128
20301010	Air Freight and Logistics	2019	3	65549
20301010	Air Freight and Logistics	2019	4	82103
20301010	Air Freight and Logistics	2019	5	85364
20301010	Air Freight and Logistics	2019	6	86394
20301010	Air Freight and Logistics	2019	7	88500
20301010	Air Freight and Logistics	2019	8	82640
20301010	Air Freight and Logistics	2019	9	104388
20301010	Air Freight and Logistics	2019	10	61327
45202030	Technology Hardware, Storage and Peripherals	2019	1	21639
45202030	Technology Hardware, Storage and Peripherals	2019	2	25273
45202030	Technology Hardware, Storage and Peripherals	2019	3	26563
45202030	Technology Hardware, Storage and Peripherals	2019	4	26885
45202030	Technology Hardware, Storage and Peripherals	2019	5	26058
45202030	Technology Hardware, Storage and Peripherals	2019	6	25798
45202030	Technology Hardware, Storage and Peripherals	2019	7	28825
45202030	Technology Hardware, Storage and Peripherals	2019	8	24368
45202030	Technology Hardware, Storage and Peripherals	2019	9	22407
45202030	Technology Hardware, Storage and Peripherals	2019	10	13820

APPENDIX C: Glossary

Bill of Lading: A shipping receipt issued by a carrier to a shipper, listing goods shipped, quantity, destination, etc., also used for customs purposes.

Consignee: the corporation or agent to whom goods are to be given over to or delivered.

Customs: the official department that administers and collects the duties levied by a government on imported goods. Also, the duties levied by a government on imported goods.

Customs Declaration: A form listing goods being imported into or exported from a country, required for tax purposes.

FEUs: See Forty Foot Equivalent Units.

Freight Forwarder: see NVOCC.

HS Code: Short for Harmonized Commodity Description and Coding System. A system of international six-digit product codes, for tariff purposes, specified by the World Customs Organization. Organized into 99 chapters (first 2 digits).

HTS Codes: Short for Harmonized Tariff System. The US system of HS codes, which contains an additional 4 digits, as specified by the US Customs department.

Forty Foot Equivalent Units: A standardized measure of container size equal to two TEUs.

Masking: see *manifest confidentiality.*

Manifest Confidentiality: In the US, a company's ability to request that identifying information for consignee, or shipper, or both be kept private. Also called *redaction, masking* or "opt out."

NVOCC: Non-vehicle owning common carrier, a freight forwarder. Companies that are responsible for the physical act of moving products. Shipping records may show a logistics provider as a consignee or shipper if providing an "end-to-end" service for a customer.

Panjiva ID: An aggregate ID that links all entities that appear to have the same name within one country but with different locations: e.g., Sams Club PA, Sams Club Mass., Sam's Club KS would all have same PID.

Redaction: see *manifest confidentiality.*

Supply Chain: The web of relationships formed among customers, suppliers, suppliers-to-suppliers, etc., and the goods shipped among them.

Shipper: The party that is sending goods to a *consignee.*

Tariff: A tax due or paid on imported goods (duty).

Tariff Value: The value of goods as reported on a customs bill of lading; may not equal actual value of goods shipped. Because shippers/consignees often pay taxes based on the tariff value, there is an incentive to minimize the value of goods reported on customs declarations.

TEUs: See Twenty Foot Equivalent Units.

Twenty Foot Equivalent Units (TEUs): A standardized measure of a container's size equal to a 20' shipping container that is 8' wide and 8' tall. TEUs are estimated by Panjiva, using container type, products shipped, weight, etc.

Our Recent Research

January 2020: <u>Natural Language Processing – Part III: Feature Engineering Applying NLP Using Domain Knowledge to Capture Alpha from Transcripts</u>

Unstructured data is largely underexplored in equity investing due to its higher costs. As a result, the information content remains largely untapped and offers an investment edge for investors. One particularly valuable unstructured data set is S&P Global Market Intelligence's machine readable earnings call transcripts. This newest publication, the third in the series (NLP I, NLP II), introduces new stock selection ideas in the areas of I) Topic identification, II) Call transparency and III) Call sentiment using more advanced NLP techniques.

- Topic Identification – Firms that referenced the most positive descriptors around their financials outperformed historically.
- Transparency – Firms that provided greater call transparency exhibited by executives' behaviors and decisions outperformed historically.
- Weighted Average Sentiment – Quantifying call sentiment using a weighted average construct led to better returns and less volatility historically.
- Additive Forecasting Power – The newly introduced signals demonstrated additive forecasting power above commonly used alpha and risk signals historically.

December 2019: <u>The "Trucost" of Climate Investing: Managing Climate Risks in Equity Portfolios</u>

Does sustainable investing come at a "cost", and is the fear of investors around the performance concessions of "green" portfolios warranted? Our latest research suggests investors' fears are misplaced – carbon-sensitive portfolios have similar returns and significantly better climate characteristics than portfolios constructed without carbon emission considerations. Other findings include:

- Highly profitable firms are likely to be leaders in reducing their carbon emission levels.
- There is no degradation in fundamental characteristics for the carbon-sensitive portfolios compared to the baseline portfolio, even though the difference in constituents can be as high as 20%.
- Carbon-sensitive portfolios were observed as having significant reductions in water use, air pollutants released and waste generated.

October 2019: <u>#ChangePays: There Were More Male CEOs Named John than Female CEOs</u>

This report examines the performance of firms that have made female appointments to their CEO and CFO positions. Our research finds that firms with female CEOs and/or CFOs:.

- Are more profitable and generated excess profits of $1.8 trillion over the study horizon.
- Have produced superior stock price performance, compared to the market average.
- Have a demonstrated culture of Diversity and Inclusion, evinced by more females on the company's board of directors.

June 2019: <u>Looking Beyond Dividend Yield: Finding Value in Cash Distribution Strategies</u>

Examines the relationship between yield-oriented strategies (dividend yield, buyback yield, and combined shareholder yield) and future stock return, across multiple countries/regions. Also provides insights into two additional topics:

- Which company fundamental characteristics support and enhance future shareholder payouts?
- Under which interest rate environment should investors favor yield-oriented strategies?

June 2019: <u>The Dating Game: Decrypting the Signals in Earnings Report Dates</u>

The first part of this report focuses on companies that deviate from a historical reporting pattern, while the second part examines a related topic – the market's reaction to companies that postpone a previously scheduled (announced) earnings release date.

- "Advancers" (companies that advance their earnings report date by at least 6 days) are likely to report improving year-year on sales, better earnings surprises, and more positive conference call sentiment readings than their industry group peers and "delayers" (companies that delay their earnings report date by at least 6 days).
- Advancers outperform delayers by over 7% on an annualized basis (Russell 3000). This return rises to 8.80% (Russell 2000) and falls to 2.21% (Russell 1000).
- The annualized return to stocks identified as buy candidates and tagged as advancers is 10.77%, compared to 6.29% for buy candidates tagged as delayers.
- Companies that postpone a previously announced earnings release date underperform the broad market by 2.44% in the 3 days surrounding the announcement. These companies are also likely to report deteriorating fundamentals.

May 2019: <u>Bridges for Sale: Finding Value in Sell-Side Estimates, Recommendations, and Target Prices</u>

This report looks at the informativeness of analyst recommendation revisions, target price revisions, and estimate dispersion, primarily within the post-2002 regulatory environment, and finds significant results in all three areas:

- Investors should focus on shifts in consensus recommendations, as the recommendation level by itself often reflects pro-management and high-growth biases.
- Target prices, labeled by some practitioners as "fiction" likewise provide insight into changing analyst attitudes. The six-month change in target price gap (the spread between target and market price) produces statistically significant results globally.
- Analyst estimate dispersion acts as an indicator of corporate quality – high quality companies have more stable revenue and income streams that are more amenable to forecasting

February 2019: <u>U.S Stock Selection Model Performance Review</u>

February 2019: <u>International Small Cap Investing: Unlocking Alpha Opportunities in an Underutilized Asset Class</u>

January 2019: <u>Value and Momentum: Everywhere, But Not All the Time</u>

November 2018: <u>Forging Stronger Links: Using Supply Chain Data in the Investing Process</u>

September 2018: <u>Their Sentiment Exactly: Sentiment Signal Diversity Creates Alpha Opportunity</u>

September 2018: <u>Natural Language Processing – Part II: Stock Selection: Alpha Unscripted: The Message within the Message in Earnings Calls</u>

July 2018: <u>A Case of 'Wag the Dog'? - ETFs and Stock-Level Liquidity</u>

June 2018: <u>The (Gross Profitability) Trend is Your Friend</u>

May 2018: <u>Buying the Dip: Did Your Portfolio Holding Go on Sale?</u>

March 2018: <u>In the Money: What Really Motivates Executive Performance?</u>

February 2018: <u>The Art of the (no) Deal: Identifying the Drivers of Canceled M&A Deals</u>

January 2018: <u>U.S Stock Selection Model Performance Review</u>

September 2017: <u>Natural Language Processing - Part I: Primer</u>

July 2017: <u>Natural Language Processing Literature Survey</u>

June 2017: <u>Research Brief: Four Important Things to Know About Banks in a Rising Rate Environment</u>

April 2017: <u>Banking on Alpha: Uncovering Investing Signals Using SNL Bank Data</u>

March 2017: <u>Capital Market Implications of Spinoffs</u>

January 2017: <u>U.S. Stock Selection Model Performance Review 2016</u>

November 2016: <u>Electrify Stock Returns in U.S. Utilities</u>

October 2016: <u>A League of their Own: Batting for Returns in the REIT Industry - Part 2</u>

September 2016: <u>A League of their Own: Batting for Returns in the REIT Industry - Part 1</u>

August 2016: <u>Mergers & Acquisitions: The Good, the Bad and the Ugly (and how to tell them apart)</u>

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