

Panjiva Basics: Handling VUCA With HALO; Lessons for Portfolio Construction in 2020

JANUARY 31, 2020

Global

Panjiva Basics

Panjiva Research is taking part in the Portfolio Construction Forum's annual markets conference from Feb. 18. This two part report looks at the relevance of supply chain and trade data, such as Panjiva's to the high-level investment decision-making process. The second part applies lessons from our 2020 Outlook in the context of the event's theme: "high VUCA (volatility, uncertainty, complexity, ambiguity) risks and opportunities ahead".

Part 1: Handling VUCA with HALO

Supply chain data can be used from macroeconomic perspectives through country and industrial comparisons all the way through to specific corporate and product analyses – comparable to high-altitude, low opening (HALO) parachute jumps. Similarly the insights from corporate and product level trends can be rolled back up to macro level views. In that regard supply chain data analysis is well suited to incorporation into portfolio management in five ways:

Economy wide trends and connections

Export growth is a critical part of economic development. Panjiva's data shows the spread of the most recent trade downturn started in Europe's manufacturing intensive economies while, with the impact of the U.S.-China trade war adding momentum in 1Q 2019. Global exports as of November had fallen in nine of the past 10 months as shown in figure 1.

Even in the darkest period though there were still identifiable pockets of growth including the emerging "mini-Chinas". Australia is also notable for having defied gravity until October.

Supply chain data, specifically international shipping data, can provide more timely international economic activity and are useful in determining both the direction of travel as well as the breaking impact of large scale policy, economic and physical events.

FIG. 1: GLOBAL TRADE DOWNTURN RAPIDLY WIDENED IN 2019

YOY Change	Sep-18	Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
GLOBAL	5.9%	11.9%	3.1%	-2.7%	0.4%	-4.9%	-0.4%	-1.0%	-0.1%	-4.9%	0.3%	-3.3%	-2.7%	-3.1%	-3.2%	
Asia	5.8%	12.8%	2.5%	-2.8%	1.8%	-9.6%	2.7%	-2.5%	-1.9%	-3.3%	0.5%	-3.2%	-3.6%	-4.1%	-2.8%	
South Korea	-8.1%	22.5%	3.6%	-1.7%	-6.2%	-11.3%	-8.4%	-2.1%	-9.8%	-13.8%	-11.1%	-14.0%	-11.8%	-14.9%	-14.4%	-5.2%
Vietnam	6.0%	2.5%	8.1%	-0.1%	-1.1%	1.9%	6.0%	8.3%	7.8%	10.2%	11.2%	17.2%	12.2%	7.7%	4.6%	11.0%
Taiwan	2.2%	6.7%	-3.0%	-2.6%	-1.6%	-7.7%	-4.6%	-2.2%	-3.9%	2.4%	1.3%	3.2%	-3.9%	-0.3%	2.0%	3.9%
China	13.9%	14.3%	3.9%	-4.6%	9.3%	-20.7%	14.0%	-2.7%	1.1%	-1.5%	3.4%	-1.0%	-3.2%	-0.8%	-1.3%	7.6%
Pakistan	3.2%	-0.3%	-6.7%	5.2%	4.0%	-0.4%	-11.0%	-1.5%	-1.5%	-8.8%	15.8%	-7.4%	2.8%	7.9%	9.6%	-3.6%
India	-2.5%	16.4%	-0.8%	0.1%	3.9%	3.2%	12.2%	0.3%	3.4%	-7.8%	1.7%	-6.2%	-6.3%	-0.8%	-0.3%	-1.8%
Indonesia	2.6%	4.3%	-3.1%	-3.9%	-4.3%	-11.2%	-9.4%	-9.5%	-8.5%	-8.9%	-5.1%	-10.0%	-5.7%	-6.1%	-6.1%	1.3%
Singapore	9.6%	16.5%	4.6%	-4.1%	-1.6%	-0.2%	-5.8%	-3.8%	-5.8%	-10.4%	-5.9%	-11.5%	-5.7%	-8.8%	-5.1%	4.6%
Japan	0.7%	5.4%	-0.6%	-2.1%	-7.0%	-3.6%	-4.6%	-7.5%	-9.7%	-2.1%	-1.5%	-3.7%	-0.9%	-6.3%	-3.5%	-2.6%
New Zealand	2.1%	-2.0%	3.4%	-5.7%	-5.1%	-1.0%	9.9%	2.3%	1.3%	-3.3%	-9.2%	-1.4%	-1.5%	0.5%	1.5%	1.1%
Hong Kong	4.2%	14.1%	-1.2%	-5.8%	-0.7%	-7.2%	-1.3%	-2.6%	-2.3%	-8.8%	-5.3%	-6.2%	-7.2%	-9.2%	-1.4%	3.3%
Thailand	-4.3%	8.2%	-2.6%	-1.3%	-5.8%	5.8%	-7.1%	-2.9%	-3.9%	1.2%	7.3%	-4.9%	-1.6%	-3.3%	-6.5%	
Malaysia	8.8%	20.7%	2.1%	3.4%	-1.4%	-9.4%	-5.2%	-5.0%	-3.5%	-7.2%	-0.1%	-3.0%	-7.8%	-7.4%	-4.9%	
Australia	5.5%	13.7%	17.2%	11.2%	6.1%	5.1%	2.2%	10.2%	11.0%	8.7%	13.7%	4.4%	6.6%	-1.1%	0.2%	
Philippines	1.1%	6.7%	1.0%	-12.3%	-1.7%	-0.9%	-2.5%	0.4%	1.0%	1.5%	3.5%	0.6%	-2.6%	0.1%	-0.7%	
Americas	8.2%	9.8%	4.9%	0.7%	3.2%	1.4%	-0.4%	-0.1%	1.7%	-3.6%	-1.4%	-1.1%	-1.5%	-3.6%	-2.5%	
Brazil	3.0%	16.7%	26.4%	9.9%	6.2%	-8.7%	-12.5%	-1.4%	6.9%	-10.4%	-11.8%	-13.5%	5.5%	-11.1%	-16.6%	-6.2%
Chile	-5.9%	9.4%	-2.2%	-6.5%	1.8%	-12.4%	-5.4%	-8.5%	-4.8%	-15.8%	-6.1%	-3.8%	-5.7%	-20.7%	-12.0%	1.3%
Peru	-10.8%	-0.1%	-2.4%	-5.1%	-3.8%	-4.0%	-11.4%	-1.6%	-14.0%	-11.2%	0.0%	-6.8%	-0.6%	3.6%	-5.0%	-3.6%
Argentina	-4.4%	2.2%	14.6%	16.6%	-4.7%	3.3%	-5.2%	2.3%	17.1%	2.1%	8.1%	7.0%	14.1%	9.1%	10.1%	0.7%
U.S.	7.6%	7.9%	3.6%	-0.3%	2.5%	2.3%	0.7%	-2.6%	-2.4%	-3.6%	-1.1%	0.0%	-2.8%	-3.6%	-1.5%	
Mexico	11.5%	12.6%	3.0%	4.8%	5.7%	3.4%	-1.2%	6.1%	6.7%	1.2%	7.0%	2.2%	-1.3%	-1.5%	-2.9%	
Colombia	7.0%	15.3%	11.0%	-14.6%	-7.8%	6.2%	-0.8%	2.2%	1.2%	-8.7%	-9.9%	-7.3%	-12.3%	-11.9%	-13.6%	
Canada	14.9%	11.6%	2.8%	-1.7%	4.7%	2.8%	4.6%	3.3%	8.5%	-2.4%	-3.4%	-0.8%	-1.3%	-0.9%	1.9%	
Europe	3.6%	12.1%	2.7%	-5.9%	-5.1%	-2.2%	-6.0%	1.0%	1.6%	-9.0%	1.3%	-6.3%	-2.1%	-0.9%	-4.9%	
Norway	15.7%	26.5%	8.0%	-1.0%	-3.4%	-8.2%	-6.0%	-13.5%	-10.2%	-21.9%	-22.6%	-29.6%	-26.6%	-34.2%	-13.5%	0.7%
Switzerland	-6.9%	-2.6%	3.5%	-18.8%	-4.6%	-14.3%	-5.6%	4.7%	0.2%	-12.5%	11.8%	9.3%	12.9%	12.5%	-8.7%	
European Union	0.9%	10.3%	-0.6%	-7.4%	-4.7%	-2.3%	-7.3%	1.1%	5.0%	-7.7%	2.0%	-6.3%	-1.4%	1.6%	-2.8%	
Russia	25.6%	30.8%	20.3%	9.6%	-8.3%	10.9%	1.0%	2.0%	-11.8%	-9.7%	-3.8%	-9.7%	-9.3%	-12.6%	-10.3%	
Mid-East/Africa	11.1%	10.6%	3.8%	-3.2%	0.4%	-3.1%	-3.1%	1.4%	3.8%	-11.1%	1.3%	-0.8%	-0.6%	-0.6%	-1.3%	

Chart compares export growth by origin. Red indicates a drop of more than 3%, green an increase of more than 3% year over year.

Source: Panjiva

Industrial performance contributors to economic activity

The real power of trade data and supply chain analysis comes from the granularity of analysis available. Even less-than-timely government statistics can provide “before the earnings report” guidance to the performance of an industry at a high level – in simplistic terms you have to import it before you sell it.

The chart below, based on Australian Bureau of Statistics figures, shows the change in 265 industrial lines – many countries report under the HS product ontology which has around 6,500 lines on the basis of the global standard HS-6. Figure 2 shows that the iron ore industry represented more than 100% of Australia’s 6.4% A\$ export growth in November 2019 – excluding it all other products dropped 2.7% year over year.

Aside from coal, LNG and aluminum there were major declines in cotton and wool while there was significant growth in exports of beef, telecoms equipment and scientific devices.

FIG. 2: IRON ORE, BEEF CENTRAL TO AUSTRALIA'S RECENT EXPORT STRENGTH

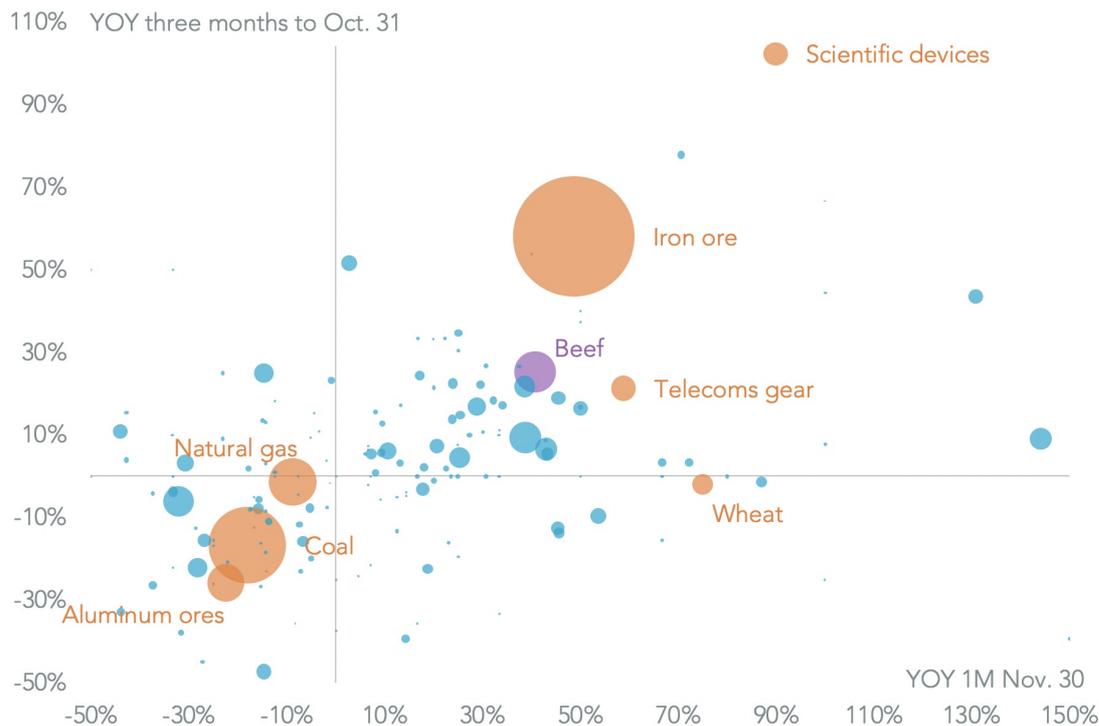


Chart segments change in Australian exports by product (SITC-3).
: Panjiva calculations based on Australian Bureau of Statistics data.

Who's who and who's doing what within industries

Dropping below the industry and product level, international shipping data can identify specific corporate trends when carefully reconciled to identifiers – which is a non-trivial technical exercise of course.

In the example below the surging exports of Australian beef to the U.S. features expanding traffic for multinational meat packers such as JBS, traders including Cargill and local, privately owned firms such as Midfield. In figure 3 we see that the analysis shows much of the recent growth has been dominated by traders – Cargill's shipments surged 26.6% higher in 4Q whereas JBS and Midfield grew by just 2.5% and 1.3% respectively.

Panjiva's data also identifies over 150 participants in the trade. Similarly, comparisons can be made to beef supplies from other countries, beef supplies to other countries as well as supplies of competing meat products.

FIG. 3: CARGILL DELIVERS FASTEST BEEF GROWTH IN Q4



Chart segments U.S. seaborne imports from Australian ports in Brisbane, Fremantle, Melbourne and Sydney by product (HS-2) on a monthly and three-month average basis.

Source: Panjiva

Joining the nodes, looking for second order effects

Portfolio management isn't just about identifying trends of course – risk management and correlation strategies (e.g. thematic investing) can also be enhanced with the use of supply chain data. A company's supply chain can be visualized and manipulated using graph theory where entities including corporations, locations and products form the nodes of a graph while the edges within the graph are defined by their trade relationships. Figure four below shows the supply chain graph for General Motors with eight major sub-clusters of suppliers.

Once constructed into a graph a variety of first and subsequent order effects can be analyzed, for example: the impact of a corporate action – ranging from an earnings beat to a bankruptcy – on that firm's suppliers and buyers; the influence of exogenous disturbances such as trade policy changes, natural disasters or strikes; divergence/convergence analysis between companies and industries. Even the change in the structure of a graph can carry useful information – are firms or whole industries changing their operating behaviors.

FIG. 4: GENERAL MOTORS SUPPLIER GRAPH FOR CALENDAR YEAR 2018

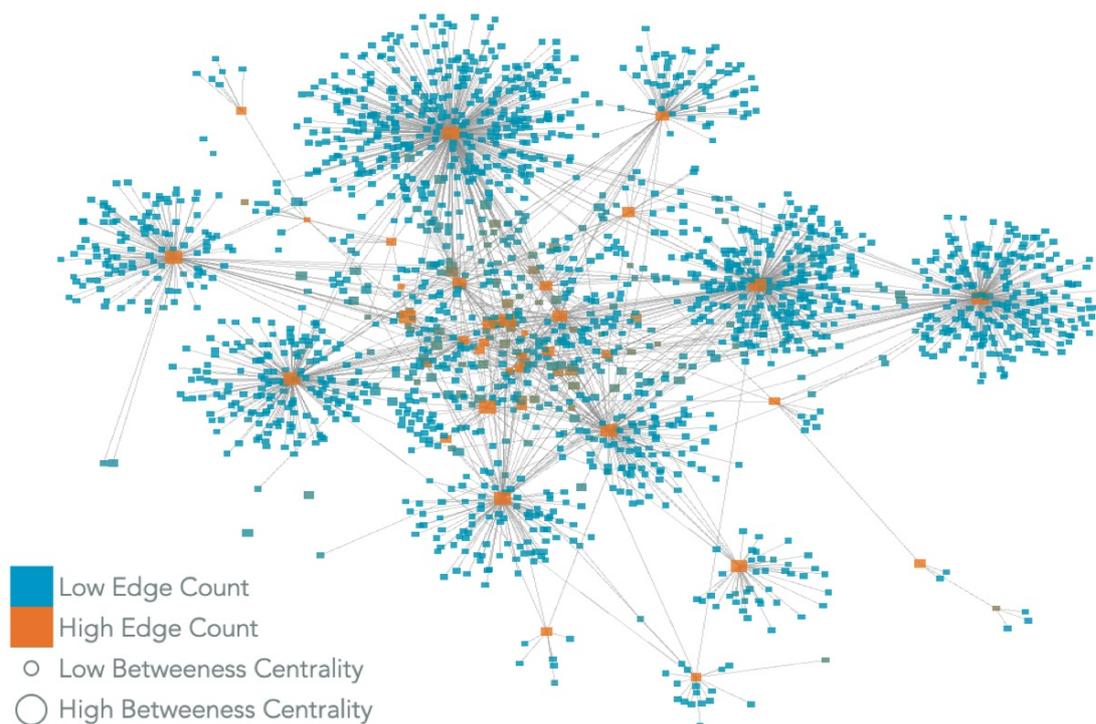


Chart shows supplier relationships by company and country with color indicating edge count (Orange high, blue low) and size indicating betweenness centrality of the node (high betweenness centrality is higher) within two transactions of General Motors. Data retrieved via S&P Global Xpressfeed.

Source: Panjiva

Proper use of supply chain insights

It's worth bearing in mind that supply chain data, like all alternative datasets, has its limitations. From a practical perspective the visibility of the chain normally starts at factories or warehouses and ends at distribution centers rather than stores. As a consequence from a positioning perspective it is more descriptive of the cost of goods sold and inventories than it is of sales or revenues.

Additionally, not all countries report detailed, shipment-level data that allows the identification of specific corporate activity. Panjiva's dataset, for example, includes shipment data on around 43% of global trade though it has full coverage at a "macro" level where trade in products between countries can be seen.

The 15 countries where Panjiva captures shipment data also provide a "slice" of shipment data for all other countries on the other side of each trade transaction. The various datasets have a variability in latency, frequency, granularity and units used.

Obviously too not all industries have the kind of globally-extended, merchandise based inputs to value generation that lend themselves well too analysis with supply chain data. Those that do, shown in figure 5, including retail, consumer goods, heavy machinery and autos.

A forthcoming paper from S&P Global Quantamental Research will analyze all these issues in more detail in the context of the automotive industry.

FIG. 5: SHIPPING DATA COVERAGE HIGHER FOR LARGE, HEAVY, SLOW SECTORS

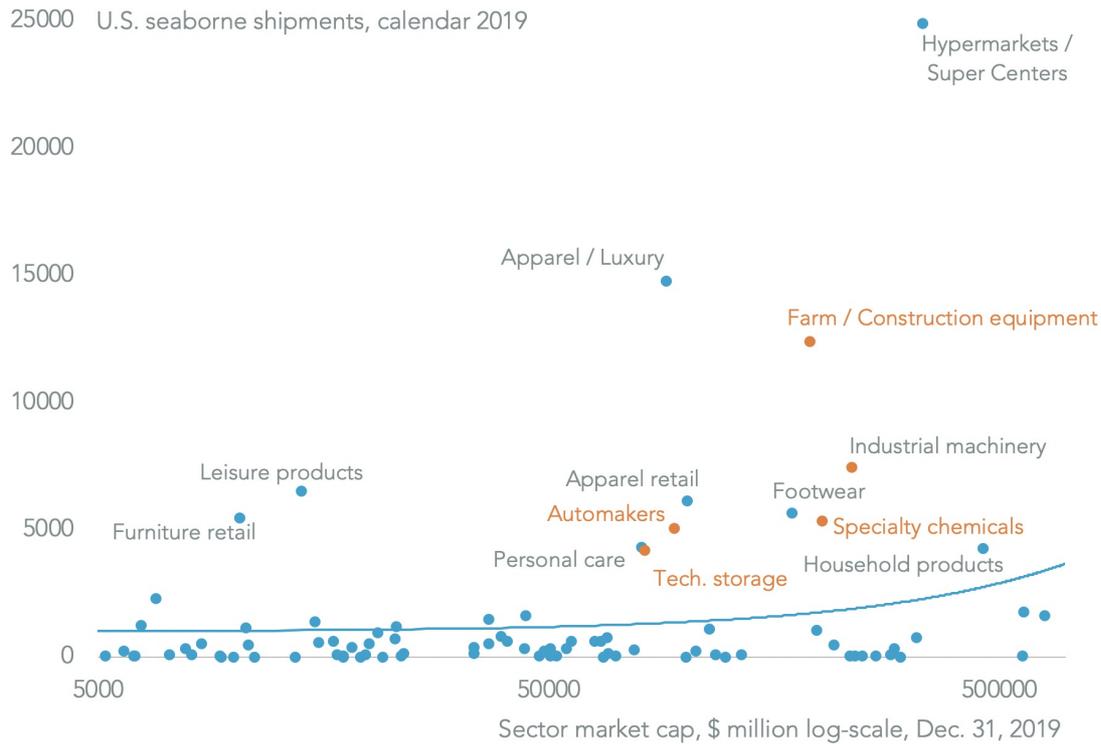


Chart compares U.S. seaborne imports in 2019 by Global Industry Classification (GICS) to sector market capitalization at year end. Calculations include S&P Global Market Intelligence data. Colors for emphasis only. Data retrieved via S&P Global Xpressfeed.

Source: Panjiva

Part 2: Supply chain lessons for 2020, and beyond

Panjiva's 2020 Outlook series has touched on a wide range of global supply chain topics including the impending U.S.-EU trade war and the health of globalization through changing corporate supply chain strategies and the state of supply chain technology. Many of those are directly applicable to managing volatility, uncertainty, complexity and ambiguity in 2020.

(V)olatility in supply chains

Corporate supply chains have had to deal with rapid shifts in the political and economic underpinnings of decision-making. Many firms have responded to growing volatility with an acceleration of investment in realigning their supply chains at the expense of investing in new products or opening new sales markets.

Panjiva’s Jan. 17 research showed that businesses actually now see trade policy volatility as “business as usual” – transcript analysis showed that in calendar 4Q 2019 just 20.9% of firms discussed tariffs in their conference calls, the lowest since 2Q 2018. At the same time the evidence of supply chain realignment has been mounting.

As shown in Figure 6, bicycle maker Giant has made one of the biggest shifts with China representing 43.9% of U.S. seaborne imports linked to the firm in 2019 from 89.1% in 2016. Retailers have significant flexibility, shown by Costco which has cut to 65.7% from 67.1%. Other companies have had to change course mid flight – Superdry’s initial shift into China from Turkey was driven by cost concerns, but it has since had to move back to Turkey.

FIG. 6: GIANT TAKES A BIG STEP OUT OF CHINA, COSTCO CUTS MORE SLOWLY

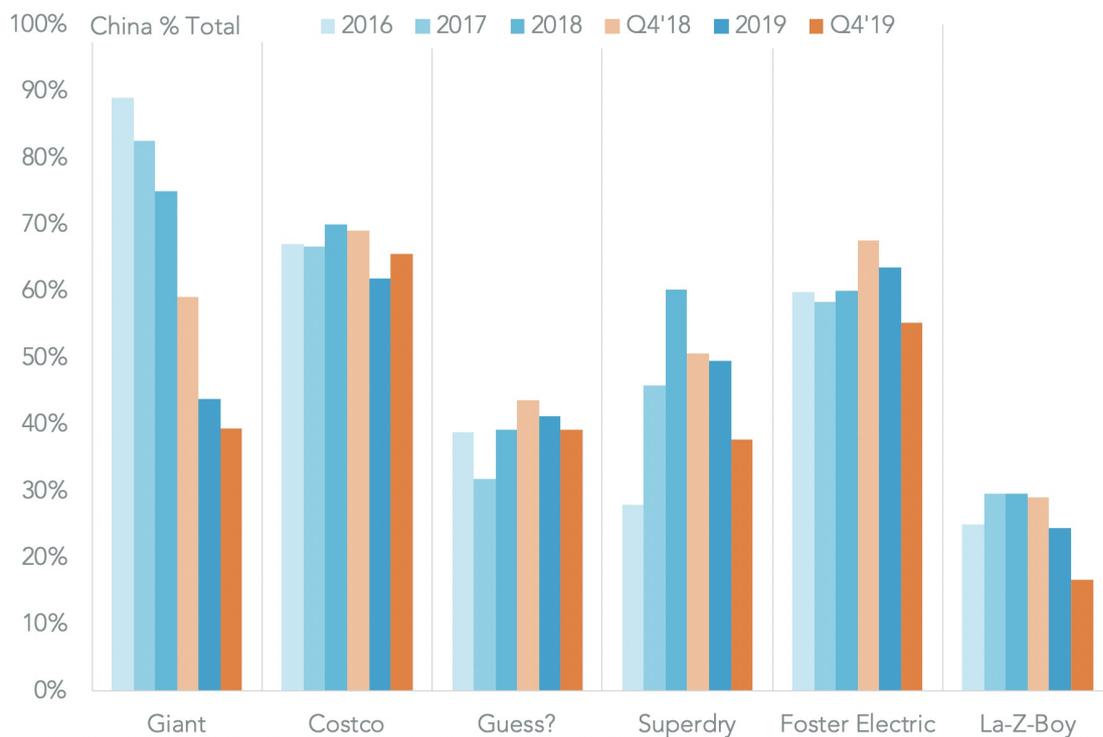


Chart compares China as a proportion of U.S. seaborne imports associated with Giant, Costco, Guess?, Superdry, Foster Electric and La-Z-Boy.

Source: Panjiva

The trade policy shifts of the past two years are by no means the end of the story. Investors may have assumed that the recently signed phase 1 trade deal will bring a pause to U.S.-China tensions and policy uncertainty.

Yet, the detail of the commitments shown in figure 7 below suggest purchases of industrial products, which are generally led by private and not state-owned firms, need to rise by 88.4% in 2021 versus 2017. Similarly shipments of agricultural products need to rise by 93.2%, energy by 443.1% and services by 44.8%. Successful delivery is by no means guaranteed and there are already significant policy hurdles to the so-called phase 2 negotiations.

FIG. 7: MANUFACTURING, SERVICES CRITICAL TO PHASE 1 DELIVERY

	2015	2016	2017	2018	L12M	2020	2021 versus 2017		
							2021	% change	\$ change
Manufactured	46431	45820	50677	49455	49538	83577	95477	88.4%	44800
Industrial machinery	12248	11387	12893	14200	12731				
Electrical equipment and machinery	7747	7199	6843	6783	6321				
Pharmaceutical products	1849	2001	2449	2779	4070				
Aircraft (orders and deliveries)	0	0	0	0	0				
Vehicles	9065	8853	10335	6796	7271				
Optical and medical instruments	3334	3695	3978	4335	4727				
Iron and steel	1116	1051	1255	752	382				
Other manufactured goods	11072	11634	12924	13811	14036				
Agriculture	21500	22803	20927	10444	13657	33427	40427	93.2%	19500
Oilseeds	10489	14203	12225	3119	7069				
Meat	377	616	559	440	974				
Cereals	2486	1308	1358	697	263				
Cotton	854	552	974	921	699				
Other agricultural commodities	6251	5152	4573	4196	3772				
Seafood	1044	973	1240	1071	880				
Energy	1603	1890	7650	7987	3833	26150	41550	443.1%	33900
Liquefied natural gas	0	115	424	464	83				
Crude oil	15	361	4379	5431	3022				
Refined products	1566	1289	2444	1782	584				
Coal	23	125	403	311	143				
Services	49021	54404	56008	57139	56587	68808	81108	44.8%	25100
Commitments	118555	124917	135263	125025	123614	211963	258563	91.2%	123300

Chart shows U.S. exports to China of products targeted in the phase 1 trade deal. 2020 and 2021 based on commitments made by the Chinese government, data through Nov. 30, 2019.

Source: Panjiva

Relations between the EU and U.S. sit on the knife-edge of improving towards a trade deal or worsening towards a tariff-driven trade war. Tax policy sits at the heart of the matter with a spat over digital services taxes having only been narrowly avoided while a carbon border tax debate is only just getting started. President Trump has continued to hang the threat of autos tariffs over the EU. Figure 8 shows, however, that the major automakers have not yet responded with stockpiling and may have been beset by weak underlying demand for cars.

As has been the case with the ongoing aerospace subsidy disagreements it will be a wide range of industries – including particularly metals, autos and luxury goods – that will feel the impact of widening and deepening tariffs.

FIG. 8: ROT HAS SET INTO CAR PARTS IMPORTS FROM EUROPE IN 4Q

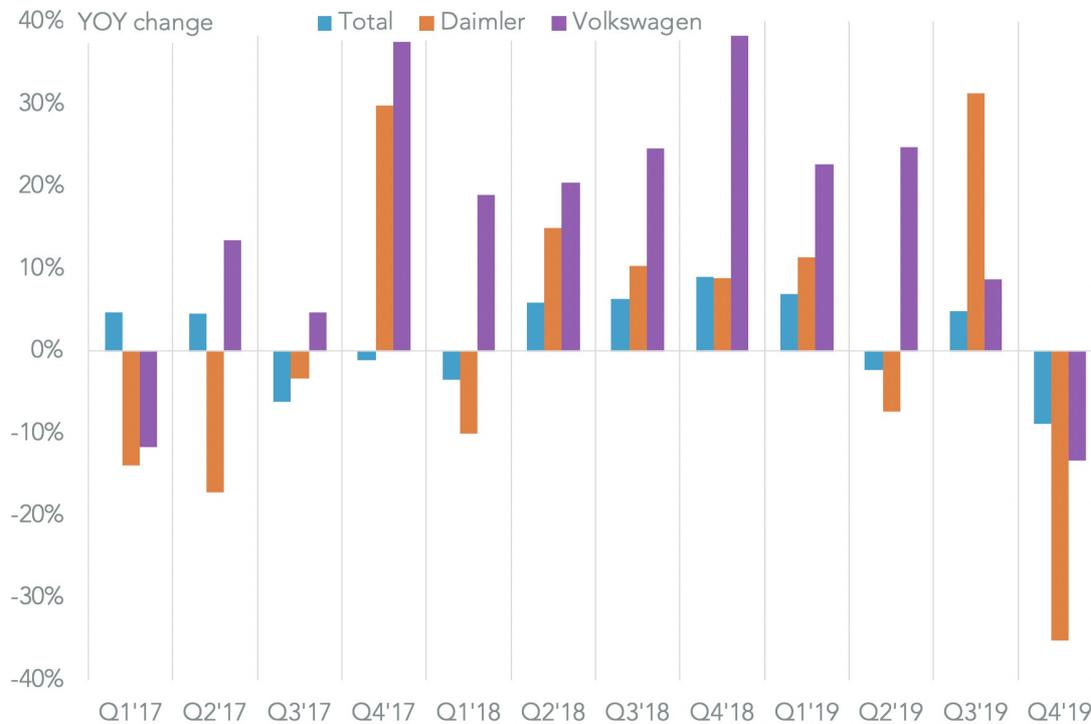


Chart segments U.S. seaborne imports of auto parts from the EU by shipper.

Source: Panjiva

The good news is that elsewhere in the world there is a continued push towards trade liberalization. The crown jewel (at least for 2020) would be a finalization of the Regional Comprehensive Economic Partnership (RCEP) which would bring Japan, South Korea, China, ASEAN, Australia and others together in a free trade zone that includes 44.6% of Japan's exports and 29.6% of China's as shown in figure 9. Another area for growth and development opportunity will come from the implementation of African Continental Free Trade Area (AfCTA).

The cloud hanging over global trade is the need for WTO reform – without a strong dispute settlement system corporations will have little clarity about which trade rules will be upheld and which will be ignored for an indefinite period.

FIG. 9: REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP DEAL MATTERS MORE TO JAPAN THAN TO CHINA

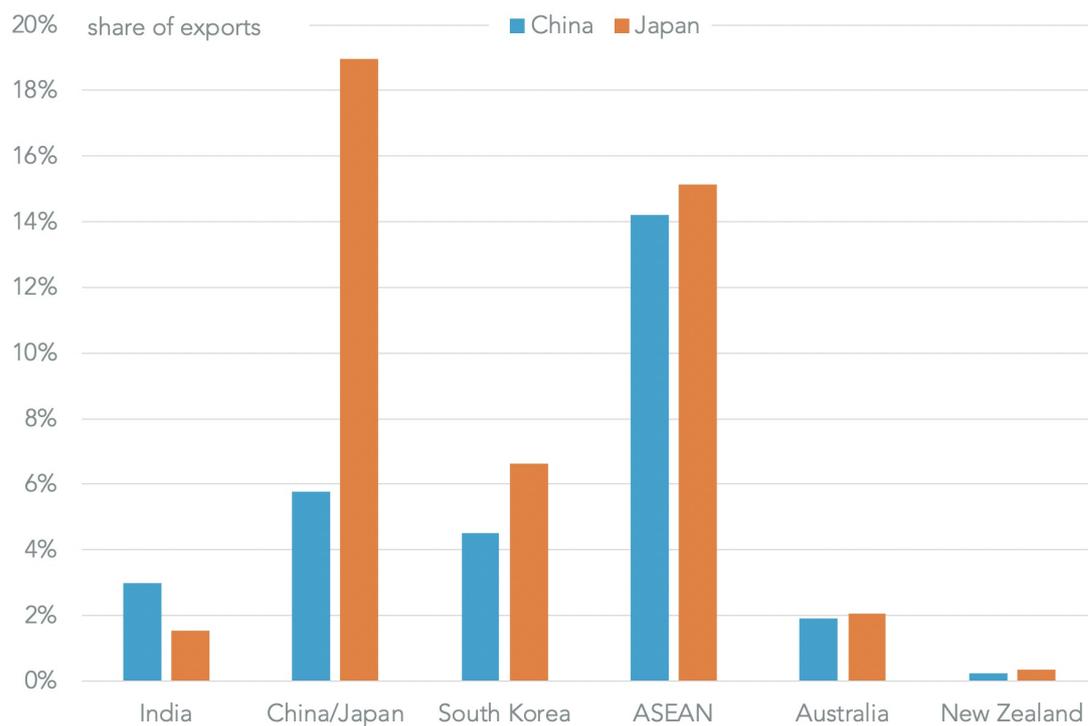


Chart segments China and Japan's exports to the RCEP group by destination.

Source: Panjiva calculations based on China General Customs Administration and Japanese Finance Ministry data.

While the need for action to tackle climate change is a given, there remains considerable uncertainty as to the policy mechanisms involved and how they will impact upon supply chains. As mentioned already the EU's push towards a carbon border tax could rapidly lead to the "greening" of trade deals more broadly. Indeed, the French government's insistence of only signing deals with signatories of the Paris Climate Accord is a tacit sign that has already happened.

The cost of operating supply chains will also increase if the shipping industry is included in carbon emissions pricing schemes. On the basis of Trucost data for the carbon intensity of revenues shown in figure 10, the direct impact on the industry could be significant with each \$10 per ton of carbon pricing equivalent to 1.3% points of revenue for the largest container-lines.

FIG. 10: SHIPPING EMISSIONS INTENSITY TOOK A DIP IN 2018

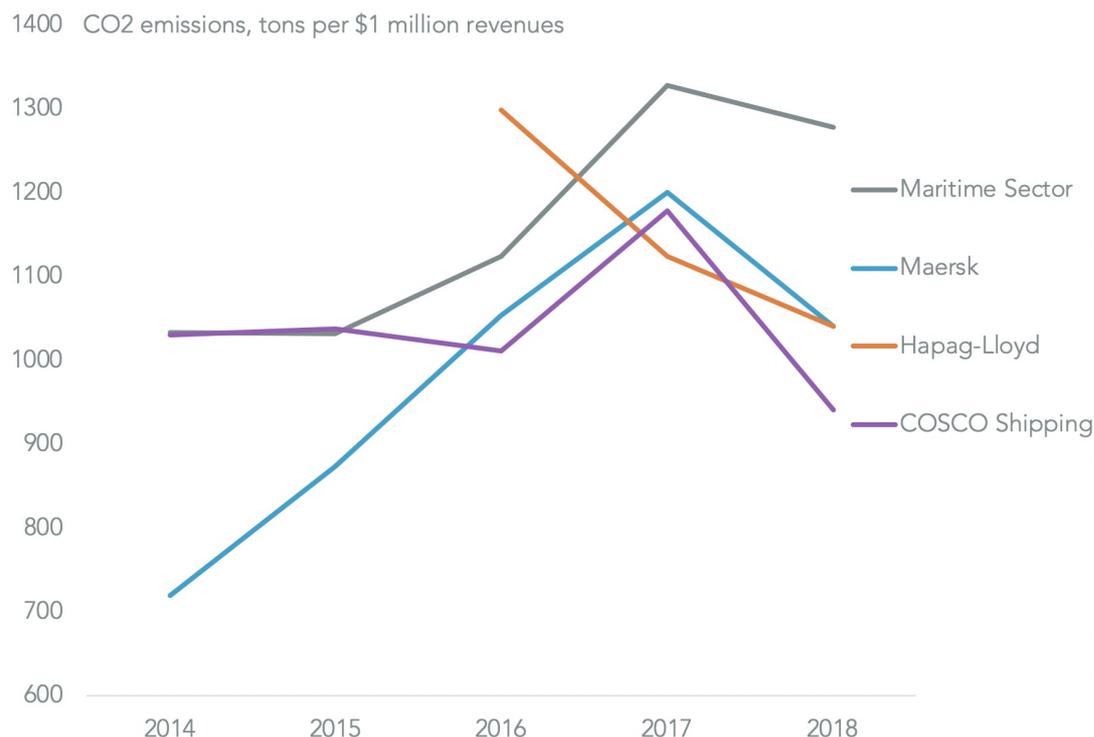


Chart compares carbon intensity of revenues by company. Calculations based on S&P Global Trucost data.
Source: Panjiva

Increasing (C)omplexity

Managing volatility requires a balance between a diversified supply base and the costs of unnecessary complexity within that supply base.

Corporations are already having to build up their technological capabilities in data gathering (IoT) and decision making (data-science skills) including mainstream manufacturing industries.

There's already a sign, however, that less complexity may be a preferred strategy. Figure 11 shows that, on a broad-brush basis, the pendulum may have swung with a 3.5% drop in the average number of shippers per consignee in U.S. imports in 2019 versus the peak of 2015, Panjiva's data shows. The auto industry has yet to see such an adjustment, with the enactment of the U.S.-Mexico-Canada Agreement and potential for a U.S.-EU trade war casting doubts over longer-term decision making on the complexity of supply chains.

FIG. 11: PAST PEAK COMPLEXITY



Chart compares the index of total shippers and consignees on U.S. seaborne imports to the ratio of shippers per consignee for total trade and automotive sector shipments.

Source: Panjiva

Handling (A)mbiguity

There are a wide-range of high impact, low probability risks that can add a degree of ambiguity to the assumptions underlying the decisions being made by supply chain operators and decision makers. Many of these in 2020 relate to the risk of physical conflict whether in the Middle East, South China Sea or the India-Pakistan border. The latter may be exacerbated by the low proportion of Pakistani supplies in Indian exports as shown in figure 12.

Most recently the impact of the rise in coronavirus cases is ambiguous – a public health emergency will not necessarily become a supply chain disaster.

Planning for, and adapting to, such ambiguity is a core use case for supply chain data more broadly. If the aphorism that countries that trade together don't fight each other is true, then the minimal share of Pakistan's exports accounted for by India should be a cause for concern.

FIG. 12: INDIAN IMPORTERS HAVE LITTLE EXPOSURE TO CONFLICT WITH PAKISTAN

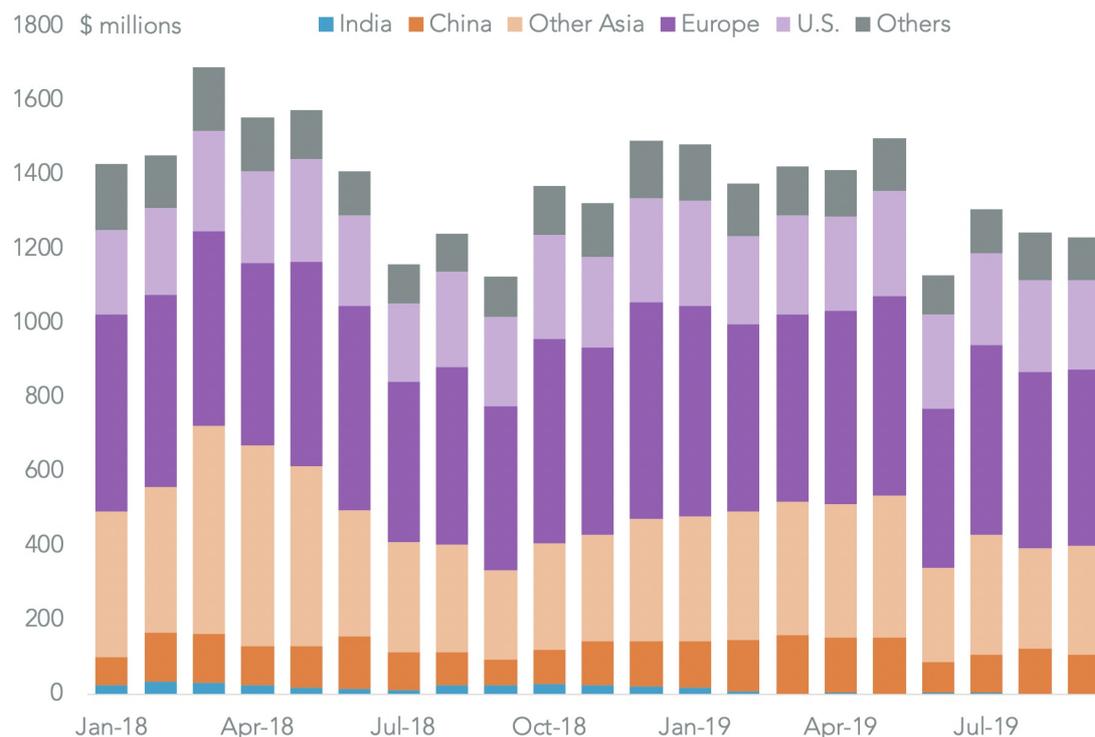


Chart segments Pakistani exports by destination.

Source: Panjiva

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