



Potential Impacts of the U.S. - China Trade Issue on the Chemical Industry Supply Chain

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With President Trump currently pursuing a highly aggressive trade policy towards China, the impact on chemical supply chains in China, the U.S., and the rest of world could be substantial. U.S. and Chinese chemical companies are already being impacted, and their options to mitigate the consequences of this policy in the short term seem limited. This is due to several factors, such as the substantial effort required to develop new trade relationships and unwillingness to invest huge amounts of capital in establishing new supply chains.

In this paper, we aim to analyze this trade in some detail, focusing on those chemical segments for which U.S. - China trade matters the most. We will also point out some consequences in reduced chemical trade between the two countries due to higher tariffs – even though currently it cannot be forecast with any certainty whether these tariffs will be lasting, or whether a trade deal between China and the U.S. can be achieved.

According to data from the United Nations Conference on Trade and Development (UNCTAD) from 2007 to 2017 (2018 data is not available yet), Chinese chemical exports to the U.S. grew much faster than general exports. In the same period, U.S. exports to China underperformed relative to all exports from the U.S. to China (Tab. 1).

China in 2017 exported US\$ 16.6 billion of chemicals to the U.S., or 11.8% of its total chemical exports of US\$ 141.2 billion (or about 1.1% of China's total chemical market, which reached a value of about US\$ 1,446 billion in 2017). Meanwhile, U.S. chemical

exports to China in 2017 reached a similar value of US\$ 15.7 billion, though due to the larger total U.S. chemical exports, this represents only 7.6% of the total U.S. chemical exports.

Recent data points out that while the trade in chemicals is certainly affected by the trade issue between the U.S. and China, it is not among the reasons for it. According to the U.S. census bureau, the U.S. in 2017 exported US\$ 130 billion worth of goods to China, while it imported US\$ 505 billion. Compared to this imbalance, the value for chemical exports (US\$ 15.7 billion exports from the U.S. to China vs US\$ 15.7 billion imports from China) seems very balanced.

Unfortunately, given the nature of trade issues, this does not mean that chemicals are unaffected. Indeed, duties have already been imposed on a variety of chemicals. However, let us first take a closer look at the types of chemicals traded between China and the U.S., and their relative importance.

The UNCTAD database lists 33 categories which can be regarded as covering chemical products in a broader sense. These 33 categories combined account for the total 2017 chemical exports from China to the U.S. of US\$ 16.6 billion.

Six of these categories cover exports exceeding US\$ 1 billion:

- Carboxylic acids and derivatives
- Nitrogen-function compounds
- Organo-inorganic and heterocyclic compounds, nucleic acids
- Medicinal and pharmaceutical products excluding medicaments
- Perfumery, cosmetics or toiletry preparations

- Plates, sheets, films, foil & strip, of plastics

In terms of total trade loss, these categories are those where the biggest absolute losses are to be expected in case of unified, high import duties. However, the importance of the U.S. as an import destination varies from slightly below 10% for the last category (Plates, sheets, films ... of plastics) to almost 30% for the Perfumery category. Thus, assuming a 25% customs duty would reduce exports to the U.S. by 50%, the Chinese plastics producers would only lose about 5% of their total global export volume while producers of perfumery preparations would lose 15%.

Looking at U.S. exports to China, the top 6 categories account for 45% of total U.S. exports to China and include

- Misc. hydrocarbons and derivatives
- Medicinal and pharmaceutical products excluding medicaments
- Medicaments and veterinary medicaments
- Polyethers, polyesters, polycarbonate
- Other plastics
- Plates, sheets, films, foil & strip, of plastics

For these categories, China accounts for between 5% and 35% of U.S. global exports, with the category "Polyethers, polyesters, polycarbonate" reaching the highest share and thus likely to be the most affected by a trade issue between the two countries.

As stated above, the overall trade imbalance in chemicals is relatively small, with China exporting US\$ 1.06 worth of chemicals to the U.S. for every US\$ 1 imported into China for the U.S. However, for individual categories the imbalances can be much bigger. Tab. 2 shows those categories for which the export from one

Tab. 1: Chemicals export China and US versus all exports (source: UNCTAD)

China Export Growth to U.S. (yoy)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-YR CAGR
Selective Chemicals Exports	21.8%	53.2%	-23.1%	26.4%	20.7%	18.3%	7.3%	1.5%	-2.8%	-3.4%	25.6%	10.6%
All China Exports to U.S.	14.4%	8.4%	-12.5%	28.2%	14.5%	8.4%	4.7%	7.6%	3.2%	-5.9%	11.6%	6.3%
U.S. Export Growth to China (yoy)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10-YR CAGR
Selective Chemicals Exports	36.4%	9.9%	12.2%	16.7%	9.4%	-5.5%	4.5%	2.2%	-5.0%	5.7%	11.4%	-11.5%
All U.S. Exports to China	-8.0%	9.5%	-2.6%	32.1%	13.3%	6.1%	10.1%	1.6%	-6.1%	-0.4%	12.4%	-3.8%



Tab. 2: Chemical categories with major 2017 trade imbalance between China and the U.S.

Categories dominated* by China exports to U.S.	US\$ millions	% of Global Exports	Categories dominated* by U.S. exports to China	US\$ millions	% of Global Exports
Carboxylic acids, anhydrides, halides	1 092.2	14.0%	Alcohols, phenols, halogenat., sulfonat., nitrat. der.	519.30	9.2%
Nitrogen-function compounds	1 194.2	12.6%	Polymers of ethylene, in primary forms	854.49	10.7%
Organo-inorganic, heterocycl. compounds, nucl. acids	2 657.1	15.8%	Polymers of styrene, in primary forms	141.03	9.9%
Other organic chemicals	724.8	19.8%	Polymers of vinyl chloride or halogenated olefins	380.96	10.3%
Synth. organic colouring matter & colouring lakes	217.1	8.3%	Polyethers, epoxide resins; polycarbonat., polyesters	854.87	15.4%
Dyeing & tanning extracts, synth. tanning materials	28.6	12.5%	Waste, parings and scrap, of plastics	190.74	30.0%
Perfumery, cosmetics or toilet prepar. (excluding soaps)	1 186.0	28.6%	Prepared addit. for miner. oils; lubricat., de-icing	499.02	10.6%
Tubes, pipes and hoses of plastics	561.4	22.9%	Miscellaneous chemical products, n.e.s.	2 163.76	10.6%
Monofilaments, of plastics, cross-section > 1mm	56.3	11.7%			
Insecticides & similar products, for retail sale	252.7	5.3%			
Explosives and pyrotechnic products	279.2	34.5%			

* Exports that have at least twice the value of corresponding imports for the same category.

country into the other is at least twice as big as the corresponding import.

Broadly speaking, the U.S. is a substantial net exporter for commodity and engineering plastics as well as for some small-volume specialty chemicals. The first reflects the U.S. utilization of cheap shale gas to produce plastics while the second one reflects the higher maturity and stronger focus of specialty chemicals for the U.S. chemical industry. In contrast, China is a net exporter to the U.S. for a number of organic intermediates as well as for colors and dyes, which reflects the cost advantage of China's producers in somewhat more labor-intensive chemical production as well as the shift of key customer industries from the West to Asia. As a consequence of these imbalances on the level of chemical categories, these categories are particularly vulnerable to tariffs imposed during trade issues.

At the moment, it is far from clear how the trade issue will play out. U.S. president Trump is always good for some surprises – however, these might take the shape of ever tightening trade barriers and increased tariffs, or some kind of grand bargain that he can sell to U.S. voters as a demonstration of his bargaining skills. However, in the case of further trade restrictions, several consequences are very likely.

Chemical trade between the two countries will be reduced drastically, as both countries

search for alternative suppliers in countries that are not affected by the trade issue. Ed Brzytwa, director of trade of the American Chemistry Council, went as far as saying that as a consequence of China's most recent retaliatory tariffs, "effectively, that market (China) is closed to U.S. exporters".

Insecurity about chemical investment in China will increase, and to some extent also that of chemical producers in the U.S. In both cases, chemical production is at least partly scheduled to be exported back to the respective home country, which would obviously be endangered by higher tariffs.

Global (and even Chinese) chemical companies may consider shifting investment from China to other countries that offer somewhat similar advantages (low production costs, proximity to huge markets, etc.) but will not be affected by the trade issue, e.g., India or South-East Asia.

Chemicals produced in the U.S. are already suffering from both higher cost of materials imported from China and the shrinking Chinese export market due to retaliatory tariffs, and will suffer even more.

According to S&P Global Platts, for U.S. chemical producers, the trade issue could lower the return on investment for hundreds of planned chemical projects recently built or already under construction.

Apart from these direct consequences, it is

important to note that indirect consequences may have a much bigger impact. While the amount of chemicals exported from China to the U.S. is sizeable, they account for only about 4% of total Chinese exports to the U.S. However, if a trade issue reduces U.S. demand for the remaining 96% of current Chinese exports, this will certainly also be felt by the Chinese chemical industry, which domestically provides many raw materials for these exports.

It is therefore not surprising that the U.S. trade policy has been criticized by a number of organizations and companies.

BASF stated the company is "concerned about the U.S. announcements, and the response of several of its trading partners, to impose import tariffs on a wide range of products that could affect the chemical industry and its numerous customer industries" while Houston-based Phillips 66 remarked that the trade issue is cutting margins for chemicals as the demand from China weakens.

The Houston Chronicle is worried about impacts on jobs in the Houston area: "The Gulf Coast petrochemical industry, already bruised by trade tensions with China, faces higher costs, shrinking profits and tougher market access from the new round of tariffs imposed by the Trump administration, putting thousands of American jobs and billions of dollars in capital investments at risk if the trade war with China escalates."