

COVID-2019 IMPACT: APRIL 13TH UPDATE

April 13, 2020

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TEHCET Supply-Chain Impact Summary (TSIS) provides an update on the coronavirus (COVID-19) situation. Information includes trends pertaining to the spread of the virus and the impact on economic activity.

1. SUMMARY

The TEHCET COVID-19 survey of April confirmed logistic issues are emerging as a concern to CMC member companies and the semiconductor industry at large.

Information with regard to impact on the supply-chain from CMC Members is that there are no wide ranging shutdowns of any material or chip fabricators, however a few sites are encountering lower production levels and all non-essential personnel are required to work from home. We are now seeing reports of layoffs and cost-control measures being implemented. Industry contacts indicate that materials ordering activity is also normal, and in some cases better than usual. Discussions lead us to believe that BCP protocols have been implemented by device makers (and OEMS), so these companies may be building up material supply in anticipation of future, unknown disruptions because of the COVID-19 situation.

The global spread of the coronavirus outside of China caused an increase in cases in other countries and regions, especially in Europe and the U.S. As noted in previous updates, governments around the world have instituted border closures, travel restrictions, and community shutdowns. It is now recognized that the global economy will experience a contraction in the first half of 2020 given the restricted economic activity caused by the response to address the COVID-19 virus pandemic.

Industry contacts in China reaffirm the improving work situation there as more employees have returned to work though public health protocols are in-place. Contacts note that travel by Expressway and High Speed Rail are essentially back to normal; and that the supply chain in China is stable and slowly improving some. Shipping costs are gradually coming down as commerce improves. There has not been much change in import/export activity over the past couple of weeks. This may be the result of a decrease in demand for Chinese goods caused by the COVID19. As the outbreak continues to grow proliferate overseas, number of new cases have been imported back to China—reportedly many tied to Chinese passport holders returning to home.

On April 13th, the French government extended its anti-COVID19 measures until May 11th. Although it appears semiconductor and materials companies are open. “The only people permitted to be outdoors are those who can’t work from home, who are going to help sick relatives, buy essential supplies from approved shops or attend a medical appointment, or who are taking brief exercise alone.”¹.

¹ <https://www.weforum.org/agenda/2020/03/people-in-france-can-t-leave-home-without-this-permit-during-the-covid-19-outbreak/>

In the US, state Governors in California, Oregon and Washington announced a “Western States Pact”, agreeing they would coordinate efforts on when and how to reopen their economies “based on certain health outcomes.” Governors in New York, New Jersey, Connecticut, Massachusetts, Pennsylvania, Delaware and Rhode Island have formed a working group to develop a regional plan, but haven’t set a timeline for when commercial businesses will be able to reopen.

Mandated shelter in place orders have become more prevalent in most U.S. states with only a handful of states making it optional. The number of cases appears to be trending downward but the virus is still widespread, with 6.7K cases per day being reported in New York, and more than 1K cases per day in California, with a total of over 518K active cases in the US as of April 14, 2020.

Prior announcements per region:

Malaysia: On April 1st, the Malaysian government extended its anti-COVID19 measures until April 14th. These measures include limits on travel within Malaysia and government restrictions on what type of businesses could continue operations. As noted in previous COVID updates from TECHCET, exemptions have been made for fabs and assembly & packaging operations in Malaysia, and other companies have applied and received exemptions too as long as they follow government protocols for employee health and safety. A potential issue for the semiconductor industry is that other companies (material suppliers, machine shops, service providers, etc.) in the industry supply chain have not received exemptions and this could cause some constraints in electronics manufacturing.

Singapore: Effective April 7th, Singapore announced the adoption of stricter controls as it adopted stricter safe distancing measures to stem the transmission of Covid-19 (per the Strait Times): closing all non-essential businesses and workplaces. “Semiconductor, Pharmaceutical, and Biomedical Science companies and their suppliers” are exemption from the new government mandate. (<https://covid.gobusiness.gov.sg/essentialservices/manufacturing/>).

Japan: On April 7th, a State of Emergency was declared in Japan because of Covid-19 was declared on April 7th and covers seven prefectures. Abe's news conference followed the official declaration of a state of emergency earlier in the day. The declaration will last through May 6th (End of the Golden Week holiday) and covers Tokyo, Saitama, Kanagawa, Chiba, Osaka, Hyogo and Fukuoka prefectures. The measures do not restrict companies from operating though health & safety measure are promoted to reduce any human to human contacts. Restaurants, bars, theaters, museums, shopping malls, clubs, amusement parks, etc. are all affected but the semiconductor industries and its supply chain will not. Given the COVID-19 situation, it is expected the domestic air travel within Japan will be greatly reduced in the coming months.

Table 1 summarizes COVID-19 related lockdown dates for selected countries

Table 1: Summary of Selected Country's Lockdown End Dates

Country	Lockdown/Restriction End Date	Other Actions/Restrictions
China	"Open" with restrictions and protocols in place	Suspended practically all entry to the country by foreigners and was halting almost all international passenger flights Starting on 4/12, travelers arriving in Beijing required to provide negative coronavirus test results when checking into hotels
South Korea	No lockdown. "Intense" social distancing to end April 19th	Restrictions on travelers from overseas (all arriving passengers are required to self-isolate for 14 days in an expanded screening efforts
Japan	May 6 th	Covers seven prefectures: Tokyo, Saitama, Kanagawa, Chiba, Osaka, Hyogo and Fukuoka
Malaysia	Movement Control Order (MCO) extended to April 28.	Selected businesses can operate under strict movement control and healthcare guidelines
Singapore	May 4 th	Closed all non-essential businesses and workplaces beginning on April 7 th and implemented other "circuit breaker" measures
France	Extended to May 11 th	Lock-down has been extended to May 11 th although many business outside of the hospitality and vacation industry remain open
Germany	Current measures set to end April 19 th (Update to be presented on April 15 th)	Measures/restrictions likely to continue. Strict social distancing measures likely to remaining with measures to reopen stores and possibly some schools to be set; and border closures to be relaxed
Italy	Extended to May 3 rd	
United Kingdom	Expected to extend lockdown into May	
United States	Determined by the states. Discussions of opening up economic activity on May 1 st or shortly after will be determined by the states in concert with Federal officials and agencies.	States within the US are voicing varying opinions and desires about whether to extend stay-in-place orders

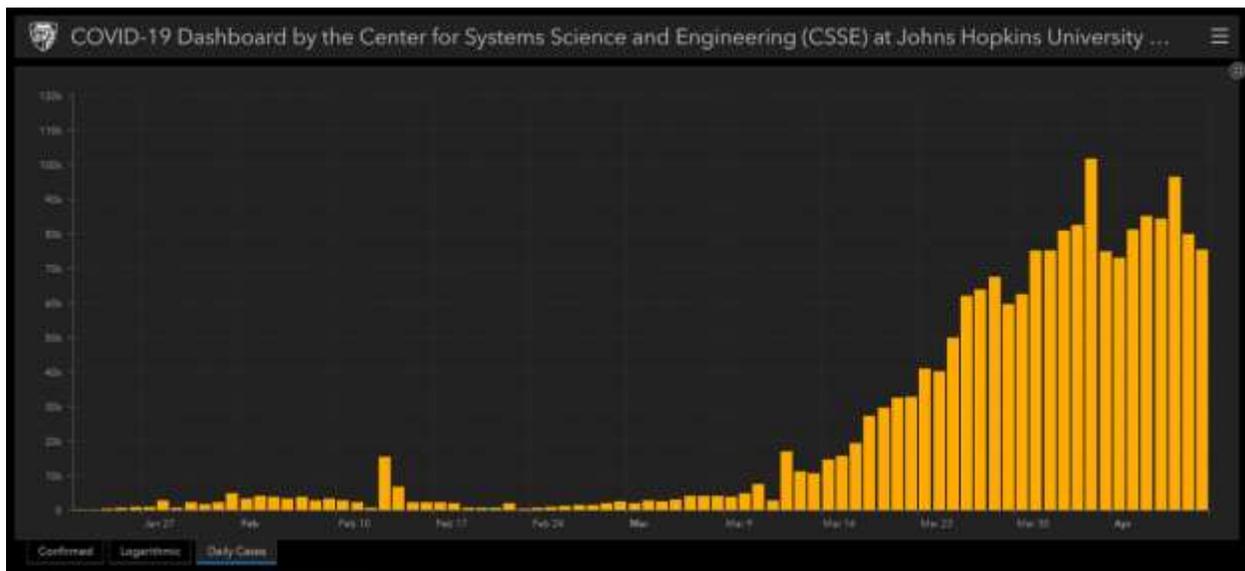
2. GLOBAL RATE OF INFECTION

The rate of new cases within China has slowed, though the crisis is growing in Europe and the U.S. continues to grow. Source: Johns Hopkins University.

Figure 1 shows total new cases reported each day. The observed increase over the past week is a function of

1. the spread of the COVID-19, especially outside of Asia
2. the increase availability of testing

Figure 1: Coronavirus COVID-19 Global Cases Reported



Source: <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>

Per the John Hopkins University tracking, the five countries with the largest number of confirmed COVID-19 cases are, in order from largest, U.S., Spain, Italy, France, and Germany. The Korea CDC reports new cases in South Korea have trended below 100/day for the past 12 days. Of the 10,284 positive cases reported in South Korea, over 7,400 have been discharged from isolation, while another 2,900 (down from 3,500 last week) remain in isolation. South Korea has implemented strict measures in screening and testing of visitors to that country.

3. GLOBAL ECONOMIC INDICATORS

A typical indicator of economic trends, is the London Metals Exchange (LME) daily pricing for key metals used in manufacturing and construction. The LME is viewed as a measure of economic activity. The index declined dramatically over the past two weeks, dropping below \$5000/tonne on March 18th (Figure 2). LME Copper pricing trended below \$4800/tonne range through late March. This reflects the growing economic uncertainty because of the coronavirus; however, during the first week of April pricing improved and approached the \$5000/tonne figure. This uptick is likely in response to supply concerns as some global mining and refining activity has been reduced.

Figure 2: Daily LME Copper Metal Pricing Through April 8th 2020



Source: <https://www.lme.com/Metals/Non-ferrous#tabIndex=0>

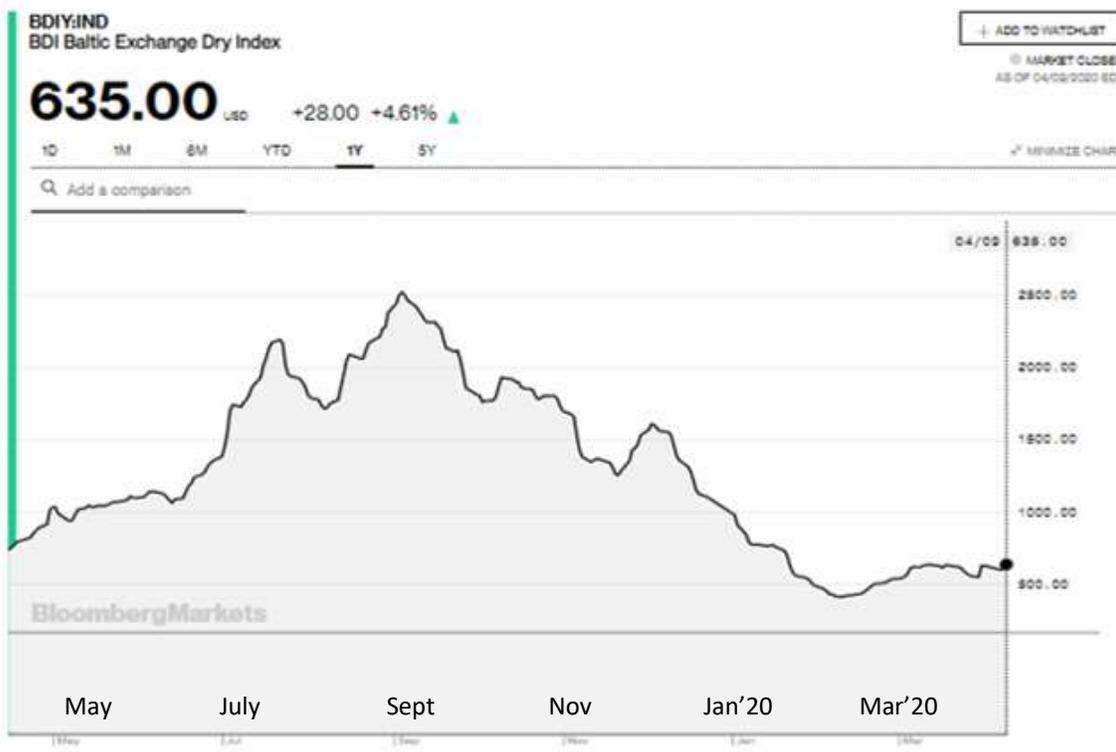
In addition to LME copper pricing trends, crude oil pricing is another measure of economic strength/growth (though intertwined with the complexes of geopolitics). Average crude oil pricing in 2019 was in the \$50 to \$60/barrel range, while in recent weeks it has dropped below \$30/barrel. On April 13th, OPEC and other oil producing countries announced an agreement to reduced oil production from May 1st to June 30th.

With reduced demand related to travel and economic activity, and with low pricing for crude and natural gas producers, a consequence will be potentially lower petroleum refining and chemical production over the coming months. Depending on the severity of this trend, it will have an impact on the pricing and availability of key chemicals in the coming months.

The Baltic Dry Index (BDI), generated by the London-based Baltic Exchange, is reported as a daily bellwether of trade and economic activity. The index measures the demand for shipping capacity. The demand for shipping will vary with the amount of cargo that is being traded (supply & demand) or moved in and out of various markets. In short, the BDI measures the daily demand for shipping capacity.

The Index shows a slow recovery from the low reported on February 10th, but by March 23rd the index declined again with the spread of the COVID-19 virus to Europe, U.S. and elsewhere. While there was some improvement in the index the previous week, demand for shipping capacity has not yet recovered to pre-January levels, and is not expanding as the COVID-19 situation spreads globally.

Figure 3: Daily Baltic Dry Index Through April 3rd 2020



Source: <https://www.bloomberg.com/quote/BDIY:IND>

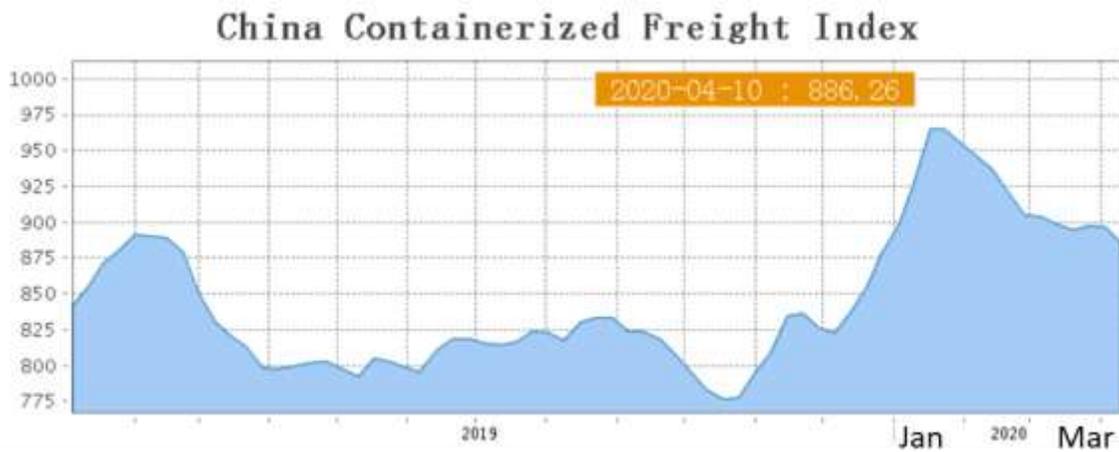
4. CHINA FREIGHT TRANSPORT TRENDS AND METRICS

China's shipping metrics include various indexes tracked by the Ministry of Transport of the People's Republic of China and that are updated weekly. The rate of decline for indices is slowing.

CHINA (EXPORT) CONTAINERIZED FREIGHT INDEX (CCFI)

This index represents export containers for the ports in China. It is a metric which indicates the fluctuation in shipping price per container. The March 27th data showed a slight improved from the previous week's index, though the last two weeks the Export Index has declined. This decline is a reflection constrained trade with its export partners as those countries are now challenged with the COVID-19 situation.

Figure 4 China Export Containerized Freight Index (CCFI) Trends Chart



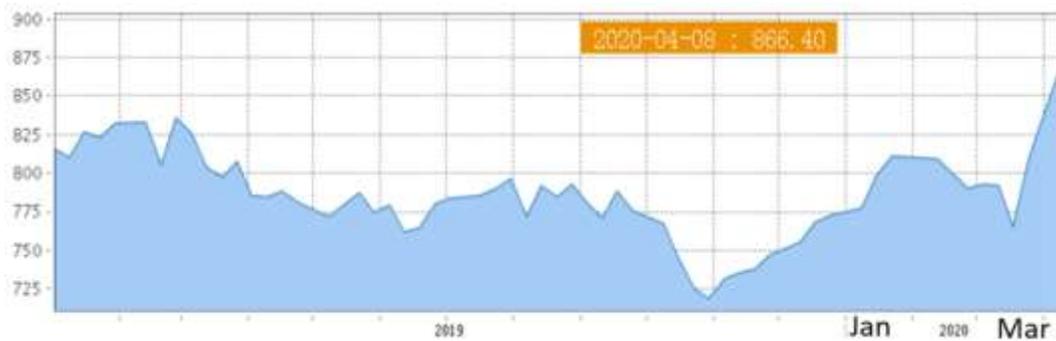
CCFI Export (Containerized Freight Index - Shipped from China)		
Date	Comprehensive Index	Weekly Growth (%)
4/10/20	886.26	-1.1%
4/3/20	896.09	-0.2%
3/27/20	897.69	0.4%
3/20/20	894.23	-0.5%
3/13/20	898.44	-0.6%
3/6/20	904.24	-0.1%
2/28/20	905.4	

Source: Shanghai Shipping Exchange (updated on 04/03/2020), <https://en.sse.net.cn/indices/cbfinew.jsp>

CHINA (IMPORT) CONTAINERIZED FREIGHT INDEX (CCFI)

This CCFI index is for import containers for Chinese ports. Similar to the export CCFI, this index is a relative indicator of shipping prices of containers being imported to China. There was a sharp decline in the index reported on March 18th, though by the March 25th report there was a sharp uptick in the index. The increase indicates more freight arriving into China as economic activity begins its recovery from constraints reported in February. **On a regional basis, the import index exhibited the biggest improvement, attributed to imported containers from the Europe and East Coast of the U.S.**

Figure 5 China Import Containerized Freight Index (CCFI)



CCFI Import (Containerized Freight Index - Shipped to China)

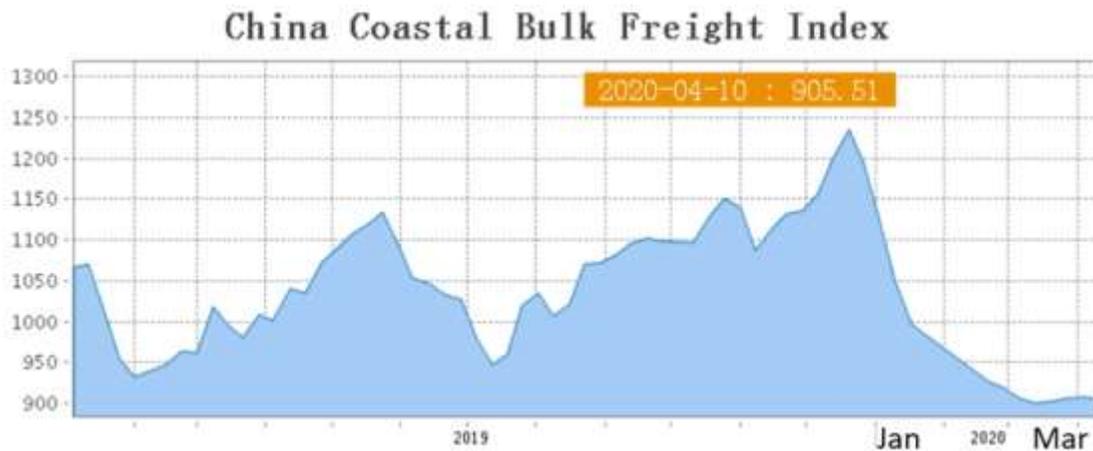
Date	Comprehensive Index	Weekly Growth (%)
4/8/20	866.40	3.4%
4/1/20	837.55	3.4%
3/25/20	809.86	5.8%
3/18/20	765.44	-3.3%
3/11/20	791.72	-0.1%
3/4/20	792.49	0.3%
2/26/20	790.21	

Source: Shanghai Shipping Exchange (updated on 04/01/2020): <https://www.sse.net.cn/index/singleIndex?indexType=cicfi>

CHINA COASTAL BULK FREIGHT INDEX (CBFI)

This index is a measure of the transportation of dry bulk goods between the different ports within China. In other words, this is an intra-China shipping index, and is based on the average revenue and average price of shipping. Activity continues to remain low compared to late 2019 activity before the Chinese New Year Holiday. While stabilized the index has not shown any strong improvement as challenges exist coming out of the COVID-19 crisis. Any improvement going forward will be an indication of growing economic activity within China.

Figure 6: China Coastal Bulk Freight Index (CBFI) Trends Chart



CBFI (Costal Bulk Freight Index - Intra China Port Shipping Index)		
Date	COMPOSITE INDEX	Weekly Growth (%)
4/10/20	905.51	-0.2%
4/3/20	907.22	0.2%
3/27/20	905.34	0.4%
3/20/20	901.34	0.0%
3/13/20	901.18	-0.4%
3/6/20	905.09	-1.5%
2/28/20	918.56	

Source: Shanghai Shipping Exchange (updated on 04/03/2020), <https://en.sse.net.cn/indices/cbfinew.jsp>