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The future of commodity prices and the pandemic-driven global recession: Evidence from 150 years of data

Bilge Erten a,⇑, José Antonio Ocampo b

a Northeastern University, Boston, MA 02115, USA
b Columbia University, New York, NY 10025, USA

1. Introduction

Natural resources provide the essential inputs of economic development for a large number of countries. The global recession generated by the coronavirus pandemics has been reflected in a strong reduction in global trade and a rapid decline in some commodity prices, notably of energy products. An important question is how long this fall in commodity prices will last, given that the pandemic-driven decline in economic activity has been very strong and may have long-term effects? On top of that, how will changes in global energy economy to mitigate climate change affect oil prices and the price of metals required to produce renewable energy? These questions matter not only for commodity producing firms, but also for a large number of commodity-exporting developing countries, particularly in Latin America and Sub-Saharan Africa.

To answer these questions, we take a long historical view. In our earlier research, and based on price data since 1865, we have shown that global commodity prices have undergone three long-term cycles or “super-cycles” with periodicities of 30–40 years, and are in the midst of a fourth one (Erten & Ocampo, 2013a). These cycles are driven primarily by changes in global demand, and show a strong co-movement across different commodity groups during the two recent cycles but not during the previous ones.

Since the current downward phase had not begun yet when we finished our earlier research, it was not possible to discern the peak of the fourth cycle. Now we can document precisely the peak year, and show the degree to which it was driven by the weakening in global economic activity. Determining the turning point in the super cycle is crucial for predicting the future trajectory of energy and non-energy prices, and to draw lessons for policies conducive to sustainable development.

2. Looking back

Our non-oil commodity price series covers major industrial metals, tropical agricultural goods, and temperate zone (or non-tropical) agricultural goods (Grilli & Yang, 1988, Ocampo & Parra, 2010). It is deflated by the manufacturing unit value index to capture real price changes. We updated this price index up to 2018 for this paper.

Fig. 1 and Table 1 display the decomposition of real non-oil commodity prices into several cyclical components using the band-pass (BP) filter approach –a statistical method that does not impose any commitments to a particular statistical model.
The three factors that are likely to affect global commodity prices are the weakness of global aggregate demand, the major changes that must take place in the global energy economy to mitigate climate change, and the growing weight of sub-Saharan Africa in world population. We focus on each of these factors here.

The links between long term commodity price cycles and those of global demand are shown in Fig. 4, and have also been particularly strong during the last two super cycles. In our earlier research we showed that global demand cycles have historically preceded the super cycles of commodity prices. The current downward phase of prices seems to have preceded the downturn of global demand, but this does not capture the magnitude of the slowdown that has taken place in the global economy since the 2007–09 financial crisis.

3. Looking forward

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2 For details about the decomposition analysis, please see the appendix.

3 All non-oil price series peak in 2011 but when taking into account the trends, the peak is estimated to be 2013.
financial crisis: an annual growth of 2.4% in 2007–2019 vs. 3.0% in 1990–2007, according to the United Nations data. The slowdown has indeed led to a debate on whether the advanced economies are now in a phase of “secular stagnation” –or secular long-term slowdown–, to which the deceleration of the Chinese economy has been added in recent years (Prasad & Wu 2019).

Therefore, as in the past, weak global aggregate demand will exert strong downward pressure on commodity prices. The collapse of economic activity and global trade that is taking place as a result of the coronavirus pandemic will, no doubt, contribute to this result. The latest IMF projections indicate that world GDP at market exchange rates will fall by 6.1% in 2020, with an incomplete recovery in 2021 (IMF, 2020). The advanced economies’ GDP fell by more than 10% in the second quarter. Some developing country regions, particularly Latin America, may have experienced a similar shock, but China experienced a recovery in the second quarter after a fall in the first quarter. There is, however, significant uncertainty about the length of the world recession and the speed of the recovery.

One of the strongest effects of pandemic has been the collapse of oil and other energy prices (coal and natural gas). Beyond this conjuncture, the major issue is that the use of fossil fuels will have to strongly decline if the world is to meet the targets set in the 2015 Paris Agreement on Climate Change: a 1.5 °C warming over 2100.
the pre-industrial revolution levels, and clearly avoiding temperatures over 2 °C above those levels. This implies that the demand for fossil fuels must decrease significantly if the world is going to meet these targets. The Energy Transition Commission (2017, chapter 4) estimates that to achieve the 2 °C target, coal consumption should significantly decline since the 2020s, and oil use should peak in 2020 and start declining heavily since the 2030; only gas consumption could experience a weak increase in demand. This means that coal and oil prices should experience a strong decline. Although current trends in the demand for fossil fuels have not followed this advice, there is growing pressure to meet the Paris targets. Of course, there could be an additional demand for metals associated with growing renewable energy production.

Non-oil commodity prices have experienced diverse trends in 2020, with overall fairly constant prices, within the downward trend they exhibited in recent years. The most important were the decline in base metal prices until April followed by a recovery in recent months, probably driven in both cases by Chinese demand. World Bank projections for the full year indicate that, in contrast to energy prices, non-oil prices will not experience an additional decline (World Bank, 2020). It cannot be discarded, however, that non-oil prices may fall if the world recession lasts longer than currently projected or the world economy exhibits a weak recovery.

It should be finally added that the population boom that sub-Saharan Africa is experiencing will be reflected in the growing supply of labour in that continent. This increase in labour supply to meet the Paris targets. Of course, there could be an additional demand for metals associated with growing renewable energy production.

Panel A shows real price decompositions for metals and total agriculture, and Panel B shows real price decompositions for tropical and non-tropical agriculture. The prices are decomposed into a long-term trend, a super cycle, and a short-term cycle component, using the asymmetric Christiano & Fitzgerald (2003) band-pass filter. For details on the data sources and methodology, please see text.

Panel A: Metal and Total Agricultural Prices

Panel B: Tropical and Non-Tropical Agricultural Prices

Fig. 2. Panel A shows real price decompositions for metals and total agriculture, and Panel B shows real price decompositions for tropical and non-tropical agriculture. The prices are decomposed into a long-term trend, a super cycle, and a short-term cycle component, using the asymmetric Christiano & Fitzgerald (2003) band-pass filter. For details on the data sources and methodology, please see text.
increasing labour force in sub-Saharan Africa. Given this adverse outlook for several commodity markets in the medium run, many developing countries that rely on commodity exports as a major source of growth are likely to experience modest growth prospects in the near future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Following Cuddington and Jerrett (2008) and Erten and Ocampo (2013a), we use the asymmetric Christiano and Fitzgerald (ACF) BP filter to decompose the natural logarithms of real commodity price indices into three components: (1) the long-term trend \( LP_T \), (2) the super cycle component \( LP_{SC} \), and the other shorter cycle component \( LP_O \):

\[
LP_t = LP_T + LP_{SC} + LP_O \tag{1}
\]

We define the super cycle as cyclical components of the price series whose periodicities range from 20 to 70 years following previous studies (Heap, 2005; Cuddington & Jerrett 2008; and Erten & Ocampo, 2013b),

\[
LP_{SC} = LP_{BP}(20, 70) \tag{2}
\]

The long-term trend is then defined as all cyclical components whose periodicities exceed 70 years, allowing the trend to evolve gradually over time:

\[
LP_T = LP_{BP}(70, \infty) \tag{3}
\]

The remaining other short cycles can be filtered out as cycles with 2–20 year periodicities:

\[
LP_O = LP_{BP}(2, 20) \tag{4}
\]

The sum of non-trend components \( LP_{NT} \) yields the deviation from long-term trend, or equivalently, the summation of super cycles with other shorter cycles:

\[
LP_{NT} = LP_{BP}(2, 20) + LP_{BP}(20, 70) \tag{5}
\]

Thus, the cycle-trend decomposition in Eq. (1) can be stated as follows:

\[
LP_t = LP_T + LP_{SC} + LP_O \tag{6}
\]

\[
LP_t = LP_{BP}(70, \infty) + LP_{BP}(20, 70) + LP_{BP}(2, 20) \tag{6}
\]

\[
LP_t = LP_T + LP_{NT} \tag{6}
\]

Fig. 3. This figure shows the decomposition of real crude oil prices into a long-term trend, a super cycle, and a short-term cycle component, using the asymmetric Christiano & Fitzgerald (2003) band-pass filter. For details on the data sources and methodology, please see text.
Fig. 4. Panel A shows co-movements of commodity price super cycles, where the left-side graph displays the non-oil and oil price super cycles, and the right-side graph displays the super cycles for metals, tropical and non-tropical agriculture. Panel B shows the co-movements of global output and commodity price super cycles, where the left-side graph displays the super cycles for global output and non-oil prices and the right-side graph displays the super cycles for global output and oil prices. For details on the data sources and methodology, please see text.

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