

Unequal exchange and extractive economies

Metal extraction and trade of Chile, Peru, Argentina and Australia from a world-systems perspective

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Research interest:

Trade has become increasingly important to sustain the metabolic profile of industrialized countries. Metals are crucial for industrialized countries, and since they are point resources, trade is essential for their availability. Extraction of metals is connected to many environmental pressures and impacts. Unequal ecological exchange theories pose that it is mostly primary ores with low value which are extracted in and exported from countries of the global south, while processing (value-adding) and consumption take place in the global north.

Research questions:

- (1) Importance of metals for the national economies and their trade activities
- (2) Share of each level of processing on total trade flows in metals and importance of trading partner group (*OECD/ROW*)
- (3) Physical and monetary trade balances in trade with metals differentiated by level of processing and trading partner
- (4) Terms of trade
- (5) Upstream requirements of the traded metals

Methods and data

- Theoretical framework: Unequal ecological exchange, world-systems analysis
- Methodological framework: MFA
- Databases: UN Comtrade (SITC Rev, 2, timeline 1980 – 2017), IRP (timeline 1990 – 2017)
- Trade data of metals taken from UN Comtrade was divided into three categories, according to its level of processing (*primary ores, semi-manufactured goods, finished products*) at the time of export resp. import, for both biophysical and monetary flows
- Data taken from IRP could not be divided up into differentiated level of processing, but was used to show the upstream requirements of traded ores and metallic goods.

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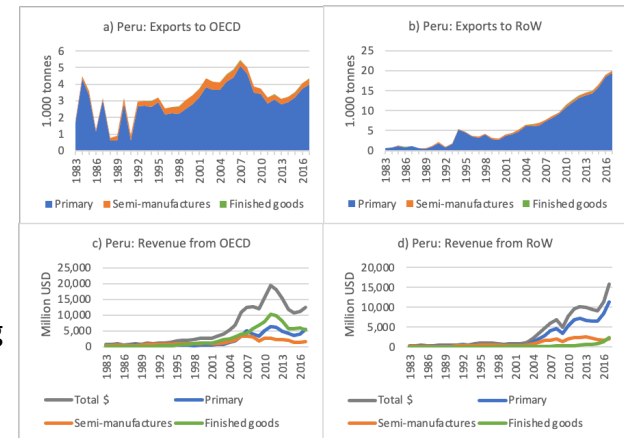
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Results

- Regarding their metal extraction and trade patterns, Chile, Peru, and Australia show clear **patterns of extractivist economies**. Metals do not play an important role in Argentina's extraction and trade activities.
- In the three extractivist economies, a **net outflow of biophysical primary ores** can be observed, leading to domestic resource depletion and hinting at little manufacturing happening domestically.
- The OECD country group was the most important export partner regarding primary ores until the new millennium, when **ROW became increasingly important**, which was mostly due to China's fast growing economic activities.
- In monetary terms, the by far **largest share of money** spent on imports by the three extractivist economies was **spent on imports of semi-manufactured goods and finished products**.
- Terms of trade: The overall TOT for Chile, Peru and Australia for trade with metals stay below 1 and are therefore **unfavourable**. The differentiated (level of processing / trading partner) TOT show mixed results, no clear trend of either bettering or decline can be observed.
- Upstream requirements: RMC is lower than DMC for Chile, Peru, and Australia, which means **domestic consumption is overestimated** for those countries. Argentina's RMC was higher than its DMC until the early 2000s, afterwards the picture reversed. The deficits shown in the RTB were up to 45 (Chile) resp. 22 (Peru) times higher than that of the PTB, indicating the **magnitude of environmental impacts left behind in the countries of origin** of the extracted and exported metal. Australia's RTB and PTB are quite close together. Argentina shows mixed results with PTB being positive, but RTB turning negative from the new millennium onwards.



Readership

Scholars and students of social ecology, industrial ecology; all interested in international trade of metallic resources, unequal ecological exchange and extractive economies