

## RESEARCH REPORT

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### Summary of work on silver production data 1870–1900

Our immediate project is to gain an overview on silver extraction from 1870 to 1900. We seek a comprehensive understanding of silver production in different regions of the world. As a second objective, we hope to learn details on the flow of silver among countries.

Our work is based on the valuable data presented in volume 189 of the Moneta series, directed by Georges Depeyrot<sup>1</sup>. The three volumes of the series include, among other data, annual silver production data for 28 countries, covering both huge suppliers, such as Unites States, Mexico, Chile, Bolivia, Germany and so forth, and tiny producers, such as Finland, Norway, Sweden and so on. We believe that the documentation covers almost all silver-producing countries. It was natural, then, for us to sum the production of all countries, year by year, to estimate the global level of silver production. (India and Uruguay are not taken into account, because data are available for only one year in each of them, making it difficult to simulate missing values.) In the accompanying graphs, we compare our sums of national-level data to the global totals that were prepared at various times in the past and included in Volume 1 of the three-volume series.

Following the big picture of our analyzing process, as described above, we first tried to collect silver production data (we chose measurement of quantity in kilograms rather than ounces, as this is the most common measure shared in the data) for each of the 26 countries from 1870 to 1900 by the following procedure. We take the United States as an example: after searching the contents, we found all possible tables listing U.S. silver data from 1870 to 1900 of United States in kilograms and combined these data by calculating their mean value annually. We excluded outlying values and used these annual mean values to approximate the U.S.’s silver production. Even though we tried our best to compute information as completely as possible for all countries by transforming available ounce or dollar data into kilograms, there were significant missing data for several of the countries—for example, Columbia, Japan, and New Zealand. To handle these missing values, we implemented three methods, resulting in three different estimates for global silver production data. For our so-called “raw estimate,” we treated missing values as zeros and summed across all the countries, year by year. For the second estimate, “missing values simulated by min,” we estimated missing data for each country as the minimum value of all its available data. Our third estimate, “missing values simulated by median,” filled in missing values with the median of available data.

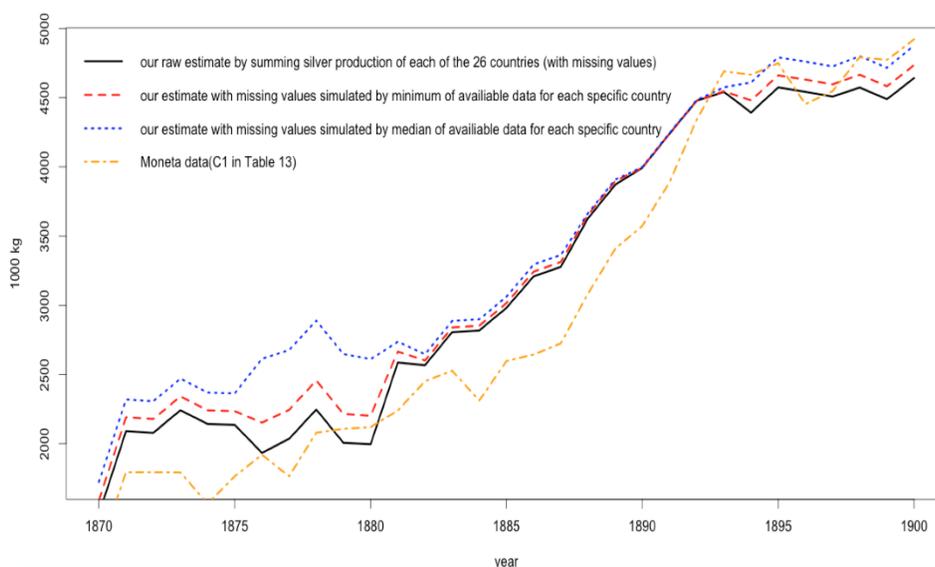


Figure 1: Comparison of different estimates for annual silver production

Figure 1 reports results of our three estimates along with the global silver production data reported in volume 189 of Depeyrot<sup>2</sup> denoted as ‘Moneta data’. It can be seen that all our three estimates tend to be higher than data given in volume 189 of Depeyrot, even though “our raw estimate” totally ignored missing values, which were 25 percent of the entries in the data structure.

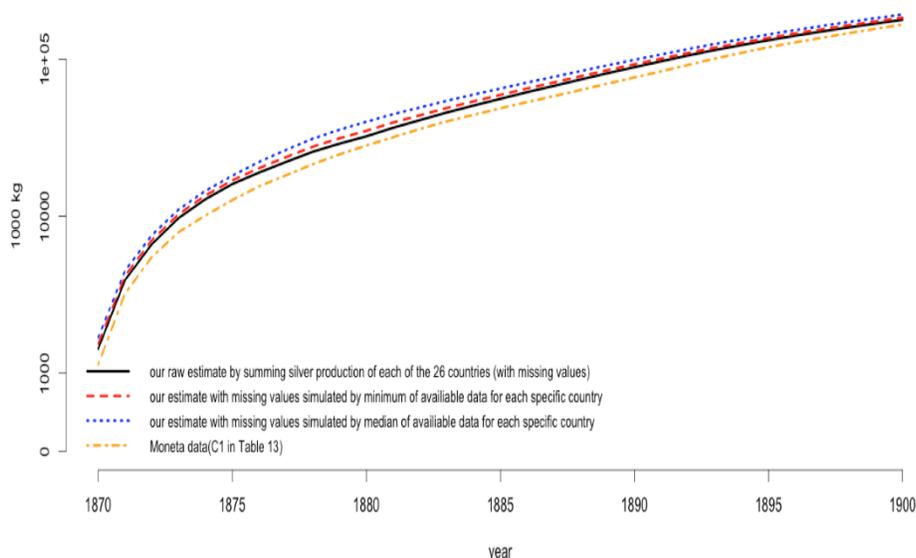


Figure 2: Comparison of estimates for cumulative silver production 1870-1900

This discovery made us think that our methodology may be different from that of volume 189 of Depeyrot and possibly has not been exploited before.<sup>3</sup> That is, tabulating all currently available regional estimates of silver production, plus making conservative estimates of missing values, may give more comprehensive estimates of global silver output than the totals calculated in earlier analyses. If this is the case, our project will be meaningful in enabling researchers to get a more accurate understanding of silver production at the end of the nineteenth century. In addition, further relevant work, such as extending the analysis to a longer time period and investigating flows of silver among countries and regions, can also be considered.

## NOTES

<sup>1</sup> Georges Depeyrot, *Imperialism and Gold Standard (1870-1900): Transfers of Precious Metals and Globalisation*, 3 vols. Volumes 188, 189, and 190 in Collection Moneta (Wetteren, Belgium: Moneta, 2015).

<sup>2</sup> Depeyrot, *Imperialism and Gold Standard*.

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