

World Historical Balance of Payments Database (WBOP)

Online Appendix: Construction of the Historical Series

Companion to G. Nieves & T. Piketty, "Unequal Exchange & North–South Relations: Evidence from Global Trade Flows & the World Balance of Payments, 1800–2025" (WIL WP 2025/11)

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Introduction

This appendix documents, series by series and country by country, how each variable in the World Historical Balance of Payments Database (WBOP) is constructed. Additional details about sources and methods are provided in WBOP data files. The database provides fully annual series for 57 core territories — 48 countries and 9 residual regions that together cover 100% of world population and GDP — over the 1800–2025 period. It comprises both a set of national accounts (population, gross domestic product, price indexes and market exchange rates) and a complete balance of payments (trade in goods and services, foreign income, foreign transfers, the current account, and the resulting stock of net foreign wealth). All benchmark series are expressed in current US dollars at market exchange rates and follow, as closely as the historical record allows, the concepts of the IMF Balance of Payments Manual (BPM6). For every variable we describe (i) the sources used over their years of coverage and (ii) how the series is carried back from the start of coverage to 1800.

The overriding objective of the database is internal consistency along two dimensions. Globally, the world balance of payments is a closed system in which every flow must sum to zero across countries: we therefore impose, item by item, that world exports equal world imports, that world income inflows equal world outflows, and that world transfers balance, so that one country's surplus is always another's deficit. Historically, the current accounts implied by these flows are cumulated into stocks of net foreign wealth and required to reproduce the independent benchmark estimates of foreign assets and liabilities available around 1914 and 1970–2025. The WBOP is thus not a mechanical concatenation of national studies, but an attempt to provide a plausible reconciliation of all the evidence available on global stocks and flows. In particular, we aim to make plausible assumptions about BOP invisible flows over the 1800–1914 and 1914–1970 subperiods for missing countries.

A direct implication is that, whenever an isolated national series — for GDP, prices, exchange rates or any balance-of-payments item — cannot be reconciled with the world total, with neighboring countries, or with the broad historical record, we favor the assumption that keeps the global and historical picture coherent over the one that reproduces that single country study exactly. Generally speaking, as explained in the paper (WIL WP 2025/11), we have relatively detailed and reliable countries studies for the BOP – including invisible flows – of the main Western powers, including over the 1800–1914 and 1914–1970 subperiods. The more uncertain part has to do with the counterpart in the South and its distribution between the various regions and countries, on the basis of available country studies, particularly in South & South Asia, Latin America and East Asia. For instance, future research and new country studies could lead us to revise somewhat the exact distribution of invisible flows (and their subcomponents) between the various regions and countries of the global South in later versions of the WBOP, especially over the 1800–1914 subperiod. But as argued in the country notes and in the robustness section below this is unlikely to radically alter the global patterns and findings uncovered in this research.

More generally, we prioritize global and historical consistency over country-level “accuracy,” and we flag every such departure in the country notes and in the robustness section below. One example with Argentina illustrates the point. The GDP and exchange-rate series of Ferreres (2010) would place Argentina's GDP per capita at roughly 400 US dollars at current market exchange rates around 1810 — against about 51 for France, 68 for the United States and 114 for the United Kingdom, then the richest economy in the world, on exactly the same basis. There is no evidence whatsoever that the Río de la Plata was, on the eve of independence, four to eight times richer than the leading Atlantic economies; the figure is an artefact. We therefore discard the earliest Ferreres years for the level of Argentine GDP and reconstruct pre-1870 output from Maddison per-capita growth anchored to population and prices, retaining Ferreres only from the 1870s onward, where it is reliable. The same logic governs the many analogous choices documented throughout this appendix.

Appendix A. National Accounts

1. Population

Method. Annual population for all 57 territories over 1800–2025, taken directly from World Inequality Database (WID) (indicator npopul).

Workbook / source. Sheet B1d / A1. Source: WID.

2. GDP

Method. GDP in current USD (sheet B1b) = nominal GDP in local currency (B1a) ÷ market exchange rate (B1x). Over its years of coverage nominal LCU is a national series entered directly (sources per country below); real GDP (B2c) equals that nominal series deflated by the price index. For every country the recent period is the WID series — itself based on official national accounts from the United Nations, World Bank and IMF — which starts in 1960 (or 1970 for most of Western Europe); the country notes below give the earlier, historical sources.

From 1800 to the start year. Before the national series begins, there are no historical national accounts, so nominal GDP is reconstructed from three independent pieces and anchored to the real data. Real output per person is taken from Maddison per-capita growth (sheet B3a) and chained backward from the start year; this volume path is multiplied by the country's own price index to express it in current prices, and then by WID population to obtain the total. The resulting series is pinned to the level of the national series in its first year, so the reconstructed pre-history splices on without a jump. Small sub-period correction factors keep the level in line with independent benchmarks where needed, see country cases below.

Workbook / source. Sheets B1a (LCU) · B1b (USD MER) · B2c (real index) · B3a (Maddison MPD 2023) · A1 (population). Real growth verified = Maddison; level anchor verified = population.

Europe

Germany: National LCU 1870–1970 from JST (rescaled for the WID/JST population ratio; 1945 set to 103% of 1946); official 1970–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Denmark: National LCU 1870–1970 from JST, with Fouquin–Hugot (TradeHist) filling years missing in JST; official 1970–2023. 1800–1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Spain: National LCU 1870–1970 from JST; official 1970–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

France: National LCU 1800–1970 from Piketty–Zucman (tables FR1/FR2/FR8; ≈ JST 1870–1970); official UN/WB/IMF 1970–2023.

Britain: National LCU 1800–1960 from Piketty–Zucman (UK1/UK2/UK8); official 1960–2023.

Italy: National LCU 1870–1970 from JST; official 1970–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Netherlands: National LCU 1870–1970 from JST, with Fouquin–Hugot (TradeHist) filling years missing in JST; official 1970–2023. 1800–1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Norway: National LCU 1870–1970 from JST, with Fouquin–Hugot (TradeHist) filling years missing in JST; official 1970–2023. 1800–1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Sweden: National LCU 1870–1970 from JST, with Fouquin–Hugot (TradeHist) filling years missing in JST; official 1970–2023. 1800–1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Other Western Europe: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

Other Eastern Europe: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

North America / Oceania

United States: National LCU 1800–1960 from Piketty–Zucman (US1/US2/US8); official 1960–2023.

Canada: National LCU 1870–1960 from JST; official 1960–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Australia: National LCU 1870–1960 from JST; official 1960–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

New Zealand: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Other North America / Oceania: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

Latin America

Argentina: 1870–1883 compound growth from Ferreres (2010); 1884–1959 from GPIH/Lindert; official 1960–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Brazil: 1850–1861 Goldsmith (1986); 1861–1869 Mitchell (IHS); 1870–1960 GPIH/Lindert; official 1960–2023. 1800→1850: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Chile: 1800–1809 set to the mean growth of Colombia and Mexico; 1810–1959 compound growth from Díaz–Lüders–Wagner (2016); official 1960–2023.

Colombia: 1800–1887 from Mejía (2015) & Kalmanovitz–López (2010), gap years interpolated; 1888–1904 De Corso (2013); 1905–1960 Banco de la República; official 1960–2023.

Mexico: 1800–1894 from Coatsworth (1989), gaps interpolated; 1895–1960 from INEGI (2015), 1910–1921 interpolated; official 1960–2023.

Other Latin America: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

Middle East / North Africa

United Arab Emirates: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Algeria: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1800–1909 the Maddison per-capita growth increment is scaled by a factor of 1.5 to keep the reconstructed level in line with independent benchmarks.

Egypt: Extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention, before 1960; official from 1960. A nominal LCU GDP series is available in Bharti et al. (2025) from 1886 but is not used, owing to series incompleteness, the lack of a price index and monetary complexity. Over 1800–1909 the Maddison per-capita growth increment is scaled by a factor of 1.7 to keep the reconstructed level in line with independent benchmarks.

Iran: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1800–1909 the Maddison per-capita growth increment is scaled by a factor of 1.7 to keep the reconstructed level in line with independent benchmarks.

Morocco: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Saudi Arabia: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Turkey: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Other MENA: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

Sub-Saharan Africa

DR Congo: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1910–1959 the reconstructed per-capita level is trimmed by a factor of 0.99 per year to keep it in line with independent benchmarks.

Ivory Coast: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Ethiopia: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Kenya: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1910–1959 the reconstructed per-capita level is trimmed by a factor of 0.99 per year to keep it in line with independent benchmarks.

Mali: National official nominal GDP for 1967–2023. 1800→1967: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Niger: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1910–1959 the reconstructed per-capita level is trimmed by a factor of 0.99 per year to keep it in line with independent benchmarks.

Nigeria: National official nominal GDP for 1960–2023. Before 1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention. Over 1910–1959 the reconstructed per-capita level is trimmed by a factor of 0.99 per year to keep it in line with independent benchmarks.

Rwanda: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Sudan: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

South Africa: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Other Sub-Saharan Africa: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

Russia / Central Asia

Russia: Extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention, before 1961; official from 1961. A nominal LCU GDP series is available in Bharti et al. (2025) from 1885 but is not used, owing to series incompleteness, the lack of a price index and monetary complexity.

Other Russia / Central Asia: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

East Asia

China: Extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention, before 1960; official from 1960. A nominal LCU GDP series is available in Bharti et al. (2025) from 1910 but is not used, owing to series incompleteness, the lack of a price index and monetary complexity. Over 1910–1949 the reconstructed per-capita level is trimmed by a factor of 0.9975 per year to keep it in line with independent benchmarks.

Japan: National LCU 1870–1960 from JST; official 1960–2023. 1800→1870: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

South Korea: extrapolation based on Maddison per capita growth, WBOP price index and WID population before 1960 (Bharti et al. not used); official 1960–2023.

Taiwan: extrapolation based on Maddison per capita growth, WBOP price index and WID population before 1960 (Bharti et al. not used); official 1960–2023.

Other East Asia: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

South / South-East Asia

Bangladesh: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

India: National LCU 1901–1960 from Bharti et al. (2025, from Sivasubramonian 2000); official 1960–2023. 1800→1901: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Indonesia: National LCU 1900–1960 from Bharti et al. (2025); official 1960–2023. 1800→1900: extrapolation based on Maddison per capita growth, WBOP price index and WID population.

Myanmar: Extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention, before 1960; official from 1960. The Bharti et al. (2025) nominal GDP data are not incorporated for the pre-1960 period.

Pakistan: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Philippines: Extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention, before 1960; official from 1960. The Bharti et al. (2025) nominal GDP data are not incorporated for the pre-1960 period.

Thailand: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Vietnam: National official nominal GDP for 1960–2023. 1800→1960: extrapolation based on Maddison per capita growth, WBOP price index and WID population, with the LCU pegged to the US dollar by convention.

Other South / South-East Asia: Residual region, treated as a country with LCU = US\$: real GDP from Maddison at a fixed ratio to the (non-residual) regional average and the US price index over 1800–1970; observed nominal (USD) and real (PPP) series set the price index and real exchange rate for 1970–2023.

3. Price indexes

Method. For 1970–2025 all price indexes are taken from WID, which relies on official UN, IMF and World Bank sources.

From 1800 to the start year. Where a national price series does not reach back to 1800, the index is extended backward one year at a time: each year's value is the following year's value scaled by two growth factors — the growth of a reference inflation path and a per-country correction (when needed). The reference path is the average of the US, British and French price indexes up to 1910, and the US index alone from 1910 to 1970. The correction adjusts this reference so that the implied real GDP growth (nominal deflated by the price index) matches Maddison (MPD 2023); it is set separately over four subperiods — 1800–1870, 1871–1910, 1911–1950 and 1951–1969 — with the chain re-anchored at each boundary. For most countries the correction is zero, so their pre-1800 price index simply follows the US/GB/FR reference; it is non-zero for only eight — Argentina, Brazil, Mexico and Colombia in Latin America, Ivory Coast, Mali and Niger in West Africa, and Russia — where chaining on the reference alone would imply implausible real growth, typically because of higher local inflation, see specific notes below. The US, British and French reference indexes are themselves taken from Piketty–Zucman and are additionally pinned to Taylor (2002) real-exchange-rate parity over 1870–1910.

Workbook / source. Sheet B1px; reference columns BR/BS/BT (FR/GB/US); per-country correction columns BW–DW.

Europe

Germany: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Denmark: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Spain: 1870–1970 from JST, with the index growth adjusted over 1800–1910 and 1910–1950 to match Maddison (MPD 2023) real growth; before 1870, the reference inflation path (as explained at the beginning of the section).

France: 1800–1970 from Piketty–Zucman (FR15a); no growth adjustment, but the raw 1800–1870 index is smoothed with a five-year moving average, since its year-to-year swings reflect price collection from very few items. As one of the three reference countries, France (with the US and Britain) defines the reference inflation path used before other countries' own series begin.

Britain: 1800–1855 from Piketty–Zucman (UK15a), JST thereafter; the index growth is adjusted over 1800–1910 and 1910–1950 to match Maddison (MPD 2023) real growth and Taylor (2002) real-exchange-rate parity, and the raw 1800–1870 index is smoothed with a five-year moving average (its year-to-year swings reflect price collection from very few items). As a reference country, Britain (with the US and France) defines the reference inflation path.

Italy: 1870–1970 from JST, with the index growth adjusted over 1800–1910 and 1910–1950 to match Maddison (MPD 2023) real growth; before 1870, the reference inflation path (as explained at the beginning of the section).

Netherlands: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Norway: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Sweden: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Other Western Europe: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

Other Eastern Europe: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

North America / Oceania

United States: 1800–1970 from Piketty–Zucman (US15a/US3b); the index growth is adjusted over 1800–1910 and 1910–1950 so that implied real growth matches Maddison (MPD 2023) and real exchange rates match Taylor (2002). The main effect of the 1800–1910 adjustment is to turn a small measured deflation into small inflation; without it, US (and British) prices would be too high and real incomes too low in 1800 relative to France. As one of the three reference countries, the US index — averaged with Britain and France up to 1910, and used alone from 1910 to 1970 — defines the reference inflation path applied to other countries before their own series begin.

Canada: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

Australia: 1870–1970 from JST; before 1870, the reference inflation path (as explained at the beginning of the section).

New Zealand: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Other North America / Oceania: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

Latin America

Argentina: 1870–1883 compound inflation from Ferreres (2010); 1884–1959 from Mitchell (IHS). Before 1870, the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +5% per year over 1800–1870 to match Maddison (MPD 2023) real growth.

Brazil: 1850–1913 from Goldsmith (1986); 1913–1960 from Mitchell (IHS). Before 1850, the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +3% per year over 1800–1870 to match Maddison (MPD 2023) real growth.

Chile: 1810–1959 compound inflation from Díaz–Lüders–Wagner (2016). Before 1810, the reference inflation path (as explained at the beginning of the section).

Colombia: The reference inflation path (as explained at the beginning of the section) over the whole pre-1960 period, with country-specific corrections of −0.5% per year over 1800–1870, +1.5% over 1911–1950 and +5% over 1951–1969 to match Maddison (MPD 2023) real growth; official index from 1960.

Mexico: The reference inflation path (as explained at the beginning of the section) over the whole pre-1960 period, with country-specific corrections of +1% per year over 1800–1870, +1% over 1871–1910 and +2% over 1911–1950 to match Maddison (MPD 2023) real growth; official index from 1960.

Other Latin America: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

Middle East / North Africa

United Arab Emirates: Official from 1975; the 1970–1975 production price index (a spurious jump) is replaced by a reference expenditure series. Earlier years follow the reference inflation path (as explained at the beginning of the section).

Algeria: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Egypt: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Iran: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Morocco: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Saudi Arabia: Official from 1975; the 1970–1975 production price index is corrected as for the UAE. Earlier years follow the reference inflation path (as explained at the beginning of the section).

Turkey: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Other MENA: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

Sub-Saharan Africa

DR Congo: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Ivory Coast: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +12% per year over 1911–1950 and +5% over 1951–1969 to match Maddison (MPD 2023) real growth.

Ethiopia: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Kenya: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Mali: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +12% per year over 1911–1950 and +5% over 1951–1969 to match Maddison (MPD 2023) real growth.

Niger: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +12% per year over 1911–1950 and +5% over 1951–1969 to match Maddison (MPD 2023) real growth.

Nigeria: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Rwanda: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Sudan: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

South Africa: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Other Sub-Saharan Africa: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

Russia / Central Asia

Russia: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section), with a country-specific correction of +5% per year over 1951–1969 to match Maddison (MPD 2023) real growth.

Other Russia / Central Asia: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

East Asia

China: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Japan: 1870–1970 from JST, with the index growth adjusted over 1870–1910 to match Maddison (MPD 2023) real growth; before 1870, the reference inflation path (as explained at the beginning of the section).

South Korea: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Taiwan: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Other East Asia: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

South / South-East Asia

Bangladesh: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

India: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Indonesia: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Myanmar: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Pakistan: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Philippines: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Thailand: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Vietnam: National official index for the recent decades; earlier years follow the reference inflation path (as explained at the beginning of the section).

Other South / South-East Asia: Same as the US price index over 1800–1970 (fixed real exchange rate); computed from observed nominal/real series 1970–2023.

4. Market exchange rates

Method. For 1970–2025 all market exchange rates are taken from WID, which relies on official UN, IMF and World Bank sources. For the historical period each rate is entered directly from the national or historical source listed per country (Federico–Tena, Fouquin–Hugot, JST, or a country-specific study), or — where no national quote exists — built conventionally by chaining on sterling and switching to a fixed US-dollar peg.

From 1800 to the start year. For years before a country's own exchange-rate data begin, the rate is extended back to 1800 in one of two ways. If the currency was on a fixed parity to another currency — for example the Italian lira and Spanish peseta, both tied to the French franc — that parity is simply held constant. Otherwise the currency is assumed to have been pegged to the British pound: its dollar rate is carried backward year by year so that it keeps a constant value in sterling, moving against the dollar exactly as the pound did. This pound peg is used through 1909; from 1910 the anchor switches to the US dollar and the rate is instead held fixed in dollars, mirroring the dollar's replacement of sterling as the world's reference currency. One manual correction is made to the pound anchor in 1864, when the US dollar was itself temporarily devalued (the 1860s greenback episode) — an episode most exchange-rate sources overlook, keeping the dollar at its gold parity. Residual regions are treated as though their currency were the US dollar throughout. The full list of pegs and anchor currencies is in sheet B1xb.

Workbook / source. Sheet B1x (the GB column drives the sterling peg); real exchange rate B1xr; conventional pegs B1xb.

Europe

Germany: Federico–Tena 1800–1860 (thaler/Zollverein parity); 1860–1870 fixed to sterling, because Federico–Tena is inaccurate through the 1860s (it holds the dollar at gold parity across the greenback devaluation); JST 1870–1970; IMF thereafter.

Denmark: Fouquin–Hugot 1827–1870; Federico–Tena 1818–1827; 1800–1818 fixed at the 1827 rate.

Spain: JST 1870–1970; fixed to the French franc 1800–1870.

France: Federico–Tena 1800–1826; Fouquin–Hugot 1827–1970.

Britain: Federico–Tena 1800–1826; Fouquin–Hugot 1827–1970; IMF thereafter. Sterling is the 19c default peg (essential for 1862–1878).

Italy: JST 1870–1970; fixed to the French franc 1800–1870.

Netherlands: Fouquin–Hugot 1827–1870; Federico–Tena 1818–1827; 1800–1818 fixed.

Norway: Fouquin–Hugot 1827–1870; Federico–Tena 1818–1827; 1800–1818 fixed.

Sweden: Fouquin–Hugot 1827–1870; Federico–Tena 1818–1827; 1800–1818 fixed.

Other Western Europe: Conventional LCU = US\$ throughout 1800–2023.

Other Eastern Europe: Conventional LCU = US\$ throughout 1800–2023.

North America / Oceania

United States: United States is the dollar numeraire — the market rate is US\$1 per US\$1 by construction (unity, 1800–2023).

Canada: JST 1870–1970; Federico–Tena 1800–1870, except over 1861–1878: during the US greenback episode the dollar was temporarily inconvertible and depreciated against gold and sterling, which Federico–Tena ignores by holding gold parity, so for those years the rate is taken to reflect the actual devaluation.

Australia: JST 1870–1970; Federico–Tena 1800–1870, except over 1861–1878: during the US greenback episode the dollar was temporarily inconvertible and depreciated against gold and sterling, which Federico–Tena ignores by holding gold parity, so for those years the rate is taken to reflect the actual devaluation.

New Zealand: Chained on sterling (the GB rate) back to 1800, with US-dollar-peg splices at 1910, 1928 and 1959; official rates thereafter.

Other North America / Oceania: Conventional LCU = US\$ throughout 1800–2023.

Latin America

Argentina: 1827–1962 from Ferreres (2010); IMF thereafter. 1800→1827: sterling peg.

Brazil: 1808–1914 from Ludwig, Brazil: A Handbook of Historical Statistics (Boston: G.K. Hall, 1985) — the mil-réis/pound-sterling rate, converted to mil-réis/US\$ via the sterling-dollar cross-rate and level-matched to WID at 1960 (with an 1860 sterling correction); 1915–1960 Fouquin–Hugot; IMF thereafter. 1800→1808: fixed at the 1808 rate.

Chile: 1800–1810 fixed at the 1810 rate; 1810–1959 Díaz–Lüders–Wagner (2016); IMF thereafter.

Colombia: 1800 Mejía (2015); 1801–1808 interpolated; 1809–1831 pegged to the Brazilian mil-réis; 1832 Mejía; 1833–1918 RICardo; 1919–1959 Banco de la República; IMF thereafter.

Mexico: 1821–1960 INEGI (2015); 1800–1821 pegged to the peso-dollar (Federico–Tena).

Other Latin America: Conventional LCU = US\$ throughout 1800–2023.

Middle East / North Africa

United Arab Emirates: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Algeria: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Egypt: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Iran: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Morocco: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Saudi Arabia: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Turkey: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Other MENA: Conventional LCU = US\$ throughout 1800–2023.

Sub-Saharan Africa

DR Congo: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Ivory Coast: French West Africa (franc zone): a common colonial-franc, then CFA-franc, US-dollar rate — identical across Côte d'Ivoire, Mali and Niger — entered directly throughout 1800–2023; no sterling bridge.

Ethiopia: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Kenya: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Mali: French West Africa (franc zone): a common colonial-franc, then CFA-franc, US-dollar rate — identical across Côte d'Ivoire, Mali and Niger — entered directly throughout 1800–2023; no sterling bridge.

Niger: French West Africa (franc zone): a common colonial-franc, then CFA-franc, US-dollar rate — identical across Côte d'Ivoire, Mali and Niger — entered directly throughout 1800–2023; no sterling bridge.

Nigeria: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Rwanda: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Sudan: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

South Africa: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Other Sub-Saharan Africa: Conventional LCU = US\$ throughout 1800–2023.

Russia / Central Asia

Russia: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Other Russia / Central Asia: Conventional LCU = US\$ throughout 1800–2023.

East Asia

China: Sterling peg (chained on GB) before 1910; US-dollar peg 1910–1960; official thereafter; 1864 correction.

Japan: JST 1870–1970; Federico–Tena 1800–1870, except over 1861–1878, where the rate instead follows the sterling anchor to capture the US greenback devaluation (which Federico–Tena ignores, holding the dollar at gold parity).

South Korea: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Taiwan: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Other East Asia: Conventional LCU = US\$ throughout 1800–2023.

South / South-East Asia

Bangladesh: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

India: Recorded rupee–dollar rate from Federico–Tena and Fouquin–Hugot over 1878–1970 (the rupee–sterling quote converted through the sterling–dollar cross-rate); IMF thereafter. Before 1878 the silver rupee is carried back on the pound sterling (sterling peg), so the series reaches 1800.

Indonesia: The Dutch guilder was the official currency of colonial Indonesia (van der Eng, 1998), so the guilder–dollar rate is used over 1900–1950, taken from the Netherlands series (JST, with Fouquin–Hugot earlier); Indonesia's own official rupiah rate from 1951; IMF thereafter. Before 1900, where no national quote exists, the rate is carried back on the pound sterling (sterling peg) with the 1864 dollar-devaluation correction.

Myanmar: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Pakistan: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Philippines: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Thailand: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

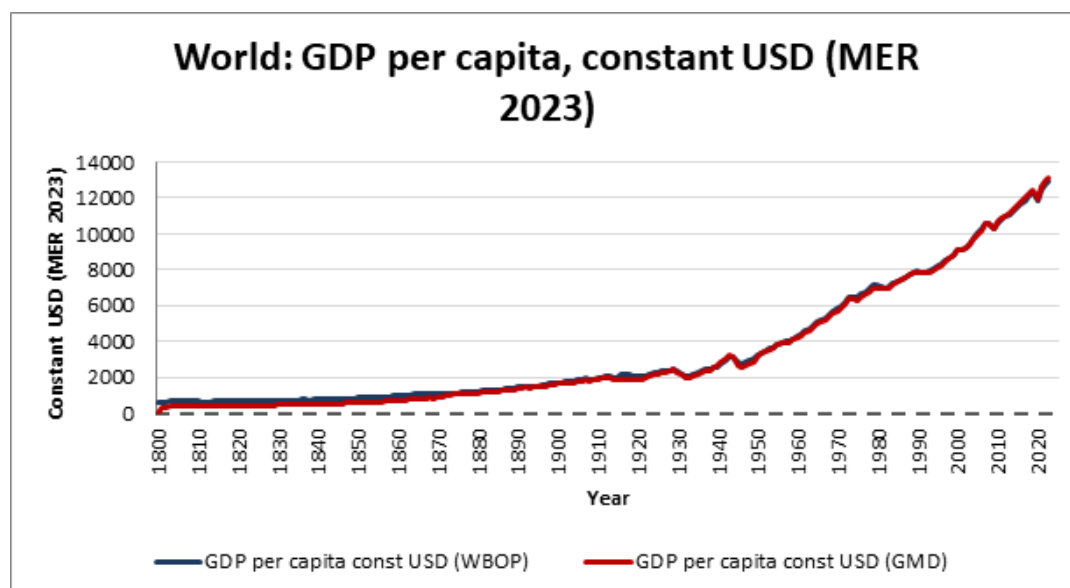
Vietnam: The rate is built conventionally: chained on sterling (the GB column) back to 1800, with an 1864 correction for the temporary dollar devaluation, then a fixed US-dollar peg from 1910 (1928 adjustment); official rates thereafter.

Other South / South-East Asia: Conventional LCU = US\$ throughout 1800–2023.

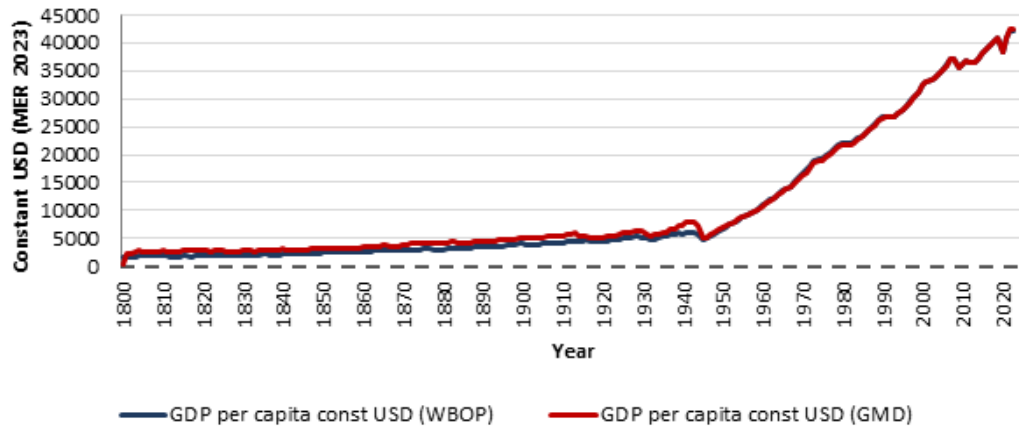
5. Comparison with the Global Macro Database

The figures below compare regional real GDP per capita in constant US dollars between the series presented here (WBOP) and the Global Macro Database (Müller, Xu, Lehib and Chen, 2025). For each country, nominal GDP is deflated by that country's own price index to express it in constant 2023 local-currency values, and then converted to US dollars at the country's fixed 2023 market exchange rate; the results are summed across the countries of each region and divided by population. Both sources are treated identically — the same base year, the same fixed-2023-market-exchange-rate conversion, and each economy's own deflator — so the comparison isolates differences in the measurement of real output rather than of prices, exchange rates or population (the same population series is applied to both sides). The figures are therefore in constant US dollars at 2023 market exchange rates, not at purchasing-power parity.

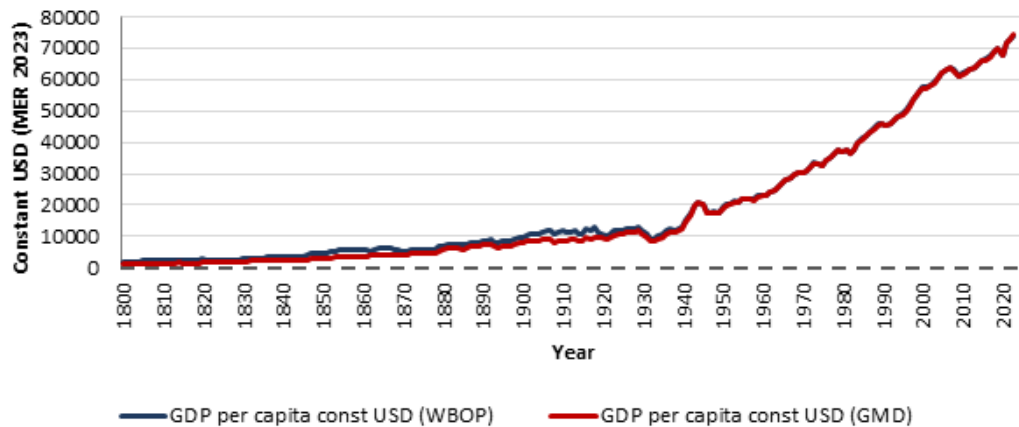
The nine regions follow the definition used throughout this appendix (a world total and eight continental groups), with the Global Macro Database aggregated over the same set of countries. The two sources agree closely over recent decades and diverge more in the nineteenth and early twentieth century, where the Global Macro Database covers fewer countries. One manual correction is applied: the Global Macro Database converts Iran's GDP at Iran's official exchange rate (about 42,000 rial per US dollar in 2023), which is overvalued by roughly ten times relative to the market rate and inflates Iran's dollar GDP to about 3.5 trillion — larger than Saudi Arabia and Turkey combined. Because the constant-dollar series anchors every year to the 2023 rate, this distortion would propagate through the entire Middle East / North Africa path, so Iran's 2023 conversion rate is replaced with the market-based rate used in WBOP (about 380,000 rial per US dollar), which brings the region's aggregate into line. A complete country-by-country comparison, together with the exact aggregation method and this correction, is provided in the companion comparison spreadsheet.



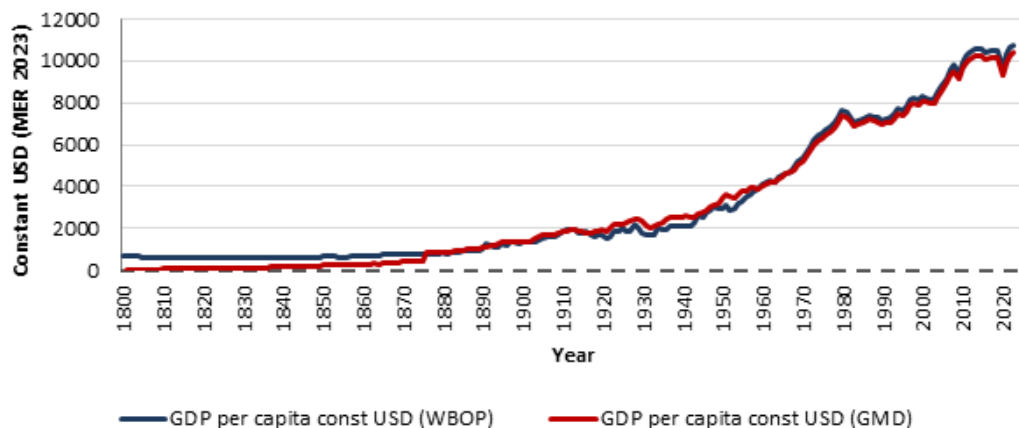
Europe: GDP per capita, constant USD (MER 2023)



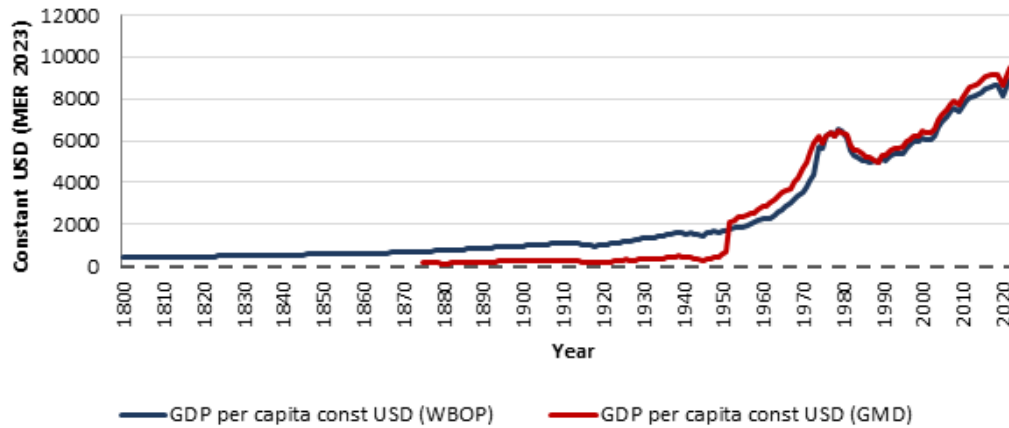
North America/Oceania: GDP per capita, constant USD (MER 2023)



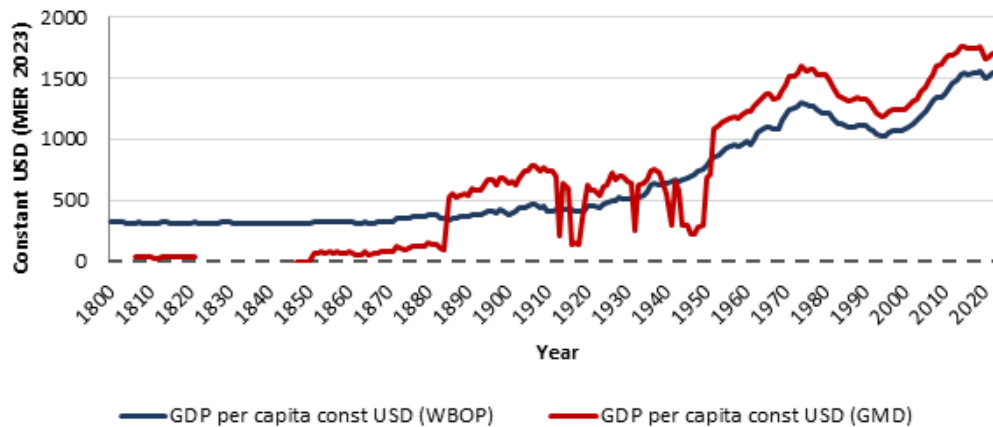
Latin America: GDP per capita, constant USD (MER 2023)



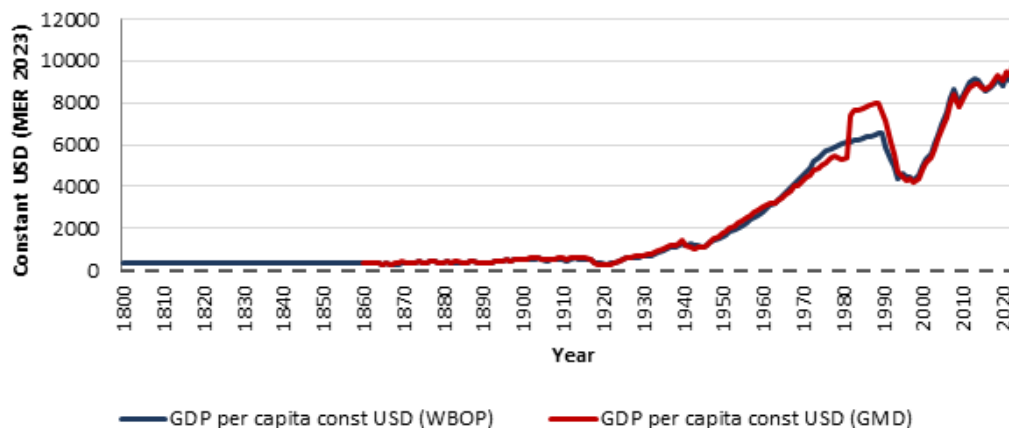
Middle East/North Africa: GDP per capita, constant USD (MER 2023)



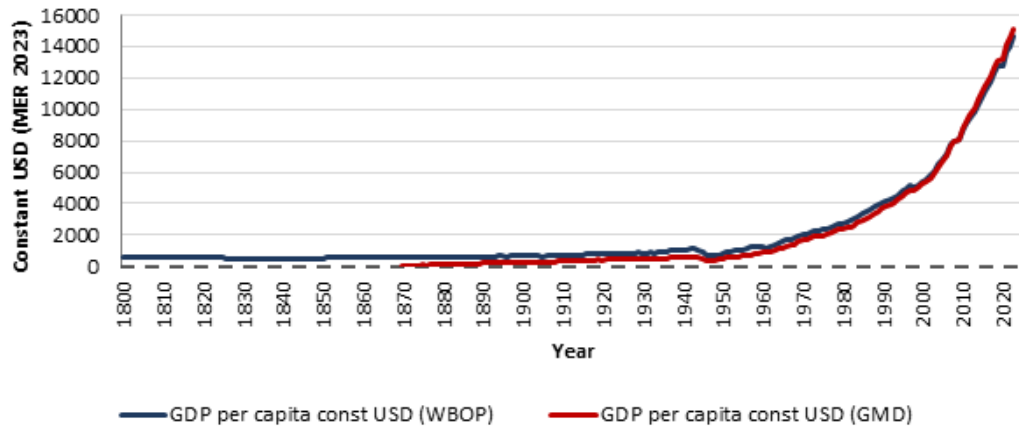
Sub-Saharan Africa: GDP per capita, constant USD (MER 2023)



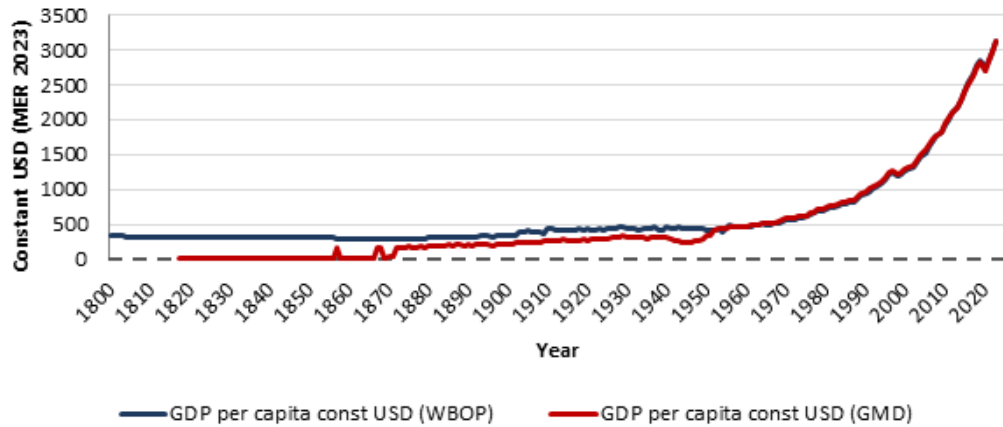
Russia/Central Asia: GDP per capita, constant USD (MER 2023)



East Asia: GDP per capita, constant USD (MER 2023)



South & South-East Asia: GDP per capita, constant USD (MER 2023)



Appendix B. Balance of payments

1. Trade in goods

Method. Goods exports and imports are spliced from three sources: Federico–Tena from each country's first available year to 1938, the CEPII Gravity database for 1948–1969, and WID/IMF balance-of-payments data for 1970–2023. The Federico–Tena figures are in current US dollars at current market exchange rates, except over 1862–1877, where they are corrected for the US-dollar devaluation Federico–Tena does not account for. The 1939–1947 war years, which no source covers consistently, are filled by linearly interpolating the trade-to-GDP ratio between 1938 and 1948 (each year adds one-tenth of the 1938–1948 change). These raw country series are stored as levels (sheets C0e/C0f) and as trade-to-GDP ratios (C0b/C0c). A final benchmark step then reconciles the two sides of world trade — recorded world imports and world exports do not coincide — by rescaling every country's exports and imports proportionally so that world exports and world imports each equal their average; Europe over 1800–1910 and the United States over 1870–1970 are held fixed, so the adjustment falls on the rest of the world. The benchmark series are in sheets C1a–C1f.

From 1800 to the start year. For countries whose Federico–Tena series begins after 1800, the trade-to-GDP ratio is carried back at its first observed value to 1801, and 1800 is set to the average of the first five Federico–Tena years. Bangladesh, Pakistan and Myanmar are handled specially: for the years they have no Federico–Tena data of their own, they are given India's trade-to-GDP ratio directly. Residual regions take the average of their region — “other South/South-East Asia” the mean of that region, “other MENA” the mean of MENA, and so on.

Workbook / source. Sheets C0b/C0c (% GDP) · C0e/C0f (levels, = Federico–Tena) · C1a–C1f (net-zero benchmark). FT start year shown per country.

Colonial reallocation under Federico–Tena: British India→India; Dutch East Indies→Indonesia; Siam→Thailand; Formosa→Taiwan; French Indochina→Vietnam; Ottoman Empire→Turkey; Persia→Iran; Belgian Congo→DR Congo; British East Africa (Kenya+Uganda)→Kenya; Ruanda-Urundi→Rwanda; Anglo-Egyptian Sudan→Sudan.

Europe

Germany: Federico–Tena 1836–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1836: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Denmark: Federico–Tena 1843–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1843: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Spain: Federico–Tena 1821–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1821: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

France: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Britain: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Italy: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Netherlands: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Norway: Federico–Tena 1830–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1830: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Sweden: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Other Western Europe: Residual region: Federico–Tena from 1850 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: ratio held constant.

Other Eastern Europe: Residual region: Federico–Tena from 1860 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1860: ratio held constant.

North America / Oceania

United States: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Canada: Federico–Tena 1828–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1828: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Australia: Federico–Tena 1826–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1826: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

New Zealand: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Other North America / Oceania: Residual region: Federico–Tena from 1800 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1800: ratio held constant.

Latin America

Argentina: Federico–Tena 1820–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1820: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Brazil: Federico–Tena 1820–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1820: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Chile: Federico–Tena 1810–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1810: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Colombia: Federico–Tena 1820–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1820: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Mexico: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Other Latin America: Residual region: Federico–Tena from 1820 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1820: ratio held constant.

Middle East / North Africa

United Arab Emirates: Federico–Tena 1918–1938; CEPII Gravity 1958–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1918: the trade/GDP ratio is held at its first FT value (1800 = average of the first

five FT years). CEPII Gravity does not cover 1948–1957; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Algeria: Federico–Tena 1830–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1830: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Egypt: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Iran: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Morocco: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Saudi Arabia: Federico–Tena 1918–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1918: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Turkey: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Other MENA: Residual region: Federico–Tena from 1800 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1800: ratio held constant.

Sub-Saharan Africa

DR Congo: Federico–Tena 1887–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1887: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Ivory Coast: Federico–Tena 1850–1938; CEPII Gravity 1960–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years). CEPII Gravity does not cover 1948–1959; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Ethiopia: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Kenya: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Mali: No separate Federico–Tena series: Mali takes Ivory Coast's trade/GDP ratio for 1850–1938 (French West Africa), held constant back to 1800; 1939–1947 interpolated; CEPII Gravity 1960–1969; WID/IMF BoP 1970–2023. CEPII Gravity does not cover 1948–1959; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Niger: No separate Federico–Tena series: Niger takes Ivory Coast's trade/GDP ratio for 1850–1938 (French West Africa), held constant back to 1800; 1939–1947 interpolated; CEPII Gravity 1960–1969; WID/IMF BoP 1970–2023. CEPII Gravity does not cover 1948–1959; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Nigeria: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Rwanda: Federico–Tena 1922–1938; CEPII Gravity 1963–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1922: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years). CEPII Gravity does not cover 1948–1962; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Sudan: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

South Africa: Federico–Tena 1826–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1826: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Other Sub-Saharan Africa: Residual region: Federico–Tena from 1850 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: ratio held constant.

Russia / Central Asia

Russia: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Other Russia / Central Asia: Residual region: Federico–Tena from 1800 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1800: ratio held constant.

East Asia

China: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Japan: Federico–Tena 1860–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1860: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

South Korea: Federico–Tena 1876–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1876: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Taiwan: Federico–Tena 1896–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1896: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Other East Asia: Residual region: Federico–Tena from 1800 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1800: ratio held constant.

South / South-East Asia

Bangladesh: No separate Federico–Tena or CEPII Gravity series. For 1800–1938 Bangladesh takes India's trade/GDP ratio (it was part of British India); 1939–1947 interpolated; CEPII Gravity does not cover 1948–1969, which are imputed from the nearest available years (a short moving average of the trade/GDP ratio) multiplied by GDP; WID/IMF BoP 1970–2023.

India: Federico–Tena 1800–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated.

Indonesia: Federico–Tena 1825–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1825: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Myanmar: No separate Federico–Tena series: for 1800–1938 Myanmar takes India's trade/GDP ratio (part of British India until 1937); 1939–1947 interpolated; own CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023.

Pakistan: No separate Federico–Tena series: for 1800–1938 Pakistan takes India's trade/GDP ratio (part of British India); 1939–1947 interpolated; own CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023.

Philippines: Federico–Tena 1810–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1810: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Thailand: Federico–Tena 1850–1938; CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1850: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years).

Vietnam: Federico–Tena 1860–1938; CEPII Gravity 1965–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1860: the trade/GDP ratio is held at its first FT value (1800 = average of the first five FT years). CEPII Gravity does not cover 1948–1964; those years are imputed from the nearest available CEPII years (a short moving average of the trade/GDP ratio) multiplied by GDP.

Other South / South-East Asia: Residual region: Federico–Tena from 1800 once regional coverage is adequate (else the regional average); CEPII Gravity 1948–1969; WID/IMF BoP 1970–2023; 1939–1947 interpolated. 1800→1800: ratio held constant.

2. Invisible flows

Method. The balance of payments has three invisible components — net trade in services, net foreign income and net foreign transfers — which together make up the total net invisible balance. For 1970–2023 each is observed directly in the WID/IMF balance-of-payments series and the total is simply their sum. For 1800–1969 the components must be reconstructed.

The reconstruction rests on a global-accounting logic. Across the nineteenth and early twentieth centuries the major Western economies — above all Britain, France and the Netherlands — accumulated large positive net foreign wealth, and their own historical balance-of-payments statistics show that this accumulation came from the invisible balance (income on foreign assets, shipping and other services), not from trade in goods, on which they typically ran deficits. Because the world balance of payments is a closed system in which every item must sum to zero across countries, these creditor surpluses must have an equal and opposite counterpart: invisible outflows from the rest of the world — profits and dividends repatriated to foreign investors, colonial transfers such as India's “Home Charges”, and freight and insurance paid to Western carriers. The central task is therefore to allocate this global negative invisible balance across the debtor economies of Latin America, Asia, Africa, the Middle East and Russia in a way that is both historically plausible and globally consistent.

The total invisible balance for each territory is taken from its own balance-of-payments study where one exists, and otherwise set as a stepped path (in % of GDP) informed by comparable countries, the observed goods trade balance, and the historical literature. On the creditor side we draw on Mitchell's International Historical Statistics as the backbone, extended by national reconstructions: Britain from Imlah (1952, 1958), Brezis (1995) and Feinstein (1972); France from Lévy-Leboyer (1977, 1987) and Lévy-Leboyer and Bourguignon (1985); Germany from the Bundesbank (2024); the Netherlands from CBS (2000), Smits et al. (2000) and Toussaint et al. (2022); Spain from Artola et al. (2021) and Prados de la Escosura (2017); Sweden from Waldenström (2016, 2017); and the United States from the Historical Statistics of the United States (North 1960; Simon 1960). On the debtor side we use the

long-run reconstructions now available for individual non-Western economies — Nogués-Marco (2021), Cuenca-Esteban (2001, 2007), Maddison (1971), Naoroji (1901) and Mukherjee (2010) on India and its “drain” to Britain; Van der Eng (1998) on Indonesia; Franco (1983) on Brazil; Ferreres (2010) on Argentina; Gregory (1979) on Russia; Yan and Xin (2023) on China; and Esteves and Khoudour (2009, 2011) on remittances — together with the interwar official estimates of the League of Nations and the Bank for International Settlements, the first IMF series from 1950, and, crucially, Twomey (1998, 2000), who compiles benchmark estimates of the stock of foreign investment held in the Third World (Latin America, Africa and Asia) as a share of GDP from 1900 onward — the debtor-side counterpart to the creditor powers' foreign assets.

These estimates are then made mutually consistent. A net-zero condition is imposed separately on each component — exactly as for goods, world inflows are set equal to world outflows (both equal to their average) by a proportional adjustment across countries — and the whole is validated by cumulating the implied current accounts into net foreign wealth and comparing the resulting stocks in 1914 and 1970 against independent contemporary and modern estimates, which they match to within about 5–10%. Wherever an item is directly observed it is used as given; the historical source figures are anchored on the studies below but adjusted for this global consistency, and the unobserved items are inferred from those observations, from neighboring countries and from the global-consistency requirement. Each total is then split into services, foreign income and transfers, gross flows are estimated and the net-zero correction is applied item by item, after which the current account and net foreign wealth follow by accumulation.

Europe

Germany: total net invisible balance (share of GDP): +0.8% (1800–1830); +0.9% (1831–1832); +0.8% (1833–1835); +1% (1836–1876); +0.5% (1877–1878); +0.6% (1879); 1880–1913: Mitchell IHS; +2.5% (1914); +1.7% (1915); +1.2% (1916); +1% (1917); +1.1% (1918); +0.2% (1919); +0.6% (1920); +0.5% (1921); +0.4% (1922); +0.1% (1923); 1924–1969: Bundesbank (2024).

Denmark: total net invisible balance (share of GDP): +0.7% (1800–1862); +0.6% (1863–1864); +0.7% (1865); +0.9% (1866); +0.5% (1867–1869); +1% (1870); +2% (1871); +3% (1872); +4% (1873); 1874–1969: Mitchell IHS.

Spain: total net invisible balance (share of GDP): 1800–1969: Artola et al. (2021) and Prados de la Escosura (2017).

France: total net invisible balance (share of GDP): +0.5% (1800–1819); 1820–1913: Lévy-Leboyer (1977, 1987) and Lévy-Leboyer and Bourguignon (1985); +5% (1914); +4.5% (1915); +4% (1916); +2% (1917–1918); +3% (1919); 1920–1938: Mitchell IHS; +1% (1939); +0.5% (1940–1944); 1945–1969: Mitchell IHS.

Britain: total net invisible balance (share of GDP): 1800–1815: Brezis (1995); 1816–1913: Imlah (1952, 1958); 1914–1969: Feinstein (1972).

Italy: total net invisible balance (share of GDP): -0.3% (1800–1860); 1861–1969: Mitchell IHS.

Netherlands: total net invisible balance (share of GDP): 1800–1969: CBS (2000) and Smits et al. (2000).

Norway: total net invisible balance (share of GDP): -1% (1800–1830); +2% (1831); +3% (1832); +5% (1833–1864); 1865–1969: Mitchell IHS.

Sweden: total net invisible balance (share of GDP): +0.5% (1800–1855); +0.6% (1856–1857); +0.5% (1858–1860); 1861–1969: Mitchell IHS.

Other Western Europe: total net invisible balance (share of GDP): +2% (1800–1869); +4% (1870); +6% (1871–1914); +4% (1915–1969).

Other Eastern Europe: total net invisible balance (share of GDP): -1% (1800–1839); -2% (1840–1849); -3% (1850–1913); -2% (1914); -1% (1915–1916); 0% (1917); +1% (1918–1919); +2% (1920–1949); +1% (1950–1966); +2% (1967–1968); +3% (1969).

North America / Oceania

United States: total net invisible balance (share of GDP): 1800–1969: Historical Statistics of the United States (North 1960; Simon 1960).

Canada: total net invisible balance (share of GDP): -1% (1800–1859); -2% (1860–1869); -5% (1870–1909); -8% (1910–1939); -5% (1940–1949); -3% (1950–1961); -1% (1962–1968); -2% (1969). Anchored on scattered BoP datapoints (Mitchell IHS, 1900; Hartland 1960, 1869).

Australia: total net invisible balance (share of GDP): +5% (1800–1829); +2% (1830–1839); -2% (1840–1849); -8% (1850–1879); -4% (1880–1899); -5% (1900–1939); -3% (1940–1958); -2% (1959); +1% (1960–1967); -1% (1968); -2% (1969). Anchored on the Mitchell IHS BoP datapoint (1861).

New Zealand: total net invisible balance (share of GDP): -1% (1800–1819); +2% (1820–1839); +4% (1840–1849); +8% (1850–1869); -2% (1870–1879); -8% (1880–1899); -15% (1900–1909); -20% (1910–1929); -12% (1930–1949); -8% (1950–1954); -4% (1955–1961); -2% (1962–1967); -1% (1968–1969). Anchored on the Mitchell IHS BoP datapoint (1950).

Other North America / Oceania: total net invisible balance (share of GDP): +2% (1800–1889); -5% (1890–1939); -3% (1940–1949); +10% (1950–1959); +20% (1960–1969).

Latin America

Argentina: total net invisible balance (share of GDP): -2% (1800–1829); -5% (1830–1849); -15% (1850–1879); -20% (1880–1900); 1901–1969: Ferreres (2010).

Brazil: total net invisible balance (share of GDP): -5% (1800–1819); -20% (1820–1829); -40% (1830–1839); -30% (1840–1849); -25% (1850–1859); -20% (1860–1870); -15% (1871–1875); 1876–1897: Franco (1987) and EHDB (Estatísticas Históricas do Brasil, 1988); -20% (1898–1909); -10% (1910–1929); 1930–1969: EHDB (Estatísticas Históricas do Brasil, 1988).

Chile: total net invisible balance (share of GDP): -10% (1800–1808); -15% (1809–1819); -10% (1820–1909); -15% (1910–1929); -10% (1930–1939); -8% (1940–1959); -4% (1960–1968); -2% (1969).

Colombia: total net invisible balance (share of GDP): -2% (1800–1969).

Mexico: total net invisible balance (share of GDP): -2% (1800–1889); -4% (1890–1909); -8% (1910–1939); -2% (1940–1959); -1% (1960–1969).

Other Latin America: total net invisible balance (share of GDP): -75% (1800–1815); -70% (1816–1819); -60% (1820–1825); -50% (1826–1830); -40% (1831–1849); -30% (1850–1869); -40% (1870–1880); -20% (1881–1909); -15% (1910–1947); -10% (1948); -5% (1949); +1% (1950–1959); +2% (1960–1969).

Middle East / North Africa

United Arab Emirates: total net invisible balance (share of GDP): -1% (1800–1910); 0% (1911–1969).

Algeria: total net invisible balance (share of GDP): -2% (1800–1839); +10% (1840); +20% (1841); +30% (1842); +40% (1843–1860); +20% (1861–1870); +5% (1871–1879); -5% (1880–1944); +3% (1945–1961); +50% (1962); 0% (1963–1969).

Egypt: total net invisible balance (share of GDP): -5% (1800–1859); -20% (1860–1869); -25% (1870–1880); -15% (1881–1900); -10% (1901–1919); -5% (1920–1949); +3% (1950–1955); +25% (1956); +5% (1957–1969). Anchored on scattered BoP datapoints (Mitchell IHS, 1930; Owen 1981, 1884).

Iran: total net invisible balance (share of GDP): -5% (1800–1859); -2% (1860–1909); -5% (1910–1924); -15% (1925–1939); -25% (1940–1949); -15% (1950–1959); -5% (1960–1969).

Morocco: total net invisible balance (share of GDP): -2% (1800–1955); +4% (1956–1969).

Saudi Arabia: total net invisible balance (share of GDP): -1% (1800–1939); -10% (1940–1947); -30% (1948); -20% (1949); -55% (1950–1954); -50% (1955–1959); -40% (1960–1962); -30% (1963–1967); -25% (1968–1969).

Turkey: total net invisible balance (share of GDP): -3% (1800–1849); -1% (1850–1869); -3% (1870–1879); -1% (1880–1969). Anchored on the Mitchell IHS BoP datapoint (1830).

Other MENA: total net invisible balance (share of GDP): 1800–1960: regional historical BoP estimates (Mitchell IHS; Owen 1981 for Egypt); -10% (1961–1966); -8% (1967); -5% (1968); -2% (1969).

Sub-Saharan Africa

DR Congo: total net invisible balance (share of GDP): -1% (1800–1897); -5% (1898–1959); -2% (1960–1968); -1% (1969).

Ivory Coast: total net invisible balance (share of GDP): -1% (1800–1909); -5% (1910–1939); -10% (1940–1969).

Ethiopia: total net invisible balance (share of GDP): -1% (1800–1889); -2% (1890–1949); +1% (1950–1969).

Kenya: total net invisible balance (share of GDP): -0.5% (1800–1869); -1% (1870–1879); -2% (1880–1929); -1% (1930–1939); +1% (1940–1949); +4% (1950–1969).

Mali: total net invisible balance (share of GDP): -1% (1800–1879); -2% (1880–1949); +4% (1950–1969).

Niger: total net invisible balance (share of GDP): -1% (1800–1879); -2% (1880–1949); +1% (1950–1966); +4% (1967–1969).

Nigeria: total net invisible balance (share of GDP): -1% (1800–1879); -2% (1880–1929); -5% (1930–1969).

Rwanda: total net invisible balance (share of GDP): -1% (1800–1850); -0.5% (1851–1869); -1% (1870–1879); -2% (1880–1949); +1% (1950–1966); +4% (1967–1969).

Sudan: total net invisible balance (share of GDP): +1% (1800–1839); +4% (1840–1910); +3% (1911–1920); +1% (1921–1929); -5% (1930–1959); +1% (1960–1969).

South Africa: total net invisible balance (share of GDP): -2% (1800–1839); -1% (1840–1899); -5% (1900–1909); -50% (1910–1920); -10% (1921); +5% (1922–1929); +10% (1930–1949); +4% (1950–1969). Anchored on the Mitchell IHS BoP datapoint (1923).

Other Sub-Saharan Africa: total net invisible balance (share of GDP): -1% (1800–1839); -4% (1840–1859); -6% (1860–1889); -8% (1890–1910); -5% (1911–1939); -2% (1940–1949); +1% (1950–1969).

Russia / Central Asia

Russia: total net invisible balance (share of GDP): -3% (1800–1803); -2% (1804–1817); -3% (1818); -2% (1819); -3% (1820–1824); -4% (1825–1830); -5% (1831–1841); -4% (1842–1843); -5% (1844); -4% (1845–1851); -5% (1852–1856); -4% (1857–1859); -3% (1860–1861); -2% (1862–1863); -1% (1864–1865); 0% (1866–1867); -1% (1868–1869); -2% (1870–1872); -3% (1873); -4% (1874–1875); -6% (1876–1878); -7% (1879); -9% (1880); -10% (1881); -12% (1882–1888); -11% (1889); -10% (1890); -9% (1891); -7% (1892–1893); -8% (1894–1896); -9% (1897–1899); -10% (1900–1901); -11% (1902–1904); -10% (1905); -8% (1906–1916); 0% (1917); +25% (1918–1920); +10% (1921); -1% (1922–1950); 0% (1951–1969). Anchored on Gregory (1979) and Chuchko (2022) (Russian BoP, late 19th–early 20th century).

Other Russia / Central Asia: total net invisible balance (share of GDP): -3% (1800–1803); -2% (1804–1817); -3% (1818); -2% (1819); -3% (1820–1824); -4% (1825–1830); -5% (1831–1841); -4% (1842–1843); -5% (1844); -4% (1845–1851); -5% (1852–1856); -4% (1857–1859); -3% (1860–1861); -2% (1862–1863); -1% (1864–1865); 0% (1866–1867); -1% (1868–1869); -2% (1870–1872); -3% (1873); -4% (1874–1875); -6% (1876–1878); -7% (1879); -9% (1880); -10% (1881); -12% (1882–1888); -11% (1889); -10% (1890); -9% (1891); -7% (1892–1893); -8% (1894–1896); -9% (1897–1899); -10% (1900–1901); -11% (1902–1904); -10% (1905); -8% (1906–1916); 0% (1917); +25% (1918–1920); +10% (1921); -1% (1922–1950); 0% (1951–1969).

East Asia

China: total net invisible balance (share of GDP): -1% (1800–1819); -1.4% (1820–1839); -2% (1840–1894); -1% (1895–1907); -2% (1908–1917); -1% (1918–1935); -2% (1936–1937); -1% (1938–1944); -2% (1945–1949); +1% (1950–1956); +2% (1957–1966); +1% (1967–1969). Anchored on Yan and Xin (2023) (BoP reconstruction from 1800).

Japan: total net invisible balance (share of GDP): -1% (1800–1819); -1.4% (1820–1849); -0.5% (1850–1859); +1% (1860–1869); +2% (1870–1879); +1% (1880–1889); +4% (1890–1899); +3% (1900–1929); +2% (1930–1938); 0% (1939–1940); +1% (1941–1942); +2% (1943–1944); -20% (1945–1949); +3% (1950–1956); +2% (1957–1966); +1% (1967–1968); -1% (1969). Anchored on the Mitchell IHS BoP datapoint (1868).

South Korea: total net invisible balance (share of GDP): -1% (1800–1897); 0% (1898–1900); +1% (1901–1903); +2% (1904–1905); +1% (1906–1908); 0% (1909–1911); -1% (1912–1913); -2% (1914–1927); -1% (1928–1932); 0% (1933–1935); +1% (1936–1937); +2% (1938–1939); +3% (1940–1942); +4% (1943–1944); +5% (1945–1946); +6% (1947–1950); +7% (1951–1952); +8% (1953–1958); +9% (1959); +10% (1960); +9% (1961); +8% (1962–1969). Anchored on the Mitchell IHS BoP datapoint (1910).

Taiwan: total net invisible balance (share of GDP): -1% (1800–1807); 0% (1808); -1% (1809–1810); 0% (1811–1815); -1% (1816–1855); 0% (1856–1863); +1% (1864–1878); +2% (1879–1883); +3% (1884–1892); +2% (1893–1894); +1% (1895); 0% (1896); -1% (1897–1898); -2% (1899); -3% (1900); -5% (1901); -6% (1902); -7% (1903–1905); -9% (1906); -12% (1907); -15% (1908); -18% (1909–1912); -19% (1913); -21% (1914); -22% (1915); -21% (1916); -19% (1917); -17% (1918); -16% (1919–1921); -17% (1922–1923); -16% (1924); -15% (1925–1926); -14% (1927–1929); -13% (1930); -12% (1931); -11% (1932–1933); -10% (1934–1935); -9% (1936); -8% (1937); -7% (1938); -5% (1939); -4% (1940); -3% (1941); -2% (1942); 0% (1943); +4% (1944); +6% (1945); +9% (1946); +12% (1947); +13% (1948); +14% (1949); +15% (1950); +16% (1951); +17% (1952); +15% (1953); +12% (1954); +10% (1955); +7% (1956); +6% (1957–1969). Anchored on the Mitchell IHS BoP datapoint (1900).

Other East Asia: total net invisible balance (share of GDP): -2% (1800–1892); -1% (1893–1906); -2% (1907–1908); -3% (1909–1916); -2% (1917–1918); -1% (1919–1924); -2% (1925–1930); -1% (1931–1933); 0% (1934); +1% (1935); +2% (1936); +3% (1937); +4% (1938); +6% (1939); +7% (1940); +8% (1941); +10% (1942); +11% (1943); +12% (1944); +14% (1945–1947); +15% (1948–1956); +20% (1957–1964); +15% (1965–1966); +10% (1967); +5% (1968); +3% (1969).

South / South-East Asia

Bangladesh: total net invisible balance (share of GDP): -3% (1800–1834); -4% (1835–1856); -5% (1857–1861); -6% (1862–1866); -5% (1867–1868); -6% (1869–1873); -7% (1874–1877); -8% (1878–1885); -7% (1886–1888); -6% (1889–1892); -5% (1893–1907); -6% (1908–1911); -5% (1912–1913); -4% (1914); -5% (1915–1917); -4% (1918–1922); -5% (1923); -4% (1924–1930); -3% (1931–1934); -2% (1935–1936); -1% (1937–1938); 0% (1939–1940); +1% (1941–1942); +2% (1943–1945); +3% (1946–1969).

India: total net invisible balance (share of GDP): -4% (1800–1859); -5% (1860–1869); -6% (1870–1913); -3% (1914); -2.5% (1915); -2% (1916–1922); 1923–1969: Mitchell IHS (League of Nations); the pre-1923 path is a hand-set assumption consistent with Maddison 1971, Mukherjee 2010 and Nogués-Marco 2021.

Indonesia: total net invisible balance (share of GDP): -2% (1800–1817); -4% (1818); -6% (1819); -8% (1820–1868); -12% (1869–1907); -15% (1908–1924); 1925–1969: Mitchell IHS (League of Nations); the pre-1925 path is a hand-set assumption consistent with Van der Eng 1998.

Myanmar: total net invisible balance (share of GDP): -3% (1800–1834); -4% (1835–1856); -5% (1857–1861); -6% (1862–1866); -5% (1867–1868); -6% (1869–1873); -7% (1874–1877); -8% (1878–1885); -7% (1886–1888); -6% (1889–1892); -5% (1893–1907); -6% (1908–1911); -5% (1912–1913); -4% (1914); -5% (1915–1917); -4% (1918–1922); -5% (1923); -4% (1924–1934); -5% (1935–1939); -6% (1940–1943); -7% (1944–1949); -5% (1950–1951); -4% (1952–1953); -3% (1954–1955); -2% (1956–1957); -3% (1958); -2% (1959); -3% (1960–1961); -2% (1962–1964); -1% (1965–1967); 0% (1968–1969).

Pakistan: total net invisible balance (share of GDP): -3% (1800–1834); -4% (1835–1856); -5% (1857–1861); -6% (1862–1866); -5% (1867–1868); -6% (1869–1873); -7% (1874–1877); -8% (1878–1885); -7% (1886–1888); -6% (1889–1892); -5% (1893–1907); -6% (1908–1911); -5% (1912–1913); -4% (1914); -5% (1915–1917); -4% (1918–1922); -5% (1923); -4% (1924–1934); -5% (1935–1938); -6% (1939–1948); -5% (1949–1950); -4%

(1951); -3% (1952); -2% (1953); -1% (1954); 0% (1955); +1% (1956); +2% (1957–1959); +3% (1960–1966); +4% (1967–1969).

Philippines: total net invisible balance (share of GDP): 0% (1800–1805); +1% (1806–1808); +2% (1809–1816); +1% (1817–1818); 0% (1819–1821); -1% (1822–1824); -2% (1825–1830); -3% (1831–1844); -4% (1845–1846); -5% (1847–1848); -6% (1849–1856); -5% (1857–1862); -4% (1863–1864); -5% (1865); -6% (1866–1867); -5% (1868–1871); -6% (1872–1874); -5% (1875–1877); -6% (1878); -7% (1879); -8% (1880–1883); -9% (1884–1886); -10% (1887–1888); -9% (1889); -8% (1890); -7% (1891–1892); -6% (1893); -5% (1894–1895); -4% (1896); -3% (1897–1902); -4% (1903); -3% (1904); -4% (1905–1907); -5% (1908–1913); -6% (1914–1916); -5% (1917–1918); -4% (1919–1930); -3% (1931–1932); -2% (1933–1934); -1% (1935); 0% (1936); +1% (1937); +2% (1938); +3% (1939); +4% (1940–1945); +3% (1946); +2% (1947–1948); +1% (1949); 0% (1950); -1% (1951–1953); -2% (1954–1960); -1% (1961–1962); 0% (1963–1964); +1% (1965–1966); +2% (1967–1969). Anchored on scattered BoP datapoints (Mitchell IHS, 1934; Ponciano 2003, Table 7, 1916).

Thailand: total net invisible balance (share of GDP): -3% (1800–1827); -4% (1828–1846); -5% (1847–1849); -6% (1850–1852); -7% (1853–1855); -6% (1856–1858); -5% (1859–1862); -4% (1863–1864); -3% (1865); -4% (1866–1867); -5% (1868–1873); -6% (1874–1878); -7% (1879–1883); -8% (1884–1892); -9% (1893); -8% (1894–1895); -9% (1896–1898); -10% (1899–1900); -11% (1901–1910); -9% (1911); -10% (1912–1915); -9% (1916–1925); -8% (1926–1928); -7% (1929–1930); -8% (1931–1937); -7% (1938–1943); -6% (1944); -5% (1945–1946); -4% (1947); -3% (1948); -2% (1949); -1% (1950); 0% (1951); +1% (1952); +2% (1953–1960); +3% (1961–1965); +4% (1966); +3% (1967–1969). Anchored on the Mitchell IHS BoP datapoint (1924).

Vietnam: total net invisible balance (share of GDP): -2% (1800–1830); -3% (1831–1850); -4% (1851–1863); -3% (1864–1871); -4% (1872–1877); -3% (1878–1884); -4% (1885); -5% (1886–1888); -6% (1889–1892); -5% (1893); -4% (1894); -3% (1895–1896); -2% (1897–1901); -3% (1902–1903); -4% (1904); -5% (1905); -7% (1906); -8% (1907–1908); -9% (1909); -10% (1910); -9% (1911); -10% (1912–1915); -9% (1916–1918); -8% (1919–1921); -7% (1922); -6% (1923–1927); -7% (1928–1934); -6% (1935); -5% (1936); -3% (1937); -1% (1938); +1% (1939); +3% (1940); +5% (1941); +6% (1942); +8% (1943); +9% (1944–1945); +10% (1946–1947); +11% (1948); +10% (1949–1950); +9% (1951–1953); +8% (1954); +15% (1955–1965); +14% (1966); +13% (1967); +12% (1968); +11% (1969).

Other South / South-East Asia: total net invisible balance (share of GDP): -2% (1800); -3% (1801–1832); -4% (1833–1854); -5% (1855–1858); -6% (1859–1873); -7% (1874–1878); -8% (1879–1884); -7% (1885–1888); -6% (1889–1893); -5% (1894–1902); -6% (1903–1907); -7% (1908–1911); -6% (1912–1919); -5% (1920–1921); -6% (1922–1924); -5% (1925–1930); +2% (1931–1944); +10% (1945–1954); +15% (1955–1965); +10% (1966); +5% (1967); +4% (1968); +3% (1969).

3. Trade in services

Method. Net trade in services is one of the three components into which the total net invisible balance (from the section above) is split. For 1970–2023 service exports and imports are observed directly in the WID/IMF balance-of-payments series. For 1800–1969 the treatment depends on how far the underlying source decomposes the invisibles, and is given per country below: where the source reports services (or all three components), net services is read from it and reconciled to the source total; where the source reports only the total invisible balance and the foreign income, net services is obtained as total net invisibles – net income – net transfers, with the services–transfers split from the League of Nations' interwar publications or, where these are unavailable, from computed transfers (explained in the transfers section below) — a source-constrained estimate, not a free residual; and where no study decomposes the invisibles, net income and net transfers are set from assumed shares (consistent with the foreign-asset anchors) and net services is the residual of the assumed %-of-GDP invisible balance. Gross service exports and imports are then recovered from the net figure using leverage-ratio assumptions, and a net-zero correction is applied so that world service exports equal world imports, both equal to their average, as for the other flows.

From 1800 to the start year. Before a country's own decomposition begins, net services follows the same 1800→start bridge as the total invisible balance (from the section above): with net income set from an assumed share and net transfers computed, net services is the residual of the assumed %-of-GDP invisible balance.

Workbook / source. Sheets D0d (net) · D0e/D0f (gross) · D1a–D1f (net-zero). Study columns in G0b: CZ/DA (Spain), DD (Netherlands), DS (Argentina), DY (Brazil).

Europe

Germany: 1800–1923: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS and the transfers computed; 1924–2023: net services taken directly as gross service exports minus imports (Bundesbank 2024; WID from 1970).

Denmark: 1800–1969: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS (Danish BoP, 1874–1948) and the transfers computed; 1970–2023: WID.

Spain: 1800–1849: assumed net services (a %-of-GDP path); 1850–2023: net services taken directly from the national BoP as gross service exports minus imports (Artola et al. 2021; Prados de la Escosura 2017; WID from 1970).

France: 1800–1969: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS extended by Lévy-Leboyer (1977, 1987) and Lévy-Leboyer and Bourguignon (1985), and the transfers computed; 1970–2023: WID.

Britain: 1800–1969: net services from Feinstein (1972), which reports gross services from 1870 (with income throughout and transfers from 1915); over 1800–1869 the total invisible balance is from Imlah (1952, 1958) and Brezis (1995) and services is obtained by difference. In the assembled series services is reconciled to the total. 1970–2023: WID.

Italy: 1800–1969: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS (Italian BoP, 1860–1948) and the transfers computed; 1970–2023: WID.

Netherlands: 1800–1969: net services taken directly from the national BoP (CBS 2000, Table 6; see also Smits et al. 2000, Table 7.3); 1970–2023: WID.

Norway: 1800–1969: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS (Norwegian BoP, 1874–1947) and the transfers computed; 1970–2023: WID.

Sweden: 1800–1969: net services derived as total net invisibles – income – transfers, with the total and income from Mitchell IHS (Swedish BoP, 1861–1947; foreign-wealth cross-checks in Waldenström 2016, 2017) and the transfers computed; 1970–2023: WID.

Other Western Europe: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other Eastern Europe: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

North America / Oceania

United States: 1800–2023: net services taken directly from the national BoP as gross service exports minus imports (HSUS for 1800–1969, underlying North 1960 and Simon 1960; WID from 1970).

Canada: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Australia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

New Zealand: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other North America / Oceania: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Latin America

Argentina: 1800–1900: residual of the assumed invisible-balance path; 1901–1969: net services from Ferreres (2010), which reports the full balance of payments (see also Taylor 2000); 1970–2023: WID.

Brazil: 1876–1897: net services from Franco (1987); 1930–1969: net services from the EHDB (Estatísticas Históricas do Brasil), the invisibles corrected against the visible surplus; other pre-1970 years: residual of the assumed invisible-balance path; 1970–2023: WID.

Chile: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Colombia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Mexico: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other Latin America: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Middle East / North Africa

United Arab Emirates: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Algeria: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Egypt: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Iran: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Morocco: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Saudi Arabia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Turkey: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other MENA: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Sub-Saharan Africa

DR Congo: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Ivory Coast: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Ethiopia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Kenya: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Mali: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Niger: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Nigeria: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Rwanda: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Sudan: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

South Africa: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other Sub-Saharan Africa: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Russia / Central Asia

Russia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other Russia / Central Asia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

East Asia

China: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Japan: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

South Korea: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Taiwan: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other East Asia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

South / South-East Asia

Bangladesh: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

India: 1800–1969: net services derived as total net invisibles – income – transfers, with the total from Mitchell IHS (from 1923, on League of Nations BoP) and income from the League of Nations for the interwar decades, the transfers computed, and the pre-1923 path a hand-set assumption (consistent with Maddison 1971, Mukherjee 2010, Nogués-Marco 2021); 1970–2023: WID.

Indonesia: 1800–1969: net services derived as total net invisibles – income – transfers, with the total from Mitchell IHS (from 1925, on League of Nations BoP) and income from the League of Nations from 1946 (a share of the total before), the transfers computed, and the pre-1925 path a hand-set assumption (consistent with Van der Eng 1998); 1970–2023: WID.

Myanmar: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Pakistan: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Philippines: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Thailand: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Vietnam: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

Other South / South-East Asia: 1800–1969: net services is the residual of the assumed invisible-balance path (income from an assumed share and transfers computed); 1970–2023: WID observed net services.

4. Foreign income

Method. For 1970–2023, net foreign income is observed in WID. For 1800–1969 net income is taken from the country's own investment-income series wherever a study provides one, and otherwise set as a share of the total invisible balance — the country's own income-to-total share where one has been estimated, or a default share rising from 0.10 in 1800 to 0.70 by 1870 and about 0.80 by 1900. Where income is set as a share, the figure is reconciled to the total and to global consistency, but its sign and magnitude are anchored on the country's economic history and, where they exist, on country-specific studies cited in the entries below. Gross income inflows and outflows are then recovered from the net figure using leverage-ratio assumptions, and a net-zero correction is applied so that world income inflows equal world outflows, both equal to their average, as for the other flows.

From 1800 to the start year. Before a national income series begins, net income is set as a share of the total invisible balance (from the section above) — the country's own estimated income-to-total share where one exists, otherwise the default share rising from 0.10 in 1800 to about 0.80 by 1900. The source for each country and period is given below.

Workbook / source. Sheets E0d (net) · E0e/E0f (gross) · E1a–E1f (net-zero) · A8a (WID, 1970+). Study/share columns in G0b: CD (France), CG (Germany), CX (Spain), DE (Netherlands), DK/DL (India), DO/DP (Indonesia), DT/DV (Argentina), DZ (Brazil), EB (default share).

Europe

Germany: 1800–1879: net income as a share of the total invisible balance; 1880–1913: German investment income apportioned from Mitchell IHS's total and income balances; 1914–1923: net income as a share of the total invisible balance (the war and hyperinflation gap); 1924–1969: German net investment income, gross inflows minus outflows (Bundesbank 2024); 1970–2023: WID.

Denmark: 1800–1922: net income as a share of the total invisible balance (the Danish total is available from 1874 but the income decomposition only from 1923); 1923–1969: Danish net investment income (Mitchell IHS, on League of Nations data); 1970–2023: WID.

Spain: 1800–1849: net income as a share of the total invisible balance; 1850–1969: Spanish net investment income (Artola et al. 2021; Prados de la Escosura 2017); 1970–2023: WID.

France: 1800–1819: net income as a share of the total invisible balance; 1820–1913: French investment income apportioned from Lévy-Leboyer's total and income balances (1977, 1987); 1914–1919 and 1939–1944: net income as a share of the total invisible balance (the two war gaps); 1920–1938 and 1945–1969: Lévy-Leboyer's income balance directly; 1970–2023: WID.

Britain: 1800–1815: the British investment-income balance (Brezis 1995); 1816–1869: Imlah (1952, 1958); 1870–1969: gross income inflows minus outflows (Feinstein 1972, extending Mitchell IHS); 1970–2023: WID.

Italy: 1800–1860: net income as a share of the total invisible balance; 1861–1969: Italian net investment income (Mitchell IHS); 1970–2023: WID.

Netherlands: 1800–1969: Dutch net investment income (CBS 2000; see also Smits et al. 2000); 1970–2023: WID.

Norway: 1800–1864: net income as a share of the total invisible balance; 1865–1969: Norwegian net investment income (Mitchell IHS); 1970–2023: WID.

Sweden: 1800–1860: net income as a share of the total invisible balance; 1861–1969: Swedish net investment income (Mitchell IHS); 1970–2023: WID.

Other Western Europe: 1800–1945: net income as a share of the total invisible balance; 1946–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other Eastern Europe: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

North America / Oceania

United States: 1800–1900: net income entered directly (HSUS, underlying North 1960 and Simon 1960); 1901–1969: US net investment income, gross inflows minus outflows (HSUS); 1970–2023: WID.

Canada: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Australia: 1800–1839: net income as a share of the total invisible balance; 1840–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

New Zealand: 1800–1819: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1820–1869: net income as a share of the total invisible balance; 1870–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other North America / Oceania: 1800–1889: net income as a share of the total invisible balance; 1890–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Latin America

Argentina: 1800–1900: net income as Argentina's estimated income share of the total invisible balance (see Taylor 2000); 1901–1969: Argentine net investment income (Ferrerres 2010); 1970–2023: WID.

Brazil: 1800–1875 and 1898–1929: net income as a share of the total invisible balance; 1876–1897: Brazilian net investment income (Franco 1987); 1930–1969: net investment income (EHDB, Estatísticas Históricas do Brasil); 1970–2023: WID.

Chile: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Colombia: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Mexico: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other Latin America: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Middle East / North Africa

United Arab Emirates: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Algeria: 1800–1839: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1840–1879: net income as a share of the total invisible balance; 1880–1961: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1962: net income held at its 1961 level (the 1962 shock enters as a transfer, not income); 1963–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Egypt: 1800–1955: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1956: net income held at its 1955 level (the 1956 shock enters as a transfer, not income); 1957–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Iran: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Morocco: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Saudi Arabia: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Turkey: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other MENA: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Sub-Saharan Africa

DR Congo: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Ivory Coast: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Ethiopia: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Kenya: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Mali: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Niger: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Nigeria: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Rwanda: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Sudan: 1800–1929: net income as a share of the total invisible balance; 1930–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

South Africa: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other Sub-Saharan Africa: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Russia / Central Asia

Russia: 1800–1916: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1917: the 1916 investment-income balance scaled to one-half (Revolution); 1918–1922: the same balance scaled down further, entered directly; 1923–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other Russia / Central Asia: 1800–1916: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1917–1922: values entered directly (post-Revolution adjustment); 1923–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

East Asia

China: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Japan: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

South Korea: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Taiwan: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other East Asia: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

South / South-East Asia

Bangladesh: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

India: 1800–1922: net income as India's estimated income share of the total invisible balance, following Maddison (1971), Mukherjee (2010), Nogués-Marco (2021) and Cuenca-Esteban (2001, 2007) on the India–Britain balance; 1923–1969: Indian net investment income (Mitchell IHS, on League of Nations data); 1970–2023: WID.

Indonesia: 1800–1945: net income as Indonesia's estimated income share of the total invisible balance, following Van der Eng (1998); 1946–1969: Indonesian net investment income (Mitchell IHS, on League of Nations data); 1970–2023: WID.

Myanmar: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Pakistan: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Philippines: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Thailand: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Vietnam: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

Other South / South-East Asia: 1800–1969: net income as a share of the total invisible balance (the default share, rising from 0.10 in 1800 to 0.70 by 1870); 1970–2023: WID observed net foreign income.

5. Foreign transfers

Method. In the balance of payments, transfers are unilateral flows — monetary movements with no counterpart good or service acquired and no payment to a factor of production. Today they consist mainly of workers' remittances, public development aid and pensions. Historically, and especially over the nineteenth and early twentieth centuries, the largest transfers resulted from the coercive relationship between empires and their colonies: the colonial “Home Charges” remitted by British India and the Dutch East Indies to Britain and the Netherlands, the war tributes and indemnities imposed on defeated or subjugated states, and inter-imperial reparations. The imperial centres are allocated the transfer inflows they drew from their colonies, and the colonised and defeated economies the matching outflows, on the basis of the historical literature on the colonial drain and on reparations — Naoroji (1901), Banerji (1963), Maddison (1971), Mukherjee (2010), Cuenca-Esteban (2001, 2007), Nogués-Marco (2021) and Patnaik and Patnaik (2021) on British India, Van der Eng (1998) on Indonesia, and Bazelon et al. (2023) and Robinson (2023) on reparations. We take the magnitudes from these studies and, as for the other flows, adjust them for global and historical consistency, so that world transfer inflows equal world transfer outflows. For 1970–2023, net transfers are observed in WID. For 1800–1969, where a country's own study reports a transfer series it is used directly; otherwise net transfers are set as a share of the residual invisible balance — $\text{transfers} = (\text{transfer share}) \times (\text{total invisibles} - \text{income})$ — using the country's own estimated share where one exists or a default share falling from 0.50 in 1800 to 0.10 by 1900. These recurring flows are complemented by specific one-off transfers (tributes, indemnities, reparations and asset expropriations), entered directly and documented after the country entries below.

From 1800 to the start year. Before a country's own transfer study begins, $\text{net transfers} = (\text{transfer share}) \times (\text{total invisible balance} - \text{income})$, using the country's own estimated share where one exists and otherwise the default share falling from 0.50 in 1800 to 0.10 by 1900. The specific one-off transfers documented below are added on top regardless of coverage.

Workbook / source. Sheets F0d (net) · F0e/F0f (gross) · F1a–F1f (net-zero) · A8a (WID, 1970+). Study/share columns in G0b: BU/BV (Britain), CY (Spain), DF (Netherlands), DU/DW (Argentina), EA (Brazil), EC (default share).

Europe

Germany: 1800–1923: a share of the residual invisibles (total invisibles – income); 1924–1969: German net transfers (Bundesbank 2024); the Franco-Prussian indemnity received in 1871 is entered on top (below); 1970–2023: WID.

Denmark: net transfers as a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Spain: 1800–1849: a share of the residual invisibles (total invisibles – income); 1850–1969: Spanish net transfers (Artola et al. 2021; Prados de la Escosura 2017); 1970–2023: WID.

France: 1800–1969: a share of the residual invisibles (total invisibles – income); the Franco-Prussian indemnity paid to Germany in 1871, the Haitian indemnity received in 1825 and the Moroccan indemnity received in 1887 are entered on top (below); 1970–2023: WID.

Britain: 1800–1914: the declining colonial-transfer share consistent with Nogués-Marco (2021) applied to the residual invisibles (total invisibles – income); 1915–1969: British net transfers (Feinstein 1972); the Opium War indemnities received in 1842 and 1858 are entered on top (see the specific transfers below); 1970–2023: WID.

Italy: net transfers as a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Netherlands: 1800–1969: Dutch net transfers (CBS 2000; see also Smits et al. 2000), which include the Home Charges received from the Dutch East Indies; 1970–2023: WID.

Norway: net transfers as a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Sweden: net transfers as a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Other Western Europe: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other Eastern Europe: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

North America / Oceania

United States: 1800–1969: US net transfers (HSUS), including the wartime and post-war transfers of 1918–1921 and 1941–1951 (Lend-Lease and the Marshall Plan; below); 1970–2023: WID.

Canada: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Australia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

New Zealand: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other North America / Oceania: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Latin America

Argentina: 1800–1900: a share of the residual invisibles (total invisibles – income); 1901–1969: Argentine net transfers (Ferreres 2010); 1970–2023: WID.

Brazil: 1876–1897 and 1930–1969: Brazilian net transfers (Franco 1987; EHDB); other pre-1970 years: a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Chile: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Colombia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Mexico: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other Latin America: 1800–1969: a share of the residual invisibles (total invisibles – income); the Haitian indemnity paid to France in 1825 is entered on top (below); 1970–2023: WID.

Middle East / North Africa

United Arab Emirates: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Algeria: 1800–1961: a share of the residual invisibles (total invisibles – income); 1962: the independence settlement, entered directly (below); 1963–1969: a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Egypt: 1800–1955: a share of the residual invisibles (total invisibles – income); 1956: the Suez Canal Company nationalization, entered directly (below); 1957–1969: a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Iran: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Morocco: 1800–1969: a share of the residual invisibles (total invisibles – income); the indemnity paid to France in 1887 is entered on top (below); 1970–2023: WID.

Saudi Arabia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Turkey: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other MENA: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Sub-Saharan Africa

DR Congo: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Ivory Coast: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Ethiopia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Kenya: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Mali: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Niger: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Nigeria: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Rwanda: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Sudan: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

South Africa: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other Sub-Saharan Africa: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Russia / Central Asia

Russia: 1800–1917: a share of the residual invisibles (total invisibles – income); 1918–1921: the Soviet repudiation of Tsarist debt and expropriation of foreign assets, entered directly (below); 1922–1969: a share of the residual invisibles (total invisibles – income); 1970–2023: WID.

Other Russia / Central Asia: 1800–1917: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1918–1921: a specific one-off transfer entered directly, corresponding to the Soviet repudiation of Tsarist external debt; 1922–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

East Asia

China: 1800–1969: a share of the residual invisibles (total invisibles – income); the Opium War indemnities paid to Britain in 1842 and to Britain and France in 1858 are entered on top (below); 1970–2023: WID.

Japan: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

South Korea: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Taiwan: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other East Asia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

South / South-East Asia

Bangladesh: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

India: 1800–1969: India's transfer share of the residual invisibles (total invisibles – income) — the colonial Home Charges remitted to Britain — following Naoroji (1901), Maddison (1971), Mukherjee (2010) and Cuenca-Esteban (2001, 2007); 1970–2023: WID.

Indonesia: 1800–1969: Indonesia's transfer share of the residual invisibles (total invisibles – income) — the Home Charges remitted to the Netherlands — following Van der Eng (1998); 1970–2023: WID.

Myanmar: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Pakistan: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Philippines: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Thailand: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Vietnam: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Other South / South-East Asia: 1800–1969: net transfers as the default share of the residual invisibles (total invisibles – income), falling from 0.50 in 1800 to 0.10 by 1900; 1970–2023: WID observed net transfers.

Specific transfers embedded in the series

The one-off transfers below are entered directly into the WBOP series, on top of the recurring transfer flows in the country entries above. Each is a well-documented historical payment; the amounts are those embedded in the database, and they are reconciled to global consistency with the rest of the balance of payments. In the additional **Online Appendix: Additional Material on Transfers** (see wbop.world) we discuss a series of one-off transfers that could also be included but we decide not to for methodological reasons. The extra appendix provides the alternative series with this additional transfers included and a comparison with the current WBOP series. Noteworthy, as shown in the referred separate file, their inclusion would not affect our main results.

Haitian indemnity (Haiti → France, 1825). France recognised Haitian independence only in 1825, in exchange for an indemnity of 150 million francs (later reduced to 90 million) to compensate former slaveholders for their lost plantations and enslaved people. Haiti borrowed heavily to meet the early instalments — the so-called “double debt” — and serviced the obligation into the twentieth century, a lasting drag on its development. Source: Henochsberg (2016), *Public Debt and Slavery: the Case of Haiti (1760–1915)*.

First Opium War indemnity (China → Britain, 1842). Under the Treaty of Nanjing that ended the First Opium War, China paid Britain 21 million silver dollars for the destroyed opium, the debts of the Canton Hong merchants and British war costs, alongside the cession of Hong Kong.

Second Opium War indemnity (China → Britain and France, 1858–1860). The Treaties of Tianjin (1858) and the Convention of Beijing (1860) imposed a further indemnity of 8.4 million dollars, split 5.6 million to Britain and 2.8 million to France.

Franco-Prussian War indemnity (France → Germany, 1871). The Treaty of Frankfurt required France to pay the newly unified Germany 5 billion francs, discharged by 1873 — the largest war indemnity of the nineteenth century, which helped finance German industrialisation and the shift to gold.

Moroccan indemnity (Morocco → France, 1887). Morocco paid France 1.5 million francs in 1887 in settlement of border and commercial disputes.

Soviet repudiation and expropriations (Russia, 1918–1921). The Bolshevik government repudiated the foreign debt of the Tsarist state and nationalised foreign-owned assets in Russia, inflicting a large one-off loss on foreign creditors and investors — principally French, British and German. It is entered as a negative transfer to those countries.

Suez Canal nationalisation (Egypt, 1956). Egypt nationalised the Suez Canal Company, transferring the chiefly British- and French-owned asset into Egyptian ownership.

Algerian independence settlement (1962). On independence, French colonial assets in Algeria were expropriated or abandoned — a one-off transfer of foreign-owned property to Algeria.

United States wartime and post-war transfers (1918–1921 and 1941–1951). The large unilateral US transfers of the two world wars and their aftermath — including Lend-Lease and the Marshall Plan — are already present in the recorded US transfer series.

6. Current account

Method. Net current account (sheet H1a) is the identity net goods + net services + net income + net transfers, each after its net-zero correction. No independent source; the provenance is that of the goods, services, income and transfer sections.

7. Foreign wealth (net foreign assets and liabilities)

Method. Net foreign wealth is built up year by year from the current account. A country's current account — the sum of its net trade in goods, net trade in services, net foreign income and net foreign transfers (the four preceding sections) — is the net amount it lends to (if positive) or borrows from (if negative) the rest of the world that year. Adding it to the stock carried over from the previous year gives the new stock: net foreign wealth in year t equals net foreign wealth in $t-1$ plus the current account of $t-1$, all in current US dollars (sheet I1d in dollars, I1a as a share of GDP). Iterating this identity from the 1800 position through to 2023 traces each country's whole net external position. The 1800 starting values follow the historical balance-of-payments and foreign-wealth reconstructions that reach back to the early nineteenth century: a positive position for the Netherlands (+37.1% of GDP) from the Dutch balance of payments of Smits et al. (2000); positive positions for Britain (+3.4%) and France (+1.4%) from Imlah (1952, 1958) and Brezis (1995) for Britain and Lévy-Leboyer (1977) for France; and a negative position for the United States (−19.7%) from North (1960). These are consistent with the contemporary pre-1914 foreign-asset estimates (Giffen 1889; De Foville 1893; Colson 1903) and with Piketty–Zucman (2014). For the remaining economies — Canada (−24.5%), the West Indies (within “other Latin America”, −13.5%), Indonesia (−7.3%), India (−0.4%) and others — no early stock estimate exists, so the 1800 position is set as the debtor counterpart required for the world to sum to zero and to stay consistent with these creditor positions. The accumulation is in nominal dollars, so capital gains and losses on the stock are ignored — assets and liabilities are treated as dollar-denominated — except over 1862–1878, when past positions are indexed to sterling rather than the dollar, so the temporary Civil-War devaluation of the dollar does not create an artificial fall and recovery in foreign wealth.

Consistency checks. The cumulated series is validated at two benchmarks: the 1913 position against Twomey (1998, 2000) and Piketty–Zucman (2014), and the 1970 position against the observed external positions (Lane and Milesi-Ferretti 2007, 2009, 2018; Nievas–Sodano 2024, as used in WID), with gaps within about 5–10% of the stock

estimates for the main creditor powers. Gross foreign assets and gross foreign liabilities are then split from the net position using an assumption on the evolution of leverage (sheets I1b/I1c).

Workbook / source. Sheets I1a (net) · I1b/I1c (gross) · I1d (cumulation).

8. Implied rates of return on foreign wealth

Method. Three implied rates of return are computed in the same way for every territory, with no country-specific variant. In each year, the return on foreign assets is gross foreign-income inflows divided by gross foreign assets; the return on foreign liabilities is gross foreign-income outflows divided by gross foreign liabilities; and the asset–liability differential is the first minus the second. Both ratios are contemporaneous — income and stock are dated to the same year, not a lagged stock. None of the four inputs is directly observed: the gross income inflows and outflows are the gross foreign-income flows of the foreign-income section, and the gross foreign assets and liabilities are not measured independently but split symmetrically from net foreign wealth around an assumed gross-leverage level — adding and subtracting half the net position — so that their difference equals net foreign wealth. Because the gross positions rest on this leverage assumption, and the pre-1970 income and wealth series are themselves reconstructed, the level of the implied return is fragile; only its long-run trends are meaningful.

Workbook / source. Sheets J1b (return on assets), J1c (return on liabilities) and J1a (the differential); the inputs are the gross income flows (E1b/E1c) and the gross assets and liabilities (I1b/I1c), the latter split from net foreign wealth (I1a) around the leverage level (I1z).

9. Trade in goods: primary commodities vs manufactured goods

Method. The goods trade of each country is split between primary commodities and manufactures. The share of primary commodities is from Federico–Tena for 1800–1938 and from UN International Trade Statistics (1948–1960), UN Comtrade (1962–1979) and the WTO (1980–2023) thereafter; manufactures are the residual. A net-zero benchmark anchors primary-commodity trade to world exports, which prevents negative manufactured exports for countries whose commodity share is close to 100%. Primary commodities are defined as SITC 0–4 plus 68 and manufactures as SITC 5–8 minus 68; primary commodities are split further into agriculture (SITC 0–2 and 4, excluding 27–28) and fuels and mining (SITC 3, 27–28 and 68).

From 1800 to the start year. Only the commodity share is carried back to 1800; the trade level itself comes from the trade-in-goods section. The share is interpolated backward to 1800 and, for colonies, taken from the imperial classification — Colombia from Mexico; the United Arab Emirates and Saudi Arabia from the Ottoman Empire; DR Congo from the Belgian Congo; Ivory Coast, Mali and Niger from French West Africa; Ethiopia, Kenya and Rwanda from British East Africa; Taiwan from Korea; Bangladesh, Pakistan and Myanmar from India; Indonesia from the Dutch East Indies; and Vietnam from French Indochina. Federico–Tena shares of 100% are capped at 99%, and the Netherlands' export commodity share is reduced over 1850–1880.

Workbook / source. Sheets K0a–K0h (raw shares); K1 and K2 (primary and manufactured trade, after the net-zero correction); K3 (agriculture versus fuels and mining).

10. Robustness

Every series in this database is adjusted for two kinds of consistency, as described throughout this appendix. Globally, a net-zero condition is imposed item by item, so that world exports equal world imports, world income inflows equal world outflows and world transfers balance: one country's surplus is another's deficit. Historically, the cumulated current accounts are required to reproduce the independent estimates of net foreign wealth around 1914 and 1970, which they match to within about 5–10% (Twomey 1998, 2000; Piketty–Zucman 2014; Lane and Milesi-Ferretti 2007). The database is therefore a plausible reconciliation of all the available evidence on global stocks and flows, and even a figure taken directly from a country-specific study is modified to fit the world total.

This section asks whether those modifications distort the economic content of the underlying studies. For a group of countries whose 1800–1969 invisible balance is otherwise set by a hand-chosen path — because no continuous national balance of payments is available — we compare the WBOP series against the benchmark-year estimates of the country studies that do exist. Where the underlying study is itself continuous and reliable, the corrections preserve its economic meaning: the sign of the external position, the direction of the current account and the broad order of magnitude are unchanged. Where the WBOP departs from a study, it is because global consistency overrides an isolated benchmark — often a fragmentary or internally inconsistent one — that cannot by itself be reconciled with the world total. In every case the alternative series leaves the main results, and the regional aggregates on which the paper's conclusions rest, unchanged.

China

Yan and Xin's (2023, Table 5) current-account estimates cannot be treated as an observed series and mechanically cumulated into net foreign assets. Their large estimated surpluses—for example, about 87 million taels in 1894—depend heavily on components that are reconstructed with weak evidence and are accompanied by a large, oppositely signed net-errors-and-omissions residual. The remittance series is largely extrapolated from Zhang Zhongli's approximate benchmark of 25 million taels annually in the 1880s; Remer's more systematic estimates mainly concern 1899–1913 and 1929, not 1850–94 (Remer 1933, ch. VIII, pp. 177–88), while Hou provides no independent annual pre-1894 remittance series (Hou 1965, based on the 1964 dissertation), and Lin Man-houng offers principally narrative evidence that remittances helped offset late-Qing trade deficits and sustain silver inflows. The “services” credit is likewise not a net balance: expenditures by foreigners in China—estimated at roughly 10 million taels in 1893 and 24–26 million in 1894—must be offset against freight and insurance paid to foreign firms and against interest and repatriated foreign profits. Foreign carriers dominated treaty-port shipping (Hou 1965, pp. 61 and 138), and Hou's investment-payment estimates show sizeable foreign outpayments by the turn of the century (p. 99). Merchandise trade is better documented, but it does not validate a continuous current-account surplus: Hsiao's customs data and subsequent corrections indicate a substantial merchandise surplus in 1867–87—around 629 million taels cumulatively, or 30 million annually—but a deficit of about 213 million, or 16 million annually, in 1888–1900 (Hsiao 1974, Table 1 and revised customs reconstructions). (The Federico–Tena trade series used elsewhere in this appendix instead shows a small surplus around 1894; the two customs reconstructions differ, and this reading relies on Hsiao's.) Thus Yan and Xin's result is highly sensitive to assumed remittances and omitted service and investment-income debits.

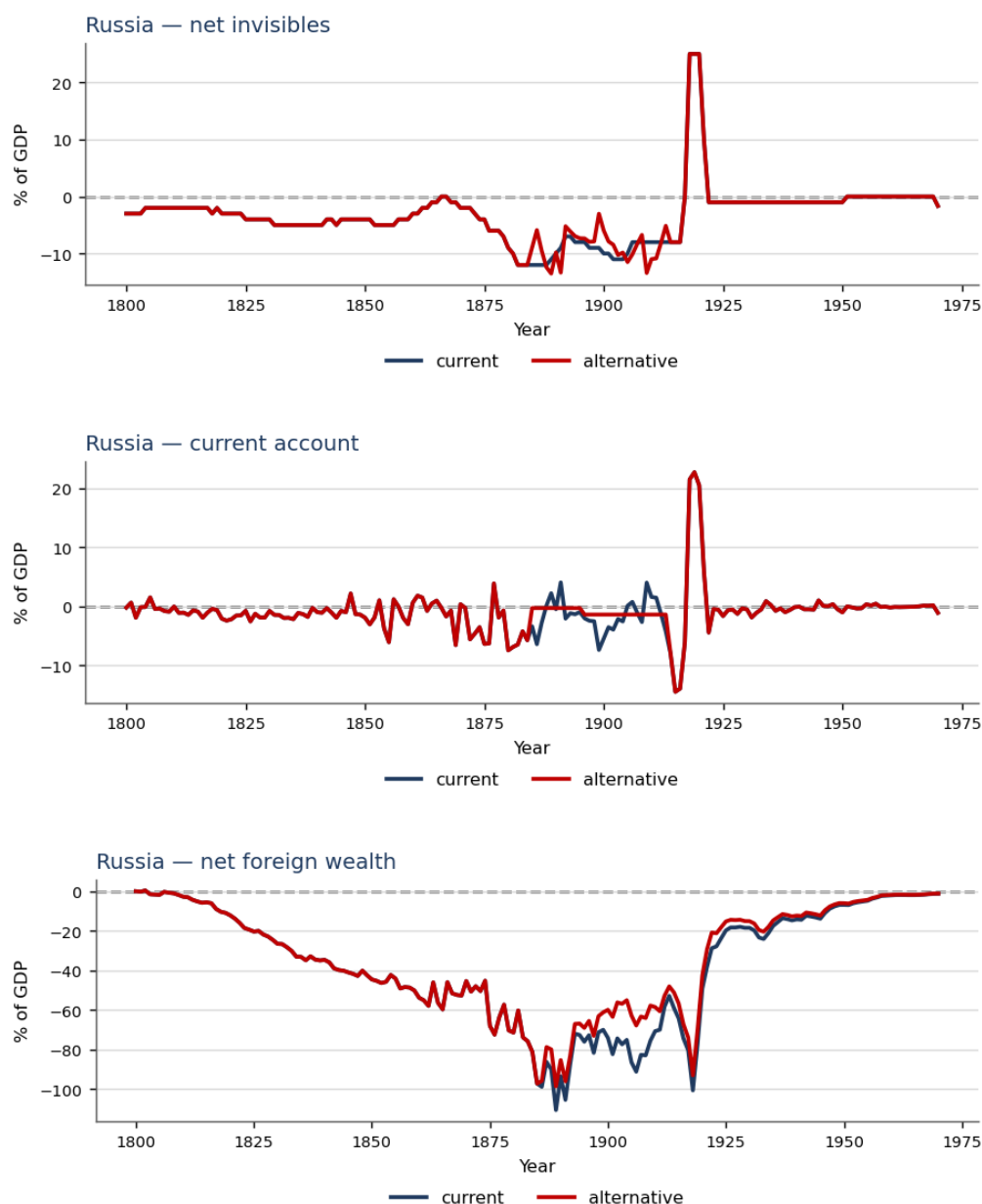
More fundamentally, the businesses and property of permanently resident overseas Chinese are not assets of China under residence-based external accounting. By contrast, foreign liabilities are directly documented: foreign-owned enterprise assets were already estimated at approximately 136 million taels in 1894; the 1895 Japanese indemnity added 230 million taels, and the 1901 Boxer indemnity another 450 million Haikwan taels. Hou estimates foreign direct investment at US\$503 million in 1902 and US\$1.067 billion in 1914 (Hou 1965, p. 13), while broader estimates including loans and portfolio claims reach approximately US\$788 million and US\$1.61 billion, respectively; roughly £139 million of foreign loans also remained outstanding in 1911. These figures overlap and should not be added mechanically, but there is no corresponding evidence of China-resident foreign assets of comparable magnitude. Consequently, Yan and Xin may provide a scenario for selected balance-of-payments flows, but their

series cannot support a historical NFA reconstruction or the conclusion that Qing China was a net creditor. China may have run current-account surpluses during parts of 1867–87, but it was probably already a net debtor by the 1890s and was unambiguously so after the Japanese and Boxer indemnities.

Russia

Study. Gregory (1979) reconstructs the Russian balance of payments for 1885–1913 and finds net foreign investment — the counterpart of the current-account deficit — of only 0.3% of national income in 1885–1895 and 1.4% in 1895–1913; Chuchko (2022) corrects the imperial trade balance over the same period.

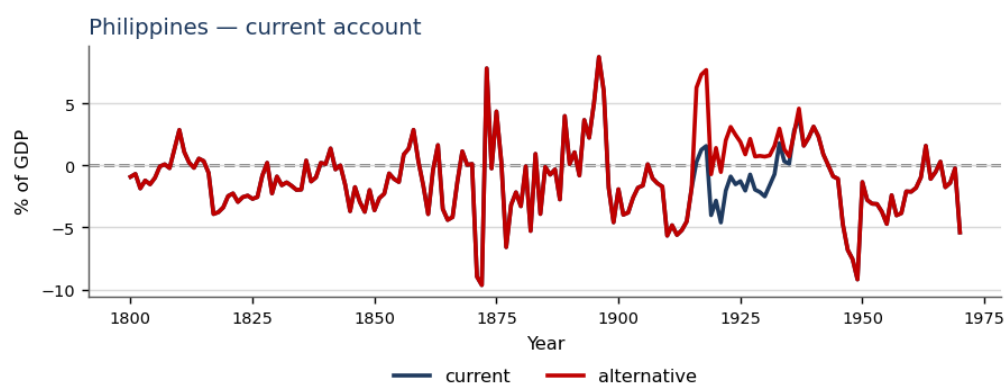
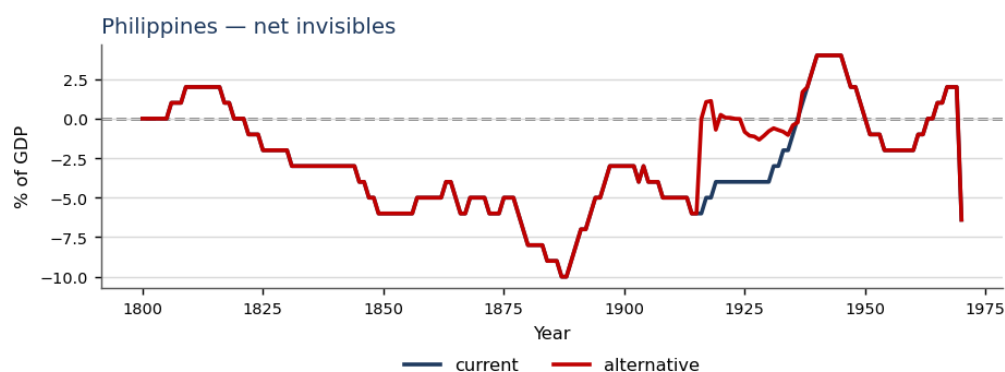
WBOP series. The WBOP sets net invisibles at about –8 to –10% of GDP and cumulates net foreign wealth of about –71% (1880) and –74% (1900). Anchored instead to Gregory’s flow estimates the position is smaller — of the order of –20 to –50% of GDP by 1913 — but of the same sign: Russia is a large net debtor on both readings. The Jones–Obstfeld database (below) confirms the smaller deficit, and the qualitative characterization is unchanged.

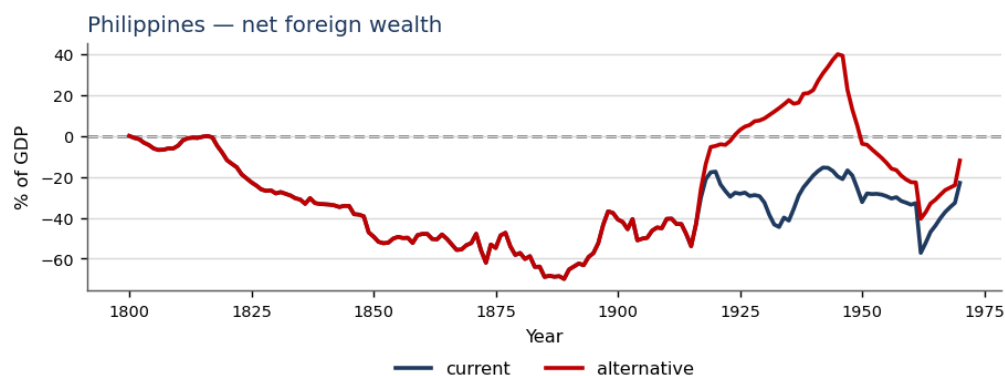


Philippines

Study. Ponciano (2003, Tables 7–8) gives the Philippine balance of payments and international reserves for 1913–1938: trade surpluses in most years, a net service-and-transfer account near zero in 1916–1924 and mildly negative (about -1.5% of GDP) in 1925–1936, and an overall balance in surplus in most years — the 1916 current account is about $+2.5\%$ of GDP. This is a benchmark-period study for 1913–1938, not a continuous series back to 1800; and, the source being available only as a scanned document, it is not clear that its near-zero invisible balance captures the colonial-era outflows a US colony (Spanish before 1898) would have run — profit remittances by US firms, repatriated salaries and pensions of colonial officials, and earlier Spanish remittances. If it does not, the recorded surplus is an upper bound.

WBOP series. The WBOP sets net invisibles at about -4 to -8% of GDP over 1850–1930 and cumulates net foreign wealth of about -57% (1880), -41% (1900) and -41% (1910). Ponciano's benchmark years imply the Philippines was closer to balance, or a modest creditor, in the 1910s–1930s; the WBOP debtor position reflects the pre-1913 colonial-liability path, for which no national balance of payments exists, reconciled to the world total. To the extent that Ponciano's benchmark omits colonial profit and transfer outflows, the WBOP's negative invisible path is the more complete measure. The Philippines is small in the world position and the South-East Asia aggregate is unaffected.

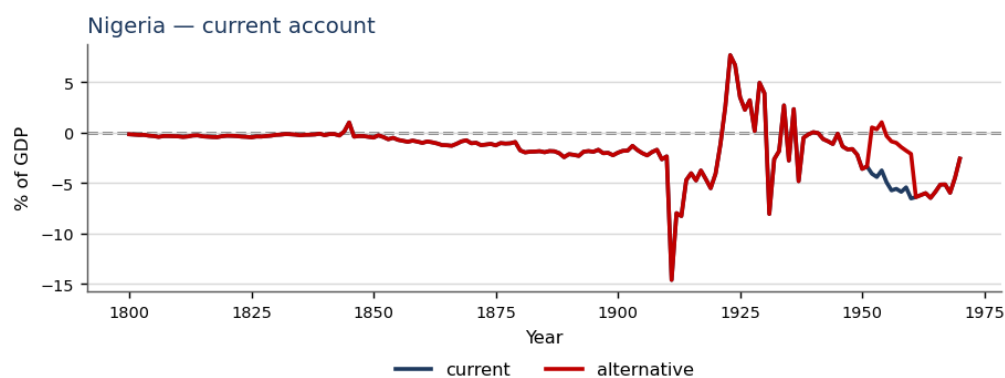
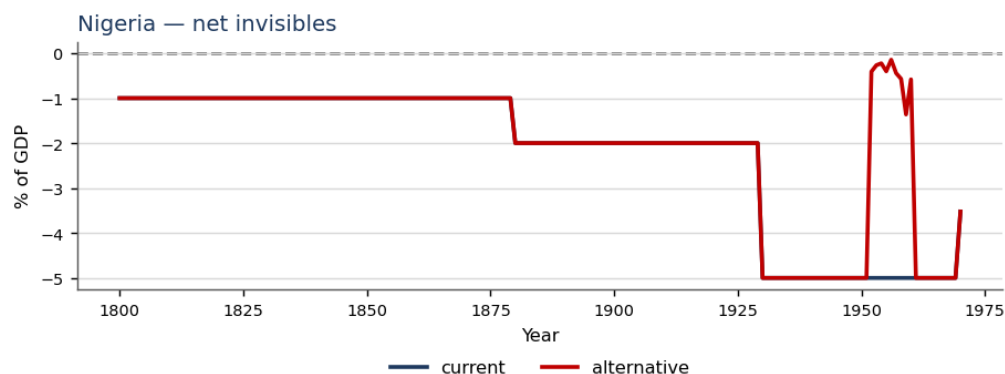


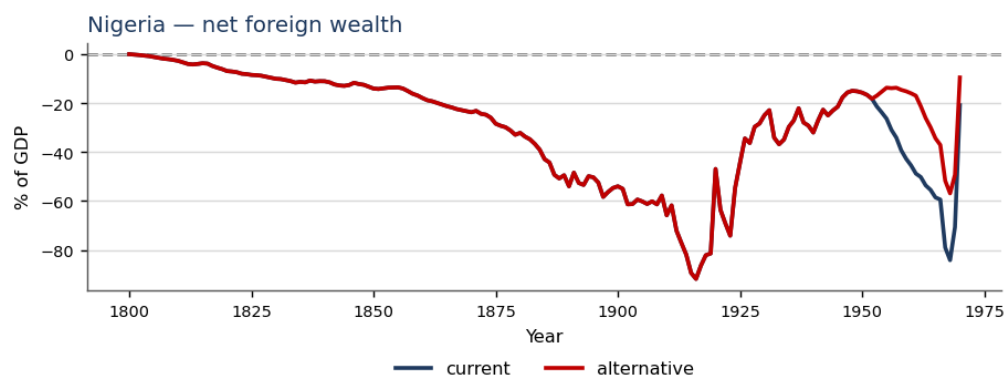


Nigeria

Study. Ekundare (An Economic History of Nigeria, 1860–1960, Table 17.8) and the World Bank Nigeria survey give the overall current-account balance for 1952–1960: surpluses of about +1 to +2.5% of GDP in 1952–1954, then deficits from 1955, the 1960 deficit reaching about -5% of GDP. The source records surpluses “for a considerable number of years” before 1955.

WBOP series. The WBOP sets net invisibles at about -5% of GDP over 1930–1969 and cumulates net foreign wealth of about -32% (1880) and -54% (1900). The late-1950s deficit matches the source (-5% against the workbook’s -6.5% at 1960); the difference is the early-1950s surpluses, which the assumed path misses, so the pre-1955 debt build-up is somewhat overstated. The sign of the recent position, and the regional aggregate, are unaffected.

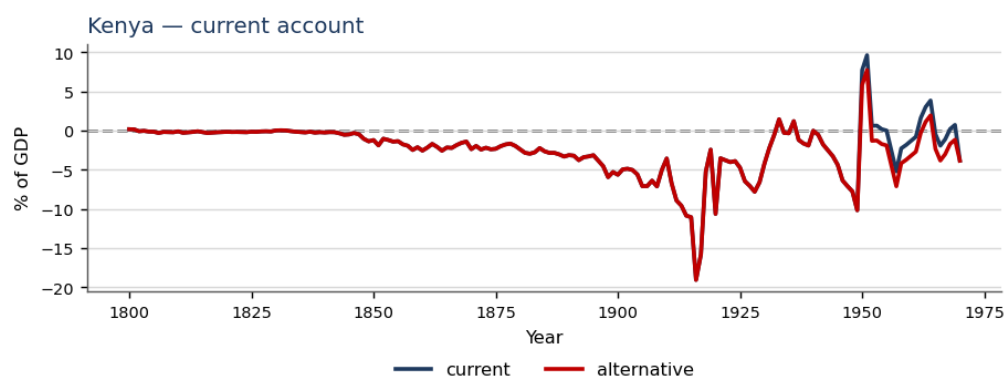
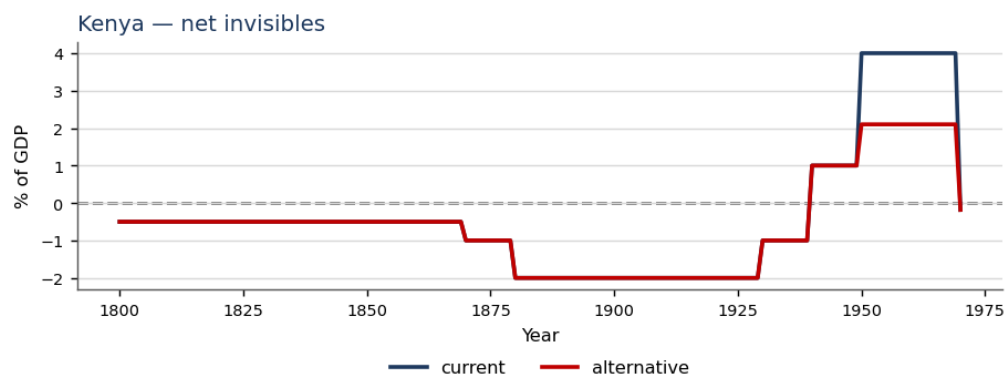


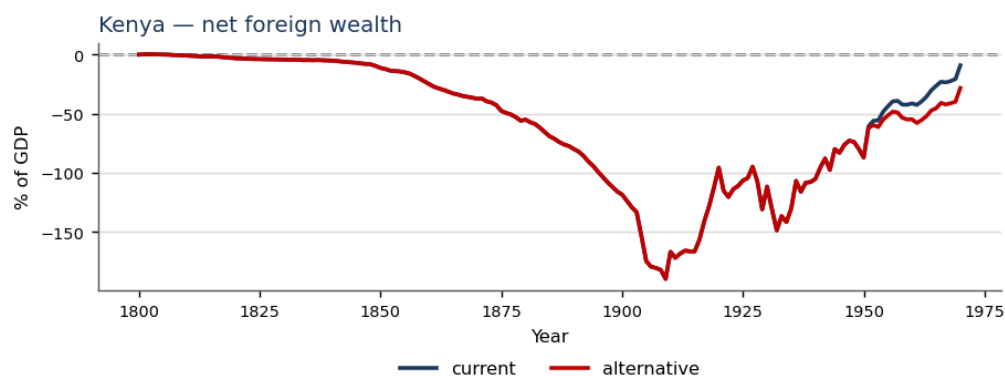


Kenya

Study. The World Bank Kenya economic report (Basic Data and balance-of-payments table, 1963) gives net invisibles of +15.1 on GDP of \$728m — about +2.1% of GDP — and a current-account deficit of -13.4, about -1.8% of GDP, for 1963.

WBOP series. The WBOP sets net invisibles at -0.5% (1800–1869) rising to -2% (1880–1929) and +4% (1950–1969), and cumulates net foreign wealth of about -55% (1880), -118% (1900) and -105% (1940). The recent invisibles (+4%) are close to the World Bank's +2%, and the recent current account is of the same small order. The large -118% position at 1900 rests on the assumed -2% invisibles for 1880–1929, for which no Kenyan balance of payments exists: it is a consistency-driven imputation rather than a measured position and is likely too large. Kenya is small in the world total and the aggregate is unaffected.



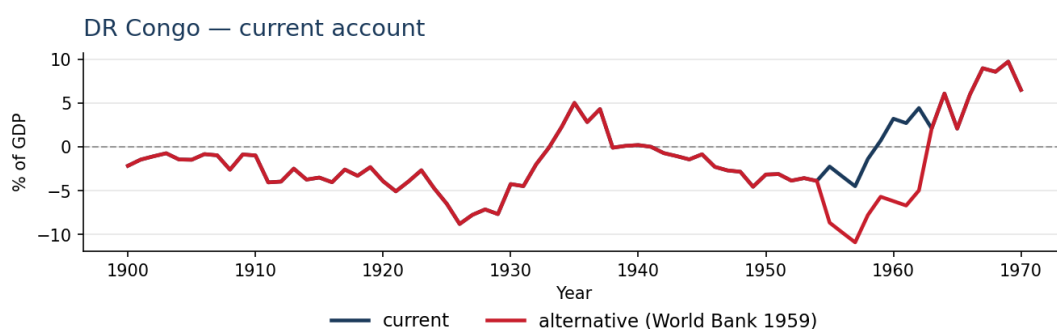
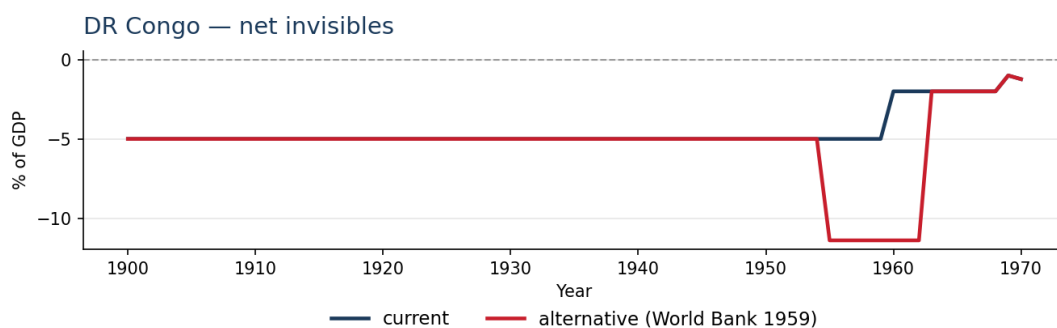


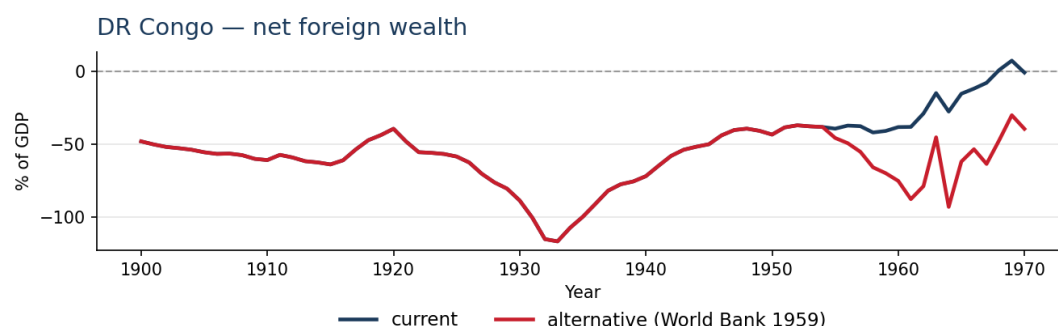
DR Congo

Study. The World Bank Congo report gives Congo's balance of payments for 1959 (Tableau 15): a large trade surplus (+\$282m) offset by a heavy invisible deficit — foreign shipping and insurance -\$119m, repatriated capital income (chiefly Belgian firms' profits) -\$80m and labour-income transfers -\$70m — giving a net invisible balance of about -\$358m, or -11.4% of GDP, and an overall current account near -2.4% of GDP. External long-term debt was about 25% of GDP in 1957.

WBOP series. The WBOP assumes a net invisible drain of only -5% of GDP and cumulates net foreign wealth of about -20% (1880), -48% (1900), -72% (1940) and -38% (1960). The 1959 balance of payments shows the drain was more than twice as large (-11.4%); applied over the report window (charts below) it pulls the recent position down toward -75%. Far from being too large, the workbook's -72% at 1940 is defensible — even conservative — for an economy whose mining sector (Union Minière and others) was overwhelmingly foreign-owned; the documented public debt (about 25% of GDP) is only the sovereign part of a net position dominated by foreign equity.

DR Congo — net invisibles, current account and net foreign wealth: current (WBOP) vs alternative (World Bank balance of payments, 1959):



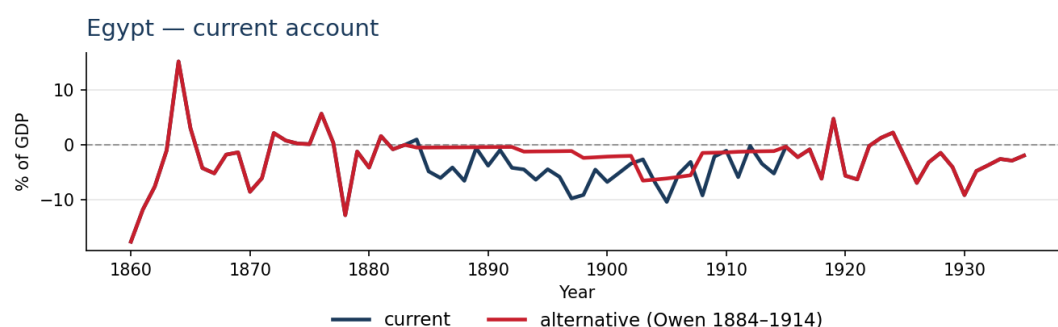
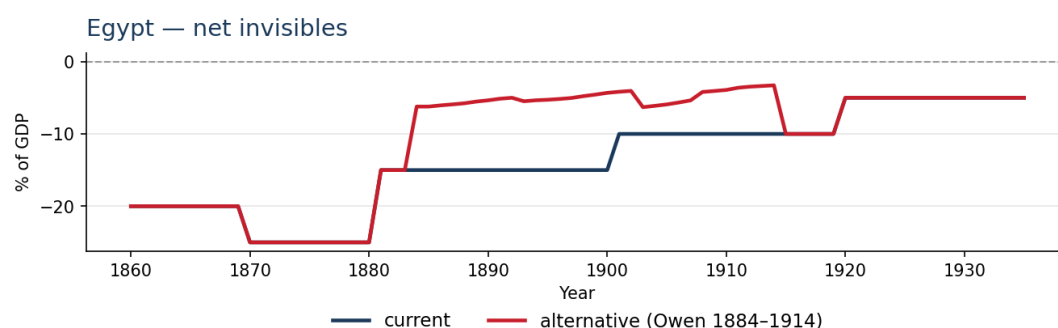


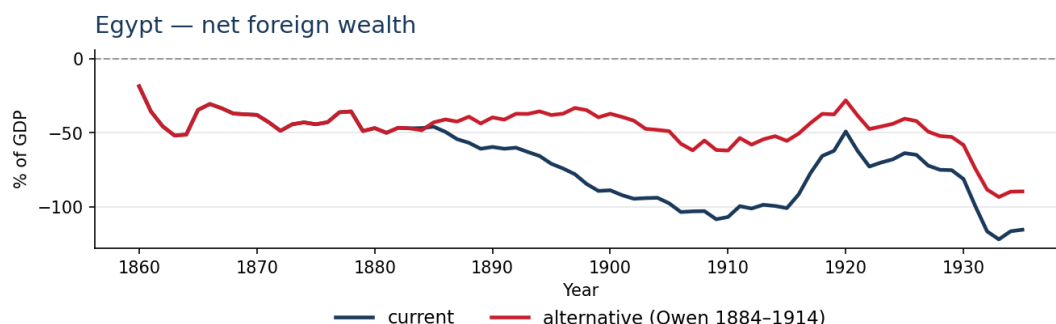
Egypt

Study. Owen (1981, Table 58, from Crouchley) gives Egypt's balance of payments for 1884–1914 in five period averages: a documented net invisible balance (interest and dividends on the foreign debt) of $-\text{£}4.8\text{--}8.7\text{m}$ a year — about -4 to -6% of GDP — offset by the cotton-trade surplus, so that the overall balance of payments was near zero (small deficits of $-\text{£}0.4\text{--}2.7\text{m}$ a year outside the 1903–07 slump). The foreign public debt itself was $\text{£}91\text{--}98\text{m}$ at the 1876 default and the 1880 Law of Liquidation, about -230% of 1880 GDP, easing as cotton-era GDP grew.

WBOP series. The WBOP instead assumes a much larger invisible drain — about -25% of GDP at the 1880 peak, -15% through 1900 and -10% by 1913 — and cumulates net foreign wealth of about -47% (1880), -89% (1900) and -98% (1913). Substituting Owen's documented invisibles and overall balance over 1884–1914 (holding the workbook in all other years) leaves Egypt a large but roughly stable debtor, net foreign wealth near -50% throughout, rather than deteriorating to -98% (charts below): the sign and order of magnitude are right, but the WBOP overstates the pace of deterioration. This compares net positions; the -230% figure is the gross public-debt stock and the workbook's -47% at 1880 is a net position anchored before the Owen window, so the two levels are not directly comparable.

Egypt — net invisibles, current account and net foreign wealth: current (WBOP) vs alternative (Owen 1884–1914, Table 58):





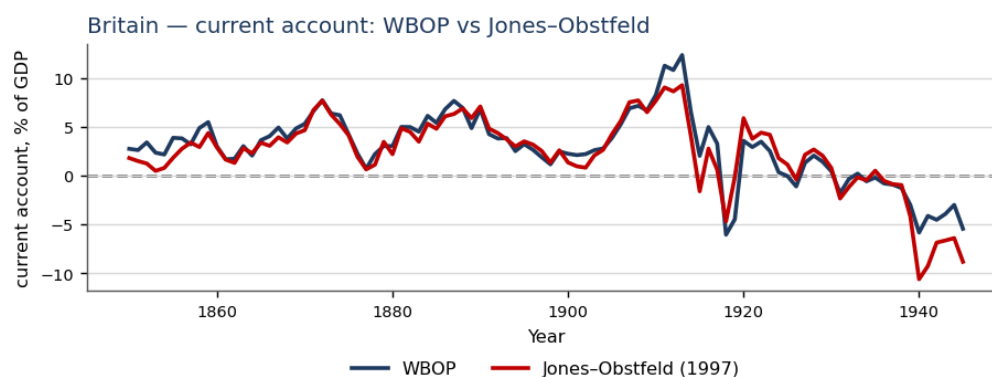
Iran

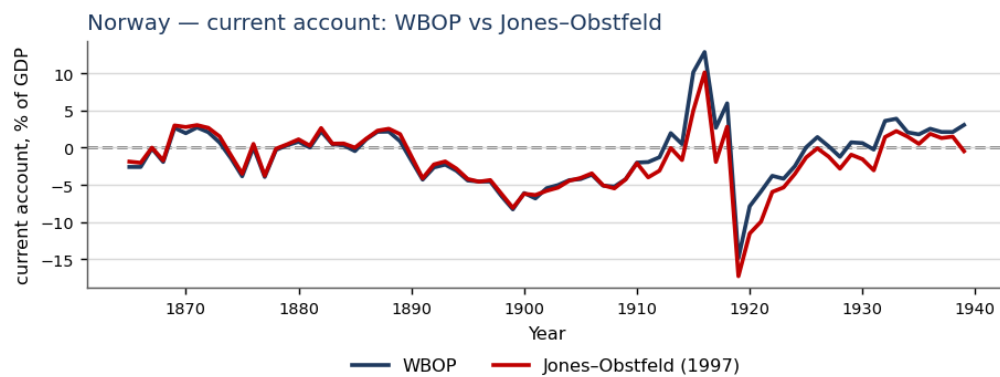
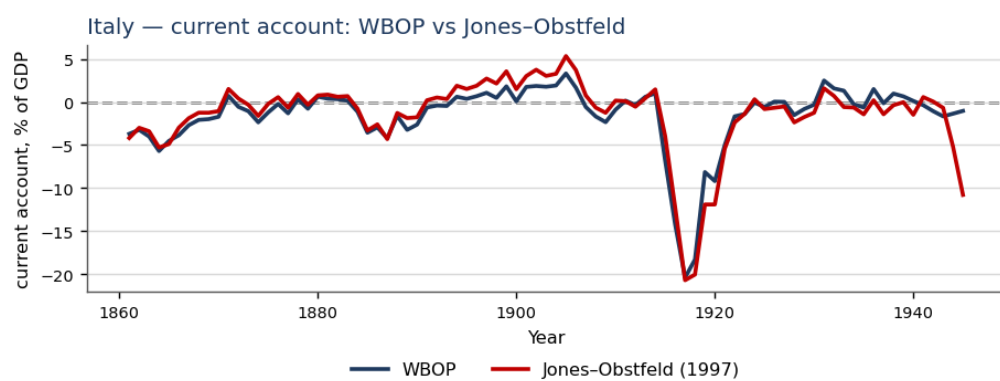
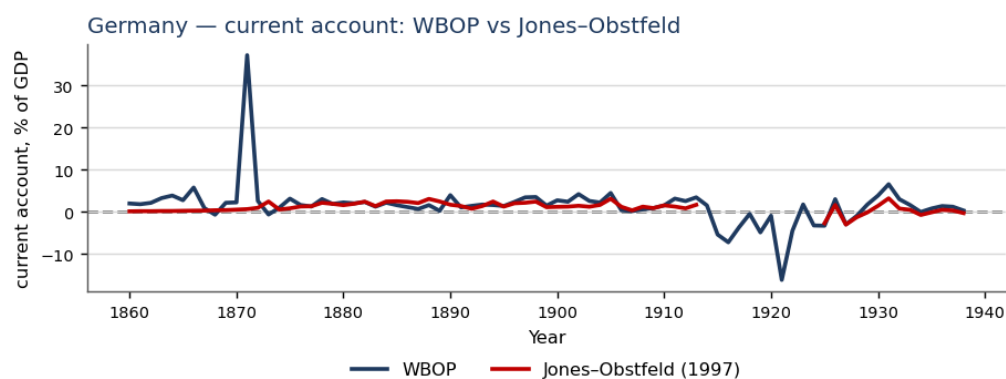
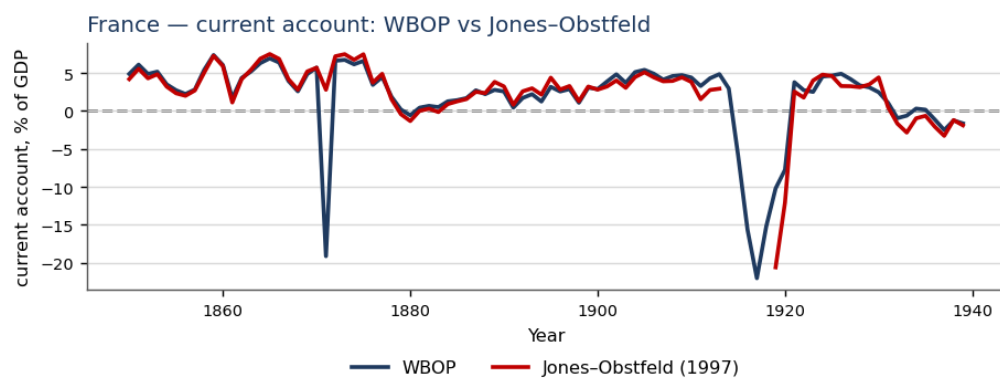
Issawi (1971) documents Iran's foreign borrowing — essentially nil before 1900, then Russian and British loans reaching about £6.7m by 1914 (roughly -17% of GDP) — together with the kran exchange rate and the Reuter, tobacco and oil concessions. This is a debt-and-concession record, not a net-invisibles flow: no continuous Iranian balance of payments exists for the period. The WBOP's net foreign wealth is a net international investment position: foreign assets minus all foreign liabilities, the sovereign debt plus foreign-owned private capital (mines, oil and other concessions, banks, railways). The country study documents only the gross public or external debt, which is one component; since these economies held almost no foreign assets, their net position should be more negative than their public debt alone.

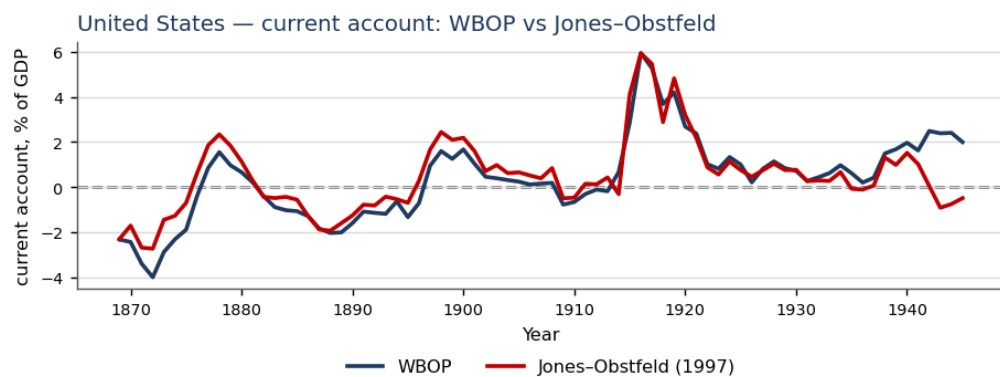
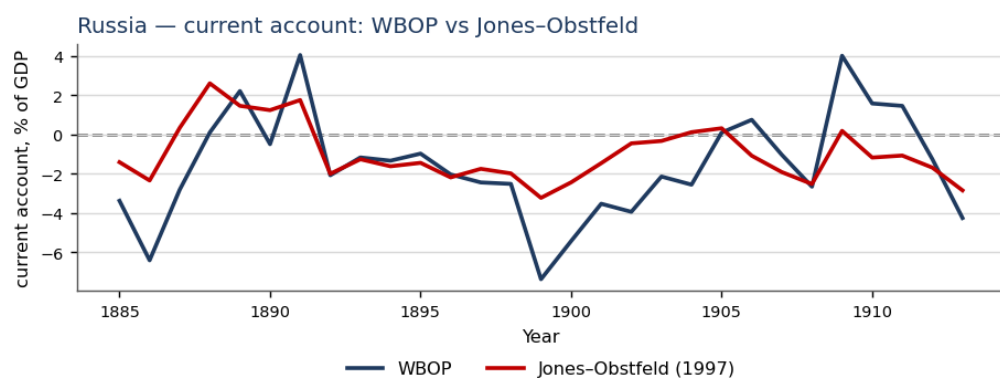
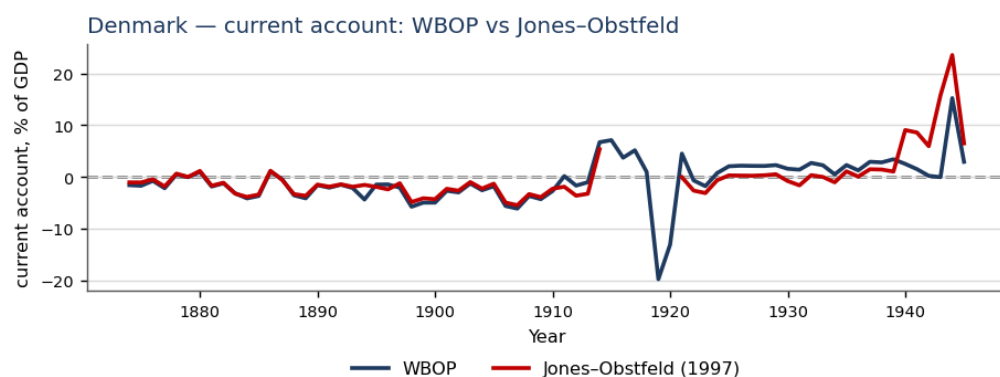
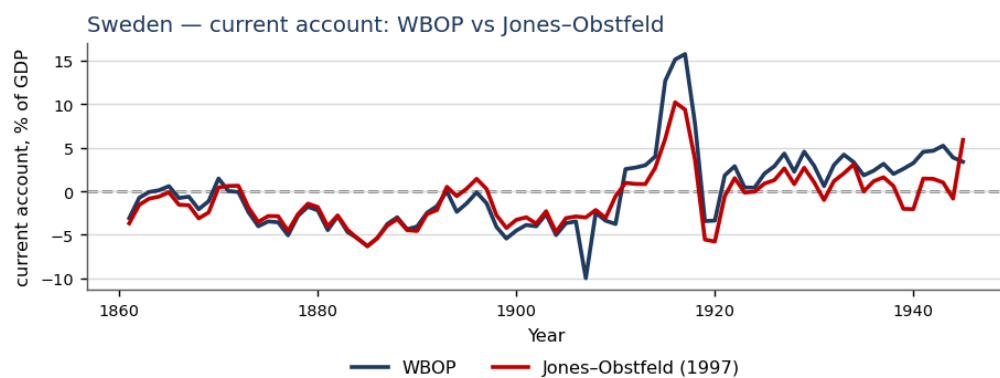
Cross-country databases

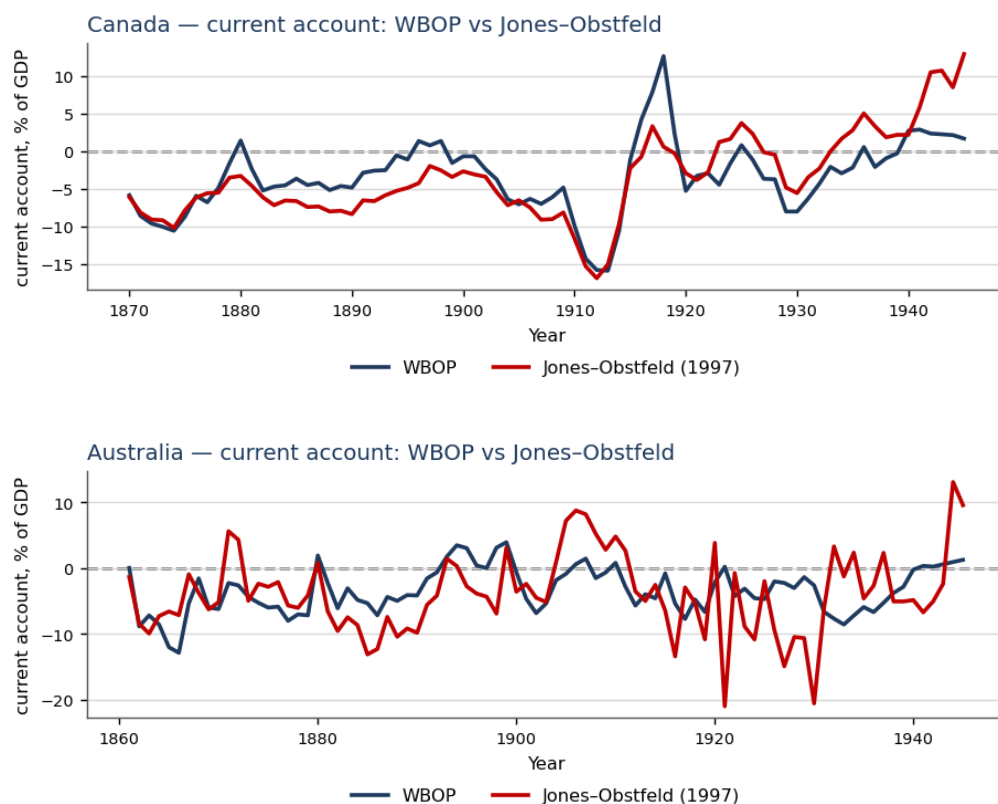
Jones–Obstfeld (1997) current-account database. Ready-made historical current-account series with matching GDP for 13 economies (AUS, CAN, DEN, FIN, FRA, GER, ITA, JAP, NOR, RUS, SWE, UK, USA). We compute each country's current account as a share of GDP directly from the database (current account ÷ GDP, both in national currency) and compare it with the WBOP current account (sheet H1a) for the 12 covered core territories (Finland is a residual region in WBOP). The two are broadly consistent — corroborating the WBOP construction over 1850–1945 — with the main gap being Russia, where Jones–Obstfeld confirm a smaller deficit than the workbook (noted above). Japan is too sparse in the database (two observations) for a comparison. Graphs below, one per country (WBOP in navy, Jones–Obstfeld in red):

WBOP vs Jones–Obstfeld (1997) — current account, % of GDP (one graph per country):

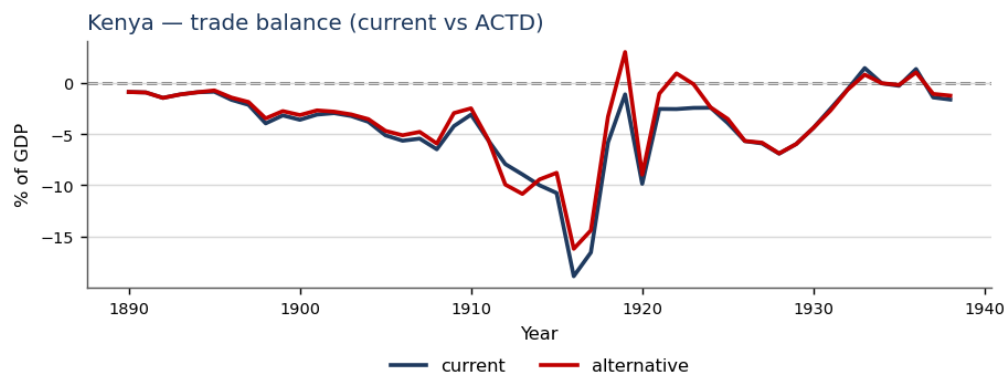
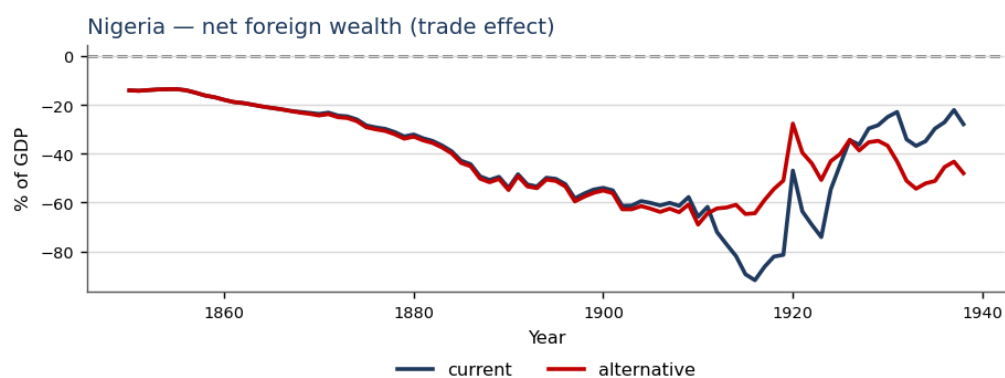
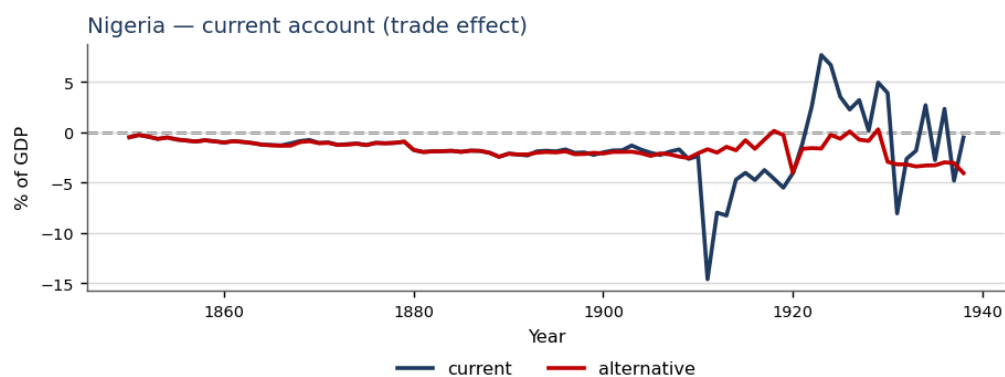
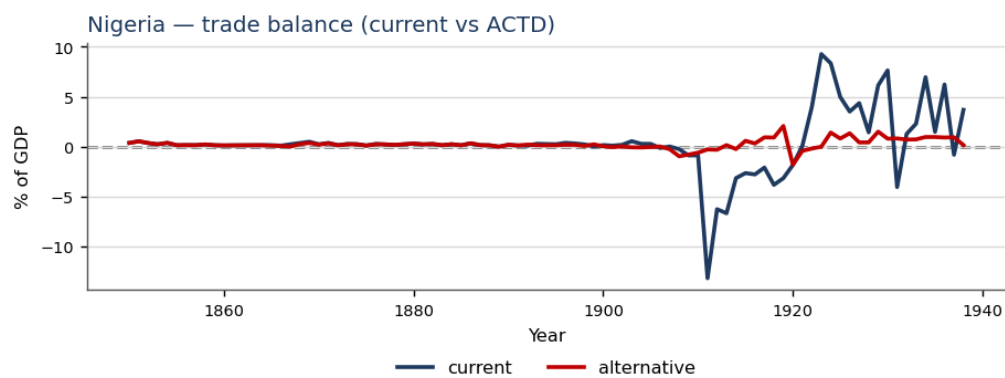


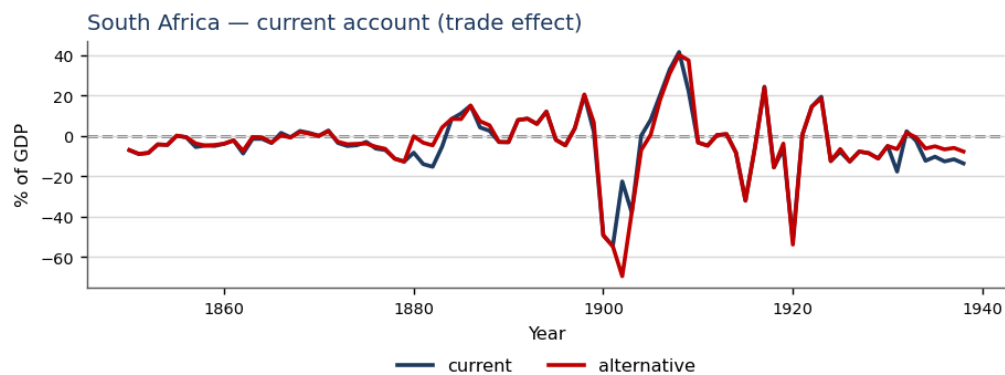
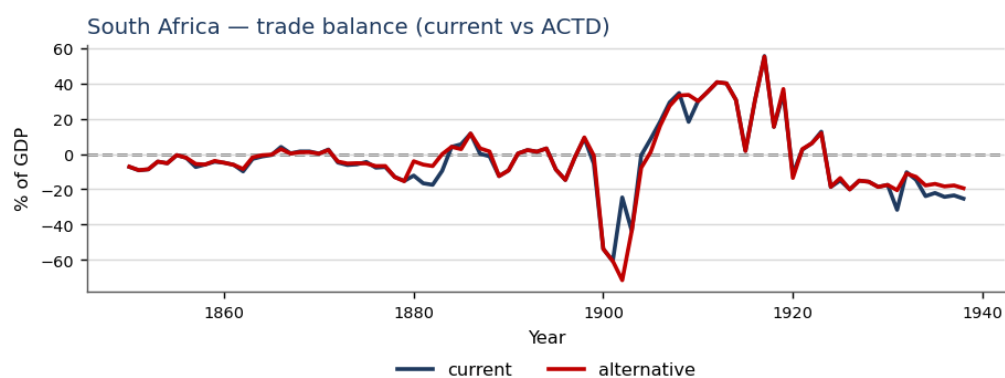
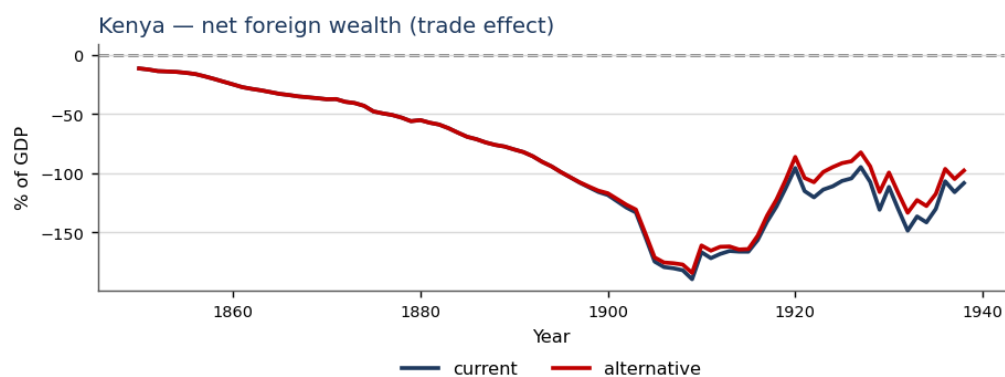
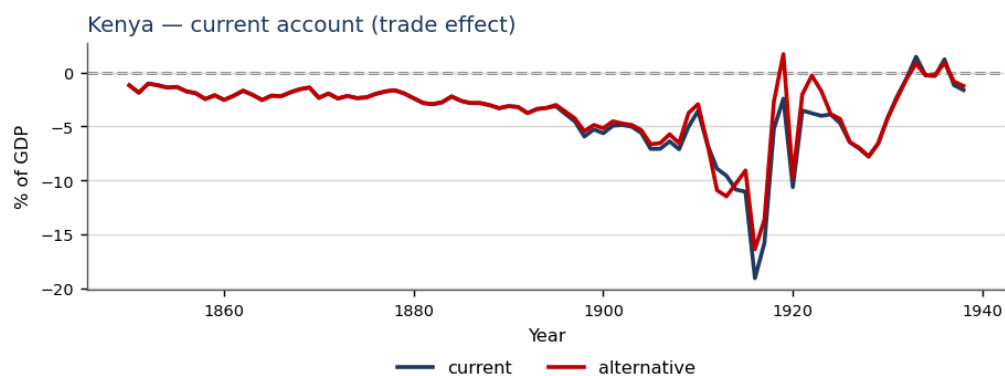


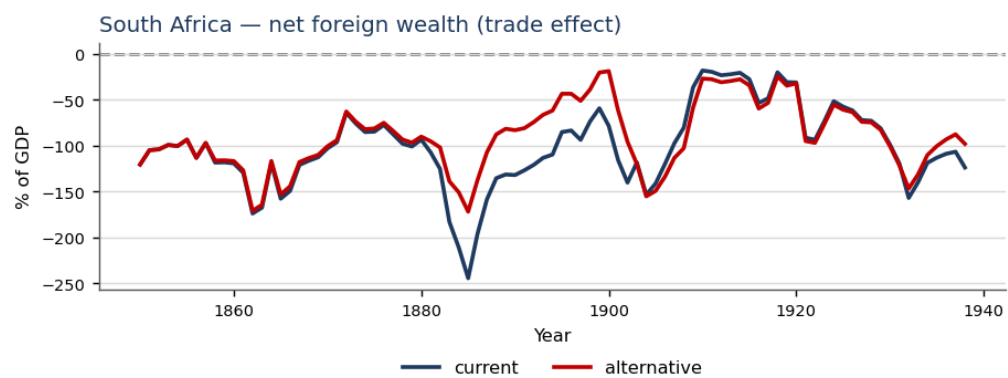




African Commodity Trade Database (ACTD). Frankema, Williamson and Woltjer (“An Economic Rationale for the West African Scramble?”, *Journal of Economic History* 78(1), 2018; NBER Working Paper 21213, 2015), introduced in Frankema et al. (“An Introduction to the African Commodity Trade Database, 1730–2010”, *Research Data Journal* 3(1), 2018): product-level export and import prices, quantities, composition and net barter terms of trade for nineteen areas of Sub-Saharan Africa, 1730–2010 (values for 1808–1939), showing a commodity terms-of-trade boom to the mid-1880s followed by a prolonged decline. These series are absent from Federico–Tena, which covers only about a third of African polities before 1850. In the workbook, African trade ($C0b = C0e/B1b$) is Federico–Tena from late starting dates (Kenya 1850, Congo 1887, Rwanda 1922) with imputation and regional averages; the database supplies earlier, product-level series, sharpens the primary-versus-manufactured split, and provides a terms-of-trade series that the workbook does not otherwise contain — directly relevant to the low-commodity-price and unequal-exchange interpretation for Africa. The numeric files (DANS repository, doi:10.17026/dans-xt9-fzkw) support value-based comparisons: actual exports and imports, converted to US dollars, replace the workbook’s Federico–Tena goods trade for Nigeria, Kenya and South Africa, and yield the African net-barter terms-of-trade series shown in the figures below. The product-level data confirm that African exports were almost entirely primary commodities.







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