

**CITATIONS, BIBLIOGRAPHY, AND INDEX FOR  
*PRINCIPLES FOR DEALING WITH  
THE CHANGING WORLD ORDER:  
WHY NATIONS SUCCEED AND FAIL***

**BY RAY DALIO**

The following pages provide more detailed attributions of sources used in the book. References are made via page number and opening words of relevant text.

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## NOTE ON DATA SOURCES

In addition to the specific cases, which we call out in the following pages, the internal analyses shown in *Principles for Dealing with the Changing World Order* utilize data and information from public, private and internal sources. In particular, the country power analyses shown throughout *Principles for Dealing with the Changing World Order* draw upon thousands of individuals series, which come from a variety of databases and academic sources, too many to list here in full.

A partial list of notable data sources used includes: Amsterdam Institute for Advanced Labor Studies (ICTWSS Dataspace), Bank of England, Bank for International Settlements, Barro-Lee Educational Attainment Dataset, Bloomberg Finance L.P., Clio Infra, Correlates of War, Encyclopedia Britannica, Energy Information Administration, Gapminder, Global Entrepreneurship Monitor (GEM), Global Financial Data, Global Trade Information Services, Google NGram Viewer, INSEAD Knowledge, Institute of International Finance, International Labour Organization, International Monetary Fund, Long Finance Initiative, Maddison Historical Statistics, National Bureau of Economic Research (Historical Cross-Country Technology Adoption (HCCTA) Dataset), Organisation for Economic Co-operation and Development, Our World in Data, Penn World Table, Stockholm International Peace Research Institute, Transparency International, United Nations, Varieties of Democracy (V-DEM), World Bank, World Economic Forum, World Inequality Database, World Intellectual Property Organization, and World Values Survey.

Other potential sources for internal analyses include: the Australian Bureau of Statistics, Capital Economics, CBRE, Inc., CEIC Data Company Ltd., Clarus Financial Technology, Conference Board of Canada, Consensus Economics Inc., Corelogic, Inc., CoStar Realty Information, Inc., CreditSights, Inc., Credit Market Analysis Ltd., Dealogic LLC, DTCC Data Repository (U.S.), LLC, Ecoanalitica, Energy Aspects, EPFR Global, Eurasia Group Ltd., European Money Markets Institute – EMMI, Evercore, Factset Research Systems, Inc., The Financial Times Limited, GaveKal Research Ltd., Harvard Business Review, Haver Analytics, Inc., The Investment Funds Institute of Canada, ICE Data Derivatives UK Limited, IHS Markit, Impact-Cubed, Institutional Shareholder Services, Informa (EPFR), Investment Company Institute, International Energy Agency (IEA), Investment Management Association, JP Morgan, Lipper Financial, Mergent, Inc., Metals Focus Ltd, Moody's Analytics, Inc., MSCI, Inc., Organisation for Economic Cooperation and Development (OCED), Pensions & Investments Research Center, Qontigo GmbH, Quandl, Refinitiv RP Data Ltd, Rystad Energy, Inc., S&P Global Market Intelligence Inc., Sentix GmbH, Spears & Associates, Inc., State Street Bank and Trust Company, Sustainalytics, Totem Macro, US Department of Commerce, Verisk-Maplecroft, Vigeo-Eiris (V.E), Wind Information (HK) Company, Wood Mackenzie Limited, and World Bureau of Metal Statistics.

## NOTES AND CITATIONS

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## CHAPTER 1: THE BIG CYCLE IN A NUTSHELL

- 30 **GLOBAL REAL GDP PER CAPITA:** This chart combines spliced estimates at a country level for major countries. The analysis for this chart is based in part on data from Maddison Historical Statistics and from Fouquet, Roger and Stephen N. Broadberry. “Seven Centuries of European Economic Growth and Decline.” *Journal of Economic Perspectives* 29.4 (2015): 227–244. Specific country series, many found via Fouquet and Broadberry, include: for the UK, the Bank of England’s dataset, “A Millennium of Macroeconomic Data”; as well as Broadberry, Stephen, Bruce Campbell, Alexander Klein, Mark Overton and Bas van Leeuwen. *British Economic Growth, 1270–1870*. Cambridge: Cambridge University Press, 2015. For NLD, van Zanden, Jan Luiten, and Bas van Leeuwen. “Persistent but not consistent: the growth of national income in Holland 1347–1807.” *Explorations in Economic History* 49 (2015): 119–130. For ITA, Malanima, Paolo. “The long decline of a leading economy: GDP in central and northern Italy, 1300–1913.” *European Review of Economic History* 15 (2011): 169–219. For ESP, Alvarez-Nogal, Carlos and Leandro Prados de la Escosura. “The rise and fall of Spain (1270–1850).” *Economic History Review* 66.1 (2013): 1–37. For SWE, Schön, Lennart and Olle Krantz. “The Swedish economy in the early modern period: constructing historical national accounts 1560–2000.” *European Review of Economic History* 16 (2012): 529–549. For PRT, Palma, Nuno, and Jaime Reis. “Portuguese demography and economic growth, 1500–1850.” Paper for “Accounting for the Great Divergence” Conference, The University of Warwick in Venice, 22–24 May 2014. For CHN, Broadberry, Stephen. “Accounting for the Great Divergence.” VoxEU (2013); as well as Deng, Kent and O’Brien, Patrick Karl. “Creative Destruction: Chinese GDP per capita from the Han Dynasty to Modern Times,” Working Papers 0063, European Historical Economics Society (EHES), 2014.
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- 33 **GLOBAL DEATHS BY CATEGORY:** This chart was produced using internal analysis, with reference to Our World in Data, specifically for global deaths from conflicts and based on data from various online encyclopedias, including Wikipedia and Encyclopedia Britannica.
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### CHAPTER 3: THE BIG CYCLE OF MONEY, CREDIT, DEBT, AND ECONOMIC ACTIVITY

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## CHAPTER 4: THE CHANGING VALUE OF MONEY

- 132 **Of the roughly 750 currencies:** This is based on internal Bridgewater analysis, using data sourced from Dollar Daze.
- 134 **RESERVE CURRENCIES VS GOLD:** This chart was produced using internal Bridgewater analysis, based in part on exchange rate and price data from Global Financial Data.
- 135 **SPOT FX VS GOLD:** This chart was created from Bridgewater analysis, based in part on exchange rate and price data from Global Financial Data.
- 135 **FX TOTAL RETURN VS GOLD:** This chart was produced using Bridgewater analysis, based in part on exchange rate, interest rate, and price data from Global Financial Data.
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- 139 **SPOT FX VS GOLD (1913–1930):** This chart was produced using Bridgewater analysis, based in part on exchange rate and price data from Global Financial Data.

- 143 **CURRENCY AND GOLD REAL RETURNS OF MAJOR COUNTRIES SINCE 1850:** This table was produced using Bridgewater analysis, based in part on exchange rate, interest rate, and price data from Global Financial Data.
- 144 **REAL RETURN OF GOLD:** This chart was produced using Bridgewater analysis, based in part on exchange rate and price data from Global Financial Data.
- 145 **REAL RETURN OF BILLS:** This chart was produced using Bridgewater analysis, based in part on interest rate and price data from Global Financial Data.

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- 227 **SHARE OF PORTFOLIOS LOSING X%:** This chart was produced using Bridgewater analysis, based in part on data from Global Financial Data.
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- 234 **REAL RETURN OF BILL:** This chart was produced using Bridgewater analysis, based in part on interest rate and price data from Global Financial Data.



## CHAPTER 8: THE LAST 500 YEARS IN A TINY NUTSHELL

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## CHAPTER 9: THE BIG CYCLE RISE AND DECLINE OF THE DUTCH EMPIRE AND THE GUILDER

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- 269 **SHARE OF GLOBAL OUTPUT:** This chart was produced using Bridgewater analysis, based in part on data from Maddison Historical Statistics.
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- 273 **NLD BOOKS PUBLISHED:** This chart was produced using Bridgewater analysis, based on data from Clio Infra.

- 274 **NLD SHARE OF MAJOR INVENTIONS:** This chart was produced using Bridgewater analysis, based on data from Bunch and Hellemans (1994).
- 274 **NLD EXPORTS:** This chart was produced using Bridgewater analysis, based on data for the 16th to 18th centuries from Findlay, Ronald, and Kevin O'Rourke. *Power and Plenty: Trade, War, and the World Economy in the Second Millennium*. Princeton N.J.: Princeton Univ. Press, 2009.
- 274 **MAJOR INVENTIONS:** This chart was produced using Bridgewater analysis, based on data from Maddison Historical Statistics and Bunch and Hellemans (1994).
- 274 **REAL GDP PER CAPITA (2017 USD):** The analysis for this chart is based in part on data from Maddison Historical Statistics and from Fouquet and Broadberry (2015). Specific country series, many found via Fouquet and Broadberry, include: for the UK, "A Millennium of Macroeconomic Data," as well as Broadberry, Campbell, Klein, Overton, and van Leeuwen (2015). For NLD, van Zanden and van Leeuwen (2015). For ITA, Malanima (2011). For ESP, Alvarez-Nogal and de la Escosura (2013). For SWE, Schön and Krantz (2013). For PRT, Palma, and Reis (2014). For CHN, Broadberry (2013) as well as Deng and O'Brien (2013).
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- 275 **The formation of the Amsterdam Stock Exchange:** Petram (2011): 2, 18.
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- 276 **In addition to creating:** Hart, Jonker, and van Zanden (2010): 40.
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- 277 **GRAMS OF FINE SILVER PER GUILDER:** This chart was produced using data from Hart, Jonker, and van Zande (2010).
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- 283 **Because bills of exchange:** See Quinn and Roberds (2014).
- 284 **Starting in the 1770s:** de Vries, Jan and Ad van der Woude (2010): 126.
- 284 **Available payment data supports:** Quinn and Roberds (2014): 13.
- 285 **Having lost half its ships:** de Vries and van der Woude (2010): 126.
- 285 **the Dutch East India Company:** de Vries and van der Woude (2010): 455–456.
- 285 **DUTCH EAST INDIA COMPANY BALANCE SHEET and DUTCH EAST INDIA COMPANY PROFIT & LOSS:** These charts were produced using Bridgewater analysis, based on data from de Vries and van der Woude (2010).
- 285 **As the Bank of Amsterdam printed:** Quinn and Roberds (2014): 17.
- 286 **That led to the classic:** Quinn and Roberds (2014): 16.
- 286 **BANK OF AMSTERDAM HOLDINGS:** This chart was produced based on data from Hart, Jonker, and van Zanden (2010).
- 286 **For reference, the full balance sheet:** Quinn and Roberds (2014): 16.
- 286 **The Bank of Amsterdam had no choice:** Quinn and Roberds (2014): 17–18.
- 286 **BANK OF AMSTERDAM LOANS OUTSTANDING:** Quinn and Roberds (2014): 34.

- 287 **Bank of Amsterdam deposits:** Quinn and Roberds (2014): 19, 26.
- 287 **The bank used its holdings:** Quinn and Roberds (2014): 19–20.
- 287 **Accounts backed by coins:** Quinn and Roberds (2014): 16.
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- 287 **Historical data suggests:** Quinn and Roberds (2014): 26.
- 288 **DUTCH GUILDER and VALUE OF THE DUTCH GUILDER:** These charts were produced using Bridgewater analysis, based on data from Global Financial Data and Quinn and Roberds (2014).
- 288 **BANK OF AMSTERDAM RESERVE RATIO (PRECIOUS METAL TO MONETARY LIABILITIES):** This chart was produced using data from Quinn and Roberds (2014).
- 289 **DUTCH EIC TOTAL RETURNS BY YEAR and TOTAL EQUITY RETURNS:** These charts were produced using Bridgewater analysis, based on data from Global Financial Data; van Lent, Wim, and Stoyan V. Sgourev. “Local Elites versus Dominant Shareholders: Dividend Smoothing at the Dutch East India Company.” *Academy of Management Proceedings* (2013): 1; as well as other sources.
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- 296 **GBR GOVT BOND YIELD (VS MAJOR COUNTRY MEDIAN):** This chart was produced using Bridgewater analysis, based in part on data from Global Financial Data and "A Millennium of Macroeconomic Data."
- 296 **GBR GOVT REVENUE:** This chart was produced using Bridgewater analysis based on data from "A Millennium of Macroeconomic Data."
- 297 **MAJOR INVENTIONS and SHARE OF MAJOR INVENTIONS:** This chart was produced using Bridgewater analysis, based on data from Bunch and Hellemans (1994).
- 297 **The Industrial Revolution:** For this section, I owe a debt of gratitude to Joel Mokyr for his insightful analysis in *The British Industrial Revolution: An Economic Perspective* (2019).
- 299 **REAL GDP PER CAPITA:** This chart combines spliced estimates at a country level for major countries. The analysis for this chart is based in part on data from Maddison Historical Statistics and from Fouquet and Broadberry (2015). Specific country series, many found via Fouquet and Broadberry, include: for the UK, "A Millennium of Macroeconomic Data," as well as Broadberry, Campbell, Klein, Overton, and van Leeuwen (2015). For NLD, van Zanden and van Leeuwen (2015). For ITA, Malanima (2011). For ESP, Alvarez-Nogal and de la Escosura (2013). For SWE, Schön and Krantz (2013). For PRT, Palma, and Reis (2014). For CHN, Broadberry (2013) as well as Deng and O'Brien (2013).
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- 301 **LITERACY RATES:** This chart is based on data from Our World in Data.
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- 301 **This law created monopolistic:** Velde (2007): 276–279.
- 302 **New laws prohibited:** Velde, François R., and David R. Weir. "The Financial Market and Government Debt Policy in France, 1746–1793." *The Journal of Economic History* 52.1 (1992): 18.
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- 305 **In 1796, the government held a ceremony:** "An Assignat Press from the French Revolution." Cité de l'Économie.
- 306 **FRENCH CURRENCY VS GOLD:** This chart was produced using Bridgewater analysis, based on data from Global Financial Data.
- 307 **It should be noted that:** "Great Britain, France, and the Neutrals, 1800–02." Encyclopedia Britannica.
- 307 **A New World Order:** I owe a debt of gratitude for this section to Henry Kissinger, *A World Restored*. Weidenfeld and Nicholson, 1957.



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- 308 **“splendid isolation”:** The sentiment for this term dates back to a speech made by 1st Lord of the Admiralty, George Goschen in 1896. It then became popular among contemporary politicians to describe Britain’s foreign policy at the time. See: Veldeman, Marie-Christine. “Britain and Europe: From ‘Splendid Isolation’ to ‘Semi-Detachment.’” *Équivalences* 39.1 (2012): 40–41.
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- 309 **GBR EMPIRE SIZE (%WORLD):** This chart was produced using Bridgewater internal analysis, based on landmass data from the World Bank and data on historical dates of empire control from various online encyclopedias, including Wikipedia, oxfordreference.com, and Encyclopedia Britannica.
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- 310 **GBR SHARE OF WORLD EXPORTS:** This chart was produced using Bridgewater analysis, based in part on Daudin, O’Rourke, and de la Escosura and “A Millennium of Macroeconomic Data.”
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- 311 **Trust in the pound:** For a more detailed description of this phenomenon, see: Sowerbutts, Rhiannon and Marco Schneebalg. “The demise of Overend Gurney.” *The Bank of England Quarterly Bulletin*, 2016: 96–106.
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- 313 **GDP (% OF GLOBAL GDP):** This chart was produced based on Bridgewater analysis, based in part on data from Maddison Historical Statistics.
- 313 **For comparison, the top 1 percent’s:** This was sourced from the data available from Thomas Piketty.
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- 314 **The combination of social change:** “Liberal Welfare Reforms 1906–11” The National Archives.
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- 320 **Other countries’ central banks continued:** Schenk (2011).
- 321 **GBR SHARE OF GLOBAL RESERVES:** This chart was produced using Bridgewater analysis, based on data from Eichengreen, Barry, Livia Chițu, and Arnaud Mehl. “Stability or Upheaval? the Currency Composition of International Reserves in the Long Run.” *IMF Economic Review* 64.2 (2015); Eichengreen, Barry, and Marc Flandreau. “The Rise and Fall of the Dollar, or When Did the Dollar Replace Sterling as the Leading International Currency?” Working Paper 1651, National Bureau of Economic Research, July 2008.
- 321 **GBP SHARE OF GLOBAL DEBT:** This chart was produced using Bridgewater analysis, based in part on data from Chițu, Eichengreen, and Mehl; Kindleberger (2013); and data from Global Financial Data.
- 321 **GBP SHARE OF GLOBAL TRANSACTIONS:** Bridgewater analysis, based on data from Eichengreen, Chițu, and Mehl (1999); Hartman; Schenk (2010); and “A Millennium of Macroeconomic Data.”
- 322 **The Pound’s Suspended Convertibility:** Beyond specific instances listed below, much of this account of the pound’s decline is indebted to the illuminating research of Catherine Schenk on this topic.
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- 322 **The US was anxious:** Schenk (2010): 44–46.
- 322 **The Bank of England was eager:** Schenk (2010): 31–33; See also, Cairncross, Alec. *Years of Recovery: British Economic Policy, 1945–51*. Routledge, 2013: 126–127.
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- 323 **GBR CURRENT ACCOUNT:** This chart was produced based on “A Millennium of Macroeconomic Data.”
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- 325 **Countries that continued to hold:** Schenk (2010): 273.
- 326 **AVERAGE SHARE OF POUNDS:** Data for these bar charts are from Schenk (2011): 25.
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- 329 **THE EUROZONE COMPARED TO THE US AND CHINA:** This chart was produced primarily based on Bridgewater analysis. Data for GDP per capita was sourced from the World Bank; military spending data primarily from the Stockholm International Peace Research Institute; patent data from the WIPO statistics database (as of Dec 2020); and Nobel prize data from Encyclopedia Britannica.

## CHAPTER 11: THE BIG CYCLE RISE AND DECLINE OF THE UNITED STATES AND THE DOLLAR

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- 357 **IDEOLOGICAL POSITIONS OF THE MAJOR PARTIES:** This chart was produced based on data from Vote View.
- 357 **SHARE OF CONGRESSIONAL MEMBERS’ VOTES CAST ALONG PARTY LINES:** This chart was produced based on data from Vote View.
- 358 **USA UNEMPLOYMENT RATE and USA CB BALANCE SHEET:** These charts were produced using Bridgewater analysis, including data from Global Financial Data.
- 359 **UNEMPLOYMENT RATE and CB BALANCE SHEET across countries:** These charts were produced using Bridgewater analysis, including data from Global Financial Data.

## CHAPTER 12: THE BIG CYCLE RISE OF CHINA AND THE RENMINBI

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## CHAPTER 14: THE FUTURE

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- 466 **GLOBAL LIFE EXPECTANCY AT BIRTH:** This chart was produced using Bridgewater analysis, based on data from Our World in Data and the UN for the front history, extended back based on data from Clio Infra and Gapminder. The 2020 point is based on countries that had reported data for the year as of August 2021.
- 467 **GLOBAL RGDP PER CAPITA (LOG) and GLOBAL RGDP PER CAPITA (2017 USD):** Global RGDP is primarily a mix of European countries before 1870 due to limited reliable data coverage across other countries before that point. These charts combine spliced estimates at a country level for major countries. The analysis is based in part on data from Maddison Historical Statistics and from Fouquet and Broadberry (2015). Specific country series, many found via Fouquet and Broadberry, include: for the UK, “A Millennium of Macroeconomic Data,” as well as Broadberry, Campbell, Klein, Overton, and van Leeuwen (2015). For NLD, van Zanden and van Leeuwen (2015). For ITA, Malanima (2011). For ESP, Alvarez-Nogal and de la Escosura (2013). For SWE, Schön and Krantz (2013). For PRT, Palma, and Reis (2014). For CHN, Broadberry (2013) as well as Deng and O’Brien (2013).
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- 471 **GLOBAL DEATHS BY CATEGORY:** This chart was produced using Bridgewater analysis, based on analysis of death counts from major events using data from various online encyclopedias, including

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## CORRECTIONS TO INITIAL 2021 PRINTING

- 74 The title of the classical Chinese text Four Books and Five Classics was originally misstated as Five Books and Four Classics.
- 91 In footnote 4, the current wealth share of the top 1 percent is 20-25% but was originally misstated as 35%.
- 393 In footnote 16, “the issuance of debt that got monetized and led to high inflation” was misstated as occurring after the Taiping Rebellion. It did not occur in a coordinated way until after the Chinese Revolution, during the 1930s.

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