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Technical appendix

Out of balance: What's next for growth, wealth, and debt?

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Technical appendix: Balance sheet data overview

This appendix outlines the data sources for national balance sheets and estimation approaches, where applicable.

United States

US balance sheet data for 2024 reflects values through the end of the year. Almost all US balance sheet data from 1952 to the present is directly reported by the Financial Accounts of the United States published by the Federal Reserve. The only items for which we rely on additional sources are the value of government-owned land (which leverages a study published by the Bureau of Economic Analysis) and of mineral resources (which relies on Rystad Energy UCube data and on estimates of gross value added for the mining sector).[1] In addition, we used OECD data to add granularity to the Federal Reserve estimates for sectoral structures, which are not split across different categories: we relied on OECD data to split the total value of structures across dwellings, non-dwelling buildings (for example, offices), and other structures (for example, infrastructure)

We made some adjustments to consolidate financial assets and liabilities within sectors. For example, the household sector balance sheet, which also includes nonprofit institutions and noncorporate businesses, does not include noncorporate equity. This is a nearly identical sum that is reflected as both an asset and liability within the sector, thus canceling out when consolidating. In addition, while the value of structures other than dwellings comes directly from the Fed, we allocate it to "buildings other than dwellings" and to "other structures" (infrastructure) based on the relative size of these items in the other OECD countries in our sample.

Europe and other OECD economies

Data for the balance sheets of all countries in our sample, other than the United States and China, are reported by national statistical agencies via the OECD.[2] Data is available from the OECD beginning in the mid-1990s for most economies, and in most cases continues through 2023 for real assets and through 2024 for financial assets. The exceptions are Italy, for which data is available from 2000; Mexico, for which data is available from 2003; and South Korea, for which data is available from 2008.

In a few instances, we used additional sources and estimates to fill data gaps or to adjust for structural breaks in the data series reported by the OECD and national agencies, as follows:

— For Germany, the methodology used by the national statistical agency (Destatis) to compute the value of non-listed equities changed between 2015 and 2016, resulting in a time series break in the data. We thus adjusted pre-2016 data for a smoother historical time series, assuming that these values grew at the same rate as listed equities. We "backcast" values starting in 2016, applying historical growth rates of listed equity.[3]

— For Italy, most data is available since 2000, but no data for non-dwelling buildings and infrastructure is available prior to 2005. For each sector, we estimated the values for 2000 through 2004 by assuming that the aggregate value of non-dwelling buildings and infrastructure grew at the same rate as that of dwellings, and then backcast this from the starting value in 2005.

— For some European countries (Belgium, Denmark, Ireland, Italy, Poland, and Spain), estimates for land values are available only for households. We estimated the value of land for other sectors by applying the ratio between the value of land and structures owned by households to the value of structures of financial corporations, nonfinancial corporations, and governments.

— For Germany and Ireland, data on inventories for nonfinancial corporations is not available. We estimated it by computing, for every year, the average ratio between the value of inventories and the value of produced assets of nonfinancial corporations for all high-income economies in the data set, and multiplying it by the value of fixed assets of nonfinancial corporations in each country.

Values for 2024 financial assets are based on national central bank data, collected via the OECD quarterly financial accounts databases and reported through the fourth quarter for all countries other than Mexico. While the approach to value financial assets and liabilities used by the OECD is aligned with that used for the financial items of the United States and China, one key difference exists for debt securities liabilities, such as government bonds. The OECD assesses them at market value, while the values provided for China and the United States refer to face or par value (for example, the amount to be paid to bond holders when the bonds mature). The two values can differ significantly when the interest rates prevailing on the market diverge from those on securities outstanding. For instance, the Federal Reserve Bank of Dallas noted that in 2020, the market value of federal debt was about 7 percent higher than its par value; at the end of 2024, it was about 7 percent lower.[4]

Values for real assets in 2024, including real estate and productive assets, are calculated with a perpetual-inventory-method approach using investment data, assumed depreciation rates, and price indexes.[5] We use a range of data sources:

— For gross fixed capital formation and changes in inventories, we use data from the OECD quarterly national accounts.

— Price indexes are provided by IHS Markit. We use output price indexes for housing, construction, machinery and equipment, and scientific research and development, depending on the asset in question.

Capital consumption rates are derived based on data from the French INSEE, the US Bureau of Economic Analysis, and the EU KLEMS database. We backcast balance-sheet items from the earliest year of OECD data availability, applying historical growth rates to the last year of actuals, using a range of sources, as follows:

— *Debt:* IMF Global Debt Database.

— *Equity:* World Inequality Database (WID) via the data series “Market value of corporations (equity liability).”

— *Currency and deposits:* For countries with data available (such as China and the United Kingdom), we used broad money data from the IMF; for other countries, as well as for the eurozone and other regional aggregates, we used the data series “Private - Deposits & Currency” from the WID.

— *Real estate:* WID, via the data series “National housing assets.”

— *Productive assets:* WID, series “National other domestic capital,” defined as nonfinancial assets owned by the national economy except housing assets, agricultural land, and natural capital.

China

China's balance sheet data is reported by China's Academy of Social Sciences via CEIC for the years 1978 to 2022.

Financial asset and liability data use a similar taxonomy as those from the Fed and OECD for the United States and Europe, respectively. Real asset data is reported by sector as a single total. We thus estimated splits of real assets into individual line items—real estate, productive assets (infrastructure, machinery and equipment, and intellectual property), and inventories—using a collection of external data points and sources, but kept totals anchored in official data.

We started by estimating productive assets and inventories, informed by external data sources. We split productive assets proportionally (based on real asset totals) between government and nonfinancial corporations, with the exception of a share of machinery that was allocated to households. Inventories were entirely allocated to nonfinancial corporations. The sources we consulted include the following:

— Li & Zhang (2017), who provide a national balance sheet account for the 2004–11 period across sectors, with greater asset granularity.[6] We allocated household real assets into real estate and machinery based on the average splits from this work.

— Herd (2020), who provides estimates for China's infrastructure stock up to 2016.[7]

— The OECD and China's National Bureau of Statistics, which provide R&D spending figures for the 1991–2024 period, to inform intellectual property stock.[8] We estimated stock in IP as cumulative R&D spending over time, effectively assuming R&D spending is equivalent to investment in intellectual property, and that the growth in stock valuation offsets depreciation.[9]

— IHS Markit, which provides data on machinery manufacturing apparent consumption and construction and machinery output price indexes, contributing to estimates of machinery and infrastructure.

— China's National Bureau of Statistics also provides gross capital formation and gross fixed capital formation by sector and fixed asset investment data, contributing to estimates of machinery and infrastructure, and inventories of industrial enterprises.

— Rystad Energy UCube and the US Geological Survey 2021 Mineral Commodity Summaries provide data used to estimate the value of natural resource endowments.[10]

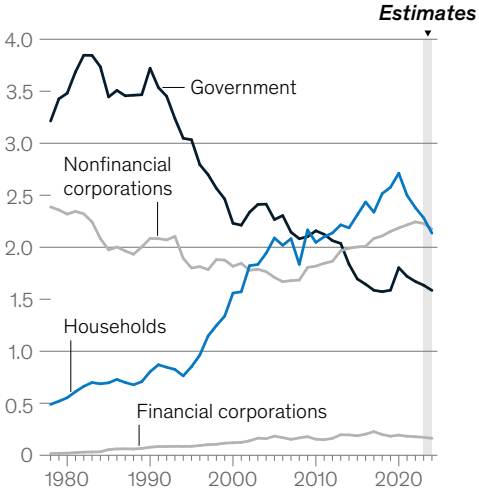
We then calculated real estate as the residual within each sector, after productive assets and inventories were estimated. We split household real estate into structures and land starting with a data point on the share of real estate attributable to land from a 2009 government survey.[11] From there we applied a perpetual inventory method with an assumed depreciation rate, uplift in price index for construction each year, and household gross fixed capital formation. Land was treated as a residual. We then applied the split of structures and land each year to other sectors' real estate.

Ultimately, this approach shows a gradual increase in the real estate share of total real assets leading up to 2000, after which it declined to about 70 percent of total real assets in 2020. The 70 percent figure is in line with the global average share of real estate in real asset totals.[12] At the same time, the decline in government and rise in household real assets point to a transfer of real estate between these sectors (Exhibit 1).

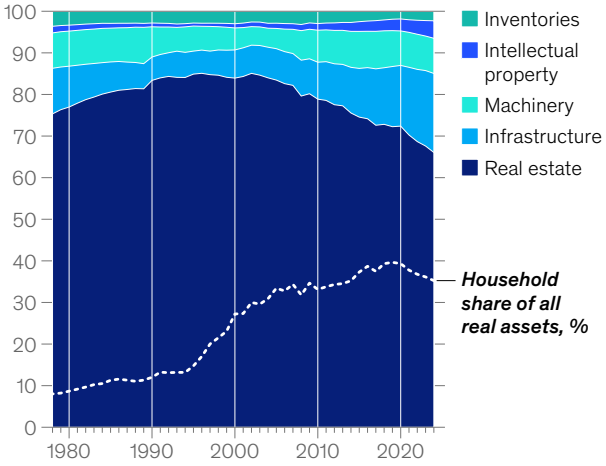
Exhibit 1

China's real assets underwent a major shift from government to households beginning in the 1990s.

China's real assets by sector, officially reported,[1] GDP multiple



Distribution of real assets by type, estimated by McKinsey Global Institute,[2] %



[1]Value of real assets up to 2022 directly provided by the Chinese Academy of Social Sciences via CEIC; data for 2023-24 estimated based on the evolution of variables such as GFCF and price indexes.
[2]Informed by official statistics, wherever available.
Source: CEIC; China National Bureau of Statistics; Herd (2020); IHS Markit; Li & Zhang (2017); People's Bank of China; McKinsey Global Institute analysis

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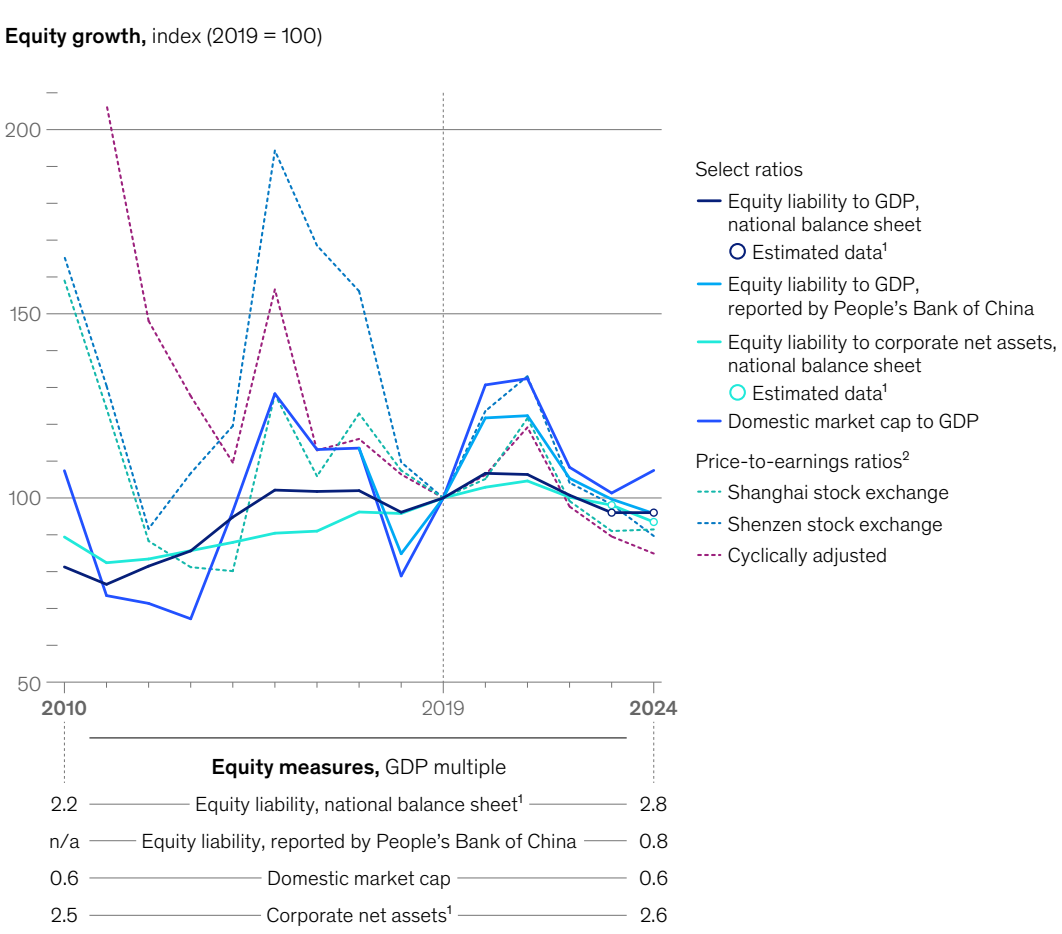
Approach for estimating 2023 and 2024 balance sheet values

We used CEIC data up to 2022 for financial assets and liabilities. We then extrapolated the 2023 and 2024 values based on annual absolute changes in flow of funds stock data from the People's Bank of China. Data for 2024 from the People's Bank of China is available only for the first half of the year. We assumed that the full-year GDP ratio was equal to the GDP ratio for the first half of the year.

Equity values were an exception. They were assumed to grow at the same rate as the total Chinese market capitalization reported by the People's Bank of China. We tested the robustness of this approach by considering the direction of multiple other equity data series, including price-earnings ratios. (Exhibit 2).

Exhibit 2

China's national balance sheet equity follows the same trend as other market equity measures, but with less volatility.



[1]Values up to 2022 reported by Chinese Academy of Social Sciences via CEIC; 2023 and 2024 values estimated based on People's Bank of China data. 2024 figures for China reflect mid-year estimates.
[2]P/E ratios are annual averages. Cyclically adjusted P/E ratio computed by Oxford Economics.
Source: CEIC; Oxford Economics; People's Bank of China; World Bank; McKinsey Global Institute analysis

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To extend real assets to 2024, the first step was to estimate gross fixed capital formation by sector, which has actual values reported only through 2022. We used country-wide gross fixed capital formation and then considered shifts in types of fixed asset investment through 2024. We assumed that household gross fixed capital formation grew at the same rate as investment in residential real estate and then allocated the remaining capital formation across other sectors, assuming their relative share of the total remained constant from 2022.

We then applied varying approaches by asset type:

— *Machinery and infrastructure:* Assumed to grow using the perpetual inventory method, applying an assumed depreciation rate, the uplift in values from the machinery output or construction output price indexes (from IHS Markit), and new investment. To get to the new investment, we estimate the implied investment based on stock changes of the prior years, depreciation, and price uplift, and then apply reported changes in fixed asset investment for machinery and infrastructure from China's National Bureau of Statistics. Sector splits are assumed to be constant from 2022.

— *Intellectual property:* Increase in stock is assumed to be equal to R&D spending for 2023 and 2024, as reported by China's National Bureau of Statistics, continuing our methodology from earlier years. Sector splits assumed to be constant from 2022.

— *Inventories:* Increase in stock is assumed to be equal to inventory formation (the difference between gross capital formation and gross fixed capital formation) for 2023 and 2024, fully allocated to nonfinancial corporations.

— *Real estate:* The structures component of real estate is assumed to grow using the perpetual inventory method, applying an assumed depreciation rate, uplift in construction output price index (from IHS Markit), and investment for 2023 and 2024. Investment growth was based on fixed asset investment growth in household real estate and non-housing real estate for government and corporations. The land component of real estate across sectors was assumed to grow by the change in the China home price index from the Bank for International Settlements.

— *Mineral and energy reserves:* Value is assumed to grow at the same rate as that of the gross value added of the mining sector.

Endnotes

1 See William Larson, New estimates of value of land of the United States, Bureau of Economic Analysis, US Department of Commerce, April 2015. For a detailed explanation of our energy and minerals asset valuation approach, please see the technical appendix of *Rise and rise of the global balance sheet: How productively are we using our wealth?* McKinsey Global Institute, November 2021.

2 In addition to China and the United States, our sample includes Australia, Canada, France, Germany, Italy, Japan, Mexico, South Korea, and the United Kingdom. We also consider Belgium, Czech Republic, Denmark, Finland, Ireland, the Netherlands, Poland, Romania, Spain, and Sweden, whose balance sheet data is not reported individually but aggregated in an "other EU" balance sheet estimate.

3 Backcasting refers to estimating historical data backward in time starting with an anchor year, based on a price index or other growth rate in an analogous asset or concept.

4 Market Value of U.S. Government Debt, Federal Reserve Bank of Dallas, accessed September 2025. For a further discussion, see "Face and market value of debt securities in official statistics", Office for Budget Responsibility, July 2021.

5 There are two exceptions: for Canada, estimates for 2024 real assets are provided directly via the OECD; for Japan, we computed 2024 real asset values by applying the year-on-year value growth rates published by the Japanese Cabinet Office.

6 Yang Li and Xiaojing Zhang, *China's National Balance Sheet: Theories, Methods, and Risk Assessments*, Springer, 2017.

7 Richard Herd, *Estimated capital formation and capital stock by economic sector in China: The implications for productivity growth*, World Bank Policy Research Working Papers, number 9317, July 2020.

8 Prior to 1990, we model R&D expenditure by multiplying annual GDP estimates from the National Bureau of Statistics by the average ratio between R&D spending and GDP for the 1990s.

9 Given the significant uplift in R&D spending over the past half-century in China, there are limited benchmarks for estimating China's intellectual property. In advanced economies, however, the value of IP stock tends to hold a consistent multiple over time with R&D spending (in the United States this is 7.5, in Germany it is 6). Our cumulation-based estimate of IP stocks in China has an average multiple with R&D spending since 2000 of 6.6, with a standard deviation less than 20 percent of that value. This suggests that this IP stock estimation approach provides results on par with what would be expected in our advanced economy balance sheet data, given reported R&D spending.

10 For a detailed explanation of our energy and minerals asset valuation approach, please see the technical appendix of The rise and rise of the global balance sheet: How productively are we using our wealth? McKinsey Global Institute, November 2021.

11 This estimation was extrapolated from a 2009 survey from the Ministry of Land and Resources of the People's Republic of China, which has since become the Ministry of Natural Resources of the People's Republic of China.

12 See *The rise and rise of the global balance sheet: How productively are we using our wealth?* McKinsey Global Institute, November 2021.

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