McKinsey Global Institute

The rise and rise of the global balance sheet

How productively are we using our wealth?

November 2021

McKinsey Global Institute

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Preface

As the world looks to rebound from the COVID-19 pandemic, an understanding of the health and resilience of the global economy can help inform the decisions of business leaders and policy makers as they work to shape the recovery.

Even before the pandemic, the adequacy of traditional tools of economic and financial assessment had come under scrutiny. This report inaugurates a new line of research at the McKinsey Global Institute with foundational analysis of national balance sheets that complements other methodologies. National debt levels have risen markedly during the pandemic, giving new importance to balance sheet data that provide perspectives on the composition of national wealth and debt adequacy across countries. This research raises questions that we intend to explore in follow-on work, and we hope it will contribute to the discussion of ways to strengthen economic prosperity in the postpandemic era.

The research was led by Jonathan Woetzel, a McKinsey senior partner and MGI director in Shanghai, Jan Mischke, an MGI partner in Zurich, Anu Madgavkar, an MGI partner in New Jersey, Eckart Windhagen, a McKinsey senior partner in Frankfurt, Sven Smit, a senior partner in Amsterdam and co-chair of MGI, Michael Birshan, a senior partner in London, and Szabolcs Kemeny, a director of client capabilities in Budapest. Rebecca J. Anderson led the working team, which comprised Mohammed Abo Taleb, Olivier Bus, Jakob Graabak, Adrian Grad, Kenton Hoyem, Gabriela Hrasko, Joel Kirshner, Yifei Liu, and Arvind Vasudevan.

We are particularly indebted to Hans-Helmut Kotz, resident fellow, Center for European Studies at Harvard University, and senior fellow, Leibniz Institute for Financial Research SAFE in Frankfurt, Germany, for his extensive guidance, counsel, and good humor throughout the ten months of this research.

We also would like to thank our other academic advisers on this research project for their many important contributions. They are Martin Baily, senior fellow in economic studies at the Brookings Institution; Dag Detter, principal of Detter & Co and co-author of *The Public Wealth of Nations*; Rakesh Mohan, president and distinguished fellow at the Centre for Social and Economic Progress in Delhi, India; Andrew Sheng, chairman, the George Town Institute of Open and Advanced Studies, Penang, Malaysia; Michael Spence, William R. Berkley Professor of Economics, Leonard N. Stern School of Business at New York University; and Laura Tyson, distinguished professor at the graduate school of the Haas School of Business at the University of California, Berkeley.

We also thank our discussion partners, who provided valuable input and challenge to some of our preliminary results, including Ian Ball, professor at the School of Accounting and Commercial Law, Victoria University, Wellington, New Zealand; Diane Coyle, co-director, the Bennett Institute for Public Policy at the University of Cambridge; Monika Grzegorczyk and Guntram B. Wolff, respectively research assistant and director of Bruegel in Brussels, Belgium; Catherine L. Mann, former global chief economist at Citibank and former chief economist at the Organisation for Economic Co-operation and Development; Raghuram Rajan, former governor of the Reserve Bank of India and distinguished service professor of finance at the University of Chicago Booth School of Business; Adam Posen and his colleagues at the Peterson Institute for International Economics in Washington, DC; and Axel Weber, chairman of the Institute of International Finance and UBS Group AG.

We are grateful for the valuable input from international organizations and the national statistics offices of all ten countries in our sample. In particular, we would like to thank the following: at the European Central Bank, Maciej Anacki, team lead and economist-statistician; at the OECD's Statistics and Data Directorate, Pierre-Alain Pionnier, head of section, productivity, labour, and price statistics, Bettina Wistrom, head of unit, annual national

accounts, Isabelle Ynesta, senior statistician, financial statistics, Belen Zinni, head of unit, productivity, and Jorrit Zwijnenburg, head of section, sectoral and national accounts; at the National Institute of Statistics and Geography in Mexico, José Arturo Blancas Espejo, director general of economic statistics, Francisco Guillén Martín, deputy director general of national accounts, and Angel Fernando Pineda Solis, director of national accounts; at HM Treasury in the United Kingdom, Sue Connaughton, deputy director, balance sheet analysis, Tom Josephs, director, fiscal, and Graham Prentice, senior policy adviser and head of balance sheet analysis; at the UK Office for National Statistics, Marianthi Dunn, head of capital stocks and the national balance sheet, Kristofer Johannsson, senior analyst, Tusan Nguyen, assistant economist, and Kelly Thomas, statistical officer; at the Bureau of Economic Analysis in the United States, Dylan Rassier, chief, national accounts analysis and research, and David Wasshausen, chief of the Expenditure and Income Division, national accounts.

While we benefited greatly from the variety of perspectives we gathered from these experts and advisers, our views have been independently formed and articulated in this report.

Several McKinsey colleagues provided valuable expert input that helped shape our thinking. MGI partner Mekala Krishnan served as our research "challenger." We also thank Tera Allas, Rima Assi, Luciano Di Fiori, Miklos Dietz, Jonathan Dimson, Karilyn Farmer, Marc Goedhart, Naoyuki Iwatani, Tim Koller, Jeffrey Lorch, Ryan Luby, James Manyika, Hasan Muzaffar, Stefano Napoletano, Rob Palter, Aleksander Petrov, and Joydeep Sengupta.

MGI senior editor Stephanie Strom and editorial director Peter Gumbel edited and produced this report, together with operations manager Vasudha Gupta and senior graphic designers Marisa Carder, Jonathon Rivait, and Patrick White. Nienke Beuwer and Rebeca Robboy, MGI directors of external communications, helped disseminate and publicize the research. We are grateful to knowledge specialist Tim Beacom and Deadra Henderson, MGI's manager of professional development and operations, for their support.

This report contributes to MGI's mission to help business and policy leaders understand the forces transforming the global economy. As with all MGI research, this research is independent and has not been commissioned or sponsored in any way by business, government, or other institution. We welcome your comments at MGI@mckinsey.com.

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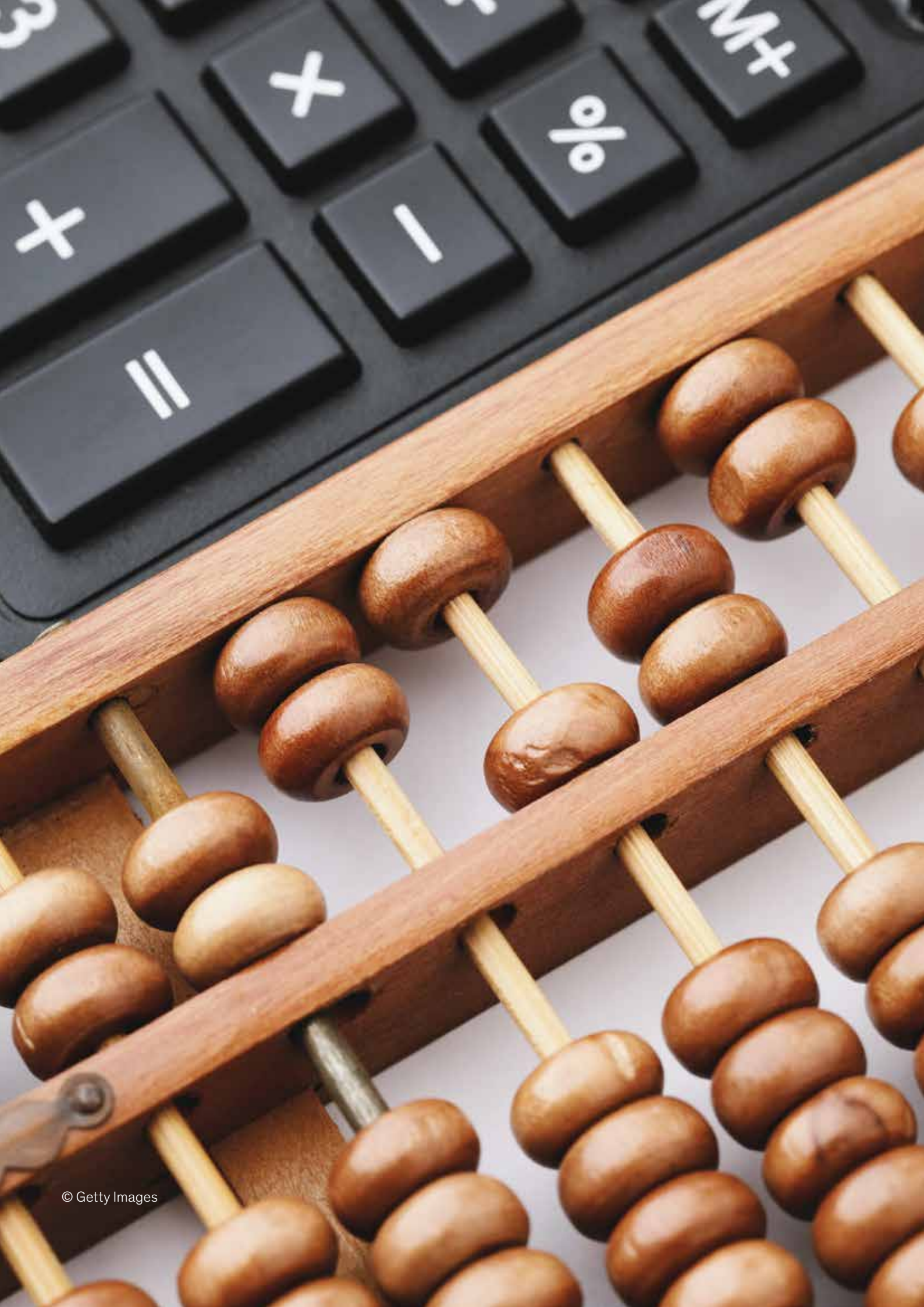

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In brief

The rise and rise of the global balance sheet

While the state of economies is usually measured by GDP or other metrics of economic flows, this research examines the balance sheets of ten countries representing more than 60 percent of global income: Australia, Canada, China, France, Germany, Japan, Mexico, Sweden, the United Kingdom, and the United States. This view highlights a dual paradox: bricks and mortar make up most of net worth, even as economies turn digital and intangible, and balance sheets have expanded rapidly over the past two decades, even as economic growth has been tepid. How countries and companies adjust to this divergence between wealth and GDP, find 21st-century stores of value, and address growing financial imbalances will determine the future course of the global economy and our wealth.

The market value of the global balance sheet tripled in the first two decades of this century. Each of its three components—real assets and net worth; financial assets and liabilities held by households, governments, and nonfinancial corporations; and financial assets and liabilities held by financial corporations—grew from about $150 trillion in 2000, or about 4 times GDP, to about $500 trillion, or about 6 times GDP in 2020.

The world has never been wealthier, with large variations across countries, sectors, and households. Net worth is the store of value that determines wealth and supports the generation of future income. At the consolidated global level, it is equivalent to the value of real assets because all financial assets are matched by corresponding liabilities so that they net out. Net worth tripled between 2000 and 2020 to $510 trillion, or 6.1 times global GDP, with China accounting for one-third of global growth. Households are the final owners of 95 percent of net worth, half in the form of real assets, mostly housing, and the rest in financial assets such as equity, deposits, and pension funds. Net worth per capita ranged from $46,000 in Mexico to $351,000 in Australia in our sample. In China and the United States, the top 10 percent of households owned two-thirds of wealth.

Two-thirds of global net worth is stored in real estate and only about 20 percent in other fixed assets, raising questions about whether societies store their wealth productively. The value of residential real estate amounted to almost half of global net worth in 2020, while corporate and government buildings and land accounted for an additional 20 percent. Assets that drive much of economic growth—infrastructure, industrial structures, machinery and equipment, intangibles—as well as inventories and mineral reserves make up the rest. Except in China and Japan, non-real estate assets made up a lower share of total real assets than in 2000. Despite the rise of digitization, intangibles are just 4 percent of net worth: they typically lose value to competition and commoditization, with notable exceptions. Our analysis does not address nonmarket stores of value such as human or natural capital.

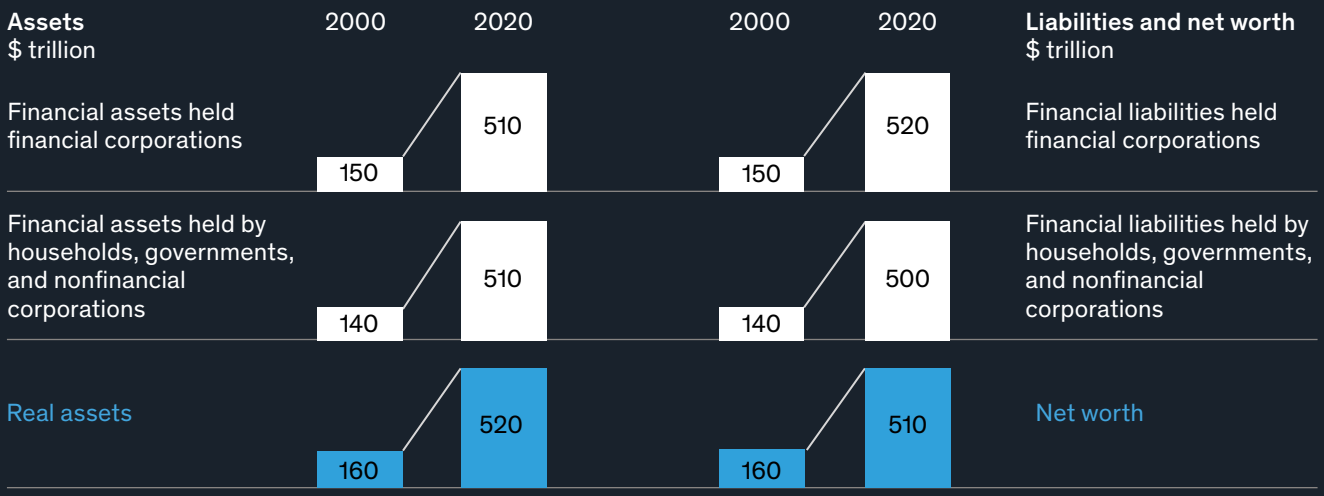
Asset values are now nearly 50 percent higher than the long-run average relative to income. Net worth and GDP historically moved in sync at the global level, with country-specific deviations followed by corrections, as in Japan in 1990. However, in the countries in our sample, net worth in 2020 was nearly 50 percent higher relative to income than the long-run average between 1970 and 1999. Asset price increases above inflation propelled by low interest rates drove this divergence, while saving and investment accounted for only 28 percent of net worth growth. In 2000–20, annual post-inflation valuation gains quadrupled compared with earlier decades and almost caught up with the returns from the operation of assets, which declined.

For every $1 in net new investment, the global economy created almost $2 in new debt. Financial assets and liabilities held outside the financial sector grew much faster than GDP, and at an average of 3.7 times cumulative net investment between 2000 and 2020. As asset prices rose, economy-wide loan-to-value (LTV) ratios, which compare debt to produced assets, remained constant at about 80 percent on average, but exceeded 100 percent in Canada, Japan, and the United Kingdom. While the cost of debt declined sharply relative to GDP, thanks to lower interest rates, high LTV ratios raise questions about financial exposure and how the financial sector allocates capital to investment.

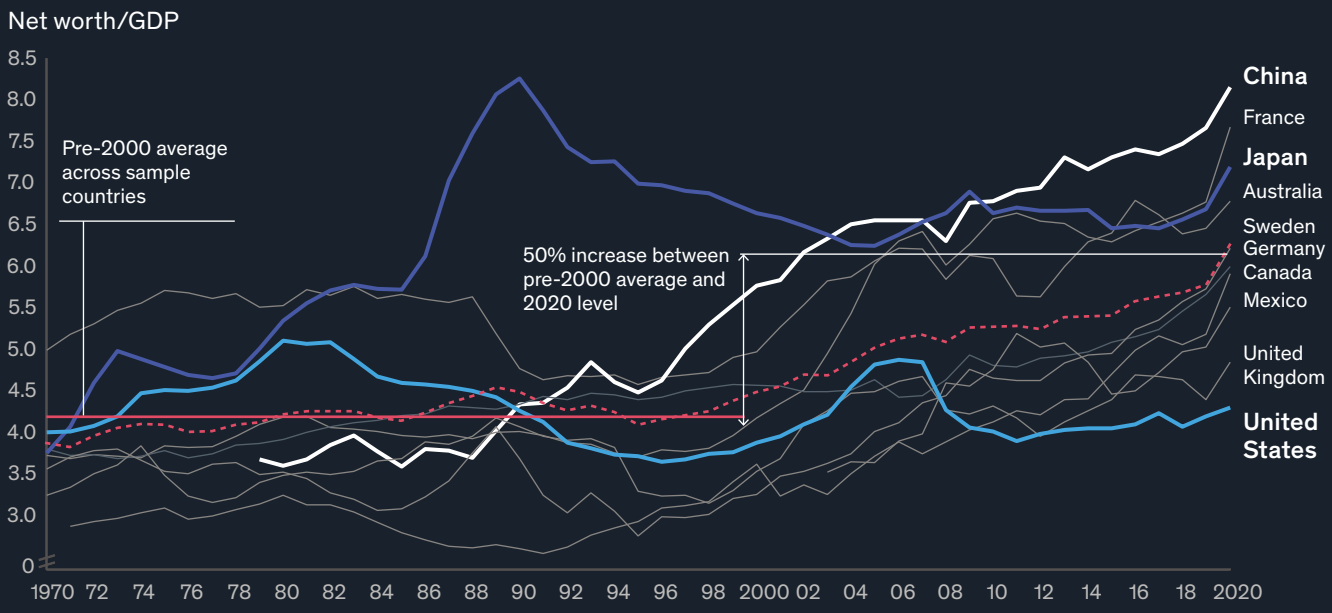
How may the future unfold, and what can economic actors do? We see three potential scenarios: (1) a new paradigm in which the value of assets relative to income is higher, in part because of demographic changes and a higher propensity to save among high-income households; (2) a mean reversion in asset prices; and (3) a rebalancing of the balance sheet relative to income from faster GDP growth as investment and productivity growth accelerate along with inflation. Households, corporates, financial institutions, and policy makers could assess and stress test the impact of those scenarios on their own balance sheets, find markers for how the economy will evolve, and hedge downsides while benefiting from upsides. Growing out of any potential imbalance would require all economic actors to redirect capital into productive and growth-enhancing investments such as sustainability, affordable housing, digital infrastructure, and yet-to-be-discovered 21st-century stores of value for savers .

A balance sheet for the global economy

The global balance sheet has more than tripled in size in the past 20 years

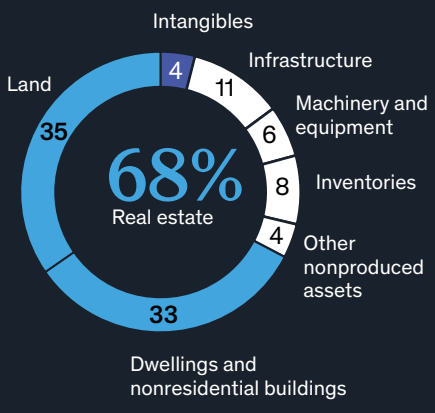


Net worth has grown much faster than GDP since 2000, with variations by country

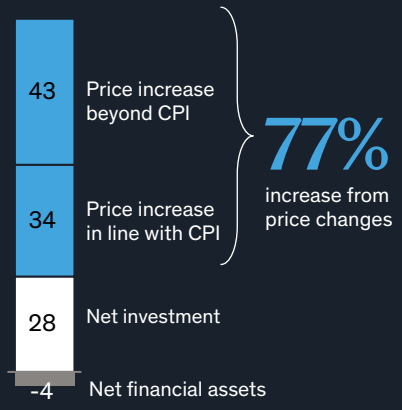


Composition and growth of net worth

Distribution of real assets
global average, 2020, %

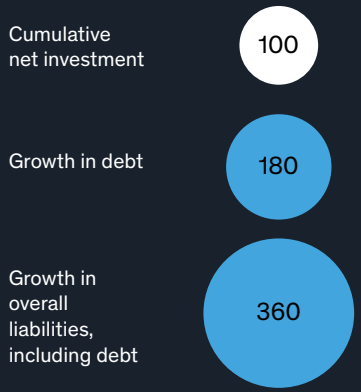


Drivers of net worth growth
2000–20, %



Net investment vs liabilities

2000–20, $ trillion



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Executive summary

In this research, we borrow a fundamental tool from the corporate world—the balance sheet—to take stock of the underlying health and resilience of the global economy. This view complements more usual approaches based on GDP or other economic flows. It provides an in-depth look at the state of the global economy after two decades of turbulence, notably the 2008 financial crisis and its aftermath, more than a decade of ultra-low interest rates and heavy central bank intervention, and, most recently, the COVID-19 pandemic.

We focus on ten countries that together account for about 60 percent of global GDP: Australia, Canada, China, France, Germany, Japan, Mexico, Sweden, the United Kingdom, and the United States (see Box E1, "Our research approach, key concepts, data sources, and limitations").

50%

Increase in asset prices since 2000 over the long-run average

A central finding from this analysis is that, at the level of the global economy, the historical link between the growth of wealth, or net worth, and the value of economic flows such as GDP no longer holds. Economic growth has been sluggish over the past two decades in advanced economies, but net worth, which long tracked GDP growth, has soared in relation to it. This divergence has emerged as asset prices rose sharply—and are now almost 50 percent higher than the long-run average relative to income. The increase was not a result of 21st-century trends such as the increasing digitization of the economy. Rather, in an economy increasingly propelled by intangible assets, a glut of savings has struggled to find investments offering sufficient economic returns and lasting value to investors.[1] These (ex-ante) savings have instead found their way into a traditional asset class, real estate, or into corporate share buybacks, driving up asset prices. At the same time, the growth in financial assets and liabilities has mirrored that of real assets, whether in response to or as a reason for real asset price increases.

Should we celebrate these trends or worry about them? Wealth as measured by net worth is rising fast. Yet the divergence between net worth and GDP raises some critically important questions for policy makers and business leaders. Foremost among them: is society in the throes of a paradigm shift as today's world uncovers new sources of wealth? Why has this rise in net worth not resulted in sustainable increases in economic flows? Is there a risk of reversion to the historical mean, which would potentially entail a sharp decline in net worth and a knock-on effect on financial markets? What new 21st-century stores of value may emerge?

In this research, we seek to create an analytical foundation, a diagnostic accounting that will support further research into the health of the world's economy, as well as provide a useful framework for answering such questions.

[1] See *Getting tangible about intangibles: The future of growth and productivity?*, McKinsey Global Institute, June 2021, McKinsey.com; and Lukasz Rachel and Lawrence H. Summers, *On secular stagnation in the industrialized world*, National Bureau of Economic Research, working paper number 26198, August 2019.

Box E1

Our research approach, key concepts, data sources, and limitations

We sought to complement GDP or flow-based approaches to economic analysis by building an integrated global balance sheet of all types of assets and liabilities, over time, and across countries.

National balance sheets measure financial assets, liabilities, real assets, and net worth as the sum of all assets minus liabilities in the household, government, nonfinancial corporate, and financial sectors. Financial assets and liabilities include all types of financial instruments like savings accounts and bank deposits, fixed-income securities like bonds, equity, pension assets, and derivatives (but not pay-as-you-go pension systems). Real assets include natural endowments like land and natural resources, which are not the result of a production process, as well as produced assets like dwellings and buildings, infrastructure, machinery and equipment, precious metals, and intellectual property products, which are also referred to as intangible assets.

This work aims to provide a balance sheet of the financial and real economy at current market prices. In line with national accounting guidelines in the 2008 System of National Accounts, we focus on the private market value of assets and intentionally show and analyze asset price effects rather than adjust for them.[1] This analysis does not account for externalities or societal value beyond private value—in other words, it excludes assets like natural capital (for instance, biodiversity) and human capital, and assumes that intangibles quickly lose commercial value due to competition. In many analyses, we normalize the market value of balance sheet items or net worth by nominal GDP to adjust for size and income levels of countries and also because income must eventually underpin the value of assets. We do not adjust for different asset price levels across countries.

The primary component of our data, stocks of financial and real assets that compose balance sheets, comes from the Organisation for Economic Co-operation and Development (OECD), Federal Reserve Board, CEIC, and national statistics offices. In some cases, adjustments and extrapolations were needed, particularly for the United States and China. Limitations of these data sources include varying accounting assumptions like depreciation rates on structures, different methodologies for estimating land values, large uncertainty about estimating the value of unlisted equity, as well as a likely undercounting of public assets.[2]

This research marks our first attempt to create and analyze a global balance sheet. We consider this a useful frame of reference to better understand the context in which corporate leaders and policy makers operate. For instance, it helps develop a better understanding of what underpins household and national net worth and where we store value, including the role of intangibles. It also helps explain how net worth is formed and rises and falls over time and across countries. This in turn provides insight into the sustainability of wealth accumulation, pension systems, and the dynamics of wealth concentration, among others. A balance sheet approach also provides a complementary view of the role of the financial system, including how leveraged our economies are in aggregate beyond traditional measures of debt and its relation to GDP. By taking into account not only debt but also the assets backing that debt, this approach can throw a spotlight on potential risk exposures.

We acknowledge the gaps in this work. By taking a global and cross-sector view, we have not analyzed in depth the challenges in specific sectors, such as the potential to optimize the value of public assets on government balance sheets, for example by redeveloping or redeploying public land for higher-value use or improving operational public assets.[3] We also have not assessed the precise exposure of the financial balance sheet to risk scenarios. We note changes in ratios like asset valuations and loan-to-value measures but do not address in depth underlying theories of why, for instance, asset prices have diverged from GDP growth. By taking a private market value perspective, we do not look at depletion of natural capital or development of human capital. We made several extrapolations and interpolations to obtain solid data for the ten economies; more granular views would be possible for a larger set of countries if harmonized balance sheet data were a priority for more economies.

For full details of our balance sheet accounting of the global economy, including valuation and depreciation methods and a list of our data sources, see chapter 1 and the technical appendix.

1 The System of National Accounts (SNA) is the internationally coordinated standard set of recommendations on how to compile measures of economic activity. Its origins date back to 1947, when the issue was taken up by United Nations Statistical Committee, leading to the 1953 publication of the first SNA. It has subsequently been revised five times, in 1960, 1964, 1968, 1993, and 2008. See Historical versions of the System of National Accounts, United Nations Statistics Division, unstats.un.org.

2 Dag Detter and Stefan Fölster, "Unlocking public wealth," *IMF Finance & Development*, March 2018.

3 Dag Detter, *Exploring the unknown: How asset maps can transform public financial management*, IMF Public Financial Management Blog, August 30, 2021.

Assets on the global balance sheet are split almost equally between real assets, financial assets outside the financial sector, and those within it

To construct a global balance sheet, we add up all real assets in the economy, as well as all financial assets across all sectors (including, notably, the financial sector), analogous to the way a corporation builds its balance sheet. In 2020, the combined balance sheet of the ten focus countries totaled about 18.1 times their GDP in financial and real assets. Scaled up to the global economy as a whole, that total amounted to $1,540 trillion (Exhibit E1).

At a functional level, three balance sheets of (coincidentally) about $500 trillion each interlock: the real economy balance sheet; the financial balance sheet; and the financial sector balance sheet.

The real economy balance sheet has $520 trillion in real assets, such as machinery and equipment, infrastructure, buildings, natural resources, and intellectual property, or IP. These are mirrored on the liability side as net worth.

Exhibit E1

Each of the three components of the global balance sheet amounted to about $500 trillion in 2020, or six times GDP.

Size of balance sheet
$ trillion

	Real assets		Liabilities and net worth	
1 The financial sector	*Financial assets held by financial corporations*	510	*Liabilities held by financial corporations*	520
2 The financial system	*Financial assets held by households, governments, and nonfinancial corporations*	510	*Liabilities held by households, governments, and nonfinancial corporations*	500
3 The real economy	*Nonfinancial assets*	520	*Net worth*	510

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

The financial balance sheet of households, corporations, and governments has $510 trillion in financial assets like stocks, bonds, pension funds, and cash and deposits that facilitate ownership and risk transfer of real assets as well as time shifting of savings and consumption. These financial assets are mirrored on the balance sheet by $500 trillion in liabilities, since they represent eventual claims against those same sectors. The financial balance sheet is coincidentally almost the same size as the real economy one, although historically it has been much smaller.

Finally, financial institutions create and intermediate those financial assets and liabilities—with transformation of risks, maturity, and size—and hold $510 trillion in financial assets and corresponding liabilities of $520 trillion. Exhibit E2 shows how these three balance sheets interlock. Each of three amounts to about six times GDP. While each equalizes within itself at a closed economy level, in our analysis of ten countries, there is a small negative net financial position, meaning that these countries collectively borrow from the rest of the world and so assets and liabilities do not match precisely.

At the global level, real assets constitute net worth and make up 6.1 times GDP, while aggregate financial assets net out

In this report, we assess assets and liabilities, gross and net, at the line-item level, across sectors, across countries, and, finally, from a global perspective. A key concept for this research is that of net worth as a mirror image of real assets at the global level. Net worth is the store of value that defines wealth and is available to support the generation of future income. For households, net worth includes both real assets such as property and financial assets including stocks and bonds.

6.1x GDP

Total size of real assets and net worth

At the global or closed economy level, however, financial assets are matched by corresponding liabilities, such as the bonds owned by households that are a liability of a government, or equity that is a liability for the issuing corporation. Hence, while the gross volume of financial assets is now nearly equivalent to the value of real assets, on a net basis, after subtracting corresponding financial liabilities, the net aggregate value is zero. Net worth is what is left after financial assets and liabilities net each other out and thus is equivalent to the value of real assets.[2] Therefore, while financial assets represent wealth to sectors, institutions, and households, and fulfill many functions like ownership and risk transfer of real assets, on the consolidated global balance sheet, financial assets do not add to net worth, nor do financial liabilities subtract from it.

At a national level, countries can, however, have positive or negative net financial assets or liabilities contributing to net worth. These represent lending or borrowing positions in relation to the rest of the world; in our sample countries, such positions account for a maximum of 13 percent of total country net worth.[3]

[2] See James Tobin, *Asset accumulation and economic activity: Reflections on contemporary macroeconomic theory*, University of Chicago Press, 1980.

[3] In our sample of ten countries, the collective net financial position is less than 0.1 times GDP, a slight negative. For this reason, real assets do not exactly match net worth.

Exhibit E2

The global balance sheet can be interpreted as three interlocking balance sheets of about $500 trillion each.

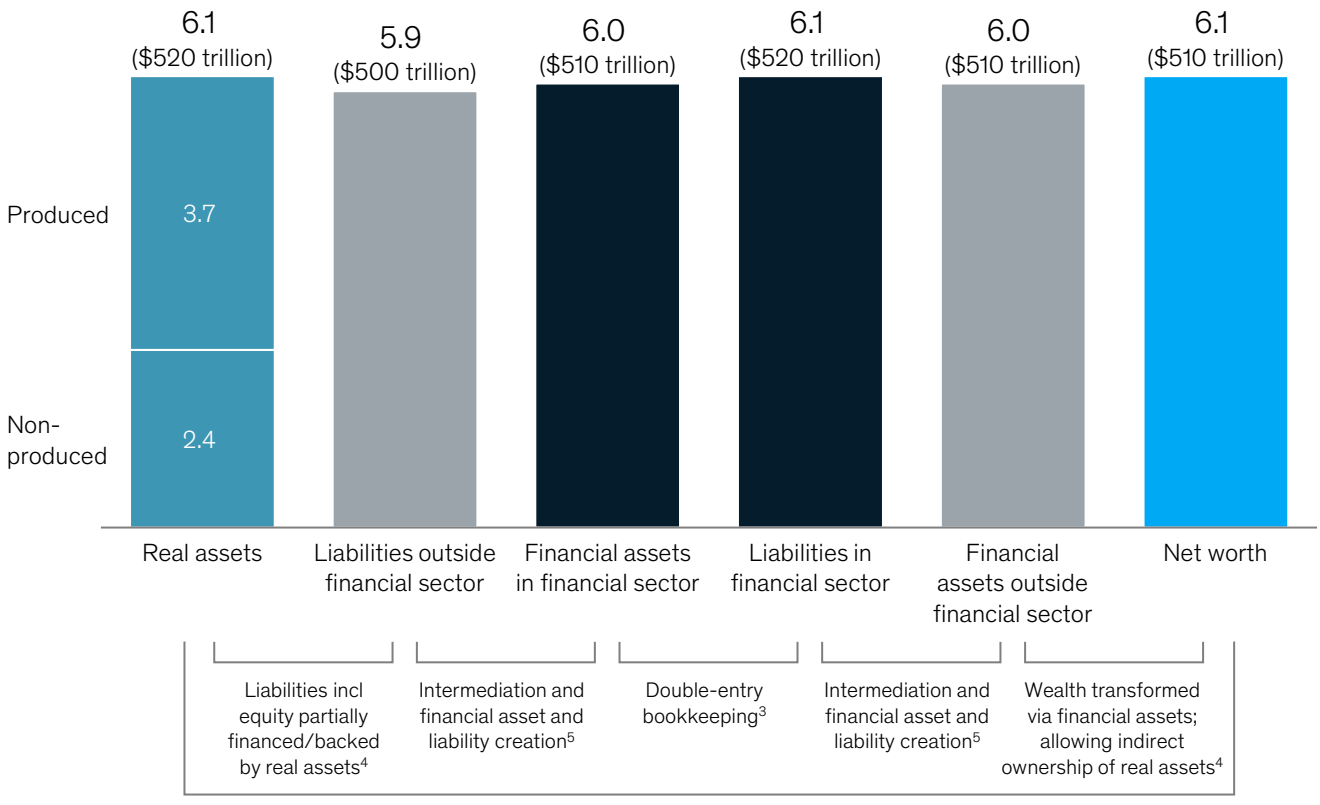
Balance sheet components, 2020, GDP multiple

Simplified

The real economy balance sheet, where savers and investors accumulate real assets and thus wealth. In a world without finance, real assets and wealth are identical—for example, someone accumulates wealth by building a house.[1]

The financial balance sheet outside the financial sector, which incorporates financial assets and liabilities of households, governments, and nonfinancial corporations. These assets and liabilities enable ownership and the transfer of risk related to real assets and allow smoothing or time shifting of consumption and savings.[2] All financial assets and liabilities are created in pairs and net out at the global level.

The financial sector balance sheet, which reflects intermediation activities of the financial sector between ultimate savers and final investors (in real assets), based in the nonfinancial sectors. Financial institutions' balance sheets must balance via double-entry bookkeeping.[3]



Wealth ultimately transformed into real assets (directly or via corporate equity ownership); real assets serve as store of wealth[5]

1. Globally, assets equal liabilities (and net worth) within each of the three levels shown; small deviations are due to the collective rest-of-world position across the ten countries in our sample.
2. Consumption smoothing refers to saving and borrowing to maintain an even level of consumption over time.
3. Financial sector double-entry bookkeeping includes real assets; for that reason, as well as due to asymmetric valuation changes on assets and liabilities, liabilities are not perfectly equal to financial assets.
4. Not all real assets have a financial liability against them (eg, house without a mortgage), and not all liabilities are asset backed (eg, student loans). Historically, liabilities have been much smaller than real assets.
5. Not all financial flows are intermediated by the financial sector (eg, direct equity ownership), and there are financial assets and liabilities only within the financial sector.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

The world has never been wealthier, with large variations across countries and households

Since 2000, the global balance sheet and net worth have tripled in size. Net worth grew from $160 trillion in 2000 to $510 trillion in 2020. Net worth averaged $66,000 per capita globally in 2020, albeit with large variations across economies, and even larger differences between households within an economy. In the countries in our sample, per capita net worth ranged from $46,000 in Mexico to $351,000 in Australia.[4] This raises questions about how to build wealth for more households and what drives country differences in the market value of net worth.

To normalize net worth for differences in income levels across countries—and also because net worth is a claim on future output—we also look at net worth as a multiple of GDP. It ranged from 4.3 times in the United States to 8.2 times in China (Exhibit E3).

$66,000

Average per capita net worth across the ten countries in our sample

A variety of factors shape the level of net worth relative to GDP across countries. They include resource endowments, trade balances, investment rates, as well as price levels of assets in comparison with consumer baskets. Australia, Canada, and Mexico have considerable natural resources of 0.3 to 0.5 times GDP. Manufacturing exporters Germany and Japan, as well as resource exporter Canada, hold significant net financial assets and have a net lending position to the rest of the world, as a result of current account surpluses. China and Japan have some of the highest net-worth-to-GDP ratios and historically heavy investment in stocks of public and corporate non-real estate assets that are nearly twice as high as in other economies in our sample, except for Mexico.

Relative price levels, particularly in real estate, also play a role. In Australia, China, and France, the value of residential land and buildings relative to GDP is 18 to 44 percent above our sample average, even as residential living space per capita is broadly in line with our sample average.[5] Net worth in the United States was the lowest relative to GDP among the ten countries. This reflects the significant US net foreign debt (among other net liabilities) as well as the country's comparatively low household and corporate real estate wealth relative to income—even though it has the highest per capita floor space in our sample, in part because its land market is vast and more elastic than in other countries.[6] (Note that household net worth in the United States is higher than average among our sample countries relative to GDP and more than one-third higher than national net worth, as households there have large equity and debt claims against the corporate and public sector which are not backed by real assets or total economy net worth. Put differently, US households have large asset holdings that eventually can be regarded as claims against themselves in their role as taxpayers and consumers.)

Across the ten countries in our sample, China accounted for 50 percent of the growth in net worth, or wealth, over that period, followed by the United States, at 22 percent. Japan, which held 31 percent of wealth across the ten economies in 2000, held just 11 percent of the total in 2020.

Within the household sectors of China and the United States, two-thirds of wealth is owned by the top 10 percent of households.[7] In the United States, the amount of the country's wealth held by the top 10 percent of households grew from 67 percent in 2000 to 71 percent in 2019, while the share of the bottom 50 percent of wealth owners dropped from 1.8 percent in 2000 to 1.5 percent in 2019. In China, these shifts were more extreme: the top 10 percent of households owned 48 percent of the nation's wealth in 2000, and by 2015, those households owned 67 percent. The bottom 50 percent of Chinese households owned 14 percent of the wealth in 2000 and 6 percent in 2015.[8]

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4 These figures are based on nominal conversions to US dollars. At purchasing power parity, Mexico's per capita net worth is $104,000 and Australia's is $356,000.

5 Data on residential living space sourced from Rogoff and Yang include 8 of the 10 countries. This sample average excludes Japan and Sweden. See Kenneth Rogoff and Yuanchen Yang, "Has China's housing production peaked?," *China and the World Economy*, Volume 29, Issue 1, 2021.

6 See Aida Caldera Sanchez and Asa Johansson, "The price responsiveness of housing supply in OECD countries," *Journal of Housing Economics*, May 2013, Volume 2, Issue 3.

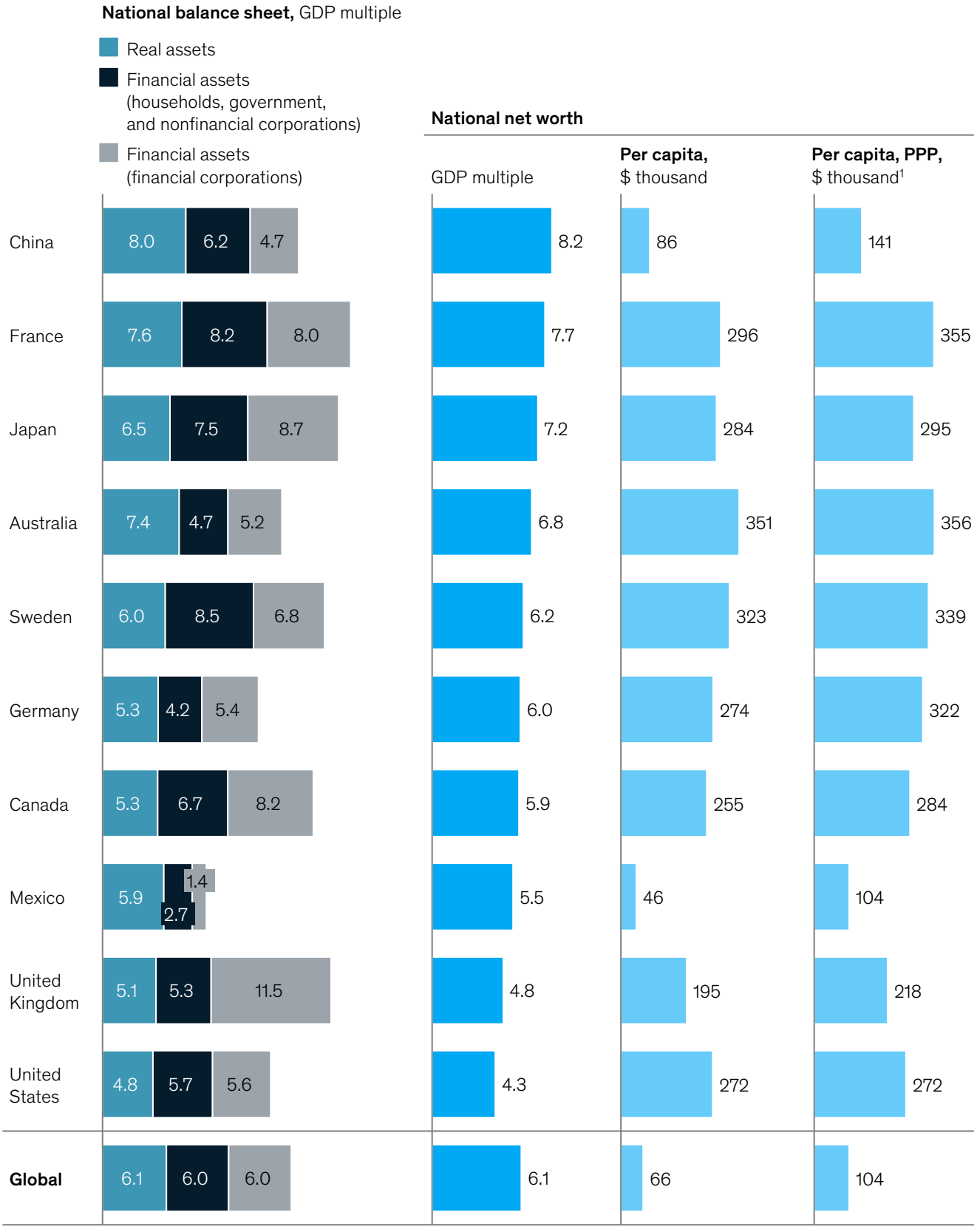
7 We focus on China and the United States for reasons of data availability. The World Inequality Database, wid.world. See also *Inequality: A persisting challenge and its implications*, McKinsey Global Institute, June 2019; and Thomas Piketty, *Capital in the Twenty-First Century*, The Belknap Press of Harvard University Press, 2017.

8 The World Inequality Database, wid.world.

Exhibit E3

Total balance sheets and net worth vary widely by country.

National balance sheets and net worth at market prices, 2020



1. Purchasing power parity. Rates from World Bank; sample average redistributes GDP weights based on PPP GDP; global (extrapolated) view takes into account world PPP GDP multiplied by the net worth/GDP ratio of 6.1.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

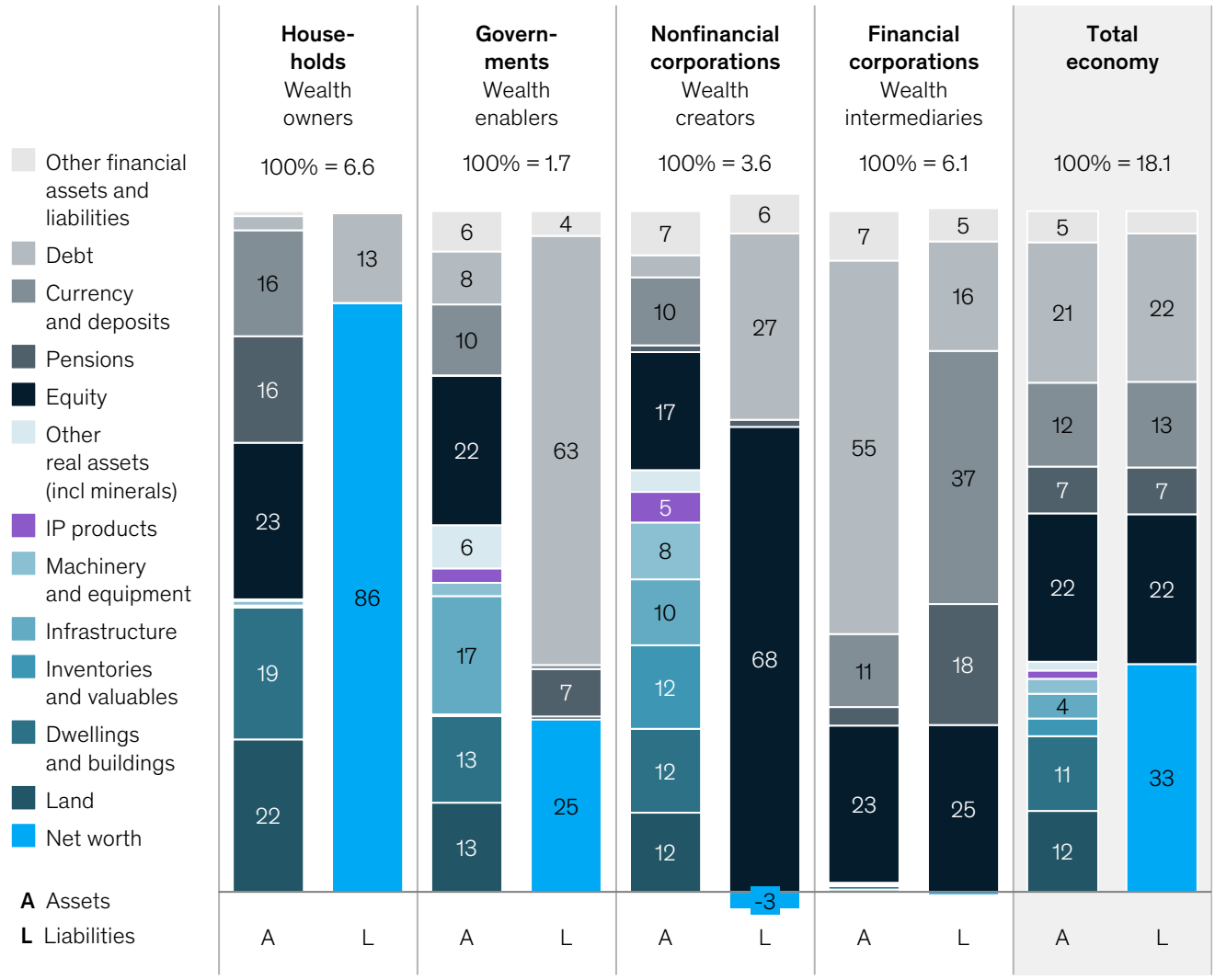
Asset, liability, and net worth profiles vary across economic sectors, with households owning about 95 percent of wealth

Households can be regarded as the final owners of wealth. For households, real assets—mostly housing—make up almost half of net worth. Net financial assets, in roughly equal parts pension assets, deposits, and equity, make up the other half (Exhibits E4 and E5). Distribution of household assets, however, varies between countries. For instance, assets held by households in Australia, France, Germany, and Mexico are primarily buildings and land, while in the United States, equity and pensions make up most of household wealth. Among other factors, this reflects differences in countries' pension systems, for instance pay-as-you-go arrangements versus those where assets are accumulated to meet pension obligations. In Japan, deposits make up more than one-third of total household assets. Via those financial assets and real estate holdings, households in the ten countries control 95 percent of net worth, ranging from 64 percent of national net worth in Mexico to 135 percent in the United States.

Exhibit E4

The distribution of assets and liabilities varies by sector.

Global balance sheet by sector, 2020, %, GDP multiple

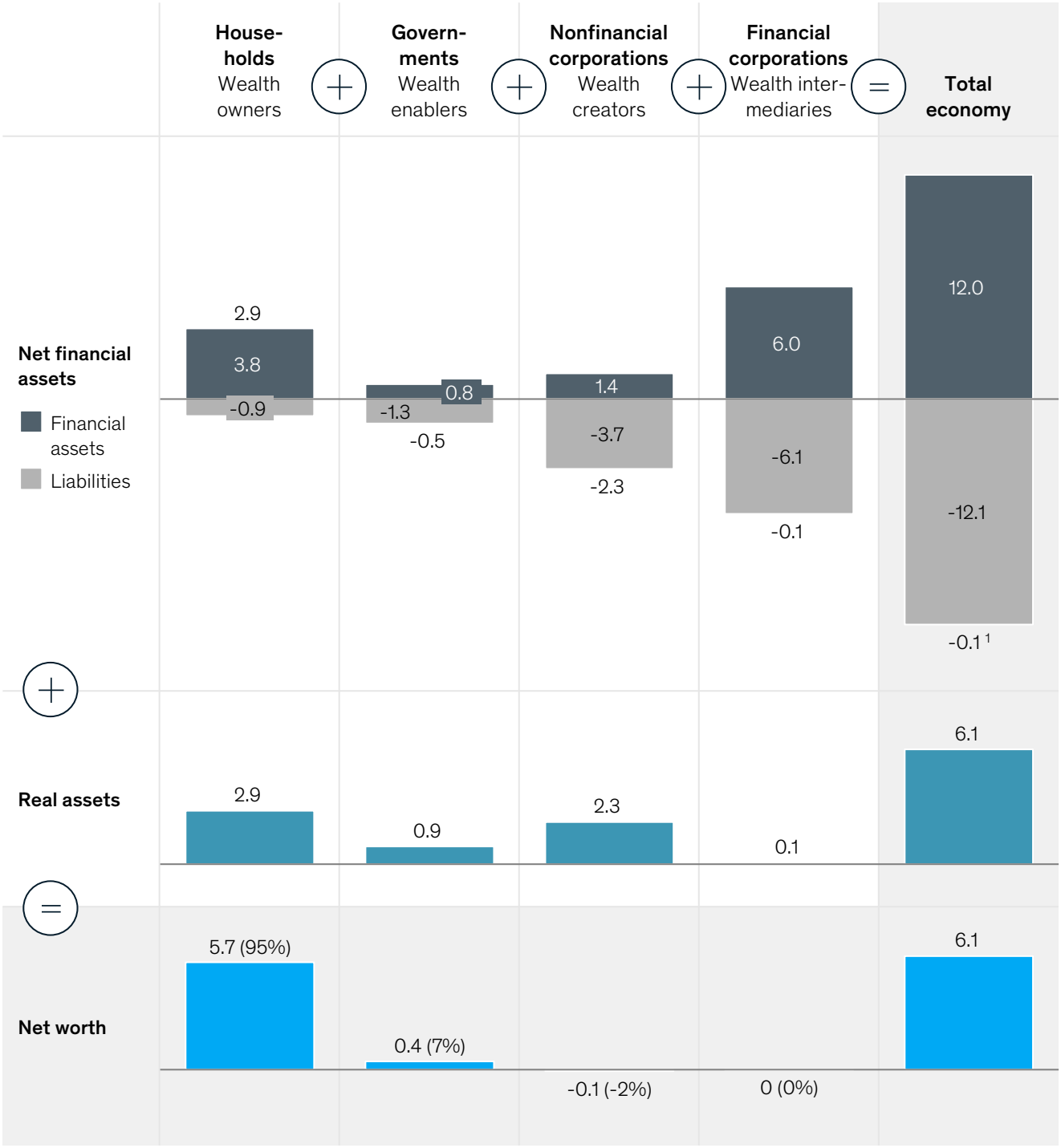


Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit E5

Real assets constitute net worth at the total economy level, while financial assets work to pass net worth on to households.

Wealth breakdown by sector, 2020, GDP multiple



The top row shows that total net financial assets net out at a global level, leaving real assets equivalent to net worth (middle row). In the corporate sector, real assets are offset by net financial assets.

Bottom row: Net worth is mostly held by households—half in the form of financial claims on corporates and governments, the other half in real estate.

1. At the global level, net financial assets are equal to zero. The -0.1 times GDP figure here represents the collective rest-of-world position across the ten countries in our sample.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

The public sector, often seen as an enabler of wealth, owns mostly public buildings, infrastructure, land, and natural resources, which are worth about 90 percent of GDP, as well as financial assets such as stakes in state-owned enterprises. On the liability side, public debt in many countries exceeds the value of public assets. Public net worth was sizable, particularly in China, at 1.8 times GDP (due to sizable land ownership and high investment in state-owned firms), Australia (due to natural resource endowments), and Sweden (which had relatively low levels of public debt and a broad portfolio of financial and nonfinancial public assets). By contrast, the UK and US governments are net borrowers that have not built public wealth commensurate with debt.

Nonfinancial corporations, the creators of wealth, own productive assets like machinery, factories, and intangibles to the tune of 0.8 times GDP, and inventories amounting to about 0.4 times GDP. They also have significant real estate holdings, such as hotels, restaurants, and office buildings. They pass this wealth on to households via debt and equity. This sector includes state-owned enterprises if they generate substantial revenue.[9] (State-owned enterprises that have little or no revenue are included in the government sector.) Real assets in the corporate sector range from 1.3 times GDP in the United States to 3.8 times GDP in China.

Financial corporations, the intermediators of wealth, mirror the assets and liabilities in other sectors. They hold financial assets such as mortgages, public and corporate bonds, and equities. At the same time, they owe deposits, bonds, and pension assets, mostly to households.[10] The financial sector includes central banks and their expanding balance sheets.

Real estate makes up two-thirds of global real assets or net worth, raising questions about capital and wealth allocation

The value of residential real estate including land amounted to almost half of global net worth in 2020, with corporate and government buildings and the land associated with them accounting for an additional 20 percent. Other fixed assets like infrastructure, industrial structures, machinery and equipment, and intangibles—the types of assets that typically drive economic growth—make up only one-fifth of real assets or net worth (Exhibit E6). They range from just 15 percent of net worth in France and the United Kingdom to 39 percent in Japan. This raises questions about the way societies allocate and build capital and wealth and, at a time of rapid economic change linked to technological advances, whether we have managed to find a 21st-century store of wealth that could be as durable as bricks and mortar. For now, despite the rapid adoption of digitization, that does not appear to be the case.

Intangible assets are a prime example. In this research, intangible assets refer to intellectual property like R&D and software, and they play an increasingly important role in today's economy.[11] The OECD reported in 2015 that intangible assets had expected returns of 24 percent, the highest rate among produced asset categories.[12]

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9 The 2008 System of National Accounts classifies state-owned enterprises with prices at least 50 percent of costs as corporations.

10 For further understanding of the foundations of our research, see *System of National Accounts 2008*, European Commission, International Monetary Fund (IMF), Organisation for Economic Co-operation and Development (OECD), United Nations, and World Bank, 2008, and Francois Lequiller and Derek Blades, *Understanding national accounts*, second edition, OECD, 2014.

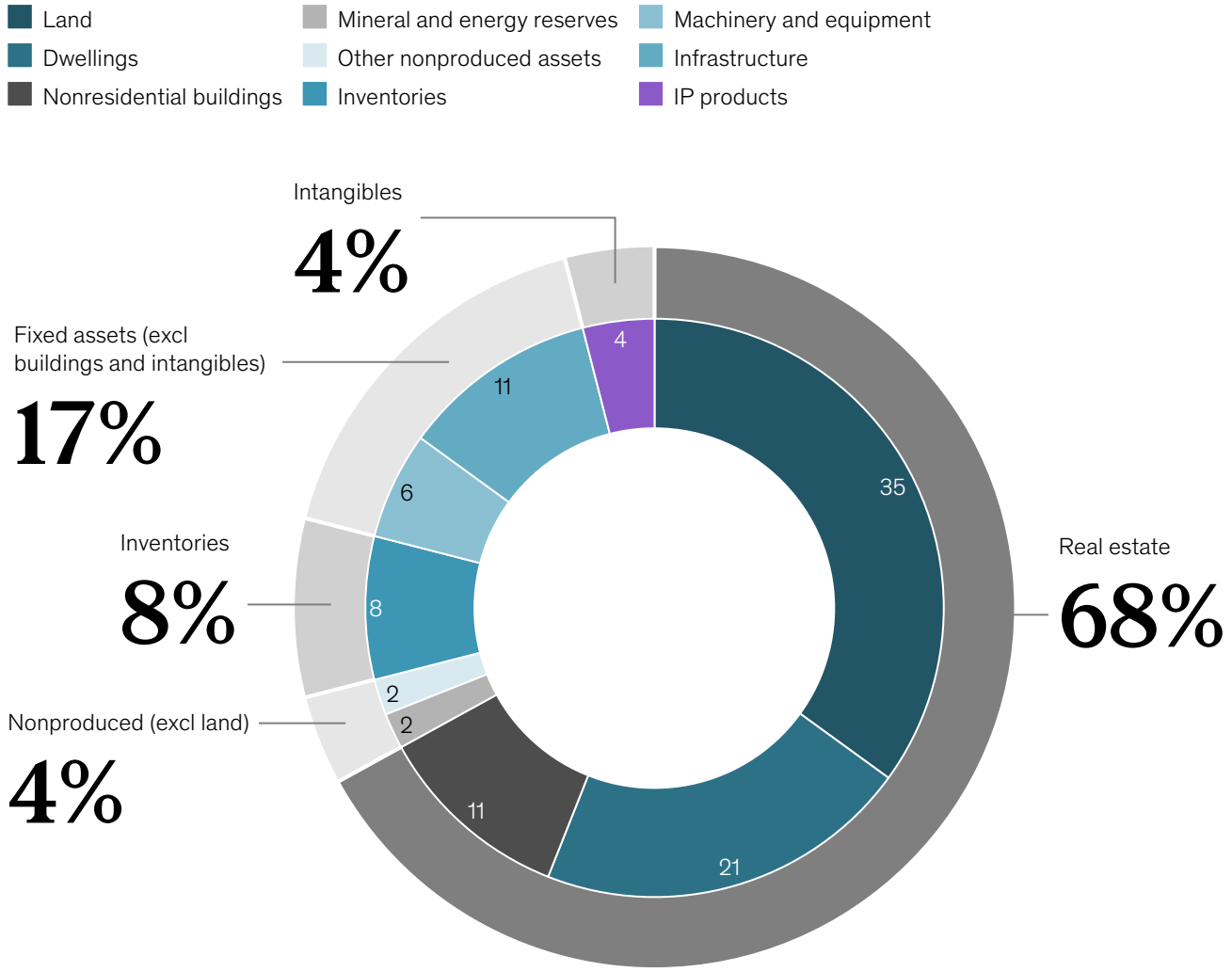
11 Broadly defined, investment in intangibles has come to outstrip tangible investment in a number of geographies; see Jonathan Haskel and Stian Westlake, *Capitalism without capital: The rise of the intangible economy*, Princeton University Press, 2017; Carol Corrado et al., *Intangible investment in the US and EU before and since the Great Recession and its contribution to productivity growth*, European Investment Bank, 2017; and Carol Corrado et al., "Innovation and intangible investment in Europe, Japan, and the United States," *Oxford Review of Economic Policy*, Summer 2013, Volume 29, Number 2.

12 *The impact of R&D investment on economic performance: A review of the econometric evidence*, OECD, April 2015. Additional research suggests that these high returns may not persist over time. The authors note that idea production, or the creation of intangible assets through research and development, faces diminishing returns over time across industries. See also Nicholas Bloom et al., "Are ideas getting harder to find?," *American Economic Review*, April 2020, Volume 110, Number 4.

Exhibit E6

Real estate accounts for two-thirds of real assets.

Distribution of real assets, global average, 2020, %



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Labels for values <1 not shown. Figures may not sum to 100% because of rounding.
Source: AMECO; CEIC; EU KLEMS; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Nonetheless, intangibles represent only 4 percent of total net worth and have thus not served as a significant store of value, at least not as currently measured. The reason is that for their mostly corporate owners, the value of intangible assets is assumed to decline rapidly due to obsolescence and competition, even if their value to society may have a much longer shelf life (see Box E2, “Measuring intangibles”). The market value of equities in many (but not all) countries has not materially diverged from underlying asset values as recorded under customary accounting standards, which suggests this assumption is broadly in line with markets.

Box E2

Measuring intangibles

Intangible assets are difficult to measure. To assess their value on national balance sheets for this research, we varied two parameters.

First, we expanded the definition of intangibles beyond intellectual property by including organizational capital, training, and brand investments. This increased global net worth relative to GDP by 4 percent. While this would roughly double the value of intangibles on the balance sheet, their value would nonetheless remain small compared to their tangible counterparts.[1]

Second, we adjusted assumptions on the lifespan of intangibles, which has a much larger impact. Current accounting standards assume relatively high amortization rates of more than 20 percent annually, or a commercially exploitable life of less than five years. This would be in line with relatively rapid loss of value to competition or obsolescence.

From a societal point of view, however, it could be argued that intangibles, like know-how, live nearly forever. The invention of the wheel in the fourth millennium BC, for instance, is still relevant to e-bike manufacturers today. Removing any depreciation or amortization from the measurement of intangibles over the past 20 years would increase global net worth by 11 percent and nearly quadruple their value. In the United States, this approach would add about 0.8 times GDP to corporate assets and thus go a long way toward explaining the difference in corporate equity liabilities relative to underlying net asset values of one times GDP in 2020. While we tested this sensitivity, in this research we stick to the commercially exploitable value of intangibles as a store of value on a balance sheet, to conform with their treatment in national accounts as well as with market valuations in other countries.

[1] See Ryan H. Peters and Lucian A. Taylor, "Intangible capital and the investment-q relation," *Journal of Financial Economics,* February 2016.

Among the ten sample countries, companies and markets in Canada and the United States may seem to value intangibles more favorably than those in the other countries, however. As market-to-book ratios soared, the value of corporate equity in the United States exceeded the value of underlying net assets by one times GDP in 2020. This may reflect a higher value of intangibles, but it could also relate to the market and competition environment or be in part a result of so-called superstar effects among the top 10 percent of companies in economic profits.[13]

Wealth has grown out of proportion with income due to asset price inflation, marking a departure from historical trends

Before 2000, net worth growth largely tracked GDP growth at the global level. There were individual country differences and exceptions from this pattern, typically reverting to the historical mean over time. These countries and periods include the United States in the late 1970s and early 1980s, when construction costs greatly exceeded general inflation; Japan during the asset bubble of the late 1980s that was followed by the "lost decade"; Sweden in the real estate bubble followed by a banking crisis in the early 1990s; and the United States during the real estate price rise before the 2008 financial crisis (Exhibit E7).[14]

In about 2000, however, net worth at market value began growing significantly faster than GDP in almost all of our sample countries, even as real investment continued moving in tandem with GDP. This coincides with a period during which interest rates and rates of return on real estate declined to historical lows.[15]

[13] We define superstar companies as global firms in the top 10 percent of companies in economic profit. *Superstars: The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018, McKinsey.com. For an analysis of the competitive environment, see Thomas Philippon, *The great reversal: How America gave up on free markets*, Harvard University Press, 2019.

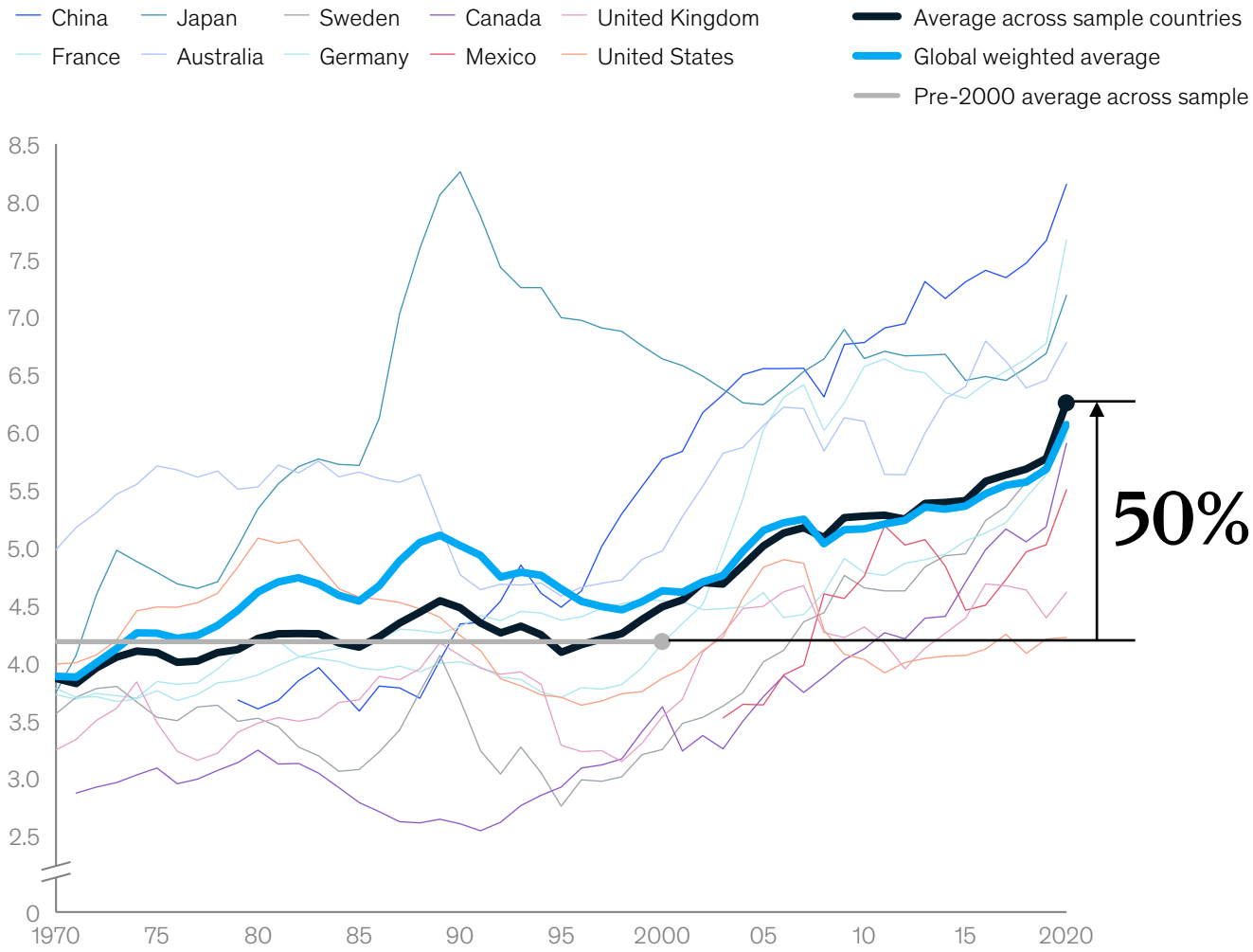
[14] See Robert Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015.

[15] See Thomas Laubach and John C. Williams, "Measuring the natural rate of interest," *The Review of Economics and Statistics*, November 2003, Volume 85, Number 4; Kathryn Holston, Thomas Laubach, and John C. Williams, *Measuring the natural rate of interest: International trends and determinants*, Federal Reserve Bank of San Francisco, working number paper 2016-11, December 2016; Robert E. Hall, "Low interest rates: Causes and consequences," *International Journal of Central Banking*, September 2017; Mauricio Ulate, *Going negative at the zero lower bound: The effects of negative nominal interest rates*, Federal Reserve Bank of San Francisco, working paper number 2019-21, September 2019; and Lukasz Rachel and Lawrence H. Summers, *Secular stagnation and the decline in real interest rates*, National Bureau of Economic Research, working paper number 26189, November 2019.

Exhibit E7

Since 2000, net worth at market prices has increased relative to nominal GDP in most countries.

Net worth at market prices relative to nominal GDP, 1970–2020



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Labels for values <1 not shown. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Inequality Database; World Bank; McKinsey Global Institute analysis

Compared to GDP, net worth between 2000 and 2020 was 104 percentage points higher on average than between 1970 and 1999, albeit with considerable variation across the ten countries. The largest increase in net worth relative to GDP in 2000 to 2020 was in France, a full 371 percentage points, as real estate prices soared, particularly in the early 2000s.[16] Sweden's net worth grew by 301 percentage points relative to GDP from 2000 to 2020, reflecting higher valuations on residential and corporate real estate, while China's grew by 262 percentage points, due mostly to growth in produced assets controlled by nonfinancial corporations.

Net worth growth relative to GDP was somewhat more muted in the United States. An increase of 94 percentage points in the value of real assets relative to GDP from 2000 to 2020 was partially masked by net foreign liabilities (that is, foreign debt and other obligations that exceed ownership of foreign assets), which increased by 41 percentage points over that period. Also, the continuing impact of the 2008 financial crisis slowed the growth of home

[16] One hundred percentage points is equal to a change in GDP multiple of 1. The percentage point figures in this report consider the change inclusive of the first year in the listed range. Given end-of-year reporting of stocks, the percentage point figures for 2000–20 take the difference between GDP multiples of 2020 and 1999.

prices in the United States compared to most other countries in our sample. Savers, including companies, put their money into financial assets instead: in the period 2000 to 2020, the average value of nonfinancial corporate equity liabilities relative to GDP and to underlying net corporate assets was almost double the value of the average from 1950 to 1999.

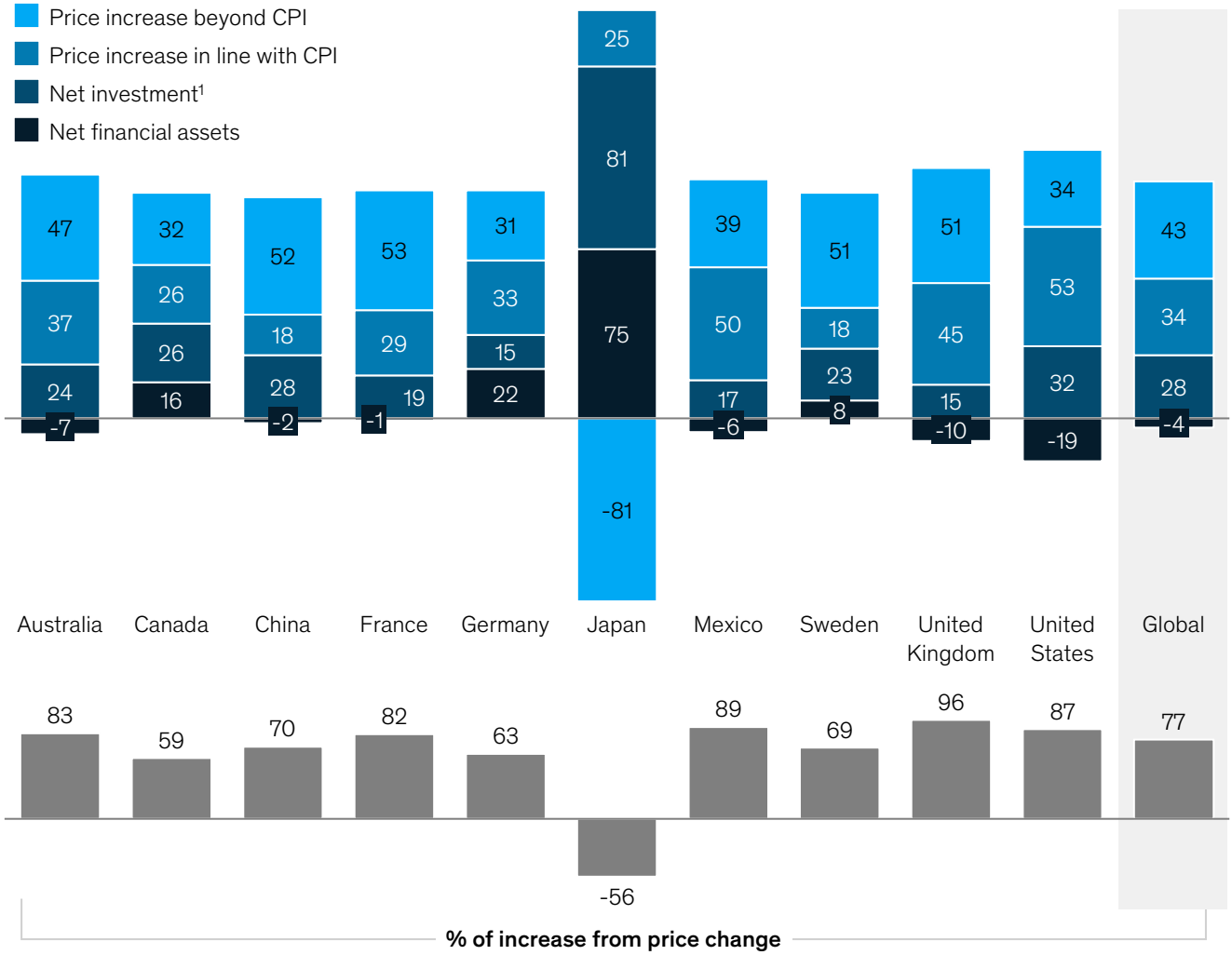
Higher asset prices accounted for about three-quarters of the growth in net worth between 2000 and 2020, while saving and investment made up only 28 percent

Net worth is a claim on future income, and historically, growth in net worth largely reflected investments of the sort that drive productivity and growth, plus general inflation. Net worth is increasingly driven by price growth beyond inflation, while net investment contributed only 28 percent to net worth expansion (Exhibit E8). Asset price increases thus made up 77 percent of net worth growth (negative net financial assets made up 4 percent), and more than half of those price effects were in excess of general inflation.

Exhibit E8

Price changes across countries account for 77 percent of net worth growth from 2000 to 2020.

% of net worth growth derived from price increases, net investment, and net financial assets, 2000–20



1. Net investment is calculated as the sum of nominal investment less depreciation from 2001 to 2020 (without adjusting for price effects).
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Mexico data start in 2003.
Source: CEIC; Federal Reserve Board; national statistics offices; IHS Markit; OECD; World Bank; McKinsey Global Institute analysis

Real asset valuations have grown over the past two decades as interest rates have fallen and operating returns have stagnated or declined

Real assets are critical to the global economy. Returns on those assets account for about one-quarter of GDP directly. Growth in real assets also complements labor in driving productivity, which in turn drives economic growth. As expected, our analysis shows a positive relationship between an increase in produced assets and capital returns on a per capita basis, as well as between produced assets per capita and labor productivity. Widely discussed differences in labor share of income across our sample countries also largely reflect differences in the value and portfolio mix of assets in each country.[17]

As asset valuations soared, valuation gains over and above inflation outstripped operating returns in several economies over certain time periods, creating a rationale for investors to prioritize the potential for asset price increases over real economic investment and improvement of operating assets (Exhibit E9).

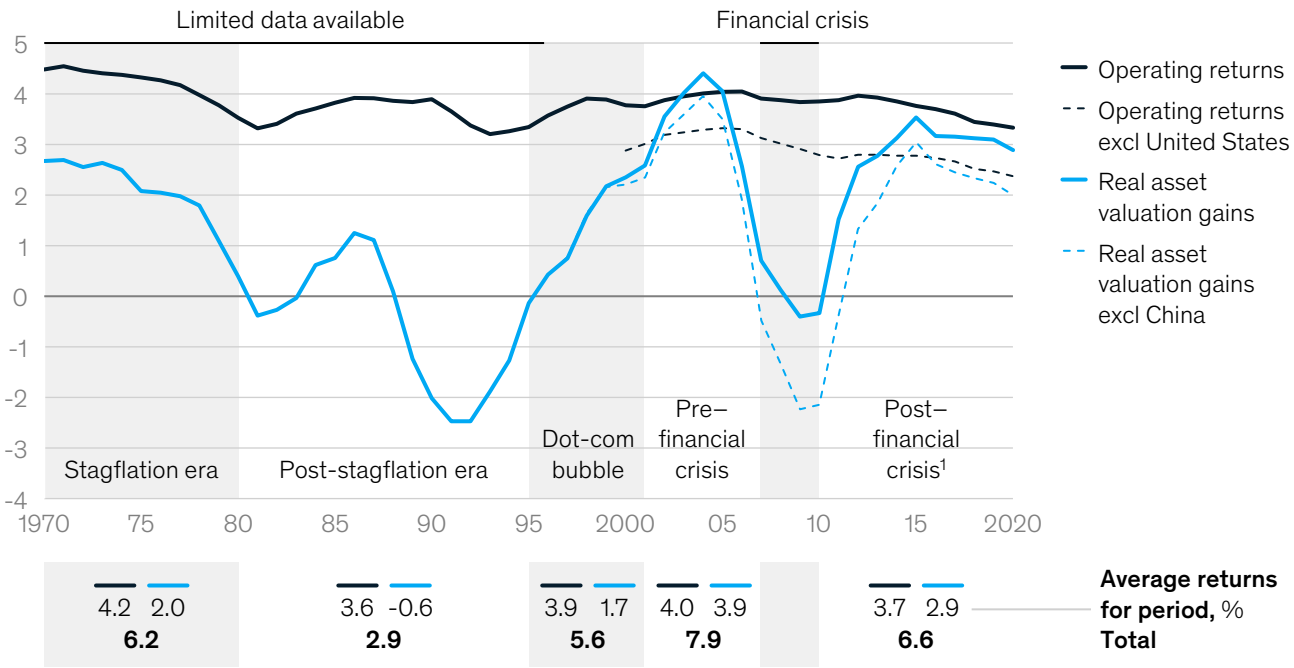
As part of this broader trend, the value of corporate assets and equity has diverged from GDP and from corporate profits over the past decade. Since 2011, total corporate real assets grew as a weighted average by 61 percentage points relative to GDP across the ten countries. Corporate liabilities increased even more. Liabilities linked to equity grew by 105 percentage points while debt liabilities grew by 27 percentage points. The corporate profits underpinning those values declined by one percentage point relative to GDP at the global level. This divergence points to declining capital productivity and returns.

[17] See also *A new look at the declining labor share of income in the United States*, McKinsey Global Institute, May 2019; "Understanding the downward trend in labor income shares," in *World Economic Outlook: Gaining Momentum?*, IMF, April 2017; and Loukas Karabarbounis and Brent Neiman, "The global decline of the labor share," *The Quarterly Journal of Economics*, February 2014, Volume 129, Issue 1.

Exhibit E9

After 2000, valuation gains approached operating returns.

Real asset operating returns and valuation gains post-inflation, 5-year rolling averages, %



1. These figures reflect the period 2010 to 2020. If this period had begun in 2008, average operating returns would have been 3.7% and average post-inflation valuation gains 1.9% (and total returns 5.6%).

Note: Data availability starting dates: United States, 1970; France, 1979; Japan, 1995; Sweden, United Kingdom, 1996; Australia, Canada, Germany, 1997; China, 2001; Mexico, 2004. Operational returns calculated as net operating surplus divided by produced assets and land.

The global average is an extrapolation derived from a weighted average of ten countries based on GDP.

Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Operating returns on produced assets vary significantly across the ten countries, from 3 to 4 percent in the European Union and Asian countries we analyze to 6 to 8 percent in Australia, Canada, the United Kingdom, and the United States, and 11 percent in Mexico. Asset portfolios and industry mix only partially explain these differences. For Australia and the United Kingdom, high land prices may skew some of the findings, as land is not typically counted as capital stock used in production even though rents associated with urban land often contribute to capital returns. The high yields in the United States and Canada, however, persist after adjusting for this. This raises questions about market and competitive conditions that foster or inhibit high returns and drive or hamper capital productivity.[18]

Declining interest rates and, notably, rental yields were central to increasing asset values

As net worth relative to GDP has grown in most countries since 2000, interest rates have fallen, particularly in the past decade. Indeed, our analysis found a strong inverse correlation between net worth relative to GDP and five-year rolling averages of nominal long-term interest rates after 2000 in all countries apart from China, Japan, and the United States. In the United States, this is at least in part because of the 2008 financial crisis, which muted real asset prices for a sustained period despite very low interest rates. Japan, meanwhile, had low interest rates throughout the period, leaving little room for further declines.[19] In China, by contrast, net worth grew materially relative to GDP, while interest rates did not see a significant decline over the past decade in the same manner as in our other countries.

3x

Average increase in home prices since 2000 in the ten sample countries

Real estate, which, as we have shown, represents two-thirds of net worth, illustrates the basis of valuation gains and their link to interest or discount rates. As home prices have risen, approximately tripling on average across the ten sample countries from 2000 to 2020 (with Japan as an outlier, as home prices there declined), the impact of higher rental income, including imputed rents on property owned outright, was outweighed by sharply decreasing rental yields. Rental yields are a proxy for capitalization rates used by the real estate industry to determine property values based on expected rental income streams.[20] Capitalization rates and, by extension, rental yields typically decline with declining interest rates as financing costs decrease, as well as with expected rent growth. Declining interest rates have hence played a decisive role in rising real estate prices. Additionally, inelastic land and real estate markets meant that changes in interest rates or rental yields drove up real estate prices rather than reducing rents.[21] A long-term view of some real estate markets suggests that valuations today are relatively high by historical standards (see Box E3, "Real estate prices seem elevated from a long-term historical perspective").

In the United Kingdom, lower rental yields, or higher value-to-rent multiples, accounted for 38 percent of the increase in real estate–related net worth, with rent increases explaining an additional 31 percent; 21 percent of the increase reflects the multiplicative impact or interaction effects of rents and yields rising at the same time. Only 9 percent of that increase was due to net capital investment in maintaining or growing the stock of buildings. A similar pattern holds true, with variation, across countries (Exhibit E10). Australia, Canada, France, and the United Kingdom had the highest growth in the value of household real estate relative to GDP.

[18] See *Getting tangible about intangibles: The future of growth and productivity?*, McKinsey Global Institute, June 2021.

[19] Japan's long-term interest rate in 2000 was 1.7 percent, according to the OECD. Other countries in 2000 had long-term interest rates of at least 5 percent.

[20] Rental yields are defined as rental income in a given year compared to the market value of a home (in other words, the rent-price ratio). Capitalization rates are defined as net operating income of a property divided by the property's market price. Capitalization rates are used to discount future rental income expectations and are a primary metric used by developers and investors to determine the price they are willing to pay for a property. Taking a similar approach, we use rental yields as effective discount rates on rent prices to understand home prices. See also Edward Glaeser and Joseph Gyourko, "The economic implications of housing supply," *The Journal of Economic Perspectives*, Winter 2018, Volume 32, Number 1; and Edward L. Glaeser, Joseph Gyourko, and Albert Saiz, "Housing supply and housing bubbles," *Journal of Urban Economics*, September 2008, Volume 64, Number 2, pp. 198-271.

[21] For further discussion of home price growth and broader economic implications, see John V. Duca, John Muellbauer, and Anthony Murphy, "What drives home price cycles? International experience and policy issues," *Journal of Economic Literature*, 2021, Volume 59, Number 3.

Box E3

Real estate prices seem elevated from a long-term historical perspective

According to data from Nobel laureate Robert Shiller, inflation-adjusted home prices in the United States over the past 130 years have mostly moved in line with goods price inflation. However, there were two exceptions to this: beginning in and immediately following World War II and beginning in the late 1990s and continuing through 2006.[1]

Home prices then fell sharply during and after the 2008 financial crisis but have since rebounded to their pre-crisis levels.

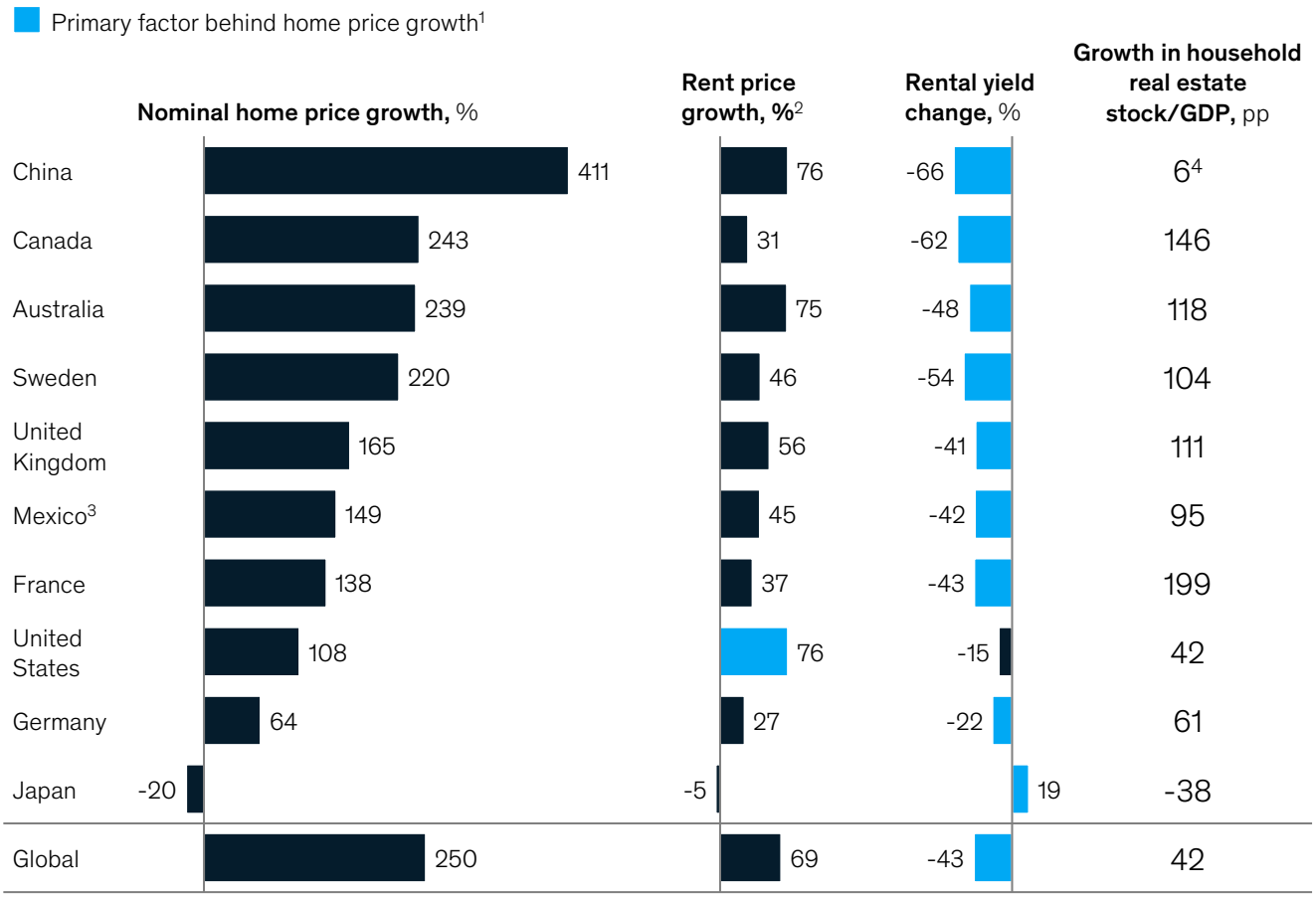
An even longer-term view of home prices focuses on the Herengracht canal in Amsterdam dating back more than three centuries to 1650.[2] There, too, home prices have largely moved in line with inflation over time, and rent prices have largely moved at the same pace as home prices. The Amsterdam data also show a notable increase in real home prices beginning in the 1990s through 2005 (when the data end). Real prices in 2005 were near their late-18th-century peak.

1 "Online data Robert Shiller," econ.yale.edu.
2 Piet M. A. Eichholtz, "A long run house price index: The Herengracht Index, 1638–1973," *Real Estate Economics*, 1997, Volume 25, Issue 2, pp. 175–92; and Brent Ambrose, Piet M. A. Eichholtz, and Thies Lindenthal, "House prices and fundamentals: 355 years of evidence," *Journal of Money, Credit and Banking*, 2012, Volume 45.

Exhibit E10

Rising home prices are a function of rent price growth and declining rental yields, with the latter shaping home prices in most countries.

Dynamics of real estate price and stock changes across countries, 2000–20



1. Home prices are a function of rental income and rental yields (which are a proxy for capitalization rates used by the real estate industry), wherein home prices are equal to rental income divided by rental yields. Specifically, the percent increase in nominal home prices is equal to the following formula: (% increase in rents – % increase in rental yields)/(1+ % increase in rental yields).
2. Rent prices reflect imputed rent of owner-occupied homes.
3. Mexico's data reflect the period 2005–20.
4. China's overall household real estate stock has grown only slightly faster than GDP, with a growth in GDP multiple of 6 percentage points from 2001 to 2020, even though nominal home prices have grown over 400 percent.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Of the net worth gains tied to real estate at the global level, some 55 percent derived from higher land prices, while 24 percent was attributable to higher construction costs. (The remaining 21 percent was a result of net investment—that is, construction of new homes or improvements to existing ones, less wear and tear.)

Nearly all net worth growth from 2000 to 2020 occurred in the household sector as a result of growing equity and real estate valuations

Household net worth grew from 4.2 times GDP in 2000 to 5.7 times GDP in 2020, growth that actually exceeded total net worth growth given net worth declines in the nonfinancial corporate sector, particularly in the United States. Half of household net worth growth in this time frame came from rising equity values, which were most prominent in China, Sweden, and the United States (growth in GDP multiples of 1.7, 1.0, and 0.8, respectively). An additional 40 percent of household net worth growth relates to rising housing values (Australia, Canada, France, Sweden, and the United Kingdom all saw growth in excess of a full GDP multiple). Household net worth also grew as a result of rising deposits that filtered through to them on the back of money creation and stimulus measures (most pronounced in China and Japan, where deposit assets grew by more than 0.5 times GDP). Debt in the household sector kept comparatively steady relative to GDP at the global level, up by 0.2 times GDP, but grew by 0.6 times GDP in China, albeit from very low levels.

At the global level, government net worth did not change much, by less than 0.1 times GDP, although this masks a wide range across countries—from a growth of 0.7 times GDP in China to a decline of 0.7 times GDP in the United Kingdom. Government debt expanded throughout relative to GDP, from 0.2 times GDP in Germany to 1.2 times GDP in Japan. Some governments also saw growth in financial assets, such as equity of state-owned enterprises in China, and real assets, especially in Australia (minerals) and France (buildings and land).

Nonfinancial corporations saw equity liabilities grow at the global level by 0.3 times GDP more than the increase in the real assets backing those equities, particularly in Canada, Japan, and the United States, where equity growth was more than five times larger than real asset growth. Real assets in nonfinancial corporations grew by more than a full GDP multiple in China (particularly in inventories including construction work in progress), France and Sweden (particularly corporate land valuation increases), and Mexico (particularly in commercial buildings and machinery and equipment). China saw the most significant growth in net debt liabilities, with a change in GDP multiple of 0.7.[22] At the other end of the spectrum, Japan's nonfinancial corporations reduced debt relative to GDP.

Financial corporations had minimal change (and near-zero levels) of net worth. Balance sheets, however, grew by roughly two GDP multiples, nearly half of which came from growth in debt assets (mirroring growth in debt liabilities spread across other sectors, and including debt acquired by central banks in asset-purchasing programs). The remainder came from equity and currency and deposit assets, including those from within the financial sector. On the liability side of the balance sheet, nearly all the growth came from currency and deposit liabilities, and some equity growth. The United Kingdom, which had the largest financial corporation balance sheet relative to GDP in our sample in 2020, also saw the greatest growth over the past two decades, by more than 5.5 multiples of GDP.

[22] Subtracting debt assets to account for intrasector holdings.

Financial assets and liabilities also grew faster than GDP, mirroring the growth of real asset values and vastly exceeding net investment

From 2000 to 2020, total financial assets grew from 8.5 to 12 times GDP, with growth taking place within and outside of the financial sector. Within the financial sector, financial assets grew from 4.4 times GDP in 2000 to six times GDP in 2020. Currency and deposit liabilities within the financial sector, including central banks and commercial banks, in particular saw substantial growth of 96 percentage points. Central bank balance sheets, which are included in the financial sector and reflect many (but not all) of these currency liabilities, expanded collectively from 0.1 times GDP in 2000 to 0.5 times in 2020. Over the same period, central banks in Japan, France, and Germany increased their balance sheets, by 1.2 times GDP, 0.7 times, and 0.6 times, respectively. More than 40 percent of the global increase in financial assets and liabilities relative to GDP between 2000 and 2020 (and about 10 percent of the increase in US dollar terms) occurred from 2019 to 2020 during the COVID-19 pandemic.[23]

Outside of the financial sector, financial assets such as bank deposits, corporate bonds and equity assets, and pensions grew from 4.2 times GDP in 2000 to six times GDP in 2020. Over the same period, debt-to-GDP ratios outside the financial sector grew by 79 percentage points, with substantial variance across the ten countries. (In the total economy, debt-to-GDP ratios increased by 77 percentage points over this period.) This growth in financial assets (and liabilities) outside the financial sector mirrored a similar increase in real asset values.

However, new debt and other liabilities greatly exceeded net investment. Between 2000 and 2020, almost $2 in debt, or about $4 in total liabilities including debt, was created for each $1 in net new investment—and that does not include the balance sheet of financial corporations (Exhibit E11). The country variations were wide, with the amount of debt created for each $1 in net new investment ranging from just over $1 in China to nearly $5 in the United Kingdom. This raises questions about capital allocation and purposeful creation of debt, as well as the sustainability of rising debt in the event of a mean reversion in asset prices.

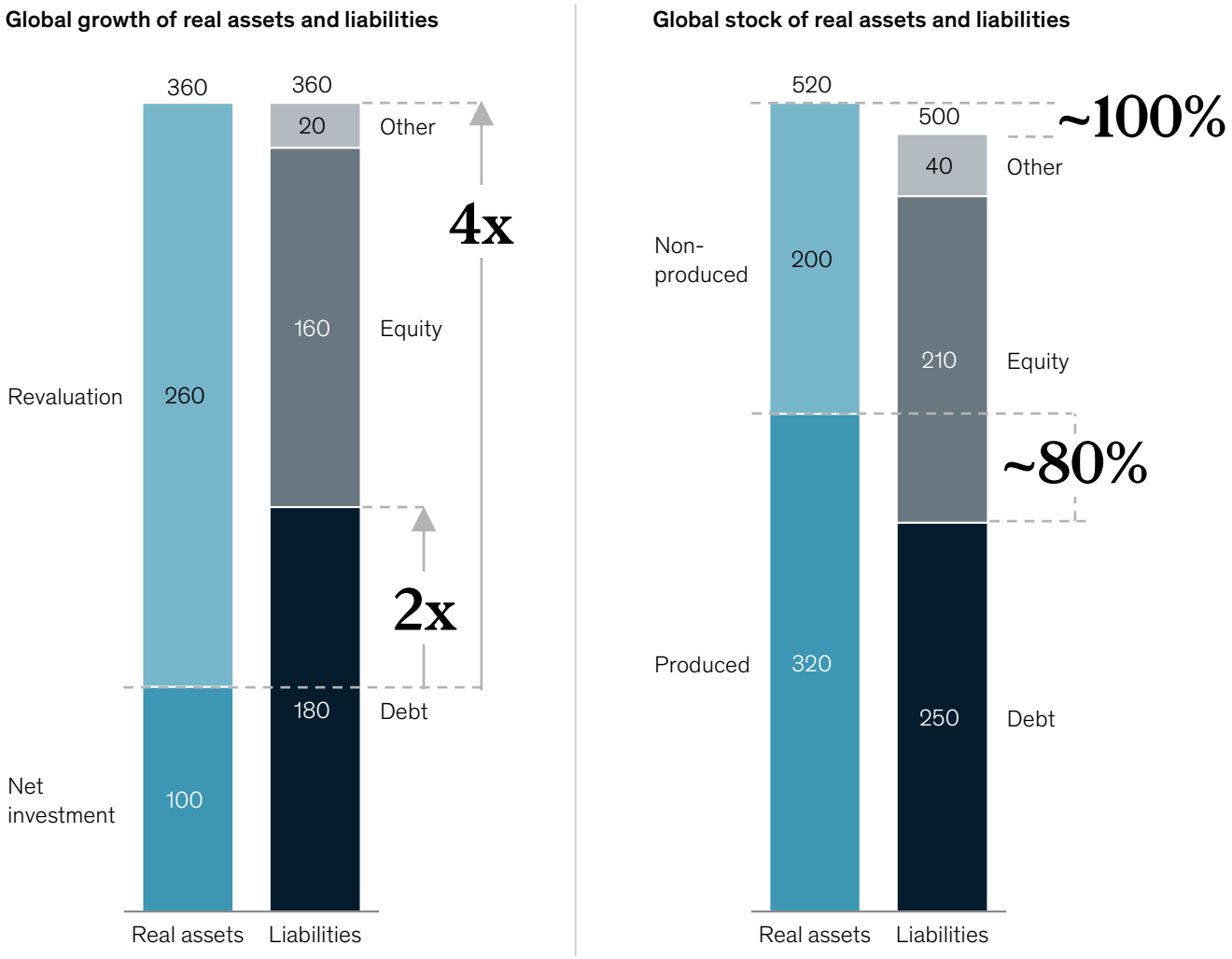
For each $1 of new investment, almost $2 in debt, or about $4 in total liabilities including debt, were created between 2000 and 2020.

[23] Central bank data are sourced primarily from the OECD, with supplemental data directly from the central banks in several cases. This includes data for all years from Australia, China, and the United Kingdom, and for 2020 from Canada, France, Germany, and Japan.

Exhibit E11

From 2000 to 2020, almost $2 of debt and $4 of liabilities were created for every $1 of net investment.

Global growth and stock of real assets and liabilities, excluding financial sector, nonconsolidated data, 2000–20, $ trillion



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

While this research cannot provide an answer to debt sustainability questions, it complements well-established metrics such as debt-to-GDP ratios with comparisons of liabilities to assets. For instance, while debt-to-GDP ratios are similar in countries like China, France, and the United Kingdom, loan-to-value ratios, which we define as debt relative to produced assets, vary markedly across these three countries, from 57 percent in China to 98 percent in France to 138 percent in the United Kingdom. Loan-to-value ratios are particularly high in the government sector, with debt often several factors higher than underlying public assets. Despite rising debt, the cost of debt has sharply declined relative to GDP thanks to declining interest rates.[24]

[24] See Olivier Blanchard, "Public debt and low interest rates," *American Economic Review*, April 2019, Volume 109, Number 4.

Several scenarios are possible, with an imperative to deploy wealth more productively for critical investment needs

There are different ways to interpret the vast expansion of balance sheets and net worth relative to GDP. It could mark an economic paradigm shift, or it could precede a reversion to the historical mean, softly or abruptly. Aiming at a soft rebalancing via faster GDP growth might well be the safest and most desirable option. To achieve that, redirecting capital to more productive and sustainable uses seems to be the economic imperative of our time, not only to support growth and the environment but also to protect our wealth and financial systems.

In the first view, an economic paradigm shift has occurred that makes our societies wealthier than in the past relative to GDP. In this view, several global trends including aging populations, a high propensity to save among those at the upper end of the income spectrum, and the shift to greater investment in intangibles that lose their private value rapidly are potential game changers that affect the savings-investment balance.[25] These together could lead to sustainably lower interest rates and stable expectations for the future, thereby supporting higher valuations than in the past.[26] While there was no clear discernible upward trend of net worth relative to GDP at global level prior to 2000, cross-country variation was always large, suggesting that substantially different levels are possible. High equity valuations, specifically, could be justified by attributing more value to intangible assets, for instance, if corporations can capture the value of their intangibles investments more enduringly than the depreciation rates that economists assume. Rapidly rising levels of debt, in this view, would be supported by higher asset values and low costs of debt, thus not representing a problem.

In the opposing view, this long period of divergence might be ending, and high asset prices could eventually revert to their long-term relationship relative to GDP, as they have in the past. Increased investment in the postpandemic recovery, in the digital economy, or in sustainability might alter the savings-investment dynamic and put pressure on the unusually low interest rates currently in place around the world, for example. This would lead to a material decline in real estate values that have underpinned the growth in global net worth for the past two decades. At current loan-to-value ratios, lower asset values would mean that a high share of household and corporate debt will exceed the value of underlying assets, threatening the repayment capacity of borrowers and straining financial systems. We estimate that net worth relative to GDP could decline by as much as one-third if the relationship between wealth and income returned to its average during the three decades prior to 2000. Assessing scenarios including this reversion of net worth to GDP, a reversion of land prices and rental yields to 2000 levels, and a scenario in which construction prices moved in line with GDP since 2000, we find that net worth to GDP by country would decline by between 15 and 50 percent across the ten focus countries.

Not only is the sustainability of the expanded balance sheet in question; so too is its desirability, given some of the drivers and potential consequences of the expansion. For example, is it healthy for the economy that high house prices rather than investment in productive assets are the engine of growth, and that wealth is mostly built from price increases on existing wealth?

Decision makers could hence work to stabilize and reduce the size of the balance sheet relative to GDP by growing nominal GDP. To do so, they would need to redirect capital to new, productive investment in real assets and innovations that accelerate economic growth.

For business leaders, this would mean identifying new growth opportunities and ways to continuously raise the productivity of their workforce with capital investment that complements rather than displaces their employees. Many corporations have excess liquidity that they could deploy. Sustainability investments, for instance, could turn from a cost to a growth opportunity if framework conditions such as higher carbon pricing were put in place

[25] Atif Mian, Ludwig Straub, and Amir Sufi, "What explains the decline in r*? Rising income inequality versus demographic shifts," presented at the 2021 Jackson Hole Economic Symposium, Federal Reserve Bank of Kansas City, August 2021.

[26] See also Adrien Auclert et al., *Demographics, wealth, and global imbalances in the twenty-first century*, National Bureau of Economic Research, working paper number 29161, August 2021.

that require higher investment yet keep a level playing field between competitors. Could changes to the way intangibles are accounted for on corporate balance sheets result in higher investment? And how should business leaders think about providing new stores of value, justifying equity valuations and building household wealth?

Leaders of financial institutions could seek to develop financing mechanisms aimed at deploying capital to new growth opportunities while limiting debt creation for asset transactions at ever-rising prices. Also, the global balance sheet is directly reflected on their own balance sheets. Beyond risk assessments, what do the trends of the past 20 years and scenarios ahead mean for their balance sheets and revenue growth? How might they contribute to the evolution of the global balance sheet, and what does it mean for responsible banking?

For policy makers, rebalancing would require removing barriers to investment in glaring gaps in the economy such as sustainability and affordable housing.[27] Tools already exist to achieve this, such as reforming zoning regulations that make real estate scarce; tax levers that alter the taxation of capital and property gains relative to income; and getting more serious about carbon pricing and regulation. Likewise, as financial regulators, they can affect debt levels by changing standards or maximum loan-to-value ratios for the provision of loans or revisiting the tax advantages of debt. Policy makers can also aim to increase their own buildup of productive assets and net worth, starting with better measurement.

A broader question is how to reorient institutional frameworks. Decision makers could develop new metrics decoupled from transaction prices of small volumes of traded assets to measure wealth. The framework governing competition in an era of intangibles and their role in storing wealth could evolve. Pension systems and savings may require new structures to accommodate wealth that has historically grown sustainably only in tandem with GDP yet is now elevated. It could mean adjusting the rules governing financial systems and institutions if savings and investment make up less than one-third of growth in real assets, and most balance sheet growth is linked to rising asset prices.

For business leaders, financial institution leaders, policy makers, and households alike, this research offers a new way of assessing the macroeconomic context in which they are operating and living. It offers a platform for developing scenarios for the future and finding ways to hedge against risks and capture benefits should balance sheets be rebalanced and the economic environment change as a result. And it suggests the importance of working toward a rebalancing by growing GDP and redirecting capital rather than risking a mean reversion in asset prices.

This report lays the groundwork for further research in which we expect to address some of these questions, and we invite comments and insights.

The global economy over the past two decades has been marked by rapid technological change, as digitization has taken hold across sectors and businesses have ramped up investment in intangible assets. While emerging economies have experienced strong growth spurts, that is not the case for many advanced economies, for whom the 21st century—even before the COVID-19 pandemic—has been a tale of financial crises and uneven recovery, forcing central banks to expand their balance sheets in an unprecedented way, and of extremely low interest rates and inflation by historical standards. Given these conditions, how healthy and resilient is the global economy today as we prepare for another recovery? The balance sheet view we adopt in this report raises important questions about economic priorities, investment, long-term stores of value, and future prosperity.

[27] See Edward Glaeser and Joseph Gyourko, "The economic implications of housing supply," *The Journal of Economic Perspectives*, Winter 2018, Volume 32, Number 1; and Dag Detter, "How cities can lead the way in bridging the global housing gap," World Economic Forum, June 2018.

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1. A tripling of the global balance sheet

Taking a balance sheet perspective allows us to apply standard metrics of corporate finance—such as returns on assets and loan-to-value ratios—to countries, providing fresh insights into their economic well-being. A balance sheet view also sheds light on a nation's mix of financial and real assets like factory equipment and hardware, comparing them to its liabilities to provide a portrait of its wealth and economic resilience.

In this chapter, we lay out the principles underpinning the construction of national balance sheets and their size and composition in ten countries, which account for more than 60 percent of global GDP: Australia, Canada, China, France, Germany, Japan, Mexico, Sweden, the United Kingdom, and the United States. These countries represent varying levels of economic development and different demographics, resource endowments, financial and pension system structures, and trade balances. They provide a sample for comparison, illuminating how structural differences and choices affect balance sheet composition and resilience.

We then assess each country's wealth by weighing its assets against its liabilities to determine its net worth. Net worth is a store of value for savers and a claim on future prosperity. Examining a nation's net worth enables better understanding of how trends such as low or declining interest rates, land price appreciation, and the increasing role of finance may affect wealth. It also provides insight into the strength and resilience of the balance sheets of the countries we have studied and the global economy at large.

Assets on the world's balance sheet in 2020 totaled $1,540 trillion, or 18.1 times GDP, up from 13.2 times GDP in 2000

The balance sheet of the ten focus countries comprised total assets equivalent to 18 times GDP in 2020. Extrapolating that multiple to the global economy brings total assets on the global balance sheet to $1,540 trillion (Exhibit 1). These assets fell almost equally into three categories in 2020. Real assets like buildings and machinery totaled $520 trillion. Financial assets controlled by households, corporations, and governments amounted to $510 trillion, the same total as financial assets residing in the financial sector of $510 trillion. The balance sheet at the global level has three interlocking components that mirror one another in some ways: a real economy balance sheet, a financial balance sheet outside the financial sector, and a financial sector balance sheet (see Box 1, "Spotlight on three interlocking components of the global balance sheet").

On the liability side of the global balance sheet, debt and other financial liabilities of 6.1 times GDP in the financial sector and 5.9 times GDP in the nonfinancial sector in 2020 are a mirror image of financial assets.

Net worth, or the sum of all assets minus all liabilities, stood at $510 trillion, or 6.1 times GDP. This is roughly equivalent to the value of real assets ($520 trillion); the small difference is the result of a slightly negative net financial position in the ten countries of less than 0.1 times GDP, meaning that these countries collectively borrow from the rest of the world by this amount. The net worth figure is especially relevant for our research. As we discuss in the following chapters, its growth over the past two decades has far outstripped GDP growth. While this is not unprecedented at a country level, it is a historical anomaly at the global level.[28]

[28] Other periods during which net worth diverged from GDP growth include the late 1970s to early 1980s, when construction prices in the United States expanded rapidly (relative to general inflation) and, at the end of that decade, Japan's asset bubble followed by its "lost decade." For greater historical context in the United States and globally, see Robert Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015.

Exhibit 1

Each of the three components of the global balance sheet amounted to about $500 trillion in 2020, or six times GDP.

Size of balance sheet
$ trillion

	Real assets		Liabilities and net worth	
1 The financial sector	*Financial assets held by financial corporations*	510	*Liabilities held by financial corporations*	520
2 The financial system	*Financial assets held by households, governments, and nonfinancial corporations*	510	*Liabilities held by households, governments, and nonfinancial corporations*	500
3 The real economy	*Nonfinancial assets*	520	*Net worth*	510

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Box 1

Spotlight on three interlocking components of the global balance sheet

The global balance sheet has three interlocking components that illustrate the functions of the financial system and the way wealth is accumulated and distributed. These three components are the real economy balance sheet, the financial balance sheet outside the financial sector, and the financial sector balance sheet (Exhibit 2). In many ways, these three parts are different reflections of the same global economy that mirror one another.

The real economy balance sheet is where savers and investors accumulate real assets and thus wealth. This balance sheet consists of real assets like housing, industrial facilities, and minerals, which represent the wealth or net worth of an economy. In a world without finance, real assets and wealth are identical—for example, someone accumulates wealth by building a house.

Financial assets and liabilities held outside the financial sector enable ownership and the transfer of risk related to real assets. For instance, a mortgage will allow a family to buy a house, and the related wealth stays with the seller in the form of a financial asset like a cash deposit associated with the mortgage (Exhibit 3). Financial assets and liabilities also allow smoothing or time shifting of consumption and savings, for example through a student loan. All financial assets and liabilities are created in matching pairs and net out at the global level. While they often reflect real assets, they do not need to. For example, they could be much larger, as is the case with consumer loans, or smaller, as with real assets that are not financed.

The financial sector creates money and intermediates between ultimate savers and final investors (in real assets), based in the nonfinancial sectors.[1] This involves pooling of savings, pooling of risks, and maturity transformation—that is, converting short-term liabilities (such as deposits) to long-term assets (such as mortgages). A bank may create money by forming two matching pairs of assets and liabilities, for example, creating a mortgage liability for a home buyer that is an asset for the bank, while crediting the seller with an equivalent deposit asset that is a liability for the bank. In the mortgage example, the cash deposit is low risk, can be split into small denominations, and is fully liquid, while the mortgage is illiquid, is higher risk, and typically involves larger-sized exposure. Financial institutions' balance sheets must balance via double-entry bookkeeping. However, their financial assets do not perfectly equal their liabilities, because banks hold small amounts of real assets such as IT systems and real estate, too.

For another example, consider the interplay of the three components when a company issues equity to finance investment in new equipment. An investment bank in the financial sector underwrites a sale of company equity, enabling a transfer of currency and deposit assets from households to the company. In this process, the new equity becomes an asset for households and at the same time represents a liability for the company, which at least theoretically is expected to redeem the equity at some point.

The company then uses cash from its sale of equity to pay workers producing the equipment, moving currency and deposit assets back to the household sector.[2] The company has a new piece of equipment on its balance sheet, while households (at the total sector level) have the same level of cash they started with before they bought its equity, plus the equity asset. This equity asset translates to net worth held by households, which is equal in value to the new equipment produced. Ultimately, the company has a new real asset (the equipment), balanced by the new liability (equity); households have a new financial asset (equity), balanced by new net worth; and the financial sector has no new assets or liabilities because the investment bank served as an intermediator, enabling transactions (Exhibit 4).[3]

All three balance sheets provide a snapshot-in-time view of levels of assets and liabilities, and the picture changes from year to year. Line items on the balance sheet decline in value as a result of depreciation and amortization as capital assets are consumed, become obsolete, or are retired, and as financial assets and liabilities are written down, repaid, or extinguished. Line items increase in value with new capital investment and new financial issuance as well as revaluation due to rising (or falling) prices.

The interplay of the three balance sheets propels the world's economy and fosters the accumulation of wealth. Real assets, also referred to as capital, are an input to production, which in turn generates income and allows for consumption and greater investment. Investment in real assets in many cases would not be possible without the support of financing and a functioning financial sector. The nearly equal size of the three balance sheets is a more recent phenomenon, however; historically, the real economy balance sheet was much larger than financial assets in and out of the financial sector. The balance between real and financial assets and liabilities thus appears to have shifted, even though the fundamental relationships between the balance sheets remain constant.

1 The financial sector also has intrasector transactions, such as interbank lending.
2 For simplicity, we are assuming that the only input to producing the new equipment is labor, and that all cash raised from the equity issuance is paid out to workers.
3 In practice, banks would also earn revenue from services provided. For simplicity, we have not reflected this here.

Exhibit 2

The global balance sheet can be interpreted as three interlocking balance sheets of about $500 trillion each.

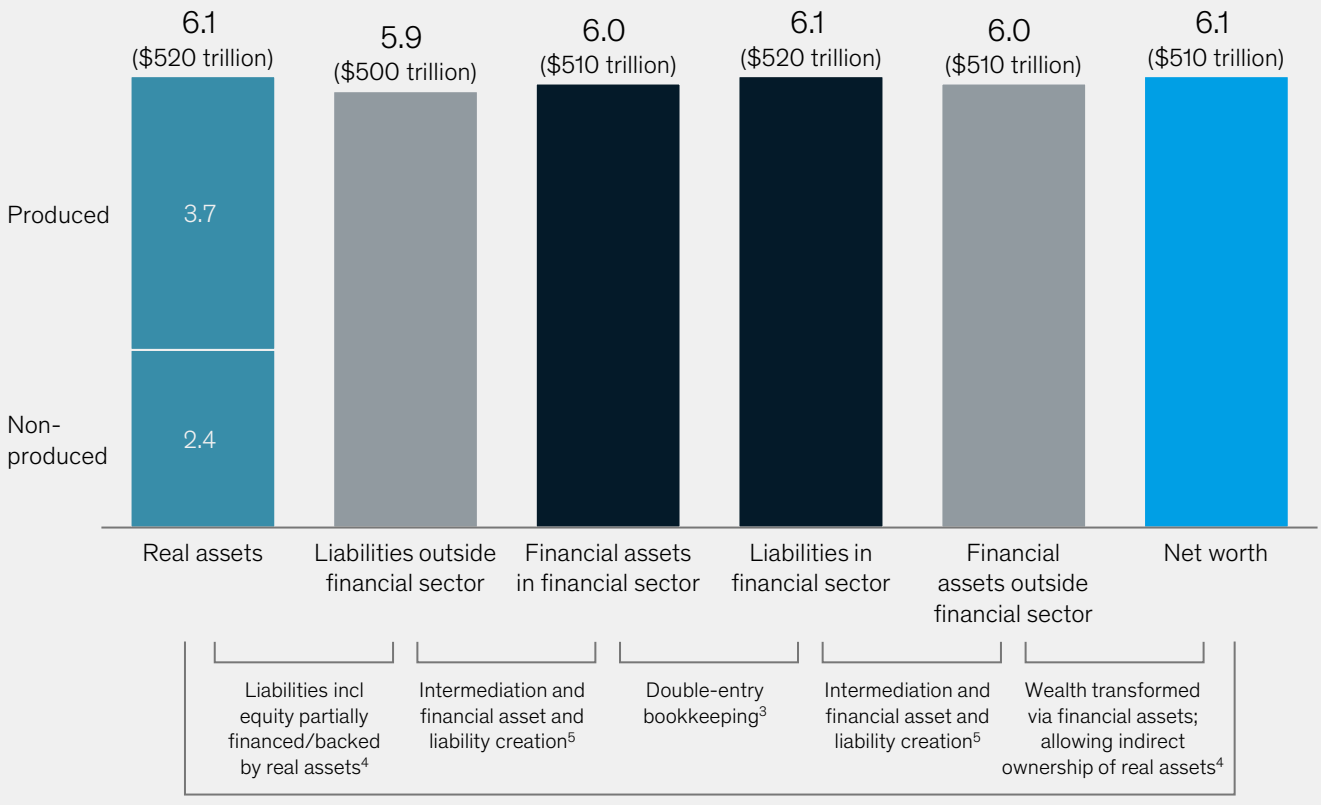
Balance sheet components, 2020, GDP multiple

Simplified

The real economy balance sheet, where savers and investors accumulate real assets and thus wealth. In a world without finance, real assets and wealth are identical—for example, someone accumulates wealth by building a house.[1]

The financial balance sheet outside the financial sector, which incorporates financial assets and liabilities of households, governments, and nonfinancial corporations. These assets and liabilities enable ownership and the transfer of risk related to real assets and allow smoothing or time shifting of consumption and savings.[2] All financial assets and liabilities are created in pairs and net out at the global level.

The financial sector balance sheet, which reflects intermediation activities of the financial sector between ultimate savers and final investors (in real assets), based in the nonfinancial sectors. Financial institutions' balance sheets must balance via double-entry bookkeeping.[3]



Wealth ultimately transformed into real assets (directly or via corporate equity ownership); real assets serve as store of wealth[5]

1. Globally, assets equal liabilities (and net worth) within each of the three levels shown; small deviations are due to the collective rest-of-world position across the ten countries in our sample.
2. Consumption smoothing refers to saving and borrowing to maintain an even level of consumption over time.
3. Financial sector double-entry bookkeeping includes real assets; for that reason, as well as due to asymmetric valuation changes on assets and liabilities, liabilities are not perfectly equal to financial assets.
4. Not all real assets have a financial liability against them (eg, house without a mortgage), and not all liabilities are asset backed (eg, student loans). Historically, liabilities have been much smaller than real assets.
5. Not all financial flows are intermediated by the financial sector (eg, direct equity ownership), and there are financial assets and liabilities only within the financial sector.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

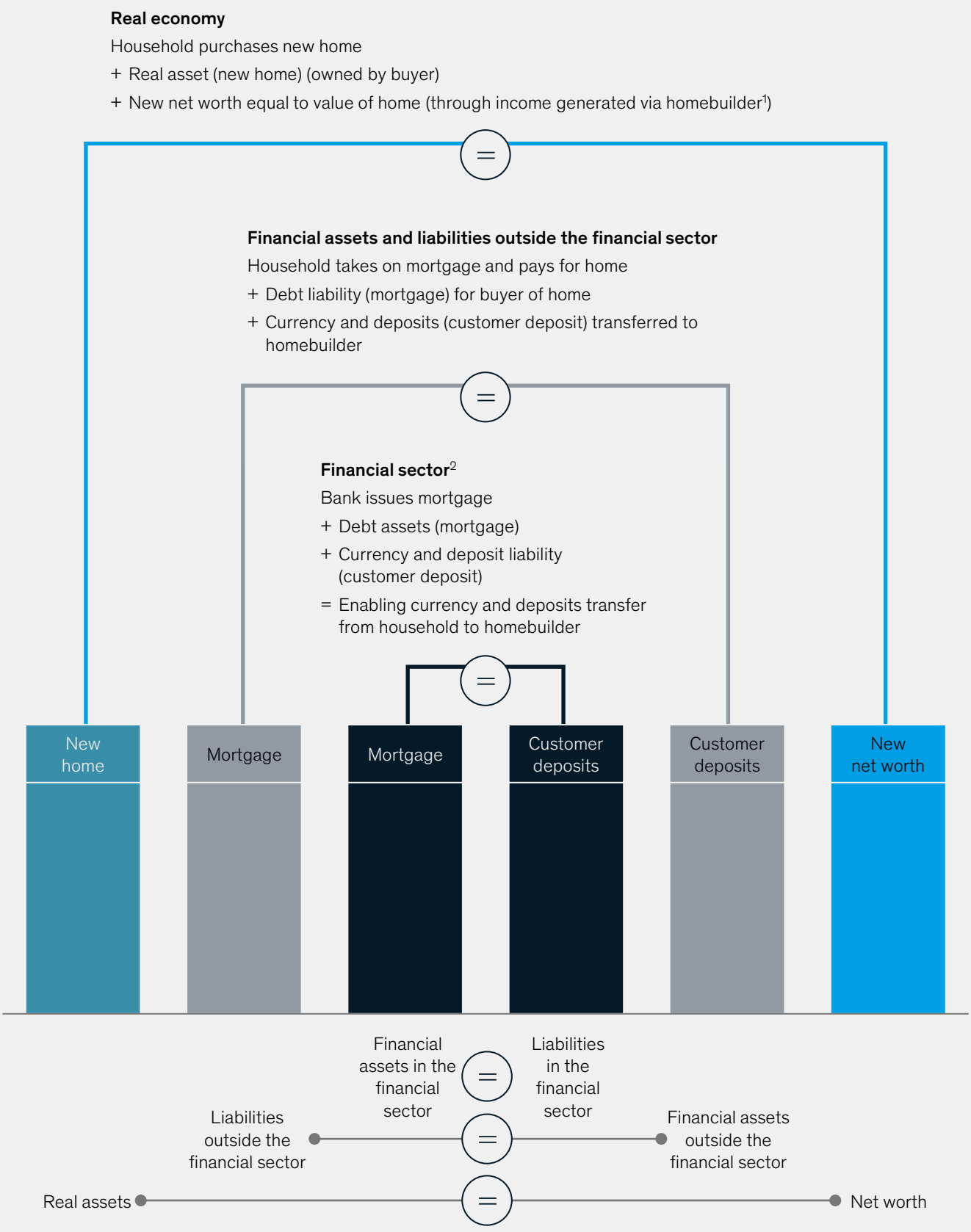
Exhibit 3

Balance sheets grow with creation of asset-liabilities pairs.

Mortgage example

Worked example: Bank issues mortgage to household to purchase a new home

Simplified



1. From there, cascading through the economy via profits and wages for workers, resulting in consumption and savings, and ultimately accruing to savers.
2. In practice, banks would also earn revenues from services provided. For simplicity, we have not reflected this here.

Source: McKinsey Global Institute analysis

Exhibit 4

Balance sheets grow with creation of asset-liabilities pairs.

Corporate investment example

Worked example: Nonfinancial company issues equity to fund investment in equipment

Simplified

Real economy

Company invests in new equipment

+ Company produces new equipment financed by cash raised by equity issuance, resulting in new produced asset on balance sheet
+ New net worth equal to value of equipment on balance sheet of households holding the equity[1]

=

Financial assets and liabilities outside the financial sector

Growth of equity

+ Equity assets and liabilities created through equity issuance of company
= Equity asset transferred to households, household deposits transferred to company

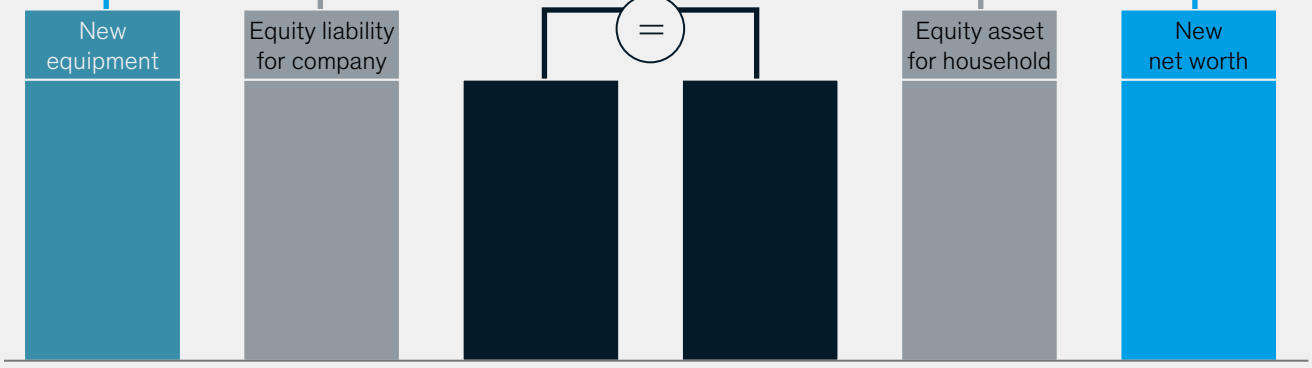
=

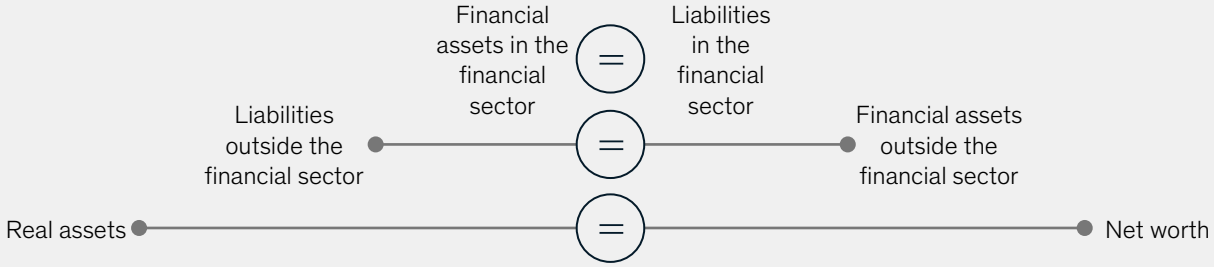
Financial sector[2]

Intermediates in transactions

= Underwriting sale of company stock (no impact on balance sheet)
= Enabling currency and deposits transfer from household to company accounts, and from company to households (in the form of wages to workers)

=





1. For simplicity, this example assumes the only cost of production is labor. The company pays workers the amount raised via equity, returning cash to the household sector. The household sector then has a positive financial asset balance from the equity that was purchased, translating to net worth for the household sector equal to the value of the new equipment on the company balance sheet.
2. In practice, banks would also earn revenues from services provided. For simplicity, we have not reflected this here.

Source: McKinsey Global Institute analysis

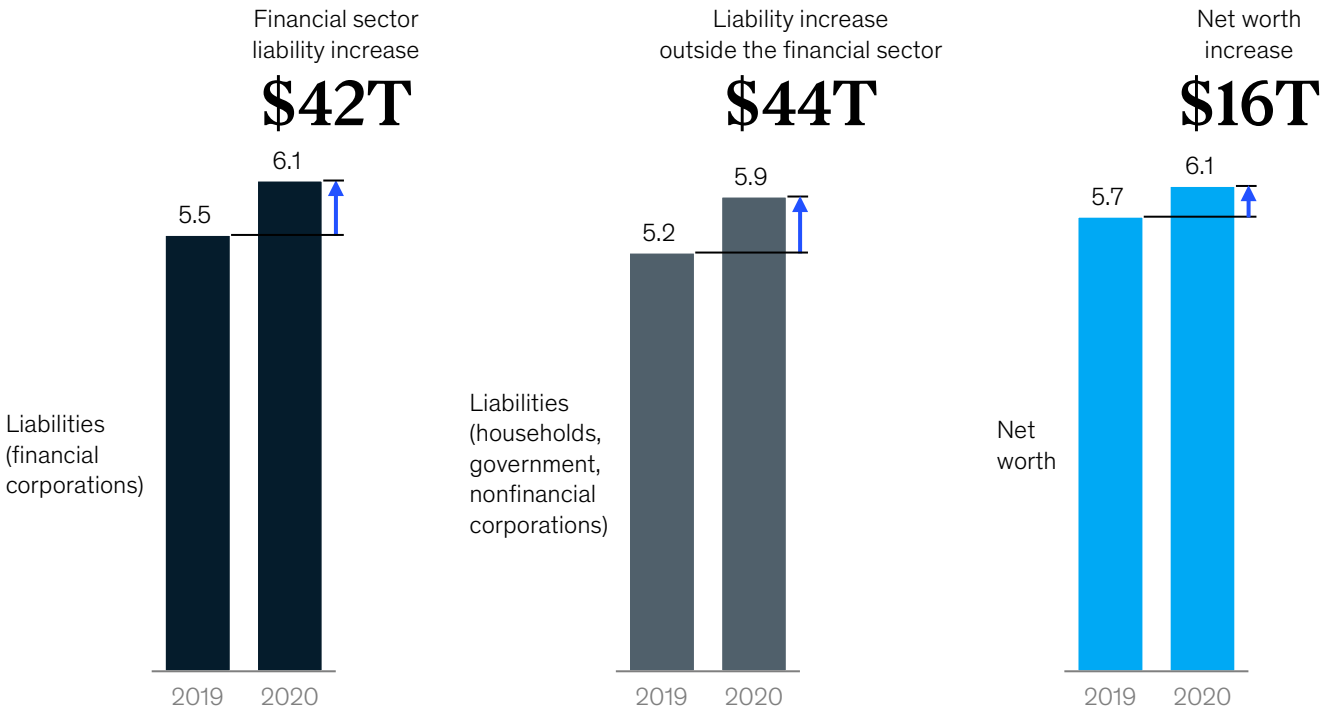
The balance sheet grew during the pandemic in 2020 as asset prices rose and governments around the world increased borrowing to protect their economies

The global balance sheet in 2020 was significantly larger than in 2000, when each of the three balance sheet components stood at around 4 times GDP. Its growth continued during the COVID-19 pandemic in 2020 (Exhibit 5). We estimate that each of the financial components of the balance sheets grew between $40 trillion and $45 trillion, while net worth grew by $16 trillion, from the end of 2019 through 2020. Real assets closely mirrored the expansion of net worth, growing by about $18 trillion. Balance sheet expansion was mostly financial and occurred as countries took on debt, equity valuations grew, and currency and deposits expanded. As GDP declined or barely grew across all countries, the GDP multiple growth for the global balance sheet and net worth was substantial compared to prior years. This created the appearance of an acceleration in balance sheet growth.

Exhibit 5

The global balance sheet grew by more than $40 trillion in both financial components in 2020, but by less than $20 trillion in net worth

Liabilities and net worth side of the global balance sheet, 2019 and 2020, GDP multiple



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

The balance sheet includes real assets like real estate as well as financial assets like equities and public and corporate bonds, all valued at market prices

The asset side of an economy's balance sheet is an inventory of all financial and real assets owned by its households, governments, corporations, and financial firms (Exhibit 6).[29] Real assets are both produced and nonproduced assets. Produced assets include machinery, houses and hospitals, highways and sewer systems, intellectual property, and inventory on warehouse shelves. Nonproduced assets consist primarily of land and minerals. Financial assets—which are mirrored by financial liabilities on the other side of the balance sheet—include debt, equity, currency and deposits (or cash), pensions, and other financial instruments.[30]

Under the international framework for national accounts, the 2008 System of National Accounts, all assets and liabilities are valued at current market prices on national balance sheets. Different methods are used to estimate market values (Exhibit 7). For real estate, for example, home price indexes are often used to establish the value of residential real estate. Buildings are valued using a perpetual inventory method that accumulates investments, depreciates them, and adjusts them to reflect current construction costs; land values are the residual. Intellectual property such as R&D and software is also valued using perpetual inventory methods, with very high amortization rates to reflect rapid loss of value due to competition and obsolescence.

In practice, there are a number of sensitivities and constraints in the methods used to derive the scope and valuation of balance sheet items. While depreciation rates have a strong impact on asset values and on the split of value between land and buildings, rates vary by country and are often high. The equity of unlisted corporations will, in practice, often be valued at book and may be undercounted. Public-sector assets are often undercounted, depending on the quality of information underpinning estimates.[31] Additionally, the System of National Accounts excludes human capital, natural capital, and consumer durables from its scope of assets.

See the technical appendix for full details of valuation methodologies and Box 2, "Our sources and methodologies for this research," for an overview of sources used and estimations applied.

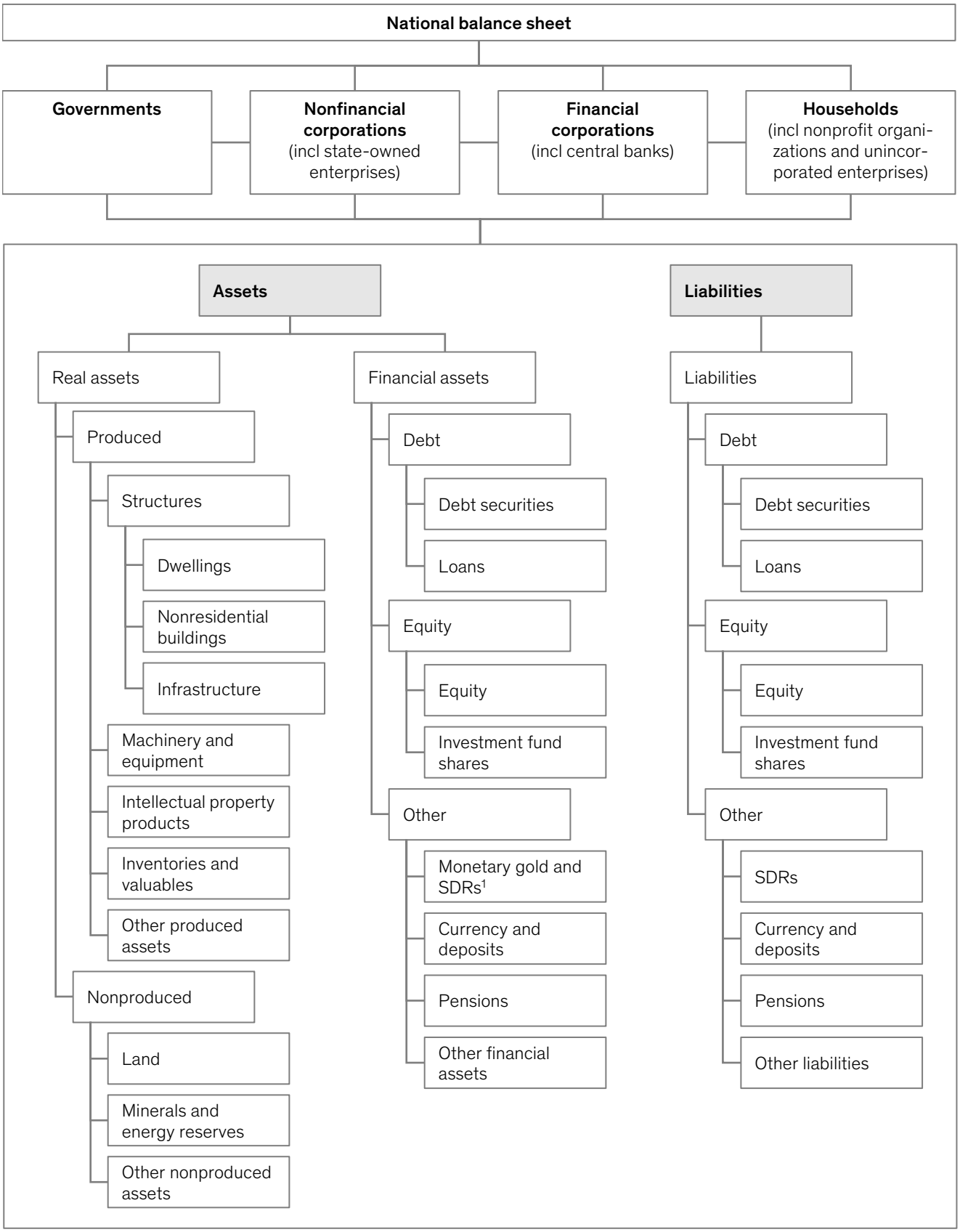
[29] This research aligns sectors with the 2008 System of National Accounts, which groups nonprofits and unincorporated enterprises in households, most state-owned enterprises in the corporate sector, and central banks in the financial sector.

[30] Pensions, not including pay-as-you-go systems, are considered a form of financial assets and liabilities in the 2008 System of National Accounts, even though funded pensions with defined contributions are often baskets of stocks, fixed income securities, property, and cash, among other financial assets.

[31] Most governments use cash accounting rather than accrual accounting and, as a result, balance sheet assets are based on statistical estimates. For further information, see Ian Ball and Gary Pflugrath, "Government accounting: Making Enron look good," *World Economics Journal*, March 2012, Volume 13, Number 1.

Exhibit 6

National balance sheets incorporate the balance sheets of four sectors, valued at market prices.



1. SDR = Special drawing rights, an international reserve asset created by the IMF to supplement official reserves.

Note: Intellectual property products include R&D spending, mineral exploration and evaluation, computer software and databases, and original artworks. Inventories and valuables include precious metals and cryptocurrencies. Other nonproduced assets include other natural resources as well as intangible assets such as goodwill, contracts, leases, and licenses. Pensions exclude pay-as-you-go pension systems. Infrastructure is listed in the 2008 System of National Accounts as "other structures."

Source: Lequiller and Blades, 2014; System of National Accounts, 2008; McKinsey Global Institute analysis

Exhibit 7

Balance sheet line items have clear definitions and valuation approaches; however, they are sensitive to accounting assumptions.

Balance sheet line item	Example	Valuation method
Dwellings	Buildings or parts of buildings used as residences, excluding associated land	Valued via the perpetual inventory method, which begins with the previous year's stock and subtracts depreciation, applies an asset price increase (or decrease) adjustment, and adds new investment. New investment is reflective of the cost of construction (materials and labor). The prices of structures tend to increase with the price of construction inputs.
Nonresidential buildings	Offices, industrial buildings, warehouses, excluding associated land	
Infrastructure	Structures other than buildings, for example tunnels, roadways, sports arenas, mining structures, excluding associated land	
Machinery and equipment	Machines, trains, military vehicles, wireless towers, excluding consumer durables like cars and refrigerators	Valued via the perpetual inventory method, with investment as the cost of acquiring machinery
Intellectual property products	Computer software and databases, R&D, natural resource exploration	Valued via the perpetual inventory method, with investment as the sum of historic R&D expenditure, production cost, or purchasers' price
Inventories and valuables	Inventories include materials and supplies in stock, finished and resale goods, and work-in-progress goods; valuables include produced goods such as gold kept as store of value	Book values adjusted for current market prices or valued per perpetual inventory method. Valuables valued at actual or estimated acquisition prices.
Other produced	Livestock, tree, crop and plant resources, and other products	Current prices for animals; trees, crops, and plants valued at current written-down value of cumulative capital formation
Land	Land under buildings and structures, agricultural land, recreational land	Most often calculated as latest price paid by a new owner, less the value of any structures on the land
Minerals and energy reserves	Proven and economically exploitable mineral and energy reserves	Present value of expected net returns resulting from commercial exploitation of resources
Other nonproduced	Goodwill, marketing assets, leases and licenses, natural resources such as groundwater	Varies by specific asset; goodwill priced at written-down value upon acquisition, other natural resources valued at present value of future returns
Equity	Claims on the residual value of a corporation after claims of all creditors are met	Current market prices for all listed equity; unlisted equity market price often estimated through book values adjusted by listed equity price changes
Pensions	Liabilities and corresponding assets of defined-benefit and defined-contribution plans, but excluding pay-as-you-go plans	Current prices as reported by private and public pension funds

Source: Eurostat; Lequiller and Blades, 2014; national statistics offices; System of National Accounts, 2008; McKinsey Global Institute analysis

Box 2

Our sources and methodologies for this research

This work aims to provide a balance sheet of the financial and real economy at current market prices. In line with national accounting guidelines in the 2008 System of National Accounts, we focus on the private market value of assets and intentionally show and analyze asset price effects rather than adjust for them. This analysis thus also does not account for externalities or societal value beyond private value—in other words, it excludes assets like natural capital (for instance, biodiversity) and human capital, and assumes that intangibles quickly lose value due to competition. In many analyses, we normalize the market value of balance sheet items or net worth by nominal GDP to adjust for size and income levels of countries, since income needs eventually underpin the value of assets. We deliberately do not adjust for different asset price levels across countries.

The primary component of our data, stocks of financial and real assets that compose balance sheets, comes from the Organisation for Economic Co-operation and Development (OECD), Federal Reserve Board, CEIC, and national statistics offices. The data as published are mostly aligned with the 2008 System of National Accounts, an internationally coordinated framework for compiling measures of economic activity.[1] In some cases, adjustments and extrapolations were needed, particularly for the United States and China. Given that they are the world's largest national economies, these estimates are especially influential in our analyses.

In the United States, real estate data from the Federal Reserve Board do not separate structures from land. We therefore deducted the cost of structures from the real estate total to determine land values, an approach in line with that used by other countries and researchers.

In China, the national balance sheet does not include land use rights, a valuable component of overall real estate value. We have estimated the value of these rights using survey data from the Chinese Ministry of Land and Resources and allocated their value to land.[2]

China's fixed asset data are presented as a lump sum in the government and corporate sectors, requiring us to estimate splits across fixed asset types. We leveraged work by Yang Li and Xiaojing Zhang, who provide estimates for capital stocks by asset type on China's balance sheet.[3] We also adjusted infrastructure estimates to align with a 2020 World Bank report that estimated China's capital stock.[4]

Data on minerals are also missing from US and Chinese balance sheets. We performed a separate analysis using US Geological Survey mineral commodity summaries and implied margins based on Australia's mineral commodity summaries and national statistics office data to reach an approximate net present value of minerals stocks for China and the United States. Australia, Canada, and Mexico directly provide data.

Concerning flows, we estimated the distribution of investment and depreciation across line items and sectors based on subtotals in a given year. We allocated depreciation totals from the OECD across assets using distributions based on depreciation figures from EU KLEMS.[5] We allocated asset totals of investment across sectors based on changes in stocks plus depreciation.

In many cases, "other changes in volume" flow accounts are unavailable or incomplete. For the sake of simplicity, we estimated revaluation accounts, or price changes as the change in stocks between years less net investment. This ignores the "other changes in volume" account, but based on limited data, the "other changes in volume" accounts appear to be small relative to stock size.[6]

As of August 2021, data on 2020 balance sheets were available from national statistics offices for most countries, although in some cases the data did not have the same level of granularity, such as splits by sectors. In these cases, we applied splits to asset totals based on prior year averages. Real asset data were missing for China and Japan, and for non-household sectors in Australia. In these cases, we added investment data to 2019 stocks, subtracted an estimated depreciation figure, and then applied a revaluation figure based on relevant gross output indexes, for example, manufacturing of machinery and equipment. Total financial assets and liabilities in 2020 were also extrapolated for China based on proxies from China's central bank balance sheet.

For full data methodology and a complete list of sources, please refer to the technical appendix.

1 System of National Accounts 2008, European Commission, IMF, OECD, United Nations, and World Bank, 2008.
2 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.
3 Yang Li and Xiaojing Zhang, *China's national balance sheet: Theories, methods, and risk assessment*, Springer, 2017.
4 Richard Herd, *Estimating capital formation and capital stock by economic sector in China: The implications for productivity growth*, Policy Research Working Papers, number 9317, World Bank, July 2020.
5 EU KLEMS database, Vienna Institute for International Economic Studies, euklems.eu.
6 The US Federal Reserve Board's financial accounts tables provide a detailed breakdown of capital, financial, revaluation, and "other changes in volume" accounts. "Other changes in volume" account aggregate figures apply to both financial and real assets, and thus cannot be directly factored into the changes in real assets year to year. Given the specificity of data provided, we can subtract the sum of net investment and revaluation account totals from the change in nonfinancial stocks each year to get a discrepancy that can be attributed to "other changes in volume." From 2013–19, the average discrepancy was just 4 percent in the nonfinancial corporate sector and 1 percent in the household sector, indicating that the vast majority of changes in stocks are explained by both net investment and revaluation. "Financial accounts of the United States – Z.1," Federal Reserve Board, 2021.

On the global balance sheet, financial assets and liabilities net out to zero, so that net worth becomes equivalent to real assets

Households consider their net worth a measure of their financial health. Understanding how their assets stack up against their liabilities guides myriad everyday decisions, such as whether a family can afford to buy a car. They have many reasons to accumulate wealth, or net worth. At the household level, net financial assets such as equities, deposits, and pension promises make up about half of net worth. Households count on these assets as well as real assets like houses and land as stores of net worth.

The global balance sheet, in turn, encompasses the aggregated balance sheets of households, corporations, financial institutions, and governments. This means that equities, bonds, deposits, and other financial holdings that are assets to households or other institutions represent claims against financial institutions, companies, governments, or other households. In other words, they are liabilities for the latter. For example, a mortgage is a liability for a household but an asset for the bank that provided it. Similarly, a euro, peso, or renminbi is an asset for households and businesses that hold it, but a liability for the central banks of the European Union, Mexico, and China. It is fiat money, ultimately backed by the trust in these institutions. And corporate equity is a household asset but a liability for the issuing company—more precisely, a promise to perform, a claim on a residual of future revenues.

From the perspective of the global aggregated balance sheet, claims represented by financial assets are matched by liabilities, netting to zero. Financial assets and liabilities therefore enable transfers of wealth without requiring exchange of ownership of real assets and can add to net worth for individuals, sectors, or institutions, but they do not add to global net worth. This means that net worth is equivalent to the value of real assets on the global balance sheet (Exhibit 8).

At the individual country level, the difference between financial assets and liabilities is the net international investment position, which can be thought of as the net lending or net borrowing position of a country. In the ten focus countries as of 2020, net financial positions constituted a maximum of 13 percent of total net worth; they have grown over time, and they can be much higher in small countries outside of our sample.[32]

Net worth grows with investment or real asset price changes

Net worth grows as a result of net investment, which increases the quantity of produced assets, or as a result of higher prices on produced or nonproduced assets. When land prices decline, for example, net worth falls in proportion to the declining value of real estate assets.

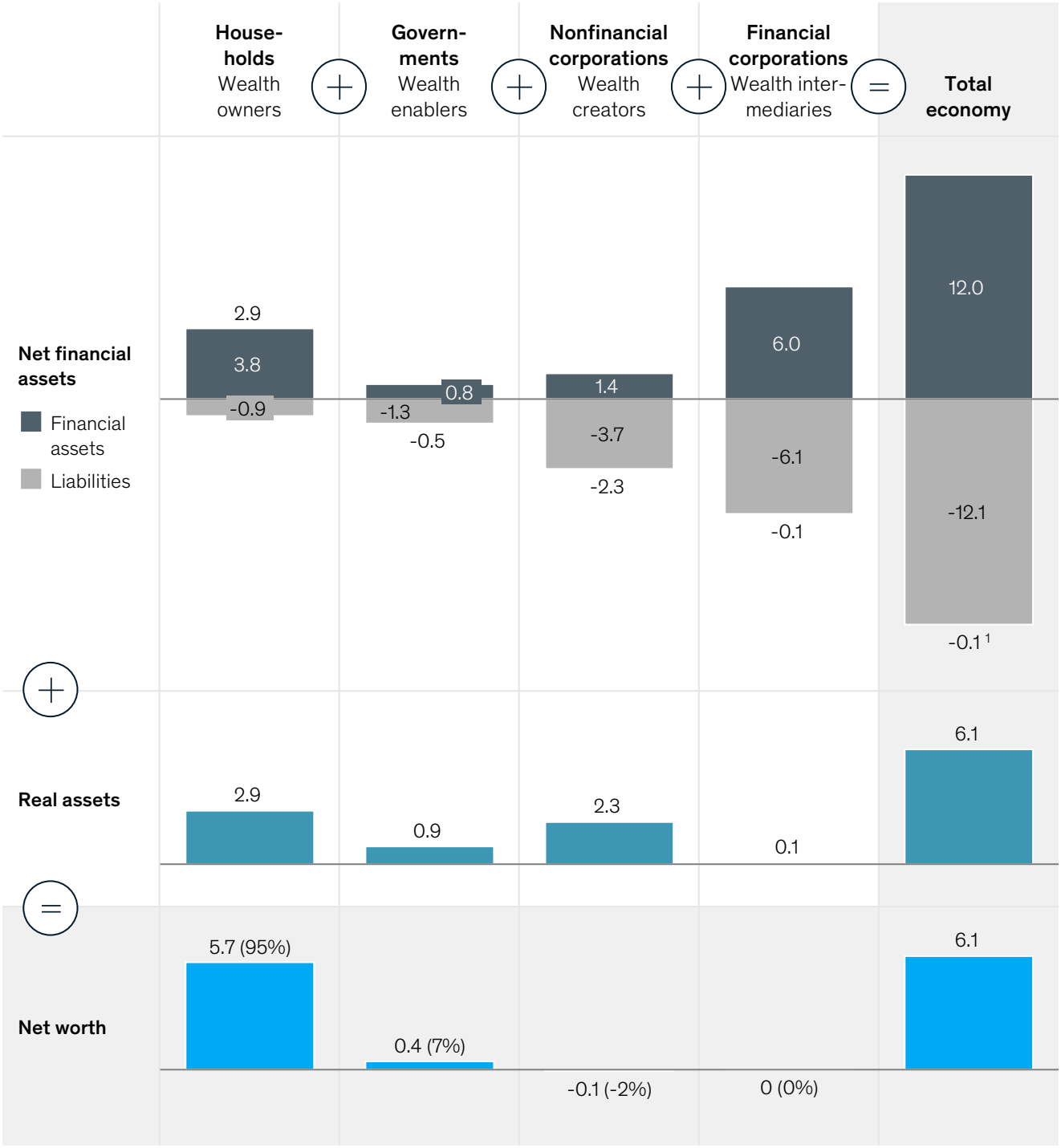
As financial assets and liabilities are created (or retired) and change value in matching pairs, they do not change global net worth. If an aircraft manufacturing company, for example, issues bonds to invest in new equipment like a 3-D printer, it creates both a financial liability for itself and a financial asset for the buyer of the bond. If a financial corporation was involved as an intermediary, a second pair of corresponding financial assets and liabilities is created on the financial sector balance sheet. No additional net worth is created beyond the value of the real asset, the industrial 3-D printer in this case, but net worth was transferred from the company or its owner via the financial corporation to the buyer of the bond. Similarly, a rise in equity prices adds to the net worth of the owning households or institutions—but becomes a rising liability for the issuing corporation (in other words, a promise for greater future dividends). Global net worth will grow only if the rising equity price is reflected in higher underlying real asset investments of the corporation. In other words, equity growth without corresponding asset growth will not translate to higher net worth for the total economy (Exhibit 9).

[32] In Canada, for example, the net international investment position has grown over time, partially as a result of the dollar's depreciating against other currencies. See Gabriel Bruneau, Maxime Leboeuf, and Guillaume Nolin, "Canada's international position: Benefits and potential vulnerabilities," *Financial System Review*, Bank of Canada, June 2017. Some countries not included in our ten-country cohort have larger net international investment positions and, as a result, have net worth significantly greater or less than the value of real assets.

Exhibit 8

Real assets constitute net worth at the total economy level, while financial assets work to pass net worth on to households.

Wealth breakdown by sector, 2020, GDP multiple



The top row shows that total net financial assets net out at a global level, leaving real assets equivalent to net worth (middle row). In the corporate sector, real assets are offset by net financial assets.

Bottom row: Net worth is mostly held by households—half in the form of financial claims on corporates and governments, the other half in real estate.

1. At the global level, net financial assets are equal to zero. The -0.1 times GDP figure here represents the collective rest-of-world position across the ten countries in our sample.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 9

Investment and other transactions reflected on balance sheets affect net worth.

▲ Increase ▼ Decrease ■ Neutral

	Balance sheet impacts		
Scenarios	**Real assets**	**Financial assets and liabilities**	**Net worth**
A household buys a new house financed by a bank mortgage[1]	▲ Value of new house	▲ Mortgage (financial asset for bank and liability for household) ▲ Cash deposits (financial asset for household and liability for bank)[2]	▲ Equal to value of new house
A manufacturing firm buys new equipment financed with cash	▲ Value of new equipment	■ Cash transfer; no new assets or liabilities created	▲ Equal to value of equipment
Real estate price decline due to economic recession	▼ Price decline multiplied by existing quantity of real estate	■ No new assets or liabilities created	▼ Equal to decrease of real estate
Depreciation at a logistics firm exceeds its investment in new technology	▼ Amount depreciated (less any new investment)	■ No new assets or liabilities created	▼ Equal to amount depreciated (less any new investment)
A student takes a bank loan to pay for education[1]	■ No new real assets created	▲ Student loan (financial asset for bank and liability for student) ▲ Cash deposits (financial asset for student and liability for bank)[2]	■ No net worth created
A company repays principal on a bank loan[1]	■ No new real assets created	▼ Debt liability for company and asset for bank ▼ Cash deposits (financial asset for company and liability for bank)[2]	■ No net worth created
Equity prices increase as a result of growing market expectations[1]	■ No new real assets created	▲ Equity (financial asset for households owning equity, liability for traded companies)	■ No net worth created
The national currency of a country with significant foreign equity holdings depreciates in value	■ No new real assets created	▲ Net equity (total economy equity assets less equity liabilities)	▲ Equal to growth of net equity

1. Assuming transaction takes place within one country.
2. When banks intermediate, financial assets and liabilities in the total economy are double the value of new debt (for example, mortgage or student loan).

Source: Lequiller and Blades, 2014; national statistics offices; System of National Accounts, 2008; McKinsey Global Institute analysis

Net worth as a multiple of GDP ranged widely as of 2020, with the United States at the low end and China at the high end

As of 2020, real assets relative to GDP in the ten focus countries ranged from 4.8 times GDP in the United States to 8 times GDP in China (Exhibit 10). Financial assets held within and outside of the financial sector varied even more widely. Mexico had the lowest level of financial assets within and outside of the financial sector relative to income, at 1.4 and 2.7 times GDP, respectively. Sweden had the most financial assets outside the financial sector, at 8.5 times GDP, and the United Kingdom (a significant financial hub) had the most financial assets within the financial sector, at 11.5 times GDP.

Net worth per capita in 2020 ranged from $46,000 in Mexico to $351,000 in Australia, or a weighted average of $145,000 per capita across the ten economies.[33] In other words, an average person in our country sample would have $145,000 in net worth, or six times average annual income. Measured at purchasing power parity, the range narrowed, from $104,000 in Mexico to $356,000 in Australia. Extrapolated to the global population, net worth per capita was $66,000, or $104,000 at purchasing power parity.

In China and the United States, two-thirds of wealth is owned by the top 10 percent of households.[34] The amount of wealth held by the top 10 percent of households in the United States grew from 67 percent in 2000 to 71 percent in 2019, while the bottom 50 percent of wealth owners' share dropped from 1.8 percent in 2000 to 1.5 percent in 2019. In China, these shifts were more extreme: the top 10 percent of households owned 48 percent of the nation's wealth in 2000 and 67 percent by 2015. The bottom 50 percent of Chinese households owned 14 percent of the country's wealth in 2000 and 6 percent in 2015.[35]

In a world increasingly powered by intangibles, real estate accounts for two-thirds of global net worth

While the global economy has become increasingly reliant on intangible assets, global net worth remains firmly tethered to bricks and mortar and land. Real estate owned by households accounts for roughly half of net worth worldwide, with corporate and government buildings and the land associated with them representing an additional 20 percent. The rest of global net worth is made up of other real assets including fixed assets such as infrastructure, factories and industrial buildings, machinery and equipment, and intellectual property, which together make up 20 percent; inventories, which are about 8 percent; and other nonproduced assets including mineral reserves that constitute less than 5 percent of total real assets (Exhibit 11). These assets include corporate campuses like the 168-acre site that is home to PepsiCo, major infrastructure projects such as China's Three Gorges Dam in Hubei Province, stores of oil and precious metals, the myriad inventories in Amazon and Alibaba's warehouses, and machinery and equipment more broadly.

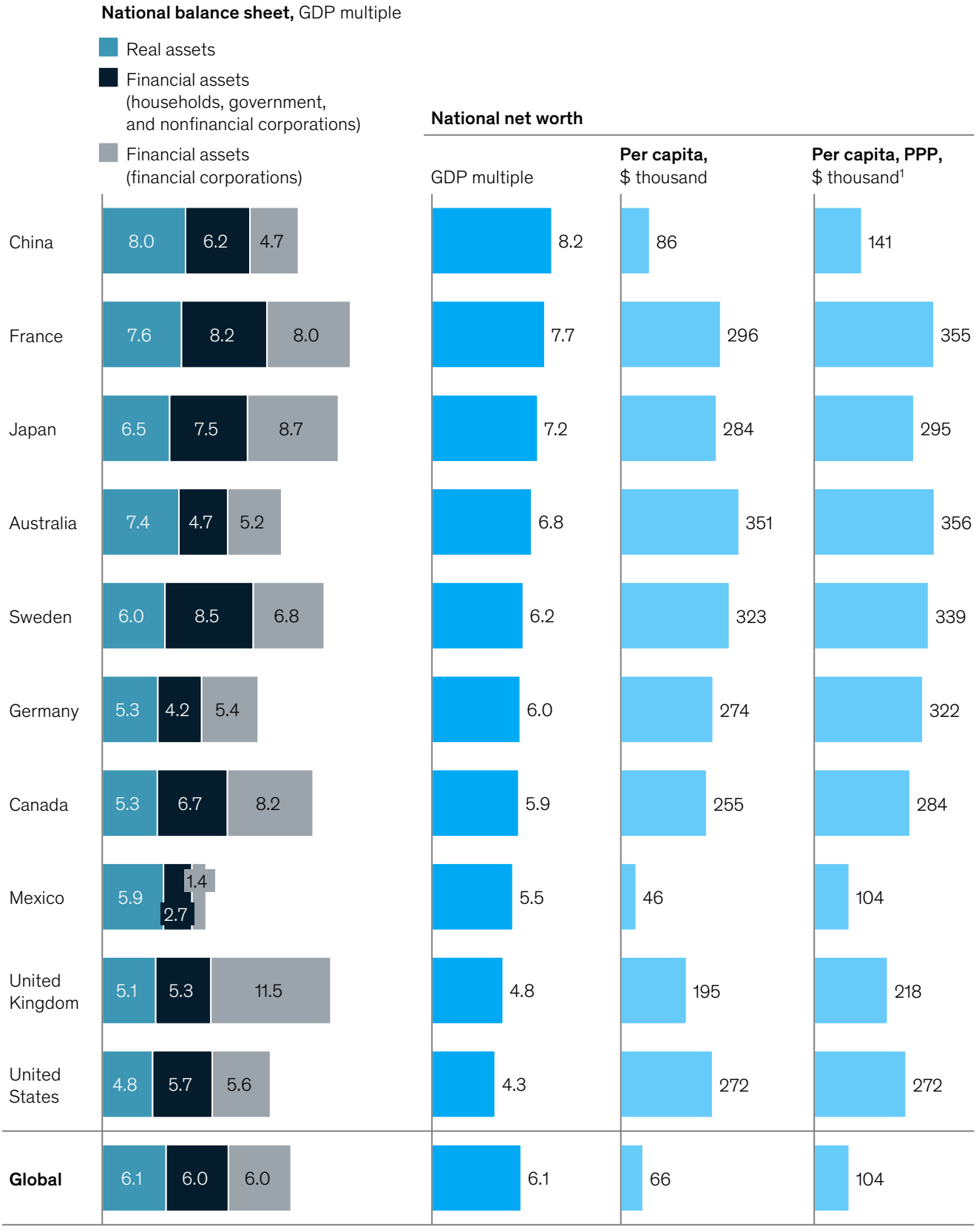
Strikingly, net worth is still mostly tangible. While investment in intangible assets has grown relative to investment in tangible assets in many countries when broadly measured, under current accounting standards, intellectual property—including research and development, software, and original artworks—is assumed to rapidly lose its value to competition and obsolescence.[36] On paper, intellectual property products make up less than 4 percent of global net worth and real assets. Intangibles do, however, generate economic returns. The OECD reported in 2015 that intangible assets had expected returns of 24 percent, the highest rate among produced asset categories.[37]

[33] These figures represent averages rather than medians, and thus do not account for skews in distribution.
[34] World Inequality Database, wid.world. See also *Inequality: A persisting challenge and its implications*, McKinsey Global Institute, June 2019; and Thomas Piketty, *Capital in the twenty-first century*, The Belknap Press of Harvard University Press, 2017.
[35] World Inequality Database, wid.world.
[36] See *Getting tangible about intangibles: The future of growth and productivity?*, McKinsey Global Institute, June 2021.
[37] *The impact of R&D investment on economic performance: A review of the econometric evidence*, OECD, April 2015, oecd.org. Additional research suggests that these high returns may not persist over time. For more information, see Nicholas Bloom et al., "Are ideas getting harder to find?," *American Economic Review*, April 2020, Volume 110, Number 4.

Exhibit 10

Total balance sheets and net worth vary widely by country.

National balance sheets and net worth at market prices, 2020



1. Purchasing power parity. Rates from World Bank; sample average redistributes GDP weights based on PPP GDP; global (extrapolated) view takes into account world PPP GDP multiplied by the net worth/GDP ratio of 6.1.

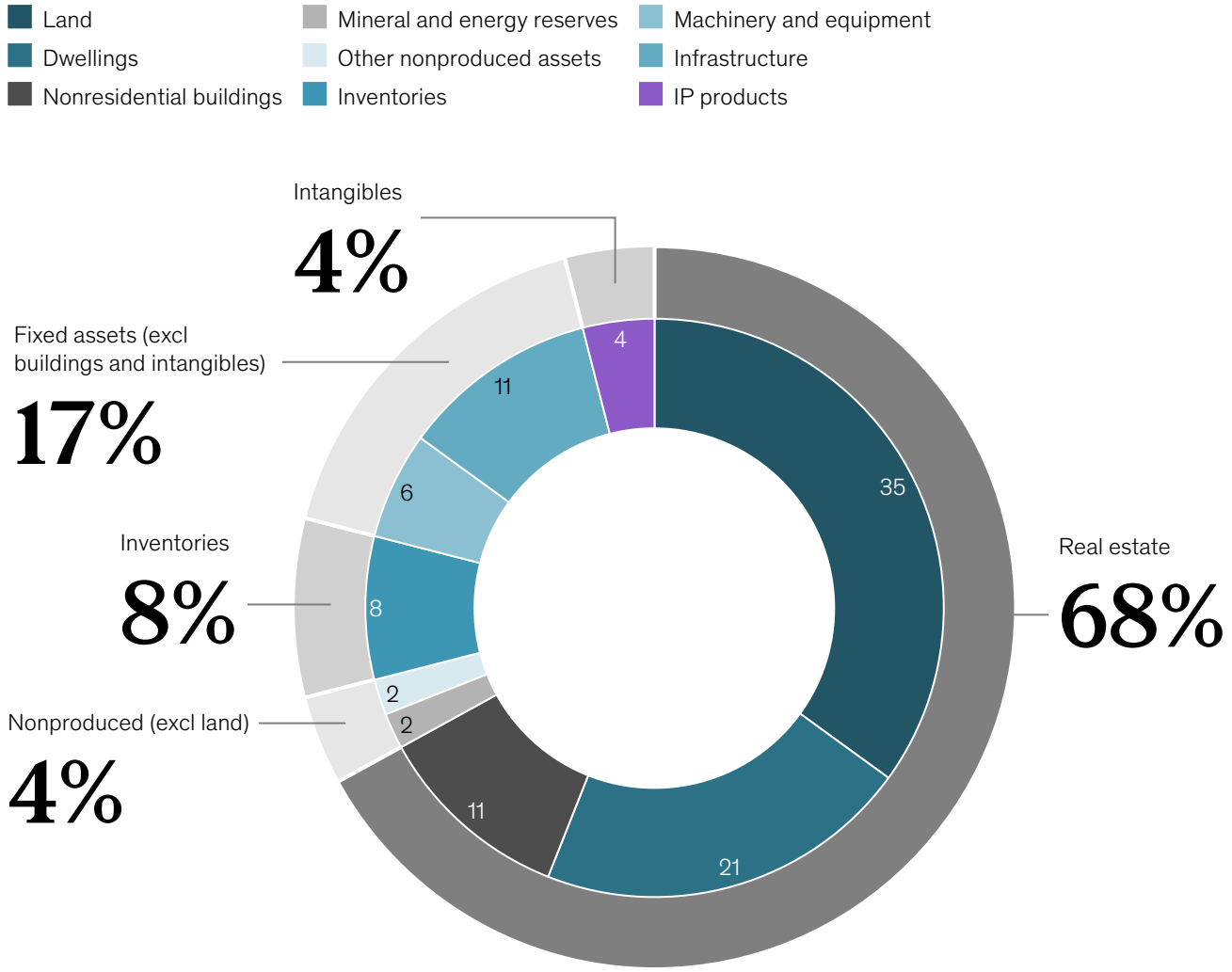
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 11

Real estate accounts for two-thirds of real assets.

Distribution of real assets, global average, 2020, %



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Labels for values <1 not shown. Figures may not sum to 100% because of rounding.
Source: AMECO; CEIC; EU KLEMS; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Adjusting scope and parameters of measurement, including for intangibles, could increase net worth by 25 percent to 7.6 times GDP

We found that global net worth relative to GDP could increase as much as 25 percent when adjusting several scope and accounting parameters (Exhibit 12). Of the ten countries in our sample, Canada is most sensitive to changes in net worth parameters, with its net worth increasing by nearly 46 percent (nearly half of which stems from the sensitivity case using a less conservative valuation of natural resources).

Current accounting standards define an asset on a balance sheet as an item that stores value; is owned by an institution, like a household or corporation; generates economic benefits for that owner; and is a means for carrying value from one accounting period into another. The assets and net worth of nations as reflected on their balance sheets thus do not include a number of assets typically regarded as having high value. These include consumer durables like cars and refrigerators, claims on pay-as-you-go pension plans, and human capital as

well as natural capital with no clear owner, like the open seas or biodiversity.[38] Consumer durables are assumed to be fully consumed, or depreciated fully, within a year of purchase and thus do not store value over time even though many of these items are used for well over a year. Human capital cannot be owned and traded (though some professional athletes might disagree). Pay-as-you-go pension plans are considered a policy obligation rather than a financial liability, like other committed future public expenses, such as Social Security in the United States and the AP retirement funds in Sweden. Certain intangible investments, such as organizational capital and brand building, are also not included.

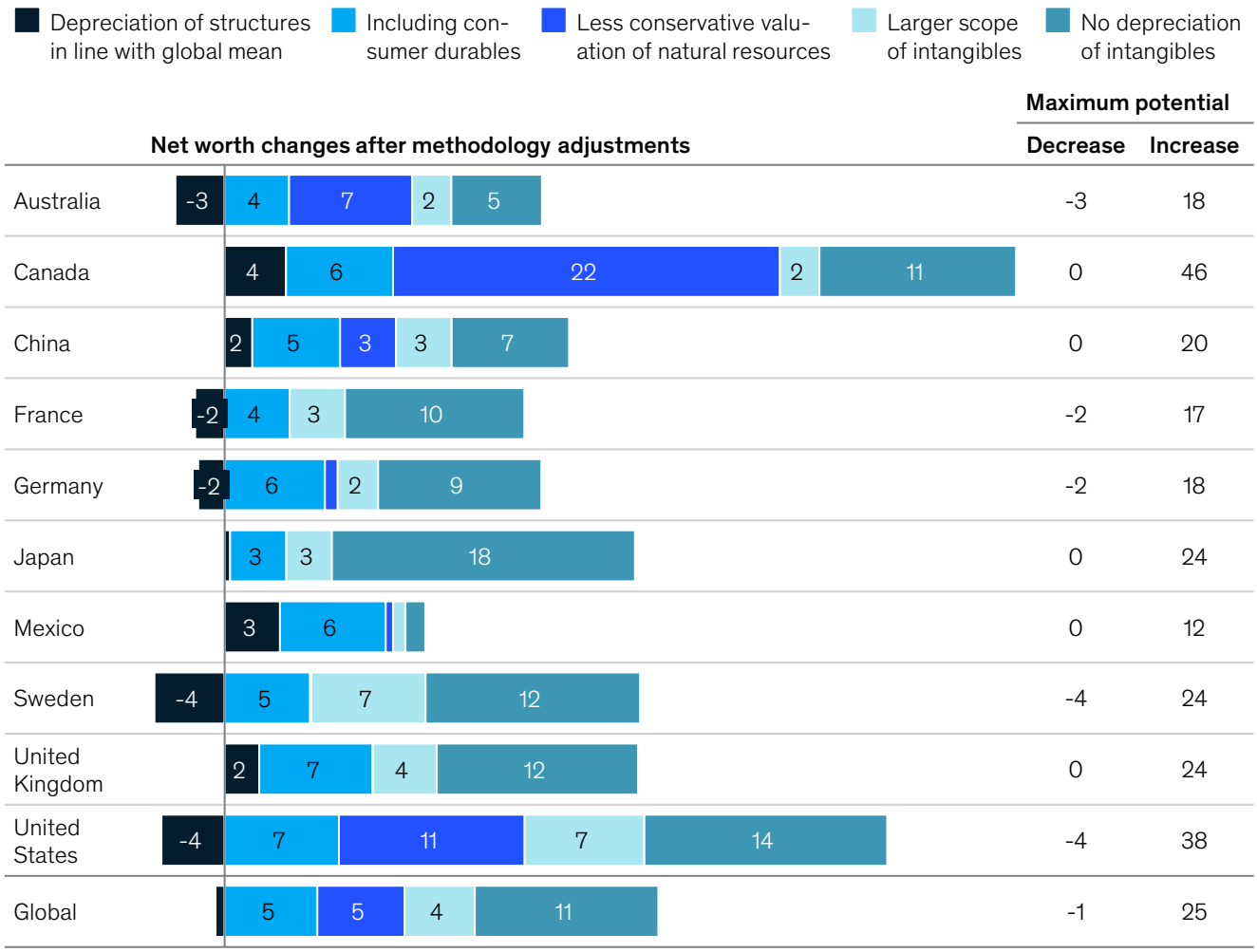
Net worth calculations are also highly dependent on accounting assumptions such as depreciation rates and valuation methods. For instance, if a building is assumed to fully depreciate in 30 years, net worth associated with it will decline faster than if it is assumed to

[38] See Colin Mayer, *Prosperity: Better business makes the greater good*, Oxford University Press, 2019. Mayer emphasizes the problems arising from not accounting for the overuse of natural capital, which he describes as the "most serious omission and mismeasurement [issue]."

Exhibit 12

Global net worth could be as much as 25 percent higher if measurement parameters were changed.

Impact of methodological assumptions on net worth, 2018, %



Note: Average depreciation rates were applied across countries and all structures. For Mexico and the United Kingdom, the average value of consumer durables across the other eight countries was assumed due to lack of data. See technical appendix for full methodology. The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Data labels for values below 1.0 not shown. Figures may not sum to 100% because of rounding.

Source: CEIC; European Central Bank; Federal Reserve Board; INTAN-Invest; national statistics offices; OECD; RIETI; Rystad Energy Ucube; Statista; US Geological Survey; World Bank; McKinsey Global Institute analysis

fully depreciate in, say, 50 years. Valuation approaches also matter for all real assets for which markets do not exist and market prices are hence not available.

To test the sensitivity of national and global net worth figures, we made two adjustments to scope: including the value of consumer durables and including a broader range of intangibles such as organizational capital, training, and brand investments from the INTAN-Invest database.[39] However, we have not integrated the value of human and natural capital, which is examined in literature, although the debate is at an early stage.[40]

We also tested three accounting parameters that significantly influence net worth but are subject to debate. These are depreciation rates for structures, the valuation approach to depletable natural resources (minerals and metals), and the depreciation or amortization rates for intangibles.

For the first parameter, we found that depreciation rates applied to structures vary widely across countries. We tested aligning depreciation rates for each country to the average depreciation rate of total structures across the ten countries in our sample in each year. For the second parameter, on natural resources, we employed less conservative assumptions on future income resulting from commercial exploitation of mineral and energy reserves, details of which can be found in the technical appendix.

Finally, for the third parameter, in addition to increasing the scope of intangibles as mentioned above—which would roughly double the value of intangibles—we also adjusted assumptions on the lifespan of intellectual property products. This had a much larger impact. Current accounting standards assume relatively high amortization rates of more than 20 percent, or a commercially exploitable life of less than five years. This would be in line with relatively rapid loss of value to competition and obsolescence.

From a societal point of view, however, it could be argued that intangibles like know-how live (nearly) forever. The invention of the wheel many thousand years ago, for instance, remains relevant to e-bike manufacturers today. Removing any depreciation or amortization from the measurement of intellectual property products over the past 20 years would increase global net worth by 11 percent, or nearly quadruple their value. Corporations hold most intangible assets, and it is often argued that those intangibles explain the increasing divergence between market capitalization and net real assets on corporate books.[41] In fact, the market value of listed and unlisted corporate equity in the United States exceeded net asset values by one times GDP in 2020, compared to 0.3 times GDP in 2000. This was almost in line with the 0.8 times GDP increase in intellectual property products we would see if depreciation were eliminated (Exhibit 13). It should be noted, however, that on balance sheets outside the United States and Canada, equity values have not diverged as dramatically from net corporate assets, so this difference may also reflect superstar dynamics among companies in the top 10 percent in economic profit, as well as specific market and competition characteristics in the United States and Canada.[42]

[39] INTAN-Invest is a research collaboration dedicated to improving the measurement and analysis of intangible assets. Carol Corrado et al., *Intangible investment in the EU and US before and since the Great Recession and its contribution to productivity growth*, European Investment Bank, 2017.

[40] Natural capital (ocean, rivers, land, climate, biodiversity, and so forth) understands nature as an asset that can provide its services only when it is not degraded and depleted. UNU-IHDP and UNEP, *Inclusive Wealth Report 2014: Measuring progress towards sustainability*, Cambridge University Press, 2014. See James Cust et al., *The changing wealth of nations 2021: Managing assets for the future*, World Bank, 2021, worldbank.org; Andrew Sheng and Xiao Geng, "A one earth balance sheet," Project Syndicate, April 28, 2021, project-syndicate.org; and Kirk Hamilton and Gang Liu, *Human capital, tangible wealth, and the intangible capital residual*, Policy Research Working Papers, number 6391, World Bank, April 2016.

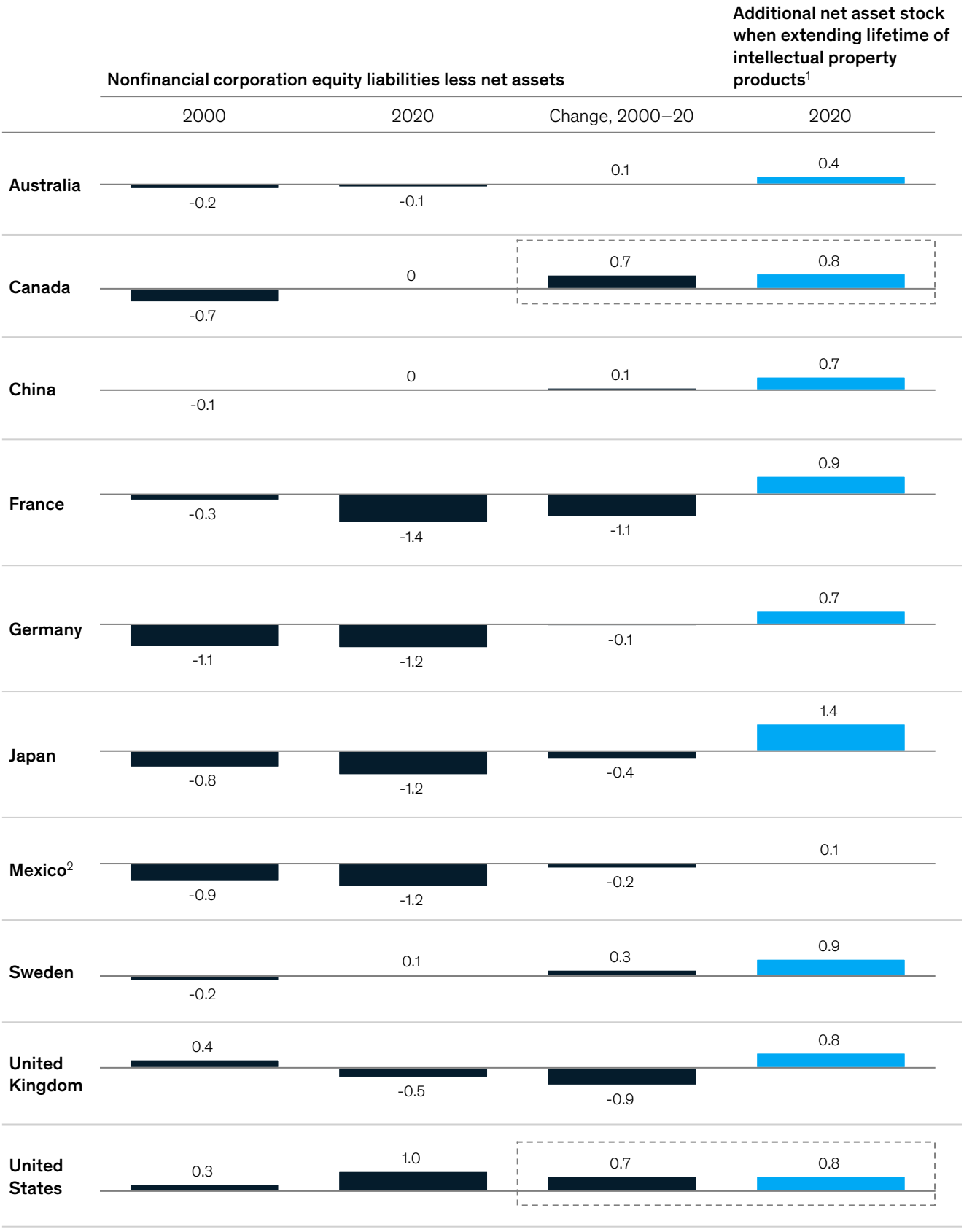
[41] See, for example, Charles Hulten and Janet Hao, *Intangible capital and the "market to book value" puzzle*, The Conference Board, Economic Program Working Paper Series, 08-02, June 2008.

[42] See *Superstars: The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018. The contested nature of markets also plays a role; see Thomas Philippon, *The great reversal: How America gave up on free markets*, Harvard University Press, 2019.

Exhibit 13

The widening gap in corporate equity and net assets in Canada and the United States could reflect a longer commercial life of intangibles.

Difference in corporate equity and net assets across countries, GDP multiple



1. Assumes zero depreciation of IP product stock; value represents cumulative depreciation of IP products from 2000–20, adjusted for inflation.
2. Mexico data begin in 2003.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Understanding the composition and distribution of global net worth complements other methods of parsing the global balance sheet

Existing research on country balance sheets tends to fall into three categories: analysis of balance sheets of specific government sectors; building a new framework to account for asset types not officially recognized under current accounting standards; and research that focuses on specific asset and liability types, typically debt.

In the first category, significant research has been done, using statistical methods based on government information, on the public sector. The International Monetary Fund (IMF) publishes the Public Sector Balance Sheet Database and working papers on the government sector's overall financial health and resilience.[43] Management and proper valuation of public assets are subjects of increasing focus in public finance, since returns on public assets can provide revenue streams for governments beyond taxation.[44] The IMF also publishes recommendations on accounting for government.[45] Research has shown that government assets and, by extension, net worth influence the cost of government debt.[46] Government net worth is also increasingly discussed in a political context, especially as public financial management has moved into the spotlight during the COVID-19 pandemic.[47]

In the second category, the World Bank's *Changing Wealth of Nations* series provides a view of wealth, notably including human and natural capital in its analysis.[48] Similarly, many financial institutions have researched the wealth of households and individuals and wealth distribution across and within countries.[49] Others make a case for including natural capital and a stock equivalent of total factor productivity.[50] Alternative approaches to balance sheets provide valuable points of comparison, although they do not follow the internationally recognized System of National Accounts framework.[51]

The third category comprises a large body of literature focusing on specific types of assets and liabilities, in particular debt levels, such as the references to national debt in countless news reports, policy papers, academic articles, and books. Similarly, the Institute of International Finance publishes the Global Debt Monitor, a quarterly report tracking debt levels across sectors and nations.[52] The IMF's Fiscal Monitor regularly publishes public financial metrics, including overall debt as a percentage of GDP.[53] *The Economist* has a

[43] Public Sector Balance Sheet Database, IMF, 2018. See also Dag Detter and Stefan Fölster, *The public wealth of nations: How management of public assets can boost or bust economic growth*, Palgrave Macmillan UK, 2015; Dag Detter and Stefan Fölster, *The public wealth of cities: How to unlock hidden assets to boost growth and prosperity*, Brookings Institution Press, 2017; "The neglected wealth of nations," *The Economist*, June 13, 2015; Seyed Reza Yousefi, *Public sector balance sheet strength and the macro economy*, IMF working paper number 19/170, 2019; and Matteo Ruzzante, *Financial crises, macroeconomic shocks, and the government balance sheet*, IMF working paper number 18/93, 2018.

[44] See Dag Detter and Shayne Kavanagh, *Putting public assets to work: Examining the potential of urban wealth funds for North American cities*, Government Finance Officers Association, June 2021, gfoa.org; and Martin Wolf, "The public sector needs to do a better job with assets," *Financial Times*, April 15, 2016, ft.com.

[45] The IMF Government Finance Statistics Manual (GFSM) recommends government accounting on an accrual basis. See also "Global public sector shift to accrual accounting forecast to continue," International Federation of Accountants, June 2021.

[46] See, for example, Jemima Peppel-Srebrny, *Government borrowing costs and balance sheets: Do assets matter?*, Department of Economics Discussion Paper Series, number 860, University of Oxford, 2018.

[47] Jacob Soll, *The reckoning: Financial accountability and the making and breaking of nations*, Basic Books, 2014; and Ian Ball and Gary Pflugrath, "Government accounting: Making Enron look good," *World Economics Journal*, March 2012, Volume 13, Number 1.

[48] James Cust et al., *The changing wealth of nations 2021: Managing assets for the future*, World Bank.

[49] For example, see *Global Wealth Report 2021*, Credit Suisse Group, June 2021, credit-suisse.com; *World Wealth Report 2021*, Capgemini, June 2021, capgemini.com; and *Allianz Global Wealth Report 2021*, Allianz, October 2021, allianz.com.

[50] Andrew Sheng and Xiao Geng, "A one earth balance sheet," Project Syndicate, April 28, 2021, project-syndicate.org; Kirk Hamilton and Gang Liu, *Human capital, tangible wealth, and the intangible capital residual*, Policy Research Working Papers, number 639, World Bank, March 2013.

[51] See also Harald Deutsch, *World balance sheet: Global assets at a glance*, 2020, worldbalancesheet.org.

[52] Global Debt Monitor, International Institute of Finance.

[53] Fiscal Monitor, International Monetary Fund.

"Global Debt Clock" that tracks government debt across countries.[54] Debt relative to GDP has also been the main metric used for research in McKinsey Global Institute reports.[55]

On the asset side of the balance sheet, produced assets, also called capital stocks, are frequently cited in literature on productivity and economic growth, as capital and labor are the two inputs in production and economic output. The World KLEMS initiative coordinates the development of databases, including capital stocks and other production inputs at the industry and country levels, to better understand productivity and facilitate a vast quantity of research and publications.[56] In *The Rise and Fall of American Growth*, Robert Gordon looks at the growth of capital stocks in the United States over much of the 20th century in the context of an assessment of productivity levels over time.[57]

Specific assets, including infrastructure and real estate, are also discussed in literature on economic development. McKinsey Global Institute reports on infrastructure and housing gaps explore stocks of and investment in infrastructure and real estate, highlighting the implications of shortages of these crucial assets for overall social welfare and economic health.[58]

Intangible assets are another asset class gaining more attention, as we have noted, and investment in and stocks of intangible assets are now part of the discussion about economic growth and productivity. In their 2017 book, *Capitalism without capital: The rise of the intangible economy*, Jonathan Haskel and Stian Westlake discuss how capital has shifted from tangible to intangible assets and the levels of investment in intangibles in different countries.[59] A 2021 McKinsey Global Institute discussion paper considers intangible asset investment by corporations and implications for growth.[60]

Finally, substantial research has been done on the net international investment position and current account balances. As discussed in greater detail in chapter 3, net international investment positions, or net financial assets, have played an increasingly important role in shaping the net worth of Canada, Germany, Japan, and the United States. The United States in particular is well known for raising debt abroad at very low cost and reinvesting at comparatively high returns.[61]

The global balance sheet is large and growing. In a world becoming increasingly intangible, the bulk of net worth is still stored in bricks and mortar. While real assets like machines, factories, intellectual property, and commodities have driven productivity and economic growth, they account for relatively little net worth. Can the world find a new store of value?

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[54] "The global debt clock," *The Economist*, economist.com.

[55] See *Debt and deleveraging: The global credit bubble and its economic consequences*, McKinsey Global Institute, January 2010, and *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015. Debt levels in relation to GDP have historically been viewed as the key metric when analyzing debt sustainability, but more recent debate has centered on the relevance of this metric in the context of extremely low interest rates, and also below nominal growth rates. See Olivier Blanchard, "Public debt and low interest rates," *American Economic Review*, 2019, Volume 109, Number 4; Kathryn Holston, Thomas Laubach, and John C. Williams, "Measuring the natural rate of interest: International trends and determinants," *Journal of International Economics*, May 2017, Volume 108, Supplement 1; and Jason Furman and Lawrence H. Summers, *A reconsideration of fiscal policy in the era of low interest rates*, Harvard Kennedy School, November 2020, harvard.edu.

[56] See, for example, Amat Adarov and Robert Stehrer, *Tangible and intangible assets in the growth performance of the EU, Japan, and the US*, Vienna Institute for International Economic Studies, working paper number 178, April 2020; and Dale W. Jorgenson, Mun S. Ho, and Jon D. Samuels, *Educational attainment and the revival of US economic growth*, National Bureau of Economic Research, working paper number 22453, July 2016.

[57] Robert J. Gordon, *The rise and fall of American growth: The U.S. standard of living since the Civil War*, Princeton University Press, 2016.

[58] See *Bridging global infrastructure gaps*, McKinsey Global Institute, June 2016; and *Closing California's housing gap*, McKinsey Global Institute, October 2016, McKinsey.com.

[59] Jonathan Haskel and Stian Westlake, *Capitalism without capital: The rise of the intangible economy*, Princeton University Press, 2017.

[60] See *Getting tangible about intangibles: The future of growth and productivity?*, McKinsey Global Institute, June 2021, McKinsey.com.

[61] Pierre-Olivier Gourinchas and Hélène Rey, "International financial adjustment," *Journal of Political Economy*, August 2007, Volume 115, Number 4; Pierre-Olivier Gourinchas, Hélène Rey, and Maxime Sauzet, "The international monetary and financial system," *Annual Review of Economics*, August 2019, Volume 11; and Herman Mark Schwartz, "What's wealth got to do with it? Global balance sheets and US geo-economic power," *Review of International Political Economy*, September 2019, Volume 26, Number 5.

Hong Kong shopping mall
© Getty Images

2. Among the four sectors of the economy, households control 95 percent of net worth

A national balance sheet is the sum of the individual balance sheets of four sectors: households, governments, corporations, and financial institutions including central banks. Size and composition vary significantly (Exhibit 14). Households control the bulk of net worth, governments the small remainder. Because nonfinancial and financial corporations have equity as a liability that largely corresponds to their net asset holdings, they do not have material net worth.

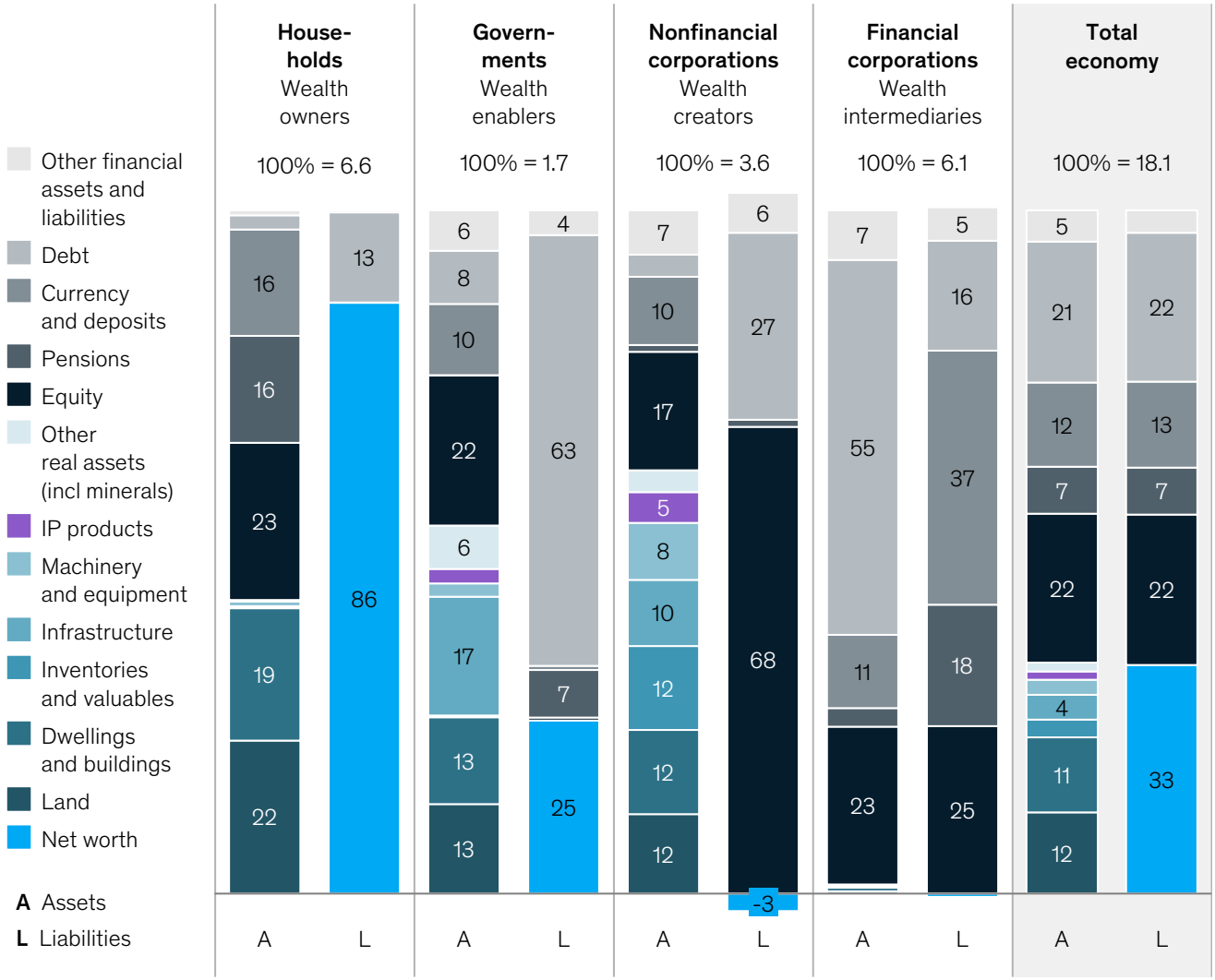
This chapter explores the differences in balance sheet structures, including all assets and liabilities, and their development over time across the four sectors, at a global level and highlighting country differences. Those balance sheet structures reflect the different roles that the four sectors play in the global economy and how their operations intersect (Exhibit 15). Country variations highlight the different preferences, system choices, and interpretation of roles that are possible.[62]

[62] For an exploration of differences in capitalist systems in a range of countries, see Peter A. Hall and David Soskice, eds., *Varieties of capitalism: The institutional foundations of comparative advantage*, Oxford University Press, 2001.

Exhibit 14

The distribution of assets and liabilities varies by sector.

Global balance sheet by sector, 2020, %, GDP multiple

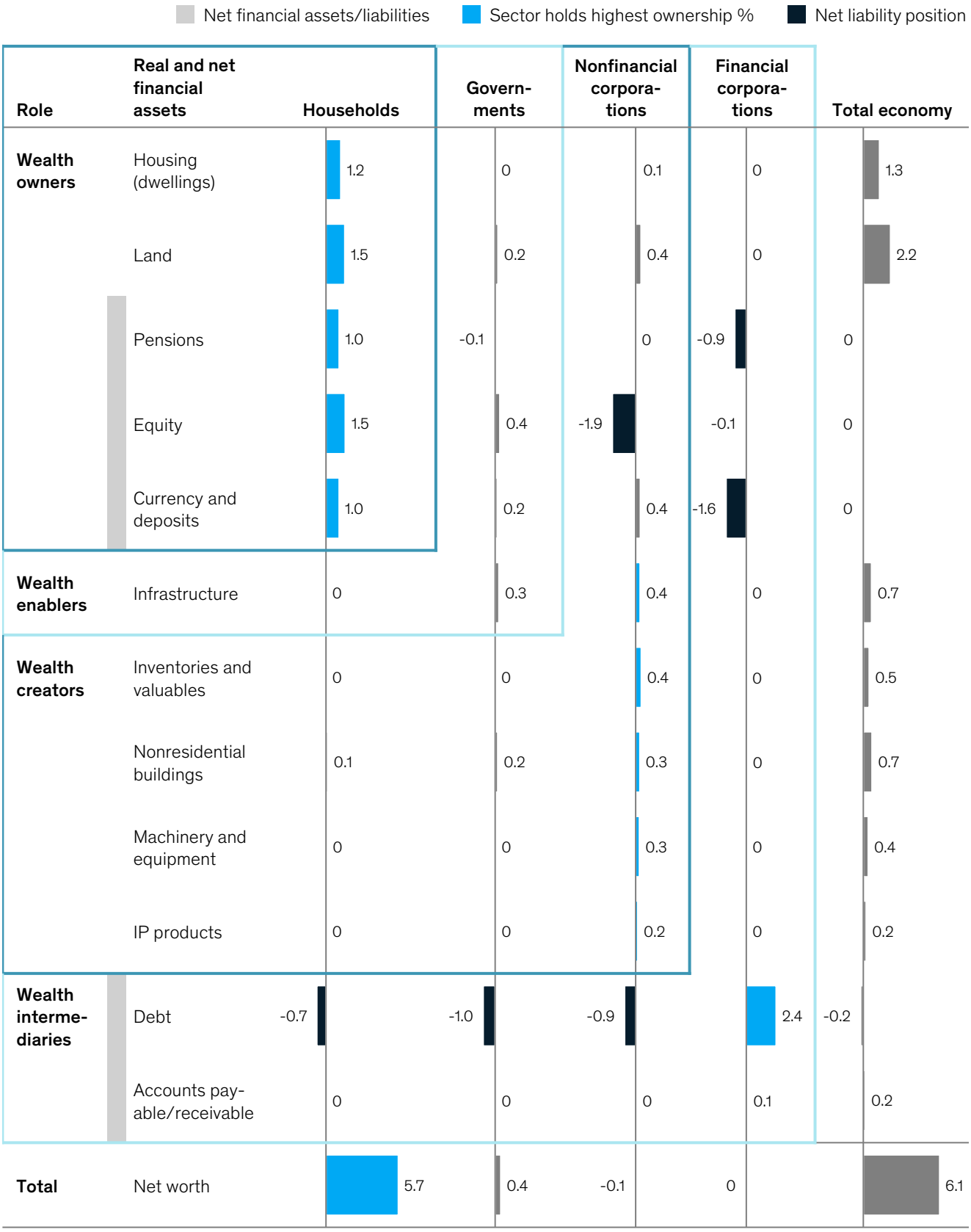


Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 15

Each sector owns a mix of assets and owes liabilities according to its function in the total economy.

Real and net financial assets by sector, 2020, GDP multiples



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. Totals may not exactly match sum of assets because of rounding and exclusion of other minor assets such as cultivated biological resources and mineral resources.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Households: Differences in financial portfolios, pension and financial systems, and land prices characterize patterns across countries

The household sector comprises individuals and families, sole proprietorships, unincorporated enterprises, and, under international accounting standards, nonprofits that provide services to households. As a sector, households have the largest balance sheet. Liabilities in the household sector are small relative to assets and almost exclusively consist of debt, largely mortgages. Household net worth is thus composed in roughly equal parts of net financial assets and real estate assets.

Through their ownership of real estate and financial assets like stocks and government bonds, often in the form of mutual funds or pension accounts, households have claims on the public and the corporate sector, directly or intermediated by the financial sector. They control about 95 percent of aggregate net worth in an economy (Exhibit 16).

Real assets held by households consist almost exclusively of real estate

Households have real assets ranging from 2.1 times GDP in Sweden and Mexico to 4.3 times GDP in Australia (as noted, balance sheets do not include consumer durables). High levels of real estate stock relative to GDP may be the product of high quantity and quality of housing, high construction costs relative to other prices in an economy, or high land prices.

The largest household real estate stock is in Australia, China, and France, all of which had household real estate values greater than three times GDP. Household land values are highest in Australia, at 2.9 times GDP. Of the ten countries, Australia also has the lowest share of land mass in urban settings, less than 1 percent, despite having rates of urbanization similar to those of the other countries.[63] Australia also has the fastest population growth of the ten, 34 percent from 2000 to 2020, primarily due to high net immigration.[64] In China, rapid growth and escalating construction prices combined with high rates of new investment to drive up the value of housing stock, based on our analysis. In France, real estate prices soared in the early 2000s, coinciding with the introduction of the euro currency in 1999 and lower interest rates, among other factors.[65]

[63] World Bank urban land dataset.

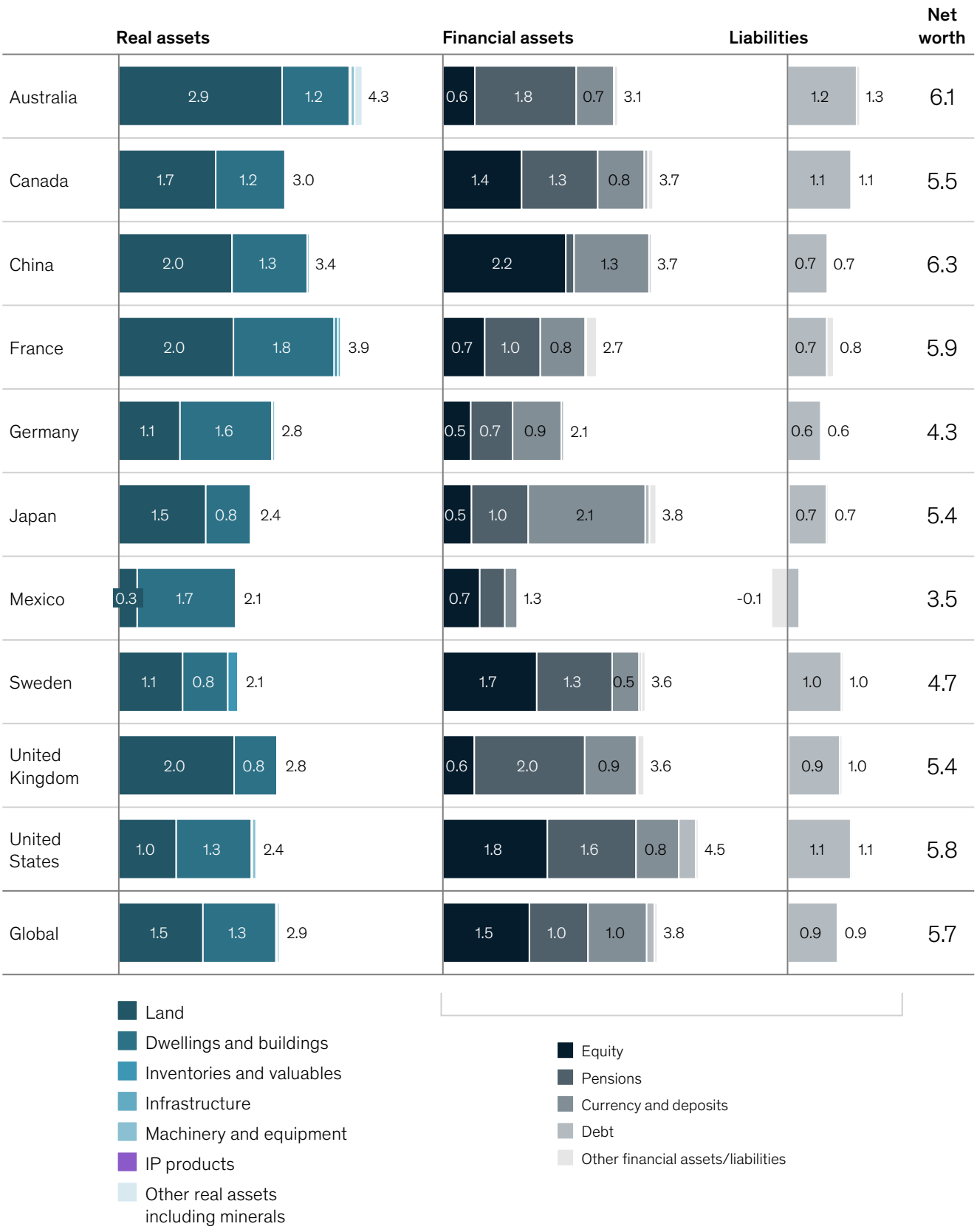
[64] Population data from the World Bank. For more information, see Joanne Simon-Davies, "Population and migration statistics in Australia," Parliament of Australia, December 2018.

[65] For more information, see Rahul Srivasta and Stephen L. Lee, "European real estate market convergence," *Journal of Property Investment & Finance*, August 2012, Volume 30; and Kim Hiang Liow, "Volatility interdependence in European securities markets: Who is the most influential?," *Journal of European Real Estate Research*, August 2013, Volume 6, Issue 2.

Exhibit 16

Germany, Mexico, and Sweden are at the lower end of household net worth, due to lower real estate and equity holdings.

Household sector balance sheets across countries, 2020, GDP multiple, nonconsolidated data



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Household financial assets are largely equities, currency and deposits, and pensions
Across countries, households fall into four groups when it comes to financial assets. First, there are households whose financial assets consist mostly of equities; second, those with financial assets mostly in currency and deposits (or cash); third, those with financial assets primarily consisting of pensions; and fourth, those with balanced portfolios of financial assets including equity, deposits, and pensions.

— **Equity driven.** China is the only country in our sample where household financial assets are predominantly equities, although households in Canada, Sweden, and the United States also hold equities with values at least one times GDP. China has experienced a substantial equity boom over the past two decades, and the country has a vast number of privately owned companies with nonlisted equity.

— **Currency and deposits driven.** Currency and deposits (cash) make up most financial assets held by Japanese households. The country's household currency and deposit stocks amount to 2.1 times GDP, more than double the global average.

— **Pension driven.** Household financial assets in Australia and the United Kingdom consist predominantly of pensions, with assets of 1.8 times and 2.0 times GDP, respectively. Notably, the household sectors of Canada, Sweden, and the United States also have pensions valued at more than one times GDP, a result of the funded pension systems prevalent in these countries. The pay-as-you-go pension systems in France and Germany, by contrast, are not counted as part of national balance sheets because they are considered a public obligation funded out of recurring government revenue (payroll taxes) rather than constituted from financial assets and liabilities.

— **Balanced.** Households in Canada, France, Germany, Mexico, Sweden, and the United States have a balance of equities, currency and deposits, and pensions among their financial assets. The household sector in the United States stands out because of its direct ownership of debt in the form of corporate and government bonds and notes, the value of which stood at 0.3 times GDP in 2020; those securities are mostly held in the financial sector in other countries.

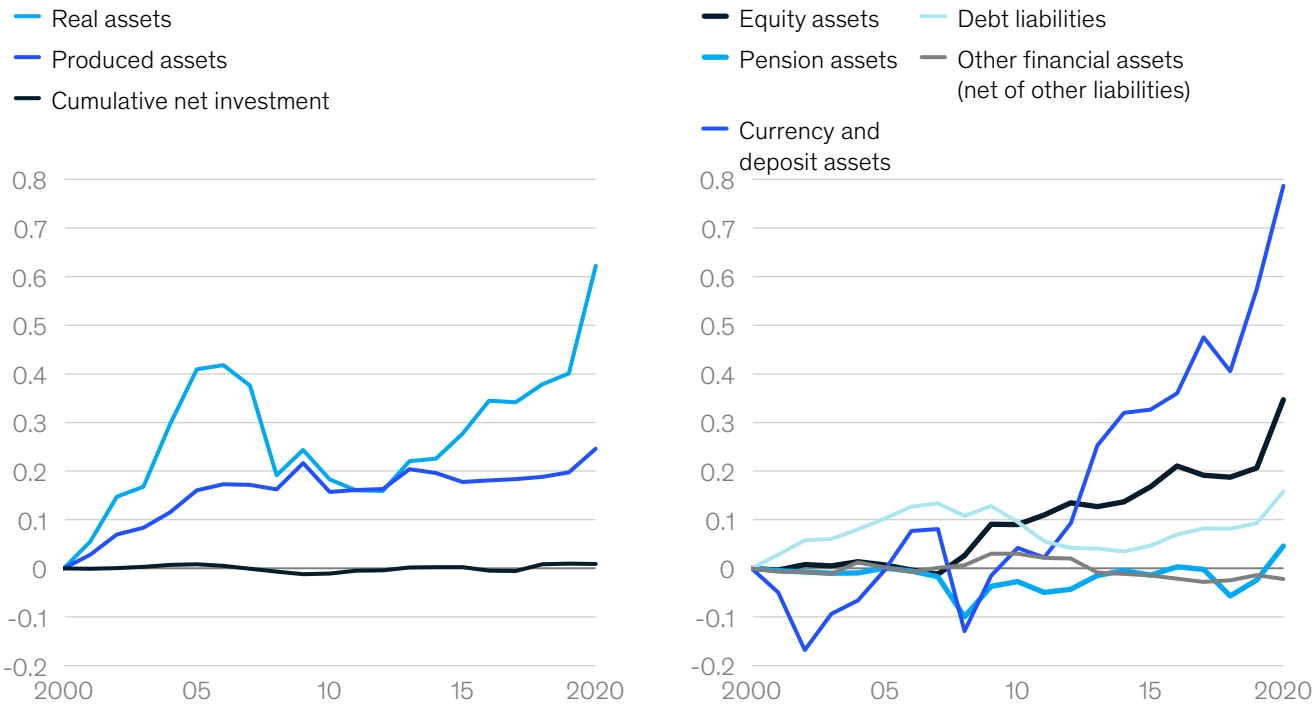
Household financial liabilities primarily reflect mortgages but also consumer and student loans, among others. Household debt is highest in Australia, Canada, and the United States, exceeding 100 percent of GDP.

The household balance sheet has changed materially over the past 20 years
While household net investment (primarily in housing), debt liabilities, and pension assets moved alongside GDP, real housing assets as well as equity assets marched upward due to rising prices, as explained in chapter 3 (Exhibit 17).

Exhibit 17

Household equity assets have grown relative to GDP and real assets since 2000, and particularly since 2018.

Growth of household balance sheet items since 2000, GDP multiple



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Governments: Wide differences in public infrastructure stocks and public debt levels

Political institutions and regulatory bodies that manage economies and provide public services constitute the government sector. Government institutions enable wealth creation by providing public goods like roads and social services, enacting economic policy and regulation, and sometimes serving as the spender of last resort, in actions such as providing fiscal stimulus during a recession or pandemic.[66] This economic role is reflected on government balance sheets, with more than one-third of assets consisting of structures, including buildings and infrastructure, as well as public land of significant value that may be understated under current accounting standards.[67] Many governments also hold significant equity, typically in state-owned enterprises.

Governments tend to have high levels of public debt relative to their assets, leaving them with low levels of net worth on average (Exhibit 18). China has the largest government net worth at 1.8 times its GDP. Net worth is negative in the United Kingdom and the United States, at -0.6 times and -0.3 times GDP, respectively, reflecting high levels of government debt as well as low levels of public assets among the ten countries.

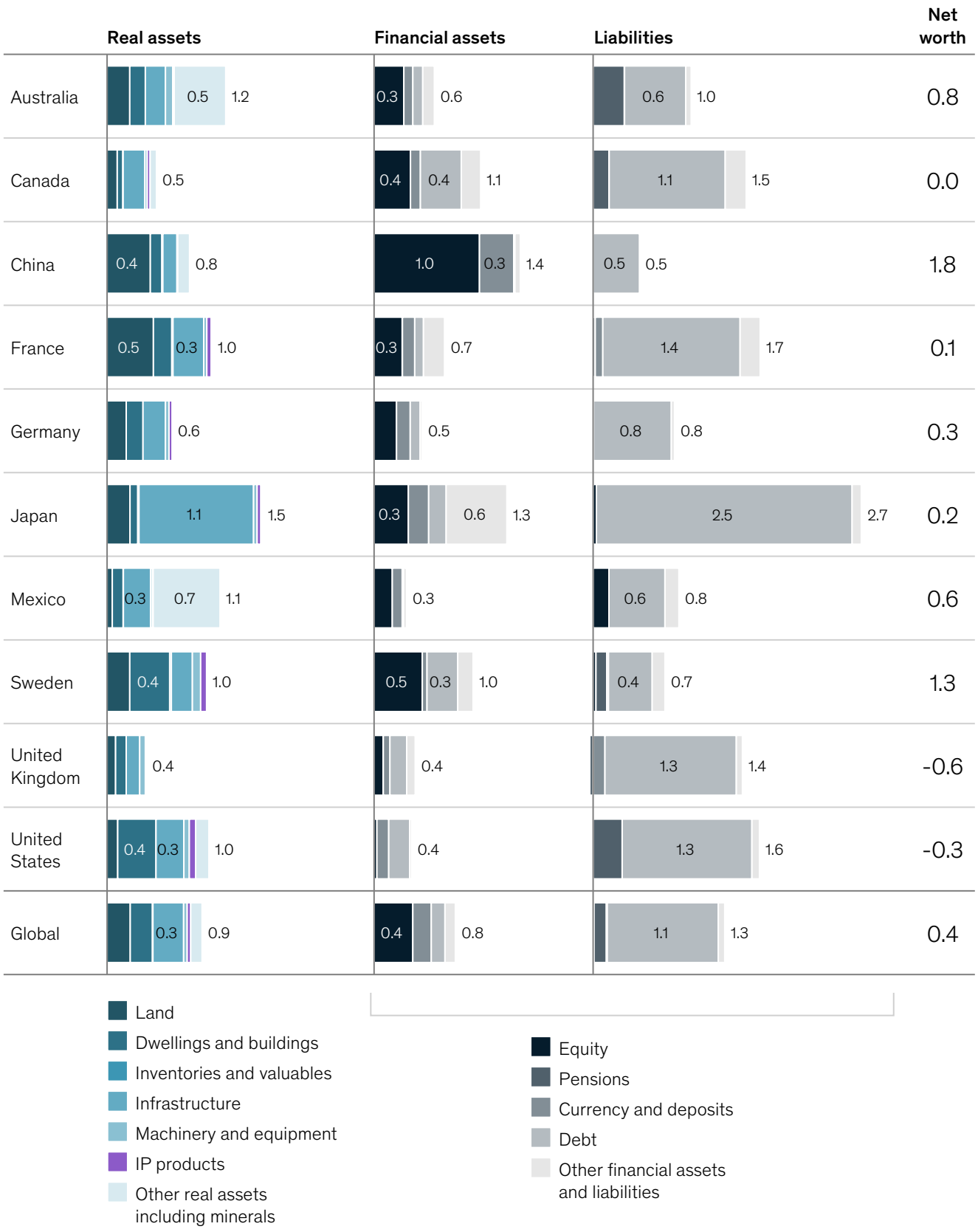
[66] For government spending during the pandemic, see Anu Madgavkar, Tilman Tacke, Sven Smit, and James Manyika, "COVID-19 has revived the social contract in advanced economies—for now. What will stick once the crisis abates?", McKinsey Global Institute, December 10, 2020, McKinsey.com.

[67] Most governments use cash accounting rather than accrual accounting and, as a result, balance sheet assets are based on statistical estimates. For further information, see Ian Ball and Gary Pflugrath, "Government accounting: Making Enron look good," *World Economics Journal*, March 2012, Volume 13, Number 1.

Exhibit 18

Governments in the United Kingdom and the United States have negative net worth driven by high debt levels compared to assets.

Government sector balance sheets across countries, 2020, GDP multiple, nonconsolidated data



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Real assets held by governments include land, buildings, infrastructure, minerals, metals, and other natural resources

The value of real assets held by governments ranges from 0.4 times GDP in the United Kingdom to 1.5 times GDP in Japan.[68]

In China, land accounts for more than half of the government sector's real assets, at 0.4 times GDP, a bigger share than in any other country in our sample. Urban land is technically owned by the Chinese government, although we have adjusted the data to reflect the value of privately owned land use rights in land values held by the household sector (see the technical appendix for details).

The value of Japan's government infrastructure, at 1.1 times GDP, makes it a significantly larger asset than in all other countries, where government infrastructure values are between 0.1 and 0.3 times GDP. (Infrastructure controlled by publicly owned corporations, like many railroads and utilities, is included among the assets of the nonfinancial corporate sector.) The Japanese government has invested heavily in infrastructure, ranging from bridges to opera houses, in an effort to stimulate economic growth.[69]

In Australia, mineral assets are included in the government sector's net worth and equal 0.5 times GDP. In Canada, China, Mexico, and the United States, mineral assets are split between the government and nonfinancial corporate sectors. Government mineral assets are equal to 0.3 times GDP in Mexico and 0.1 times GDP in Canada, China, and the United States.[70] (For full details of the methodology used to estimate the value of minerals, see the technical appendix.)

Government financial assets consist predominantly of equities, debt, and currency and deposits

China's government sector has the largest amount of financial asset holdings in our sample, because its national, regional, and local governments control markedly more equity (one times GDP) than those of other governments, in line with the strong role of China's state-owned enterprises.[71] The governments of Canada and Sweden hold the next-highest equity asset stocks and also happen to hold the two largest stocks of debt assets. Japan has the second-greatest government financial assets, with the largest portion stemming from accounts receivable (included in "other financial assets and liabilities" in Exhibit 18).

Government financial liabilities are primarily debt

Japan has the highest level of government debt, amounting to 2.5 times GDP, although the country's government also has the highest level of real assets among the sample countries. In other countries, debt liabilities held by governments range from 0.4 to 1.4 times GDP, with Australia, China, Mexico, and Sweden at the low end. (In China, most state-owned enterprises are counted in the balance sheet in the nonfinancial corporate sector, and thus debt incurred by these enterprises does not appear on the government sector's balance sheet.) Governments in Australia, Canada, and the United States also have notable pension liabilities, with values of 0.2 to 0.3 times GDP.

Governments expanded their debt in response to the 2008 financial crisis

Over the past 20 years, our research finds that real government assets rose minimally relative to GDP, with price increases in land and, in some countries, mineral reserves. During that period, net investment moved in line with GDP (Exhibit 19). Debt liabilities increased by about 0.4 times GDP over the period, with the greatest expansion in Japan, where they increased by 1.2 times relative to GDP. Liabilities tied to debt increased by 0.8 times GDP in

[68] For more information, see Elva Bova et al., *Another look at governments' balance sheets: The role of nonfinancial assets*, IMF working paper number 2013/095, May 2013.

[69] See Robin Harding, Chris Giles, and Ben Hall, "Hoped-for boom in public investment risks paving road to nowhere," *Financial Times*, November 25, 2020.

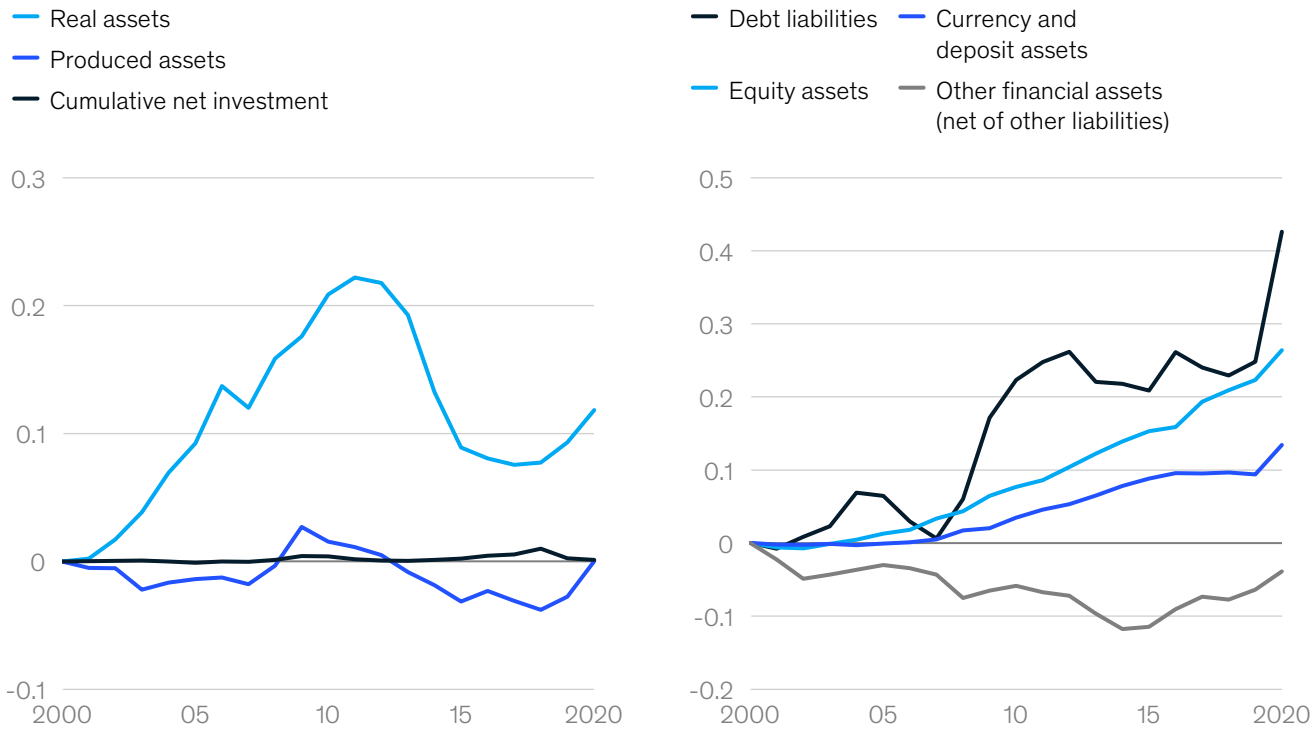
[70] The 0.7 times GDP in other real assets in Mexico includes these 0.3 times GDP in mineral assets. Mexico's national statistics office, Instituto Nacional de Estadística y Geografía, classifies most of the remaining assets in this group as "water resources."

[71] The System of National Accounts classifies any state-owned enterprise as a corporation if it charges prices for goods or services paid by customers that are equal to at least 50 percent of cost to produce them (in other words, marginal revenue is at least 50 percent of marginal cost).

Exhibit 19

Government debt has grown by 0.4 times GDP since the 2008 financial crisis.

Growth of government balance sheet items since 2000, GDP multiple



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

the United States and by 0.7 times GDP in France. MGI examined trends in government debt in 2015, noting that many of the world's largest economies were deleveraging at that time.[72] Those efforts achieved marginal success for several years, with government debt liabilities staying mostly constant relative to GDP from 2015 to 2018. The COVID-19 pandemic forced governments to increase borrowing, and that ratio increased by 0.2 in 2019–20.

While fiscal policy initiatives appear on the balance sheets of the government sector, monetary policy actions, such as asset-purchasing programs, appear on the balance sheet of central banks, which fall under the financial sector.

Nonfinancial corporations: Divergence between balance sheets and corporate profits over the past decade

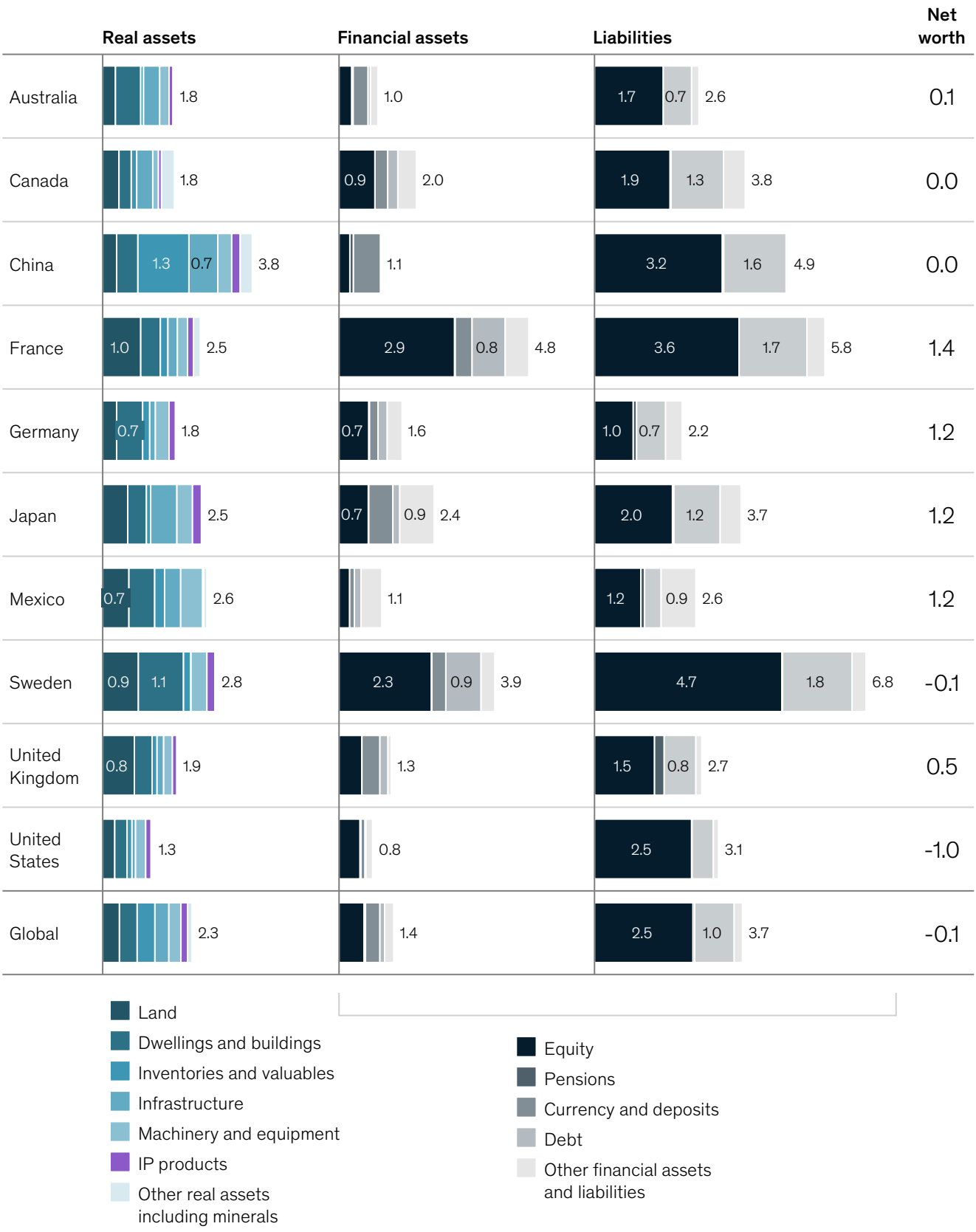
The nonfinancial corporate sector creates wealth and income by producing goods and services, including lasting real assets like the buildings, machines, and intellectual property that ultimately constitute net worth and drive productivity. These corporations also issue equity that, while technically a liability for them, provides an important source of wealth for households. The assets of nonfinancial corporations include property, plants, and equipment as well as financial assets such as cash and accounts receivable (Exhibit 20).

[72] *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015, McKinsey.com.

Exhibit 20

China has the most real assets among nonfinancial corporate sectors across countries.

Nonfinancial corporate sector balance sheets across countries, 2020, GDP multiple, nonconsolidated data



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

In the corporate sectors, real and financial assets typically broadly match financial liabilities, including equity. This means that although corporations are often described as "wealthy," their net worth is typically near zero. A perfectly rational market over the long term will price corporate equities in line with the replacement value of corporate assets, or how much a nonfinancial corporation's assets are worth on the market today minus its debt.[73]

However, in practice, the market price of a corporation's equity can greatly exceed the value of its net assets, for instance as a result of substantial market power or barriers to entry. The market can also price a corporate equity well below real asset values, for example in the case of a stock market correction. In many countries, nonlisted equity is also often valued below current market value; this results in net assets being valued higher than equity liabilities and thus positive corporate net worth.[74]

In the United States, nonfinancial corporations have negative net worth of one times GDP, suggesting that the market has placed a higher value on them than it places on their assets, perhaps in line with high profitability of intangibles-rich firms in particular (as shown in Exhibit 13).

The nonfinancial corporate sector has driven half the growth of real assets relative to GDP at a global level since 2000. Growth in real assets was mirrored in growth in debt and, even more so, equity liabilities. In the past decade, however, the growth in nonfinancial corporate balance sheets has diverged from corporate profits, echoing a broader trend of net worth (and, by extension, real assets) diverging from GDP.

Real assets in the nonfinancial corporate sector make up the most diverse portfolio of asset classes

Across the ten countries, the value of real assets in the corporate sector ranged from 1.3 times GDP in the United States to 3.8 times GDP in China.

In China, beyond high investment in infrastructure and machinery, inventories surged and accounted for one-third of the real assets held by the corporate sector in 2020, an increase of 81 percentage points since 2000, based on our analysis. This reflects a major construction boom over that period, particularly as more than half of these inventories appear to be unfinished construction projects.[75]

Compared to companies in other countries, corporations in Japan and China control more infrastructure, valued at 0.7 times GDP. In fact, based on balance sheet data, the majority of China's infrastructure is held by its corporate sector, which includes most state-owned enterprises. As previously discussed, Japan has high levels of infrastructure in the government sector, but its nonfinancial corporations also have sizable infrastructure portfolios.

Intellectual property products, or intangible assets, have comparatively low value in the total economy and in the corporate sector across countries. The largest stocks in the corporate sector are in China, Japan, and Sweden, with values about 0.2 times GDP in each country. The value of these assets is rapidly depreciated under current accounting standards.

[73] The ratio of a company's market value and the replacement cost of its assets—the amount that would have to be spent to create the existing stock of capital goods—is referred to as Tobin's Q, named after its conceptualizer, James Tobin. In the long term, Tobin's Q should tend toward 1, where the market value of a firm is equal to the replacement cost of its assets. Companies are motivated to invest when Tobin's Q is greater than 1, because the market places a premium on invested capital relative to the cost of capital. In practice, this means that companies would invest in produced assets until equity matches the firm's net asset value. For a discussion of Tobin's Q in the context of national accounts data, see Peter Van de Ven and Daniele Fano, *Understanding financial accounts*, OECD, 2017. Tobin's Q may be affected by issues including but not limited to the measurement of intangible assets (see Ryan H. Peters and Lucian A. Taylor, "Intangible capital and the investment-q relation," *Journal of Financial Economics*, February 2016), and competition (see Thomas Philippon, *The great reversal: How America gave up on free markets*, Harvard University Press, 2019).

[74] See the technical appendix for a full discussion of equity values.

[75] Based on data from McKinsey & Company's Corporate Performance Analytics. Of the 2020 inventories of the top 100 Chinese subsidiary firms by revenue, 54 percent belong to firms in the "real estate development" subindustry and 22 percent belong to firms in the "construction and engineering" subindustry.

Financial assets in the nonfinancial corporate sector range from 0.8 times GDP in the United States to 4.8 times GDP in France

Nonfinancial corporations in France and Sweden hold equities as assets that are valued at greater than two times GDP, reflecting the presence of conglomerates and within-sector equity holdings. Across country nonfinancial corporate sectors, the balance sheets of China's corporations hold the largest amount of currency and deposits (or cash) on their balance sheets at 0.7 times GDP.

Corporations in China, France, and Japan have sizable quantities of other financial assets, with values greater than 0.3 times GDP on average. Among those countries where data are available, other financial assets largely reflect accounts receivable.

Financial liabilities in the nonfinancial corporate sector are predominantly equity and debt, plus a large pool of accounts payable

Corporations in China, France, and Sweden have the greatest amount of equity—three times GDP in China and France and more than four times in Sweden. In France and Sweden, these high liabilities also reflect the presence of equity cross-holdings within the nonfinancial corporate sector. In the other countries in our sample, equity liabilities in the corporate sector range from 1.0 times GDP in Germany to 2.5 times GDP in the United States.

Among the ten countries, Sweden has the highest levels of corporate debt, at 1.8 times GDP; as with Sweden's equity, these high debt levels reflect higher intra-sector holdings. Mexico and the United States have the lowest levels, equal to or less than 0.5 times GDP. Corporations in the United States and Mexico also have the lowest levels of debt relative to equity liabilities, at 22 and 36 percent, respectively. Germany has the highest level of debt compared to its corporate sector's equity, at 75 percent.

Corporate balance sheets and equity have diverged from profits and GDP

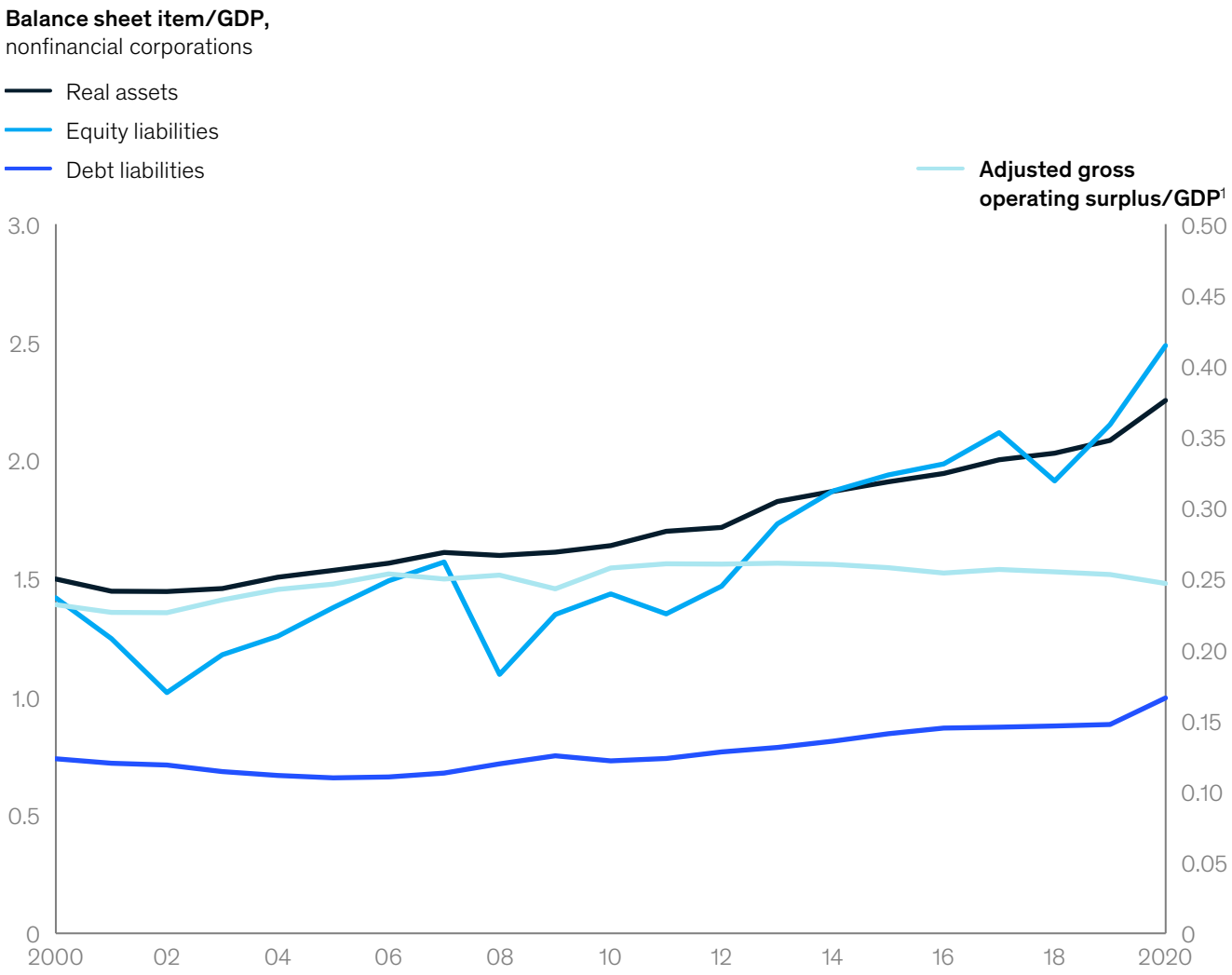
Nonfinancial corporations contribute to household wealth via the investments they make in real assets and the profits they generate to support the value of their equity held by households. Based on the global average extrapolated from the ten sample countries, the balance sheets and equity valuations of nonfinancial corporations have diverged from corporate profits since 2011 (Exhibit 21).

Gross operating surplus as a measure of profits (excluding real estate and financial services) has declined as a share of GDP by one percentage point since 2011. In contrast, corporate real assets and liabilities, including equity, grew at a much faster pace over the period to 2020. Relative to GDP, liabilities linked to equities, including estimates of the equity of unlisted companies, has increased by 105 percentage points while debt liabilities have risen by 27 percentage points. Total real assets grew by 61 percentage points. This divergence highlights rising valuations and declining returns and capital productivity.

Exhibit 21

Nonfinancial corporations' balance sheets have diverged from corporate profits over time.

Corporate profits and balance sheet items over time, 2000–20, GDP multiple



1. Adjusted gross operating surplus excludes compensation for self-employed individuals, real estate, and the financial sector.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Financial institutions: Financial balance sheets grew faster than GDP and tripled in dollar terms

Financial corporations, which include central banks, banks, insurance companies, asset managers, mutual funds, pension funds, and real estate investment trusts, intermediate funds between lenders and borrowers. Banks create money through lending, based on base money created by central banks.[76] With their assets, financial corporations provide financing needed by households, governments, and nonfinancial corporations to invest in or purchase real assets and for consumption and savings over time.

The financial sector has the largest stock of financial assets and liabilities (Exhibit 22). The largest liabilities are deposits, followed by equity and pension obligations owed to households and other sectors. Financial institutions have very few real assets on their balance sheets, less than or equal to 0.2 times GDP across countries. The assets of financial corporations typically mirror the liabilities of the other three sectors, resulting in little or no net worth. Financial corporations also have significant intrasector liabilities and assets, such as interbank debt.

[76] Michael McLeay, Amar Radia, and Ryland Thomas, "Money creation in the modern economy," *Bank of England Quarterly Bulletin 2014 Q1*, March 2014.

On a consolidated basis, their net liabilities and assets in relation to other sectors can be much lower.

The largest financial sectors relative to national GDP are those of the United Kingdom at 11.5 times GDP, Japan at 8.7 times GDP, and Canada at 8.2 times GDP, based on nonconsolidated data.

The financial sector's balance sheet has mirrored the growth in financial assets and liabilities across the household, government, and nonfinancial corporate sectors, expanding in its asset-to-GDP multiple by 1.7. As of 2020, the largest asset on the financial sector's balance sheet was debt and the largest liability was currency and deposits, reflecting growth in debt across sectors as well as expansionary monetary policy over the past two decades.

Financial assets in the financial sector primarily include debt held as an asset or claim against other sectors or other financial institutions

Mortgages are one example, corporate bonds another. Most debt assets that exist in an economy are owned by the financial sector and have counterpart liabilities in other sectors or financial institutions.[77] The value of debt held as assets by Japanese financial companies was highest, at 5.3 times GDP, while Mexico's financial firms held debt valued at just 0.9 times GDP. The United Kingdom's financial sector held derivatives with values equal to 2.5 times GDP, a substantially larger pool of these assets than in the other countries. Financial corporations in the United Kingdom also held sizable currency positions and deposits as assets, which together with their derivative holdings reflect London's role as a major international financial center.

Financial liabilities among financial firms are typically currency and deposits

The financial sector includes a country's central bank and other financial institutions. Household, government, and nonfinancial corporate sector deposits are liabilities in the financial sector—the money must be returned when demanded—while all cash is a liability for the central bank.

Across the ten countries, financial firms in Japan had the largest amount of currency and deposit liabilities, valued at 4.3 times GDP as of 2020. The United Kingdom and France were next, with currency and deposits amounting to 4.2 times and 3.9 times GDP, respectively.[78] Financial firms in Canada and the United States had the largest equity liability among financial corporations, at 2.8 and 2.0 times GDP, respectively.

Other notable liabilities include debt and pensions and, in the United Kingdom, derivatives.[79] Debt as a liability is highest in the financial sectors of the same countries where debt as an asset is highest—Canada, Japan, and the United Kingdom. Across all countries, 80 to 100 percent of pension liabilities reside in the financial sector. And in the United Kingdom, the financial sector has liabilities related to derivatives that nearly match assets that are derivatives totaling 2.4 times GDP.

Financial sector balance sheets that include central banks have grown as a result of increasing currency and deposit liabilities and equity liabilities

Central bank financial assets increased from 0.1 times GDP in 2000 to 0.5 times GDP in 2020, with the most rapid expansions taking place in France, Germany, and Japan.[80] More than a quarter of the growth globally occurred during the COVID-19 pandemic that started in late 2019. Central bank currency and deposit liabilities similarly spiked from 2019 to 2020; in Canada, Sweden, and the United States, countries where granular data were available, central bank currency and deposit liabilities more than doubled relative to GDP during that pandemic year. Since 2008, central bank balance sheets tripled in size relative to GDP (Exhibit 23).

[77] Some debt financing activities may occur outside the financial sector (and not appear on the financial sector's balance sheet); for example, households can purchase government or corporate bonds.

[78] The United Kingdom and France also have the largest currency and deposit assets in the focus countries' financial sectors. This indicates cross-holdings within the financial sector of these assets. As a result, currencies and deposits appear larger than they would in a consolidated view.

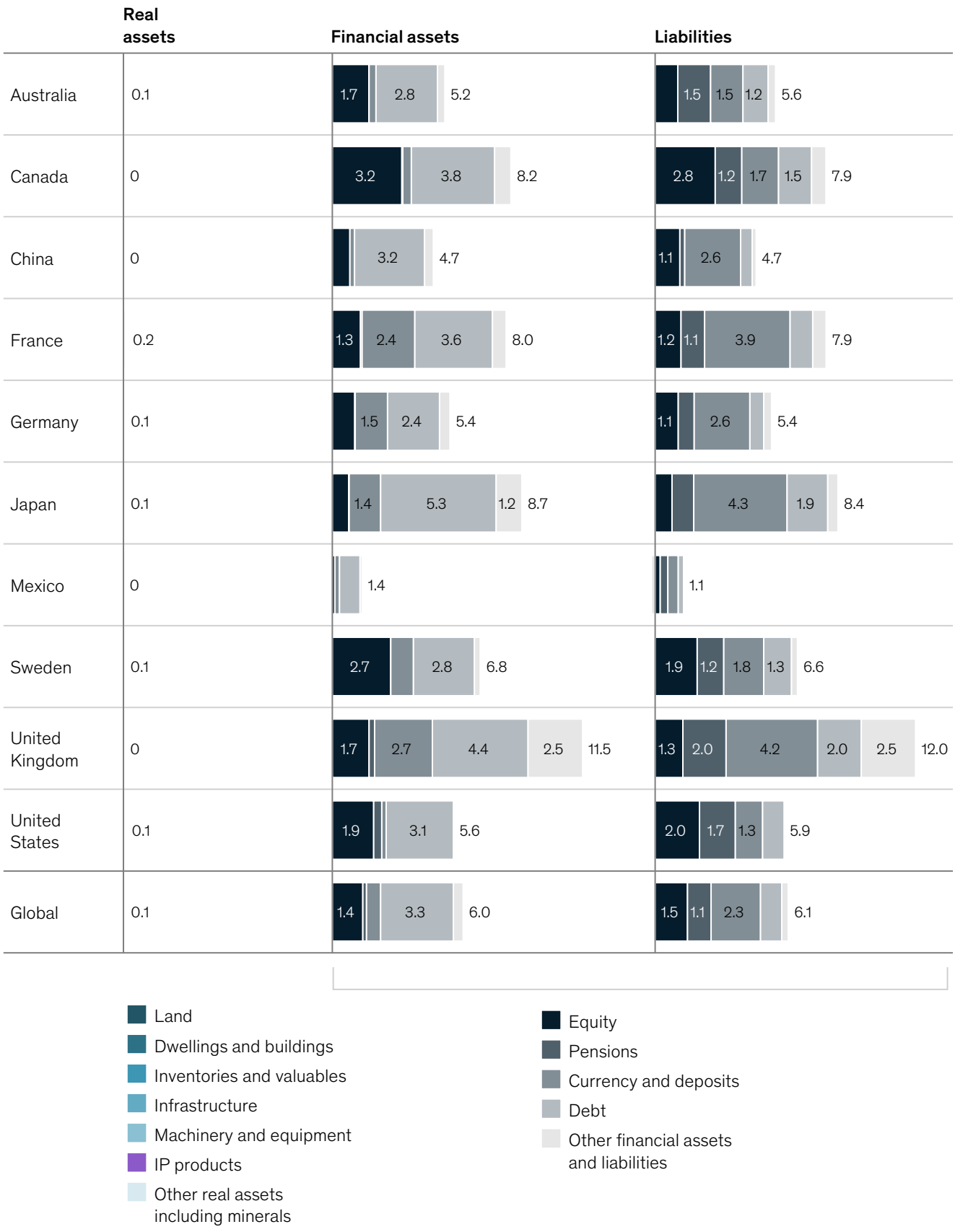
[79] The 2008 System of National Accounts includes derivatives as a financial asset (and liability), even though the value of a swap at initiation is zero.

[80] Japan's central bank financial assets increased from 0.2 times GDP in 2000 to 1.4 times GDP in 2020. France and Germany's central bank assets each increased from 0.1 times GDP in 2000 to 0.8 times GDP in 2020.

Exhibit 22

Financial sector balance sheets are particularly large in Canada, Japan, and the United Kingdom.

Financial sector balance sheets across countries, 2020, GDP multiple, nonconsolidated data

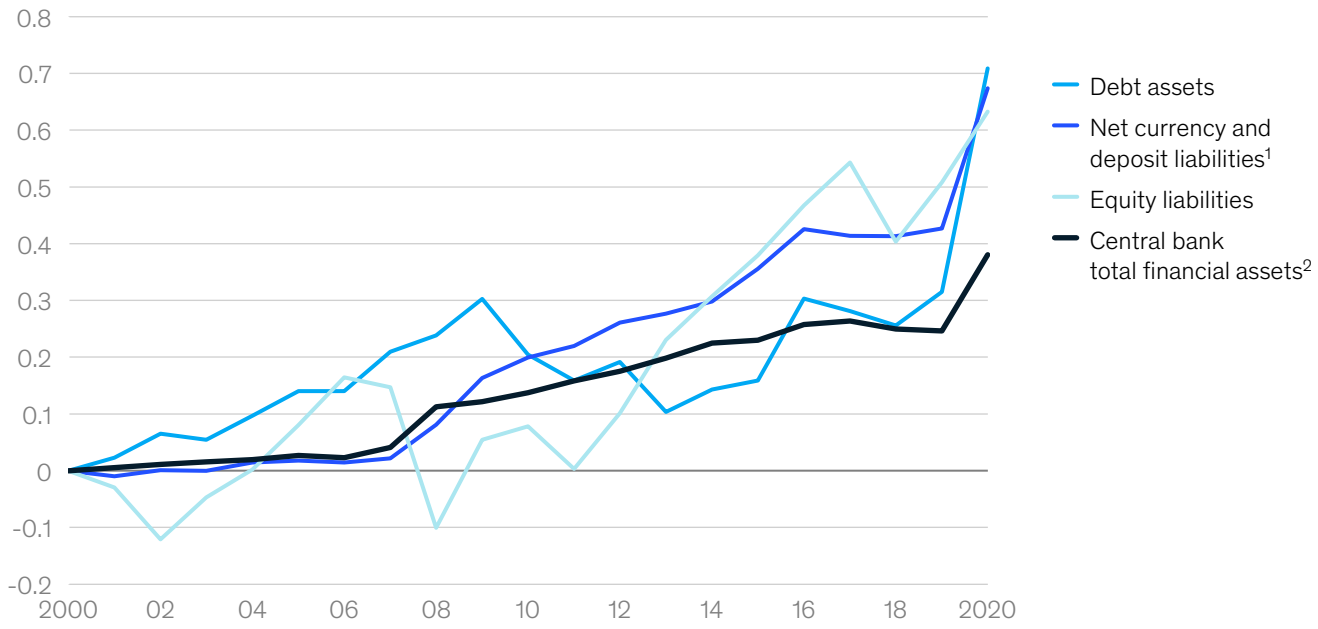


Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 23

Central bank balance sheets have tripled in size relative to GDP since the 2008 financial crisis.

Financial sector balance sheet growth, change in GDP multiple since 2000



1. Total sector currency and deposit liabilities less total sector currency and deposit assets; given nonconsolidated data, the net liability position represents the within-sector consolidated currency and deposits position.
2. Central banks are included in financial sector balance sheets; central bank total financial assets overlap with the total financial sector debt assets also shown here.

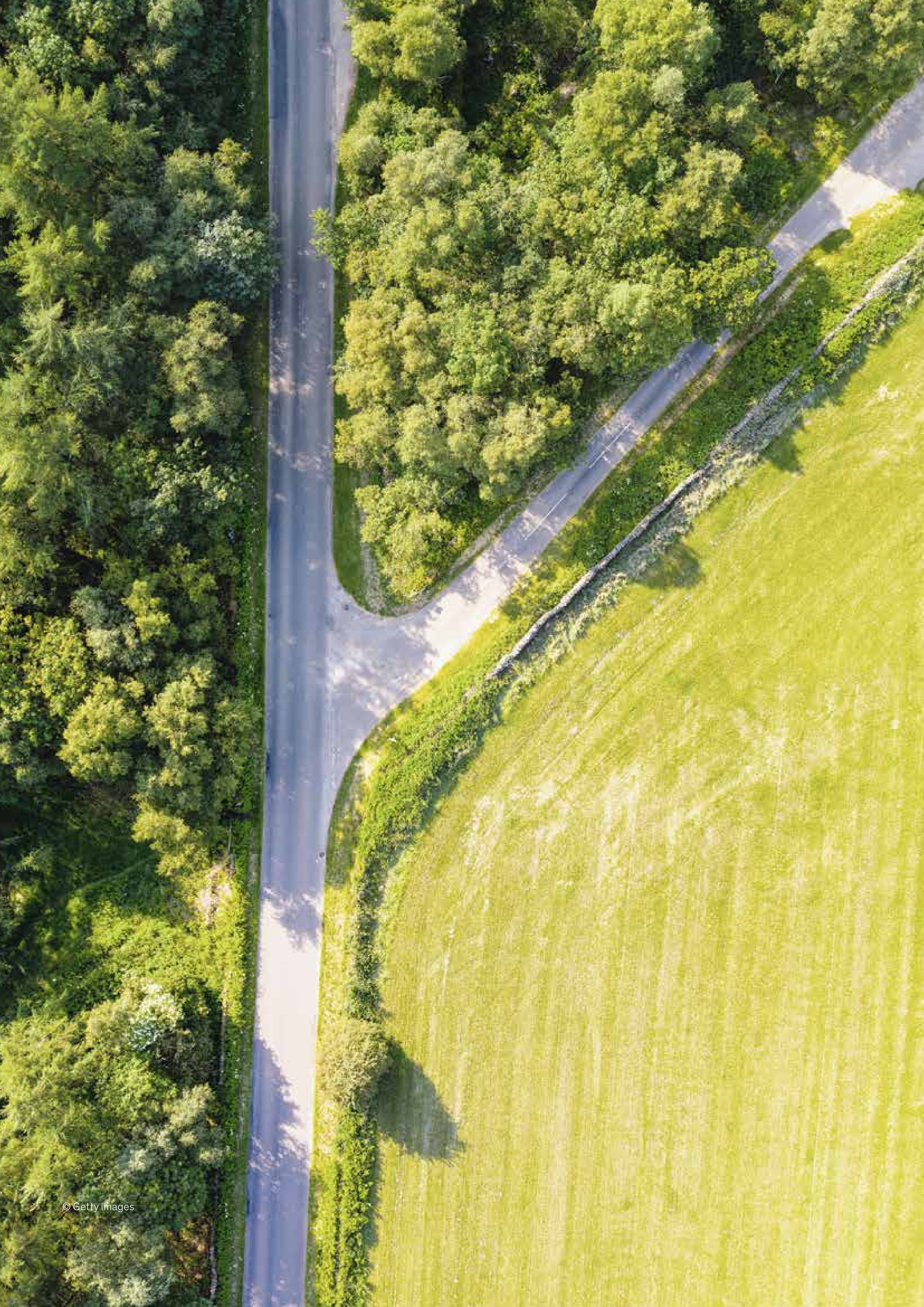
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

In the financial sector as a whole, balance sheets grew by 1.7 times GDP, nearly half of which came from growth in debt assets (mirroring growth in debt liabilities spread across other sectors, and including debt acquired by central banks in asset-purchasing programs). Debt assets grew primarily in the lead-up to the 2008 crisis, as well as between 2019 and 2020. The United Kingdom, which had the largest financial sector balance sheets in 2020, also saw the greatest growth over the past two decades, by about 5.5 times GDP.

On the liability side of the balance sheet, the largest share of growth came from currency and deposit liabilities—which can be attributed in part to money expansion and monetary policy—and includes both central bank and commercial bank assets. Net currency and deposit liabilities (netting out loops in the financial sector, particularly with central banks) grew by 0.7 times GDP from 2000 to 2020, with nearly all of the growth occurring from 2008 onward. Among the focus countries, China and Japan saw the largest growth in net currency and deposit liabilities from 2000 to 2020, each by about one GDP multiple, followed by France, at 0.8 times GDP (for France and Japan, one-third of this growth took place from 2019 to 2020).

Each of the four sectors plays its own important role in the global balance sheet and in the creation, allocation, and control of wealth. Households own wealth and provide essential financing to corporations via equity and bond purchases, as well as deposits, and to governments via bonds. Corporations and governments in turn create, intermediate, and enable wealth for households.



3. A two-decade divergence between net worth and GDP

The global economy has undergone a vast transformation over the past two decades, as rapid technological progress including digitization has taken hold and investment in intangible assets has soared. Yet over this same period, global wealth has grown largely as a result of the rising value of household real estate, a historical store of value.[81]

Interest rates, nominal and real, have fallen since the early 1980s in response to a policy of inflation control. In the wake of the 2008 financial crisis, rates became unusually low, in line with underlying productivity trends but also reflecting large-scale asset-purchasing programs by central banks. Concurrently, low interest rates have fueled increases in asset prices around the world. The value of corporate equity and other financial assets has also risen markedly, contributing to household net worth and, at the same time, increasing liabilities and expectations of operational returns for companies.

GDP growth, meanwhile, has slowed. In the ten focus countries in our sample, average yearly GDP growth was 12 percent in nominal and 4 percent in real terms from 1970 to 1999, then declined to 4 percent in nominal and 2 percent in real terms from 2000 to 2020.[82] Over the past two decades, balance sheet and net worth growth have diverged significantly from their traditional relationship to GDP growth. Whether this is a permanent change, the result of higher savings due to changing demographics and other trends in some countries, or an anomaly that will eventually end, returning the net worth relationship with GDP to its historical mean will determine the future trajectory of the global economy.

The global balance sheet has grown relative to GDP over the past 50 years and more substantially over the past decade

From 1970 to 2000, the components of the global balance sheet expanded from between $6 trillion and $12 trillion to around $150 trillion, an extrapolation based largely on data from Japan and the United States in the 1970s and 1980s (Exhibit 24). This growth largely reflects rapid increases in financial assets within and outside the financial sector following the liberalization of the financial system in the United States after the Bretton Woods system ended; a late 1980s real estate and equity boom (and, eventually, decline) in Japan; and growth in US equity markets in the 1990s.[83]

[81] For a discussion of the historical role of land and real estate as a source of wealth, see Simon Winchester, *Land*, HarperCollins, 2021.

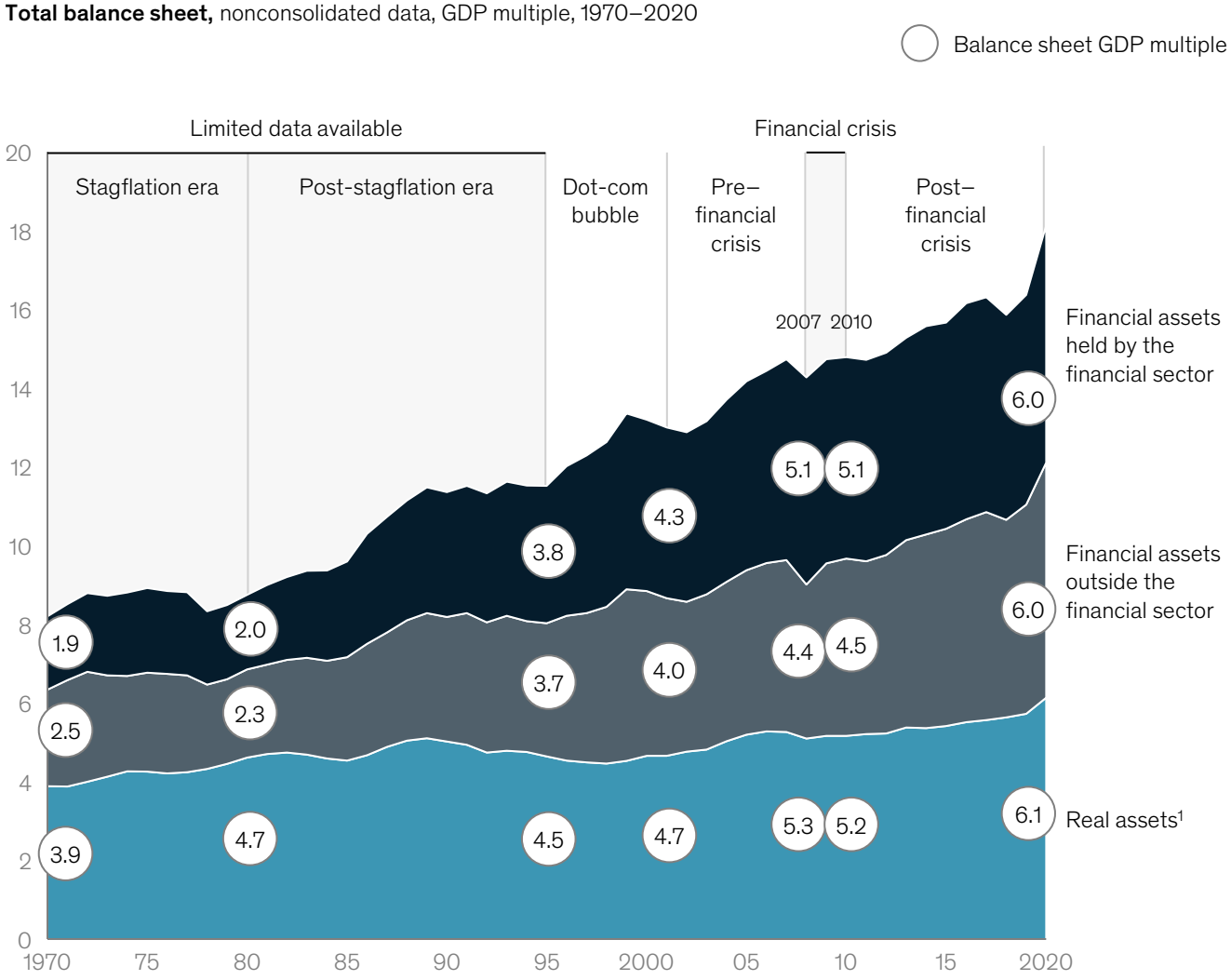
[82] Figures represent simple averages for our ten focus countries. World Bank Open Data, data.worldbank.org.

[83] For more information, see Pierre-Olivier Gourinchas and Hélène Rey, "From world banker to world venture capitalist: US external adjustment and the exorbitant privilege," in *G7 current account imbalances: Sustainability and adjustment*, Richard Clarida, ed., National Bureau of Economic Research Books, 2007; Pierre-Olivier Gourinchas and Hélène Rey, "International financial adjustment," *Journal of Political Economy*, August 2007, Volume 115, Number 4; and Shigenori Shiratsuka, "The asset price bubble in Japan in the 1980s: Lessons for financial and macroeconomic stability," in Bank for International Settlements (ed.), *Real estate indicators and financial stability*, volume 21, Bank for International Settlements, 2005.

Exhibit 24

Over the past 50 years, the global balance sheet has increased faster than GDP, with the most rapid growth occurring over the past decade.

Total balance sheet, nonconsolidated data, GDP multiple, 1970–2020



1. From 1970 to 1999, net worth is used as a proxy for real assets given limited data availability.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Financial data begin at different years: United States, Japan, 1970; United Kingdom, 1986; Australia, 1988; Canada, France, Germany, Sweden, 1996; China, 2000; Mexico, 2003.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Since 2010, the total balance sheet has grown at a rapid clip, recording average increases of 11 percentage points a year (on average across all three balance sheet components), compared with 5 percentage points from 2000 to 2010 and 6 percentage points from 1970 to 1999. While financial assets and liabilities played a strong role in this expansion over the past 20 years, in contrast to earlier periods, real assets moved up in sync.

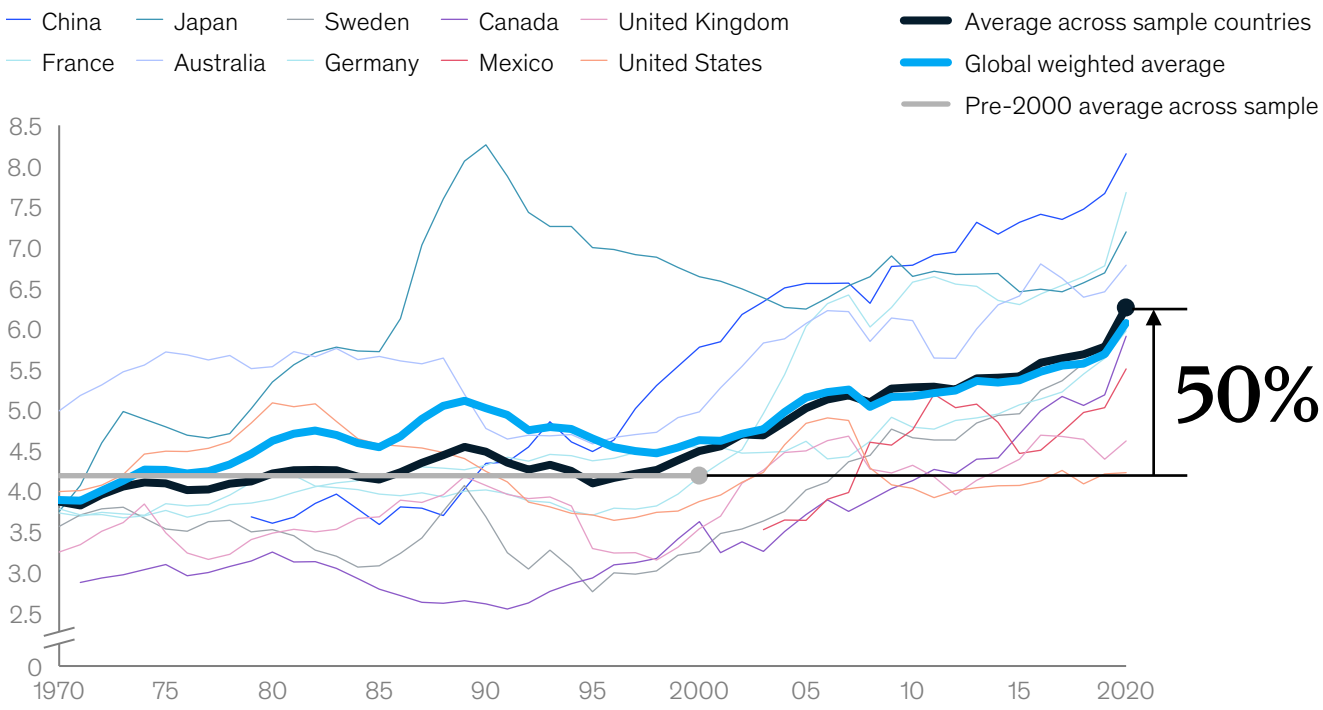
Real assets, or net worth, grew at a much faster pace than GDP between 2000 and 2020, a departure from their traditional relationship

Before the turn of the century, the growth in net worth at the global level had a relatively stable relationship to GDP growth (Exhibit 25). Given the sluggishness of global GDP growth since 2000, it would be reasonable to expect that net worth would also have tepid growth (see Box 3, "The relationship of capital and output in theory and practice").

Exhibit 25

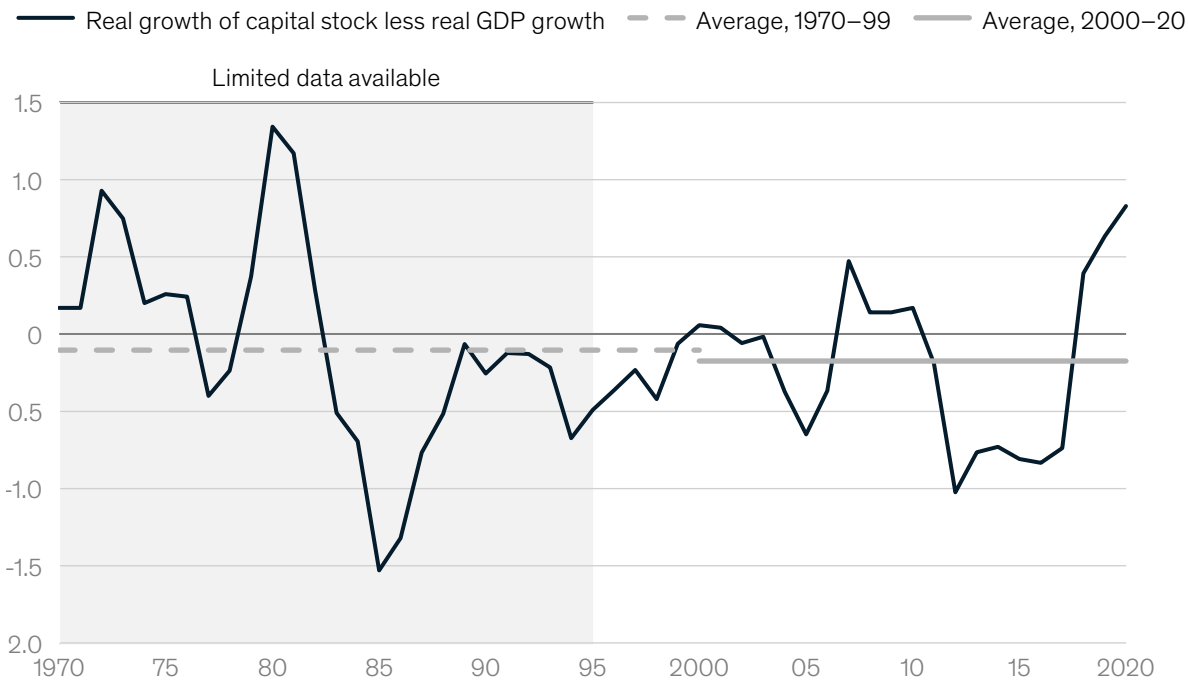
Since 2000, net worth at market prices has increased relative to nominal GDP in most countries.

Net worth at market prices relative to nominal GDP, 1970–2020



Without revaluation effects, real assets have grown broadly in line with real GDP

Real growth of capital stock less real GDP growth, 5-year rolling average, global weighted average, 1970–2020, %[1]



1. Real growth of capital stock is calculated as net investment in a given year divided by produced asset stock of the previous year.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. On the real growth chart, data availability starting dates are the following: United States, 1970; France, 1979; Australia, 1989; Japan, 1995; Sweden, United Kingdom, 1996; Canada, Germany, 1997; China, 2001; Mexico, 2004.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Inequality Database; World Bank; McKinsey Global Institute analysis

Box 3

The relationship of capital and output in theory and practice

One purpose of our inquiry is to understand the trajectory of two ratios: (1) wealth to income, and (2) capital to output. Under the simplest conditions, these ratios are identical. In fact, within the workhorse model of the growth of GDP, developed in the 1950s by Nobel laureate Robert Solow, we can derive the long-term equilibrium stock-flow ratio.[1] With K (for capital, a stock variable) and Y (for output, a flow variable), the ratio K/Y seems to have been historically roughly constant.

Solow's model is based on two relations. The first describes how inputs are transformed into outcomes. This is the production function, with labor and capital as input factors, and technological progress as the ultimate driver of productivity growth. The second relation explains the accumulation of assets over time, which produce economic returns or services provided by assets. Here, the stock of assets grows with additional funds (savings) made available to firms. Concurrently, wear and tear reduce usable productive capacities. If we now assume that (1) the production relationship is of a certain type, that is, output doubles when the two inputs, labor and capital, double; and that (2) labor and capital are allocated through perfectly competitive markets, in other words, no producer has an influence on prices and there is no market power; then the steady state value of K/Y is the capital share of income (commonly named α) divided by the real rate of return on capital, or its rental rate.

Reality is, of course, significantly more complex, as Solow himself emphasized. Competition in the various markets is less than perfect. Monopoly power exists and has possibly increased, at least in certain sectors.[2] Workers do not earn according to their marginal productivity. A highly contentious question is what should be included in the numerator, in other words, what should be counted as K.

In a much-debated book, Thomas Piketty built his analysis of long-term trends in the distribution of wealth on these Solowian (or neoclassical) foundations.[3] In fact, the evolution of the ratio of K over Y (which he calls β) determines the capital share of income (which he also dubs α). Piketty included in K the market values of financial assets, housing, and so forth. While the empirical results of a trend-wise increase in this version of the capital-output ratio have not been contested, critics have argued that most of the increase in K/Y was the upshot of rising property prices, a valuation effect.[4]

Solow suggested starting from a much cleaner K, subtracting "housing stock and associated land" as well as "financial services (in Y, the denominator), because it is so unclear what one means by output"; unincorporated enterprises, because it is impossible to separate labor income from return to capital; and general government, because the accounting conventions "make no sense."[5]

Among other issues, it is an obvious simplification to suppose a homogenous stock of capital and rate of return. Still, the benchmark model can give us an indication of typical (steady state) values. At a minimum, such stylized facts can serve as benchmarks, to think about how to justify deviations of K over Y across time and countries.

1 Robert M. Solow, "A contribution to the theory of economic growth," *The Quarterly Journal of Economics*, February 1956, Volume 70, Number 1; and "Technical change and the aggregate production function," *The Review of Economics and Statistics*, August 1957, Volume 39, Number 3.

2 This view has been argued by Thomas Philippon in *The great reversal: How America gave up on free markets*, Harvard University Press, 2019.

3 See Thomas Piketty, *Capital in the twenty-first century*, Harvard University Press, 2013.

4 See Odran Bonnet et al., *Does housing capital contribute to inequality? A comment on Thomas Piketty's Capital in the 21st century*, Sciences Po Economics Discussion Papers, number 2014-07, 2014; J. Bradford Delong and Robert Solow, "Comments and discussion," *Brookings Papers on Economic Activity*, Spring 2015; Matthew Rognlie, "Deciphering the fall and rise in the net capital share: Accumulation or scarcity?," *Brookings Papers on Economic Activity*, Spring 2015.

5 J. Bradford Delong and Robert Solow, "Comments and discussion," *Brookings Papers on Economic Activity*, Spring 2015.

There were a few notable deviations from the overall flat trend of ratios of net worth to GDP prior to 2000. In the late 1970s and early 1980s, Canada, France, the United Kingdom, and the United States experienced double-digit inflation rates. Our analysis of the United States shows that construction costs rose beyond general inflation, driving up prices of structures and pushing net worth up relative to GDP.[84] In the United States, net worth relative to GDP declined throughout the 1980s, as high interest rates curbed inflation.[85]

Similarly, net worth in Japan rose 45 percent relative to GDP as asset prices spiked from 1985 to 1990. When the boom began, Japan was a highly successful, export-driven economy, and its real estate and equity markets rose to levels previously unseen. But the country began struggling to compete as the value of its currency soared relative to that of other countries. Its equity and real estate bubble burst in 1989, triggering Japan's "lost decade(s)." To repair their balance sheets, companies and households increased their savings, banks tightened credit, and the Japanese central bank intervened, adopting expansive monetary policy by asset purchases. Yet the economy failed to fully regain its momentum. Net worth relative to GDP fell for about 15 years before stabilizing at levels that are still above the pre-1985 average in Japan and those of most other countries.[86] The Japanese equity market has yet to reach its pre-1990 peak.[87]

In another example, soaring housing prices in Sweden in the early 1990s widened the spread between net worth and GDP.[88] A similar pattern occurred in the United States before the 2008 financial crisis. In these cases and others, net worth typically returned to more normal levels in comparison to GDP over time.[89]

Since 2000, however, real assets and net worth globally have climbed higher while global GDP growth has slowed. Net worth compared to GDP was 25 percent higher on average between 2000 and 2020 than between 1970 and 1999. As of 2020, it was nearly 50 percent higher than the pre-2000 average in our ten countries, with considerable variation among them. From 2000 to 2020, our research finds, the ratio of net worth to GDP grew in France, for instance, by 371 percentage points, in Sweden by 301 percentage points, and in China by 262 percentage points.

In the United States, net worth growth has been more muted than in other economies. In comparatively elastic real estate markets outside of major cities, real estate prices took some time to recover from their 2008 peak and the ensuing collapse.[90] And while the average value of total real estate controlled by US households rose from 1.9 times GDP to 2.3 times GDP, the growing foreign debt liabilities of the US government mask this in the country's total net worth. Moreover, as economists have pointed out, the United States creates surplus income out of a net liability position.[91]

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[84] Based on data from the US Bureau of Economic Analysis, construction price growth was roughly double that of overall GDP inflation in the United States from 1965 to 1980, resulting in higher values of structures relative to GDP.

[85] See William Poole, "President's message: Volcker's handling of the Great Inflation taught us much," Federal Reserve Bank of St. Louis, January 2005.

[86] See Takeo Hoshi and Anil K Kashyap, "Japan's financial crisis and economic stagnation," *Journal of Economic Perspectives*, Winter 2004, Volume 18, Number 1, pp. 3–26; and Yang Hu and Les Oxley, "Bubble contagion: Evidence from Japan's asset price bubble of the 1980s–90s," *Journal of the Japanese and International Economies*, September 2018, Volume 50.

[87] Shigenori Shiratsuka, "The asset price bubble in Japan in the 1980s: Lessons for financial and macroeconomic stability," in Bank for International Settlements (ed.), *Real estate indicators and financial stability*, volume 21, Bank for International Settlements, 2005.

[88] See Rima Turk-Ariss, *Housing price and household debt interactions in Sweden*, IMF working paper number 15/276, December 2015.

[89] See Robert Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015; and Òscar Jordà et al., "The rate of return on everything, 1870–2015," *The Quarterly Journal of Economics*, 2019, Volume 134, Number 3.

[90] See Edward Glaeser and Joseph Gyourko, "The economic implications of housing supply," *The Journal of Economic Perspectives*, Winter 2018, Volume 32, Number 1.

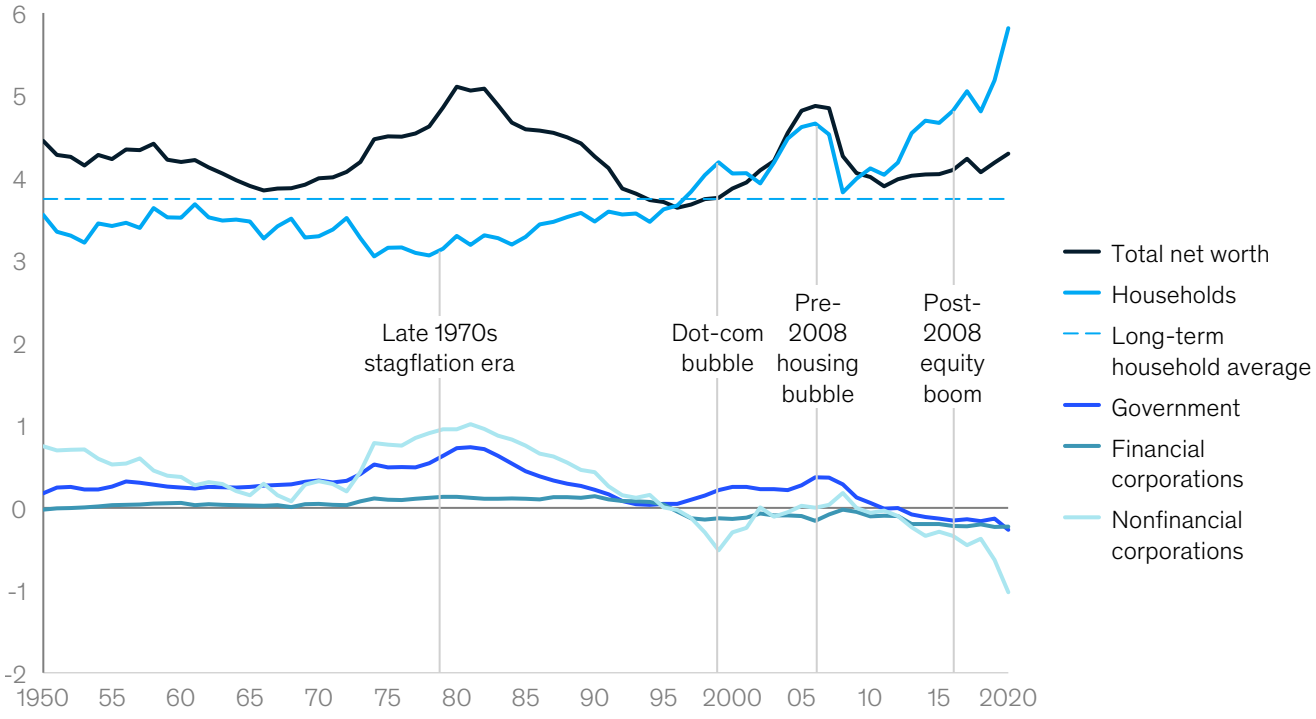
[91] Pierre-Olivier Gourinchas and Hélène Rey, "From world banker to world venture capitalist: US external adjustment and the exorbitant privilege," in *G7 current account imbalances: Sustainability and adjustment*, Richard Clarida, ed., National Bureau of Economic Research Books, Chicago, 2007; and Barry Eichengreen, *Exorbitant privilege: The rise and fall of the dollar and the future of the international monetary system*, Oxford University Press, 2010.

Furthermore, household net worth in the United States has expanded rapidly on the back of rising equity valuations. These have often been supported by expansionary monetary policy, in particular with quantitative easing, launched against the backdrop of two massive shocks—the 2008 financial crisis and the COVID-19 pandemic. The household sector's net worth position is, however, masked in overall country net worth as it nets out with the respective corporate liabilities (Exhibit 26). Equity liabilities of US firms grew from 1.5 times GDP in 2000 to 2.5 times GDP in 2020, and from 1.2 to 1.7 times underlying net asset values, according to our research. Equity valuations similarly explain the opposite trends seen in the net worth of the household and corporate sectors in the United States during the dot-com bubble of the late 1990s. Then, household net worth came to exceed country net worth, and the net worth of nonfinancial corporations turned negative. During a period of stagflation in the late 1970s, the opposite trend occurred, as equity values declined substantially relative to net assets, decreasing net worth for households while reducing liabilities and profit expectations for nonfinancial corporations.

Exhibit 26

Net worth relative to GDP has returned to long-term averages in the United States, though household net worth continues to grow.

US net worth by sector since 1950, GDP multiple



Source: Bureau of Economic Analysis; Federal Reserve Board; World Bank; McKinsey Global Institute analysis

Rising prices of real assets accounted for three-quarters of the increase in net worth between 2000 and 2020

As interest rates fell to historic lows, the value of real estate and equities rose, attracting investment. Increasing valuations attracted more funds, a cycle that continues today.

Over the past two decades, net worth has primarily grown as a result of price increases of real assets, rather than through accumulating saving and investment

Globally, we estimate that somewhat less than 30 percent of net worth growth in absolute terms was driven by net investment, while roughly three-quarters was driven by price increases.[92] These price increases can be further broken down to 34 percent, which moved in line with general consumer price inflation, and 43 percent, which grew in excess of general inflation.[93] With the exception of Japan, we see price increases driving 59 to 96 percent of absolute net worth growth across all countries. In all countries apart from Germany, Japan, Mexico, and the United States, price increases in excess of general inflation were the largest contributor to net worth growth (Exhibit 27).

For some countries, changes in net financial assets and the international investment position also played a role. In Japan and Germany, more than 20 percent of absolute net worth growth stemmed from growth in net financial assets. Canada and Sweden also saw notable positive contributions from net financial assets. In the United Kingdom and United States, by contrast, increasingly negative net international investment positions depressed net worth growth.[94]

Asset price growth greater than general (or goods price) inflation was more pronounced over the past two decades than in earlier time frames. Comparing the past 20 years with two prior 20-year periods in the United States, where longer-term data are available, we see that price growth in excess of inflation plays a larger role than in earlier decades in driving net worth growth after 2000, at 34 percent.[95] If the recessionary years of 2008 to 2009 are excluded, this figure increases to 49 percent. In the 20 years after 1980, which encompassed the US savings-and-loan crisis in the late 1980s and early 1990s, asset prices were mostly in line with general inflation and thus did not contribute substantially to actual or nominal net worth growth. From 1960 to 1980, asset price increases exceeding inflation drove 18 percent of absolute net worth growth in the United States. The two peaks in US net worth relative to GDP—in 1980, at 5.1 times GDP, and in 2006, at 4.9 times GDP—followed stretches when asset prices grew faster than inflation (Exhibit 28).

In the ten countries in our sample, in years when net worth grew relative to GDP, asset price increases in excess of inflation were the largest factor roughly three-quarters of the time. By contrast, for years in which net worth growth lagged behind GDP growth, price increases beyond inflation were the largest net worth driver only about 30 percent of the time.[96]

[92] Although net worth relative to GDP was flat or even declined in the United States and Japan from 2000–20, in absolute terms net worth growth was positive; it did not grow faster than GDP. For details of our methodology, see the technical appendix.

[93] General inflation refers to change in the consumer price index. We distinguish between increases in line with general inflation and increases in excess of goods (and services) price inflation.

[94] As mentioned previously, given the "exorbitant privilege" for the United States as the "world banker," this has been compatible with surplus income on capital accounts. See Pierre-Olivier Gourinchas and Hélène Rey, "From world banker to world venture capitalist: US external adjustment and the exorbitant privilege," in *G7 current account imbalances: Sustainability and adjustment*, Richard Clarida, ed., National Bureau of Economic Research Books, 2007.

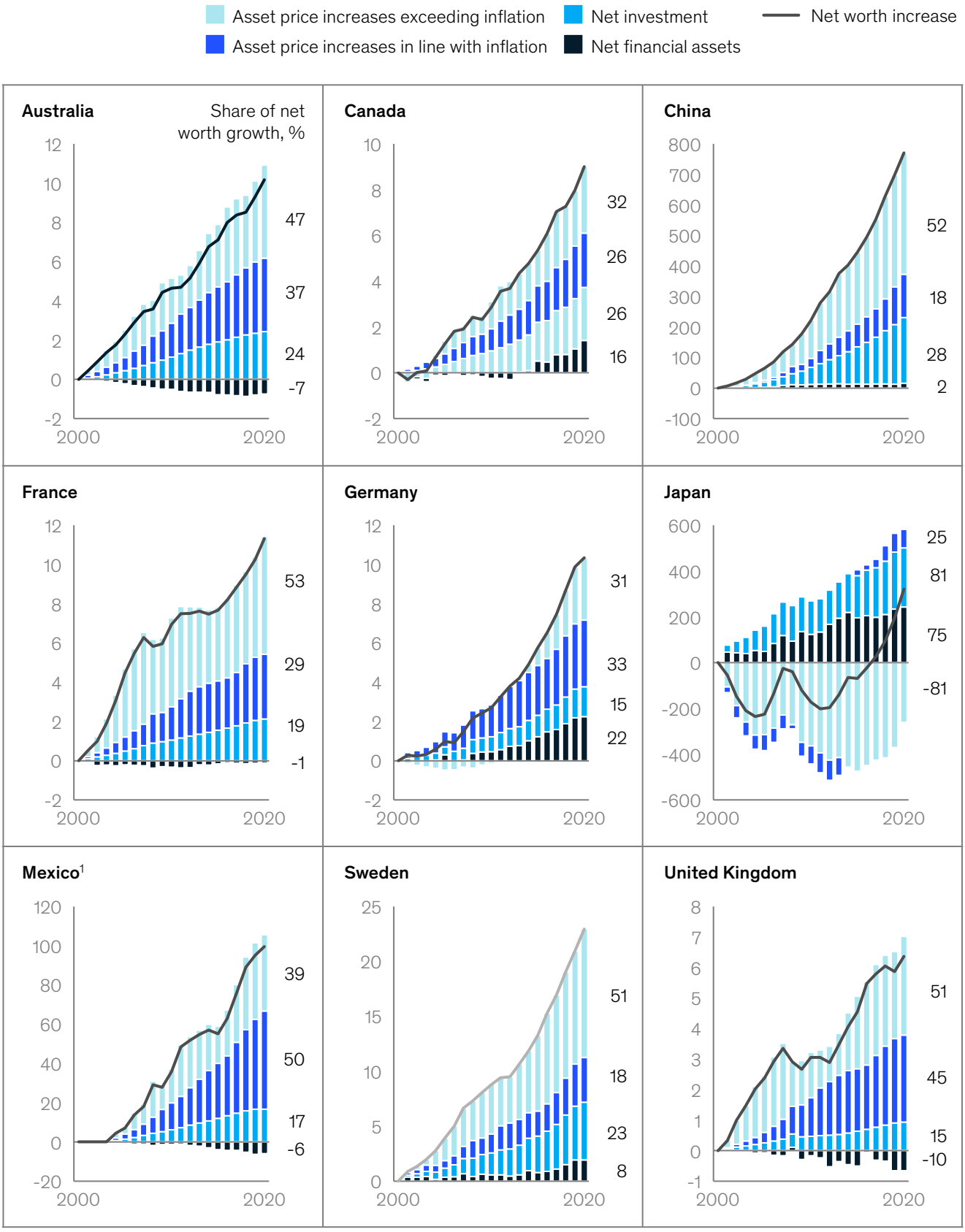
[95] For the US historical view, we use data from the Federal Reserve and the Bureau of Economic Analysis. See the technical appendix for further detail, including an explanation of our methodology.

[96] Using a chi-square test, which allows us to see whether two variables are independent or related, we see a statistically significant relationship (p-value <0.01) between years with excess asset price growth as the largest net worth contributor and years when net worth grew in excess of GDP.

Exhibit 27

Price changes across countries account for 59 to 96 percent of net worth growth from 2000 to 2020, with the exception of Japan.

Net worth growth from asset price increases, net investment, and net financial assets, local currencies, trillion



1. Mexico's data begin in 2003.

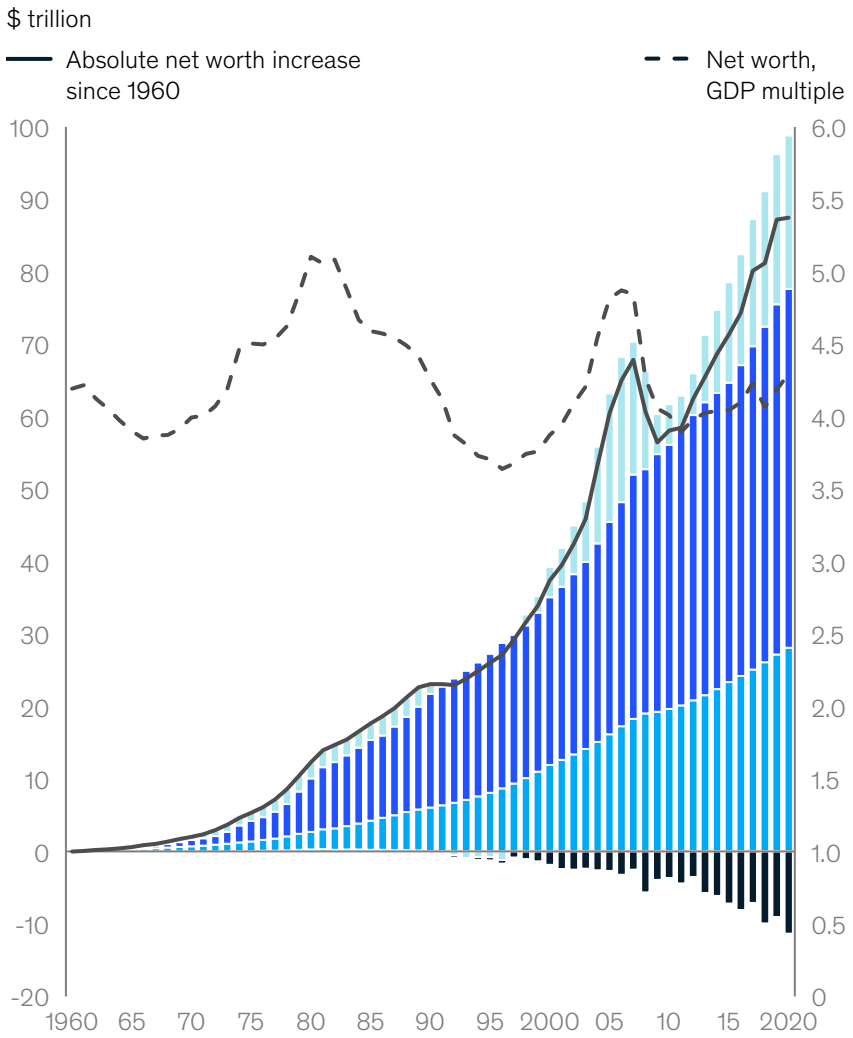
Note: Different scales reflect different countries' currencies. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 28

In the United States, price changes drove 87 percent of net worth growth from 2000 to 2020, 40 percent of which exceeded inflation.

Growth of net worth and net worth drivers since 1960 in the United States



	Share of net worth growth, %		
	1960–80	1980–2000	2000–20
Asset price increases exceeding general inflation	18	8	34
Asset price increases in line with general inflation	60	68	53
Net investment	20	40	32
Net financial assets	2	-8	-19

Source: Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve Board; McKinsey Global Institute analysis

The divergence of net worth from its historical relation to GDP is linked to to interest rate declines

After 2000, a period of growth in real asset prices and, as a result, in net worth correlates with declining interest rates globally (Exhibit 29). In advanced economies, average interest rates have declined for roughly four decades and hovered around zero since the 2008 financial crisis. A savings glut in some pockets of the economy has coincided with a declining rate of net investment relative to GDP, pushing up asset prices.

We find a statistically significant negative association between net worth relative to GDP and five-year rolling averages of nominal long-term interest rates in most countries. Apart from China, Japan, and the United States, nominal long-term interest rates explain at least a quarter of the growth in net worth relative to GDP in the other seven countries.[97]

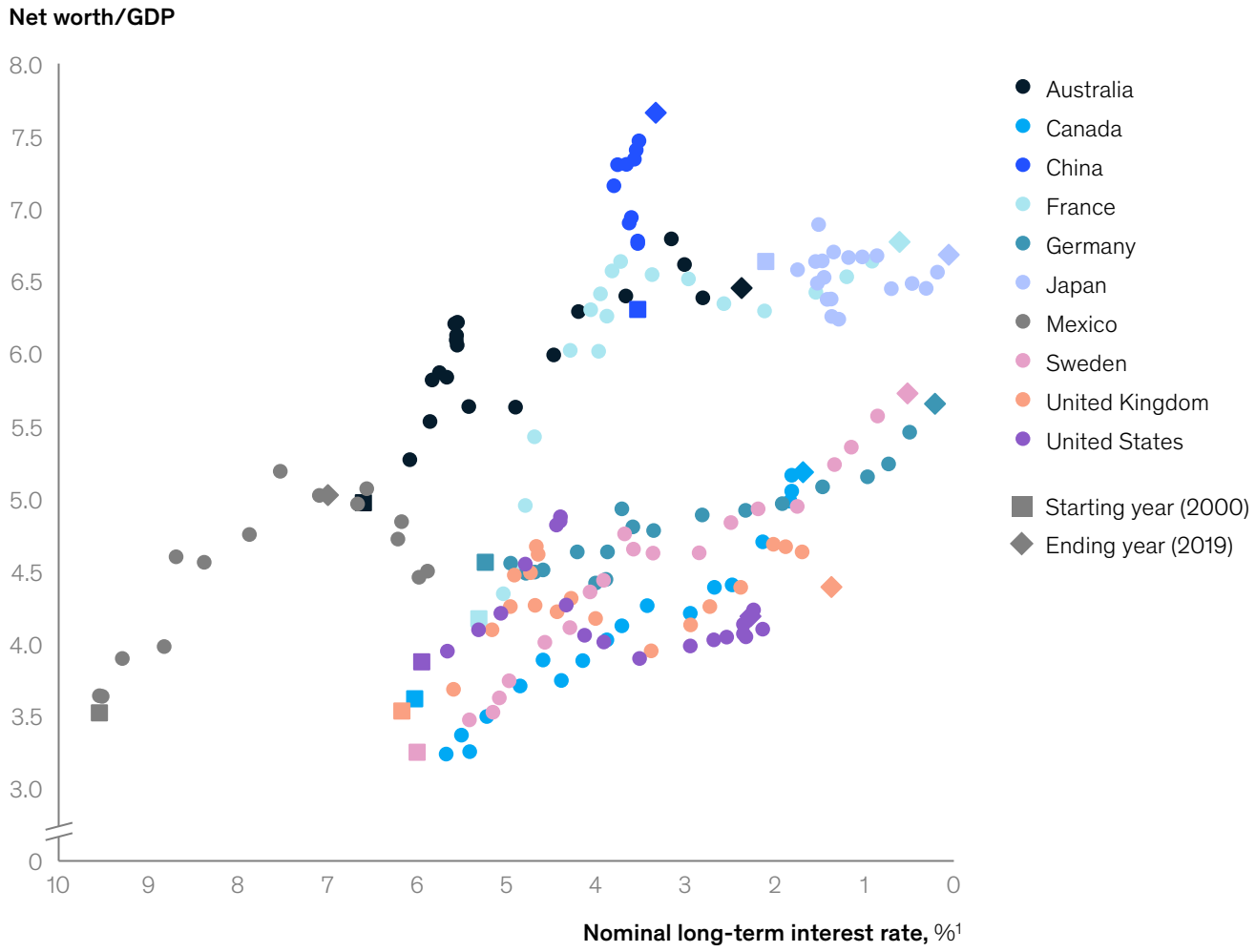
As previously noted, Japan and the United States did not see substantial growth in net worth relative to GDP from 2000 to 2020. In the United States, this is at least in part because of the

[97] See the technical appendix for a full regression output by country.

Exhibit 29

Growing net worth relative to GDP is linked to declining nominal long-term interest rates.

Net worth relative to GDP vs nominal long-term interest rates, 2000–19



1. Five-year rolling average interest rate used to account for long-term nature of investment in real assets.

Note: China's data start in 2008, Mexico's in 2003, and all other countries in 2000. Net worth/GDP and 5-year rolling averages of nominal interest rates have a statistically significant (p-value < 0.001) negative relationship (coefficient of -0.24; a 1% increase in nominal interest rates is associated with a decline in the net worth/GDP multiple of 0.24). The R-squared value is 0.19.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

2008 financial crisis that muted asset prices for a sustained period despite very low interest rates. Japan, meanwhile, had low interest rates throughout the period, leaving little room for interest rates to decline further.[98] In China, by contrast, net worth grew materially relative to GDP, while interest rates did not see a significant decline over the past decade in the same manner as in the other countries in our data.

Household real estate drove 32 to 64 percent of net worth growth in all countries except Japan, reflecting rising values compared to rents

The escalating value of housing, particularly in high-growth superstar cities where GDP per capita is 45 percent higher than elsewhere, contributed to increasing net worth across the ten countries.[99]

For all countries other than Japan, household real estate contributed at least 32 percent—and in some countries, as much as 64 percent—of net worth growth. In Australia, Canada, France, the United Kingdom, and the United States, household real estate was responsible for at least 50 percent of growth in net worth (Exhibit 30). History suggests that today's real estate prices are elevated relative to long-term trends (see Box 4, "Real estate prices also seem elevated from a long-term historical perspective"). After household real estate, the next-largest contributor to national net worth growth was corporate and public real estate, accounting for 15 to 42 percent in all countries apart from Japan.

Beyond real estate, other produced assets also had a role in growing net worth, particularly in China and Mexico, which are in a relatively earlier stage of economic development than the other countries in our sample, and in Japan. In China, Japan, and Mexico, produced assets of nonfinancial corporations, for example, machinery and equipment, inventories, and infrastructure, grew much faster than GDP and accounted for more than 20 percent of net worth growth. In China, although household real estate wealth grew the most in absolute terms and thus contributed the most to absolute net worth growth, produced assets of nonfinancial corporations and government had the fastest growth rates, greatly exceeding the country's GDP growth. As a result, the divergence between China's net worth and GDP is primarily attributable to those assets rather than to real estate. Other countries saw produced assets of nonfinancial corporations mostly move in line with GDP.

Japan's net worth grew due to substantial public investment. Real estate stock contracted as prices declined, but produced assets, particularly in the government sector, increased. Japan's net worth thus grew primarily as a result of net investment. Increasing net investment by the corporate and government sectors effectively offset the negative impact of lower real estate prices. In 2020, public infrastructure in Japan had a value relative to GDP that was 5.2 times higher than the average in the other countries in our sample.

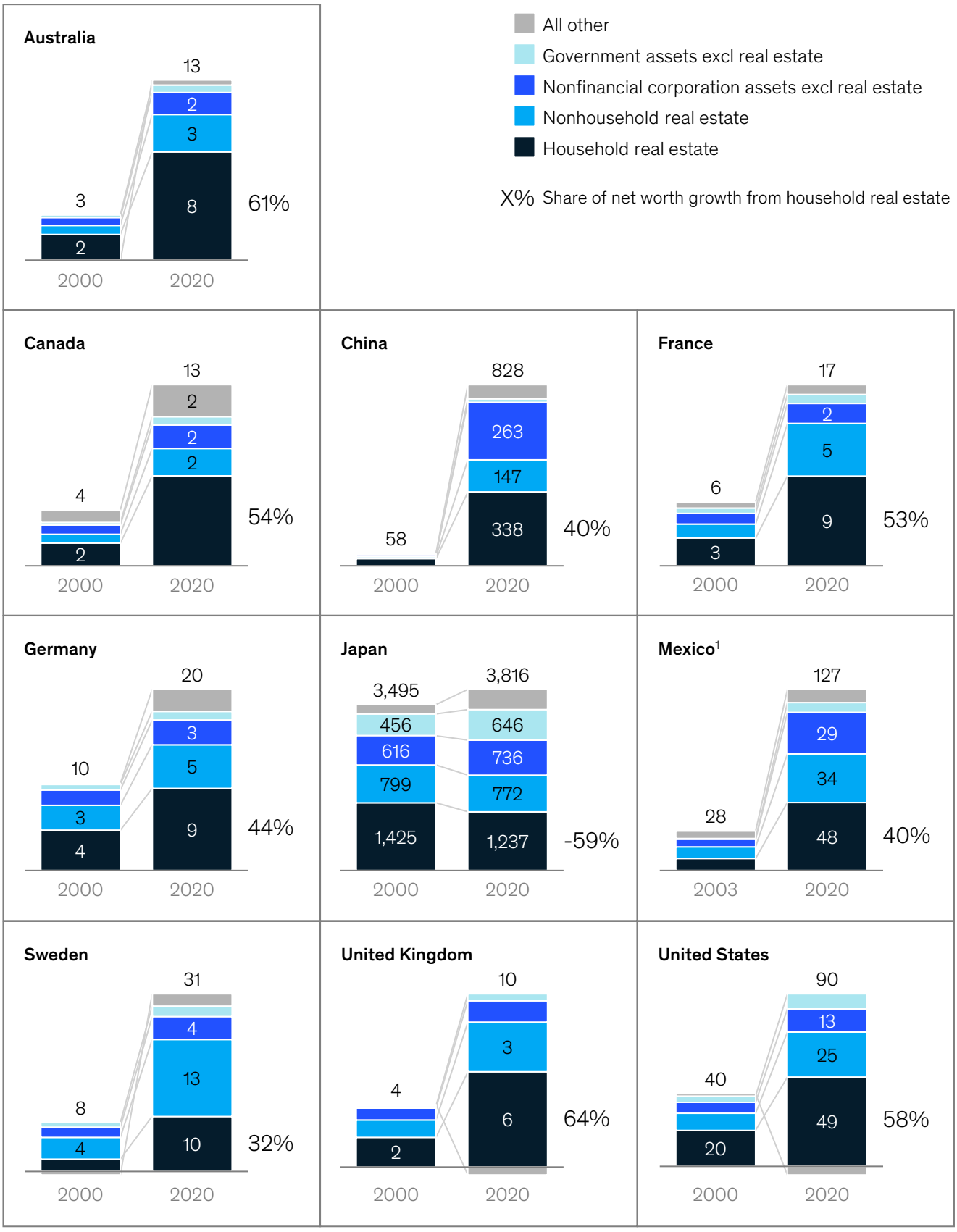
[98] Japan's long-term interest rates in 2000 were 1.7 percent, according to the OECD. Other countries in 2000 had long-term interest rates of at least 5 percent.

[99] See *Superstars: The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018.

Exhibit 30

Household real estate accounted for almost half of global wealth growth, and corporate assets added a quarter.

Net worth growth by asset type across countries, 2000–20, local currencies, trillion



1. Mexico data begin in 2003.
Note: Not to scale. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Box 4

Real estate prices also seem elevated from a long-term historical perspective

Data from Nobel laureate Robert Shiller cover US home prices over the past 130 years.[1] Inflation-adjusted home price figures show that for much of that period, home prices largely moved in line with goods price inflation—in other words, real home prices were flat—with two exceptions: beginning in and immediately following World War II and beginning in the late 1990s and continuing through 2006. (A dip around 1920 resulted primarily from the catastrophic effects of the 1918 pandemic.) The real home price growth that followed World War II stemmed from factors including a housing shortage during the war and government programs that subsidized home ownership after the war, but notably was not followed by a decline. The growth in home prices from the late 1990s through 2006, however, did culminate in a sharp decline during and immediately following the 2008 financial crisis. Since then, prices have grown again, rebounding to levels last seen before the financial crisis (Exhibit 31).[2]

Certain cities that have limited available land, including Boston and Chicago, have deviated from the national aggregate trend, with rising real home prices over the long term. For the majority of the country, however, land tends to be abundant. Intuitively, if home prices rise, developers have an incentive to build more homes, and as supplies increase, prices go back down. However, according to Shiller, this logic no longer appeared to hold, because prices began rising in the late 1990s.[3]

An even longer-term view of home prices focuses on the Herengracht canal in Amsterdam. This perspective was originally developed by Piet M. A. Eichholtz in 1996 and refined in 2012. It covers home and rent prices along the canal from 1650 to 2005.[4] Similar to the long-term US real home price index, home prices on the Herengracht canal have largely moved in line with inflation over time, and rent prices have largely moved at the same pace as home prices. While swings in home prices and the rent/price ratio do occur, even for decades at a time, home prices have historically always reverted to the mean relative to rent and overall inflation.

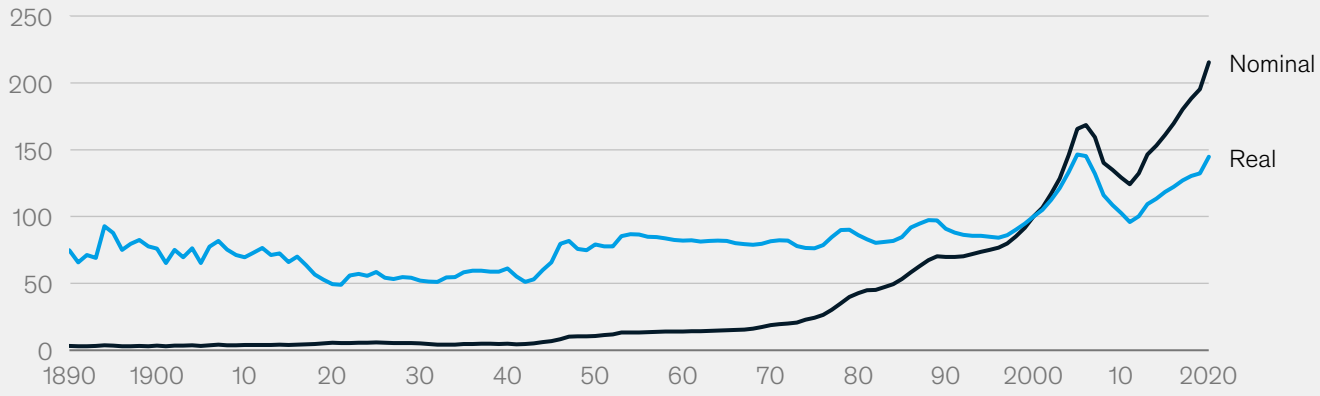
The data from Amsterdam also show a notable increase in real home prices beginning in the 1990s through 2005 (when the data end), similar to real home prices in the United States. This pattern resulted in a declining rent-to-price ratio during that time frame. Real prices in 2005 were near their late-18th-century peak.

1 "Online data Robert Shiller," econ.yale.edu.
2 See Robert J. Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015.
3 Ibid.
4 Piet M. A. Eichholtz, "A long run house price index: The Herengracht Index, 1628–1973," *Real Estate Economics*, 1997, Volume 25, Issue 2, pp. 175–92; and Brent Ambrose, Piet M. A. Eichholtz, and Thies Lindenthal, "House prices and fundamentals: 355 years of evidence," *Journal of Money, Credit and Banking*, 2012, Volume 45.

Exhibit 31

US home prices have grown substantially relative to inflation since 2000, departing from historical trends.

Nominal and real home price indexes in the United States, adjusted for inflation, 1890–2020 (index: 100 = 2000)



Source: US Home Price and Related data, for Figure 3.1 in Robert J. Shiller, *Irrational Exuberance*, 3rd edition, Princeton University Press, 2015, as updated by author

Growth in household real estate wealth stemmed from rising home prices, with the cost of land and construction also increasing

Household real estate value may grow because of increased investment that expands the actual quantity or quality of real estate stocks or because of rising market prices. All countries other than Japan saw total household real estate values grow more as a result of price increases than of the creation of a greater quantity of real estate (Exhibit 32). Net investment in new real estate stock accounted for 9 to 31 percent of the growth of household real estate values in our sample of countries excluding Japan, or 21 percent on average. Canada was at the top of the range, with net investment contributing 31 percent to higher household real estate wealth, while the United Kingdom was at the low end, with a 9 percent increase in household real estate wealth attributable to net investment. In relation to GDP, China had the highest levels of net investment in household real estate, at 8 percent of GDP on average, followed by Canada and Australia at 5 and 4 percent, respectively.

Home prices, in turn, have more than doubled in nominal terms over the past two decades across all ten countries apart from Japan, which saw declining prices, and Germany, where home prices begin to climb only after 2010.[100] Home prices reflect the prices of land and structures. The most significant driver of household real estate stock growth from 2000 to 2020 was rising land prices, accounting for more than half of the increased value of global household real estate, and about 75 percent of growth in Australia and the United Kingdom. On the lower end, Germany, Mexico, and the United States saw less than 50 percent of the increase in household real estate wealth from growing land prices. In many countries, land supply is limited by zoning policies and so is fairly inelastic to price increases.[101]

Escalating construction costs contributed an average of 24 percent to rising real estate values. Construction costs have increased across countries since 2000, at the high end rising over 200 percent in China, or roughly two and four times faster than general inflation, respectively.[102] In all countries in our data, construction costs grew by 144 percent, or 2.7 times general inflation.[103] Construction prices even rose in Japan by 15 percent, which was relatively high for a country with just 3 percent general inflation from 2000 to 2020.[104]

In inelastic land and real estate markets, declining rental yields led to home price growth in many countries

Home prices can be seen through the lens of expected rental income or, in the case of owner-occupied real estate, an implied rental value, and rental yields, which are the inverse of value-rent multiples.[105] Rental yields are a proxy for capitalization rates, which are more commonly used in the real estate industry to determine the value of real estate given expected rental income streams.[106] Capitalization rates are primarily driven by long-term interest rates but are also a function of expected rent growth, ease of financing, the tax environment, and investment substitutes.[107] In addition, expectations about price appreciation in housing markets tend to be extrapolative, potentially leading to values difficult to justify by fundamentals.[108]

[100] Germany has strong rent controls and a housing market centered on renting more than owning. Based on OECD's nominal home price index.

[101] In the United States, land and housing supply is also relatively elastic to price increases outside major cities (in other words, supply is less constrained), which contributed to lower home price growth. See Edward Glaeser and Joseph Gyourko, "The economic implications of housing supply," *The Journal of Economic Perspectives*, Winter 2018, Volume 32, Number 1.

[102] Given a lack of real estate data for Mexico prior to 2005, our analysis of Mexico goes from 2005–20. Construction prices in this time frame rose 124 percent in Mexico.

[103] Based on weighted average GDP growth from 2000–20.

[104] Many national statistics offices value land and structures that sit on it separately, with structures typically valued as the value of materials and labor required to build a home or apartment building. Land is typically valued as the residual between real estate prices and building costs. See the technical appendix for further information on asset valuation practices.

[105] For further discussion on home price growth and broader economic implications, see John V. Duca, John Muellbauer, and Anthony Murphy, "What drives home price cycles? International experience and policy issues," *Journal of Economic Literature*, 2021, Volume 59, Number 3.

[106] Properties typically are priced based on expected rental income, after deducting operating costs, discounted by capitalization rates. As such, rising prices are partially driven by declining capitalization rates (or declining rental yields).

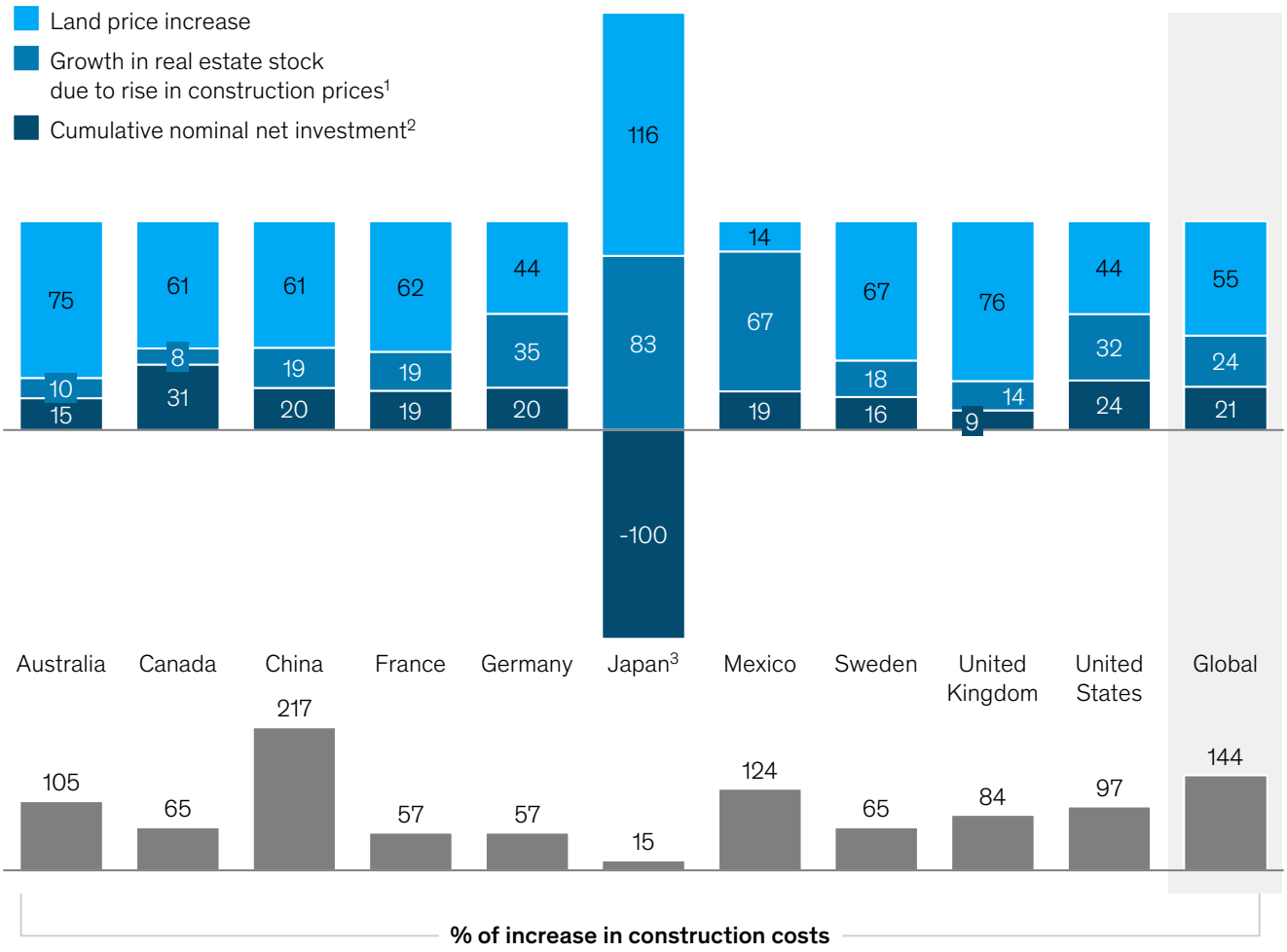
[107] Capitalization rates can also be calculated as the net operating income of a property divided by the market price of a property. For more information on capitalization rates, see *What interest rate normalization means for global real estate investors*, CBRE, September 2018.

[108] See Robert Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015.

Exhibit 32

Increasing land values were the primary contributor to absolute growth in household real estate since 2000.

Contributions to change in household real estate stock, 2000–20, %



1. The difference in dwellings and buildings stock from 2020 to 2000, less cumulative net investment.
2. The sum of net fixed capital formation in dwellings and buildings from 2001 to 2020.
3. Japan's household real estate stock declined during this period; net investment was positive while price changes were negative.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Data for Mexico begin in 2005.
Source: CEIC; Federal Reserve Board; national statistics offices; IHS Markit; OECD; Wealth Inequality Database; World Bank; McKinsey Global Institute analysis

As rental yields and interest rates declined, notable supply inelasticity of real estate and land markets in most of the ten countries meant that prices rose fast and rents grew, too, although more moderately. Had those markets been more elastic, we might instead have seen a rapid pickup in investment activity and growth in floor space, which would have dampened price increases and led to steady or declining rents.[109] The OECD has noted that areas with higher supply elasticity will see more rapid swings in housing investment in response to changes in prices.[110] For example, in the United Kingdom, which the OECD describes as a relatively more rigid housing market, home prices grew 165 percent from 2000 to 2020. In the United States, which the OECD places among the most elastic housing markets, home price growth was 108 percent, one of the lowest rates across our ten countries.[111]

[109] For more information, see Edward L. Glaeser and Joseph Gyourko, "The economic implications of housing supply," *The Journal of Economic Perspectives*, 2018, Volume 32, Number 1, pp. 3–30; and Edward L. Glaeser, Joseph Gyourko, and Albert Saiz, "Housing supply and housing bubbles," *Journal of Urban Economics*, September 2008, Volume 64, Number 2, pp. 198–271.

[110] Aida Caldera Sanchez and Asa Johansson, "The price responsiveness of housing supply in OECD countries," *Journal of Housing Economics*, May 2013, Volume 2, Issue 3.

[111] The OECD also lists Canada as having a relatively elastic housing market, but Canada was among the countries with the most significant home price growth in our ten-country sample, indicating that other factors may also be at play.

In the United Kingdom, as home prices rose, rent prices grew 56 percent, while rental yields decreased by 41 percent. Seen altogether, rent price increases and declining rental yields contributed 31 and 38 percent, respectively, to household real estate stock growth; the interaction between the two contributed 21 percent, and cumulative net investment contributed the remaining 9 percent (Exhibit 33).[112]

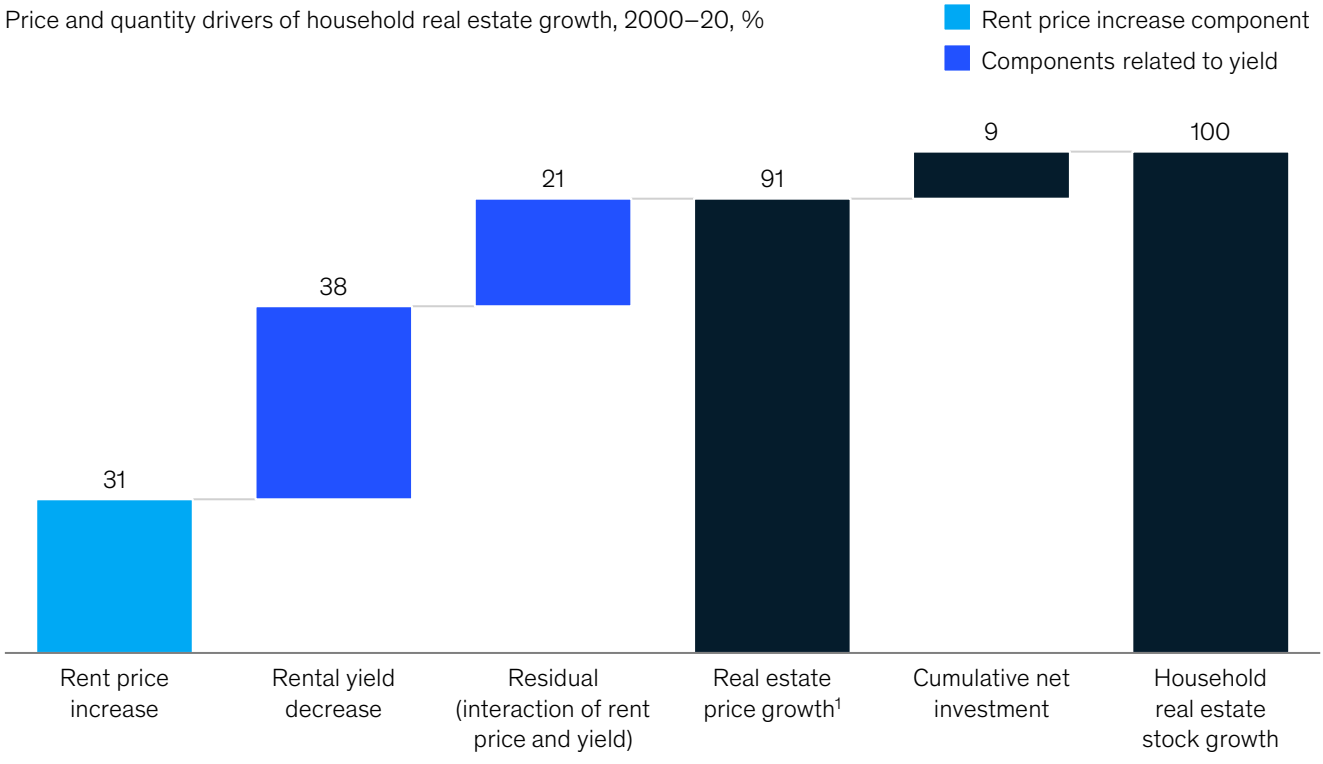
This high impact of declining rental yields on home prices held true across most countries (Exhibit 34).[113] Japan was an outlier, as was Germany, with more muted home price growth. The United States had more impact from rent increases. For instance, rent increases totaling 76 percent contributed overwhelmingly to home price growth, compared with a decrease in rental yields of 15 percent. As in other countries, interest rates have declined in the United States in recent decades, but tighter lending standards for mortgages imposed after the 2008 financial crisis put some brakes on the single-family housing market.[114] Outside superstar cities in the United States, real estate markets are more elastic than elsewhere.[115] Prices began rising again in the United States starting in 2012, posting particularly strong growth from 2019 to 2020—at 8 percent, faster than the other countries.

[112] Figures do not sum because of rounding.
[113] See technical appendix for graphical representation of the relationship between rental yields, rent prices, nominal home price growth, and relative magnitudes of rent prices and yields in shaping home price growth. Exhibit 34 and the technical appendix exhibit both reflect averages within countries. Real estate markets within countries including the United States can vary substantially.
[114] For more information, see *Structural changes in banking after the crisis*, Committee on the Global Financial System Papers, Bank for International Settlements, June 2018, Number 60, bis.org; and McKinsey Global Institute, *A decade after the global financial crisis: What has (and hasn't) changed*, August 2018, McKinsey.com.
[115] MGI defines 50 global superstar cities based on GDP and personal income per capita. These high income levels are a key contributor to low demand elasticity. See *Superstars: The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018, McKinsey.com.

Exhibit 33

In the United Kingdom, declining rental yields were the largest contributor to household real estate price growth.

Price and quantity drivers of household real estate growth, 2000–20, %

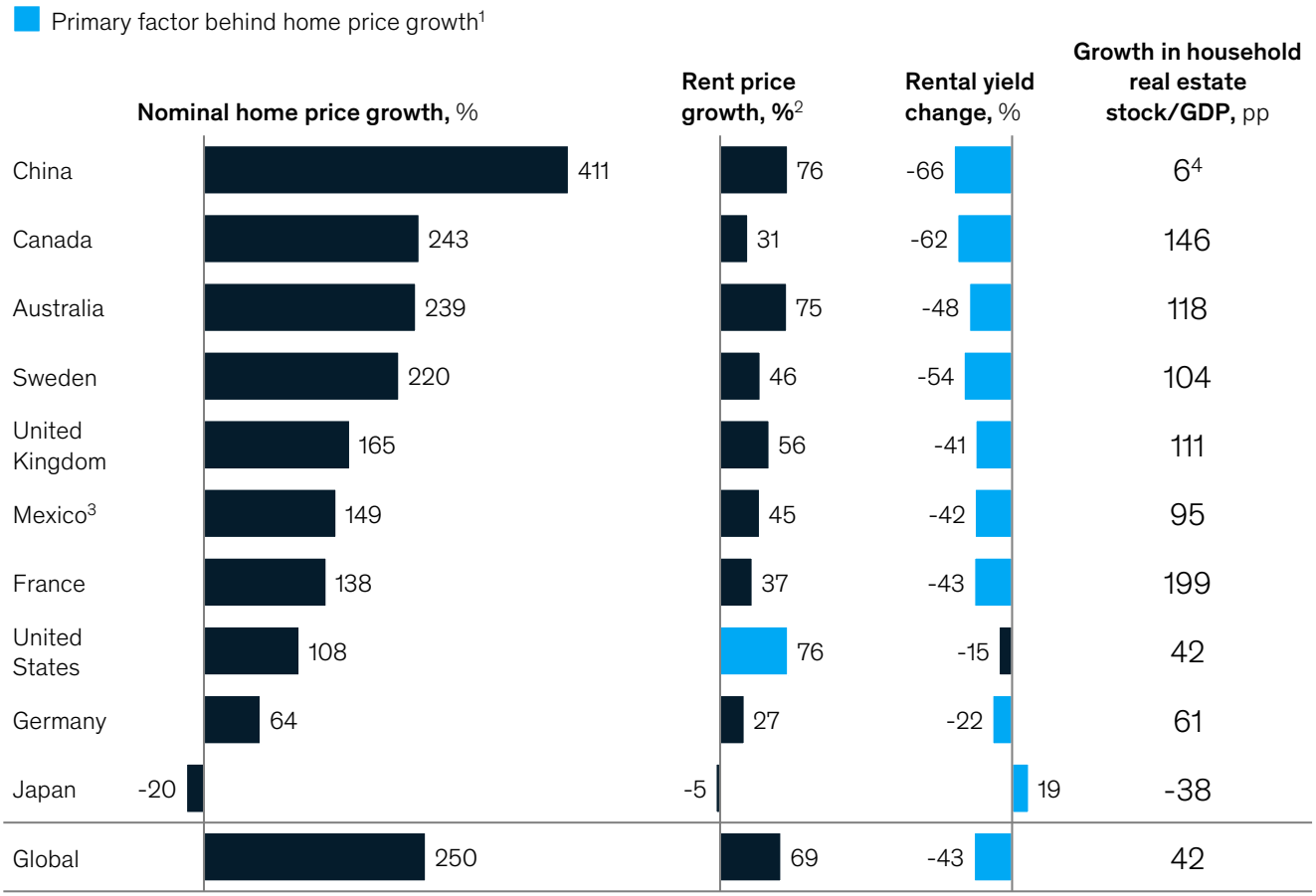


1. Home prices are a function of rental income and rental yields. Home prices are equal to rental income divided by rental yields.
Note: Figures may not sum to 100% because of rounding.
Source: EU KLEMS; OECD; United Kingdom Office for National Statistics; McKinsey Global Institute analysis

Exhibit 34

Rising home prices are a function of rent price growth and declining rental yields, with the latter shaping home prices in most countries.

Dynamics of real estate price and stock changes across countries, 2000–20



1. Home prices are a function of rental income and rental yields (which are a proxy for capitalization rates used by the real estate industry), wherein home prices are equal to rental income divided by rental yields. Specifically, the percent increase in nominal home prices is equal to the following formula: (% increase in rents – % increase in rental yields)/(1+ % increase in rental yields).
2. Rent prices reflect imputed rent of owner-occupied homes.
3. Mexico's data reflect the period 2005–20.
4. China's overall household real estate stock has grown only slightly faster than GDP, with a growth in GDP multiple of 6 percentage points from 2001 to 2020, even though nominal home prices have grown over 400 percent.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Canada and France saw the fastest growth of household housing wealth relative to GDP. Canada's household real estate stock relative to GDP increased by 1.5 times GDP, and France's increased by nearly double GDP. Declining rental yields made the biggest contribution to higher housing prices in Canada, accounting for about two-thirds of the price increase. Booming demand and favorable taxation of property gains supported Canada's market.[116] French housing prices saw the bulk of their growth in the early 2000s and have mostly stabilized since. That pattern coincides with the adoption of the euro, which was followed by a downward shift in interest rates, although additional factors may have been at play.[117]

[116] See David Ley, "Global China and the making of Vancouver's residential property market," *European Journal of Housing Policy*, December 2015, Volume 17, Issue 1.
[117] See Rahul Srivasta and Stephen L. Lee, "European real estate market convergence," *Journal of Property Investment & Finance*, August 2012, Volume 30; and Kim Hiang Liow, "Volatility interdependence in European securities markets: Who is the most influential?," *Journal of European Real Estate Research*, August 2013, Volume 6, Issue 2.

Nominal home price growth from 2000 to 2020 was largest in China, more than 400 percent.[118] This price growth is linked to large declines in rental yields, potentially due to higher growth expectations for rental income. As previously mentioned, however, household real estate was not a substantial contributor to net worth relative to GDP, given China's similarly rapid nominal GDP growth during this same period.[119]

Should key valuation parameters revert to historical means, the multiple of net worth to GDP would decline by 34 percent

Exhibit 35 shows the projected impact on multiples of net worth to GDP if net worth, land prices, or rental yields were to revert to various historical levels, or if construction prices moved in line with general inflation. Overall, we see that net worth relative to GDP would decrease by 15 to 50 percent across countries, or 34 percent overall globally. Mexico and the United States are most sensitive to a scenario in which construction prices relative to other prices in the economy moved back to where they were in 2000. The other eight countries would see the greatest impact in the event that overall net worth were to revert to average values over the span of 1970 to 1999. On the global level, this scenario would reduce net worth by 2.1 times GDP.

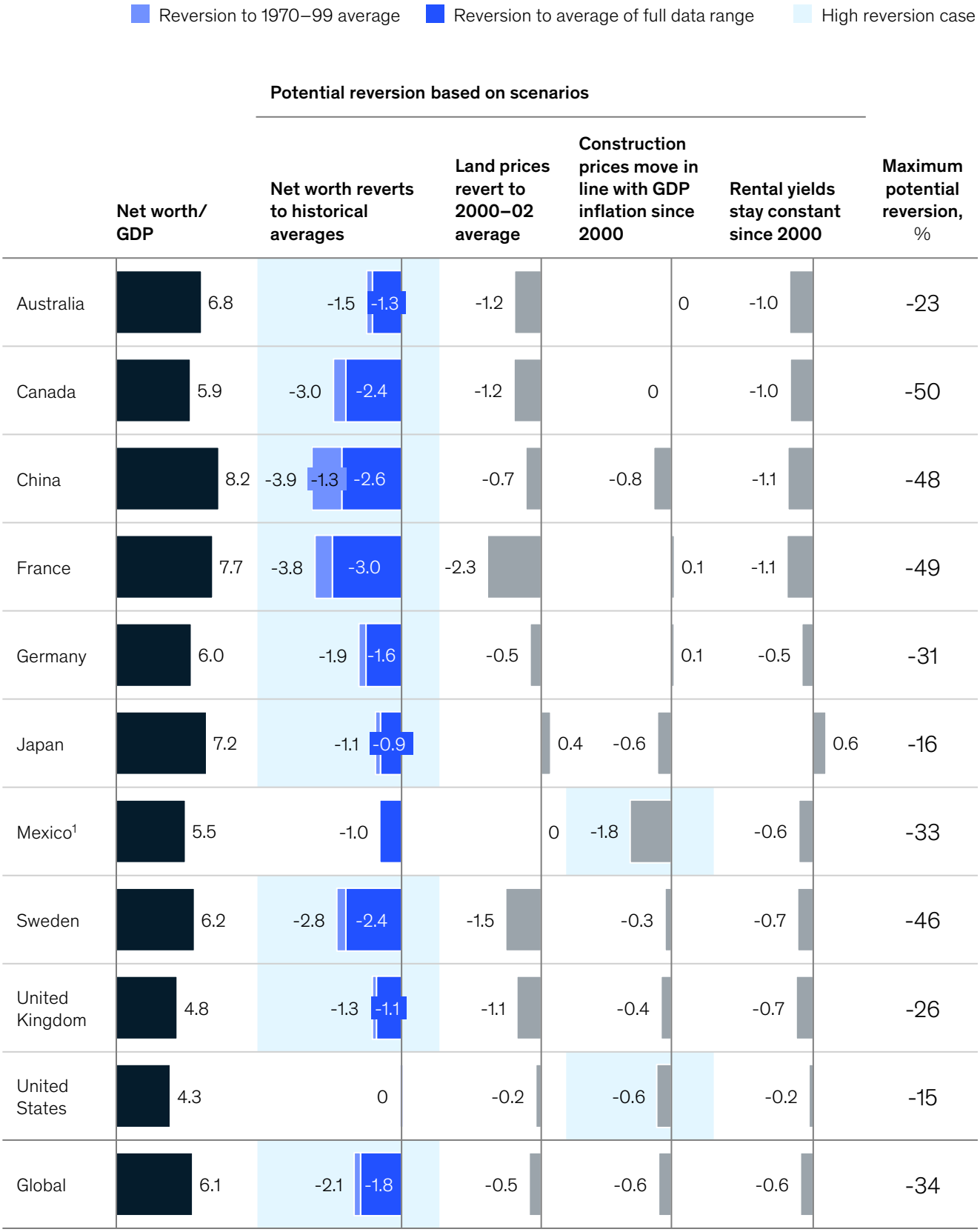
Net worth growth is increasingly driven by asset price increases that exceed goods price inflation, which in turn has caused net worth to deviate from a long-term trend of growing in line with GDP. This is consistent with declining interest rates—and hence discount rates—that have made it cheaper to finance purchases of real estate and other assets and so have played a role in driving up prices. Outside China, Japan, and Mexico, most of the upward divergence of net worth relative to GDP stems from real estate. Whether the trajectory of net worth growth continues to deviate from its historical relationship to GDP, stabilizes at high multiples of net worth to GDP, or reverts to historical multiples has vast potential implications for wealth and the resilience of the global balance sheet.

[118] Based on China's residential property price index, provided by CEIC.
[119] See Kenneth Rogoff, "Can China's outsized real estate sector amplify a Delta-induced slowdown?," VoxEU, September 21, 2021.

Exhibit 35

If net worth were to revert to its historical average relative to GDP, it would decline by one-third on average.

Range of net worth across sensitivity cases, 2020, GDP multiple



1. All cases for Mexico begin in 2003 given data availability; rental yield case begins in 2005.

Note: The full data range average is based on earliest data available for each country. See technical appendix for details on scenario assumptions and data adjustments.

Source: CEIC; Federal Reserve Board; national statistics offices; IHS Markit; OECD; World Bank; McKinsey Global Institute analysis

4. Rising valuations and declining operating returns

Real assets, whether they are factory equipment, electric power stations, office buildings, or agricultural tools, are critical factors for creating income. Operating returns on these real assets account for about one-quarter of global GDP directly, and even more indirectly, given their role in enhancing the productive capacities of labor. As an investment, they have traditionally preserved value in inflationary periods and created long-term value as the price of replacing them rises and their operational efficiency improves.

But both inflation and real GDP growth have been sluggish over the past 20 years, even as real asset values have soared, and the labor share of income has fallen in several economies. Our research finds that valuation gains in real assets have delivered unusually high returns over the past two decades, coming close to or exceeding operating returns in several economies, even after accounting for inflation. This may encourage investors to seek asset price increases rather than more traditional benefits from operating assets such as machinery. What role do real assets play in driving today's global economy? Do the operating returns they deliver justify the higher values they have attained?

Real assets generate economic returns accounting for between 20 and 40 percent of country GDP and drive productivity

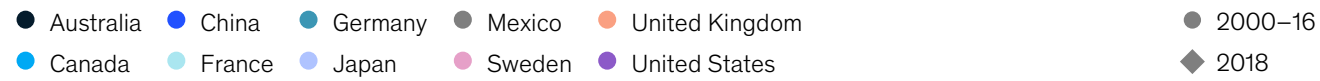
Increased capital per worker creates returns and supports productivity and wages. Our analysis confirms that gross operating surpluses, which are the value generated by a company's operating activities after wages are subtracted, increase together with a rising pool of produced assets, which are assets resulting from production, including machinery and equipment and infrastructure as well as inventories and valuables (Exhibit 36). We can also see that the higher the value of produced assets, the more each worker in an economy contributes to GDP.[120]

[120] This follows the same variables and logic as the economic growth and capital accumulation argument originally developed by Robert Solow (see Box 3 in chapter 3). In Solow's curve, output per worker is on the vertical axis and capital per worker is on the horizontal axis. As more capital is added per worker, workers produce more output, although at declining returns. In this model, technological progress is exogenous. In reality, technology and labor productivity have grown over time, the latter at a declining rate. As a result we do not see declining returns with capital deepening, in other words as more capital is added per worker. See Robert M. Solow, "A contribution to the theory of economic growth," *The Quarterly Journal of Economics*, February 1956, Volume 70, Number 1.

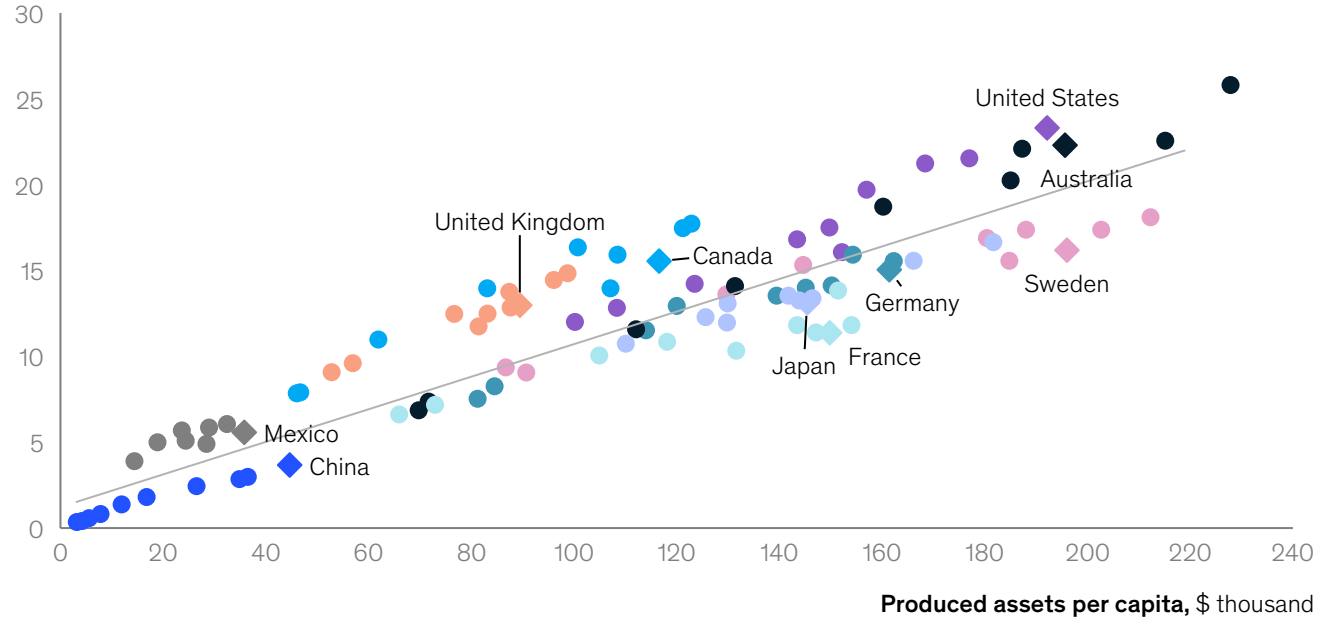
Exhibit 36

Capital creates returns and supports productivity and wages.

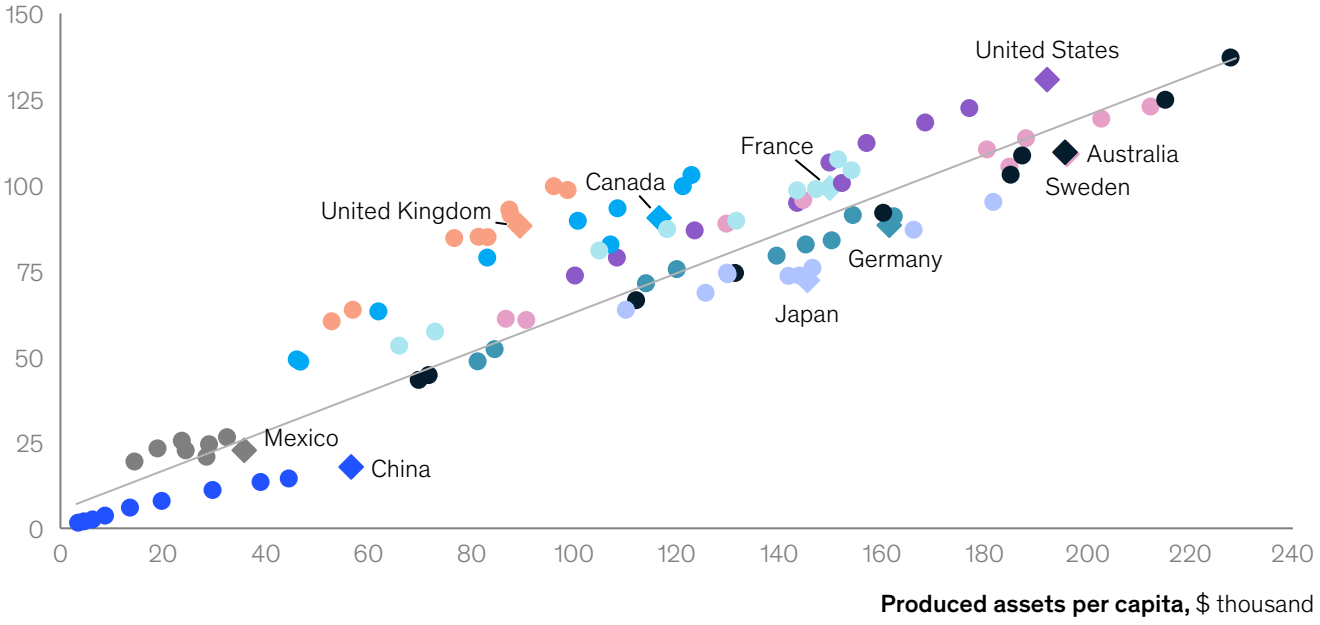
Gross operating surplus (GOS) per capita, GDP per worker, and produced assets per capita, 2000–18, $ thousand



Capital return per capita (GOS per capita), $ thousand[1]



Income and labor productivity (GDP per worker), $ thousand



1. GOS is adjusted for imputed compensation of self-employed for all countries except China, which did not have a separate GOS and mixed income split available.
Note: Exchange rates for the US dollar change year to year, varying the trend of countries slightly from what it would be if data reported in local currencies were used.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; The Conference Board Total Economy Database; World Bank; McKinsey Global Institute analysis

Returns from the operation of real assets have declined in many countries, while valuation gains have risen to historical highs

Returns resulting from the operations of real assets, which we calculate as net operating surplus divided by the value of produced assets and land, have declined in the ten sample countries by an average of 26 percent since 1970, from 4.5 percent in 1970 to 3.3 percent in 2020. Between 2006 and 2020, average operating returns declined by 18 percent. Operating returns decline even further, by 28 percent, if the United States, where returns remained strong, is removed from the data. At the same time, valuation gains exceeding inflation have reached 50-year highs over the past 20 years (apart from the collapse in price growth during and immediately following the 2008 financial crisis), even exceeding operating returns in some years (Exhibit 37). These valuation gains hold even if China is removed from the data.

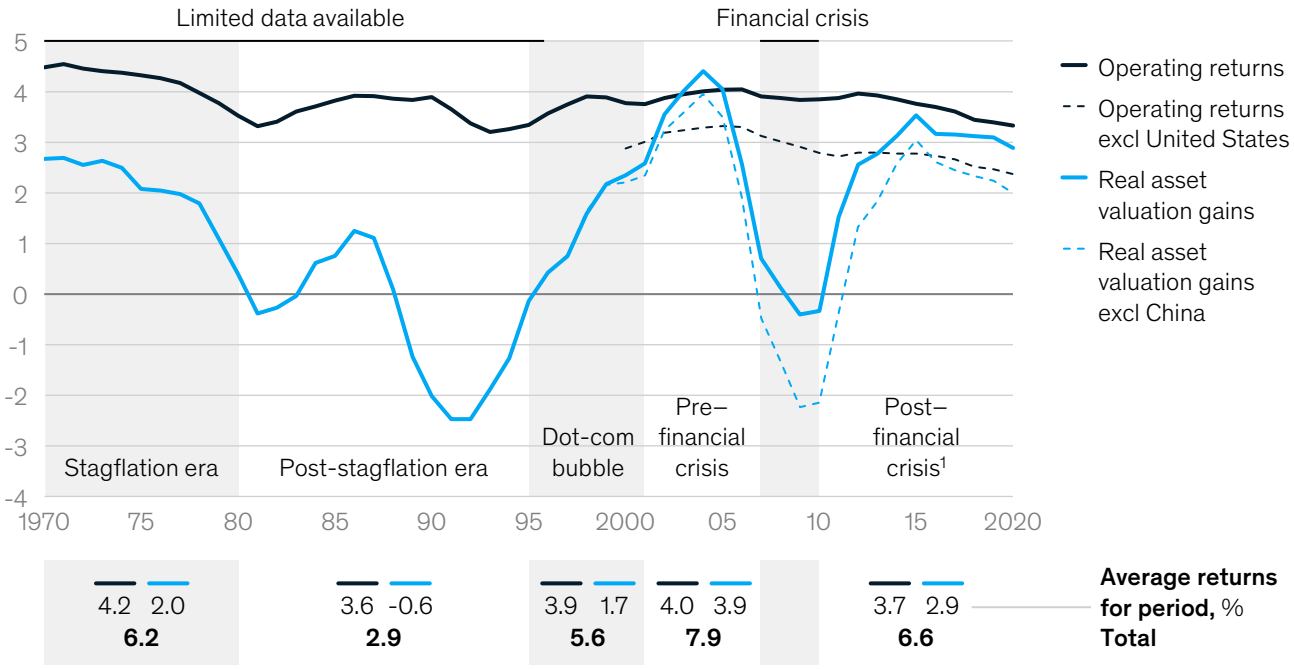
Between 2001 and 2020, countries other than Australia, Japan, and the United States saw material declines in the returns from the operations of real assets, a result of increased asset prices. Not surprisingly, returns fell sharply in 2020 during the COVID-19 pandemic.[121] A comparison of two periods—2000–02 and 2018–20—shows that declines in average operating returns were largest in Canada, China, France, Sweden, and the United Kingdom, dropping by at least 150 basis points.[122] Mexico, with the highest operating returns among the ten countries, also saw a steep drop of 5.6 percent in absolute terms from its 2004–06

[121] Based on World Bank GDP data, GDP in nominal terms declined from 2019–20 in all focus countries except Australia and China. In other words, income declined while asset stocks continued to grow, lowering returns.
[122] A decline of at least 150 basis points implies that the absolute differences between the average returns in these periods are 1.5 percent.

Exhibit 37

After 2000, valuation gains approached operating returns.

Real asset operating returns and valuation gains post-inflation, 5-year rolling averages, %



1. These figures reflect the period 2010 to 2020. If this period had begun in 2008, average operating returns would have been 3.7% and average post-inflation valuation gains 1.9% (and total returns 5.6%).

Note: Data availability starting dates: United States, 1970; France, 1979; Japan, 1995; Sweden, United Kingdom, 1996; Australia, Canada, Germany, 1997; China, 2001; Mexico, 2004. Operational returns calculated as net operating surplus divided by produced assets and land.
The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

average to 2018–20 (Exhibit 38).[123] High returns in Mexico in part reflect a particularly high capital share of income in the country.[124]

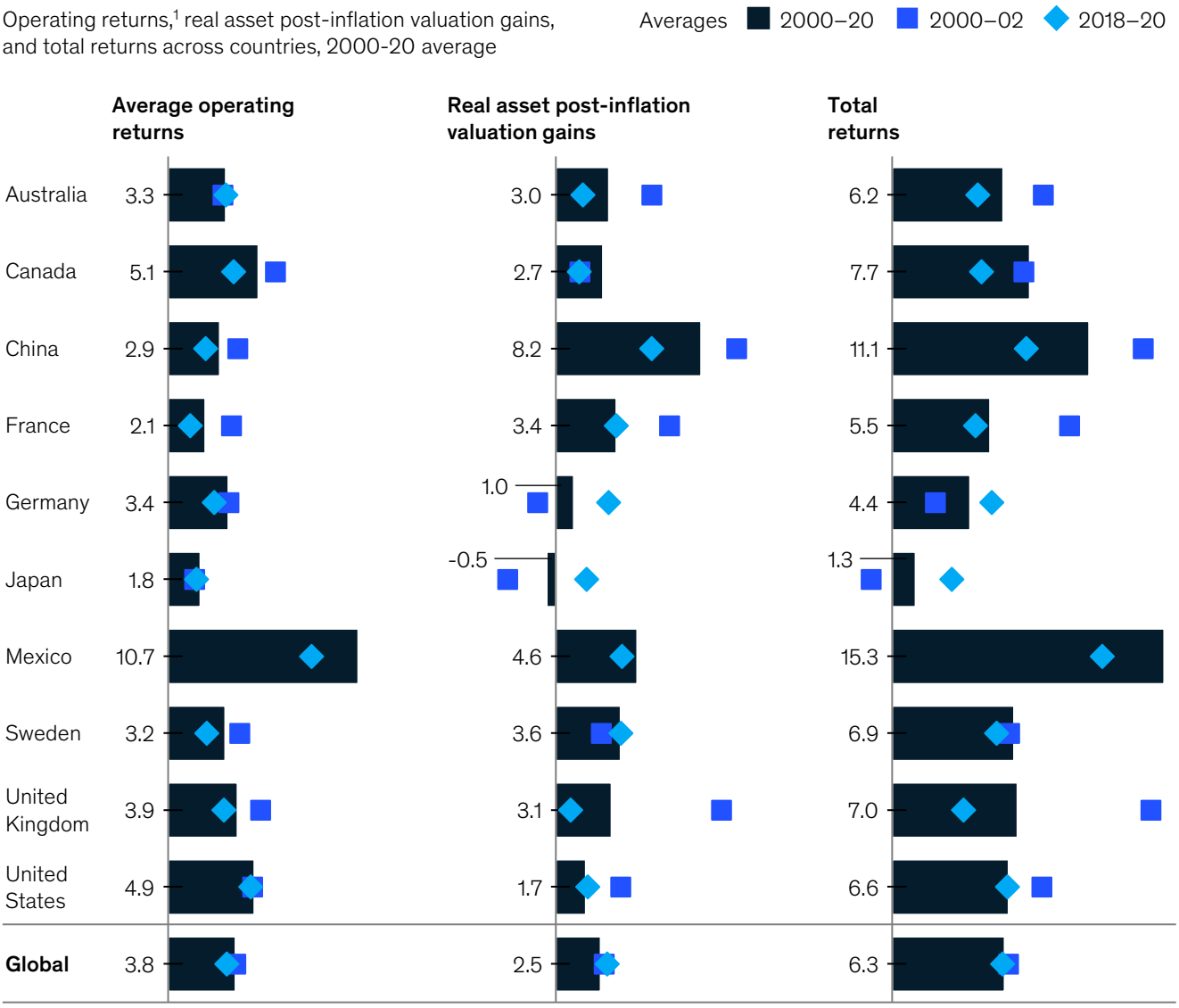
In turn, real asset valuation gains beyond inflation have been more volatile over the past two decades, exceeding operating returns prior to the 2008 financial crisis in many countries. From 2000 to 2020, valuation gains beyond inflation among real assets outpaced operating returns on average in China, France, and Sweden. China was at the high end, with 8.2 percent post-inflation valuation gains and 2.9 percent operating returns on average.[125]

[123] Mexico's data are limited prior to 2003, so returns analysis begins in 2004.
[124] Mexico's capital share of income, defined as gross operating surplus and profits from unincorporated enterprises divided by GDP, was 55 percent in 2018. The range for the other nine countries was 27 to 40 percent based on data from AMECO and the World Bank.
[125] Home prices in China rose more than 400 percent from 2000–20, according to the OECD's nominal home price index. Canada had the next-highest nominal home price growth, roughly 240 percent from 2000–20.

Exhibit 38

Over the past two decades, total real asset returns have been highest in Mexico and China.

Operating returns,[1] real asset post-inflation valuation gains, and total returns across countries, 2000-20 average



1. Net operating surplus/(produced assets + land).
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Mexico's data begin in 2003.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

So why invest in real assets and the output of their operations if valuation on its own does a good job of increasing net worth? Indeed, that may be what some private and corporate decision makers are asking themselves. If a company invests, say, $1 million in new machinery, will the value of operating that machinery to produce a widget outweigh the value of the land underneath the factory where the machinery sits? If an individual invests in rental property, will any improvements to the property to increase rent be worthwhile compared to simply waiting for market-price appreciation?

Operating returns on produced assets in 2018 varied by country between 3–4 percent and 11 percent

In addition to changes over time, there are also persistent, large cross-country variations in operating returns on assets, ranging from 3 to 4 percent in the Asian and European Union countries we analyzed to 6 to 8 percent in Australia, Canada, the United Kingdom, and the United States, and 11 percent in Mexico (Exhibit 39).[126]

These return differences seem to reflect differences in capital productivity and market environments. They are sustained even when adjusted for five factors: asset mix, industry mix, returns from resource endowments, how we account for land in capital stock, and the exclusion of real estate (Exhibit 40).

— **Asset mix.** To assess the impact of the asset mix, we first separately analyzed rates of return in the real estate sector compared to the non–real estate economy and found differences in both across countries. We further assumed typical ranges of return per asset class, from an average of 4 percent for residential dwellings to 24 percent for intellectual property products. For real estate, we used country-specific capitalization rates ranging from 3 to 9 percent. While we do see differences in expected returns across countries based on their respective asset mix, those differences are small compared to the differences not correlated with the asset mix. Note that the asset portfolio does explain much of the difference in labor share of income across countries, because labor share depends not only on respective rates of return of different assets but also on the extent of capital invested in them (see Box 5, "Differences in asset stock and mix explain much of the differences in labor share of income across countries").

— **Industry mix.** To assess the impact of industry mix, we calculated the average return per industry across our country sample, which ranged from 74 percent in the construction industry to less than 10 percent in mining, utilities, real estate, and public administration, a difference that reflects the far less capital-intense operations of the construction business.[127] On this basis, we calculated an expected rate of return for each country given its industry mix. Again, results vary across countries, with notably low expected returns in Canada and France due to high exposure to real estate (which constitutes 51 percent of capital stocks in Canada and 66 percent in France) as well as mining and utilities in Canada, which collectively account for 20 percent of its capital stock.[128] Neither Canada nor France has a large share of capital stock in industries characterized by high returns, including construction, professional services, and wholesale and retail trades.

— **Returns from resource endowments.** Significant returns from natural resources like oil reserves and minerals may distort the picture in Australia, Canada, and Mexico. Removing the mining and quarrying sector from our analysis, however, produces similar results because the yields generated by this sector are in line with or below country averages.

[126] We consider operating returns with and without land. The 6 to 8 percent figure is without land; including land, the range is 3 to 5 percent for the four English-speaking countries and 1 to 3 percent for other economies (with the exception of Mexico, which has very high returns of 8 percent with land).

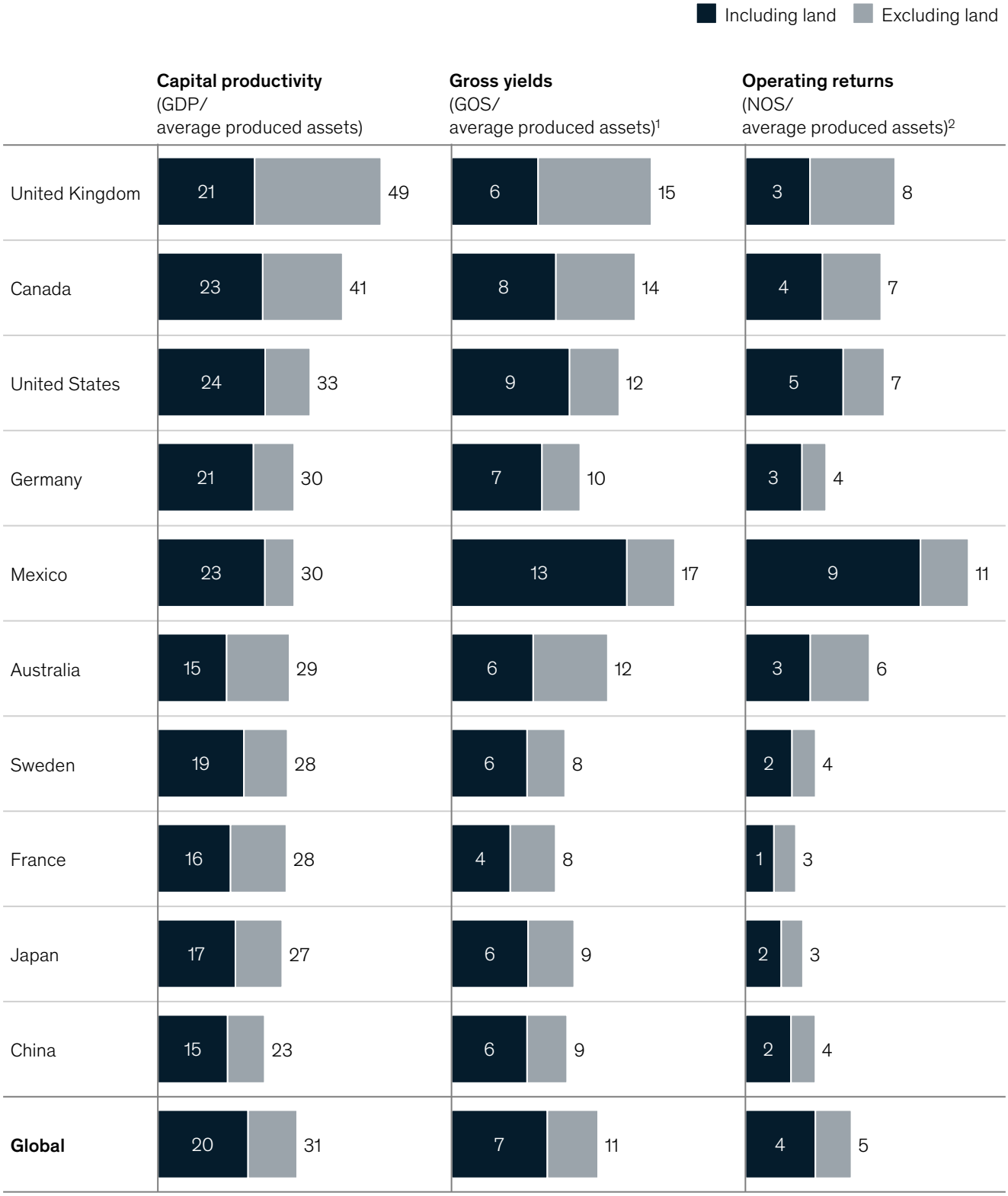
[127] Data exclude China, Mexico, and Sweden. Capital stock data by industry is from the OECD, and returns are based on gross operating surplus by industry. See the technical appendix for further description of return calculations.

[128] More than half of the capital stocks in Canada and France are in the real estate industry. In Germany, capital stock in industries such as professional and scientific services and manufacturing, which generate high returns, offset low returns from the country's significant capital stock in real estate.

Exhibit 39

Capital productivity is highest in Canada, the United Kingdom, and the United States, while operating returns are highest in Mexico.

Gross domestic product (GDP), gross operating surplus (GOS), and net operating surplus (NOS) relative to assets, 2018, %



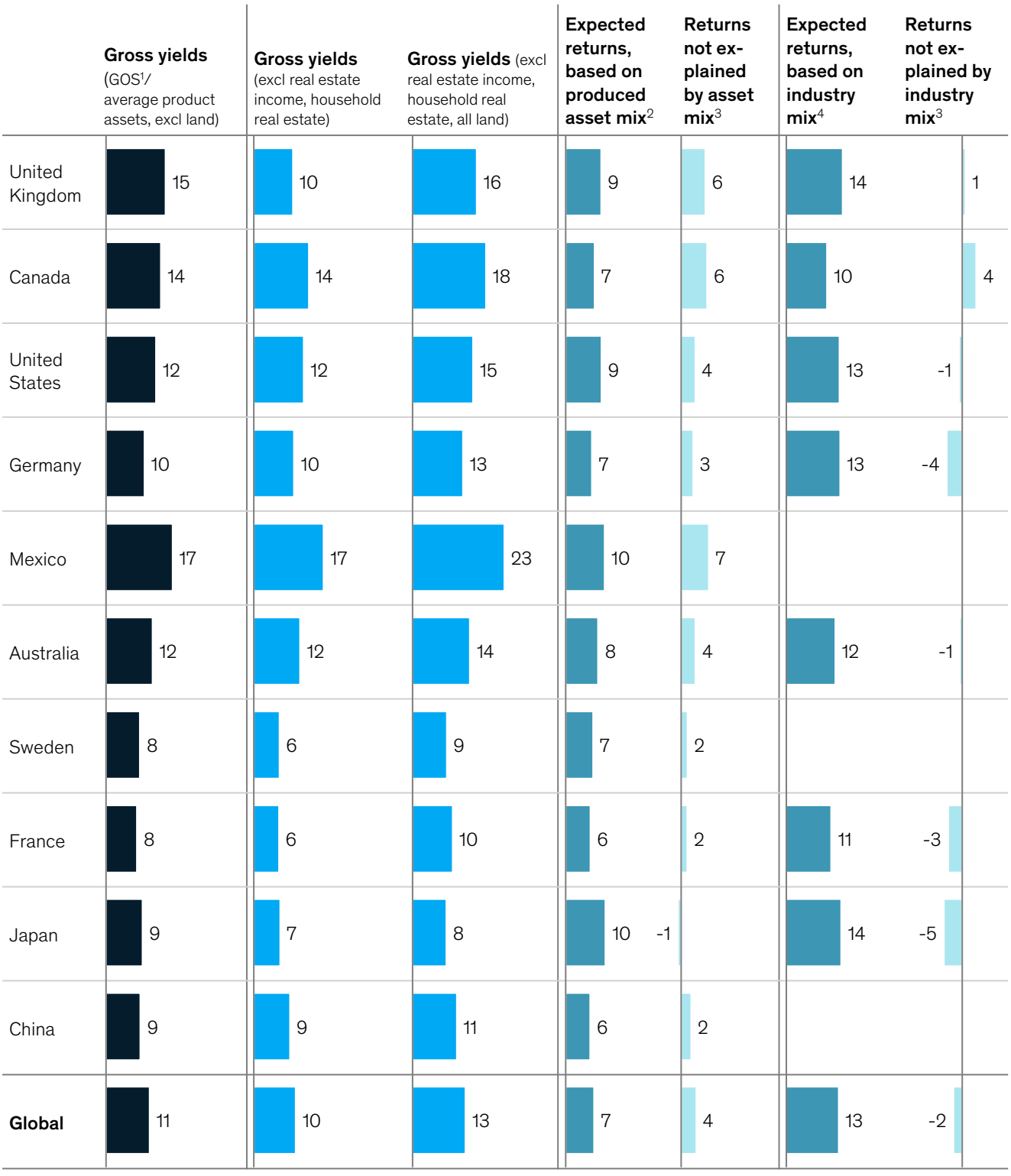
1. Gross and net operating surplus are adjusted for imputed compensation of self-employed for all countries apart from China, which did not have a separate GOS and mixed income split available.
2. Net operating surplus is calculated as gross operating surplus less depreciation in a given year.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Not to scale.
Source: AMECO; CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 40

Return differences across countries are sustained even when adjusting for industry mix, asset mix, and differences in real estate yields.

Country economic returns across metrics, 2018, %



1. Gross operating surplus adjusted for imputed compensation of self-employed for all countries except China, which did not have a separate GOS and mixed income split available.
2. Typical return on produced assets is equal to produced asset stocks multiplied by the expected return rate for each type of produced asset (including dwellings and buildings).
3. Excess return is equal to the gross yield minus the typical return rate given the produced asset and industry mix.
4. Typical returns from industry mix are equal to the weighted average return by industry based on the capital share of each industry multiplied by the average gross yield of each industry.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; real estate and infrastructure data providers; McKinsey Global Institute analysis

— **Land in capital stock.** Differences in land prices could also explain the wide variability in gross yields we found. Land is not typically counted as a factor in production, and gross operating surplus should in theory exclude returns on land. In practice, however, returns associated with land, particularly in urban areas, are difficult to disentangle from returns associated with buildings situated on land. We hence tested whether capital return differences would change if we include land in capital stock. Indeed, particularly in Australia and the United Kingdom where land prices are elevated, this addition brings gross yields for the total economy to 6 percent, closer in line with ranges seen in the European Union and Asia. Canada and the United States remain among the highest return countries, at 8 and 9 percent, respectively, when land is included.

— **Excluding real estate.** As an imperfect proxy for understanding returns from the business economy, we excluded gross operating surplus of the real estate sector and residential real estate from assets.[129] Using this measure, Germany's operating returns increase to 10 percent, while returns among the rest of the European Union and Asian economies in the sample are 6 to 9 percent. Among North American economies as well as Australia and the United Kingdom, the range is 10 to 14 percent, with the United Kingdom on the low end and Canada at the high end. Mexico's operating returns are the highest among the ten countries at 17 percent.

In China, gross yields and operating returns on real assets are comparatively low. Some of this may reflect a pool of assets that is, on average, younger than assets in more mature markets. These newer assets show up on balance sheets with higher value because they have depreciated less than an older collection of assets—although in many cases, the value derived from an asset does not depend much on its age. For instance, a ten-year-old building may produce the same rental income as a new one, and a five-year-old machine may produce the same number of gadgets as one just installed. Both older building and machine would be carried on a balance sheet at a lower, depreciated value, and thus appear more productive.

If the structural factors we tested don't explain differences in return, what drives them? One possible explanation is that large, intangible-rich corporations can generate high rates of return depending on the scale of the market and prevailing policies regulating competition, particularly in the United States.[130] Managerial experience and quality, as well as the flexibility of labor regulations, also can affect asset yields.[131]

[129] Gross operating surplus from the real estate industry consists mostly of imputed rents of owned homes rather than corporate profits.

[130] Prior MGI publications have explored this trend. Steep investor expectations have driven manufacturers to gravitate toward less capital-intensive segments of their industries, as noted in *Building a more competitive US manufacturing sector*, McKinsey Global Institute, April 2021. In the semiconductor industry, for example, US-based firms account for roughly 58 percent of the fabless segment, in which firms design chips but outsource production, but only 11 percent of the foundry segment that focuses exclusively on manufacturing. As a result, US firms generate substantial profits with comparatively low capital expenditures. In addition, growth in intangibles investment correlates with growth in total factor productivity, with an R-squared value of 55 percent, which also contributes to higher levels of operational returns. See *Getting tangible about intangibles*, McKinsey Global Institute, May 2021.

[131] Bloom and Van Reenen collected original survey data on 732 medium-size manufacturing firms in France, Germany, the United Kingdom, and the United States and found that management practices like effective monitoring, target setting, and incentive setting "are significantly associated with higher productivity, profitability, Tobin's Q, sales growth rates and firm-survival rates." See Nicholas Bloom and John Van Reenen, "Measuring and explaining management practices across firms and countries," *The Quarterly Journal of Economics*, November 2007, Volume 122, Issue 4.

Box 5

Differences in asset stock and mix explain much of the differences in labor share of income across countries

The rapid decline in the labor share of income, notably in the United States, over past decades has piqued the interest of economists.[1] Cross-country variations have been linked to differences in, among other things, labor market policies, trade exposure, and other variables.[2] Our research suggests that the asset mix in a country could also be one of the more important factors driving differences in labor share of income across countries (Exhibit 41).

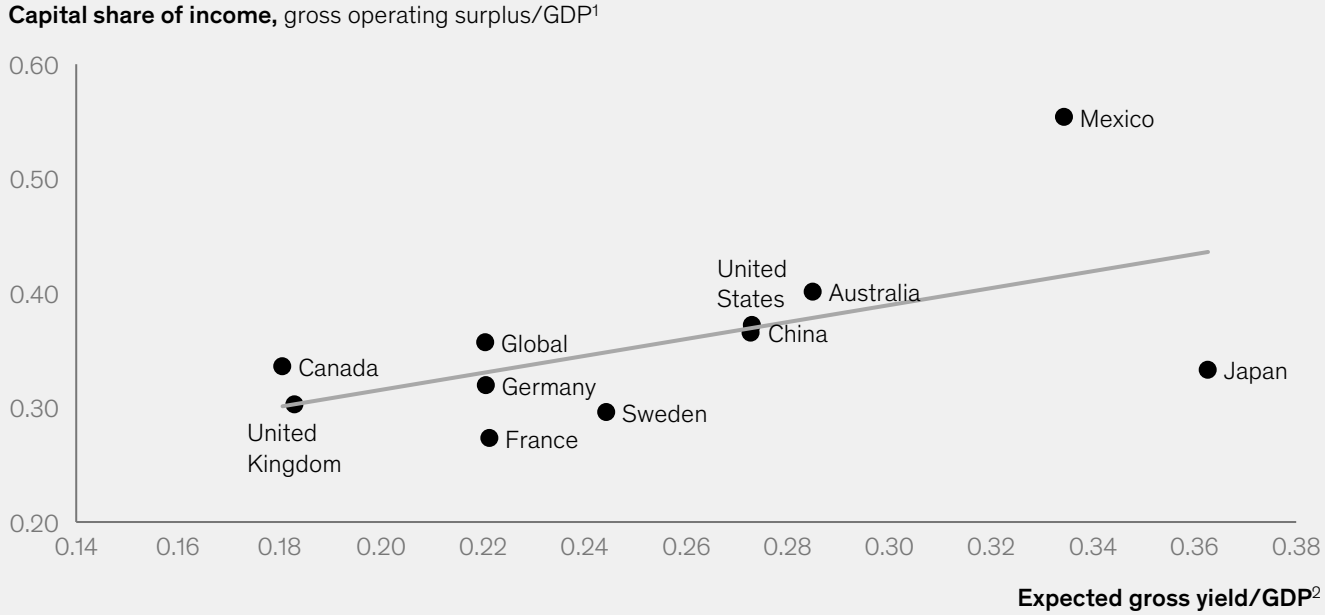
We estimate an expected proxy for the capital share of income in each country by applying typical rates of return per asset class to the stock of those assets, excluding land, in each country, as shown on the horizontal axis in Exhibit 41—in other words, the amount of GDP that can be explained by asset returns. Comparing that proxy to the capital share of income, essentially the inverse of the labor share of income on the vertical axis, we find a fairly strong correlation. (Note that our analysis includes profits from the real estate industry, which is often excluded from analyses of labor share of income.) A comparatively low capital share of income in the United Kingdom, for instance, may be linked to a low stock of capital in almost all asset classes. A high capital share of income in Mexico, in turn, may link to the country's significant natural resource endowment as well as high stock of capital in corporate assets, from buildings to machinery to infrastructure. Japan has a particularly high stock of infrastructure and IP assets yet does not seem to derive commensurate capital returns from them, and so its actual capital share of income is much lower than expected given the country's asset portfolio.

1 See *A new look at the declining labor share of income in the United States*, McKinsey Global Institute, May 2019.
2 See, for instance, "Decoupling of wages from productivity: What implications for public policies?," in *OECD Economic Outlook*, 2018, Volume 2018, Issue 2; and Gabriele Ciminelli, Romain A. Duval, and Davide Furceri, Employment protection deregulation and labor shares in advanced economies, IMF working paper number 18/186, August 2018.

Exhibit 41

Differences in asset stock and portfolio mix explain most of the difference in labor share of income across countries.

Expected gross yield on produced assets/GDP vs capital share of income, 2018



1. Gross operating surplus adjusted for imputed compensation of self-employed for all countries except China, which did not have a separate GOS and mixed income split available.
2. Expected gross yield is equal to produced assets multiplied by the expected return rate. Divided by GDP, this is the portion of GDP that is explained through asset returns.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.
Source: AMECO; CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; real estate and infrastructure data providers; McKinsey Global Institute analysis

The productivity of real assets accounts for a substantial portion of economic growth, and operating returns account for a large share of national income. This income allows for households to consume and save, supports corporate investment, and can help create greater fiscal space for governments to remain within their budget constraints. But increasing valuation returns of real assets over the past two decades have come close to the level of operating returns even after inflation, enticing investment in the existing stock of real estate and land. How will the role of real assets in the economy change as a result?

Fort Greene, Brooklyn, New York
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5. Revisiting the growth of finance and debt sustainability

An abundance of financial assets and cheap money has contributed to higher valuations and supported more debt—and stirred a broad debate about the growth of finance in the global economy.[132] The contention that there was potentially too much finance gained supporters after the 2008 financial crisis. Before that, financial deepening was generally assessed as beneficial.[133] There are two sides to the debate. One side blames the heightened role of finance for increasing inequality, spurring speculation, discouraging investment in the real assets that power economies, and other economic ills.[134] The other side contends that it has lowered transaction costs, more broadly distributed capital, and spread risk, among other benefits to business and society.[135] Meanwhile, the proposition of finance as potentially a two-edged sword is widely accepted. There is even some evidence suggesting that in advanced economies, faster credit growth can reduce productivity growth.[136]

Over the past two decades, financial assets and liabilities have grown at the same pace as those outside the financial sector. As with real assets and net worth, they have thus increased at a rate faster than global GDP.

Conventionally, a country's ability to shoulder its debts has been evaluated in comparison to its GDP, with higher levels of debt relative to GDP indicating greater risk of default. After all, given that obligations ultimately have to be honored by taxing national income, the burden increased with the ratio of debt over GDP, all else being equal. However, the extremely low, and sometimes even negative, nominal interest rates in recent years have led to a reassessment of this sustainability metric.[137] Revisiting the growth of financial assets and liabilities in the context of the real assets that underpin net worth—loan-to-value ratios—offers a complementary view of the level of debt in a country. We also look at debt costs over time relative to GDP for an additional perspective on debt sustainability.

[132] Ben Bernanke, *Why interest rates are so low, part 3: The global savings glut*, Brookings Institution, April 2015; and Robert Barsky and Matthew Easton, "The global saving glut and the fall in U.S. real interest rates: A 15-year perspective," *Economic Perspectives*, Federal Reserve Bank of Chicago, March 2021.

[133] See Ross Levine, "Financial development and economic growth: Views and agenda," *Journal of Economic Literature*, June 1997, Volume 35; and Robin Greenwood and David Scharfstein, "The growth of finance," *Journal of Economic Perspectives*, Spring 2013, Volume 27, Number 2.

[134] Olivier Godechot, "Financialization and the increase in inequality," in *The Routledge International Handbook of Financialization*, Philip Mader, Daniel Mertens, and Natascha van der Zwan, eds., Routledge, 2020; Donald Tomaskovic-Devey and Ken-Hou Lin, "Financialization: Causes, inequality consequences, and policy implications," *North Carolina Banking Institute*, 2013, Volume 18, Issue 1; Roy Kwon and Anthony Roberts, "Financialization and income inequality in the new economy: An exploration of finance's conditional effects," *Sociology of Development*, 2015, Volume 1, Number 4.

[135] William N. Goetzmann, *Money changes everything: How finance made civilization possible*, Princeton University Press, 2016.

[136] See Stephen G. Cecchetti and Enisse Kharroubi, "Why does credit growth crowd out real economic growth?," *The Manchester School*, September 2019, Volume 87, Issue S1.

[137] See *Debt and deleveraging: The global credit bubble and its economic consequences*, McKinsey Global Institute, January 2010, and *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015, McKinsey.com. Also see Jason Furman and Lawrence H. Summers, *A reconsideration of fiscal policy in the era of low interest rates*, Harvard Kennedy School, November 2020, harvard.edu.

Global liabilities more than tripled in dollar terms between 2000 and 2020, and relative to GDP since 1970

Liabilities and their corresponding financial assets have grown substantially over the past 50 years, tripling relative to GDP between 1970 and 2020. Equity, debt, and currency and deposits made the greatest contributions to overall liability growth. The pace of growth was slightly faster than growth of real assets (Exhibit 42).[138]

Liabilities outside the financial sector grew from 2.3 times GDP in 1970 to 5.9 times GDP in 2020

Liabilities outside the financial sector primarily consist of debt in the household and government sectors and equity in the nonfinancial corporate sector. Of these liabilities, equity has grown most significantly relative to GDP, by 194 percentage points in the 50-year time frame, followed by debt, which grew 178 percentage points.[139]

Liabilities linked to equity grew significantly in the late 1990s, particularly from 1996 to 1999 when Alan Greenspan, *the economist* who served as chairman of the Federal Reserve Board from 1987 to 2006, famously characterized the immense growth in equity values as "*irrational exuberance*."[140] Equity liabilities outside the financial sector grew by 81 percentage points relative to GDP during those four years, accounting for much of the increase in those liabilities over the entire 1970–99 period. From 2010 to 2020, liabilities related to equity again increased rapidly, growing by 114 percentage points outside the financial sector, with much of the growth in Canada, China, France, Sweden, and the United States.

Debt began to grow most notably beginning in the early 1980s, coinciding with a shift in the economic, business, and political climate in the United States and United Kingdom in particular.[141] Between 1971 and 1999, debt liabilities grew relative to GDP by 99 percentage points outside the financial sector. Deregulation of the financial sector and a decline in long-term interest rates that lowered borrowing costs played a role; debt grew 37 percentage points relative to GDP in the period from 1980 to 1985 alone.

From 2000 to 2020, debt liabilities outside the financial sector grew by 79 percentage points. The greatest growth in debt liabilities in the 50-year period occurred in 2020, when they increased 35 percentage points, or nine times the average annual increase over the prior 50 years. Since 2000, debt across nonfinancial sectors has grown the most in Canada, China, France, and the United Kingdom.

Other forms of liabilities, including pensions, did not see significant changes relative to GDP during the 50 years to 2020.[142]

Within the financial sector, liabilities grew from 1.8 times GDP in 1970 to 6.1 times GDP in 2020, with most growth related to currency and deposits

The financial sector's liabilities take the form of equity, debt, and pensions, similar to nonfinancial corporations, though its liabilities also include currency and deposits. Currency and deposit liabilities have been the greatest source of financial sector liability growth relative to GDP, expanding by 153 percentage points over the past five decades. Liabilities linked to equity were the next-largest source of growth, adding 135 percentage points.

[138] We use nonconsolidated data for financial assets, which can be substantially larger than consolidated data, particularly in the financial sector.

[139] One hundred percentage points means that this metric increased by a full GDP multiple; in other words, it increased by the size of GDP. We calculate percentage point growth inclusive of years listed; given end-of-year reporting, we calculate percentage point growth from 2000–20, for example, as the difference between 2020 and 1999.

[140] Steven Russolillo, "*Irrational exuberance*: Alan Greenspan's call, 20 years later," *Wall Street Journal*, December 3, 2016. See also Robert Shiller, *Irrational exuberance*, third edition, Princeton University Press, 2015.

[141] See Martin S. Feldstein, "American economic policy in the 1980s: A personal view," in *American economic policy in the 1980s*, Martin S. Feldstein, ed., University of Chicago Press, 1990; Alan S. Blinder and Janet L. Yellen, *The fabulous decade: Macroeconomic lessons from the 1990s*, The Century Foundation Press, 2001; and K. Alec Chrystal, *Dutch disease or monetarist medicine: The British economy under Mrs. Thatcher*, Federal Reserve Bank of St. Louis, May 1984.

[142] This refers specifically to funded pension systems that are included in the 2008 System of National Accounts. We have not examined changes relative to GDP of pay-as-you-go systems such as Social Security in the United States.

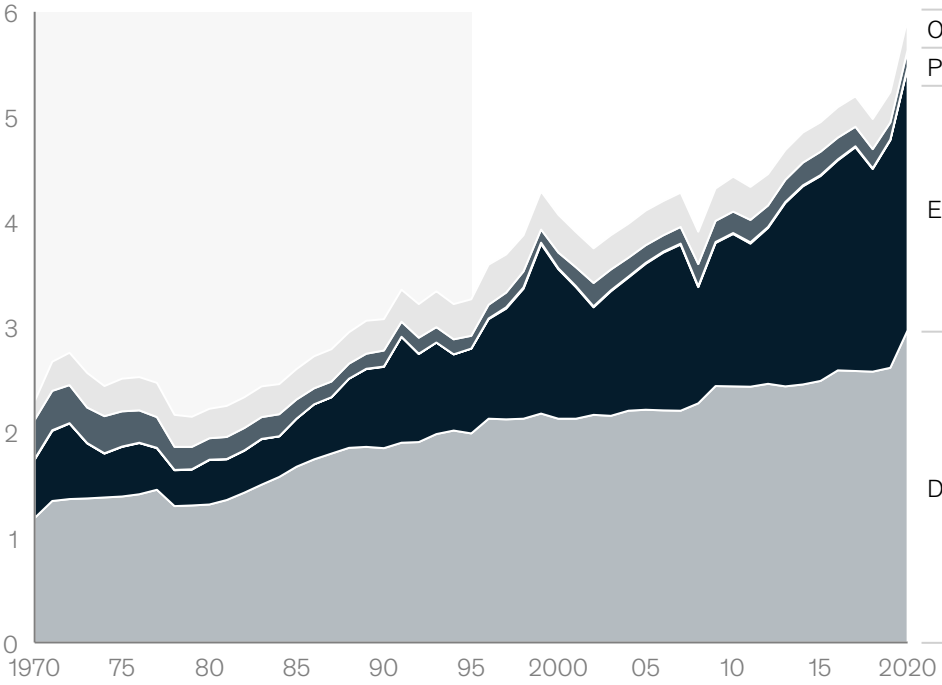
Exhibit 42

Global liabilities tripled relative to GDP from 1970 to 2020, and equity was the largest contributor to that growth.

Global financial assets relative to GDP, nonconsolidated data, 1970–2020

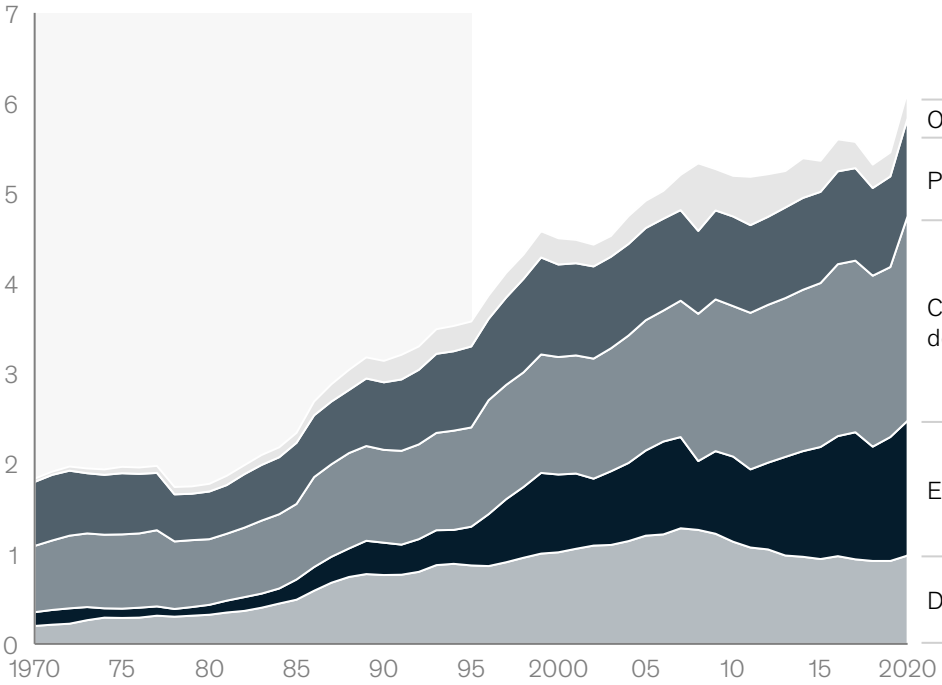
Limited financial data available

Liabilities outside the financial sector/GDP



	Change, pp	
	1971–99	2000–20
Other	18	-7
Pensions	-25	4
Equity	106	88
Debt	99	79

Liabilities in the financial sector/GDP



	Change, pp	
	1971–99	2000–20
Other	26	1
Pensions	36	1
Currency and deposits	58	96
Equity	75	60
Debt	80	-2

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Equity includes unlisted equities. Financial data begin in different years: United States, Japan, 1970; United Kingdom, 1986; Australia, 1988; Canada, France, Germany, Sweden, 1996; China, 2000; Mexico, 2003. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Currency and deposit liabilities relative to GDP grew substantially in the past two decades, in particular following 2008, from 1.6 times GDP to 2.3 times GDP in 2020. Central bank balance sheets, which are included in the financial sector and hold many of these currency and deposit liabilities, expanded collectively from 0.1 times GDP in 2000 to 0.5 times GDP in 2020.[143]

In Japan's case, monetary expansion began prior to 2000, with currency and deposit liabilities relative to GDP growing from 0.9 times GDP in 1970 to 2.3 times GDP in 2000 in the aftermath of its bubble and continuing to grow, reaching 4.3 times GDP in 2020. As noted in chapter 2, Japan's central bank balance sheet expanded the most, followed by France and Germany. Globally, more than one-quarter of the central bank balance sheet growth during 2000—2020 took place during the COVID-19 pandemic from 2019 to 2020.

Equity liabilities within the financial sector have also grown, by 75 percentage points relative to GDP between 1971 and 1999 and by 60 percentage points between 2000 and 2020. Growth in debt liabilities relative to GDP within the financial sector largely occurred prior to 2008, reaching a peak of 1.3 times GDP in 2007 (from 0.2 times GDP in 1970), immediately before the financial crisis.

Financial sector debt slowly declined after 2008 to 0.9 times GDP in 2019 (although it increased slightly in 2020 to one times GDP). There are notable exceptions to this trend, however. The financial sectors in Canada, France, and Japan reached an all-time country high of debt liabilities relative to GDP in 2020 (although the United Kingdom's was the highest across countries at two times GDP). From 2019 to 2020, Japan's financial sector saw the largest growth in debt liabilities relative to GDP, from 1.6 to 1.9 times, followed by the United Kingdom, where debt liabilities grew by 0.2 times. China's financial sector debt relative to GDP reached an all-time high in 2016 but has since declined.

While other forms of liabilities in the financial sector were relatively small in the global picture, they played a more sizable role on the balance sheet of the United Kingdom's financial sector. In particular, liabilities related to derivatives reached 5.9 times GDP in 2008 and have since declined to 2.4 times GDP.[144]

Financial depth and financial asset profiles vary markedly by country

Across countries, financial assets held by households, corporations, and governments ranged from 2.7 times GDP in Mexico to 8.5 times GDP in Sweden. In the financial sector, they ranged from 1.4 to 11.5 times GDP in Mexico and the United Kingdom, respectively (Exhibit 43). The range of financial assets relative to GDP across countries is wider than the range of real assets, reflecting different financial systems and monetary policies.

Outside the financial sector, currency and deposit assets are highest in Japan and China, at 2.9 times and 2.4 times GDP, respectively. Equities held outside the financial sector are highest in Sweden at 4.5 times GDP, followed by France at 3.9. (Some of this is equity held within the nonfinancial corporate sector, however. Using consolidated data lowers the ratio to 2.8 in Sweden and 1.9 in France.)[145] Countries with funded pension systems—Australia, Canada, Sweden, the United Kingdom, and the United States—have the most pension assets outside the financial sector, ranging from 1.3 to 2.0 times GDP. The average pension assets across our sample, in comparison, are 1.1 times GDP; in China, they are as low as 0.2 times GDP. Financial assets outside the financial sector are low across asset classes in Mexico at 2.7 times GDP, followed by Germany at 4.2 times GDP.

[143] Central bank data is sourced primarily from the OECD, with supplemental data directly from the central banks in several cases. This includes data for all years from Australia, China, and the United Kingdom, and for 2020 from Canada, France, Germany, and Japan. In absolute nominal terms, based on a simple average of the ten focus countries, central bank balance sheets grew an average of nine times their 2000 value by 2020.

[144] The 2008 System of National Accounts includes derivatives as a financial asset (and liability), even though the value of a swap at initiation is zero.

[145] Estimated based on unconsolidated-to-consolidated data ratios in 2019 as published by the OECD.

Exhibit 43

Stocks of currency and deposits, equities, and household pensions account for the largest cross-country differences in financial assets.

Financial asset breakdown across countries, nonconsolidated data, 2020, GDP multiple

Magnitude of standard deviation: >1 above average; Above average; Below average; >1 below average

		Australia	Canada	China	France	Germany	Japan	Mexico	Sweden	United Kingdom	United States	Global
Financial assets outside the financial sector	Currency and deposits	1.13	1.24	2.35	1.34	1.21	2.88	0.44	0.88	1.43	0.97	1.58
	Debt	0.16	0.73	0.06	0.94	0.37	0.42	0.18	1.23	0.39	0.53	0.39
	Equity	1.18	2.65	3.48	3.93	1.46	1.59	1.10	4.46	1.23	2.40	2.54
	Pensions	1.82	1.35	0.24	1.00	0.76	1.01	0.44	1.34	1.95	1.59	1.07
	Other	0.37	0.75	0.05	0.99	0.40	1.58	0.56	0.56	0.28	0.23	0.39
	Nonfinancial sector subtotal	4.67	6.72	6.19	8.21	4.21	7.48	2.72	8.48	5.28	5.73	5.98
Financial assets in the financial sector	Currency and deposits	0.32	0.40	0.22	2.42	1.48	1.44	0.21	1.04	2.66	0.20	0.65
	Debt	2.83	3.83	3.23	3.58	2.39	5.33	0.95	2.81	4.41	3.10	3.35
	Equity	1.70	3.21	0.81	1.30	1.03	0.75	0.12	2.69	1.69	1.90	1.41
	Pensions	0.00	0.04	0.00	0.07	0.03	0.03	0.00	0.01	0.26	0.38	0.17
	Other	0.34	0.76	0.41	0.63	0.48	1.17	0.10	0.27	2.51	0.00	0.44
	Financial sector subtotal	5.18	8.23	4.66	8.01	5.42	8.73	1.38	6.82	11.53	5.59	6.02
	Total	9.85	14.95	10.85	16.22	9.63	16.21	4.10	15.29	16.81	11.32	12.00

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Equity includes unlisted equities.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

National loan-to-value ratios offer a complementary way of looking at financial liabilities and debt

GDP has been the conventional benchmark used to evaluate a country's financial depth and debt load. Viewing debt and total liabilities only through the lens of GDP, however, neglects an important basis of comparison, which are the assets that debt and other forms of financing support. We explore the value of debt and liabilities as a whole relative to the real assets held by households, government, and nonfinancial corporations. These loan-to-value ratios provide an additional perspective on debt that is more akin to classic business metrics. These ratios also measure the amount of financing deployed for investment in or ownership of real assets.[146]

Through the lens of loan-to-value ratios, debt levels are higher in Canada and the United Kingdom and lower in China than they are in the classic debt-to-GDP metric

We calculated country- and sector-wide loan-to-value ratios as debt relative to produced assets, such as buildings, infrastructure, and machinery and equipment. Such assets often require new investment and financing, and so contribute directly to GDP.[147] We also took a broader view, calculating liability-to-real-asset ratios that encompass the full extent of obligations. For example, we added liabilities linked to equity to debt and compared the sum to all real assets, including nonproduced assets such as land, oil reserves, minerals, and other types of natural resources that are not the result of a production process.[148] We examined these ratios in the household, government, and nonfinancial corporate sectors.[149]

Across the ten countries in 2020, the weighted average loan-to-value ratio was 0.8, meaning that for every dollar of produced assets, there was 80 cents of debt. The weighted average liability-to-real-asset ratio was 1, or $1 of obligations for every dollar of real assets, even excluding the financial sector. Put differently, all real assets were owned on average via some form of finance rather than outright.[150] Meanwhile, the debt-to-GDP ratio was 3, or $3 of debt for every dollar of income (Exhibit 44).

Loan-to-value ratios provide a different measure of leverage than debt-to-GDP ratios. Some economists have expressed concerns about Japan's high debt-to-GDP level, which stood at 4.4 on an unconsolidated basis in 2020, the highest in our sample by far. However, at 1.1, the country's debts relative to its produced assets suggest that Japan may be considered less leveraged than Canada or the United Kingdom, with debt-to-produced-asset ratios at 1.4. Based on loan-to-value ratios, the United Kingdom had the highest levels of leverage, even though its debt-to-GDP ratio is comparable to those of other countries. Its broader liability-to-real-asset ratio, however, is in line with our sample averages due to high land values.

In China, debt-to-GDP ratios shot up notably over the past two decades to levels now in line with our sample averages, a topic of extensive debate—but the country's loan-to-value ratios were well below average.

Germany had a lower debt-to-GDP ratio than every country in our sample except Mexico, and its loan-to-value ratios, at about 60 percent, would make the proverbial thrifty Swabian homemaker proud. Mexico has the lowest values on all three ratios.

[146] Other research uses a similar concept. See Elva Bova et al., *Another look at governments' balance sheets: The role of non-financial assets*, IMF working paper number 2013/095, May 2013.

[147] GDP increases when individuals, businesses, and governments invest in *new* produced assets; when used assets are purchased, this does not directly contribute to GDP.

[148] Nonproduced asset purchases are not considered investment in national accounting and thus do not directly contribute to GDP.

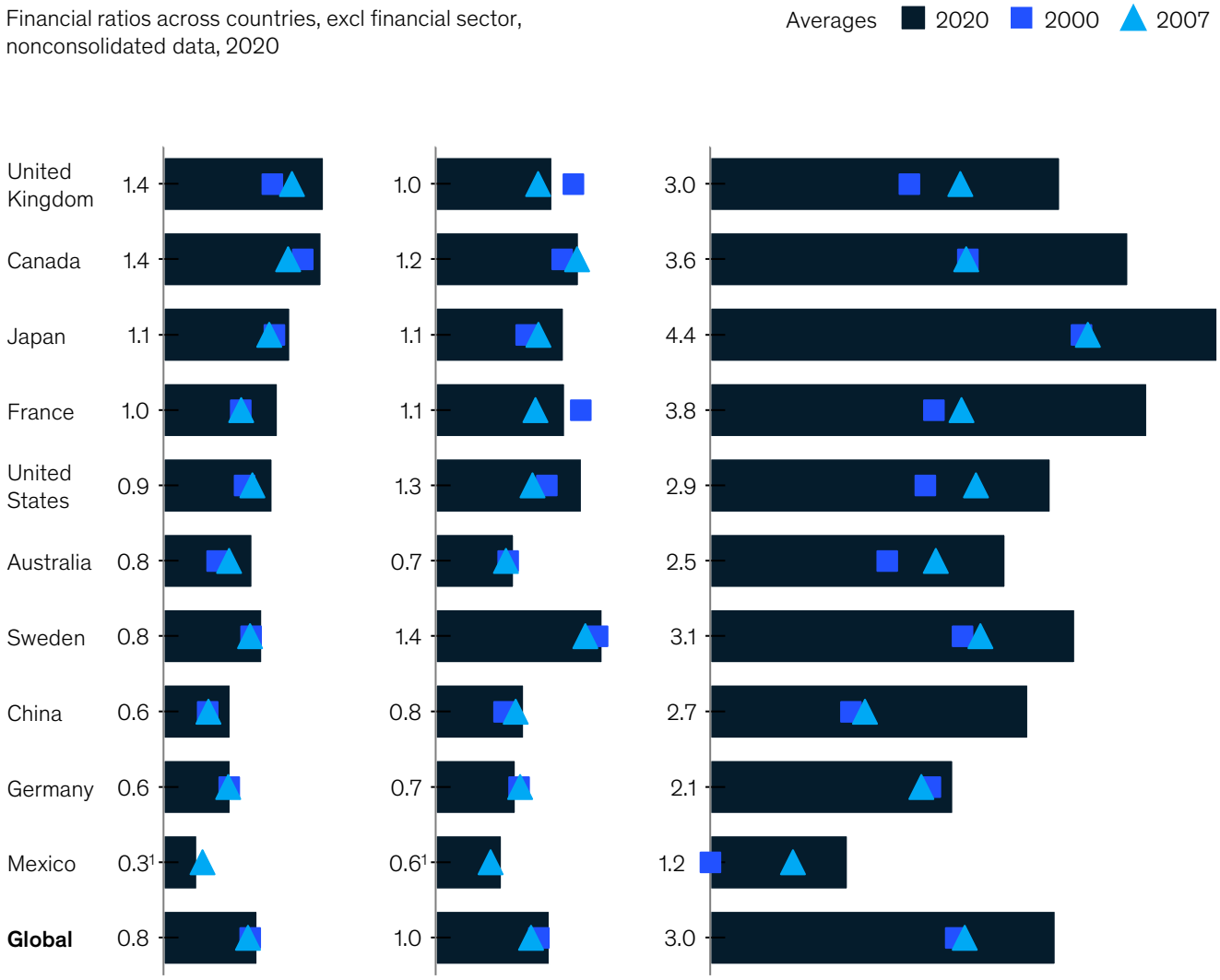
[149] Given that the financial sector acts as a financial intermediary for other sectors and invests very little in real assets, the logic underlying loan-to-value ratios does not apply to the financial sector. We have also removed financial sector debt from the debt-to-GDP ratios to enable a direct comparison.

[150] Note that this represents averages. There also is a significant amount of debt unrelated to real assets, such as consumer loans, which increases the level of financialization relative to debt backed by assets. This metric also includes unlisted equities as financialization even if they are held directly by a founding family.

Exhibit 44

Loan-to-value ratios are highest in Canada, Japan, the United Kingdom, and the United States.

Financial ratios across countries, excl financial sector, nonconsolidated data, 2020



1. Data for Mexico only begin in 2003.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Among the four sectors, governments had the highest loan-to-value ratios, often above 100 percent

Governments had the highest loan-to-value ratios on average in our sample, at 1.8, compared with 0.6 for the household and nonfinancial corporate sectors (Exhibit 45). More broadly, significant land holdings reduce liability-to-real-asset ratios in the government and household sectors to 1.4 and 0.3, respectively. Liabilities related to equity increase the ratio to 1.7 in the corporate sector.

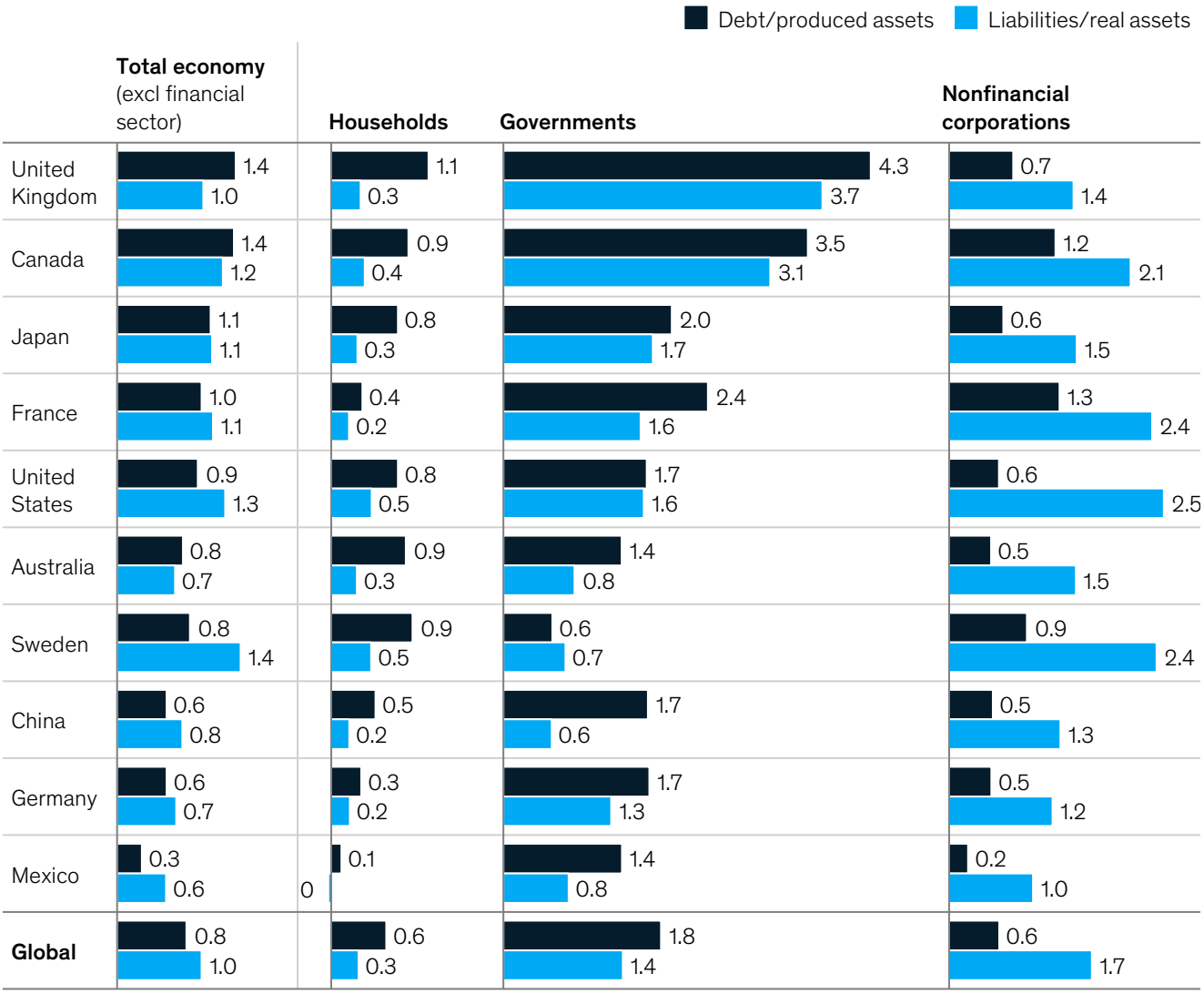
In the household sector, loan-to-value ratios were significantly higher than average in Australia, Canada, Sweden, the United Kingdom, and the United States.[151] The average household in these countries had outstanding debt roughly equivalent to the value of buildings (without the land underneath) that they own.

[151] This probably reflects easier access to credit. Much of consumption in the United States, for instance, was supported not by wage growth but by taking on debt, including through mortgage equity withdrawal. See Raghuram G. Rajan, *Fault lines: How hidden fractures still threaten the world economy*, Princeton University Press, 2011.

Exhibit 45

The government sector in most countries had the highest loan-to-value ratios.

Debt-to-produced-assets and liabilities-to-real-assets ratios by country and sector, nonconsolidated data, 2020



Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

A similar pattern, although less pronounced, holds true in the corporate sector. Loan-to-value ratios are highest in France, due to high intracompany debt obligations, followed by Canada and Sweden. In the broader ratio, which includes equity as a liability, ratios rise to much higher levels of about 2.5 in France, Sweden, and the United States. In the United States, the stock market rally has led corporate equity values to greatly exceed the value of the corporate sector's real assets. For every dollar of real assets owned by the corporate sector in the United States, the sector had obligations to debtors or shareholders of $2.50 in 2020. By contrast, the Chinese corporate sector, which also had high equity values, had high levels of real assets and therefore fewer obligations against each real asset.

Loan-to-value ratios are highest in the government sector and show the broadest range, from 0.6 in Sweden to 4.3 in the United Kingdom. Governments generally have a lower cost of borrowing than other sectors and, in some cases, step in to spend at a deficit to support an economy. If government spending increases real asset stocks at or above the amount of new debt, a country's loan-to-value ratio will not grow. The Japanese government sector, for instance, has accumulated large amounts of debt to invest heavily in public infrastructure over the past three decades. While its loan-to-value ratio is above average, Japan's government sector does not have the highest loan-to-value ratio across countries because it also has a significant pile of real assets, ranging from transit systems and highways to less traditional types of infrastructure like opera houses. The UK government sector, in turn, has the highest loan-to-value ratio, 4.3, after decades of initiatives to sell or privatize and privately finance public assets.

The implications of high loan-to-value ratios, particularly in the government sector, remain to be seen. Governments, after all, have the authority to tax, ultimately backing their creditworthiness. Still, better accounting for and management of public assets is associated with better public financial outcomes.[152]

Although debt levels have risen relative to GDP across the ten countries, loan-to-value ratios have stayed relatively constant

Over the past two decades, debt has risen relative to GDP in the household, government, and nonfinancial sectors in all countries in the sample but Germany. Yet loan-to-value ratios across countries remained flat or slightly rose, though at a slower rate than debt relative to GDP. This means that real assets increased at roughly the same rate as debt and liabilities outside the financial sector. A longer-term view of debt and assets in the United States highlights strong growth in loan-to-value ratios already in the 1980s (see Box 6, "A long-term view of debt and assets in the United States").

Excluding the financial sector, China's debt relative to GDP has increased 151 percentage points since 2000, a phenomenon discussed in a large body of research.[153] Over the same period, the value of total real assets has also grown, offsetting higher debt. China's loan-to-value ratio increased from 0.4 in 2000 to 0.6 in 2020, and broader liability-to-real-asset ratio grew from 0.6 in 2000 to 0.8 in 2020. Debts have increased more relative to assets in the Chinese household sector. The value of household real estate has grown only slightly faster than GDP in China, but household debt levels relative to GDP have grown fivefold while its loan-to-value ratio increased from a very low 0.1 to a still-moderate 0.5.

Japan was the only country whose loan-to-value ratio grew faster than its debt-to-GDP ratio in the total economy view (excluding the financial sector) from 2000 to 2020. Real assets grew slightly faster than GDP, while total liabilities outside the financial sector grew by 2.1 times GDP. In Japan's household sector, debt levels grew in line with GDP, while real asset values declined by 0.4 times GDP, resulting in a higher ratio of liabilities to real assets.

[152] New Zealand, for example, leveraged a modern accounting system and full accrual accounting methodology as part of broader public management reforms beginning in the 1980s, moving out of financial crises and low economic growth. See Graham Scott, *From output budgeting to social investment: Reflections on thirty five years of evolution in public sector management in New Zealand*, CEP Chile, 2018. Similar tools for measuring a sustainable economy and debt levels, using standard accrual accounting, and budgeting techniques have been included in IMF manuals for more than two decades. Furthermore, IMF research has shown that countries with a stronger government net worth—total assets less liabilities—experience shallower recessions and recover faster in the aftermath of economic downturns.

[153] See Emre Tiftik, Khadija Mahmood, and Raymond Aycock, *Global debt monitor: Reassessing the pandemic impact*, Institute of International Finance, September 2021, iif.com; and Gene Ma and Phoebe Feng, *China spotlight: Stimulus after the GFC and Covid*, Institute of International Finance, September 2021. Also see *Debt and deleveraging: The global credit bubble and its economic consequences*, McKinsey Global Institute, January 2010, McKinsey.com.

Box 6

A long-term view of debt and assets in the United States

Prior to 1981, US debt levels relative to GDP, as well as loan-to-value ratios, were mostly flat. Between 1950 and 1980, the country had higher average annual real GDP growth at 4 percent than in later periods, although the postwar era was also marked by high inflation that peaked around 1980.[1] During this period, households became more leveraged and the government sector became less leveraged, so that debt overall in the United States was relatively flat. Debt-to-GDP levels in the household sector increased substantially, by 37 percentage points, and the sector's broader liability-to-real-asset ratio also increased, by 15 percentage points. Debt relative to GDP in the government sector, by contrast, declined 41 percentage points, thanks to inflation (Exhibit 46).

Long-term (nominal) interest rates peaked in 1981 at 13.9 percent, followed by a gradual decline throughout the 1980s.[2] Deregulation in the financial sector, proliferation of money market funds, and debt-financed market speculation (for example, in corporate real estate) contributed to the increase of debt in the total US economy in that decade.[3] From 1981 to 1990, debt-to-GDP ratios in the household, government, and nonfinancial sectors increased by 11, 28, and 8 percentage points, respectively. Liability-to-real-asset ratios increased by 12 percentage points in the household sector, 57 percentage points in the government sector, and 84 percentage points in the corporate sector. Real assets in these three sectors relative to GDP declined during this period, further pushing up loan-to-value ratios.

The savings-and-loan crisis that resulted reined in debt, which leveled off over the early 1990s. However, the country's liability-to-real-asset ratio peaked in 1999 during the dot-com boom.[4] Higher equity valuations were unmatched by real asset growth, and from 1990 to 1999, the liability-to-real-asset ratio increased by 38 percentage points as a whole and by 122 percentage points in the nonfinancial corporate sector. Debt levels remained largely flat during that period.

The dot-com bubble burst in 2001, bringing liability-to-real-asset ratios down with it. Debt levels, however, started rising again relative to GDP, almost entirely driven by the household sector's appetite for housing. Among households, the debt-to-GDP ratio increased 35 percentage points from 2001 to 2007, and by 11 percentage points in the government sector. Unlike in the 1980s, the value of real assets, and household sector real estate in particular, increased relative to GDP so that loan-to-value ratios did not tick up dramatically.

When the housing bubble burst, leading to the 2008 financial crisis, debt levels declined as banks offered fewer mortgages and households began deleveraging, decreasing their debt relative to GDP by 20 percentage points between 2010 and 2019. To address the crisis, the US government adopted expansionary fiscal measures, and the government sector's debt-to-GDP ratio grew 21 percentage points while its liability-to-real-asset ratio grew 28 percentage points.[5] Debt relative to GDP in the nonfinancial corporate sector, meanwhile, saw minimal increases, just five percentage points, although liabilities linked to equity began to increase rapidly following recovery from the crisis.

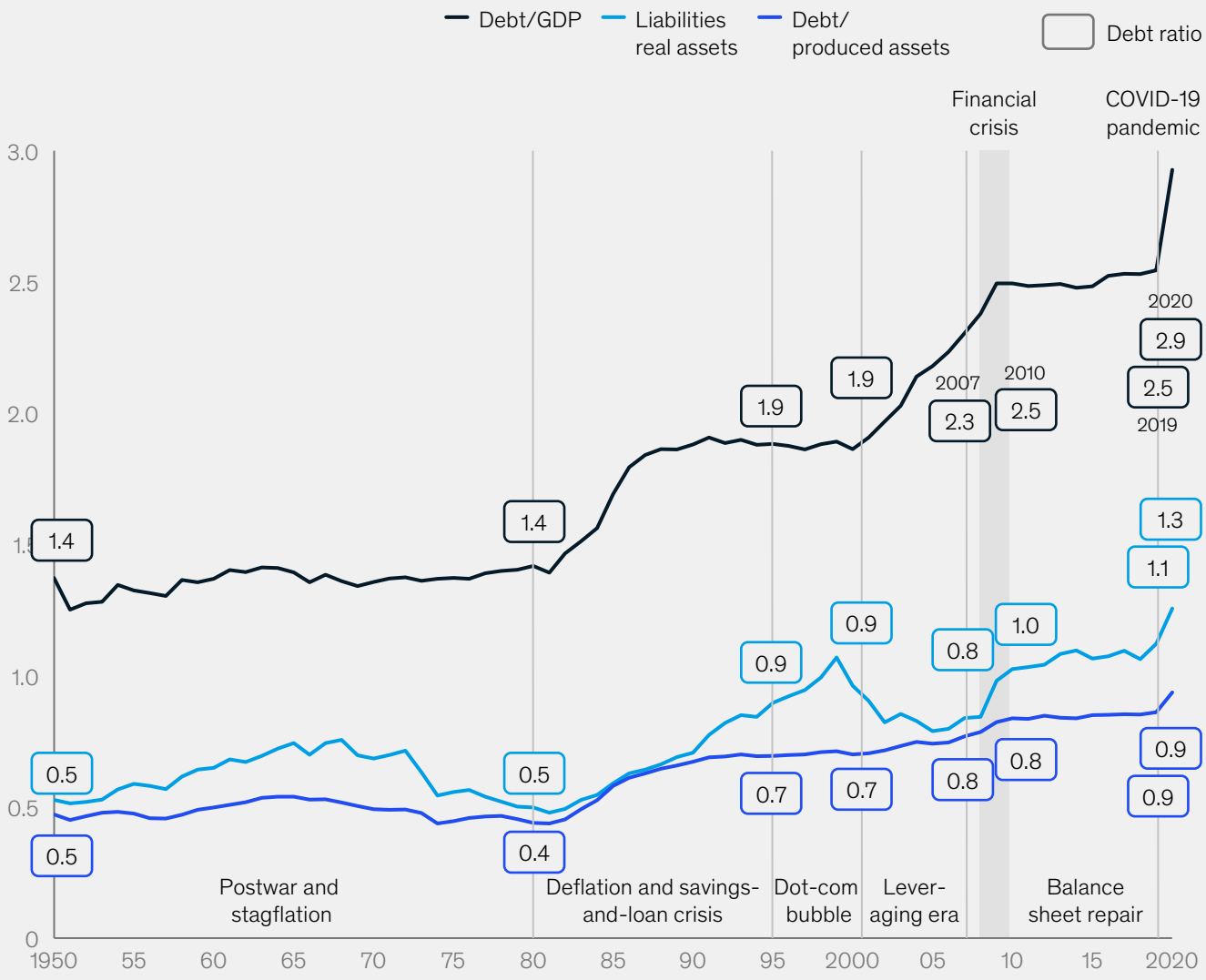
While the total economy debt relative to GDP saw minimal growth from 2010 to 2019, debt increased in 2020 as federal and state governments responded to the COVID-19 pandemic. Government sector debt grew by 25 percentage points, which was more than it had done between 2010 and 2019. Households moved from a decade of deleveraging to growing their debt relative to GDP by eight percentage points. Altogether, debt relative to GDP grew by 38 percentage points, loan-to-value ratios grew by eight percentage points, and liabilities-to-real assets grew by 13 percentage points.

1 See William Poole, "President's message: Volcker's handling of the Great Inflation taught us much," Federal Reserve Bank of St. Louis, January 2005.
2 Long-term interest rate database, OECD, oecd.org.
3 See "Commercial real estate and the banking crises of the 1980s and early 1990s" and "The savings and loan crisis and its relationship to banking," in *History of the 80s*, Volume 1, "An examination of the banking crises of the 1980s and early 1990s," Federal Deposit Insurance Corporation, December 1997.
4 The nonfinancial corporate sector reached a peak liability-to real-asset ratio of 2.2 in 1999.
5 Fiscal policy, including the American Recovery and Reinvestment Act of 2009, provided more than $1.4 trillion of support to the US economy from 2009–12 (equivalent to 9 percent of 2012 GDP). *Seven years ago, the American Recovery and Reinvestment Act helped bring our economy back from the brink of a second Great Depression*, White House fact sheet, February 26, 2015.

Exhibit 46

In the United States, loan-to-value ratios grew strongly in the 1980s.

Debt ratios in the United States, nonconsolidated data excl financial sector, 1950–2020



Note: Liabilities include listed and unlisted equities.
Source: Bureau of Economic Analysis; Federal Reserve Board; World Bank; McKinsey Global Institute analysis

Over the past decade, for every dollar of net investment in the economy, almost two dollars of debt were added

Another way to measure the increasing financial depth of an economy examines growth in total liabilities or debt against cumulative net investment after depreciation. This metric tells us the amount of liabilities or debt that countries incur relative to the quantity of net new investments over a period of time. Outside the financial sector, growth in debt was 1.8 times greater than cumulative net investment over the past decade. Expanded to include all liabilities, growth in total liabilities was roughly four times greater than cumulative net investment. Put differently, for every dollar newly invested into the economy, nearly two dollars of debt were added. The past two decades had the highest average ratios of new debt to new investment over the past 60 years, although notable differences exist across countries (Exhibit 47).

Of the ten focus countries, China raised the least new debt relative to new investment, with new debt of 1.3 times net investment over the past decade and liabilities 2.7 times the size of net investment. While China's debt levels relative to GDP have grown the most in relative terms, 66 percent from 2010 to 2020 outside the financial sector, China also has the highest levels of net investment relative to GDP, an average of 22 percent from 2010 to 2020. The other nine countries had net investment of less than 10 percent.

Declining interest rates have buffered the impact of rising debt-to-GDP ratios

While debt levels have risen across the ten countries over the past two decades, interest rates—and hence the costs of servicing debt—have fallen dramatically as central banks have embraced expansionary monetary policies in an effort to stimulate demand and promote economic recovery. Although debt levels relative to GDP have traditionally been used to assess debt sustainability, the persistence of extremely low interest rates led policy makers and researchers to ask if a new metric might be more appropriate. Jason Furman and Lawrence H. Summers recently discussed the suitability of the debt-to-GDP ratio as a core metric in such a low-interest-rate environment, suggesting instead an interest-payment-to-GDP, or debt-cost-to-GDP, metric as a basis for evaluating debt sustainability. Using debt levels on national balance sheets and ten-year bond rates, we have developed a simplified approximate measure of debt cost relative to GDP for the total economy. In line with Furman and Summers, we find that the cost of debt sharply decreased even as debt levels rose (Exhibit 48).[154]

In debt sustainability analysis, the most frequently used approach focuses on the relation between nominal interest rates and nominal GDP growth rates. When interest rates exceed the GDP growth rate, the debt ratio increases, unless compensated by a surplus of taxes over expenditures, a so-called primary surplus. Without such a surplus, the debt ratio increases without bounds. Consider, for example, two households, each earning $100,000 this year and with salary growth of 5 percent annually. Neither saves any of its income, and both have $10,000 in debt. One of these households pays 4 percent interest on its debt, while the other pays 7 percent interest. The household paying 4 percent will see its debt relative to its income decline over time, given that the interest rate is lower than the growth rate of its income. Meanwhile, the household paying 7 percent will see its debt level increase because it is paying interest at a higher rate than the rate at which its income is growing.[155]

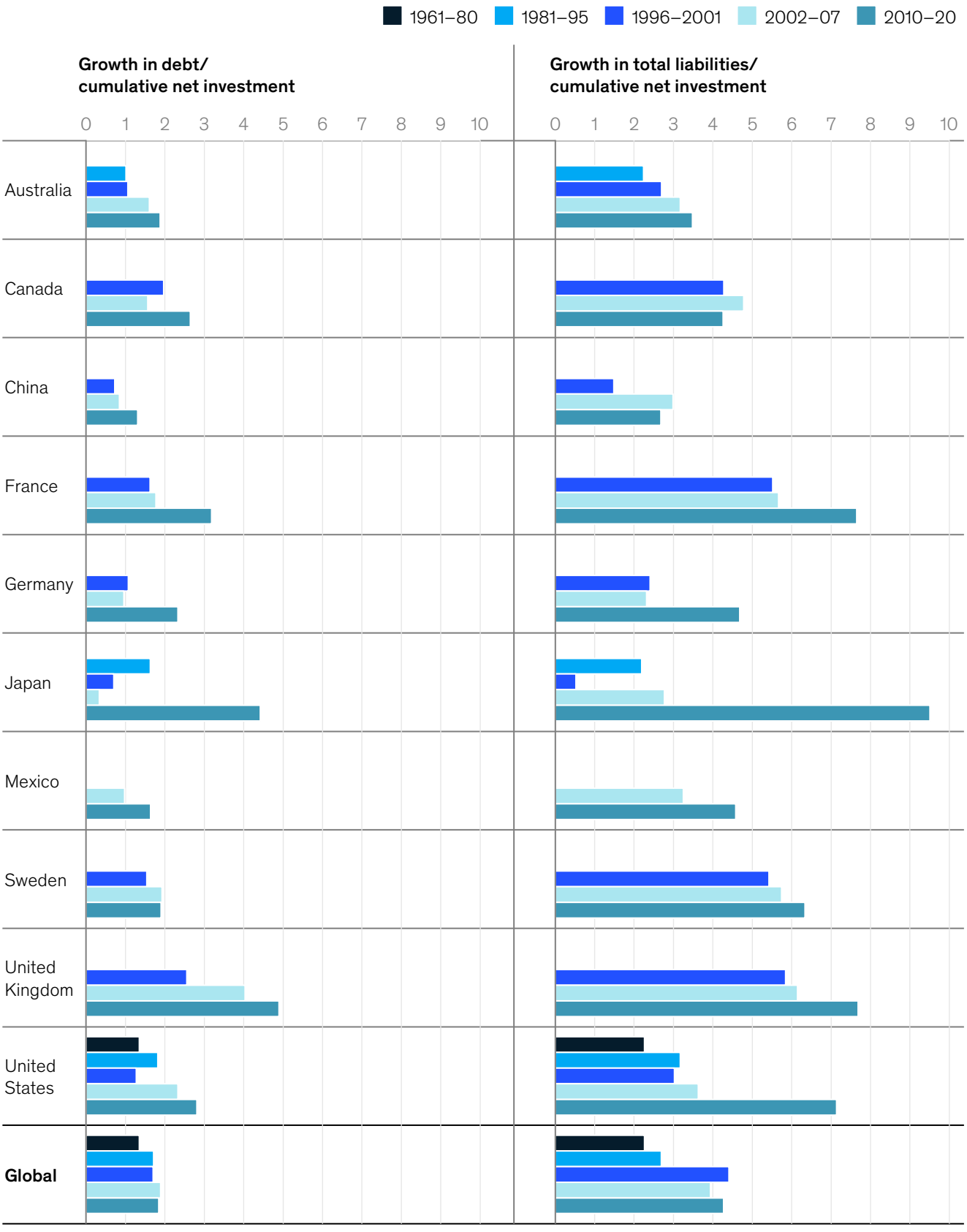
[154] See Jason Furman and Lawrence H. Summers, *A reconsideration of fiscal policy in the era of low interest rates*, Harvard Kennedy School, November 2020; and Olivier Blanchard, "Public debt and low interest rates," *American Economic Review*, April 2019, Volume 109, Number 4.

[155] See the technical appendix for the detailed formula and explanation of the relationship between debt, nominal GDP growth, and interest rates.

Exhibit 47

A long-term view of debt and liability growth relative to net investment shows significant differences across countries.

Debt and total liability change vs cumulative net investment, excl financial sector, nonconsolidated data, 1961–2020



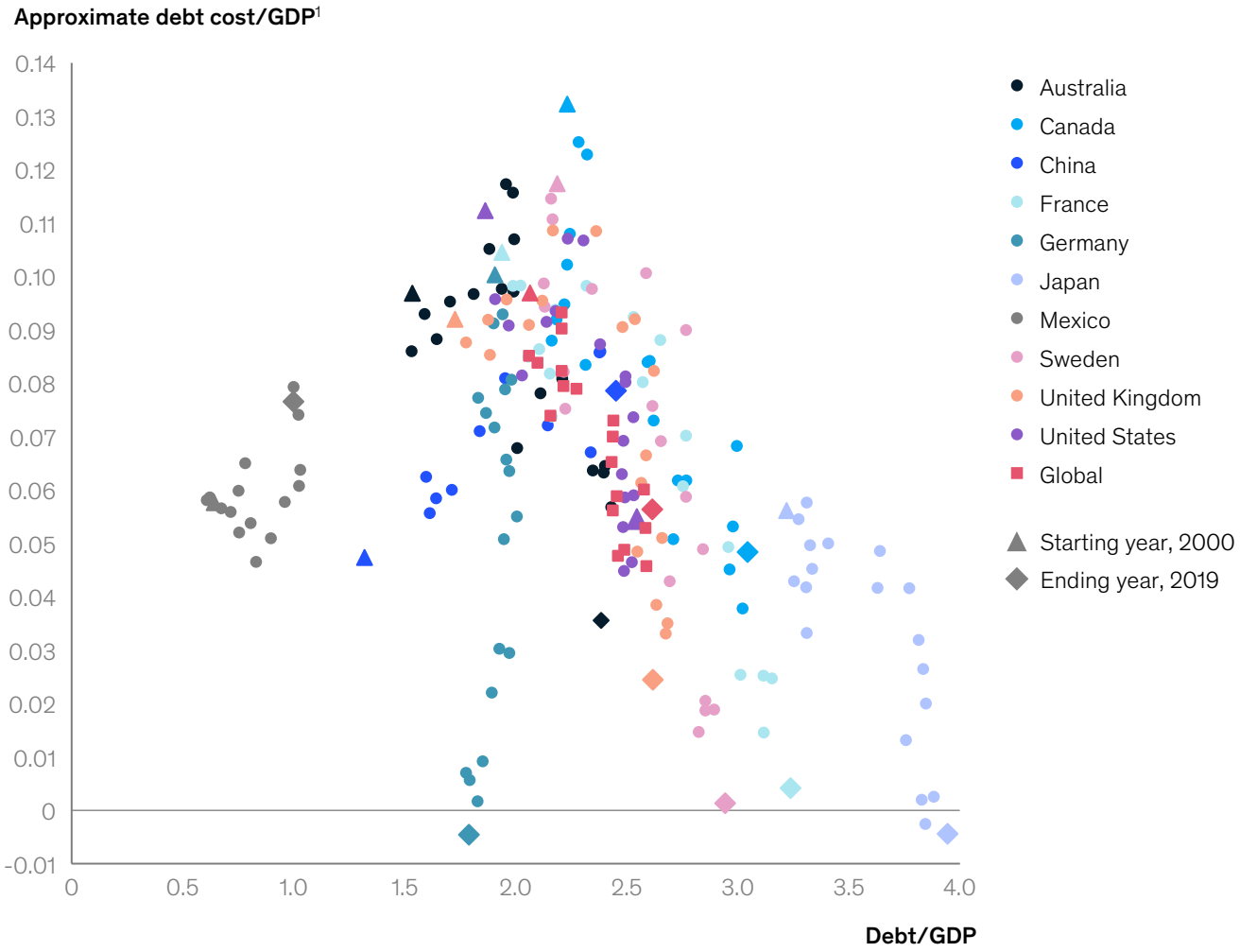
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All years not available for all countries.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Exhibit 48

Rising debt levels have been accompanied by lower cost of debt in all countries other than China and Mexico.

Approximate debt cost and debt levels relative to GDP across countries,
excl financial sector, nonconsolidated data, 2000–19



1. Calculated as debt/GDP in a given year multiplied by long-term interest rate in a given year.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Data from Mexico start in 2003, and from China in 2008.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Over the past decade at the country level, interest rates were below nominal GDP growth rates in most countries more than in the past. So even with sluggish GDP growth, country debts could be considered more sustainable using this metric alone (Exhibit 49).[156] Average long-term interest rates and average nominal GDP growth rates are firmly in the "zone" of debt sustainability across countries, a marked difference compared to the conditions before and amid the great financial crisis.

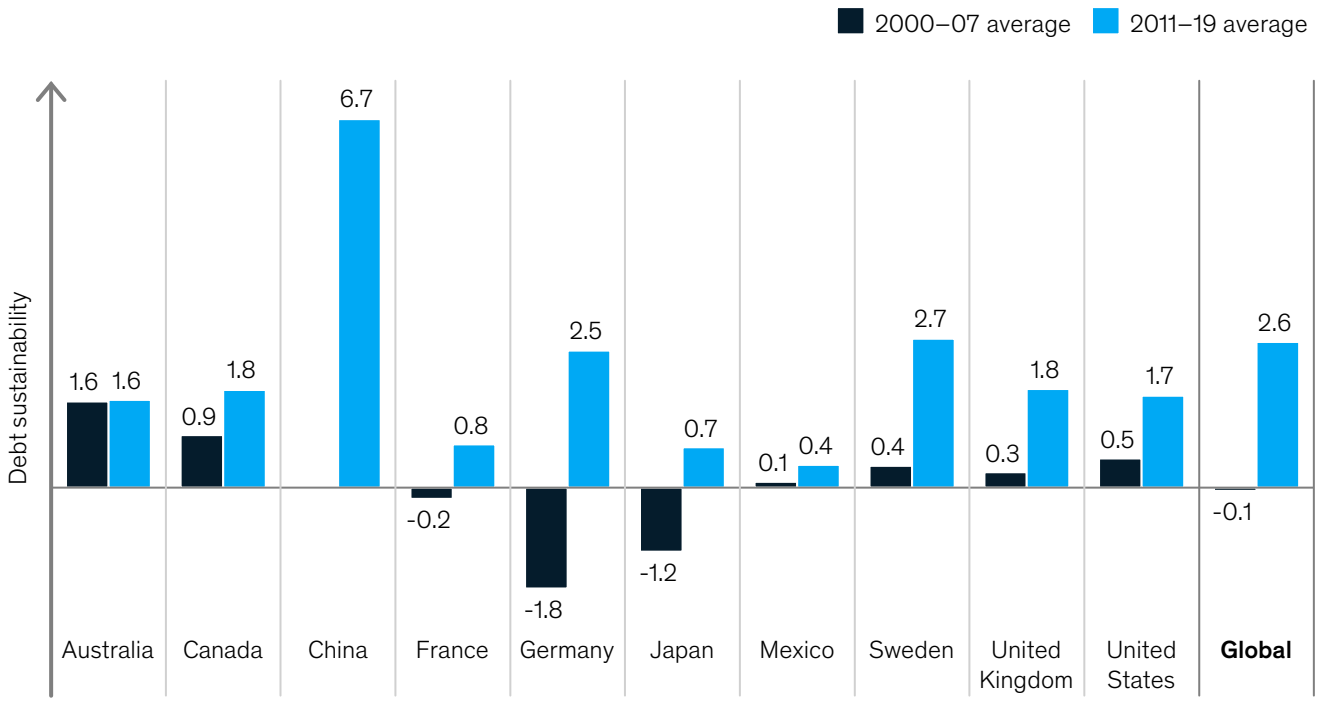
This raises the question: what happens if interest rates rise? Higher debt levels, sustainable for now, may become burdensome if interest rates increase or nominal GDP rates decline. Most immediately, higher interest rates would mean higher debt service costs relative to GDP. But they would also translate into declining asset values, in which case loan-to-value ratios would increase.

[156] Furman and Summers also raise this point.

Exhibit 49

The past decade has seen average interest rates at lower values than nominal GDP growth rates, indicating greater debt sustainability.

Spread between nominal GDP growth rates and average long-term interest rates across countries, 2000–19, %[1]



1. Average nominal GDP growth rates less average long-term interest rates (10-year government bond yield) by country and time period.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. China data begin in 2008.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Our research finds that while debt and other liabilities have grown fast, they have not grown much faster than real asset values over the past 20 years, even in the government sectors for some countries. Yet our metrics highlight different levels of leverage based on other metrics. Low interest rates have given governments some breathing room to pursue more expansive economic stimulus with the knowledge that debt costs are low. A key question is what might happen in the event of a correction in the form of higher interest rates and falling real asset values.

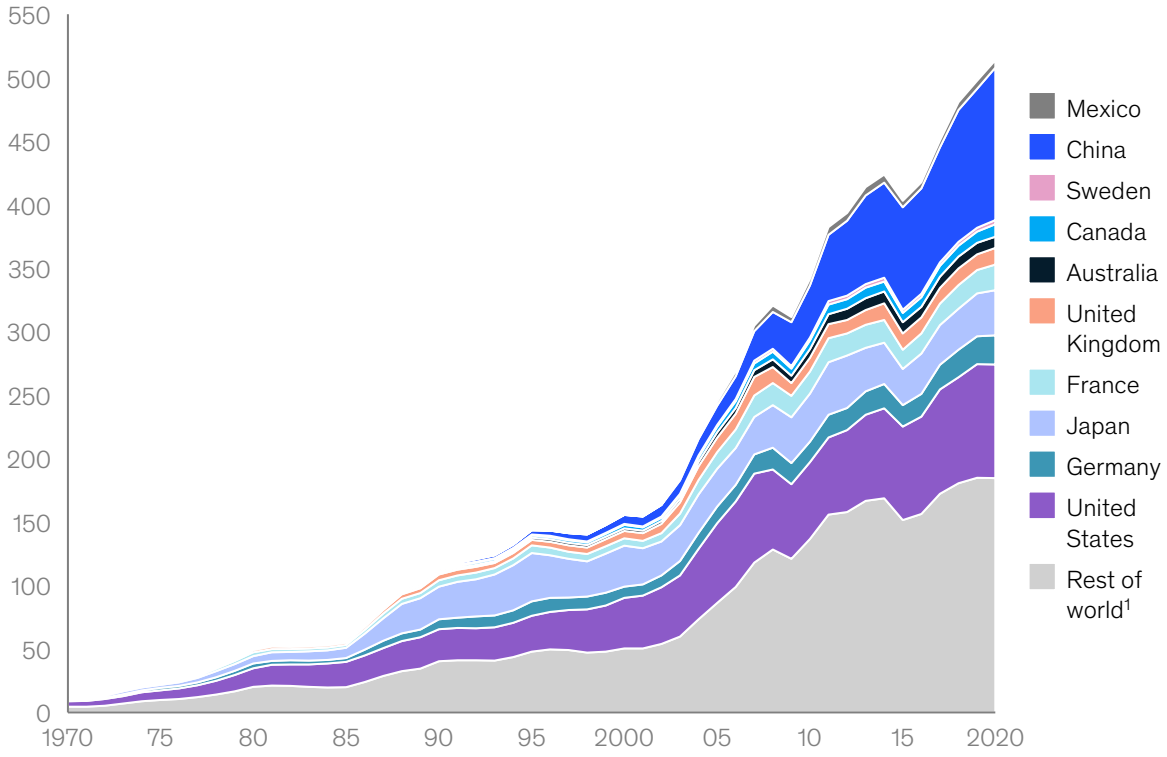
6. Country patterns and choices

A long-term view of the changes in net worth in the ten countries in our research indicates the degree to which economic geography can shift. Exhibit 50 highlights the relative size of net worth for each of the ten economies—most strikingly, the rapidly rising share of net worth in China compared to the other nine countries in recent years.

Exhibit 50

A 50-year view of net worth highlights shifts from the United States and Japan toward China.

Composition of global net worth across countries, 1970–2020, $ trillion



	Share of net worth across selected countries, %					
China	n/a	1	1	4	12	23
Japan	7	11	23	21	11	7
Germany	7	7	7	6	5	4
United States	37	28	22	26	18	17
Rest of world	38	39	35	32	40	36

1. The share of net worth owned by the rest of world is assumed to be equal to the share of world GDP not covered by the ten countries of focus. The rest of world total includes China before 1979 and Mexico before 2003.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

While balance sheets have grown sharply across all ten countries, the way in which they have done so and the factors driving the growth are often specific to individual countries or groups of countries that share certain characteristics and choices. In this chapter, we discuss how countries are similar and different across balance sheet components and trends and which characteristics and choices drive those patterns.

We look at these similarities and differences through four different lenses with specific sets of metrics. The four lenses are net worth expansion, net worth in the total economy and in the household sector, financial assets and liabilities, and economic returns. Countries cluster together in different ways viewed through each of the four lenses (Exhibit 51). Many factors shape the variance of these balance sheet outcomes across countries. These include the macroeconomic environment, notably interest rates and monetary policy; the financial system setup, including lending standards, securitization, and pension system funding; real estate market characteristics like population density, elasticity of urban land supply, stringency of zoning, urban population growth, and movement of rental yields; fiscal policy including public debt and investment; development stage and growth; demographics; trade balances; or the competitive and market environment for companies.

At the end of this chapter, we provide detailed two-page infographics highlighting the specificities of the national balance-sheet trends of each of the ten focus countries.

Net worth expansion: real estate, corporate investment, and export related

Net worth grew relative to GDP in the ten focus countries over the past 20 years, with the most substantial growth in China, France, and Sweden. Three major components drove the expansion in net worth: the real estate boom and valuation gains common to all countries except Japan; rising values of and investment in corporate assets, especially in China and Mexico; and growth in net financial assets among net exporters, those with consistent current account surpluses (in other words, accumulating net asset positions).

Real estate fueled at least 50 percent of net worth expansion relative to GDP in all countries other than China and Japan. The most significant growth in real estate stock was in Australia, Canada, France, Sweden, and the United Kingdom (China saw the greatest home price growth but also had significant GDP growth, and as a result had more muted growth of real estate in relation to GDP). Declines in rental yields occurred in all countries apart from Japan, and they played the most significant role in home price growth in Canada, France, and Sweden. At the same time, some of the underlying drivers differed. In France, for example, some of the largest asset price and net worth increases coincided with the euro introduction in 1999, although many other factors were likely at play.[157] In Canada, Sweden, and the United Kingdom, immigration and population growth in urban centers may have played a role, together with financial systems that supported housing-related credit growth.[158] In the United Kingdom, stringent zoning laws and inelastic land and real estate markets, particularly in London, arguably contributed to the growth.[159] In Australia and Canada, a sustained commodity boom likely supported asset prices through a growing trade balance, increasing household consumption and home prices.[160]

[157] See Rahul Srivasta and Stephen L. Lee, "European real estate market convergence," *Journal of Property Investment & Finance*, August 2012, Volume 30, Number 5, pp. 458–73; and Kim Hiang Liow, "Volatility interdependence in European securities markets: Who is the most influential?," *Journal of European Real Estate Research*, August 2013, Volume 6, Issue 2, pp. 117–38.

[158] See David Ley, "Global China and the making of Vancouver's residential property market," *European Journal of Housing Policy*, 2017, Volume 17, Issue 1; and Adam Alexander Tychra, *Migration and housing markets—evidence from Sweden*, University of Cambridge, January 2020.

[159] See Vasilios Plakandaras et al., "Time-varying role of macroeconomic shock on house prices in the US and the UK: Evidence from over 150 years of data," *Empirical Economics*, May 2020, Volume 58, Number 5.

[160] See Paul Corrigan, *Terms-of-trade and house price fluctuations: A cross-country study*, Bank of Canada staff working paper number 2017-1, January 2017; and Thomas Hale, "Connecting commodities to house price booms," *Financial Times*, April 17, 2019, ft.com.

Exhibit 51

Four lenses show differences and similarities across countries.

Balance sheet, net worth, financial, and economic returns indicators by country

Magnitude of standard deviation — >1 above line-item average; Above line-item average; Below line-item average; >1 below line-item average

		Global weighted avg	France	Sweden	Canada	United Kingdom	China	United States	Japan	Australia	Germany	Mexico
Net worth expansion, 2000–20, change in GDP multiple[1]	Net worth	1.4	3.5	3.0	2.3	1.3	2.4	0.4	0.6	1.8	1.4	2.0
	Real estate assets	0.9	3.3	2.2	1.8	1.6	0.6	0.7	-0.4	1.5	0.8	1.4
	Nonfinancial corporate non–real estate produced assets	0.5	0.1	0.1	0.2	0.0	1.6	0.0	0.2	0.0	0.0	0.6
	Net financial assets	0.0	-0.1	0.6	0.7	-0.3	0.1	-0.4	0.5	0.0	0.7	0.0
Net worth size and compo-sition, 2020, GDP multiple	Net worth	6.1	7.7	6.2	5.9	4.8	8.2	4.3	7.2	6.8	6.0	5.5
	Household net worth	5.7	5.9	4.7	5.5	5.4	6.3	5.8	5.4	6.1	4.3	3.5
	Household financial assets	3.8	2.7	3.6	3.7	3.6	3.7	4.5	3.8	3.1	2.1	1.3
	Real estate (dwellings, buildings, and land) assets	4.2	6.0	4.6	3.8	4.2	4.8	3.5	3.8	5.5	4.1	3.5
	Government and nonfinancial corporate non–real estate produced assets	1.6	1.2	1.2	1.0	0.8	2.7	1.0	2.6	1.1	1.1	1.6
	Mineral assets	0.1	0.0	0.0	0.4	0.0	0.1	0.2	0.0	0.5	0.0	0.3
	Net financial assets	-0.1	0.1	0.2	0.6	-0.3	0.2	-0.5	0.7	-0.6	0.7	-0.4
Financial assets and liabilities	Total balance sheet growth since 2000, change in GDP multiple	4.9	10.8	9.7	8.7	8.1	7.6	4.5	5.2	5.1	2.7	3.9
	Total balance sheet, 2020, GDP multiple	18.1	23.8	21.3	20.2	22.0	18.8	16.2	22.7	17.2	15.0	10.0
	Debt/produced assets (excl financial sector), 2020	0.8	1.0	0.8	1.4	1.4	0.6	0.9	1.1	0.8	0.6	0.3
	Liabilities/real assets (excl financial sector), 2020	1.0	1.1	1.4	1.2	1.0	0.8	1.3	1.1	0.7	0.7	0.6
	Debt increase/cumulative net invest-ment (excl financial sector), 2001–20	1.8	2.7	2.0	2.4	4.8	1.2	2.6	2.4	1.7	1.9	1.6
	Debt liability growth, percentage point increase[2]	77	237	160	220	233	166	104	157	122	11	45
	Equity liability growth, percentage point increase[2]	148	150	345	221	8	213	152	126	49	35	80
	Currency and deposit liability growth, percentage point increase[2]	96	225	90	90	213	118	70	200	67	59	22
Economic returns	Average change in interest rates per year, basis points[3]	-14	-28	-28	-23	-23	-4	-20	-10	-25	-29	-15
	Operating returns on produced assets (without land), 2018, %	5	3	4	7	8	4	7	3	6	4	11
	Capital productivity (without land), 2020, %	28	26	27	37	45	21	31	25	30	27	24

1. Mexico data begin in 2003, and thus changes in GDP multiples reflect 2003–20.
2. Percentage point increases represent the period 2000–20 for all countries other than China and Mexico. To include all of 2000, we took the difference of 2020 and 1999 figures to show an amount inclusive of 2000. China's data begin in 2000 and so its percentage point changes reflect the period 2001–20, while Mexico's data begin in 2003 and thus are inclusive of the period 2004–20.
3. Change is shown in China from 2008–19, in Mexico from 2002–19, and in all other countries from 2000–19.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP.

Source: AMECO; CEIC; EU KLEMS; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Corporate assets outside the real estate sector drove a large share of net worth growth in emerging economies China and Mexico. In China, a fast-growing economy and manufacturing hub, this reflects strong investment and inventory buildup—together with big increases in debt—as well as investments by state-owned enterprises, including in infrastructure. Mexico has built up a stock of property, plant, and equipment that is large relative to its income in an international context but in line with its position as a manufacturing hub.

Growth in net financial assets played a strong role in net worth growth in manufacturing exporters Germany, Japan, and Sweden as well as commodity exporter Canada. In the United States, an increasingly negative net foreign lending position offset some of the increases in real estate net worth.

Net worth in the total economy and in the household sector: The role of real estate markets and pension systems

As discussed in chapters 1 and 2, net worth across countries ranged from 4.3 times GDP in the United States to 8.2 times GDP in China, while household net worth ranged from 3.5 times GDP in Mexico to 6.3 times GDP in China.

Among the four countries with the highest net worth relative to GDP, Australia and France stand out for their share of real estate in net worth exceeding 70 percent. In China and Japan, by contrast, corporate and government produced assets (including real estate) relative to GDP were more than twice as large as the stocks in all other countries except Mexico.

In the countries with the lowest net worth relative to GDP, the United Kingdom and the United States, real estate also dominates net worth. That is because negative net financial assets combine with comparatively low levels of assets in the corporate and government sectors apart from real estate. Yet net worth related to real estate was also below average in these two economies. In the United States, relatively elastic land markets dampened prices outside of superstar cities where GDP is 45 percent higher than their peers.[161] In the United Kingdom, a relatively old and largely depreciated stock of buildings plays a role.[162]

From a household net worth perspective, financial assets are particularly large in Canada, China, Japan, Sweden, the United Kingdom, and the United States. Our analysis shows that large deposit holdings dominate household financial assets in Japan, while in China, financial assets mostly consist of equity, at 59 percent of total household financial assets. In the United States, equity accounts for 41 percent of household financial assets. In Australia, Canada, Sweden, and the United Kingdom, funded pension systems account for between 35 and 58 percent of household financial assets.[163] Household financial assets are lowest in Germany and Mexico, at 2.1 times and 1.3 times GDP, respectively.

[161] See *Superstars: The dynamics of firms, sectors, and cities leading the global economy*, McKinsey Global Institute, October 2018.
[162] See Mark Dowson et al., "Domestic UK retrofit challenge: Barriers, incentives, and current performance leading into the Green Deal," *Energy Policy*, 2012, Volume 50, Issue C.
[163] OECD data based on national social insurance pension plans.

Financial assets and liabilities: Debt- versus equity-driven versus low financial depth

National balance sheets expanded most rapidly in Canada, China, France, Sweden, and the United Kingdom. France's balance sheet grew the most, increasing more than ten times GDP since 2000. Germany saw the least growth in its balance sheet, although still sizable at a multiple less than three times GDP.

Three groups of countries come into focus, reflecting differences in the structure of financial systems and choices made by companies and individuals.

High loan-to-value ratios and strong debt growth characterize Canada, France, Japan, and the United Kingdom. In these countries, economy-wide loan-to-value ratios exceeded 100 percent. With the exception of Canada, these countries also saw above-average growth in currency and deposit liabilities at both the central bank and commercial bank levels. France has recorded the highest growth of currency and deposit liabilities, which increased by 225 percentage points from 2000 to 2020.[164]

Moderate loan-to-value ratios but large liabilities linked to equity prevailed in China, Sweden, and the United States. While debt levels relative to produced assets were lower than in the countries with high loan-to-value ratios, these economies with more moderate loan-to-value ratios still had large and rapidly growing financial liabilities from growing equity valuations. In 2000, China, Sweden, and the United States had liabilities related to nonfinancial corporate equities of 2.1, 2.0, and 1.5 times GDP, respectively; by 2020, these multiples were 3.2, 4.7, and 2.5 times GDP. In Sweden, this partially reflects equity cross-holdings within the corporate sector.[165]

Low loan-to-value ratios and low financial depth more broadly prevailed in Australia, Germany, and Mexico in 2020. Loan-to-value ratios in these three countries ranged from 0.3 in Mexico to 0.8 in Australia. These countries also had some of the smallest total balance sheets, between ten times GDP in Mexico and 17 times GDP in Australia, and some of the most modest overall balance sheet expansions in our sample of countries, growing between 2.7 and 5.1 times GDP.

Economic returns: Australia, Canada, the United Kingdom, and the United States had higher returns

As discussed in chapter 4, economic returns can be seen through the lens of capital productivity, which is GDP relative to produced assets, or operating returns—in other words, net operating surplus relative to produced assets. These metrics can be understood as the amount of income generated by each unit of produced asset stock. Seen through this way, countries fall into the following three groups:

High returns prevail in Australia, Canada, the United Kingdom, and the United States. They had relatively high levels of capital productivity relative to GDP and operating returns. Operating returns of these countries were between 6 and 8 percent.

[164] Within the financial sector on a net basis (currency and deposit liabilities less currency and deposit assets), China and Japan saw the largest growth in currency and deposits from 2000–20, both at one GDP multiple. France was next, at 0.8 times GDP.

[165] Sweden's nonfinancial corporate equity liabilities on a consolidated basis were 1.5 times GDP in 2000 and 3.1 times GDP in 2020, according to data from the OECD.

Comparatively low returns and capital productivity prevail in Japan and the EU countries in our sample, as well as China. Operating returns in these countries were only 3 to 4 percent, or half the rates in the anglophone countries.

Mexico saw very high levels of operating returns but low capital productivity. In other words, Mexican firms have a high level of profit from produced asset stocks, 11 percent, but this doesn't translate into equally high overall economic output or wages relative to invested capital.[166] Mexico's GDP is more heavily composed of profits than of wages compared to other countries in our data.

All ten of the countries we focus on in this report experienced significant growth in their balance sheets over the first two decades of the 21st century, yet each experienced this growth for a range of reasons that were specific to their economies. For all the country differences, policy makers and business leaders everywhere face a range of questions from this balance sheet view, as we outline in the concluding chapter.

[166] For example, while manufacturing productivity in Mexico increased by an average of 1.7 percent annually from 2005–15, average wages were stagnant. See *Latin America's missing middle*, McKinsey Global Institute, May 2019.

Country profiles

Australia

Canada

China

France

Germany

Japan

Mexico

Sweden

United Kingdom

United States

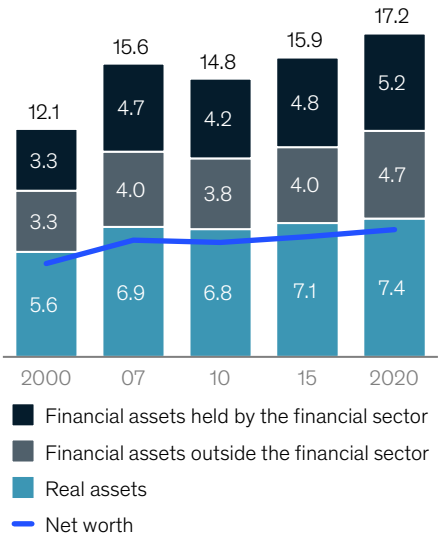
Exhibit C1

Australia

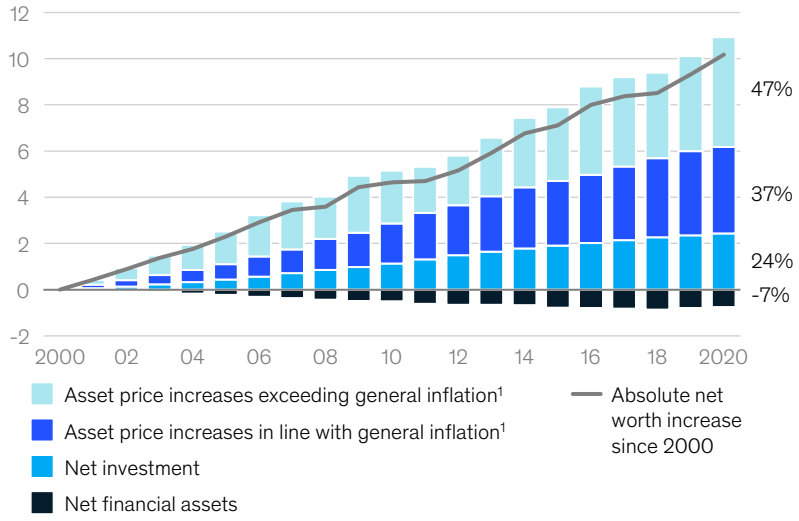
Net worth per capita **$351K** (AUD 524K)
Up from $108K in 2000,
5.3x the global average of $66K

Australia's net worth per capita of $351,000 is the highest of the ten nations in this report, and its net-worth-to-GDP ratio of 6.8 exceeds the global average of 6.1. The value of land grew by 1.5 times GDP since 2000, while the value of buildings grew by just 0.1 times GDP. Australia has more modest loan-to-value ratios than other economies. It has comparatively high operating returns.

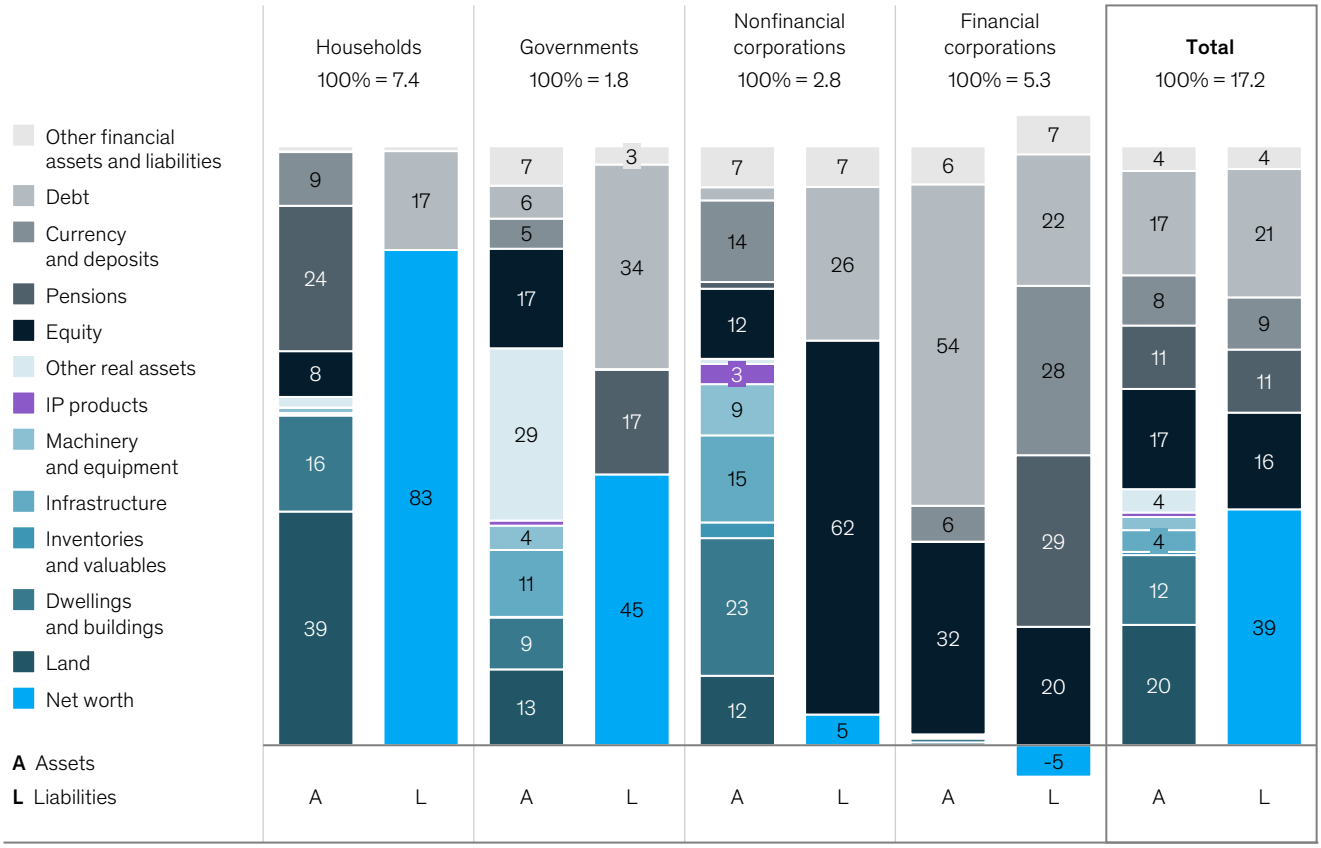
Total assets and net worth, GDP multiple



Drivers of net worth growth, AUD trillion



National balance sheet by sector, 2020, %, GDP multiple



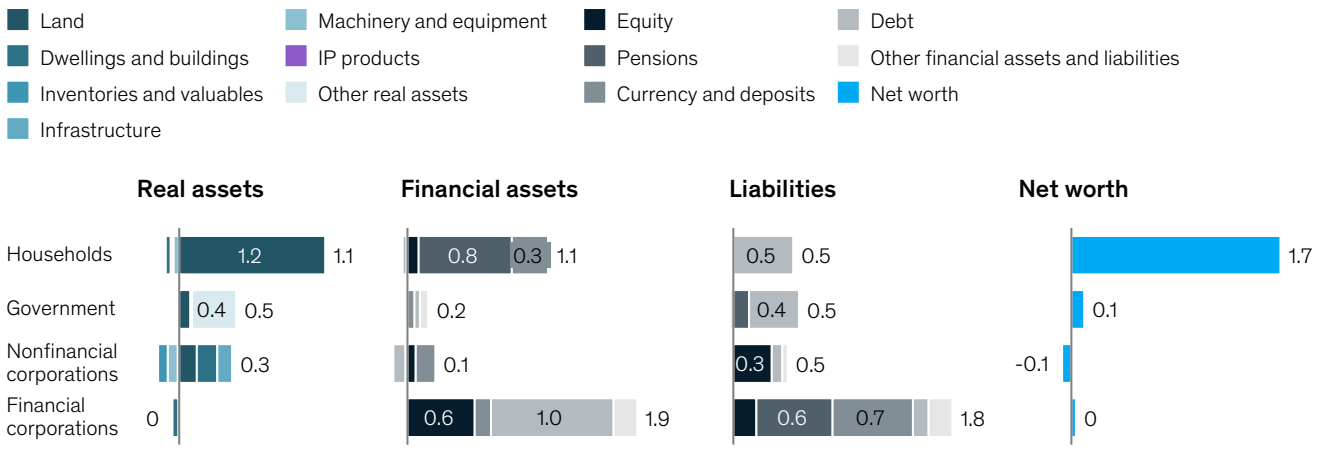
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

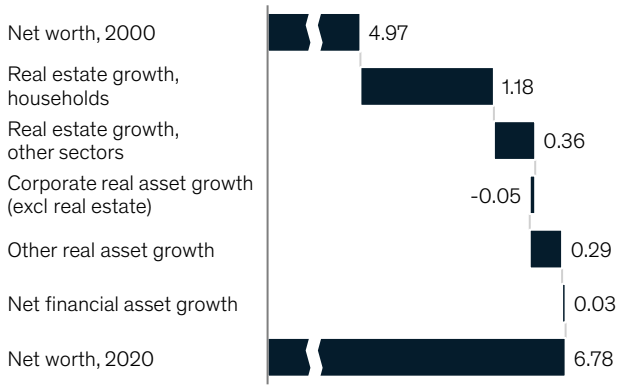
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

1.8 Change in net worth/GDP multiple, 2000–20

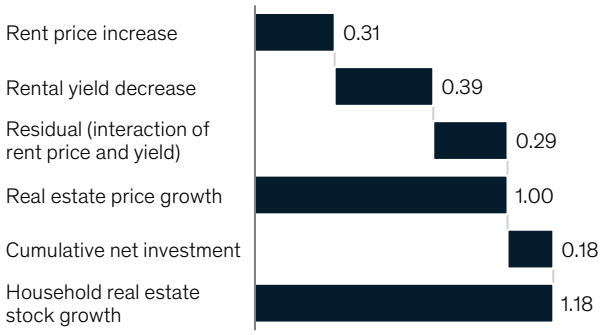
National balance sheet growth, 2000–20, change in GDP multiple



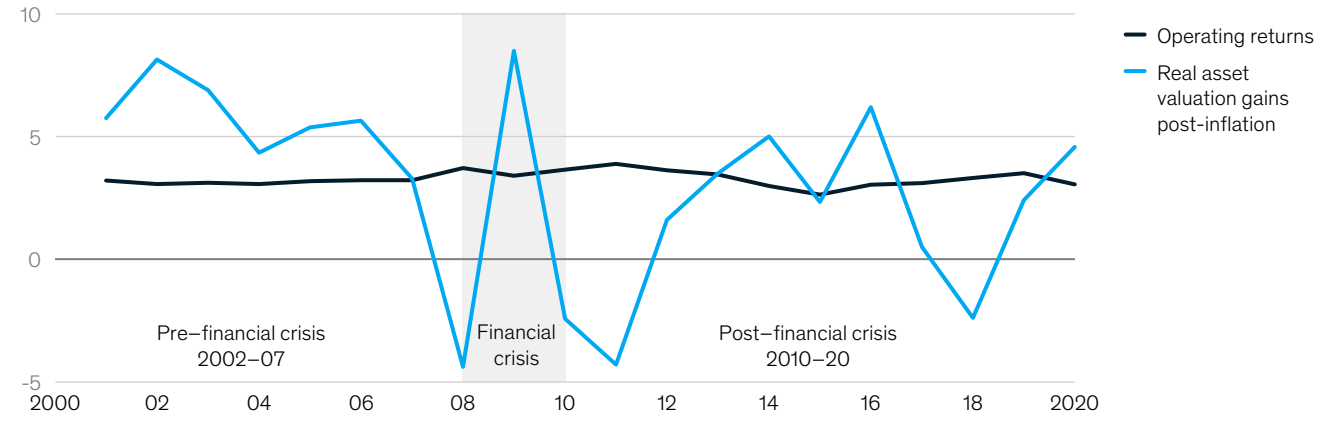
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	3.1	4.0
—	5.6	3.9
Total	8.8	7.9

	Country	Global
—	3.3	3.7
—	1.5	2.9
Total	4.8	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

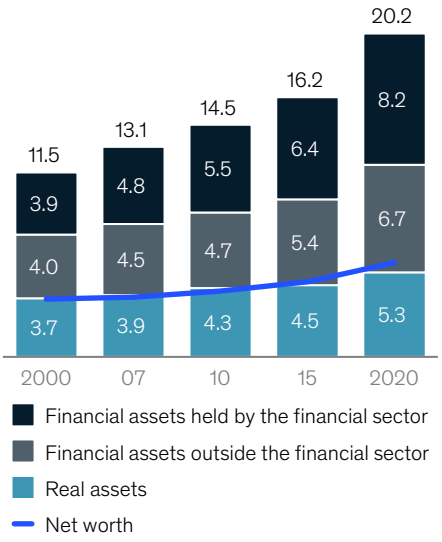
Exhibit C3

Canada

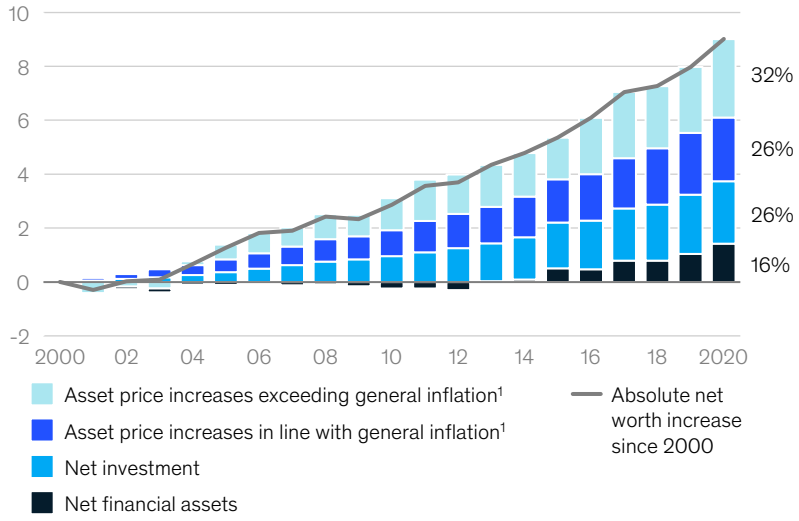
Net worth per capita **$255K** (CAD 342K)
Up from $88K in 2000,
3.9x the global average of $66K

Canada's net worth relative to GDP grew significantly after the financial crisis, increasing from 3.9 times GDP in 2008 to 5.9 times GDP in 2020. Home prices more than tripled over the past 20 years, and net investment was comparatively strong. Financial assets outside of the financial sector grew from 4 times GDP in 2000 to 6.7 times GDP in 2020. Canada has a large financial sector, and its loan-to-value ratio is second only to the United Kingdom's. Operating returns on average declined from 6.5 percent before 2008 to 4.2 percent afterward.

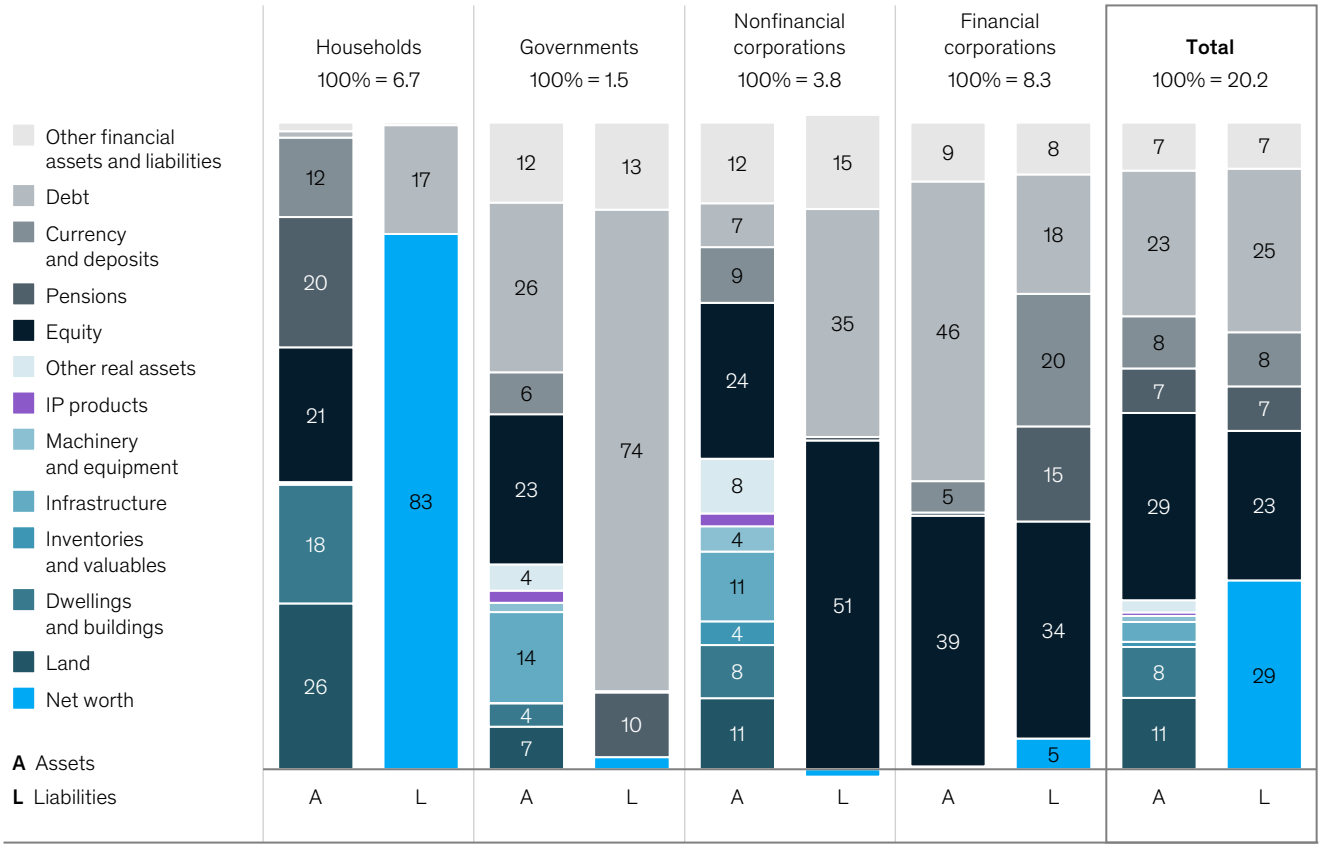
Total assets and net worth, GDP multiple



Drivers of net worth growth, CAD trillion



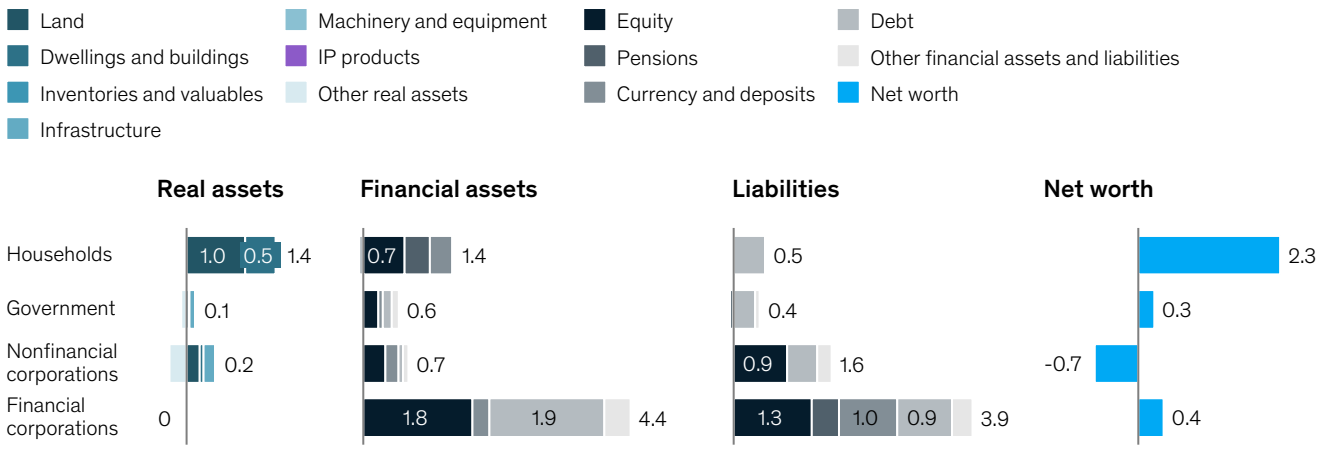
National balance sheet by sector, 2020, %, GDP multiple



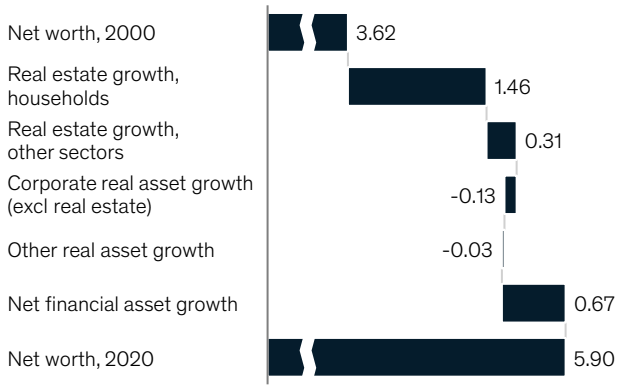
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

2.3 Change in net worth/GDP multiple, 2000–20

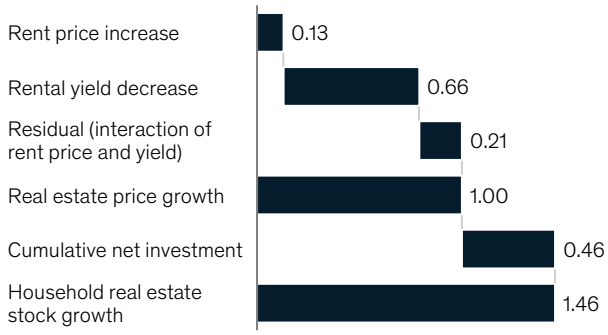
National balance sheet growth, 2000–20, change in GDP multiple



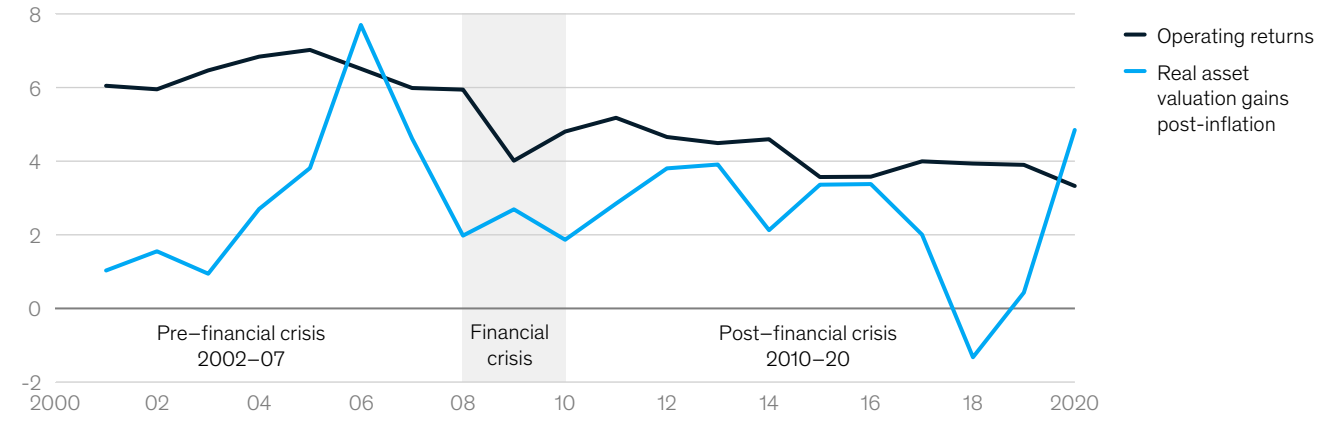
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	6.5	4.0
—	3.6	3.9
Total	10.0	7.9

	Country	Global
—	4.2	3.7
—	2.5	2.9
Total	6.7	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

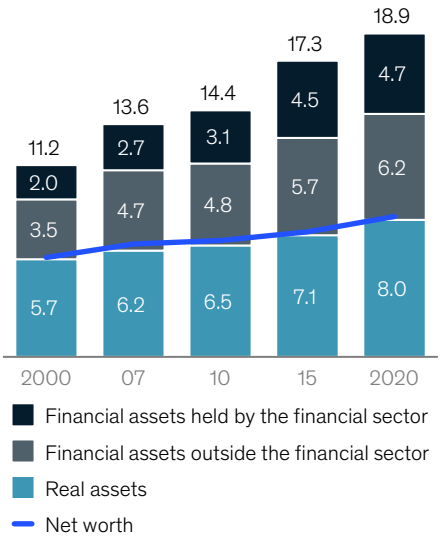
Exhibit C5

China

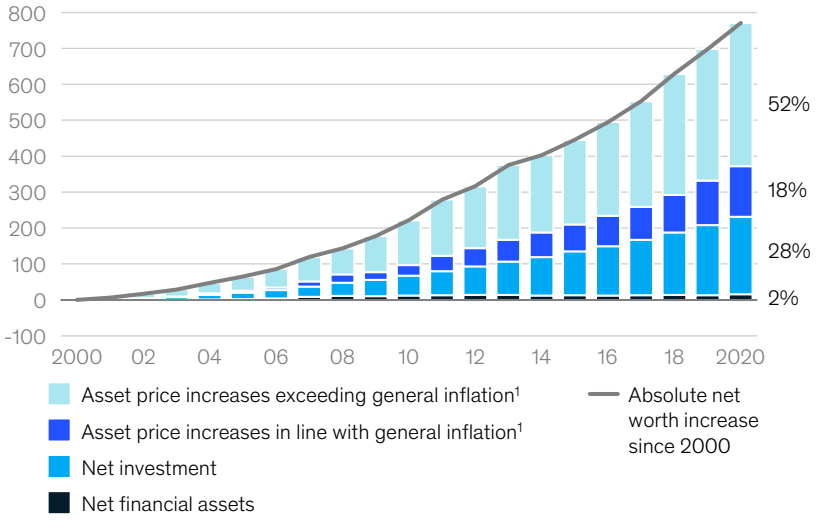
Net worth per capita **$86K** (CNY 591K)
Up from $5.5K in 2000,
1.3x the global average of $66K

China's balance sheet, net worth, and GDP have all grown strongly since 2000. Its net worth relative to GDP is now the highest among the ten countries, at 8.2 times GDP. Two-thirds of growth in net worth relative to GDP was related to corporate real assets other than real estate, distinguishing China from other focus countries. China had the largest valuation gains exceeding inflation, consistently higher than its operating returns, which have been below the global average.

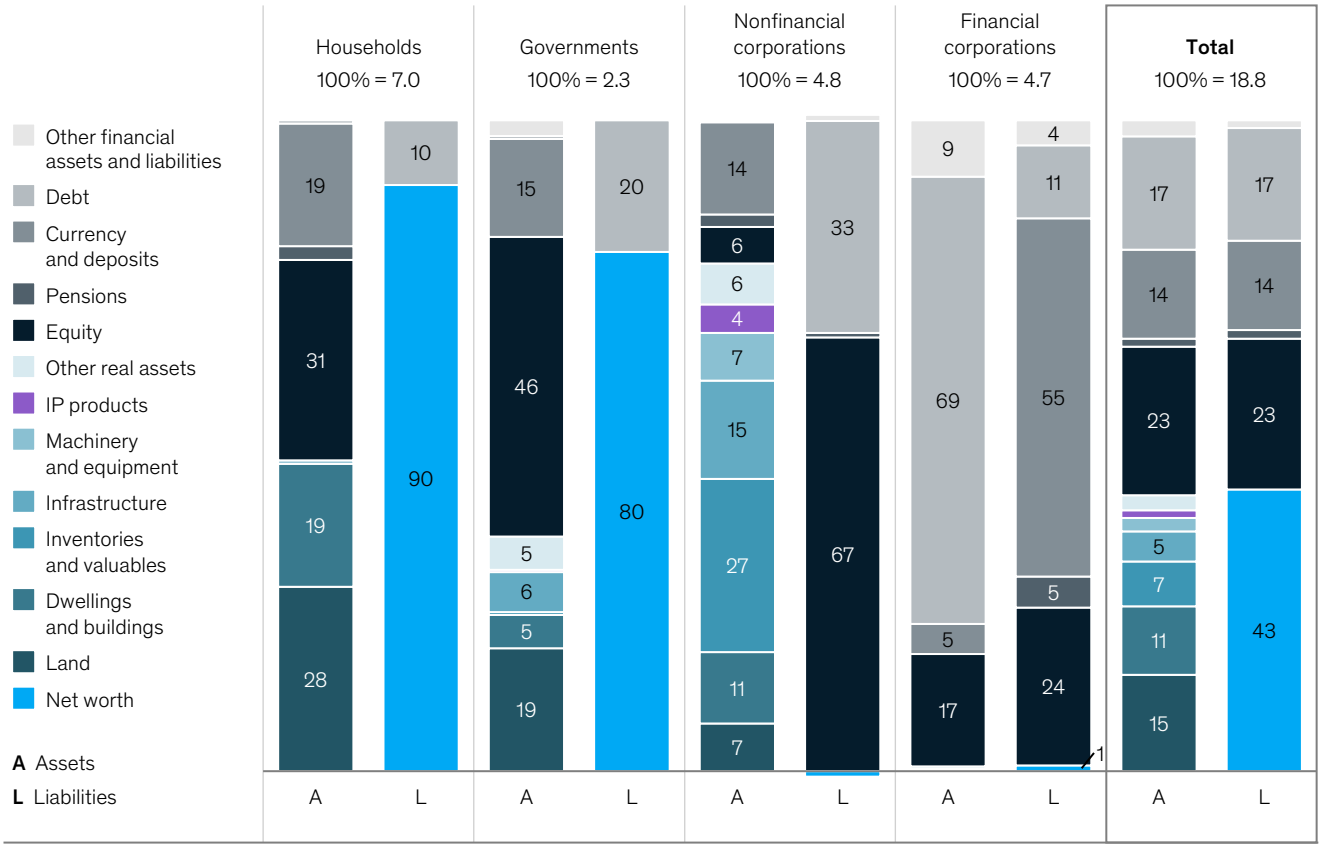
Total assets and net worth, GDP multiple



Drivers of net worth growth, CNY trillion



National balance sheet by sector, 2020, %, GDP multiple



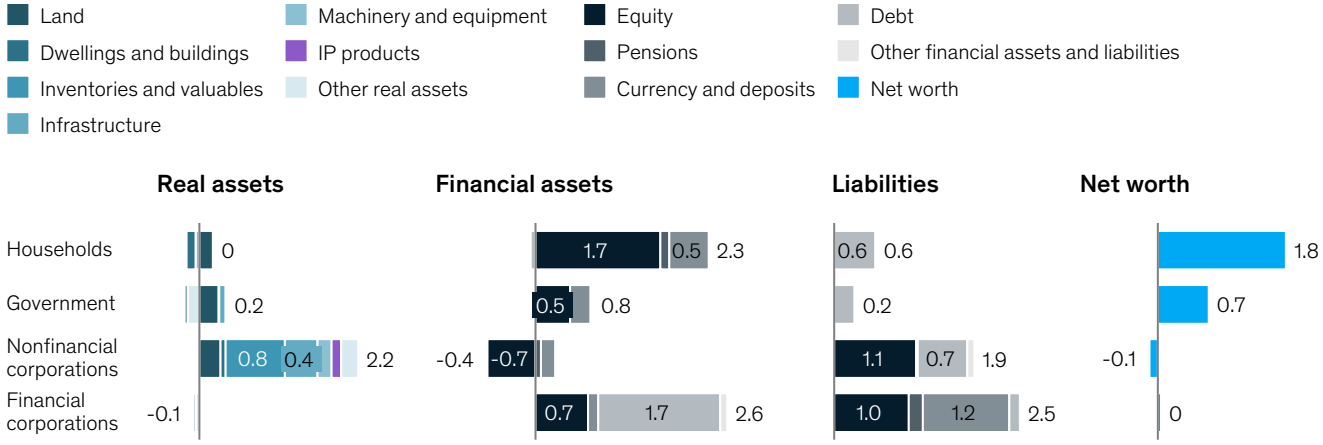
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

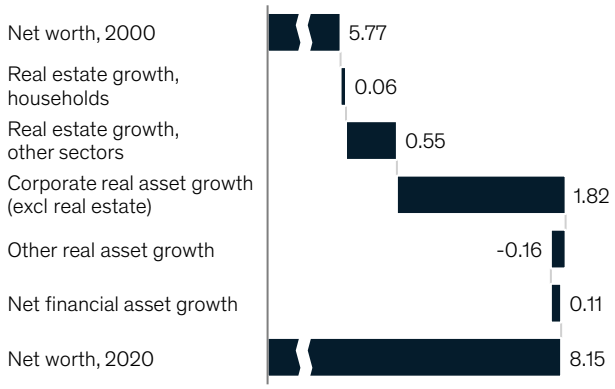
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

2.4 Change in net worth/GDP multiple, 2000–20

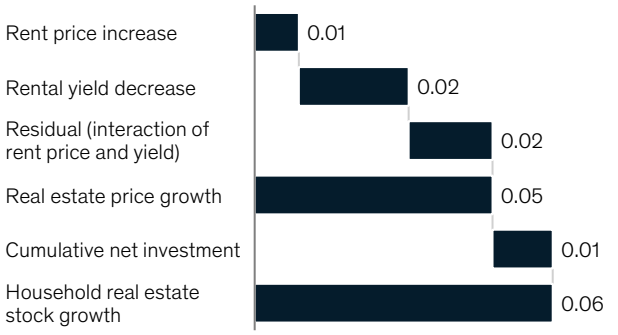
National balance sheet growth, 2000–20, change in GDP multiple



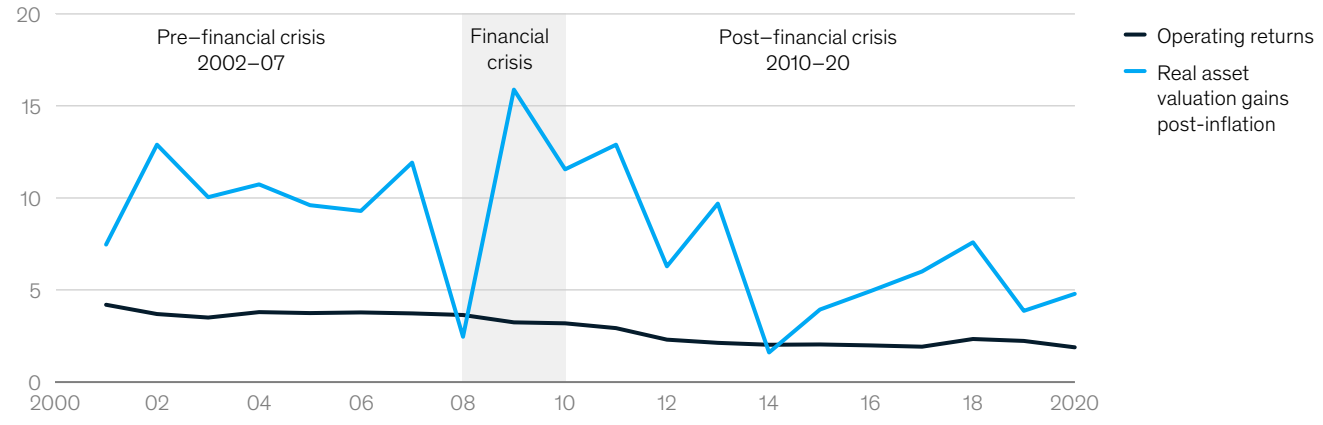
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	3.7	4.0
—	10.7	3.9
Total	14.4	7.9

	Country	Global
—	2.3	3.7
—	6.6	2.9
Total	8.9	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

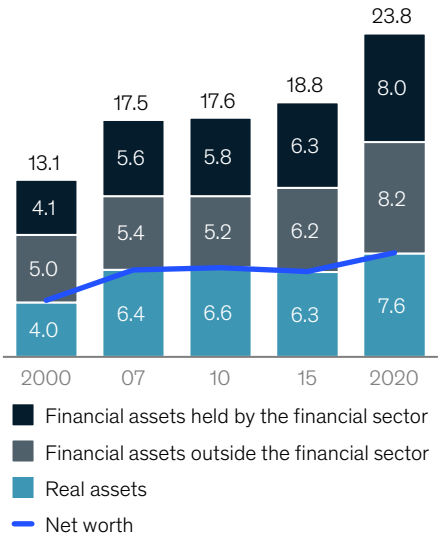
Exhibit C7

France

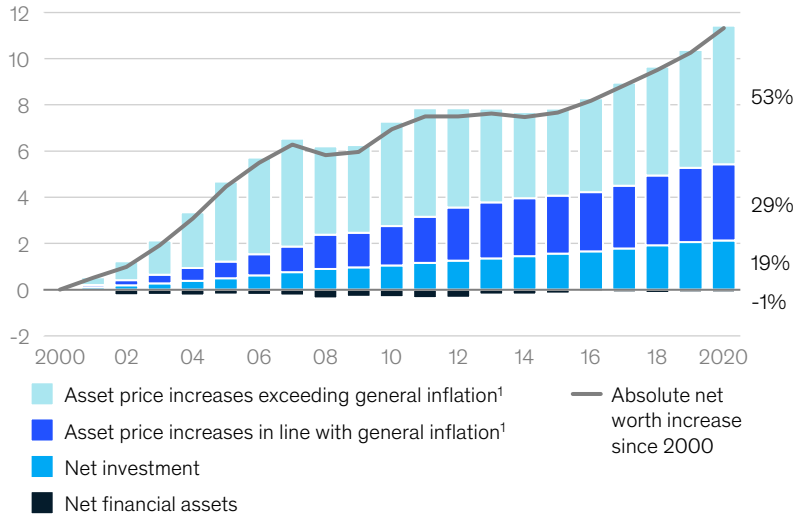
Net worth per capita **$296K** (EUR 259K)
Up from $93K in 2000,
4.5x the global average of $66K

Home prices more than doubled over the past 20 years, giving France the fastest growth in net worth relative to GDP, 3.5 times, among the ten countries. In 2020, France had the largest total balance sheet and the second-highest net worth relative to GDP. Large corporate cross-holdings characterize its nonfinancial corporate sector's balance sheet. The ratio of total financial liability to GDP grew by 7.3 and loan-to-value ratios increased from 0.7 to 1.0 in 2020, surpassing the global average. Operating returns were below 3 percent before 2008 and declined thereafter.

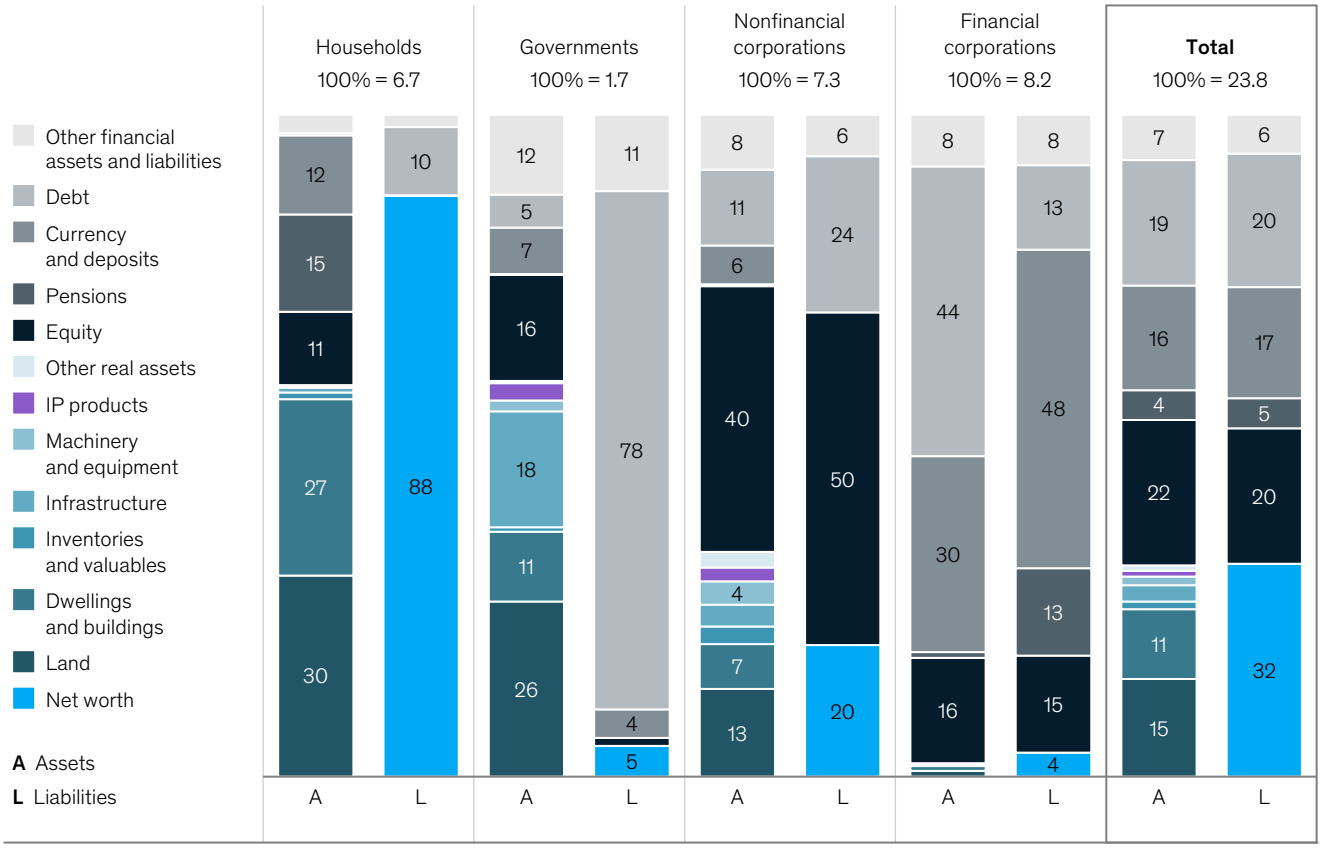
Total assets and net worth, GDP multiple



Drivers of net worth growth, EUR trillion



National balance sheet by sector, 2020, %, GDP multiple



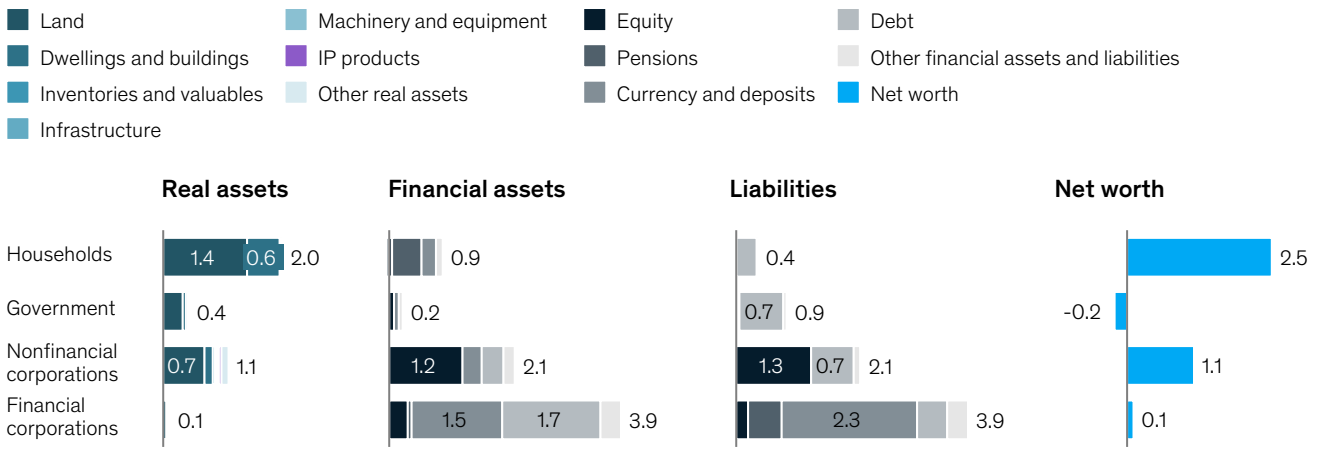
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

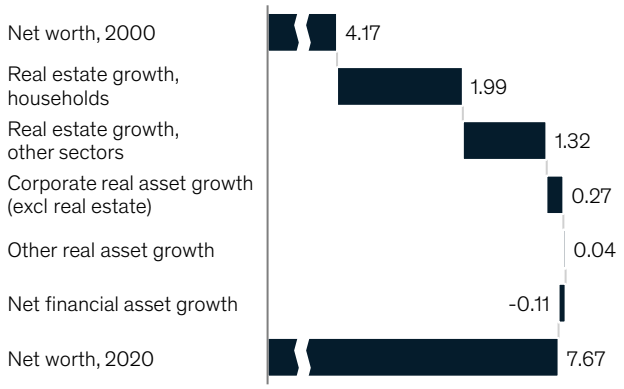
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

3.5 Change in net worth/GDP multiple, 2000–20

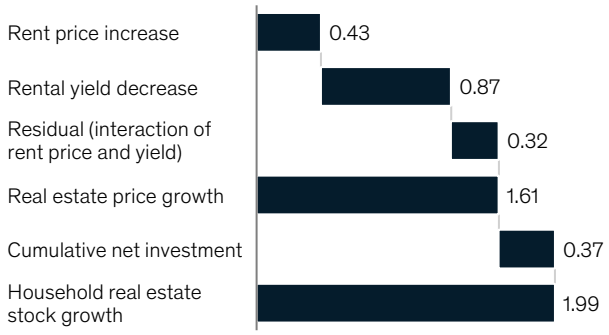
National balance sheet growth, 2000–20, change in GDP multiple



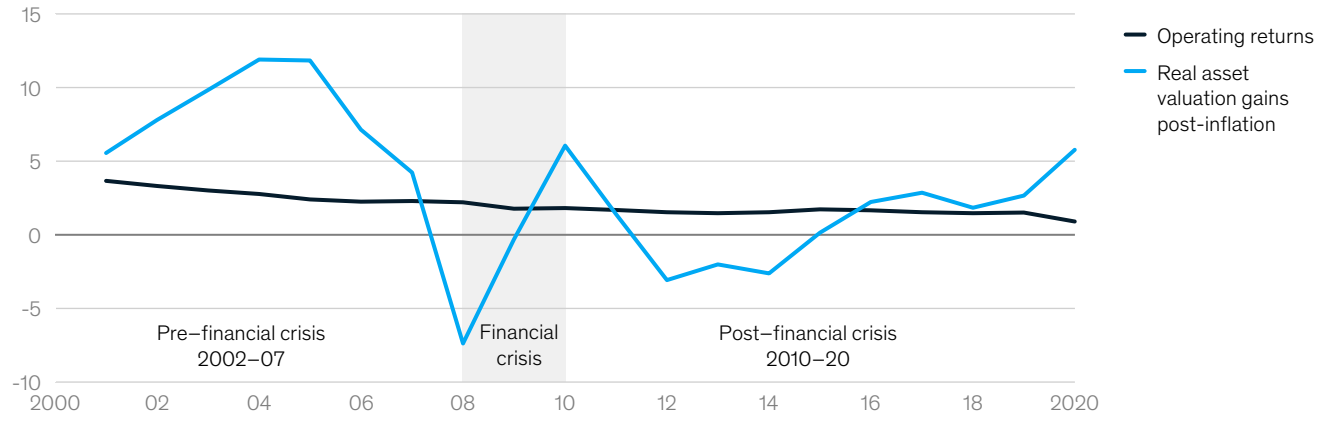
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



Average returns for period, %	Country	Global
—	2.7	4.0
—	8.8	3.9
Total	11.4	7.9

Average returns for period, %	Country	Global
—	1.5	3.7
—	1.4	2.9
Total	2.9	6.6

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

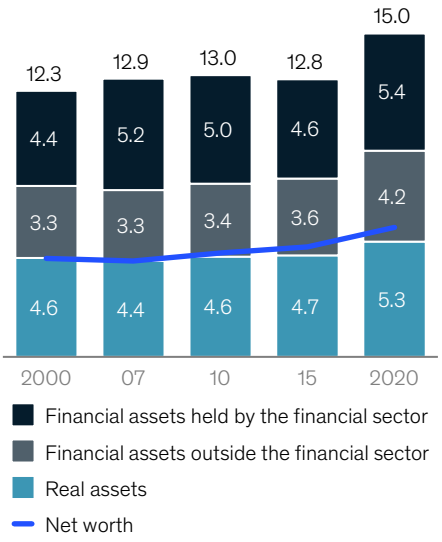
Exhibit C9

Germany

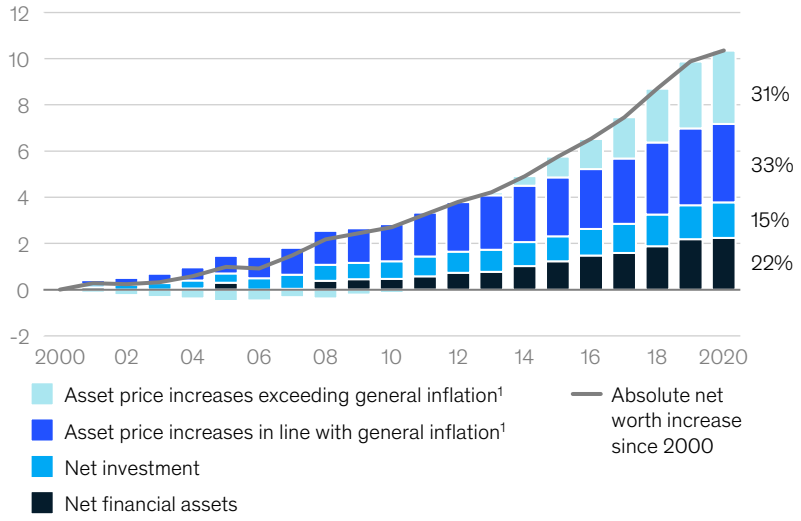
Net worth per capita **$274K** (EUR 240K)
Up from $108K in 2000,
4.1x the global average of $66K

Germany's balance sheet and net worth grew closely together with GDP from 2000 to 2016 but have diverged since. Total growth in net financial assets of 0.7 times GDP was larger than growth in household real estate stocks relative to GDP of 0.6. In contrast to other countries, German home prices didn't begin to increase until 2010. The financial balance sheet grew from 7.7 to 9.6 times GDP, driven mostly by equity and currency and deposits. Debt liabilities grew mostly in line with GDP, and loan-to-value ratios remain below the global average. Operating returns have been stable, just below the global average.

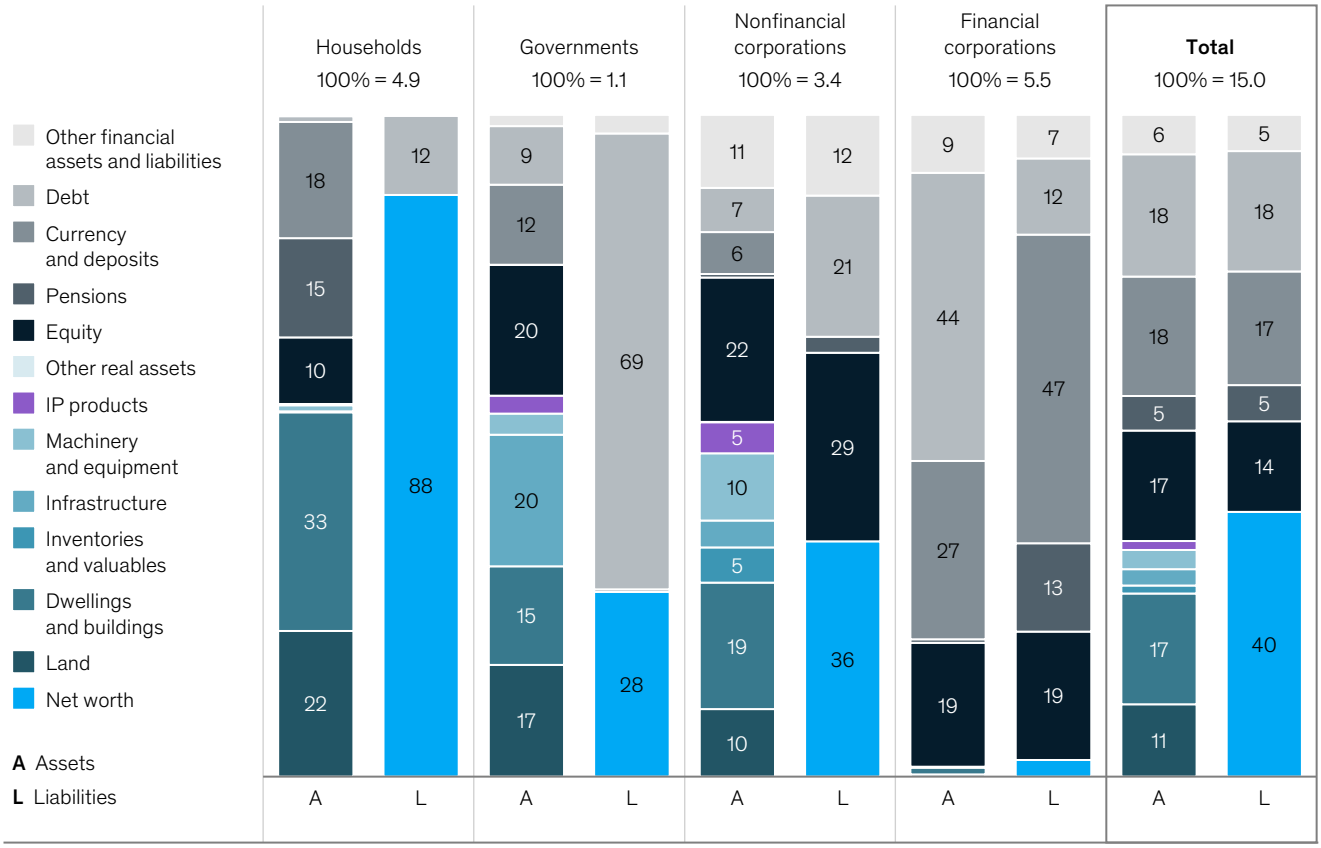
Total assets and net worth, GDP multiple



Drivers of net worth growth, EUR trillion



National balance sheet by sector, 2020, %, GDP multiple



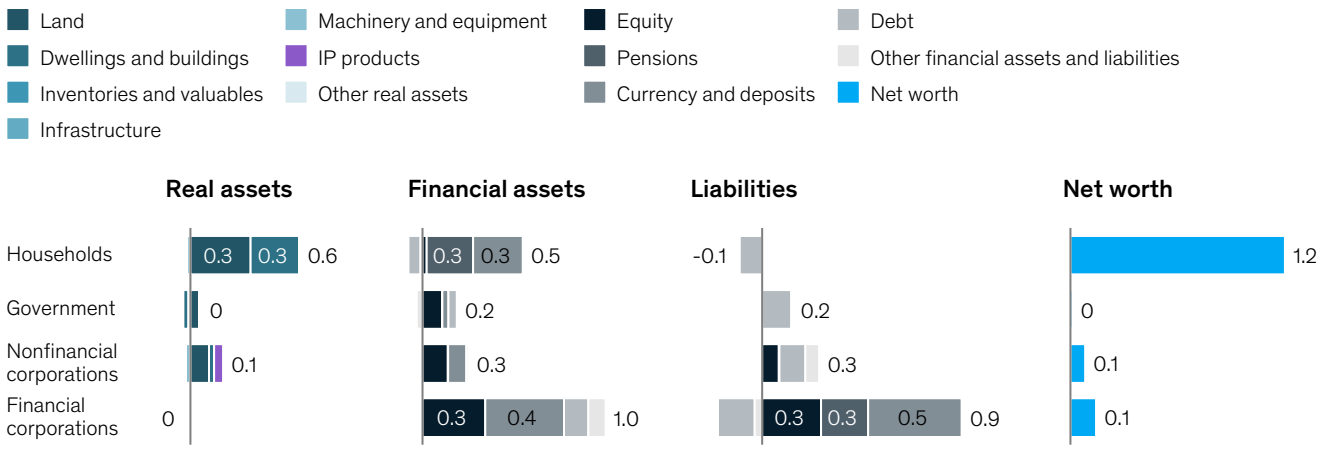
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

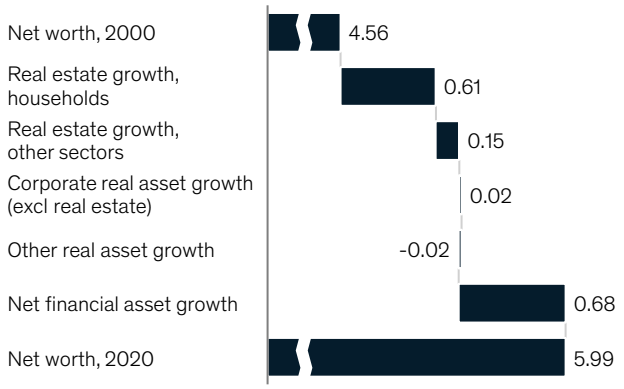
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

1.4 Change in net worth/GDP multiple, 2000–20

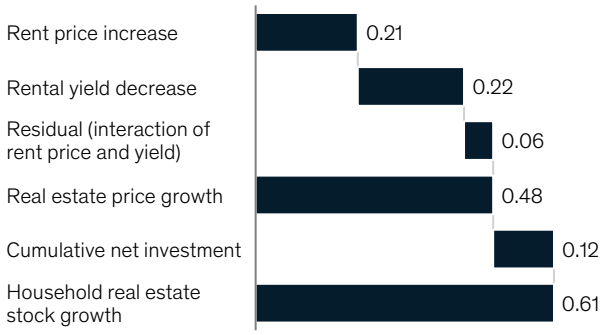
National balance sheet growth, 2000–20, change in GDP multiple



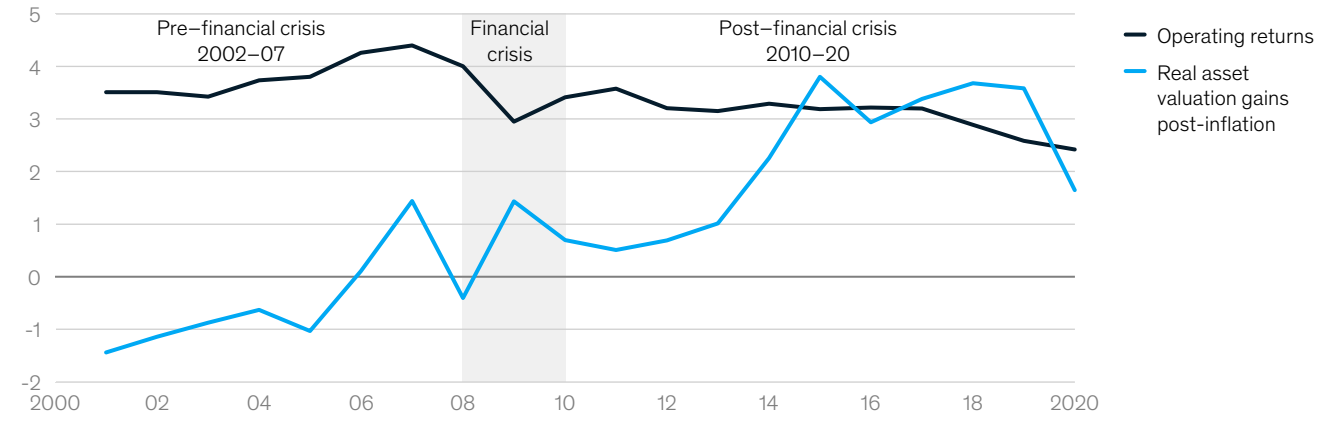
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



Average returns for period, %	Country	Global
Operating returns	3.9	4.0
Real asset valuation gains post-inflation	-0.4	3.9
Total	3.5	7.9

Average returns for period, %	Country	Global
Operating returns	3.1	3.7
Real asset valuation gains post-inflation	2.2	2.9
Total	5.3	6.6

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

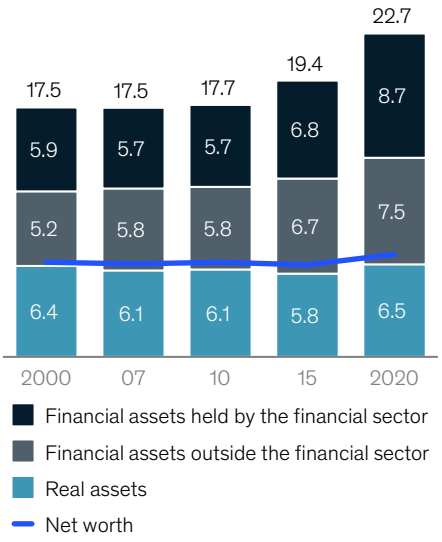
Exhibit C11

Japan

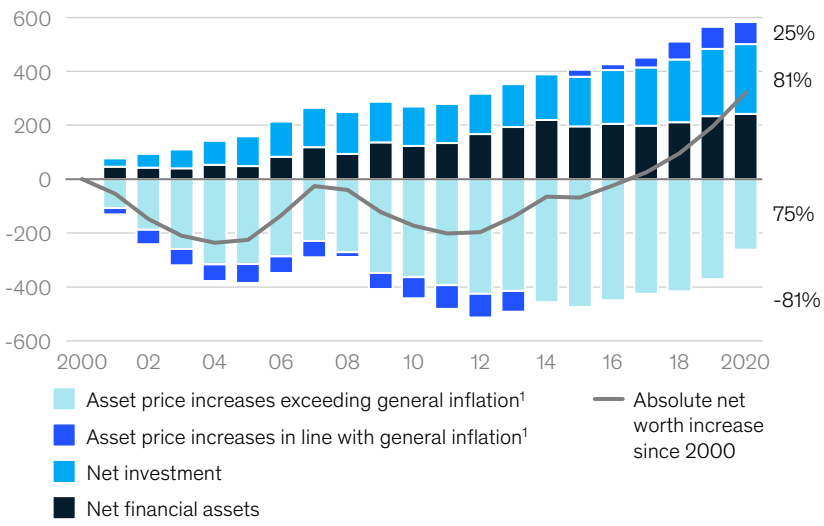
Net worth per capita **$284K** (JPY 30.3M)
Up from $256K in 2000,
4.3x the global average of $66K

While Japan's balance sheet expanded less than that of other countries over the past 20 years, it started growing rapidly in 2012 and is now the second-highest in total assets relative to GDP among the ten countries. Net worth peaked at 8.3 times GDP in 1990, a level not yet reached by any other country, and began to tick up again starting in 2005 after declining for 15 years. The country's net worth is still third-highest relative to GDP among the focus countries, after China and France.

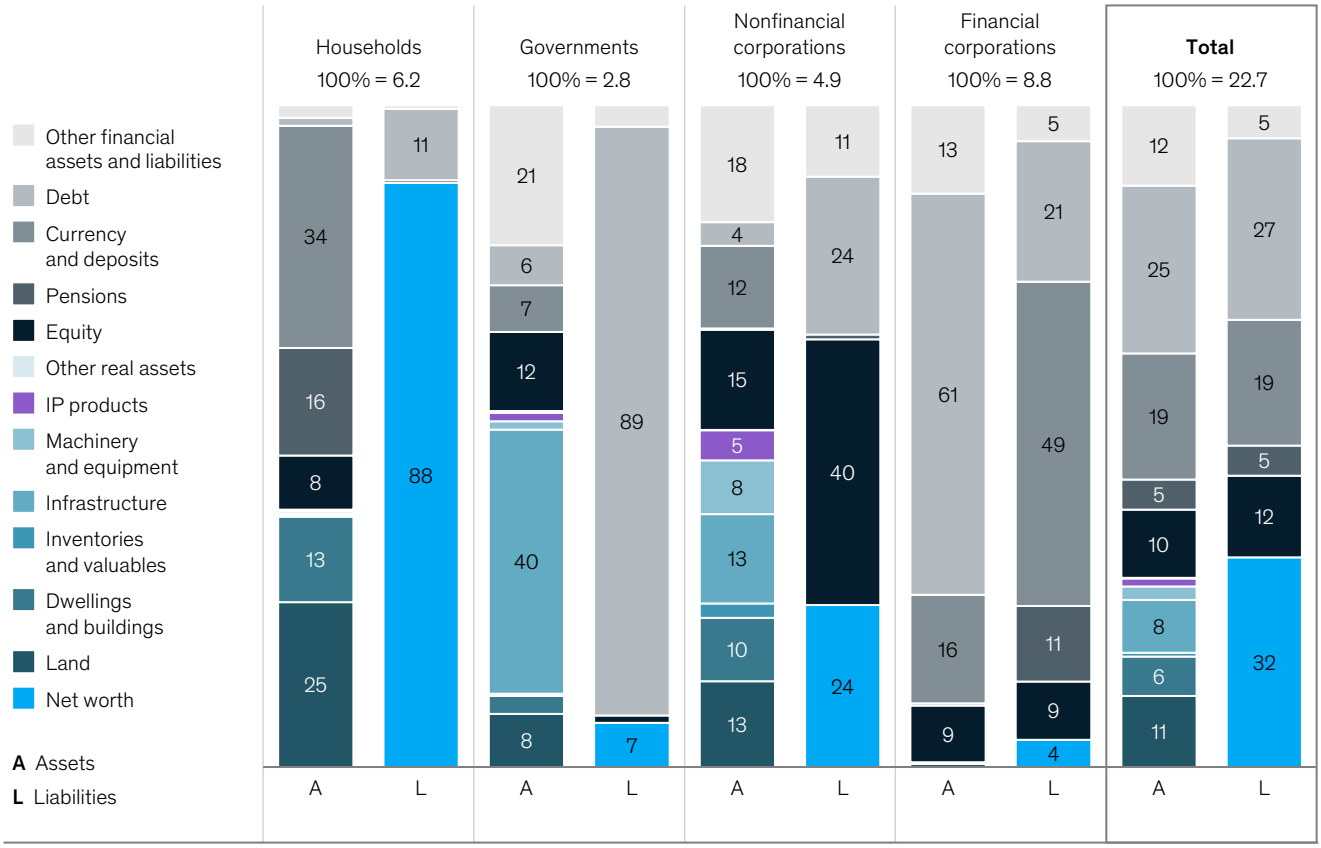
Total assets and net worth, GDP multiple



Drivers of net worth growth, JPY trillion



National balance sheet by sector, 2020, %, GDP multiple



1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

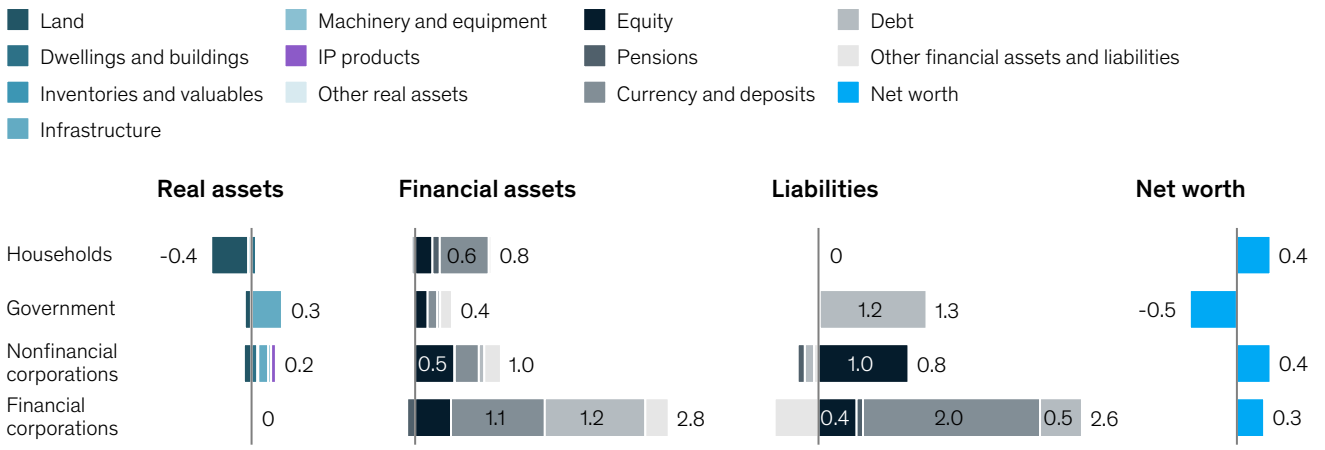
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

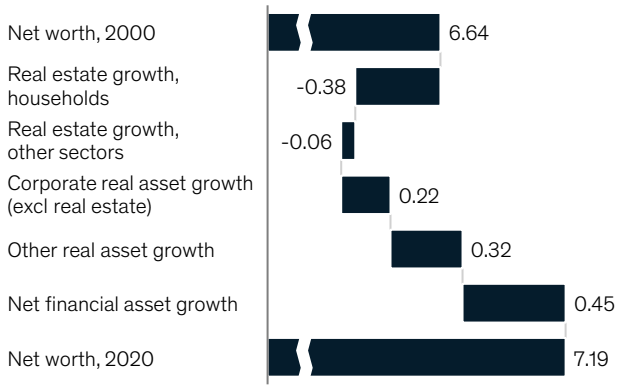
0.6

Change in net worth/GDP multiple, 2000–20

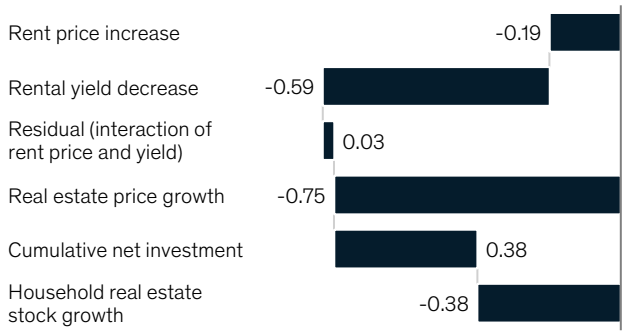
National balance sheet growth, 2000–20, change in GDP multiple



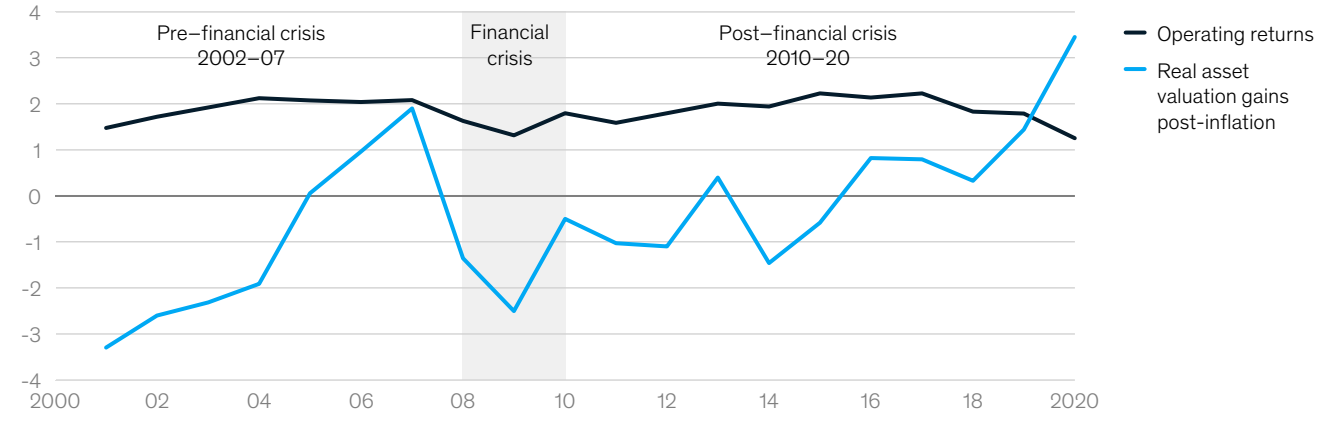
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	2.0	4.0
—	-0.7	3.9
Total	1.3	7.9

	Country	Global
—	1.9	3.7
—	0.2	2.9
Total	2.1	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

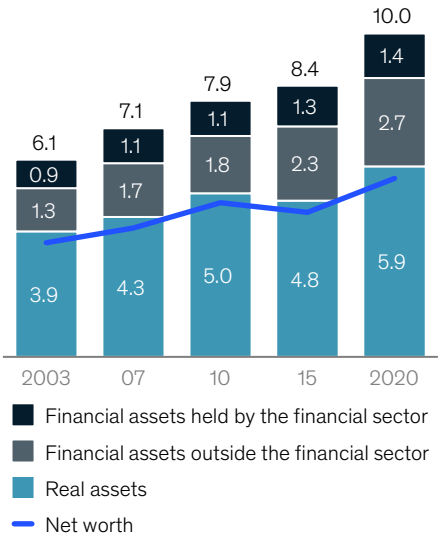
Exhibit C13

Mexico

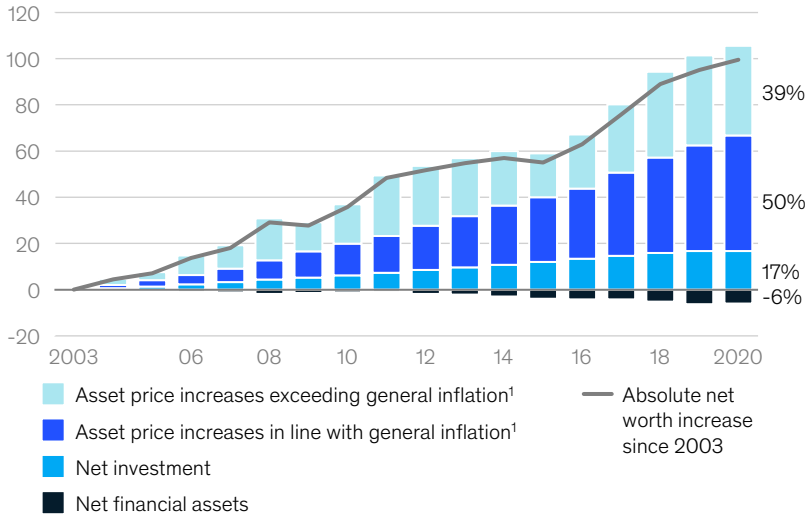
Net worth per capita **$46K** (MXN 987K)
Up from $25K in 2003,
0.7x the global average of $66K

Mexico's net-worth-to-GDP multiple grew from 3.5 in 2003 to 5.5 in 2020. Increases in household real estate prices played a big role, as did growth of real asset prices in the corporate sector. The financial balance sheet grew in line with net worth, and debt-to-GDP and loan-to-value ratios were the lowest among the ten countries. Mexico's combination of above-average valuation gains and notably high operational returns gave it total returns on real assets of almost three times the global average since 2004.

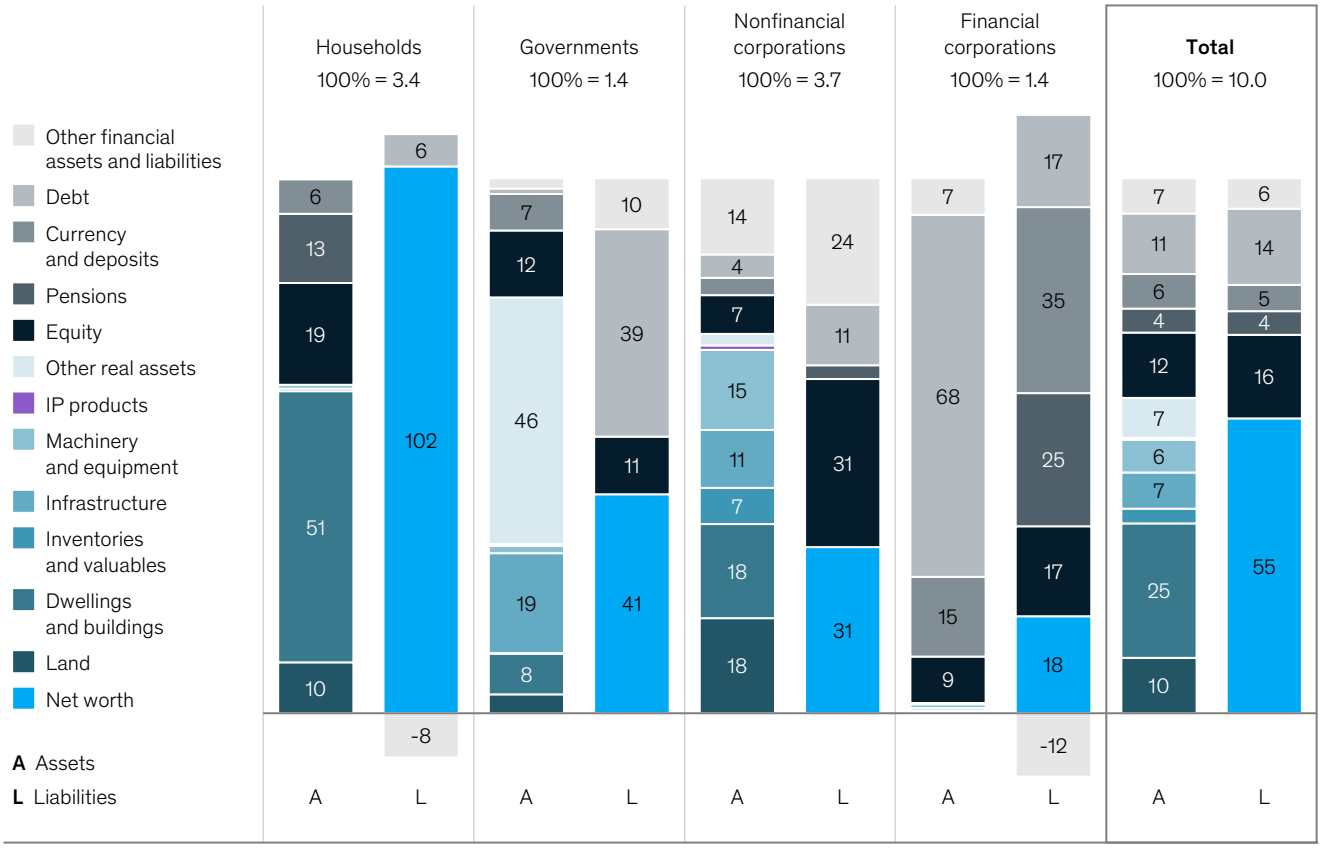
Total assets and net worth, GDP multiple



Drivers of net worth growth, MXN trillion



National balance sheet by sector, 2020, %, GDP multiple



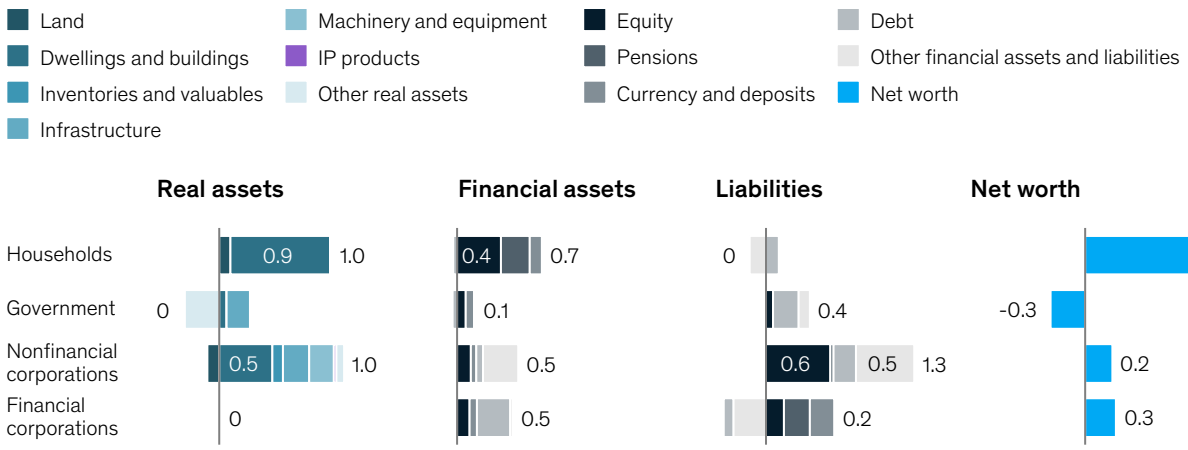
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

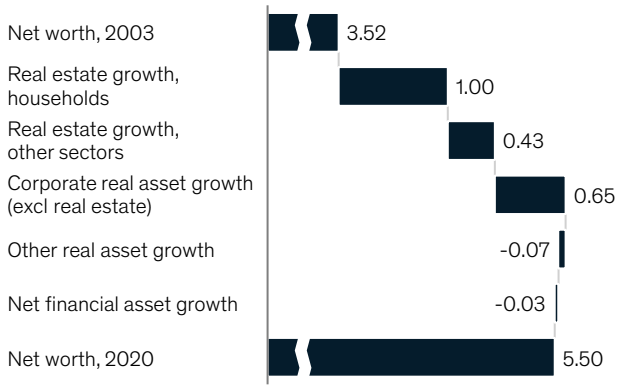
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

2.0 Change in net worth/GDP multiple, 2003–20

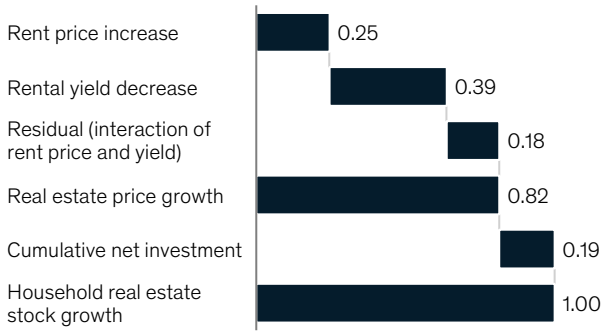
National balance sheet growth, 2003–20, change in GDP multiple



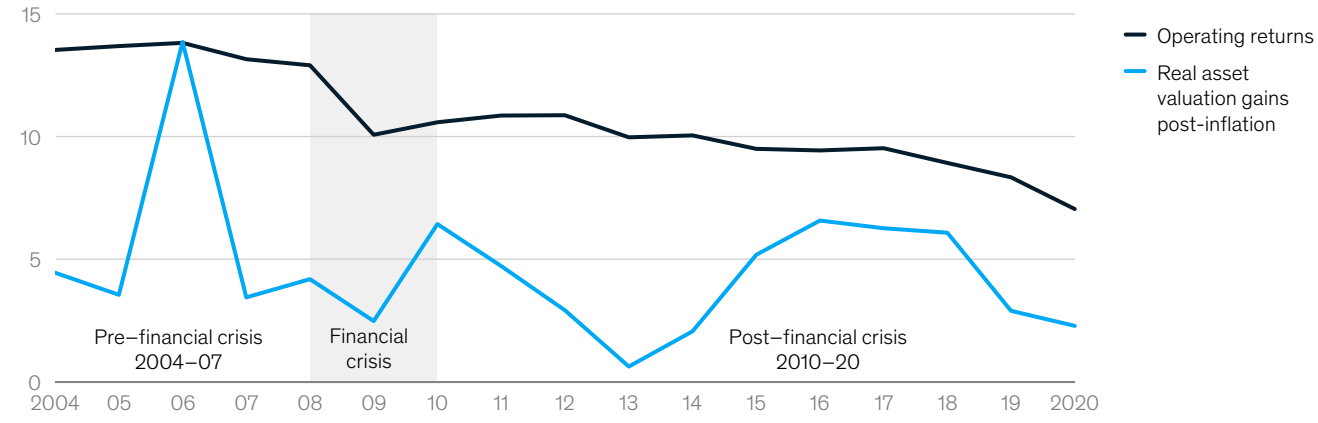
Contributors to net worth/GDP growth, GDP multiples, 2003–20



Contributors to household real estate stock growth, GDP multiples, 2003–20



Real asset valuation gains and returns, %



	Country	Global
—	13.5	4.0
—	6.3	3.9
Total	19.9	7.9

	Country	Global
—	9.6	3.7
—	4.2	2.9
Total	13.7	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

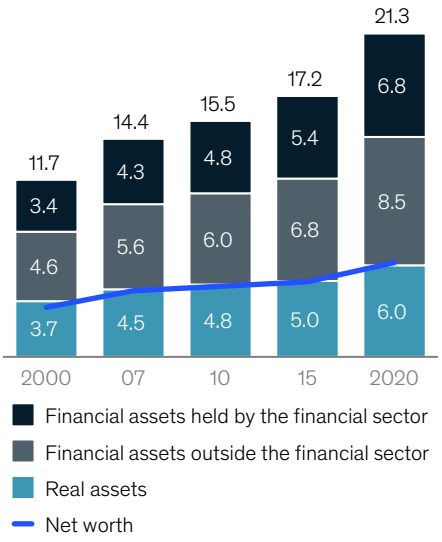
Exhibit C15

Sweden

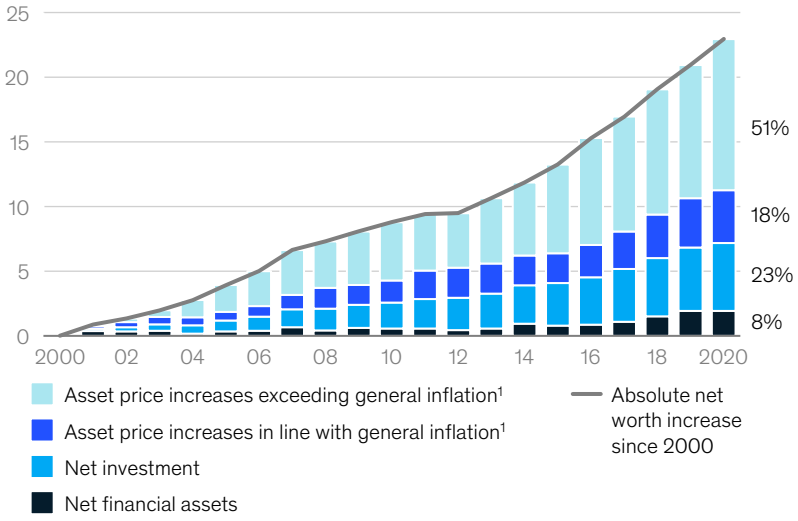
Net worth per capita **$323K** (SEK 2.97M)
Up from $96K in 2000,
4.9x the global average of $66K

Sweden experienced the second-fastest expansion of net worth and total balance sheet relative to GDP after France. Real estate prices more than tripled from 2000 to 2020. Liabilities have grown in proportion to total assets, driven primarily by equity, including substantial corporate cross-holdings. Loan-to-value ratios have been in line with global levels. Real valuation gains were higher than global averages and exceeded operating returns, which declined over the past 20 years.

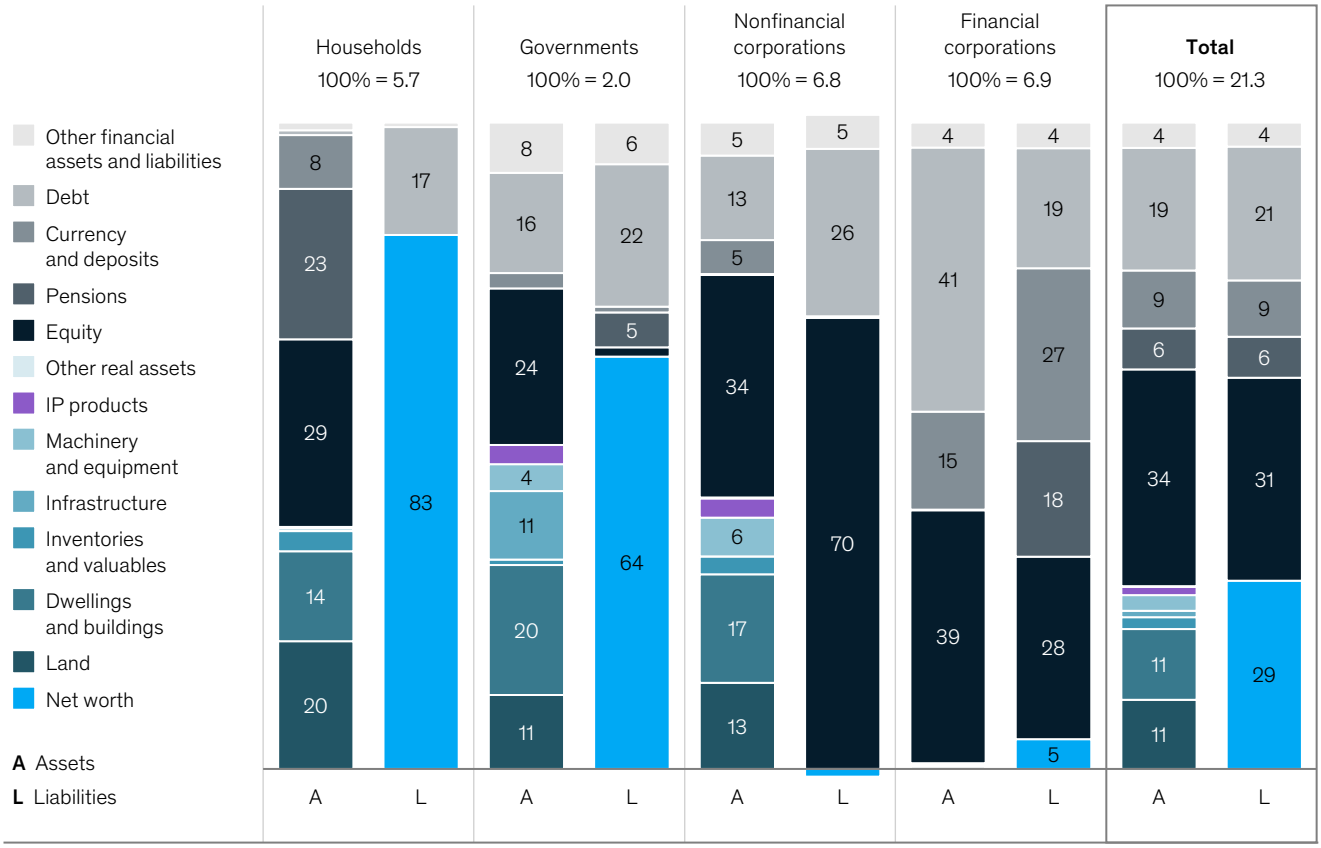
Total assets and net worth, GDP multiple



Drivers of net worth growth, SEK trillion



National balance sheet by sector, 2020, %, GDP multiple



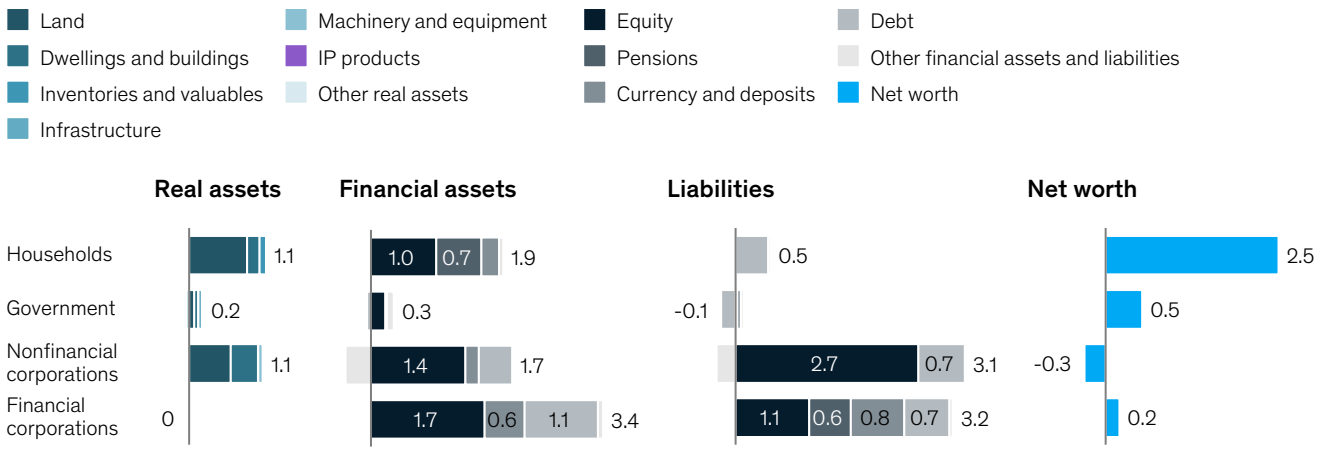
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

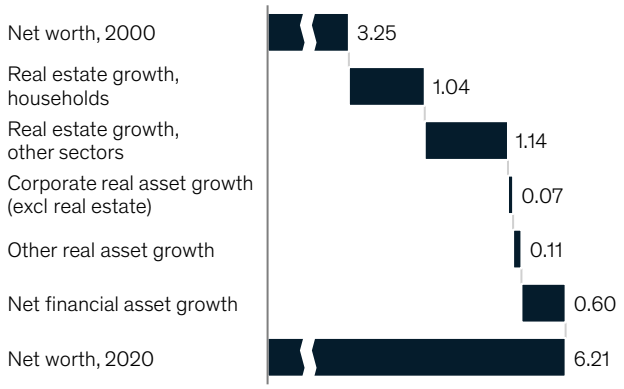
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

3.0 Change in net worth/GDP multiple, 2000–20

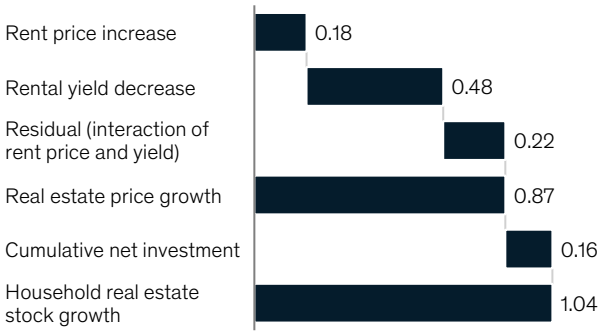
National balance sheet growth, 2000–20, change in GDP multiple



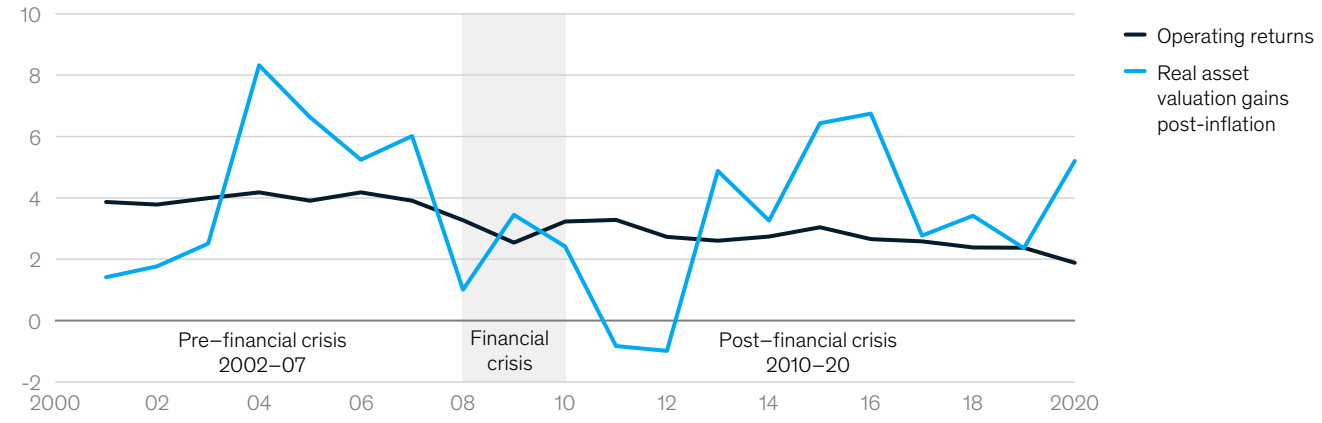
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	4.0	4.0
—	5.1	3.9
Total	9.1	7.9

	Country	Global
—	2.7	3.7
—	3.2	2.9
Total	5.9	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

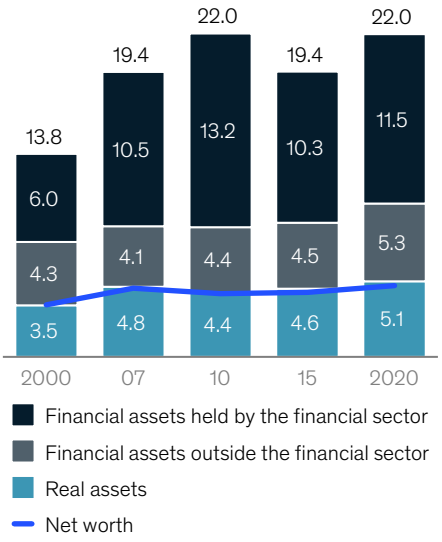
Exhibit C17

United Kingdom

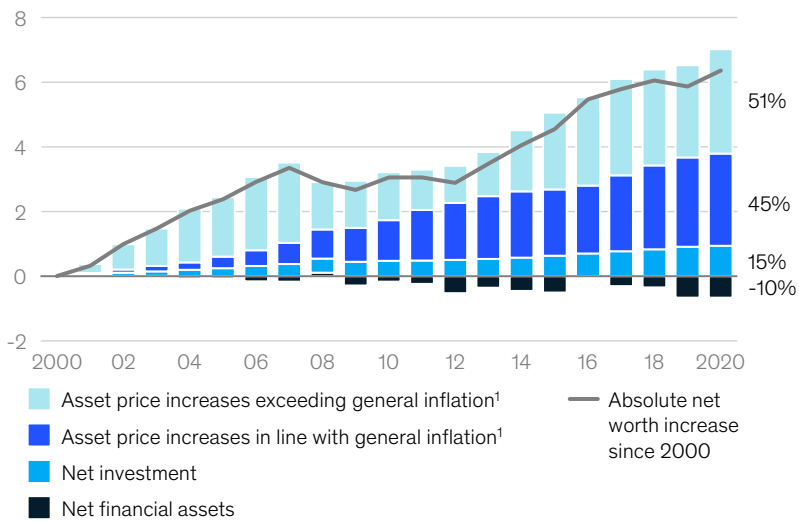
Net worth per capita **$195K** (GBP 152K)
Up from $99K in 2000,
2.9x the global average of $66K

The 2008 financial crisis heavily influenced the trajectories of net worth and balance sheets in the United Kingdom. Both rose rapidly relative to GDP before 2007 but then stagnated for about five years after the crisis before resuming growth. Real estate contributed strongly to growth in both periods. A larger-than-average increase in financial assets and liabilities, including a spike in derivatives that began in 2007, reflects the strong UK financial sector. Loan-to-value ratios are the highest among the ten countries.

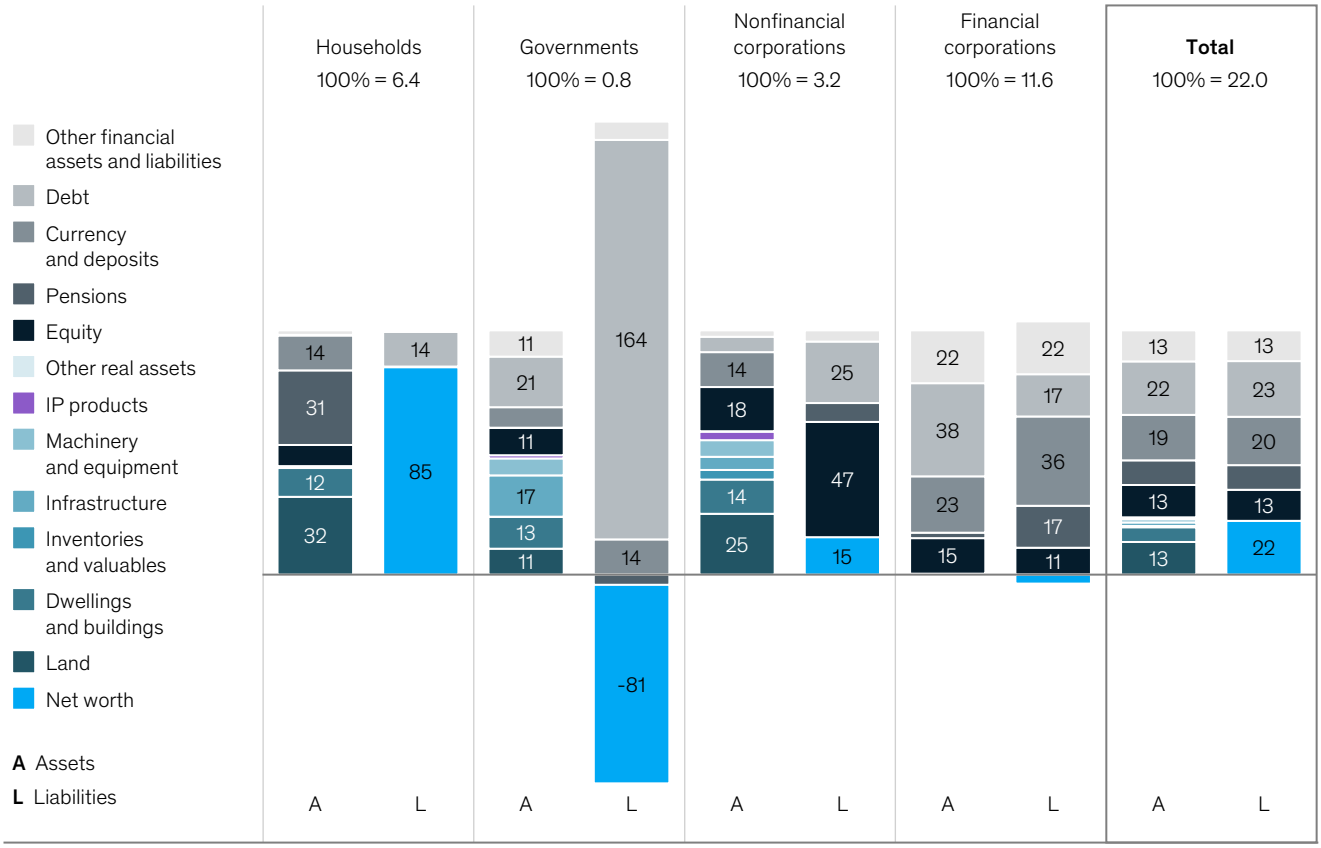
Total assets and net worth, GDP multiple



Drivers of net worth growth, GBP trillion



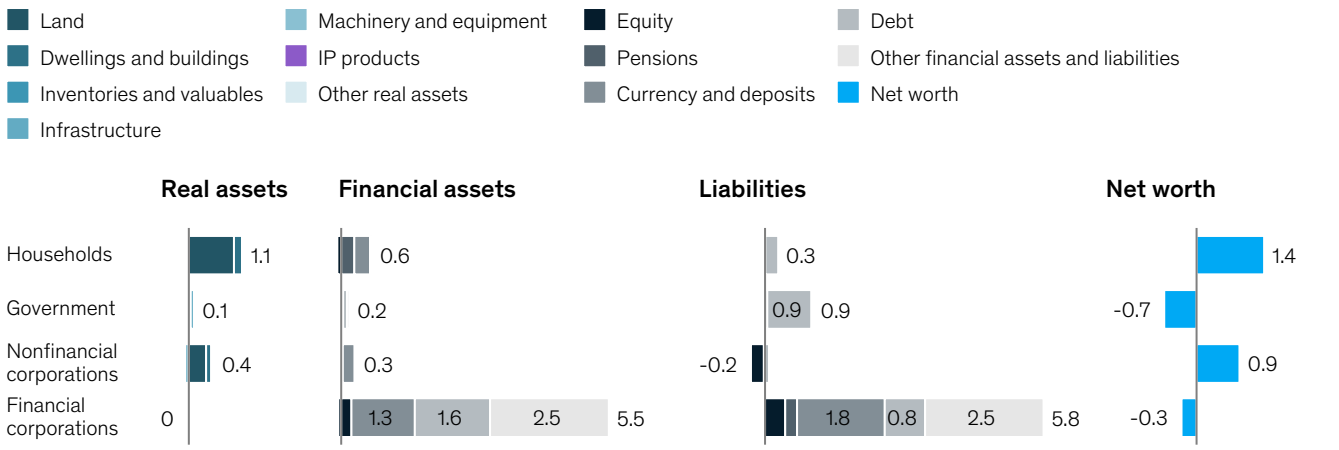
National balance sheet by sector, 2020, %, GDP multiple



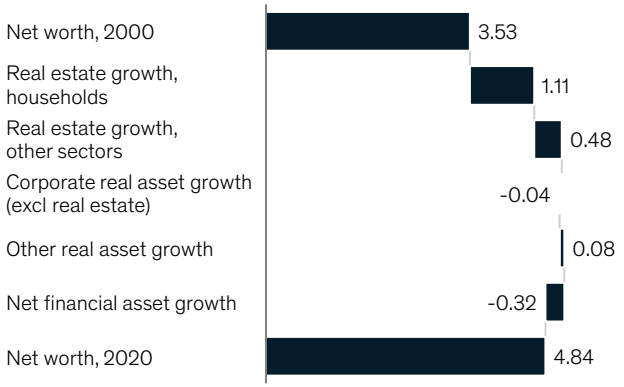
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.
Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

1.3 Change in net worth/GDP multiple, 2000–20

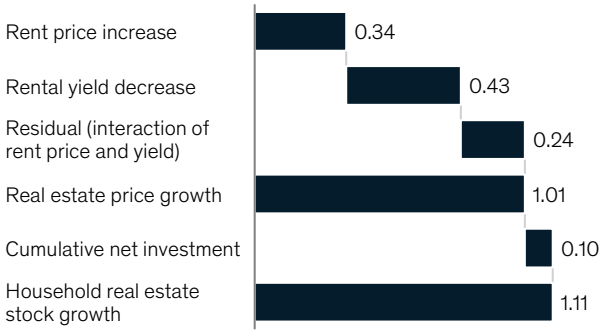
National balance sheet growth, 2000–20, change in GDP multiple



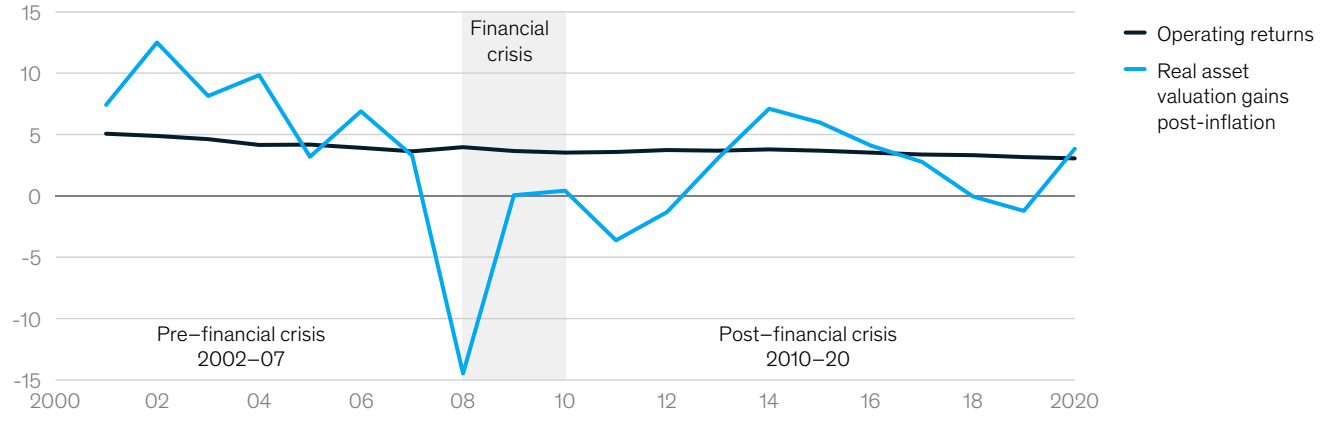
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	4.2	4.0
—	7.3	3.9
Total	11.5	7.9

	Country	Global
—	3.5	3.7
—	1.9	2.9
Total	5.4	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

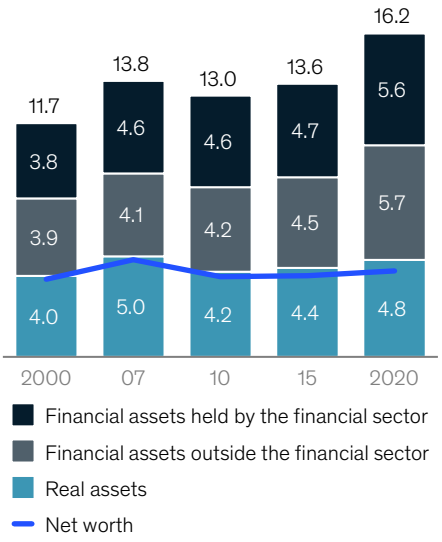
Exhibit C19

United States

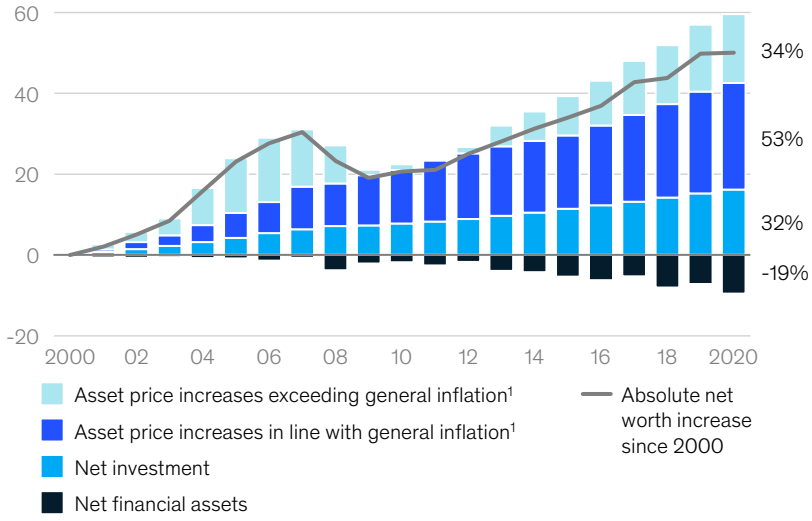
Net worth per capita **$272K** Up from $141K in 2000, 4.1x the global average of $66K

The United States had the lowest national net worth relative to GDP among the ten countries in this report, although household net worth is much higher due to equity valuations that rose to twice the value of corporate assets underpinning them. Its national net worth has also grown the least relative to GDP, as valuation changes unfolded more in equity than in real estate and the net international investment position declined by 0.4 times GDP. Operating returns stayed high in contrast to those of most other economies.

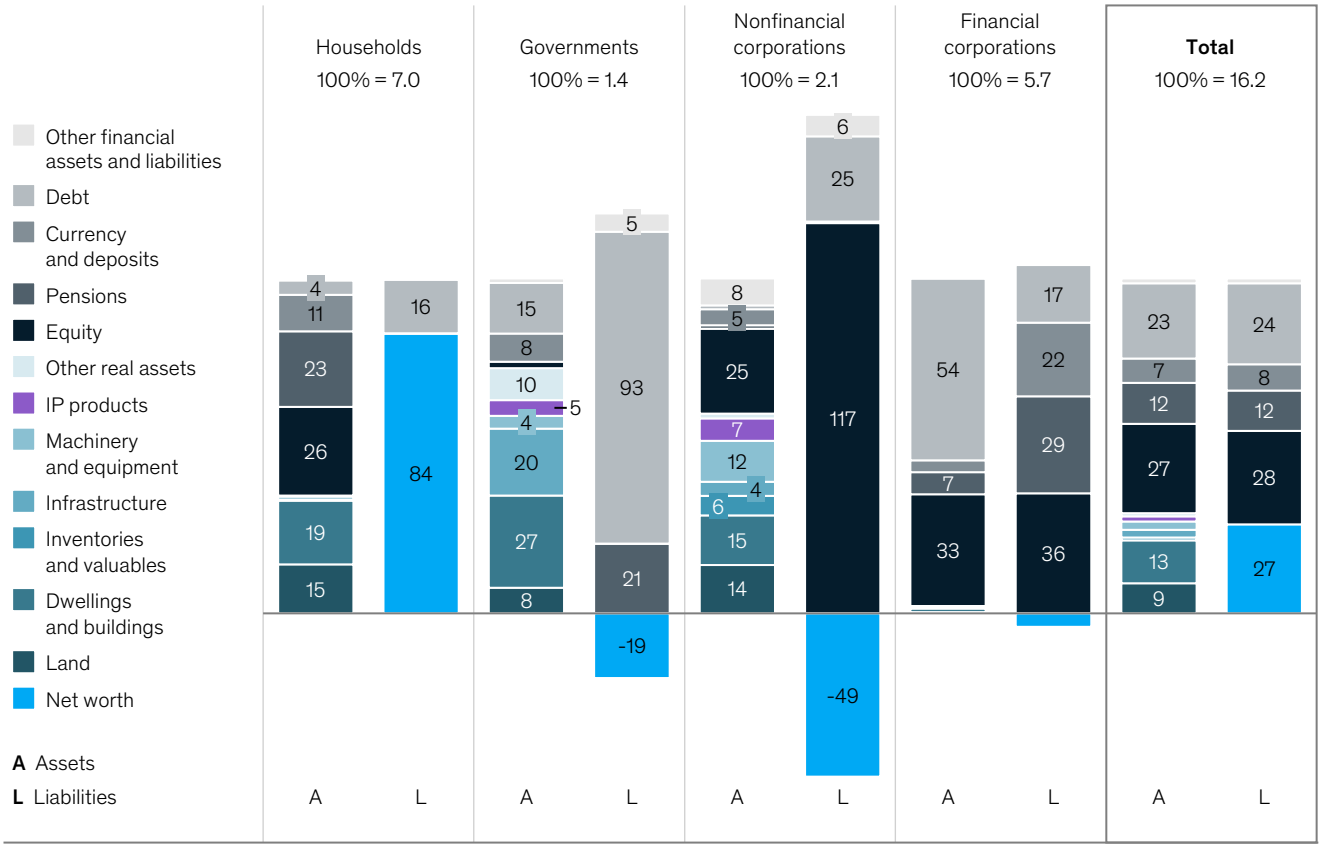
Total assets and net worth, GDP multiple



Drivers of net worth growth, $ trillion



National balance sheet by sector, 2020, %, GDP multiple



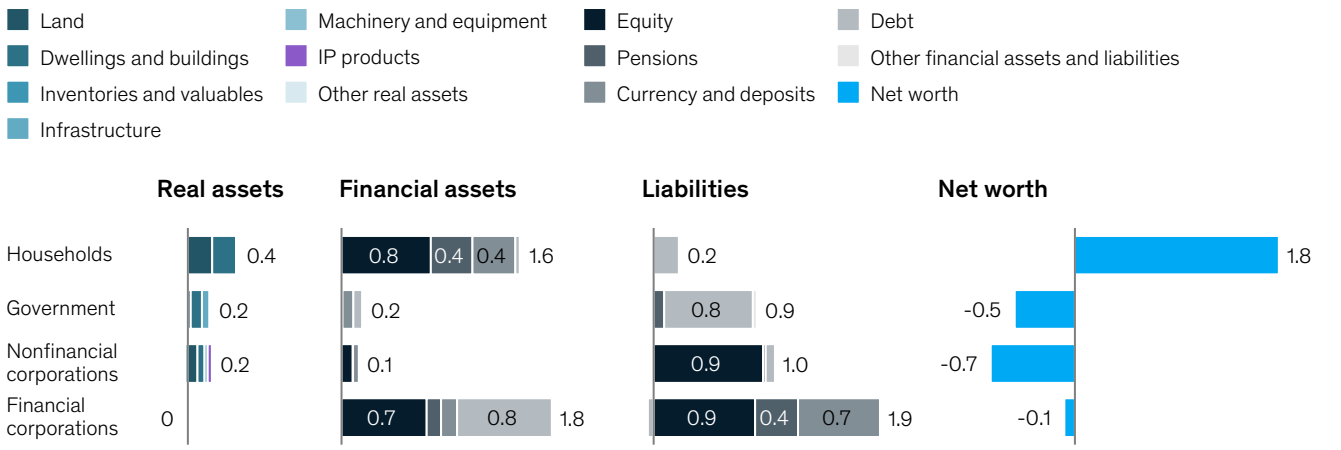
1. Analysis uses consumer price indexes published by IHS Markit and national statistics offices.

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

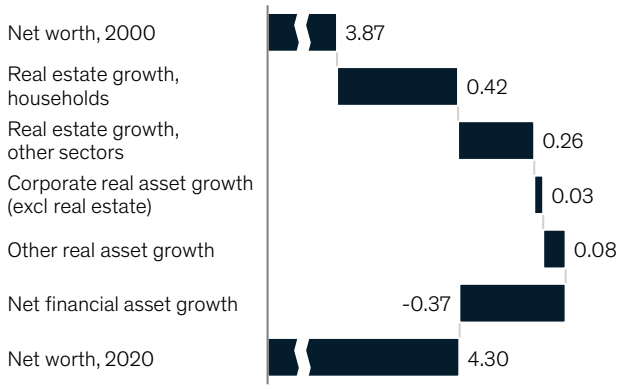
Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

0.4 Change in net worth/GDP multiple, 2000–20

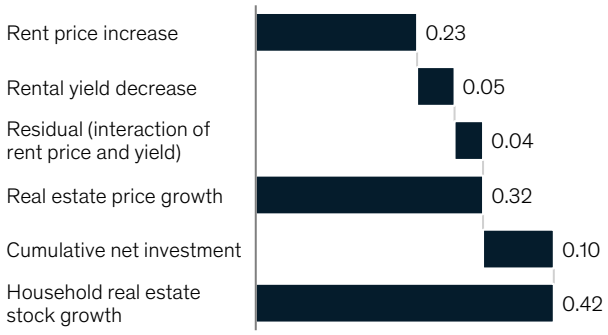
National balance sheet growth, 2000–20, change in GDP multiple



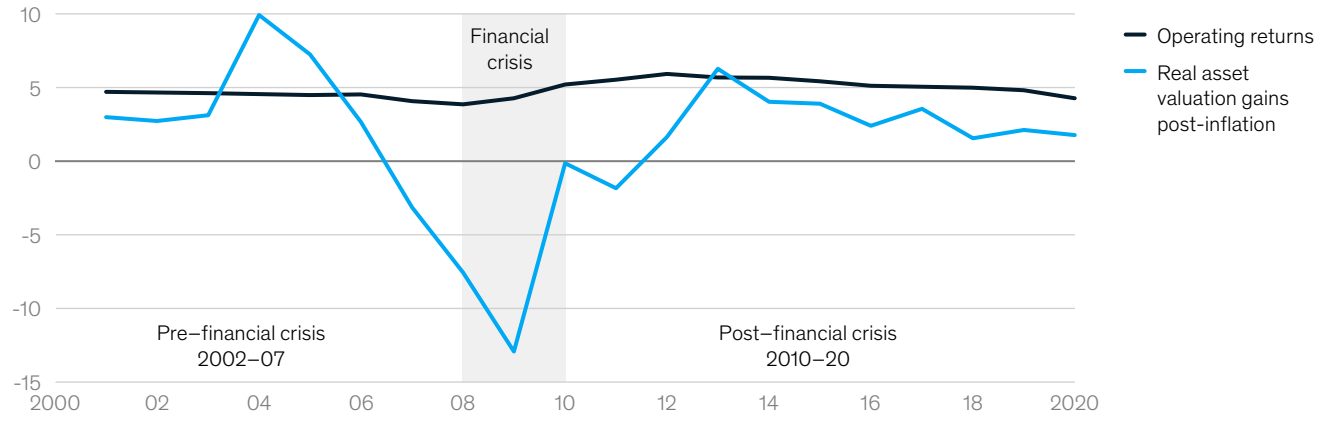
Contributors to net worth/GDP growth, GDP multiples, 2000–20



Contributors to household real estate stock growth, GDP multiples, 2000–20



Real asset valuation gains and returns, %



	Country	Global
—	4.5	4.0
—	3.7	3.9
Total	8.2	7.9

	Country	Global
—	5.2	3.7
—	2.3	2.9
Total	7.5	6.6

Average returns for period, %

Note: The global average is an extrapolation derived from a weighted average of ten countries based on GDP. Liabilities include listed and unlisted equities. All financial data is nonconsolidated. Figures may not sum to 100% because of rounding.

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Windmill park between Denmark and Sweden
© Getty Images

7. Is the global balance sheet healthy? Questions arising from this research

The patterns that have emerged from our research on national balance sheets lend themselves to different interpretations. In this concluding chapter, we lay out some of the implications of the research as well as a few questions that have arisen as we have sought to understand global balance sheet trends. Most notably, the dramatic expansion of the balance sheet and net worth by means of savings—and additional financing—flowing into escalating valuations instead of into investment in real assets that have traditionally driven economic growth raises questions about the sustainability of the global balance sheet and new stores of value in the 21st century.

Is high net worth better? What does a healthy real asset and net worth profile look like?

Most individuals, institutions, and countries regard high net worth as unequivocally good. The wealth that individuals command affords them purchasing power even when they have no income from their labor. Countries think of net worth as the value accumulated by current and former generations and stored in equipment and structures, public infrastructure, housing, natural resource endowments, and more.

In the context of the global economy, however, high net worth may not always be a good thing. As this research shows, wealth has historically moved in tandem with GDP, and in past periods when the two were out of sync because net worth had risen, the divergence was a sign of asset price inflation that eventually led to a correction. High net worth relative to GDP can also have negative side effects, such as more expensive housing that is increasingly unaffordable for average families, high construction prices that make infrastructure investments difficult to fund, and high net international investment positions that distort global trade balances and may become unsustainable. The flip side of high net-worth-to-GDP ratios can be low capital productivity, meaning that ever more capital is needed to produce a certain output, or that output has not kept pace with capital accumulation.

The dynamic of wealth accumulation mostly from asset price gains rather than savings and investment also means that wealth concentration may intensify.[167] Net worth has been highly concentrated among few households for a long time. Under current trends, those owning assets will see real valuation gains while those without assets will have difficulty purchasing more expensive assets, unless incomes grow at a faster rate than asset prices. Note, however, that households without much wealth can still own assets by financing them, and that the income stream from assets has not increased in line with rising asset prices.

[167] See *Inequality: A persisting challenge and its implications*, McKinsey Global Institute, June 2019; Era Dabla-Norris et al., *Causes and consequences of income inequality: A global perspective*, IMF Staff Discussion Note SDN/15/13, June 2015, imf.org; Juliana Menasce Horowitz, Ruth Igielnik, and Rakesh Kochnar, *Trends in income and wealth inequality*, Pew Research Center, January 2020, pewresearch.org; and Carter C. Price and Kathryn A. Edwards, *Trends in income from 1975 to 2018*, Rand Corporation, working paper WR-A516-1, September 2020, rand.org.

Our research has further shown that returns from the operations of assets have declined while valuations have increased. The financial incentives that have traditionally driven money into new, productive investments and spurred management talent to improve operations are thus reduced. Instead, investors have more reason to chase valuation gains.

It could therefore be argued that a healthy net worth profile and trajectory would be one that moves in sync with the output and societal benefit generated by the real assets that support it: for instance, significant real estate assets available at affordable prices, a high stock of tangible and intangible assets used in production by corporations that drive growth, and a broadly balanced net international investment position that minimizes skews in global trade and risks of foreign lending and borrowing. Metrics of national wealth may aim to incorporate those concepts.

Correspondingly, accumulating pension savings at a much faster rate than GDP may also prove unsustainable if that drives up asset prices rather than productive investment. Those savings will, in the end, always be a claim on income by future generations. So a better answer to the world´s demographic challenges appears to be accelerating GDP growth rather than attempting to raise old-age savings in an environment of slow growth.

Finally, governments should pay attention to their own net worth. Many have substantially increased their debt, and for good reasons. Building the asset side of their balance sheets at the same time by increasing public investment in infrastructure, affordable housing, projects that address climate change, and more would make this additional debt more sustainable.

Has the relationship between net worth and GDP irrevocably changed, marking a new paradigm of persistently high asset prices?

There are different ways to interpret the divergence of net worth and GDP since 2000. One school of thought holds that the extraordinarily low interest rates of the past three decades that contributed to higher and higher valuations reflect a permanently changed world. In this view, a higher propensity to save by aging populations and increased concentration of income among high-income households are among the trends that will sustain the low interest rates underpinning higher valuations for the foreseeable future.[168] Declining net investment, including from a shift to digital and intangibles investments where reproduction costs are low and the availability of talent is constrained, further plays into a dynamic where savings fuel rising traditional asset prices. One could also argue that the most attractive cities have reached a limit in urban land and zoning, keeping real estate scarce and valuable. In this view, the world has undergone a major paradigm shift. Large and persistent differences in net worth relative to GDP across countries also support the view that higher or lower ratios of net worth to GDP may be sustainable—although context can change. While this scenario is clearly plausible, it is important to consider whether it is desirable.

An alternative view suggests that the current period of comparatively high net worth will end at some point, and the prices of real assets could once again more closely track the trajectory of GDP. In this case, a correction or mean reversion could occur in a gradual and orderly way should nominal GDP accelerate and outgrow asset prices. Or it could result in a significant asset price correction with repercussions for the viability of debt backed by those assets.[169] Already in the postpandemic recovery, according to this view, there are signs of increased investment in the digital economy and sustainability, which has redirected savings into productive investment and put upward pressure on the unusually low interest rates that have

[168] See Adrien Auclert and Matthew Rognlie, *Inequality and aggregate demand*, Stanford University, January 2020, stanford.edu; Atif Mian, Ludwig Straub, and Amir Sufi, "What explains the decline in r*? Rising income inequality and demographic shifts," presented at the 2021 Jackson Hole Economic Symposium, Federal Reserve Bank of Kansas City, August 2021.

[169] See Kenneth Rogoff, "Can China's outsized real estate sector amplify a Delta-induced slowdown?," VoxEU, September 21, 2021; Robert J. Shiller, "Stock, bond and real estate prices are all uncomfortably high," *New York Times,* October 1, 2021; Òscar Jordà et al., "The rate of return on everything, 1870–2015," *The Quarterly Journal of Economics,* 2019, Volume 134, Number 3; Òscar Jordà et al., "Global financial cycles and risk premiums," *IMF Economic Review,* March 2019, Volume 67, Number 1, pp. 109–50; and Mikael Juselius and Mathias Drehmann, "Leverage dynamics and the burden of debt," *Oxford Bulletin of Economics and Statistics,* July 2019, Number 82, Volume 2.

prevailed for the past decade.[170] The pandemic has at least temporarily spurred inflation, and central banks may be inclined to raise rates to keep it from taking flight. That could lead to an acceleration in nominal GDP growth and a cap on further increases in real estate values, which have underpinned the growth in global net worth for the past two decades.

Decision makers could develop and observe markers to better assess which pathway balance sheets and the economy may take. These markers could include the evolution of the balance sheet and its components, and macro indicators like economic growth, inflation, and interest rates. Other markers would offer insight into potential drivers of any rebalancing, such as corporate and public investment plans and changes in policy aimed at encouraging investment and growth. They would also show indications of policy shifts that may induce changes in savings behavior, income, and wealth distribution; changes to the financial environment, including bank regulation; and changes in real estate market characteristics.

Climate risk, altered economic geography, and changing geopolitics—including shifts in flows of people, goods, services, and financial assets—all coming at the same time as we more broadly embrace online shopping, digital delivery of services, and hybrid work models will add to uncertainties about the future balance sheet evolution and should be closely analyzed.

How much finance is too much?

Creation of financial assets and their twin liabilities serves many worthwhile purposes, from helping savers and borrowers stretch income over time to supporting new productive investments and making assets tradeable. Yet there are questions about the role of the financial system in driving, rather than merely reflecting, asset price increases; about the risk built up in a larger balance sheet; and about the best design of a financial system that would drive productive investment.

Over the past 20 years, the global financial balance sheet has not expanded much relative to real assets and so may simply reflect increases in real asset stocks and valuations. Yet "cheap money" in response to a massive financial dislocation, while it did not generate goods price inflation, may have contributed to asset price increases. Loose monetary policy following the 2008 financial crisis and four decades of declining interest rates have gone hand in hand with rising asset prices. As our research has shown, the financial system has created nearly $2 in debt and about $4 in financial liabilities for every new dollar invested, and much of financing has found its way into increasing prices of existing assets. Loan-to-value ratios have stayed at about 80 percent, and if asset valuations did revert to historical averages relative to GDP, many assets with financial liabilities held against them could end up underwater.

A strong financial system would facilitate savings and consumption over time and steer capital into productive and sustainable investment, while limiting upward pressure on the value of existing assets and the associated risk. In this context, some regulators have already put in place macroprudential policies that tighten lending standards when real estate prices escalate (including a countercyclical capital buffer requirement, for example). China, for instance, has moved to curb real estate prices.[171] Policy makers could consider the interplay of fiscal and monetary policy in a way that effectively stimulates the economy without contributing to asset price inflation. They could also reconsider the tax advantage of debt financing. Many financial institutions, in turn, are thinking about their role as "responsible" lenders, and in that context could assess how they are contributing to funding sustainability initiatives and economic growth instead of real asset transactions at ever-rising prices.[172]

[170] See *How COVID-19 has pushed companies over the technology tipping point—and transformed business forever*, McKinsey & Company, October 2020, McKinsey.com.
[171] See "China's bid to stabilise its property markets is causing jitters," *The Economist*, September 4, 2021, economist.com.
[172] Miklós Dietz and Valéria Laszló, "Five retail banking products that unite value and a sense of purpose," May 2021, McKinsey.com.

As economies become intangible and societies age, what assets become stores of value in the 21st century?

Excess savings in some pockets of the economy have found their way mostly into increasing the price of real estate. If we don't want to limit the desire to save but also do not want further asset price escalation, it will be important to find alternative long-term stores of value. We identify four possible pathways for savings: higher investment including in sustainability, intangibles, growth of financial assets that are not backed by assets, and new digital assets. All but one, higher investment, come with marked drawbacks.

Higher investment including in sustainability: Societies could increase the level of traditional productive investment so that it becomes a larger store of value. Several global-scale challenges are creating plenty of opportunity for investment in the types of assets that have traditionally propelled economic growth. From affordable housing and crumbling infrastructure to carbon abatement and digitization of the public sector, these potential investments drive economies and enhance societies. How can we create business cases?

Intangibles: Although intangibles have attracted plenty of investment, they have not served as a long-term store of value at scale. Measured using current assumptions for their value rather than the broader societal value they might bring, they constitute only a tiny part of total net worth. But these assumptions and the amount of private value intangibles can hold depend on the economic and competitive context. Most intangibles can be scaled at near-zero marginal cost and are not "used up" in production. That means the returns on intangibles investments can flow to a variety of stakeholders. At one extreme, if competition is strong and IP protection light, all value of intangibles investment will quickly pass to consumers as customer surplus, increasing real income and standards of living for all but not serving as a long-term store of value for those making the investment. At the other extreme, the policy and competitive environment could allow companies investing in intangibles to protect—and scale—the value of those investments ad infinitum, through IP protection, protection of trade secrets, sustained advantages of scale, barriers to entry, or not containing monopoly power. In such a setting, intangibles investments could become long-term stores of value for savers and increase the value of their investments over time, but at the expense of competition and consumers. What policy mix is needed to extract more value and return from intangibles investment and yet also preserve customer surplus and strong competition? And what might then be the right way to measure intangibles at a company and societal level?

Growth in financial assets: Individual savers can store value in financial assets without increasing net worth if there are enough debtors willing to take up the corresponding liabilities. This mechanism of saving has been in widespread use in recent decades. Governments, for example, have become borrowers of last resort, increasing public debt obligations as a way for savers to store money that is essentially a claim on taxes to be paid by themselves or future generations.[173] Increasing household mortgage debt to finance transactions of existing real estate stock has similar features, providing a store of value for savers via a claim on future income of the next generation of mortgage holders. Pay-as-you-go pension systems also could be seen this way. Could expansion of debt and finance thus continue to serve as a store of value for savers, even while debt levels and finance already appear high by many metrics?

New digital assets: Some might regard digital currencies as real assets that are mined (like gold) to add to net worth. However, doing so requires devoting economic resources—not to mention energy and carbon emissions—to create something that has no productive value, thereby challenging that assumption.[174] Could nonfungible tokens that hold the value of reproduced digital files like photos, videos, and artwork be a better approach, allowing easier and more storage of value in digital produced assets?

[173] See Ricardo J. Caballero, Emmanuel Farhi, and Pierre-Olivier Gourinchas, "The safe assets shortage conundrum," *The Journal of Economic Perspectives*, Summer 2017, Volume 31, Number 3.
[174] See Jon Danielsson, "What happens if bitcoin succeeds?," VoxEU, February 26, 2021.

How can households, corporations, financial institutions, and policy makers assess their exposure and work toward good outcomes?

This research is primarily intended to provide a foundation and frame of reference for better understanding the economic context in which we live and operate, rather than to offer comprehensive recommendations to economic actors. Yet it does tee up a few sector-specific recommendations beyond the more general ones listed above.

Regardless of whether one believes that the divergence of net worth relative to GDP is a new paradigm, there are questions as to whether it is desirable and sustainable given the side effects and risks of a large balance sheet relative to GDP laid out above. It therefore seems prudent to put effort into raising investment as a new store of value and driving demand to accelerate nominal GDP growth as a nondisruptive rebalancing act.

Households, governments, corporations, and financial institutions alike can work toward that goal and understand how future global balance sheet scenarios would affect their own balance sheets—and how to manage their exposure.

Governments: Prioritize real GDP growth, promote productive investment including in the green economy, and pay attention to the asset side of balance sheets

Coming out of the pandemic, finding the right way to exit monetary and fiscal stimulus and heal government sector balance sheets is increasingly high on the public agenda. Given potential vulnerabilities related to the global balance sheet and its divergence from GDP, it may be prudent to put effort into attempting to grow out of that divergence. This could be achieved by driving aggregate demand and promoting investment, either of the traditional business variety or to address societal challenges like climate change and affordable housing through mechanisms such as carbon regulation and urban development and zoning. Increasing public investment in well-known areas like infrastructure and education and raising the societal return on public assets by managing them more effectively, for example by improving the efficiency of public utilities or putting public lands to better use, are other ideas.[175] Such steps could help repair public balance sheets that have gone through rapid debt expansion, strengthening the asset side to support higher debt and raising income to improve public finance.

Corporations: Support investment, growth, and wealth building

Corporations could devote resources to understanding the impact of different scenarios on their balance sheets and build monitoring mechanisms to continuously reassess the relative likelihoods of those scenarios.[176] This could also include corporate stress testing.

Corporations also have a role in continuing to protect and build wealth for the households that own their shares, by driving overall economic growth to support a healthy rebalancing of the global balance sheet relative to GDP. Playing to the economic and macro environment may not be enough. What new investments can corporations make to protect and raise income for their owners, increase productivity and income of their workers, and contribute to growth overall? How can they address equity values that in many cases have come to exceed net asset values and therefore may become a burden should a correction develop? Many corporations have excess liquidity, despite myriad opportunities to invest and expand their role in addressing societal challenges, ranging from the green economy to affordable housing to new forms of mobility. They can work alongside policy makers to create clear business and investment cases that turn them into reality.

[175] The World Bank's 2021 *Changing Wealth of Nations* report provides policy priorities including investment in public infrastructure, investing in natural solutions to climate risks, promoting asset diversification, and encouraging accumulation of "climate-proof" produced assets. See James Cust et al., *The changing wealth of nations 2021: Managing assets for the future*, World Bank.

[176] See *A new look at how corporations impact the economy and households*, McKinsey Global Institute, May 2021.

Financial institutions: Scenario analysis and capital allocation
Financial institutions by their nature have the greatest exposure to the global balance sheet, and most of them already invest in scenario analysis, stress tests, and other tools of vigilance. What new growth opportunities will develop for them should balance sheet growth recede relative to GDP, potentially putting pressure on their own balance sheets? Financial institutions can help identify and redirect capital toward new business and investment cases, including project development and finance. And they can work with policy makers to move the entire financial system and its institutional framework so that it allocates capital predominantly to productive use.

Households: Adjust exposure to potential scenarios ahead, depending on risk appetite, and provide policy makers with a mandate to steer toward a soft rebalancing
Households, or at least a small portion of them, have come to expect their wealth to increase as a result of rising stock prices and higher valuations of homes. As the holders of 95 percent of net worth globally, they are the most exposed to any potential changes in the global balance sheet, which would affect the value of their homes, their pensions, and their financial investments. Many wealthy households have made leveraged investments in financial and real assets that may provide them with handsome returns if we are indeed in a new economic paradigm, but that also represent risks should it turn out that we aren't. Accurate predictions of what the future holds are impossible, and households thus may tailor their own balance sheets based on their appetite and capacity for opportunities and risk.

Households naturally have a vested interest in sustaining and further expanding their wealth. Does this implicitly suggest a political mandate to maintain the policies that have contributed to the current environment? Or is it reason instead for a mandate to attend to resilient GDP growth and support wealth creation via higher real economic returns rather than price escalation?[177]

This report has highlighted key trends emerging from a balance sheet view of the global economy. Understanding those trends, notably the rapid growth of the balance sheet itself and of national net worth, raises critical questions about the health and resilience of the global economy. In future research, we intend to return to some of these questions in greater detail.

[177] See Marcus K. Brunnermeier, *The resilient society*, Endeavor Literary Press, 2021.

Technical appendix

This appendix gives details of the methodology and sources used in this report. It is organized into four sections, as follows:

1. Data sources
2. Sensitivities and constraints to balance sheet data
3. Data methodology and adjustments
4. Methodologies of specific analyses

Data sources

The analyses in this report include information from international organizations, data providers, national sources, public databases, and other academic papers and industry reports. In many cases, we used data directly available. In some cases we made adjustments, extrapolations, or estimations.

Foundational data sources used to compile national balance sheets include the following:

— OECD data on nonfinancial and nonconsolidated balance sheets (tables 9B, 720), gross fixed capital formation (Quarterly National Accounts), and consumption of fixed capital (table 14A).[178]

— CEIC data on China's nonfinancial and financial balance sheets and gross fixed capital formation.

— National statistics offices publications of nonfinancial and financial stocks and gross fixed capital formation. The offices are the Australian Bureau of Statistics, Statistics Canada, the National Bureau of Statistics of China, France's National Institute of Statistics and Economic Studies, the German Federal Statistical Office, the Cabinet Office of Japan, Mexico's National Institute of Statistics and Geography, Statistics Sweden, the United Kingdom's Office for National Statistics, and the US Bureau of Economic Analysis and Bureau of Labor Statistics.

— Nonfinancial and financial stock data from national central banks, in particular the US Federal Reserve Board (via its Z1 tables) and the People's Bank of China.[179]

— World Bank data on GDP and population.[180]

Additional sources used throughout our analyses include IHS Markit, EU KLEMS, World KLEMS, Rystad Energy Ucube, the World Inequality Database, INTAN-Invest, Worldometer, AMECO, Statista, real estate and infrastructure data providers, other national sources, and academic papers and other literature. Real estate and infrastructure data providers include CoStar, Green Street Advisors, CBRE, Savills, Preqin, and Capright. Other national sources include the US Department of Agriculture, Energy Information Administration, and Geological Survey; China's Ministry of Land and Resources; and Japan's Research Institute of Economy, Trade, and Industry. Papers pivotal in shaping data inputs to our analysis include Li and Zhang (2017), Larson (2015), Nichols et al. (2010), Herd (2020), and Meier and Tarhan (2007).[181]

Exhibit A1 shows data sources and different variables used in our analyses and explains whether we used directly available data or made estimates.

All data were retrieved between January and August 2021. National statistics offices may regularly update their national accounts, particularly for recent years such as 2019 and 2020. Any updates following August 2021 are not reflected in this report.

[178] National Accounts, "Table 9B: Balance sheets for non-financial assets," "Table 720: Financial balance sheets—nonconsolidated," and "Table 14A: Non-financial accounts by sector"; and Quarterly National Accounts, OECD, 2021.
[179] "Financial accounts of the United States – Z.1," Federal Reserve Board, 2021, federalreserve.gov; People's Bank of China, *Flow of funds statement*, 2021.
[180] "GDP (current LCU)," World Bank, 2021, data.worldbank.org; "Population, total," data.worldbank.org, World Bank, 2021.
[181] Yang Li and Xiaojing Zhang, *China's national balance sheet: Theories, methods, and risk assessments*, Springer, 2017; William Larson, *New estimates of value of land of the United States*, Bureau of Economic Analysis, US Department of Commerce, April 2015, bea.gov; Joseph B. Nichols, Stephen D. Oliner, and Michael R. Mulhall, *Commercial and residential land prices across the United States*, Federal Reserve Board, February 2010, federalreserve.gov; Richard Herd, *Estimated capital formation and capital stock by economic sector in China: The implications for productivity growth*, Policy Research Working Papers, number 9317, World Bank, July 2020, worldbank.org; Iwan Meier and Vefa Tarhan, *Corporate investment decision practices and the hurdle rate premium puzzle*, SSRN, January 2007, ssrn.com.

Exhibit A1

Primary source data (1 of 4)

				Australia
Stocks	Real assets	Produced assets	Structures	OECD (1988–2019) and national statistics office (2020)
			Machinery and equipment	OECD (1988–2019) and national statistics office (2020)
			Intellectual property products	
			Inventories	
		Non-produced assets	Land	
			Minerals and energy reserves	
	Financial assets and liabilities			OECD (1988–2019) and national statistics office (2020)
Flows	Gross fixed capital formation			OECD (1960–2019) and national statistics office (2020)
	Consumption of fixed capital and depreciation rates			EU KLEMS and OECD
Macro data	GDP			World Bank
	Population			World Bank
	Workers			The Conference Board
	Consumer price index			IHS Markit
	Long-term interest rates			OECD
	Nominal home price, rent price, price/rent indexes			OECD
	Construction price deflator			IHS Markit
	Gross operating surplus			AMECO
	Net operating surplus			AMECO and OECD
	Industry returns			IHS Markit, AMECO, and OECD
	Asset mix returns			Real estate and infra-structure data providers and academic papers
Others	Historical wealth[5]			WID
	Historical financial assets[6]			n/a
	Wealth inequality			n/a
	Methodology sensitivity analyses			National statistics offices, other national sources, and Statista

☐ Data immediately available

▨ Data transformed or adjusted

n/a Data unavailable or not applicable to analysis

International organizations
- OECD
- World Bank
- IMF
- European Central Bank

Data providers
- CEIC
- IHS Markit
- Rystad Energy UCube
- Real estate and infrastructure data providers[1]

National sources
- National central banks[2]
- National statistics offices[3]
- Other national sources[4]

Public databases
- AMECO
- The Conference Board
- INTAN–Invest
- World Inequality Database (WID)
- World KLEMS
- Worldometer

Others
- Academic papers

1. Includes Capright, CBRE, CoStar, Green Street Advisors, Preqin, and Savills.
2. National central banks include the US Federal Reserve and the People's Bank of China.
3. National statistics offices are the Australian Bureau of Statistics, Statistics Canada, the National Bureau of Statistics of China, France's National Institute of Statistics and Economic Studies, the German Federal Statistical Office, the Cabinet Office of Japan, Mexico's National Institute of Statistics and Geography, Statistics Sweden, the United Kingdom's Office for National Statistics, and the US Bureau of Economic Analysis and Bureau of Labor Statistics.
4. Includes China's Ministry of Land and Resources; Japan's Research Institute of Economy, Trade, and Industry; US Geological Survey; US Department of Agriculture; and US Energy Information Administration.
5. Historical wealth refers to wealth figures used in Exhibit 25 in years before official national statistics data are available.
6. Historical financial assets refers to historical financial balance sheet figures used in Exhibit 24 in years before official national statistics data are available.

Source: McKinsey Global Institute analysis

Exhibit A1 (continued)

Primary source data (2 of 4)

				Canada	China	France
Stocks	Real assets	Produced assets	Structures	National statistics office (1996–2020) and World KLEMS	CEIC, academic papers, and industry reports (2000–20)	OECD (1978–2019) and national statistics office (2020)
			Machinery and equipment	National statistics office (1996–2020)	CEIC, IHS Markit, and academic papers (2000–20)	
			Intellectual property products			
			Inventories			
		Non-produced assets	Land			
			Minerals and energy reserves		Rystad Energy Ucube, Worldometer, IHS Markit, IMF, academic papers, and other national sources (2000–20)	
	Financial assets and liabilities				CEIC (2000–19) and national central bank (2020)	OECD (1995–2020)
Flows	Gross fixed capital formation			National statistics office (1961–2020)	CEIC (2000–20)	OECD (1960–2020)
	Consumption of fixed capital and depreciation rates			EU KLEMS and OECD	EU KLEMS and World Bank	EU KLEMS and OECD
Macro data	GDP			World Bank	World Bank	World Bank
	Population			World Bank	World Bank	World Bank
	Workers			The Conference Board	The Conference Board	The Conference Board
	Consumer price index			IHS Markit	IHS Markit	IHS Markit
	Long-term interest rates			OECD	CEIC	OECD
	Nominal home price, rent price, price/rent indexes			OECD	CEIC	OECD
	Construction price deflator			IHS Markit	IHS Markit	IHS Markit
	Gross operating surplus			AMECO	OECD	AMECO
	Net operating surplus			AMECO and OECD	OECD and World Bank	AMECO and OECD
	Industry returns			IHS Markit, AMECO, and OECD	n/a	IHS Markit, AMECO, and OECD
	Asset mix returns			Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers
Others	Historical wealth			WID	WID	WID
	Historical financial assets			n/a	n/a	n/a
	Wealth inequality			n/a	WID	WID
	Methodology sensitivity analyses			National statistics office, other national sources, Statista, and Rystad Energy Ucube	CEIC, other national sources, Statista, and Rystad Energy Ucube	European Central Bank and INTAN–Invest

Exhibit A1 (continued)

Primary source data (3 of 4)

				Germany	Japan	Mexico
Stocks	Real assets	Produced assets	Structures	OECD (1995–2019) and national statistics office (2020)	National statistics office (1994–2020)	National statistics office (2003–20)
			Machinery and equipment			National statistics office (2003–20)
			Intellectual property products			National statistics office (2003–20)
			Inventories	OECD (1995–2020)		
		Non-produced assets	Land	OECD (1995–2019) and national statistics office (2020)		
			Minerals and energy reserves	n/a		
	Financial assets and liabilities			OECD (1995–2020)		
Flows	Gross fixed capital formation			OECD (1991–2020)	National statistics office (1994–2020)	National statistics office (2003–20)
	Consumption of fixed capital and depreciation rates			EU KLEMS and OECD	EU KLEMS and OECD	EU KLEMS and OECD
Macro data	GDP			World Bank	World Bank and national statistics office	World Bank
	Population			World Bank	World Bank	World Bank
	Workers			The Conference Board	The Conference Board	The Conference Board
	Consumer price index			IHS Markit	IHS Markit	IHS Markit
	Long-term interest rates			OECD	OECD	OECD
	Nominal home price, rent price, price/rent indexes			OECD	OECD	OECD
	Construction price deflator			IHS Markit	IHS Markit	IHS Markit
	Gross operating surplus			AMECO	AMECO	AMECO
	Net operating surplus			AMECO and OECD	AMECO and OECD	AMECO and OECD
	Industry returns			IHS Markit, AMECO, and OECD	IHS Markit, AMECO, and OECD	n/a
	Asset mix returns			Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers
Others	Historical wealth			WID	WID	n/a
	Historical financial assets			n/a	National statistics office	n/a
	Wealth inequality			n/a	n/a	n/a
	Methodology sensitivity analyses			European Central Bank, INTAN–Invest, other national sources, and Statista	National statistics office and other national sources	Rystad Energy Ucube

Exhibit A1 (continued)

Primary source data (4 of 4)

				Sweden	United Kingdom	United States
Stocks	Real assets	Produced assets	Structures	OECD (1995–2019) and national statistics office (2020)	OECD (1995–2019) and national statistics office (2020)	National central bank and OECD (1950–2020)
			Machinery and equipment			National central bank (1950–2020)
			Intellectual property products			
			Inventories			
		Non-produced assets	Land			National central bank (1950–2020), OECD, other national sources, and academic papers
			Minerals and energy reserves	n/a	n/a	Rystad Energy Ucube, national statistics office, IMF, academic papers, and other national sources (1950–2020)
	Financial assets and liabilities			OECD (1995–2020)	OECD (1995–2020)	National central bank (1950–2020)
Flows	Gross fixed capital formation			OECD (1993–2020)	National statistics office (1997–2020)	National central bank (1950–2020)
	Consumption of fixed capital and depreciation rates			EU KLEMS and OECD	EU KLEMS and OECD	EU KLEMS and OECD
Macro data	GDP			World Bank	World Bank	National statistics office
	Population			World Bank	World Bank	World Bank
	Workers			The Conference Board	The Conference Board	The Conference Board
	Consumer price index			IHS Markit	IHS Markit	National statistics office
	Long-term interest rates			OECD	OECD	OECD
	Nominal home price, rent price, price/rent indexes			OECD	OECD	OECD
	Construction price deflator			IHS Markit	IHS Markit	IHS Markit
	Gross operating surplus			AMECO	AMECO	AMECO
	Net operating surplus			AMECO and OECD	AMECO and OECD	AMECO and OECD
	Industry returns			n/a	IHS Markit, AMECO, and OECD	IHS Markit, AMECO, and OECD
	Asset mix returns			Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers	Real estate and infra-structure data providers and academic papers
Others	Historical wealth			WID	WID	n/a
	Historical financial assets			n/a	National statistics office	n/a
	Wealth inequality			n/a	WID	WID
	Methodology sensitivity analyses			European Central Bank, other national sources, Statista, and INTAN–Invest	Other national sources, Statista, INTAN–Invest	National central bank, other national sources, Statista, Rystad Energy Ucube, and INTAN–Invest

Sensitivities and constraints to balance sheet data

We used the 2008 System of National Accounts along with other OECD and Eurostat publications to guide our understanding of national balance sheet accounting methodologies, including line-item definitions and valuation approaches. We supplemented our understanding through direct communication with multiple statistics offices to further understand how items are valued in practice, along with their sensitivities and constraints.[182]

The data that we used on nonfinancial assets are subject to limitations and constraints that must be factored into interpretations. Results may be sensitive to assumptions made in addressing the following factors:

— Land constitutes a large portion of net worth across countries and is valued in different ways in the countries in this report. For example, in Japan, Australia, and Germany, the value of land underlying structures is based directly on the quantity of land multiplied by estimated market prices. In France and the United Kingdom, a residual approach is followed, where the total value of real estate is estimated and then the cost of the structure is subtracted. In the United States, the Federal Reserve and Bureau of Economic Analysis (BEA) do not publish separate estimates for land. The BEA cautions against forming a specific land stock value using the residual approach, because data on real estate stock are estimated separately from the value of structure replacement cost. In such a case, the final value of land could potentially be inaccurate due to source discrepancies. For more on how we calculated land values for the United States, see "United States: Splitting real estate totals into land, dwellings, buildings, and infrastructure," below.

— Government accounting varies in robustness by country, which may result in undervaluation of public assets.[183]

— Some asset types often regarded as important sources of wealth are intentionally excluded from the balance sheet. They are the following:

  • Human capital, which is not a tradeable asset even though individuals and business may consider education and training forms of investment.

  • Non–economically exploitable natural capital or any natural capital without a clear owner, including open seas, wild animals, forests, and unreachable mineral deposits.

  • Consumer durables, including items such as personal automobiles and personal computers, purchases of which are considered consumption as opposed to investment, even though individuals may consider such items assets with value.

— High depreciation rates of tangible assets may result in undervaluation. For structures, implied depreciation rates in national accounts ranged from 2 to 3.7 percent in 2019; however, based on our analysis using EU KLEMS data, expected depreciation rates for structures are 1 to 3 percent. Machinery and equipment implied depreciation rates in national accounts ranged from 14.5 to 27.6 percent in 2019; based on our analysis using EU KLEMS data, average expected depreciation rates for machinery and equipment are about 16 percent.[184]

[182] Primary inputs to our methodology included System of National Accounts, European Commission, IMF, OECD, United Nations, and World Bank, 2008, and Francois Lequiller and Derek Blades, *Understanding national accounts*, second edition, OECD, 2014. We also leveraged *Measuring capital*, OECD, 2009; *Eurostat-OECD report on survey of national practices in estimating net stocks of structures*, Eurostat and OECD, 2013; *Eurostat-OECD compilation guide on inventories*, Eurostat and OECD, 2017; *Handbook on deriving capital measures of intellectual property products*, OECD, 2010; *Final report on intellectual property products*, Joint Eurostat-OECD Task Force on Land and Other Non-financial Assets, 2020; *Manual on measuring research and development in ESA 2010*, Eurostat, 2014; Robin Lynch, *The treatment of intellectual property in the national accounts*, Economic Statistics Centre of Excellence, 2019; Young-Hwan Kim, *Estimation of the stock of land in OECD countries*, OECD, 2008; *Eurostat-OECD compilation guide on land estimation*, Eurostat and OECD, 2015; *Handbook of national accounting: Integrated environmental and economic accounting*, United Nations, European Commission, IMF, OECD, and World Bank, 2003; *OECD benchmark definition of foreign direct investment*, fourth edition, OECD, 2008.

[183] Most governments use cash accounting rather than accrual accounting, and as a result balance sheet assets are based on statistical estimates. For further information, see Ian Ball and Gary Pflugrath, "Government accounting: Making Enron look good," *World Economics Journal*, March 2012, Volume 13, Number 1.

[184] EU KLEMS database, Vienna Institute for International Economic Studies, euklems.eu.

— High depreciation rates of intellectual property products (also referred to here as intangible assets), which are not subject to wear and tear in the same way as traditional assets such as machinery or structures, significantly affect valuations. Based on our analysis, depreciation rates by country ranged between 20.8 and 40.6 percent in 2019, reflecting lower economic returns as patents age even though social returns may remain high, because intellectual property provides building blocks for greater research and innovation.

— The valuation of IP products may not fully reflect the positive externalities associated with research and innovation, which are often not directly seen or immediately realized.

— Certain asset types may be underreported. These include minerals and energy resources and nonproduced intangibles, such as goodwill from acquisitions, marketing assets, and various other forms of contracts and leases.

Financial assets, while more standardized, are also sensitive to data collection factors. They include the following:

— Unlisted equity may not be valued consistently across countries and is likely undervalued, given substantially higher corporate net asset values compared to equity liabilities seen in France, Germany, Japan, and Mexico. While listed equity has a clear market price, unlisted equity is often valued at book values occasionally adjusted with a premium, leading to possible underestimation.[185]

— Pension entitlements for pay-as-you-go programs, including Social Security in the United States, are not recorded in national accounts. In addition, there is no consistency between countries in recording pension entitlements of defined-benefit programs for government employees, which is optional under the 2008 System of National Accounts.

Data methodology and adjustments

While most of the balance sheet data in our analysis were directly available, in multiple instances certain data were not immediately available, did not have granularity, or required adjustments. This section provides a detailed overview of assumptions taken to address estimates and adjustments to data where needed.

Australia and Canada: Splits of merged stocks for nonresidential buildings and other structures

Australia and Canada reported a single category encompassing nonresidential buildings and "other structures" (infrastructure) in their national accounts, which are reported in two categories in other countries. We used proxies to make splits between the two types of structures based on average splits observed in other countries (excluding Japan, which was an outlier, and the United States, because no splits were immediately available from the main official source).[186]

In Canada, we took an additional step in adjusting the data using World KLEMS nonresidential capital stock estimates for mining and nonmining industries. All mining, nonresidential capital stocks, constituting roughly 15 to 25 percent of Canada's total nonresidential stock, were assumed to reside in other structures.

[185] See annex 5 of the *OECD benchmark definition of foreign direct investment*, fourth edition, OECD, 2008.
[186] These figures were consistent with data from *Bridging global infrastructure gaps*, McKinsey Global Institute, June 2016, McKinsey.com.

Australia: Building nonconsolidated financial asset stocks based on whom-to-whom matrices

All financial data included in our analysis are nonconsolidated, since such data were most consistently available across countries. For Australia, however, only consolidated data were available. To build nonconsolidated financial asset and liability stocks for Australia, we leveraged whom-to-whom matrices that provide detailed flows and stocks across subsectors.

China: Splits of merged fixed asset stocks, adjustments to infrastructure

China's real asset data have a slightly different structure from other countries', although the sector splits mirrored those of other countries. In the household sector, real assets included housing, automobiles, and rural productive assets. In the corporate sector, real assets included fixed assets, inventories, and other nonfinancial assets. Data on asset types in the government sector had the greatest granularity, including construction in progress, public infrastructure, intangible assets, inventories, fixed assets, and land. For each sector, adjustments were made to bring the data in line with the framework used by other countries.

In the household sector, we made the following adjustments:

— Housing stock: To split this into the typical framework of dwellings and nonresidential buildings, we applied average splits of these assets in other countries to the total household housing stock for China.

— Automobiles: We removed this line item, given that the System of National Accounts considers automobile purchases consumption and not investment; in other words, durable goods, not capital stock.

— Machinery and equipment: We assumed these to be rural productive assets, which were directly provided in the data.

In the corporate sectors, we made the following adjustments:

— Other structures (infrastructure): For nonfinancial corporations, infrastructure estimates were based on the total infrastructure stock amount in China estimated in Herd (2020), less the public infrastructure listed in the government sector.[187] No infrastructure was assumed in the financial sector.

— Machinery and equipment: For nonfinancial corporations, machinery and equipment figures were calculated as accumulated gross output of the machinery and equipment manufacturing subsector, and then assumed to depreciate by 20 percent, based on guidance from Li and Zhang (2017). We used data from IHS Markit to determine gross output in this sector.

— Dwellings, nonresidential buildings: For nonfinancial corporations, we first subtracted the infrastructure and machinery and equipment totals above from the fixed asset total, and then allocated the remaining fixed asset amount to dwellings and nonresidential buildings, which were estimated using average splits in the nonfinancial corporate sector of other countries. For financial corporations, all fixed assets were attributed to structures (dwellings and nonresidential buildings), using average splits in the financial sector of other countries.

[187] The amount directly reported for public infrastructure was 12 percent of GDP and was grouped only with the government sector. To estimate a figure for corporate infrastructure (including state-owned enterprises), we leveraged data from Herd (2020), who provides estimates from 1953–2016 for China's infrastructure stock. Data from 2017–20 was estimated using the average infrastructure as a share of GDP for the 1990–2016 period. Notably, the infrastructure estimate in Herd (2020) is narrower than the System of National Accounts (the former estimate excludes telecommunications and electricity-related infrastructure). See Richard Herd, *Estimated capital formation and capital stock by economic sector in China: The implications for productivity growth*, Policy Research Working Papers, number 9317, World Bank, July 2020, worldbank.org.

— Intellectual property products: Figures used in our analyses were based on 2007–11 estimates reported by Li and Zhang (2017) for the nonfinancial corporate sector's IP products. Forward and backward extrapolations were based on annual changes in gross output of the scientific research and development subsector in China as reported by IHS Markit. This amount was deducted from the reported other nonfinancial assets line item, with the remainder attributed to intangible nonproduced assets.

In the government sector, we made the following adjustments:

— Machinery and equipment: Figures used were based on 2007–11 estimates for government machinery from Li and Zhang (2017). Forward and backward extrapolations were based on annual changes in gross output of the machinery and equipment manufacturing subsector as reported by IHS Markit.

— Dwellings, nonresidential buildings: We used an approach similar to that detailed for nonfinancial corporations above, with machinery and equipment estimated as accumulated gross output of the machinery and equipment manufacturing subsector, and dwellings and nonresidential buildings estimated as the residual of fixed assets, in addition to the construction in progress line item reported in the balance sheet data. The split between dwellings and nonresidential buildings was based on the average split observed for the government sector in other countries.

— Other structures (infrastructure): We used the amount provided as public infrastructure.

— Intellectual property products: We assumed these to be equivalent to intangible government assets, which were directly provided.

Exhibit A2 illustrates the published figures for China's fixed assets before adjustment and the figures after adjustment based on the methods described above.

China: Adjustments to land

Broadly, three land types need to be considered in valuing China's land stock: urban land, agricultural and rural land owned by rural cooperatives, and land use rights. Land stock reported directly in China's national accounts represents urban land owned by the government that has not been leased but does not appear to include the other two categories.

Urban land is a government-owned asset and is directly reported along with fixed assets and other balance sheet items described above. Urban land value is based on the total estimate of urban land reserves, for which the right of use has not been yet granted or sold. It is estimated based on the value of new land designated for construction adjusted by a factor of three.[188]

Agricultural and rural land, which are owned by rural cooperatives in China, are not directly reported in official national balance sheet data. Li and Zhang (2017) provide estimates for this form of land for the period 2007–11 based on the present value of the net output of agriculture, forestry, animal husbandry, and fishery, and reflecting a 4 percent discount rate and 40 percent rental rate.[189] We leveraged this approach to extend figures for agricultural and rural land beyond 2011 via statistics on agricultural output from IHS Markit.

Land use rights are owned by the household sector and are also not directly reported in official national balance sheet data. Land use rights, granted for decades-long periods by the Chinese government under a leasehold system, constitute a significant portion of privately owned property values in China.[190] We estimated land use rights in 2009 based on a survey by the Chinese Ministry of Land and Resources and then reallocated that total from dwellings to land in the household sector. The share of land use rights from structures was projected

[188] Yang Li, Xiaojing Zhang, and Xin Chang, *China's national balance sheet 2018*, China Social Sciences Press, November 2018.
[189] Yang Li and Xiaojing Zhang, *China's national balance sheet: Theories, methods, and risk assessments*, Springer, 2017.
[190] "Special investigation by the Ministry of Land and Resources reveals the ratio of land and house prices to real estate projects," Chinese Ministry of Land and Resources, Central Government Portal, July 2009, gov.cn. Land use rights as a percentage of property price was available only for 2009; percentages before and after 2009 were estimated by adjusting using the land price index for 2004–11 and the construction price index from 2012 onward. The Ministry of Land and Resources has since become the Ministry of Natural Resources of the People's Republic of China.

forward from 2010 to 2020 and backward from 2008 to 2000 using land and construction price indexes and implied net fixed capital formation in structures.[191]

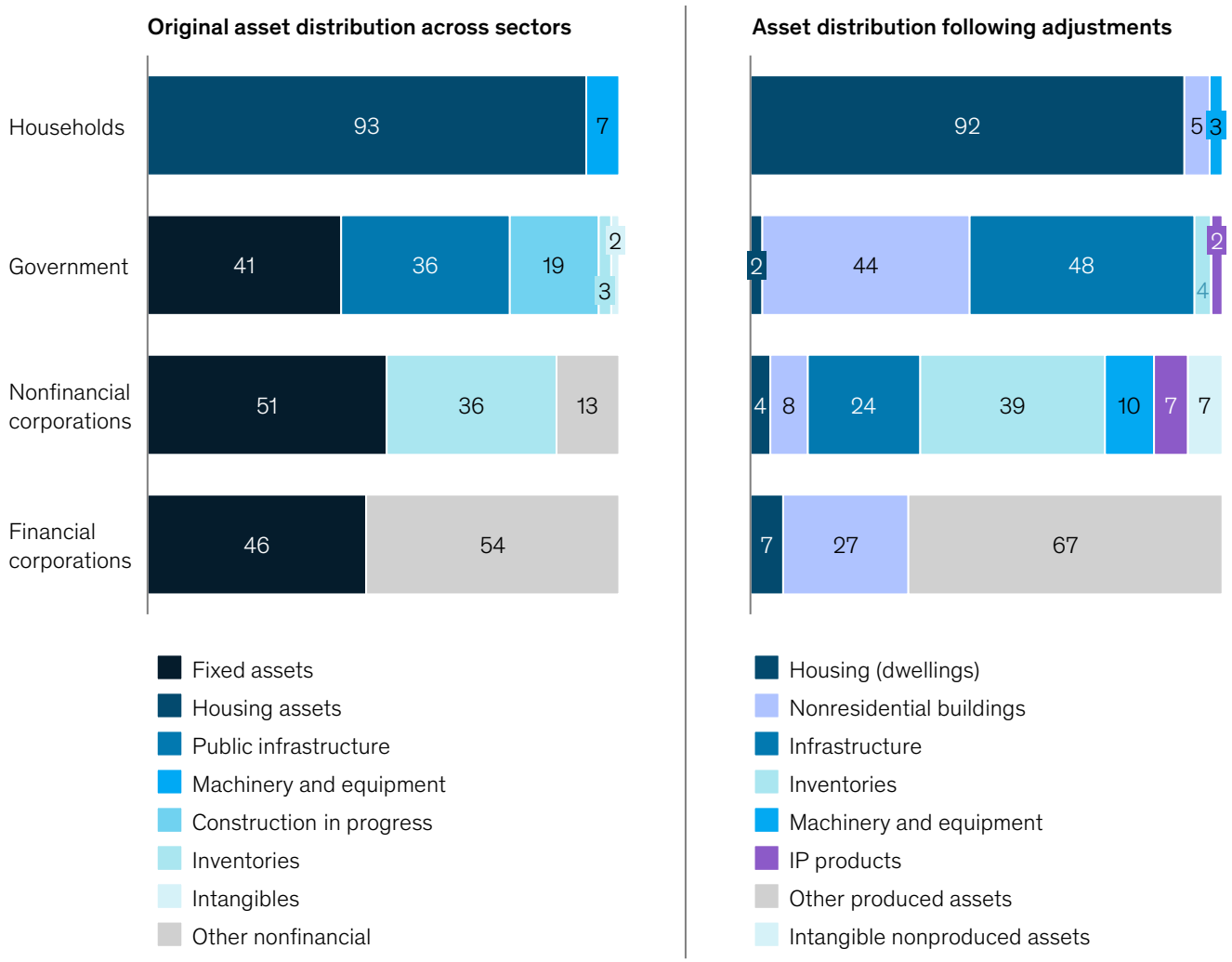
Prior to the land use rights adjustment, both dwellings including buildings and land were outliers. Dwellings including buildings was 3.1 times GDP, while in other countries it ranged from 1.2 to 2.3 times GDP. Land accounted for significantly lower value than in most other countries apart from Mexico and the United States. After reallocating the value of land use rights from structures into land, both figures for China were closer to the typical range of values observed in other countries (Exhibit A3).

[191] For the real land price index from 2004–11, see Yongheng Deng, Joseph Gyourko, and Jing Wu, *Land and housing price measurement in China*, National Bureau of Economic Research, working paper number 18403, September 2012, nber.org. The construction price index is calculated via construction sector gross output from IHS Markit. For the 2004–11 period, the real land prices index adjusted for the consumer price index was used to adjust the 2009 implied value of land use rights. For the period 2012–20, the construction price index was used after adjusting for net fixed capital formation, which additionally contributed to the change in values for the non-land proportion of the property value. For the 2000–03 period, values were based on annual growth of land prices in the 2004–11 period.

Exhibit A2

China's real assets were recategorized to fit the structure used by other countries.

Breakdown of China's real assets (excl land and minerals) before and after adjustments, by sector, 2018, %

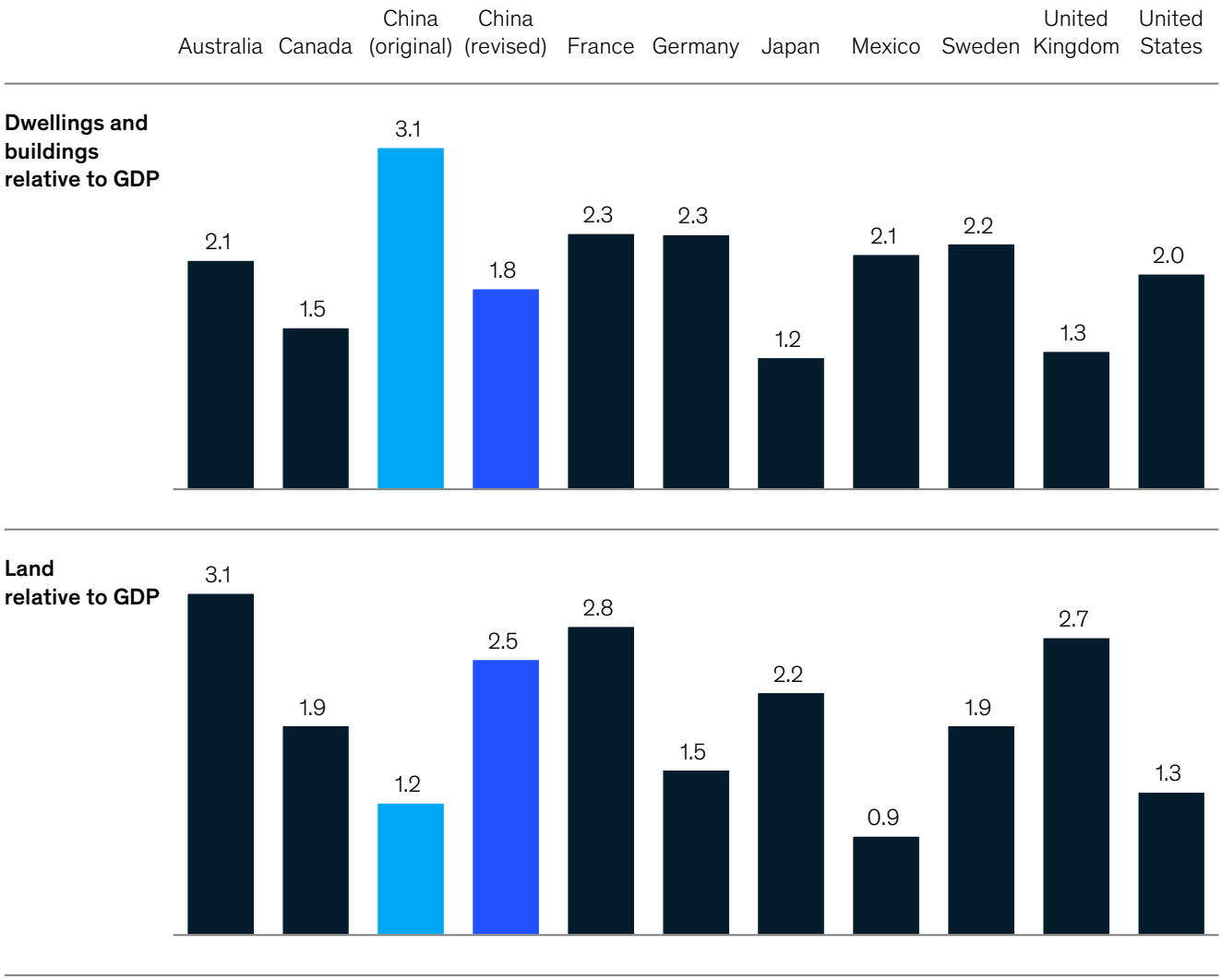


Note: All figures are before any adjustments for the estimated value of land use rights, which was merged as part of structures stocks. Figures may not sum to 100% because of rounding.
Source: Herd, 2020; IHS Markit; CEIC; Li and Zhang, 2017; McKinsey Global Institute analysis

Exhibit A3

China's building and land stock values relative to GDP align with other countries after reallocating land use rights.

Dwelling and buildings/GDP and land/GDP across countries before and after land use rights reallocation in China, 2018



Source: CEIC; China's Ministry of Land and Resources; Deng et al., 2012; Li and Zhang, 2017, 2018; World Bank; McKinsey Global Institute analysis

China and the United States: Estimates for mineral and energy reserves

Mineral and energy reserves for the United States and China were not reported in either country's national accounts even though both are significant producers of mineral and energy commodities. To estimate the minerals stock for these countries, we used a multistep approach.

Mineral and energy reserves can be split into mineral reserves and energy reserves. To estimate energy reserves, we used net present value (NPV) estimates from Rystad Energy Ucube, adopting a long-term scenario of $50 per barrel of oil. To estimate mineral reserves, we calculated the 2020 present value of minerals based on analysis of reserves, production, and price estimates per commodity type as reported in the US Geological Survey 2021 mineral commodity summaries for Australia, Canada, China, and the United States.[192] Australia and Canada served as benchmarks, since their reserves were also reported in national accounts. We assumed that present values for total mineral reserves were based on the sum

[192] Reported reserves, production, and prices per ton for the United States and all countries with available estimates, *Mineral commodity summaries 2021*, US Geological Survey, 2021. The USGS analysis covered more than 80 minerals. Coal was incorporated from external databases including the US Energy Information Administration and Worldometer.

of present value of revenues from future production and of remaining reserves 50 years into the future (based on additional assumptions that production remains constant through the next 50 years and that commodity prices grow in line with general inflation over the long term).

We then converted the present value estimate for 2020 into an NPV estimate to factor in extraction and other associated costs.[193] An average profitability ratio of 14 percent was assumed based on the implied ratio for Australia, calculated as mineral reserves reported in national accounts of roughly 0.5 times GDP divided by the present value from the US Geological Survey analysis specific to Australia of 3.3 times GDP. As an additional cross-check, the average margin for the top 40 mining companies globally over the past two decades was within 10 percent of the profitability ratio based on the implied ratio for Australia.[194]

After reaching the 2020 figure, we backcast this figure based on the share of the mining sector GVA as part of total country GVA, compared to the mining sector's GVA share in 2020. To smooth yearly price changes, we took a five-year rolling average of the change in GVA share in a given year to 2020. These estimates were stress tested using two approaches. First, the GVA backcast time series was also produced for Australia, Canada, and Mexico, which have mineral data directly available in national accounts (Exhibit A4). A more sophisticated approach was used to stress test estimated NPV time series for China and the United States using the US Geological Survey's reported production and prices figures from 1996–2000. Using this data, we calculated annual increases in production and prices for each mineral type and produced NPV estimates over the 1996–2020 period. These results moved in line with the backcasting approach using GVA data.

Mexico: Adjustments to machinery and equipment to incorporate depreciation

Mexico's machinery and equipment stock as directly reported increased at a pace far exceeding that of other countries. As of 2020, for example, Mexico's directly reported machinery and equipment stock was 1.8 times GDP, while the range for all other countries was 0.2 to 0.5 times GDP. Based on expert interviews, we learned that Mexico's figures reflect an accumulation of investment in machinery and equipment that does not include depreciation. We therefore adjusted this data to incorporate depreciation, leveraging the perpetual inventory method.[195]

A depreciation rate assumption of 16 percent was used based on the average rate used by the EU KLEMS database for machinery and equipment. We adjusted stock levels in a given year by deducting the estimated depreciation amount of stock in the previous year and then adding the estimated increase in stock due to revaluation (asset price changes) and gross fixed capital formation in machinery and equipment, as reported by Mexico's national statistics office. Revaluation figures were estimated as Mexico's consumer price index plus an assumed excess asset price growth beyond that. The assumed excess asset price growth was based on the average excess revaluation observed in other countries each year.

The resulting figure, 0.6 times GDP, was in line with machinery and equipment figures in other countries. Mexico's figure was still high relative to those of other countries in our data; however, the country's gross fixed capital formation in machinery and equipment relative to GDP also has tended to be higher than other countries', and so we would expect a higher stock figure in the past several years.

[193] We used a cost of capital of 5 percent based on Aswath Damodaran, "Cost of capital by sector (US)," January 2021, stern.nyu.edu. We used an inflation rate of 2.24 percent based on the IMF *World Economic Outlook* database forecast average for Australia, China, Canada, and the United States. *World Economic Outlook*, IMF, October 2021.

[194] "Net profit margin of the top mining companies worldwide 2002 to 2020," Statista, statista.com.

[195] The perpetual inventory method accounts for depreciation using the following formula: Stock in $year_t$ = stock in $year_{t-1}$ + gross fixed capital $formation_t$ – $depreciation_t$ + $revaluations_t$.

Exhibit A4

Mineral and energy reserves reported in national accounts move in line with changes in the mining sector's share of gross value added.

Minerals in GDP multiples (actual vs based on GVA backcasting approach)

1. Time series backcast from 2020, based on changes in mining GVA as a percent of total GVA relative to 2020's mining GVA ratio.
Source: IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

United States: Splitting real estate totals into land, dwellings, buildings, and infrastructure

For the United States balance sheet data, we leveraged the Federal Reserve Board's Z.1 accounts.[196] They treat real estate as a nonfinancial asset, including land and structures (dwellings, buildings, and infrastructure).

To gain more detail, we first estimated the value of land based on guidance and inputs from several papers.[197] We separately estimate, and then combine, private land, government land, and farmland.

— Private land: The Federal Reserve reported real estate stock data as a total of private land and structures as well as structures excluding land. The value of private land was estimated as the difference between the real estate value and the value of private structures.

— Government land: Larson (2015) calculates the share of total land owned by governments. We applied this estimate to our private land value estimates to reach a value for government land.

— Farmland: The US Department of Agriculture provided an estimate of total farmland, which we adjusted to nominal prices by applying a GDP chain-type price index. [198]

Structures were then estimated as the difference between published real estate values and estimated land figures. To distribute total structures across dwellings, nonresidential buildings, and infrastructure, we used splits implied by the OECD's published figures for the United States by sector.

United States: Removal of consumer durables from household real assets

The household sector balance sheet in the Federal Reserve's Z.1 accounts included a line for consumer durables. Given that consumer durables are not included as an asset on national balance sheets under the System of National Accounts, we excluded this from our analysis.

United States: Adjustments to financial balance sheet

We sourced financial balance sheet data from the Z.1 accounts published by the US Federal Reserve Board.[199] We have not included other accounts payable or receivable (apart from trade payables and receivables) or household equity assets in noncorporate businesses. Including these values results in a mismatch of US net financial assets with the reported net international investment position as reported by the IMF and the Federal Reserve.[200] Counterparts of these categories of financial assets and liabilities are also not reflected in the "rest of the world" account published in the Z.1 accounts.

As an example, the US net international investment position in 2018 was reported to be roughly -0.45 times GDP, and the "rest of the world" position in US financial accounts was reported to be 0.45 times GDP. In that same year, net financial assets in the United States, including other receivables and payables and equity assets in noncorporate businesses, totaled 0.14 times GDP. When we removed these two groups, however, the total net financial position came to -0.49 times GDP—much closer to the published net international investment position.[201]

[196] "Financial accounts of the United States – Z.1," Federal Reserve Board, 2021, federalreserve.gov.
[197] See William Larson, *New estimates of value of land of the United States*, Bureau of Economic Analysis, US Department of Commerce, April 2015, bea.gov; and Joseph B. Nichols, Stephen D. Oliner, and Michael R. Mulhall, *Commercial and residential land prices across the United States*, Federal Reserve Board, February 2010, federalreserve.gov.
[198] "Farms and land in farms 2020 summary," US Department of Agriculture, February 2021.
[199] "Financial accounts of the United States – Z.1," Federal Reserve Board, 2021, federalreserve.gov.
[200] "Balance of payments and international investment positions statistics," IMF, 2021, imf.org.
[201] Since the June 2021 release of Federal Reserve Z.1 tables of financial accounts, the balance sheets and measures of net worth of nonfinancial corporate business and nonfinancial noncorporate business have been adjusted. Proprietors' equity in noncorporate business were not included in liabilities at the time data were downloaded in the spring of 2021.

Gross fixed capital formation distribution across sectors and assets
For most countries, gross fixed capital formation data was only reported by sector total and as an asset total, but not by the cross-section of the two. Japan and Mexico are the only countries that provide granular data across assets and sectors.

To reach the needed level of granularity for our analyses, we used the gross fixed capital formation totals by sector and country and allocated gross fixed capital formation across assets within each sector. We based this distribution on the share of stock increases by asset type after adjusting for depreciation within each sector and country. This approach allowed for the distribution of gross fixed capital formation to match the unique characteristics of real asset investment by sector; for example, households would be expected to primarily invest in dwellings, while corporations would be more likely to invest in machinery and equipment.

Depreciation calculation approach and distribution across sectors and assets
Most national accounts report depreciation in the form of consumption of fixed capital only at total economy and total sector levels; in China, it was available only at the total economy level. National accounts do not report depreciation amounts per asset type.

We allocated total depreciation figures across sectors and assets using a two-step approach. First, we used EU KLEMS depreciation rates per asset type to derive an initial estimate of depreciation for all countries at an asset line-item level.[202] Total depreciation by asset and by year was calculated as the EU KLEMS depreciation rate multiplied by the stock for a given asset type in the previous year.

We then adjusted these depreciation estimates to match officially reported consumption of fixed capital data at a sector level.[203] In most cases, reported figures were higher than our depreciation estimates. We multiplied depreciation estimates for each asset type per sector by the percent increase or decrease of the official consumption of fixed capital, compared to estimated depreciation (summed per sector).

Approach for 2020 data
Stock and flow figures for 2020 were directly reported for Canada, France, Mexico, Sweden, and the United States. However, some or all 2020 data were missing for the other five countries in this report as of August 9, 2021. We applied custom approaches to develop indicative 2020 estimates for the five countries where data were not fully available.

— **Australia.** Real asset stocks were directly available for the household sector. We estimated stocks for remaining sectors using the perpetual inventory method based on 2019 stocks, reported gross fixed capital formation in 2020, assumed depreciation (based on historical rates), and assumed price changes. We assumed price changes to match price changes for assets in the household sector, with the exception of land, IP products, minerals, and other minor items.

  We adjusted land prices for relative sector differences observed in 2019. IP products, machinery, and nonresidential buildings were assumed to move in line with Canada's relative price changes for each respective sector, given similar historical movement in prices in Canada and Australia. We estimated mineral reserve stocks in 2020 based on changes in the Reserve Bank of Australia's commodity price index between 2019 and 2020. Other minor items, including other natural resources and nonproduced intangibles, were assumed constant given their unsubstantial amounts and lack of proxies.

[202] EU KLEMS provides depreciation rates at the asset line-item level; however, rates for nonresidential buildings and other structures were merged under the same category (the same rate was of 3.2 percent was assumed to apply to both); Similarly, machinery and IP products were not reported at an equivalent level of granularity, and adjusted values were derived by considering weighted averages of EU KLEMS capital stocks data. *Industry level growth and productivity data with special focus on intangible assets*, Vienna Institute for International Economic Studies, 2019.
[203] All countries reported consumption of fixed capital at a sector level, except for China where it was available at a total economy level.

— **China.** We estimated produced asset stocks for 2020 using the perpetual inventory method based on 2019 stocks, reported gross fixed capital formation, assumed depreciation (based on historical rates), and assumed price changes. Gross fixed capital formation figures for 2020 were available at the total economy level and were split across assets based on the prior year, then split across sectors per asset based on the average split of the prior three years. Assumed price changes were based on gross output price indexes from IHS Markit for relevant asset types and then adjusted for their historical difference with asset price increases. The increase for infrastructure stock specifically was based on a 1990–2016 compound annual growth rate from Herd (2020).[204]

  We estimated land stocks for 2020 based on three inputs. Urban land owned by a government, which historically accounted for 10 percent of total land values in China, was extended in line with the home price index from CEIC. Rural land was extended using gross output from the agricultural sector, based on data from IHS Markit. Land use rights were extended in line with China's construction price index, calculated based on real and nominal construction gross output from IHS Markit.

  Financial stock data were available for financial-sector loan assets, household loan liabilities, and all sectors' currency and deposits. We used proxies for some items, such as bond assets, deposit liabilities, and nonfinancial corporate loan liabilities based on statements from the People's Bank of China. The remaining line items were estimated based on financial flows in the first half of 2020; financial flows were annualized to 2020, and price effects were assumed to be consistent with those observed in 2019 (an average of 0 percent and median of 1 percent).

— **Japan.** Nonfinancial stocks were estimated using the perpetual inventory method. Because gross fixed capital formation was available only at the total economy level in 2020, we split gross fixed capital formation across assets and sectors to match the average distribution of the prior three years. Financial stocks were readily available as part of sector balance sheets; due to a shift in accounting methodology, we applied the growth rate between 2019 and 2020 to previous data for 2019.

  At the time of writing, the World Bank had not published 2020 GDP figures for Japan. As an estimate, we took the nominal growth rate based on 2019 and 2020 GDP figures as reported by Japan's government and applied it to the 2019 figure from the World Bank, which did not match the government figure.

— **United Kingdom.** Stock data for 2020 were directly available except for household IP products, which we assumed grew in line with IP products in remaining sectors between 2019 and 2020, or 3.2 percent. Because gross fixed capital formation was available only at the total economy level, we assumed that sector-asset splits matched the average of the prior three years.

— **Germany.** Stock data for 2020 were available only at a total economy asset level and not split by sector. We split stocks across sectors based on the distribution by asset observed in 2019.

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

Methodologies of specific analyses

While most of the content of this report focused on straightforward comparisons and ratios such as various balance sheet items relative to GDP, in several cases more intricate analyses were performed. This section provides further details on the data, methodology, and rationale for these analyses.

Methodological sensitivity analyses (in chapter 1)

We developed multiple scenarios to test data sensitivity and challenge the outputs of our analysis. The scenarios aim to measure the impact of methodological changes, such as different revaluation approaches or an expanded definition of intangibles, on net worth. We used the following scenarios:

— **Depreciation of structures in line with the global mean**, wherein we tested the sensitivity of different depreciation rates used across countries. We applied to each country the average depreciation rate across countries by year for dwellings, nonresidential buildings, and infrastructure. This adjustment increases the net worth of Canada, China, Japan, Mexico, and the United Kingdom and decreases net worth of Australia, France, Germany, Sweden, and the United States by up to 4 percent.

— **Inclusion of consumer durables**, which are a significant portion of annual household spending and typically included in how individuals view their personal wealth and belongings. Figures for total consumer durables were based on a combination of directly available data and proxies. Australia, Canada, China, and the United States had data on stock of consumer durables in their national accounts, although not all years were available for every country, while Japan had data on consumer durable expenditure.[205] Data from France, Germany, and Sweden were based on estimates of relative consumer durables across European Union countries provided by the European Central Bank.[206] The average consumer durable stock relative to GDP for these countries was assumed to apply for countries without data available. Altogether, this increased countries' net worth by 3 to 7 percent.

— **Less conservative valuation of minerals and energy reserves**, which tests the potential increase in minerals stock if profitability of minerals companies and energy prices were higher. First, for minerals, we used US Geological Survey data to estimate current stocks aligned with the approach described in "China and the United States: Estimates for mineral and energy reserves," above, and applied the maximum profit margin seen among the top 40 mining companies over the past 20 years.[207] For energy, we used net present value estimates based on data from Rystad Energy Ucube for a scenario of $100 per barrel of oil (compared to $50 above). This increases the net worth of resource-rich countries including Australia, Canada, China, and the United States, with Canada's net worth increasing most significantly, by more than 20 percent.[208]

— **Larger scope of intangibles (IP products)**, including the value of brand, organizational capital, and training stock as reported by INTAN-Invest in addition to the value of IP products already reported in national accounts, which include computer software and

[205] China's figure represents the amount of automobiles included in household stock in data provided by CEIC, which was then divided by the assumed share of automobiles in total household durables. The assumed share was based on available data from the United States on expenditure of motor vehicles and expenditure on all durable goods. "Personal consumption expenditures: Durable goods," US Bureau of Economic Analysis and FRED, Federal Reserve Bank of St. Louis.

[206] France, Germany, and Sweden's data were derived from estimates from the European Central Bank. André Casalis and Georgi Krustev, "Consumption of durable goods in the euro area," *ECB Economic Bulletin*, Issue 5/2020, European Central Bank, 2020.

[207] "Net profit margin of the top mining companies worldwide 2002 to 2020," Statista, statista.com.

[208] This scenario was performed for minerals in all countries apart from France, Japan, and Mexico. France and Japan do not appear to have significant minerals sectors, while Mexico's minerals stock information was already high relative to output levels compared to Canada and Australia, which also had minerals data immediately available. The energy scenario was performed only for Canada, China, Mexico, and the United States, which have the most significant energy reserves. See "International," US Energy Information Administration, eia.gov.

databases, entertainment and artistic originals, and research and development.[209] For countries where data were not available, we applied the average GDP multiples of expanded intangibles stock. This scenario on average doubles the valuation of IP products compared to the base scenario, increasing net worth by 2 to 7 percent across countries.

— **No depreciation of intangibles (IP products)**, through which we assumed that investment in intangibles creates lasting returns to society even though economic returns to corporations are lost to competition over time. We added back the depreciated IP products stock from 2000–20 across countries, which increased net worth by up to 18 percent, with Japan at the high end.

There are several opportunities for additional methodological tests, which we have not included in our scope. These include pension entitlements for pay-as-you-go programs, such as Social Security in the United States. Unlisted equities are often undervalued, as discussed in section 1 of this appendix. Natural capital and human capital are also major exclusions that would dramatically alter net worth and balance sheet figures were they included—human capital, for example, is six to ten times GDP by some estimates.[210]

Long-term financial balance sheet (chapters 3 and 5)

The long-term view of the financial balance sheet shown in Exhibits 24 and 42 represents the weighted average by GDP of financial assets and liabilities for countries with data available in a given year. The United States was the only country with data directly available for the entire 50-year period, 1970–2020. To bolster our global weighted average, we supplemented directly available balance sheet data with additional financial stock data from the national statistics offices of the United Kingdom for 1986–96 and of Japan for 1970–94.

To account for differences in accounting in the United Kingdom and Japan before and after the mid-1990s, when our balance sheet data begin, we took the starting year of balance sheet data, 1996 in the United Kingdom and 1994 in Japan, and extended back in time based on the relative changes in the supplemental financial stock data in each year. In doing so, we reclassified the supplemented financial stock data to match our balance sheet data in groupings of line items, for example debt, equity, currency and deposits, pensions, and other assets or liabilities. We also reclassified data to align with sector groupings. We aggregated GDP multiples for the base balance sheet model and for these new data sources by country at a matching level of granularity so that we could directly compare sources.

Altogether, 1970–85 reflects a weighted average of Japan and the United States, after which the United Kingdom comes into the data. Australia's data begin in 1988, and all other countries other than China, Mexico, and Germany join the global picture starting in 1996. Data across all countries are available beginning in 2003.

[209] INTAN-Invest is a research collaboration dedicated to improving the measurement and analysis of intangible assets. INTAN-Invest included data on France, Germany, Sweden, the United Kingdom, and the United States. Carol Corrado et al., "Innovation and intangible investment in Europe, Japan, and the United States," *Oxford Review of Economic Policy*, Summer 2013, Volume 29, Number 2. We also included data from the 2015 Japan Industrial Productivity Database from the Research Institute of Economy, Trade, and Industry.

[210] Glenn-Marie Lange, Quentin Wodon, and Kevin Carey, *The changing wealth of nations 2018: Building a sustainable future*, World Bank, 2018, worldbank.org

Long-term net worth (chapter 3)
The long-term view of net worth relative to GDP shown in Exhibits 24 and 25 is based on data directly available from the OECD and national sources and on data from the World Inequality Database (WID).[211] Given that most countries' data were not available from national sources prior to the late 1990s, we backcast historical data based on national wealth statistics from WID.[212] National and WID data tended to present different levels of net worth but displayed very similar trends and patterns over time for years when overlapping data are available.

To develop the long-term views harmonizing both national sources and WID, we used data from national sources whenever available, then adjusted the starting year from the national source backward by the percent change in the WID data for all relevant years. Using the national source as an anchor and then adjusting by percent changes in WID data prevented a step change in the data from occurring, given that net worth totals in national sources and WID did not perfectly match. Ultimately, this allowed us to develop a 50-year picture of net worth relative to GDP for most countries.

Price changes as a share of net worth growth (chapter 3)
As discussed in chapter 1, net worth grows from growth in real assets or growth in net financial assets. Real assets, in turn, grow from new investment less depreciation and asset price increases.[213] Stock data, gross fixed capital formation (investment), and consumption of fixed capital (depreciation) figures are provided directly by the OECD and national sources. To get to a revaluation, or asset price increase, figure, we took the difference of stock changes for a given year relative to the previous year and subtracted net investment for that year.

We calculated asset price increases in line with inflation using the yearly growth rate of the consumer price index (for example, in year *t*) and applying it to the real asset stock of the previous year (year *t*–1) less depreciation (incurred in year *t*). Asset price increases in excess of inflation were calculated as the difference between total asset price increases less asset price increases in line with inflation. In some cases, total asset price increases were below general inflation, resulting in a negative asset price increase.

Relationship of long-term interest rates and growth of net worth relative to GDP (chapter 3)
To test the impact of a change in long-term interest rates on net-worth-to-GDP ratios from 2000–20, we developed simple linear regressions for all countries together and each country separately. To account for the long-term nature of real asset investment, we used five-year rolling averages of nominal long-term interest rates. For years in which data were not available for four years prior—for example, before 2012 in China, where long-term interest rate data became available starting in 2008—we used averages over a combination of leading and lagging years.

The results below represent the regression outputs with the adjusted five-year rolling average nominal long-term interest rate as the independent variable and net worth relative to GDP as the dependent variable (Exhibit A5). All countries apart from China, Japan, and the United States saw a statistically significant relationship, with p-values below 0.05, between nominal long-term interest rates and net worth relative to GDP. When data for all countries are combined, they similarly indicate a statistically significant relationship, with an R-squared value of 0.19 and coefficient of -0.24. In other words, nominal long-term interest rates explain 19 percent of the variation seen in net worth relative to GDP across countries, and a 1 percent increase in long-term interest rates is associated with a decline in the GDP multiple of net worth by 0.24.

[211] Exhibit 24 uses net worth data in lieu of real asset data prior to 2000, given the longer timeline of wealth statistics available. See World Inequality Database, wid.world.
[212] Data from national sources began in most countries in the late 1990s. In the United States, data were available from 1950, in Australia from 1988, in China from 2000, and in Mexico from 2003. WID's market value of national wealth statistics by country were available starting in earlier years for all countries except Mexico.
[213] As mentioned in Box 2 in chapter 1, national accounts have an additional flow account for real assets called "other changes in volume." However, in practice, the real asset flows in this account are small.

Exhibit A5

Regression results: Net worth relative to GDP vs 5-year rolling average nominal long-term interest rates

Country	Coefficient	P-value	F-statistic	R-squared
Australia	-0.28	0.00	28.72	0.61
Canada	-0.41	0.00	229.03	0.93
China	-0.36	0.73	0.13	0.01
France	-0.41	0.00	18.87	0.51
Germany	-0.20	0.00	118.79	0.87
Japan	0.01	0.87	0.03	0.00
Mexico	-0.31	0.00	19.76	0.57
Sweden	-0.43	0.00	346.06	0.95
United Kingdom	-0.12	0.02	6.89	0.28
United States	0.05	0.44	0.66	0.04
All countries	-0.24	0.00	45.07	0.19

Source: CEIC; Federal Reserve Board; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

Real estate analysis (chapter 3)

As explained in chapter 3, household real estate accounted for nearly half of net worth between 2000 and 2020 globally, based on the ten-country weighted average. Real estate growth can be decomposed from the lens of quantity and price, the latter of which can further be decomposed into either land and construction prices or rental income and rental yields.

Exhibit 32 in chapter 3 shows a decomposition of household real estate stock growth by quantity, construction price growth, and land price increase. In this analysis, we calculate quantity growth from 2000–20 as the sum of nominal net investment in household dwellings and buildings to mirror the nominal stock increase. The remainder of the increase in household dwellings and buildings stock is attributed to construction price increase, given that the price of these structures is often calculated as cost of construction. All increases in land stock are attributed to price, given that the quantity of land is assumed constant. We also separately developed a construction price index using gross output of construction in real and nominal terms based on data from IHS Markit to calculate the percent increase in construction prices over the past two decades.

Real estate prices are also a function of rental income and rental yields, wherein rental income divided by rental yields equals the market value of a home. In many cases, rental income is not actual rents paid by a tenant but rather imputed rents of owned homes.[214] Rental yields are a proxy for capitalization rates used by the real estate industry, with the difference being that capitalization rates reflect the net operating income of a property, while rental yields would include all rents but exclude operating expenses.[215] We used the OECD's nominal home price,

[214] For further details, see Dylan Rassier et al., *Improved measures of housing services for the U.S. economic accounts*, Bureau of Economic Analysis, May 2021, bea.gov.

[215] As discussed in chapter 3, capitalization rates are primarily a function of long-term interest rates but are also a function of expected rent growth, among other factors.

rent price, and price-to-rent indexes for all countries apart from China, for which CEIC data on rent and home prices informed the analysis.[216]

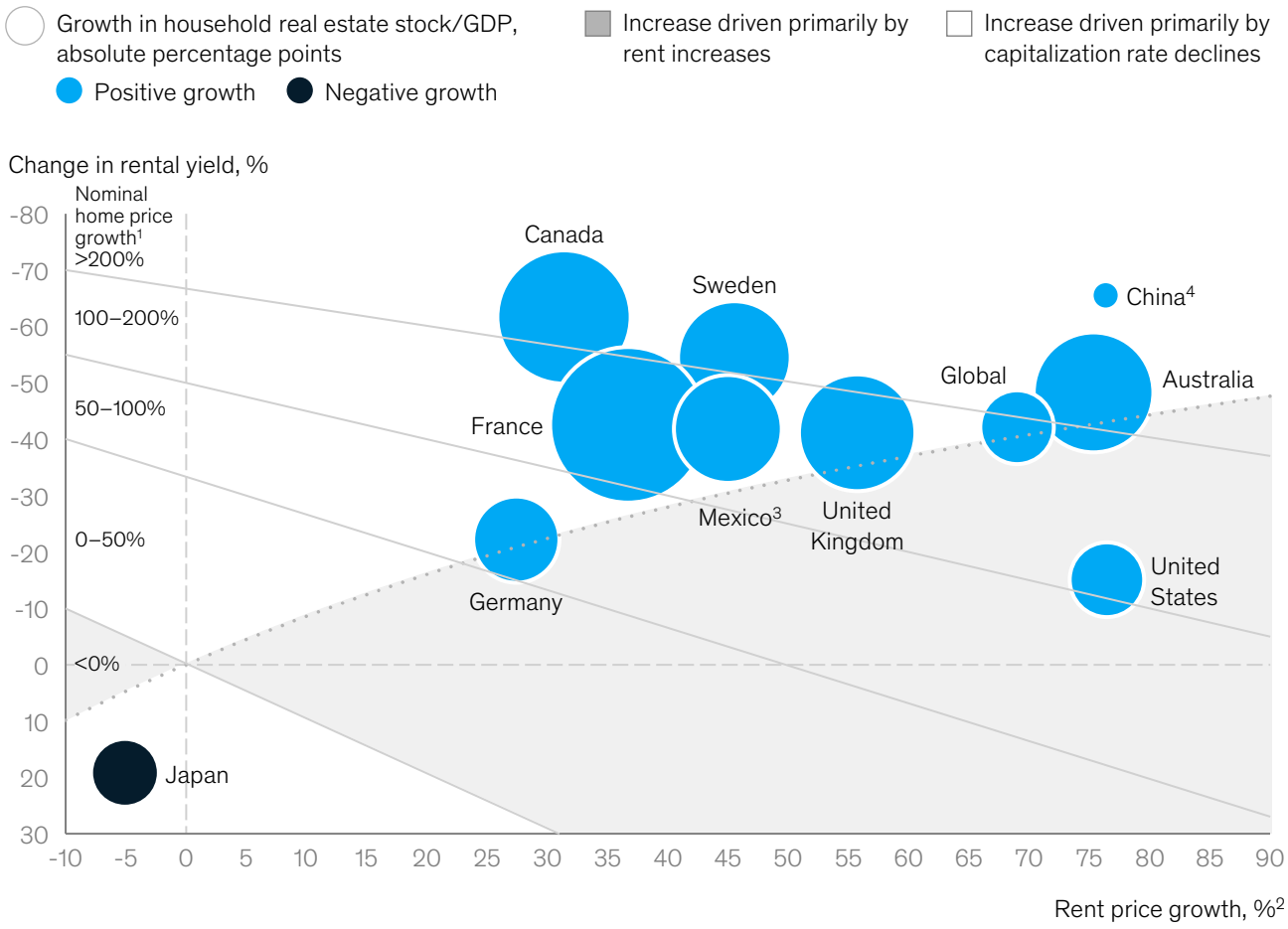
Exhibit 34 in chapter 3 shows the growth of nominal home prices, rent prices, and rental yields, along with the percentage point increase of household real estate relative to GDP. The precise relationship of these variables is presented graphically in Exhibit A6. Rent price growth, rental yield changes, and nominal home price growth are presented on the x axis, y axis, and through the isoquants, respectively.[217] The size of each country point represents the percentage point increase in household net worth relative to GDP. An increase in a given home price follows a path of possible rent price and rental yield pairs. Depending on the value of rent prices relative to rental yields, we can determine the primary driver of home prices. (In Exhibit A6, the shaded areas show the cases in which home prices are more driven by

[216] See "Housing prices," OECD, oecd.org; "China house prices growth," CEIC, ceicata.com. China's rent price index was available only for 2005–15, so for other years we assumed changes in line with general inflation plus an excess increase beyond inflation based on years with data available.
[217] Mathematically, the percent increase in home prices is equal to the percent increase in rent prices less the percent increase in rental yields, divided by the percent increase in rental yields plus one.

Exhibit A6

Rising home prices are a function of rent price growth and declining rental yields, with the latter shaping home prices in most countries.

Dynamics of real estate price and stock changes across countries, 2000–20[1]



1. Home prices are a function of rental income and rental yields, wherein the home prices are equal to rental income divided by rental yields. Specifically, the percent increase in nominal home prices is equal to the following formula: (% increase in rents – % increase in rental yields)/(1+ % increase in rental yields).
2. Rent prices include imputed rent of owner-occupied homes.
3. Mexico's data reflect 2005–20.
4. China's overall household real estate stock has grown only slightly faster than GDP, with a growth in GDP multiple of 6 percentage points from 2001 to 2020, even though nominal home prices have grown over 400 percent.

Source: CEIC; Federal Reserve Board; IHS Markit; national statistics offices; OECD; World Bank; McKinsey Global Institute analysis

rent prices, while unshaded areas show the cases in which home prices are more driven by rental yields.[218]) As explained in Chapter 3, all countries apart from the United States saw their nominal home price growth predominantly shaped by rental yield changes, and while China saw the greatest nominal home price growth, household real estate only grew slightly faster than GDP.

Net worth reversion scenarios (chapter 3)

In addition to the net worth methodological sensitivity analyses in chapter 1 (which adjusted methodological parameters such as depreciation), we also tested scenarios based on exogenous factors including the historical relationship of net worth with GDP, land prices, construction prices, and changes in rental yields. Each of these scenarios tests the potential net worth reversion across countries based on historical data. Further detail on each of these scenarios is as follows:

— **Net worth reversion to historical averages**, wherein we took data on average net worth relative to GDP for years available based on the long-term net worth analysis described in "Long-term net worth (chapter 3)," above, and compared it to the 2020 net worth relative to GDP figure for each country. We divided that difference in the base period average net worth to determine a percentage change. We did this with both the 1970–99 average, as the base (prior to the post-2000 divergence of net worth and GDP), and the long-term average (using all years available for a given country). We tested this scenario in an effort to evaluate the impact of changes to underlying economic conditions that have driven these increases, for example low interest rates and yields. This scenario reduces national net worth by a maximum of 50 percent, with Canada, China, and France at the high end given their significant growth in net worth relative to GDP over the past two decades. By contrast, the United States, given relative consistency in levels of net worth relative to GDP, sees minimal change in this scenario.

— **Land price reversion to historical averages**, which isolates the effects of land price escalation, a key contributor to increases in net worth since 2000 across countries. We took average land values for the years 2000 to 2002 (and for Mexico, just 2003), and compared them to the 2020 land stock for each country, then reduced net worth by the difference between the two. This scenario reduces national net worth by a maximum of 25 percent, with France, where much of net worth growth was driven by increases in land values, at the maximum end.

— **Construction prices move in line with GDP inflation since 2000**, through which we aim to understand the effects of construction price escalation above (or below) GDP inflation in overall net worth. For this analysis, we deflated the 2020 stock of structures including dwellings, buildings, and infrastructure by the 2000–20 increase in construction prices calculated from real and nominal construction gross output data from IHS Markit divided by the 2000–20 increase in GDP inflation. This scenario had the greatest effect in Mexico, with potential net worth reversion of 33 percent.

— **Constant rental yields since 2000**, through which we aim to understand the effects of declining rental yields in overall net worth. As described in "Real estate analysis (chapter 3)," above, home prices are a function of rental income and rental yields. As part of the real estate analysis in chapter 3, we tested how much of real estate stock growth could be attributed to a decline in rental yields alone. For this scenario, we reduced net worth by that amount because that portion of the increase could be uniquely attributed to rental yields declining. This scenario saw the greatest impact in Canada, with a potential net worth reversion of 17 percent.

[218] Mathematically, the contribution of rent price increases to home price increase is equal to the percent increase in rent prices divided by the percent increase in home prices. The contribution of rental yields follows the equation: [(-1 * % increase in rental yields)/(1+ % increase in rental yields)]/% increase in home prices.

Economic returns metrics overview (chapter 4)
Chapter 4 presents several metrics representing capital productivity and economic returns. These include the following:

— **Capital productivity**, or GDP divided by produced assets, or produced assets plus land, as specified.[219]

— **Gross yields**, or gross operating surplus adjusted for imputed compensation of self-employed business owners and divided by produced assets, or produced assets plus land, as specified.[220]

— **Operating returns**, or net operating surplus divided by produced assets, or produced assets plus land, as specified.[221]

In each of these cases, the denominator of the ratio remains the same but the numerator narrows in scope. Gross operating surplus generally reflects the share of GDP from corporate profits, though net operating surplus is closer to actual income of corporations given that depreciation is excluded.

Variations of economic returns (Chapter 4)
In Exhibit 40 of Chapter 4, we present several variations of metrics on economic returns, including adjustments for real estate, expected returns by asset mix, and expected returns by industry mix.

The real estate adjustment shows gross yields if real estate gross operating surplus is removed from the numerator and real estate stock is removed from the denominator of the ratio. Gross operating surplus of the real estate sector is dominated by imputed rents of owned homes rather than actual profits earned by corporations, while a significant share of produced assets is composed of household dwellings and buildings.[222] Removing both these components from the data offers a closer approximation of returns to the business economy.

The expected returns by asset mix are calculated as the expected return for each asset type, for example, a piece of machinery or infrastructure, multiplied by the stock of each asset type (summed together), and divided by the produced asset stock. The expected returns for each asset type were based on a variety of sources, including real estate and infrastructure data providers CoStar, Green Street Advisors, CBRE, Savills, Preqin, and Capright, as well as OECD, and Meier and Tarhan (2007).[223]

The expected returns based on industry mix are calculated as the expected return for each industry, multiplied by the share of capital stock from that industry. The expected return for each industry was calculated directly as the gross operating surplus by industry based on the total from AMECO and shares based on IHS Markit divided by the capital stock per industry from the OECD's Structural Analysis Database.[224]

[219] In the calculations of returns, produced assets are calculated as the average between a given year and the previous year, given end-of-year reporting.
[220] Gross operating surplus typically includes mixed income, which refers to both profits and compensation for self-employed business owners. To reach a gross operating surplus figure that includes only profits, the compensation of self-employed business owners must be removed. AMECO provides gross operating surplus data with this adjustment for the focus countries other than China. For China, we used gross operating surplus (including mixed income) from the OECD. "Gross domestic product (income approach), labor costs" and "Operating surplus, total economy," AMECO Online, European Commission, 2021.
[221] Net operating surplus is based on adjusted gross operating surplus (as used in the gross yields calculation) less consumption of fixed capital (depreciation) as reported by the OECD and national sources.
[222] We used the share of real estate in total gross operating surplus from IHS Markit and the total adjusted gross operating surplus for each country from AMECO.
[223] Iwan Meier and Vefa Tarhan, *Corporate investment decision practices and the hurdle rate premium puzzle*, SSRN, January 2007.
[224] "Structural analysis database," OECD, oecd.org.

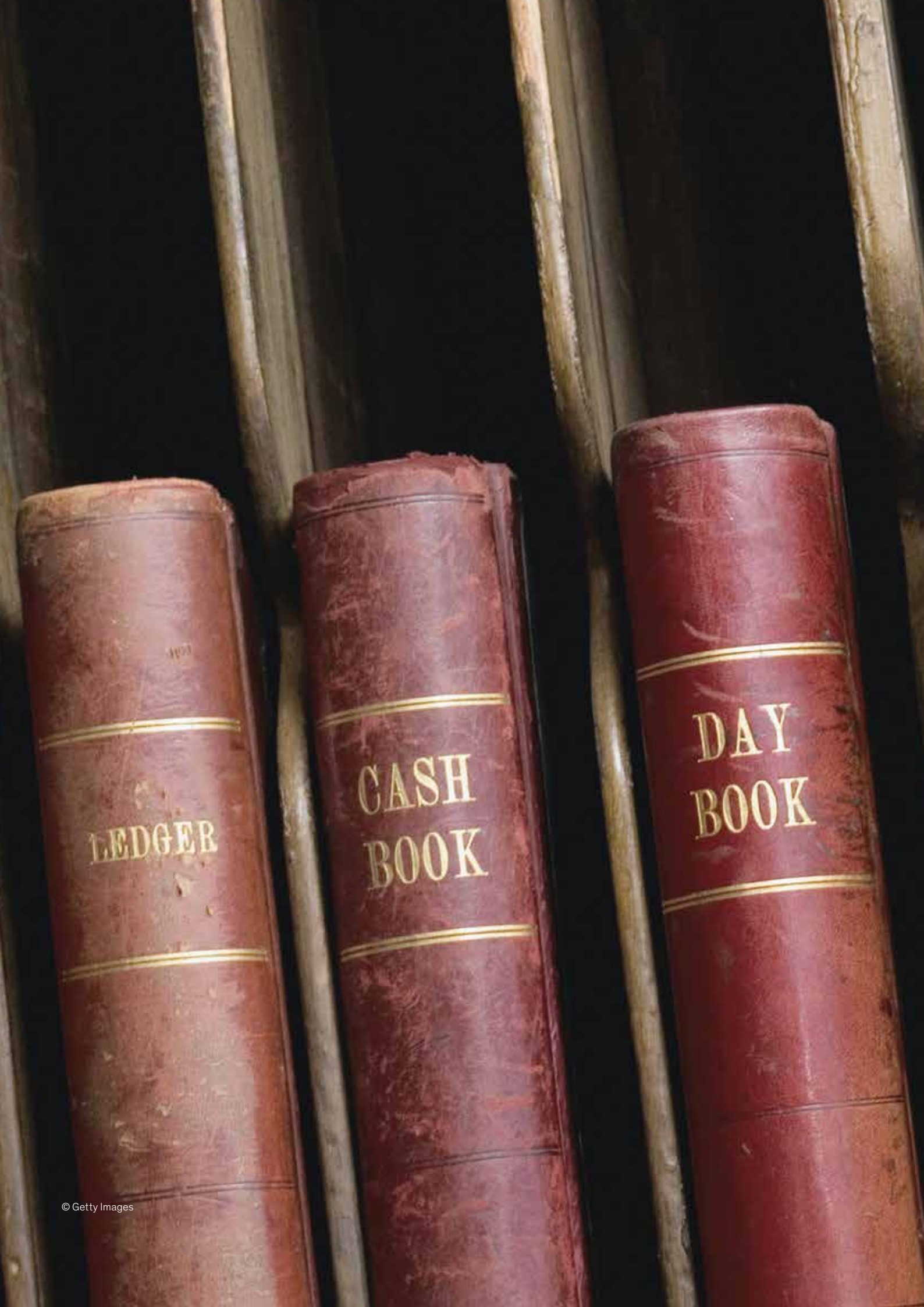
Debt sustainability via nominal GDP growth and interest rates (chapter 5)

In Exhibits 48 and 49 in chapter 5, we refer to the concept of debt sustainability being greater when nominal GDP growth rates are higher than interest rates. This is expressed by the following equation:

$$\frac{Debt_t}{GDP_t} = \left(\left(\frac{1 + interest\ rate_t}{1 + growth\ rate_t}\right) * \frac{Debt_{t-1}}{GDP_{t-1}}\right) - primary\ balance_t$$

In plain English, to reduce the debt ratio, the growth rate has to be higher than the interest rate or the primary balance (noninterest fiscal balance) has to be sufficiently positive. [225]

[225] A closely related equation appears in chapter 1 of *Debt and (not much) deleveraging*, McKinsey Global Institute, February 2015.



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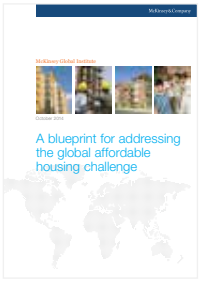

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