The post-COVID world comes into focus
In many ways, COVID changed the world we live in. Some changes proved fleeting, while others endured and in turn transformed the investing landscape.

I’m pleased to introduce the latest publication from our Strategic Investment Advisory Group, *The post-COVID world comes into focus*. It surveys the post-pandemic landscape to identify which shocks have faded, which are fading, and which are likely to persist. As investors, the more we can clearly perceive the long-term changes that COVID has wrought, the more effectively we can allocate capital for the future.

Our most seasoned CIOs, portfolio managers and strategists spanning every asset class delve into the more permanent impacts of COVID, from a reshaped global labor force to resurgent fiscal stimulus and industrial policy as well as reinvented city centers and supply chains. These changes will require significant adaptation – by individuals, firms, and policymakers.

In a post-COVID world, our experts believe, the economic playing field has shifted and now favors investments that are aligned with these fundamental changes to monetary and fiscal policy, infrastructure investment, the energy transition, real estate demand, critical technologies, and innovations in health care. The team’s latest work guides us through what investors need to know at this time of important transition, uncovering clear, actionable investment opportunities across public and private capital markets.

As always, we hope you will find our insights valuable.

George Gatch  
CEO  
J.P. Morgan Asset Management
## Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Executive summary</td>
</tr>
<tr>
<td>4</td>
<td>Key takeaways</td>
</tr>
</tbody>
</table>
| 6    | Chapter 1  
Birth, death, migration and participation |
| 14   | Chapter 2  
Deglobalization and trade fragmentation |
| 20   | Chapter 3  
The cure for inflation is slower growth |
| 25   | Chapter 4  
The visible hand: Fiscal policy is back |
| 30   | Chapter 5  
Multiplier effects: The beneficiaries of government intervention |
| 38   | Chapter 6  
The urban commuter economy |
| 44   | Chapter 7  
Work and home life after the pandemic |
| 52   | Chapter 8  
Positioning, pricing and policy: Durable changes in equity markets |
Executive summary

The picture is still a little blurry, but we can begin to see the shape and texture of a post-COVID world. Some deep changes will endure.

Author

**Jared Gross**
Head of Institutional Portfolio Strategy
With a bit of time and distance, the dramatic events of the past few years can be seen with a clarity that was lacking while society suffered through the chaos of the COVID pandemic: widespread illness, of course, but also remote work and school, supply chain disruptions, surging inflation and rapid policy responses. From today’s vantage point, we can try to assess which of these shocks have faded, which are fading and which are likely to persist. As a starting point, it’s helpful to consider where the world stood beforehand.

The decade prior to COVID saw a slow recovery from the global financial crisis of 2008–09. Monetary policy accommodation combining low (or negative) policy rates and quantitative easing became the norm across the developed world. A globalized economy with extended supply chains offered multinational firms low labor costs and high profitability. Migration provided a pressure release to developed economies operating at high employment, preventing an acceleration of wages. Failure to reach inflation targets led central bankers to assume that the neutral rate and noninflationary level of unemployment had drifted lower, allowing complacency to creep into monetary policy. Persistently low real interest rates elevated valuations for financial assets of all types and leverage across many categories of balance sheets – governments’ and central banks’ in particular.

In retrospect, the degree to which this benign equilibrium was fragile, and at risk from an exogenous shock, seems obvious. But as 2020 dawned and news stories began creeping out regarding a strange new respiratory infection in Wuhan, China, few could sense the emerging catastrophe. COVID struck home in the first quarter of 2020, when the accelerating spread of coronavirus cases around the world culminated in a rapid and virtually complete curtailment of nonessential in-person activity.

Over the next two years, the pandemic proceeded in fits and starts as new variants emerged and regional restrictions were imposed, lifted and reimposed. By 2022, the disease itself had been brought down to a manageable level by aggressive public health measures, but by then the global economy was facing the dual headwinds of the Russian invasion of Ukraine and the rapid return of restrictive monetary policy. What transpired between 2020 and 2022 was a sharp reversal of the benign environment that preceded it: Trade and migration faltered, government spending surged, inflation spiked, monetary policy tightened, interest rates rose, and asset values fell. While it may be premature to declare the COVID era “fully complete,” it is a good time to take stock of its impact and consider what has changed.

As we sift through the data to separate the permanent impacts of COVID from those that have proven ephemeral, we are struck both by the magnitude of the crisis and by the impressive resilience of the global economy. But a return to normalcy is not an “all clear.” Even faded shocks have often left behind gaps that will be filled slowly over time, if at all. More permanent impacts will require significant adaptation – by individuals, firms and policymakers.

As investors, these distinctions are critical. The more we can clearly perceive the long-term changes that COVID has wrought, the more effectively we can allocate capital for the future. Our analysis, which incorporates the research of strategists and portfolio managers across J.P. Morgan Asset Management, reflects a diversity of views that is appropriate for a subject of such breadth.
The post-COVID world comes into focus

Governments have rediscovered the appeal of aggressive fiscal policy, and monetary authorities are responding by facilitating debt issuance and managing the inflationary impacts as best they can.

Developed economies have been facing a seemingly intractable problem of aging populations, declining labor force participation and insufficient immigration. COVID may have led to a potential solution: the power of workplace technology to match labor and capital at a distance.

Manufacturing supply chains are adapting to a less globalized, multipolar world. Other countries and regions are beginning to prudently diversify away from China, reducing its historically dominant position in the global trade system.

Most of the inflationary impulses seen in this cycle will eventually respond to traditional monetary policy; others are seemingly “one-off” and unlikely to be repeated. But bringing inflation back to target with higher real rates will require below-trend growth and prove painful to leveraged balance sheets.

The “central bank put” may have been replaced with a “fiscal policy put.” Governments have rediscovered the appeal of aggressive fiscal policy, and monetary authorities are responding by facilitating debt issuance and managing the inflationary impacts as best they can.

Key takeaways
Industrial policy has returned on a massive scale, diverting substantial resources into favored sectors of the economy. The economic playing field for firms has changed and now favors targeted policy priorities across infrastructure, energy transition, technology and health care.

Dense urban central business districts – and particularly those that are dependent on mass transit – must evolve or face a permanent decline. COVID revealed a host of inefficiencies around the commuter economy that will have a lasting influence on the nature of work.

Physical assets, and real estate in particular, are not easily substituted or repurposed. The structural oversupply of office space and the undersupply of residential housing and industrial property cannot directly offset each other.

Firms operating in the post-COVID world will see the benefits of positioning, pricing and policy: We see potential gains for firms in sectors with higher post-pandemic growth prospects, firms that successfully maintained pricing power over peers, and firms that are getting a direct push from policymakers.
Chapter one

Birth, death, migration and participation

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The human toll of COVID is hard to fathom. The World Health Organization estimates that to date worldwide there have been more than 750 million cases and nearly 7 million deaths. In the United States alone, there have been more than 100 million cases and more than 1 million deaths.

In this section, we consider the role that COVID played in reshaping the global labor force, not only through the deadly impact of the disease on the existing population but also through its effects on birth rates, labor force participation, migration and productivity.

Broadly, the impact of COVID has been negative for the developed world’s supply of labor, which – all else equal – will diminish productivity and growth over time while increasing inflationary pressures from rising wages. Older workers in particular appear to have exited the labor force on a more permanent basis, which leaves a gap that must be filled. In this regard, we see some positive signs from a nascent recovery in migration and the role that new technology is playing in facilitating remote work.

As Exhibit 1 shows, labor force participation peaked at approximately 67% around 2000 and then began a long-term decline before stabilizing at roughly 63% prior to the pandemic. After plummeting in the pandemic’s early phase, the labor force staged a quick, yet partial, recovery and has been slowly moving toward its pre-COVID baseline since. Given the relatively high demand for labor in the developed world, restoring the labor supply to its previous baseline would be a positive step. The key questions are: Where did the missing workers go, and what can be done to get them back?

COVID was extremely negative for the supply of labor, but a significant recovery has taken place

EXHIBIT 1: U.S. LABOR FORCE PARTICIPATION RATE

COVID mortality and the workforce

Perhaps surprisingly, the direct impact of COVID mortality on the labor force was modest, largely because of low death rates associated with individuals of working age (generally 16 to 64 years old). Deaths were highly concentrated among the oldest age groups, few of whom were working. As Exhibit 2 shows, death rates for those 65 and older were anywhere from 65x to 360x higher than those for young adults (18–29 years). Among the working age population, the death rate was low, although the data suggest that globally the pandemic is responsible for around 2 million excess deaths in the labor force.

However modest its effects on the levels of mortality across the labor force, COVID exerted a second, and more significant, influence through the phenomenon of “Long COVID.” Although only partially understood, this extended form of the disease has affected large numbers of workers, some seemingly permanently. The latest Household Pulse Survey, conducted by the U.S. Census Bureau, suggests 16.2 million people in the U.S. are experiencing symptoms and 4.3 million of those have significant activity limitations as a result. There is encouraging data that Long COVID is declining, but it created a gap in the labor force that remains unfilled.

COVID’s impact has varied significantly by age cohort

EXHIBIT 2: AGE GROUP RATE RATIOS COMPARED WITH AGES 18–29 YEARS*

<table>
<thead>
<tr>
<th>Rate compared with 18–29 years old*</th>
<th>0–4</th>
<th>5–17</th>
<th>18–29</th>
<th>30–39</th>
<th>40–49</th>
<th>50–64</th>
<th>65–74</th>
<th>75–84</th>
<th>85+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases**</td>
<td>0.5x</td>
<td>0.7x</td>
<td>Reference group</td>
<td>1x</td>
<td>0.9</td>
<td>0.8x</td>
<td>0.6x</td>
<td>0.7x</td>
<td>0.8x</td>
</tr>
<tr>
<td>Hospitalization***</td>
<td>0.7x</td>
<td>0.2x</td>
<td>Reference group</td>
<td>1.5x</td>
<td>1.8x</td>
<td>3.1x</td>
<td>5.0x</td>
<td>9.1x</td>
<td>15x</td>
</tr>
<tr>
<td>Death†</td>
<td>0.3x</td>
<td>0.1x</td>
<td>Reference group</td>
<td>3.5x</td>
<td>10x</td>
<td>25x</td>
<td>65x</td>
<td>140x</td>
<td>360x</td>
</tr>
</tbody>
</table>

Source: National Center for Immunization and Respiratory Diseases (NCIRD), Division of Viral Diseases. All rates are relative to the 18 to 29 years age group. This group was selected as the reference group because it has accounted for the largest cumulative number of COVID cases compared with other age groups. Sample interpretation: Compared with 18 to 29 years, the rate of death is 3.5 times higher in ages 30 to 39 years and 360 times higher in those who are 85 and older. (In the table, a rate of 1x indicates no difference compared with the 18 to 29 years age group.)
Declining birth rate: Short-term effects may have lasting consequences

History tells us that fertility tends to decline during public health crises and economic shocks. For example, the Spanish flu (1918–20) caused fertility rates to plunge, reaching a low point six to nine months after the pandemic’s peak morbidity and mortality. The evidence so far suggests that COVID caused a significant but temporary change in birth rates as well.

The data for many developed economies reveals a long-term pre-pandemic decline in births that was exacerbated by COVID. Exhibit 3A shows clearly that birth rates bottomed approximately nine months after the pandemic began, and while a subsequent rebound was visible, it appears to have faded. The pattern is similar in other developed countries, including Asian countries that were already experiencing even more severe declines in birth rates before COVID (Exhibit 3B). China suffered an outright population decline (Exhibit 4), and some estimates suggest that as many as 3 million more babies would have been born in the country were it not for COVID.

The temporary downshift in the birth rate during the pandemic, while unwelcome, will have only a modest longer-term impact on the labor supply. The relatively brief duration of the shortfall suggests that when these cohorts reach working age there will likely be minimal year-to-year variation rather than an entire age cohort missing.

Many economies saw a baby bust at the beginning of the pandemic, adding to the long-term birth decline

Exhibit 3A: Adjusted Monthly Births (% of 2015–19 Avg)

Source: Bank of America Global Research, Human Fertility Database.

Exhibit 3B: Adjusted Monthly New Births (% of 2015–19 Avg)

Source: Bank of America Global Research, Human Fertility Database.

China’s population contracted in 2022

Exhibit 4: China Annual New Births and Deaths (Millions)

Source: Bank of America Global Research, Human Fertility Database.
Migration: Borders have reopened, but long-term issues demand a policy response

COVID’s modest impact on the long-term labor supply should not be taken as a sign that entrenched labor supply problems have been solved. Given that low birth rates are the norm across much of the developed world, even a small shortfall can have negative consequences. A population that cannot naturally maintain itself will require a new supply of workers to make up the difference, or the resulting shrinkage in the labor pool will harm long-term growth potential. Unfortunately, the most readily available mechanism to augment the labor force – immigration – has not kept pace.

Let’s step back and consider the historical context. Before the pandemic, net migration in the United States had declined from its 1990s highs but was stable; migration into the European Union (EU) was recovering from a slump that followed the EU sovereign debt crisis (Exhibit 5). The arrival of COVID led to a sharp drop in global migration as travel restrictions took hold, and in some countries exacerbated preexisting political hostility to immigration overall. According to the International Organization for Migration (IOM), the number of international migrants globally fell by an estimated 2 million in 2020.

The U.S. Census Bureau estimates that net international migration to the U.S. recovered to pre-COVID levels in 2022, though the gap in workers created by the severe drop-off during the pandemic has not been made up (Exhibit 6). Lifting travel restrictions helps, but hurdles remain. Notably, the high cost of travel makes the prospect of relocating (and occasionally returning home) less appealing.

Low public support for immigration in the U.S. (and the UK) leads to political pressure for maintaining or raising barriers, potentially directing migration toward nations, such as Canada and Australia, that are more broadly supportive. Given that low birth rates are endemic across almost all developed nations, such differences in immigration policies can have a meaningful marginal impact on relative trend growth assumptions.

Before the pandemic, migration in the U.S. had declined from ’90s highs but stabilized; migration into the EU was recovering from a slump

EXHIBIT 5: NET MIGRATION, U.S. AND EU


EXHIBIT 6: NET INTERNATIONAL MIGRATION (THOUSANDS)

Source: U.S. Census Bureau internal simulation of 2010–2020 estimates and vintage 2022 estimates (2021–22); data shown for 2022 are projections.

Consider the UK as a cautionary example. Acute labor shortages have damaged many sectors, especially health care, yet the government is extremely reluctant to soften border controls or immigration policy. (Given the degree to which the average Briton holds the National Health Service dear, the hostility to immigration may seem hard to justify.) The impact, however, is very real: The UK is forecast to have the slowest-growing economy in the G20 in 2023, according to the International Monetary Fund (IMF).
Accessing the global labor pool is critically important

While the developed world faces a decline in its labor force over the remainder of this century, many developing nations are seeing meaningful population growth. The trouble is that the population is not growing where many of the world’s productive assets are located. Simply put, matching labor and capital has become increasingly challenging.

While net migration can benefit an economy in the aggregate, it is not without consequences. In a paper last year, we noted that while a migration dividend can help some older economies where growth is stagnating, it can hurt economies with large, young populations through a “brain drain.” Losing skilled prime-age workers creates a vicious cycle: By disrupting human capital accumulation, out-migration reduces productivity and growth, encouraging further migratory outflows.

But in place of actual migration, there may be hope for “virtual migration.” The pandemic was a massive, real-time trial of remote working. And if working from home is possible, why not work from anywhere? Workforce technologies, their effectiveness proven during the pandemic, may offer a middle way to address the Gordian knot of an aging local workforce, labor shortage and limited migration. Furthermore, virtual migration may address labor shortages in the developed world while simultaneously reducing the risk of brain drain in emerging nations – a clear win-win for the post-pandemic global economy.

Declining labor force participation: Early retirees may be gone for good

As we have noted, labor participation fell markedly over the course of the pandemic and has yet to recover to its pre-pandemic level. We previously acknowledged the role of Long COVID in reducing the labor supply, but other factors weigh on this as well, including accelerated early retirement. Early retirements rose significantly during the pandemic, and while some of these individuals have subsequently returned to the workforce, most have not and probably won’t in the future. The propensity to return to work following retirement drops off sharply with time, especially among the oldest cohort of workers (age 55-plus), so a further reversal may be limited (Exhibit 7).

Even as the short-term distortions of the pandemic on labor participation rates ease, the continued aging of the population points to further declines in the longer-run participation trend (Exhibit 8). As the population becomes older, fewer workers support the economy. In a later chapter, we examine the aggressive public policy responses that supported developed economies during the temporary collapse in the labor supply, but such measures are not sustainable over the long run.

It has been observed that “productivity is what happens when we run out of workers.” The pandemic may have given us a foretaste of the perils of a very weak participation rate, and in doing so has highlighted the importance of improving both migration policy and labor productivity to solve the longer-run challenge of a declining labor force.

The pandemic saw a jump in early retirements, and many are not likely to return to the workforce

EXHIBIT 7: LABOR FORCE PARTICIPATION RATE (%)

EXHIBIT 8: IMPACT OF AGING ON LABOR FORCE PARTICIPATION (%)


Technology and remote work: A potentially lasting boost to the labor supply and productivity

We have yet to see remote work’s full effect on productivity, but the evidence suggests that it will be positive. New technologies developed in the pandemic are now available to remedy regional labor shortages quickly and efficiently. Over the longer horizon, they may open up new sources of labor by incentivizing discouraged workers to rejoin the workforce and by facilitating cross-border matching of labor and capital.

Certainly, many jobs require a skilled worker to show up at a particular place and time. But the pandemic expanded our understanding of how many viable use-cases may exist for remote work. As Exhibit 9 shows, many service industries are naturally better adapted to teleworking and other workforce innovations from the pandemic. We would also note the potential for workplace technology to increase productivity by cutting down on costly and time-consuming commuting and reducing the need for office space. In later chapters, we will consider the disruption that this entails for commuter transport, urban downtowns and commercial office space.

Implications

The impact of the pandemic on the four key factors affecting workforce size – births, deaths, net migration and participation – points toward a modest drag on long-run growth and the potential for higher wage inflation due to labor scarcity. Even in the positive case where inflation declines back toward target, we expect a greater degree of inflation volatility going forward.

The broader aging and population dynamics in the developed world are not going away, and offsetting factors from migration and workplace productivity may be inadequate on their own. The pandemic has offered some valuable lessons about the nature of work and the ability to access the labor supply via technology. The firms, industries and countries that integrate this flexibility most effectively will emerge with a powerful advantage over those that do not.

Service industries have the most to gain from teleworking and other workforce innovations from the pandemic

EXHIBIT 9: PERCENTAGE OF EMPLOYED ADULTS WHO SAY, THAT FOR THE MOST PART, THE RESPONSIBILITIES OF THEIR JOB CAN BE DONE FROM HOME. BY INDUSTRY

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking, finance, accounting, real estate</td>
<td>84%</td>
</tr>
<tr>
<td>Information and technology</td>
<td>84%</td>
</tr>
<tr>
<td>Education</td>
<td>59%</td>
</tr>
<tr>
<td>Professional, scientific, technical services</td>
<td>59%</td>
</tr>
<tr>
<td>Government, public administration, military</td>
<td>46%</td>
</tr>
<tr>
<td>Health care and social assistance</td>
<td>33%</td>
</tr>
<tr>
<td>Hospitality, service, arts, entertainment, recreation</td>
<td>23%</td>
</tr>
<tr>
<td>Manufacturing, mining, construction, agriculture, forestry, fishing, hunting</td>
<td>22%</td>
</tr>
<tr>
<td>Retail, trade, transportation</td>
<td>16%</td>
</tr>
</tbody>
</table>

Chapter two

Deglobalization and trade fragmentation

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Head of Global Market Insights Strategy

David Lebovitz
Global Market Strategist
Global Market Insights Strategy
What has been the lasting impact of the pandemic on the level of globalization? It’s not a simple question. The extended time frames over which globalization trends emerge, and the facets of globalization itself, make it difficult to perceive the changes in real time.

Many questions await answers. Will China retain its dominant position in the trade of durable and nondurable consumer goods after fully reopening, or will supply chains be permanently rewired? Is the dramatic reversal in supply chain pressure indicative of a return to normal flows among global regions, or does it herald a more permanent decline in global trade? Will U.S. subsidies bring semiconductor and battery production back onshore? And how will companies use technology related to automation and artificial intelligence (AI) to manage the balance between more resilient supply chains on one hand and higher labor costs on the other?

Measuring globalization

Broad trends in globalization have tended to persist over very long time periods. But countries’ willingness to play cooperatively in the international sandbox does seem to have a cyclical element. Using historical trade openness (exports and imports as a percentage of GDP) as a proxy for globalization, we can observe this pattern of rise and fall: From the conclusion of World War II through the global financial crisis, openness rose. Since then, the pace of globalization has slowed, but we do not yet see much of a retreat (Exhibit 1).

For decades, the broad trend in global trade has been a shift in manufacturing from developed economies in the U.S. and Europe to Asia. Zooming in a bit on the cross-regional data shows this trend in more detail. Exhibit 2 breaks out the flow of goods among North America, Europe and Asia as measured by shipping container traffic (twenty-foot equivalent units or TEUs). Even before COVID, an increase in both tariffs and nontariff barriers to trade served as a counterbalance to further growth of global trade. Since the pandemic, broad regional trade flows have remained largely static, with little evidence of a decline in the overall quantity of trade among regions. But there is more to the story.

**The post-2008 period may have witnessed the peak in globalization**

**EXHIBIT 1: TRADE OPENNESS 1870–2020 (SUM OF EXPORTS AND IMPORTS BY % OF GDP)**
Many governments in the developed world would like to see a pivot away from global supply chains and the return of manufacturing from Asia to Europe and North America. Advocates of such a pivot cite both domestic job creation and the specific risk of China as a security threat, but achieving this outcome is far from guaranteed. Individual firms will resist shifting to higher cost domestic manufacturing locations without economic incentives.

The pandemic has given companies two powerful incentives to shift their manufacturing:

- The widespread failure of extended global supply chains, coupled with a “just-in-time” model of production, led to delays in production across many industries. This served as a powerful warning to firms that they need to rationalize and diversify their operations.
- Government subsidies and tax incentives for domestic manufacturing have already led to some onshoring of production in the U.S. and the EU. The impact of these policies will be discussed later in the paper.

The recovery of global supply chains seems nearly complete (Exhibit 3), yet the trend toward a diversified mix of trade partners appears to be continuing. Firms, driven by their own self-interest or given a push by tariffs, seem willing to reorient and diversify supply chains within and across regions by embracing the concepts of “near-shoring” and “friend-shoring.”

**The composition of trade has shifted**

**EXHIBIT 2: CONTAINER VOLUME BY LANE (SHARE OF TOTAL TEUS)**

<table>
<thead>
<tr>
<th></th>
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<tr>
<td>2016</td>
<td>16%</td>
<td>9%</td>
<td>16%</td>
<td>14%</td>
<td>13%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
<td>11%</td>
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<tr>
<td>2017</td>
<td>14%</td>
<td>8%</td>
<td>14%</td>
<td>13%</td>
<td>13%</td>
<td>9%</td>
<td>8%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>2018</td>
<td>11%</td>
<td>6%</td>
<td>13%</td>
<td>8%</td>
<td>8%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
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<tr>
<td>2019</td>
<td>12%</td>
<td>5%</td>
<td>13%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
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<td>2020</td>
<td>11%</td>
<td>4%</td>
<td>13%</td>
<td>5%</td>
<td>5%</td>
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<td>4%</td>
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<tr>
<td>2021</td>
<td>9%</td>
<td>4%</td>
<td>13%</td>
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<tr>
<td>2022</td>
<td>10%</td>
<td>5%</td>
<td>13%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
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<tr>
<td>2023</td>
<td>11%</td>
<td>5%</td>
<td>13%</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>


The recovery of global supply chains seems nearly complete (Exhibit 3), yet the trend toward a diversified mix of trade partners appears to be continuing. Firms, driven by their own self-interest or given a push by tariffs, seem willing to reorient and diversify supply chains within and across regions by embracing the concepts of “near-shoring” and “friend-shoring.”

**Global supply chains have normalized**

**EXHIBIT 3: GLOBAL SUPPLY CHAIN PRESSURE INDEX**

China is particularly vulnerable to these trends, given its historically dominant position, while clear beneficiaries are likely to include Vietnam and Mexico (Exhibit 4), along with Eastern Europe. In each case, they offer an advantage, relative to China, of geographic proximity and/or lower labor costs.

Data on foreign direct investment (FDI) and portfolio flows also suggest that the dominance of China in the global trade system is declining. Our previous paper “The Lifeboat Economy” dealt with this issue in greater detail, highlighting two issues that could further the forces of deglobalization. First is the decline in bilateral U.S.-China foreign direct investment from peak levels. Second is a more gradual shift in global foreign direct investment from China to the U.S.

To the extent that this shift is being driven by a more assertive U.S. trade policy that has extended across two administrations of different political parties, we see little reason to think it will fade. In fact, other Western nations are now following the U.S. lead in pursuing activist trade policies that aim to limit future investments in China (and today Russia as well).
The post-COVID world comes into focus

China is catching up and getting caught at the same time

While some of the shift away from investing in China reflects rising trade barriers and the pandemic, it is also likely due to a more fundamental reason: an increase in the number of potential trade partners. When China entered the World Trade Organization (WTO) in 2001, it quickly became the manufacturing destination of choice because it combined low production costs with a motivated government that was eager to build out a manufacturing economy. But over time, China’s resounding success in developing into a technologically sophisticated, middle-income economy has come at the price of reduced competitiveness. As Exhibit 5 shows, less costly skilled labor can be found in both Asia and Latin America – along with friendly governments. As these other options have become available, supply chains have been shifting, reducing China’s market share of value chain-related products.

Compared with China, there are now cheaper labor options in both Asia and Latin America

EXHIBIT 5: ANNUAL NOMINAL AVERAGE INCOME BY COUNTRY (USD)

Source: FactSet, International Labour Organization (ILO), J.P. Morgan Asset Management; data as of May 1, 2023. *Latest data available for India is as of 2018. Annual nominal wages are calculated using monthly average income for each country as reported by the ILO. Income is converted to U.S. dollars using latest exchange rates.
Services trade and U.S.-China battles over intellectual property

Any comprehensive discussion of deglobalization needs to consider the trade in services, which has been a near mirror image of the trade in manufactured goods. The U.S.-China balance of trade in services has strongly favored the U.S. from the late 1990s through the pandemic, reflecting growing exports of intellectual property, travel, transport and telecom. Interestingly, U.S.-China trade in services has ebbed and flowed with greater magnitude than the trade in goods. At the onset of the pandemic, the trade balance for services dropped to a post-global financial crisis (GFC) low, and it remained low during the extended period of China’s zero-COVID policy.

It seems likely that U.S. exports will improve as China fully reopens, but there are risks over the longer term. The theft of intellectual property is a key element of geopolitical tensions between the U.S. and China, and the U.S. could easily curtail exports of these services for political reasons if tensions remain elevated. China’s ongoing reluctance to relinquish control of domestic data and information technology (IT) serves as a further barrier to open trade in services.

Implications

In recent decades, globalization has been positive for growth and negative for inflation. Hence, its reversal – even if modest – would trend the other way. But the reality is more complex, as global growth and inflation numbers tell us little about how different locales experience globalization. For the time being, however, the direction is clear: All else equal, China will likely suffer from reduced exports, while emerging Asia, Latin America and Eastern Europe should see gains.

Shifting production brings real-world costs, of course, that will be borne by individual firms around the world. Some of these costs will be subsidized by governments, some will be passed along to consumers, and some will result in lower margins. In the final chapter, we highlight the critical importance of identifying firms that will benefit from new trade dynamics, capture the value of subsidies and have the ability to pass through costs to their customers.
Chapter three

The cure for inflation is slower growth

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The common expectation that inflation will be structurally higher in a post-COVID economy is effectively an admission that the economy’s self-correcting mechanisms are damaged and that the time-tested methods by which central bankers have influenced the real economy are no longer effective. We are not so sure. Certainly, the excesses of the COVID era have set a difficult course over the next few years for both the economy and policymakers, but we think a return to low inflation is more likely than not. Many of the inflationary impulses seen in this cycle will eventually respond to traditional monetary policy; others are seemingly “one-off” and unlikely to be repeated.

Supply-side inflation is fading

First, we consider the economic fixes to structurally higher inflation. The demographic problem of a shrinking working age population in the developed world has been discussed at length earlier in the paper, as has the obvious solution – increasing migration. The challenge is that the workers are located in the developing world, and politics have led to restrictions on the immigration of skilled and unskilled workers to regions where there is high demand for both types of labor. But businesses have been made acutely aware of the impact that high wages have on profit margins, and the arguments for expanded migration are emerging.

Should these arguments fall on deaf ears, the obvious alternative to bringing labor to capital is bringing capital to labor. If immigration policies are not loosened, then companies will continue moving production to lower cost locations in the developing world. As noted earlier, such investments are increasingly targeting countries and regions that are geographically convenient (i.e., near-shoring). Along with lower costs for producers, such investments and the jobs they bring may also reduce the size of migrant populations originating in these same regions.

This broad rewiring of the supply chain is often cited as a likely cause of future inflation, but we think the case may be overstated, at least on a forward-looking basis. Many of the costs associated with supply failures and expensive short-term workarounds have been priced in during the three years of the pandemic. Put simply, items like critical infrastructure, communication technology, defense, pharmaceuticals, energy and food have already experienced a price increase that is the inevitable consequence of moving from the cheapest producer to a more secure supply chain. Those price increases certainly don’t need to happen again, and over time companies may find opportunities to reduce supply chain costs while preserving critical resiliency.

In contrast, for the vast majority of consumer and industrial goods there is no national security or public policy focus pushing to move production back on shore. But there remains a persistent profit-maximizing incentive to produce at the lowest cost, perhaps while also diversifying production and building a more resilient supply chain. This will result in real shifts in manufacturing but not necessarily to higher cost locations. As noted in an earlier chapter, non-China Asia, Latin America and Eastern Europe offer low cost and geographic convenience in varying measure.
Policy responses lead to recession and disinflation

Even if demographics and deglobalization together put some upward pressure on consumer prices in the years to come, economic forces do not act in a vacuum; rather, they must contend with the response from policymakers and central bankers. We know that the Federal Reserve (Fed), European Central Bank (ECB) and other central banks are focused on reining in current inflation and restoring a measure of lost credibility. It seems unlikely that they would suddenly choose to accept a higher long-term inflation target rather than endure a period of short-term subpar growth.

We should not have been surprised that inflation rose sharply after years of negative real rates and quantitative easing, followed by a massive surge in fiscal spending. Nor should we be surprised when inflation peaks and then falls as these policies are rapidly reversed (Exhibit 2). Higher interest rates and a declining money supply have proven their effectiveness in the past and will likely do so again.

The Fed is currently pursuing a double-barreled policy of monetary tightening: raising short-term interest rates to slow the economy and using quantitative tightening (QT) to reduce the money supply. Real rates are now positive across the curve, and QT had removed approximately 16% of the money supply prior to the recent banking crisis. Fiscal policy remains broadly supportive but nowhere near the “surge” levels associated with the pandemic response. As a result, we believe the Fed’s long-term inflation target of 2% is reachable over time.

Potential growth was slow before the pandemic, but it is probably even slower now

EXHIBIT 1: DECLINING POTENTIAL GROWTH RATES IN THE U.S.

The current inflationary episode appears normal by historical standards

EXHIBIT 2: HISTORICAL INFLATION PEAKS (INDEXED TO 100 AT CPI PEAK)

Potential growth and a potential recession

Against a backdrop of elevated inflationary pressures, the task facing central banks will be more challenging, but not impossible. The question therefore is not whether central banks can return the economy to pre-pandemic target inflation rates but, rather, how much economic pain is necessary to get there. The Fed understands that it lost precious credibility in letting inflation flare up, and it is now implicitly allowing for a recession as part of the solution. The Fed seems biased to overtighten or at least is willing to keep rates elevated for an extended period rather than pivoting quickly at the first sign of soft data. The eventual outcome should be a decline in inflation back toward the 2% target – accompanied by a period of negative real growth.

While there could be a temptation to raise the inflation target and shorten the period of economic contraction, the benefit would be limited. A 3% inflation target vs. a 2% inflation target might require a smaller economic contraction, but it would not change the medium- to long-term amount of economic restraint necessary to keep the rate of inflation stable. Growth must be restrained at potential in either case.

Potential growth is effectively the speed limit on sustainable growth at full employment that is neither inflationary nor deflationary. Potential growth was slow before the pandemic (Exhibit 1), but it is probably even slower now if the secular forces of demographics and deglobalization are real. The current level of growth is too high relative to potential; to reduce inflation pressures, growth must be reduced (Exhibit 2). While central banks rarely describe policy in these terms, this is effectively what they are seeking to achieve.

Are high real rates sustainable, or survivable?

It follows that if potential growth must be slower, then the neutral policy rate (r-star) may need to be higher post-pandemic to ensure that economies do not exceed their (now slower) growth speed limit. Debates around the level of neutral policy rates in a post-pandemic economy may seem academic, but they can have a significant real-world impact on bond markets and asset prices broadly. Policy rates may be a creation of central bankers, but they greatly influence the supply and demand for capital and the productive capacity of capital previously deployed. Central bankers may see a justifiable need for higher neutral rates … and the real economy may feel some pain as a result.
Most productive assets in the global economy, whether real or financial, have some kind of capital structure, which in practice means that debt financing is used to purchase the asset or enhance its returns. During the extended period of low nominal and real interest rates that prevailed up to and into the pandemic, a lot of debt was added at very low interest rates to assets with any sort of income stream or expectation of price appreciation.

Now, post-COVID, the cost of refinancing that debt has gone up while the potential income generation and price appreciation have gone down. It follows that the next step is likely to be a drop in price. But downward price adjustments often leave asset owners with little or no equity, facing the unpleasant decision of recapitalizing the asset or defaulting on the debt. The principle is the same whether it’s a margin call on a stock portfolio, refinancing an office building or a deposit run on a bank.

If there is sufficient capital available, the process of recapitalization stands a chance of succeeding. Often, equity holders may be diluted or even wiped out, but the senior debt remains largely unharmed. Voluntary debt restructuring may play out in the event of a more serious loss in asset value without causing broader damage. Outright defaults and foreclosures would be more concerning, of course: Given that they are deflationary, the central bank might initially tolerate them as being consistent with a restrictive monetary policy stance, but if they metastasized through the economy, central banks would be forced to lower rates before too much damage was done.

This is the crux of the matter. Central banks have responded appropriately to the surge in inflation by raising short-term interest rates and restricting the money supply. But the capital structure of the modern, debt-financed economy will face significant challenges as a result, and it’s not yet clear if a sharply higher neutral policy rate is sustainable for long. In the best case, the outcome may be a slow write-down of capital that was invested too aggressively. In the worst case, a decade of low cost debt may come to ruin if the write-down accelerates and insufficient capital is available to recapitalize leveraged assets.

**Implications**

The move higher in interest rates that occurred in 2022 has restored yield and defensive diversification to bonds, and it has significance for asset allocation broadly and for portfolio construction in fixed income. As a result, investors should be repositioning fixed income allocations to reflect this important function.

For U.S. investors who have been tilting defensively toward cash, the time to return to more traditional bond allocations may be at hand. For European (and Japanese) investors who had been looking offshore to escape negative yields, the opportunity to return capital to local bond markets is appealing. Over the secular horizon, we expect policy rates to decline, providing positive returns to duration and leading us to favor moving out the yield curve to longer maturities.

We also see long-term value in high quality corporates and securitized products, where “safe spread” offers fair compensation for credit risk and all-in yields have risen dramatically. These sectors also happen to reward disciplined active management, where fundamental research helps to protect portfolios from concentrations of credit risk. Riskier credit sectors like high yield or loans should be approached cautiously but opportunistically.
Chapter four

The visible hand: Fiscal policy is back

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The role of government changed profoundly during the COVID era. Simply put, governments got a taste for spending – spending on infrastructure, on the energy transition, on health care and life sciences. These changes will prove enduring, we believe, with effects across the global economy and important implications for investors.

This new posture is a far cry from the one that held sway during the economic doldrums that followed the global financial crisis, when central bankers pointed an accusing finger in the direction of fiscal authorities who either lacked the political will to embrace deficit spending or were actually pursuing fiscal austerity in the face of subpar growth. But the sleeping giant of fiscal spending was awoken with a shock as the scale of the economic calamity that followed the outbreak of COVID became clear.

Concerns about debt were quickly replaced by a pressing need to support economies in the face of a global economic shutdown. Governments around the world, regardless of where they sat on the political spectrum, acted decisively – though somewhat differently (Exhibit 1). The U.S. government focused on supporting individuals, providing stimulus checks, rent and student loan relief, and some direct employer subsidies to maintain payrolls. Despite a surge in unemployment, U.S. households maintained a high level of consumption and even increased savings during the pandemic.

European policymakers mounted a fiscal response of similar magnitude through providing direct support to employers in order to keep people in their jobs. The two approaches proved equally successful: Personal consumption held steady, and many businesses remained in a state of suspended animation, ready for the recovery in demand that occurred once lockdowns were lifted.

**Financing support during COVID: Budget deficits and bond purchases**

While fiscal policy reemerged as the first line of economic defense, monetary policymakers did not recede into the background. Far from it. They directly financed the surge in deficits (Exhibit 2), ensuring that governments could get cash quickly without raising interest rates. It’s no coincidence that central bank purchases almost exactly mirrored government issuance.

Central bankers also maintained, and augmented, pre-COVID monetary policies that anchored short-term interest rates near zero and lowered long-term interest rates via quantitative easing. This further emboldened governments that were surprised by their ability to issue record high levels of debt at record low levels of interest rates.

**Peak COVID-crisis deficits were offset by central bank purchases**

<table>
<thead>
<tr>
<th>Country</th>
<th>2020 budget deficit</th>
<th>2020 central bank government bond purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>16%</td>
<td>18%</td>
</tr>
<tr>
<td>UK</td>
<td>13%</td>
<td>16%</td>
</tr>
<tr>
<td>Japan</td>
<td>12%</td>
<td>14%</td>
</tr>
<tr>
<td>Eurozone</td>
<td>10%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Source: BEA, BoE, BoJ, Bloomberg, Cabinet Office (Japan), ECB, Eurostat, Federal Reserve, ONS, Refinitiv Datastream, J.P. Morgan Asset Management; data as of April 27, 2023.

**Government around the world, regardless of where they sat on the political spectrum, acted decisively**

<table>
<thead>
<tr>
<th>Exhibit 1: Average government deficit in 2020 by economic stance (% GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right-leaning</td>
</tr>
<tr>
<td>-8.22</td>
</tr>
</tbody>
</table>

Source: Global Party Survey (GPS), OECD, J.P. Morgan Asset Management. Governments in 15 developed markets are classified as left- or right-leaning using the Harvard GPS economic left-right scale. Coalitions are defined using their largest party; data as of April 27, 2023.
The question now: Was this a one-off “break-the-glass” fiscal intervention, or are we looking at a lasting change in fiscal behavior? In our view, we are looking at an enduring shift in government mindset and a profoundly different role for fiscal policy. Investors should not underestimate how this contrasts with the last cycle, when governments, particularly in Europe, turned to extreme austerity. That austerity in turn played a significant role in the weak growth and inflation that characterized the post-GFC decade.

Consider first how the term “build back better” or its variants have become pervasive in political discourse across developed economies. While governments have scaled back direct pandemic stimulus measures as COVID has receded and economies have reopened, broader public investment is ramping up (Exhibit 3). Its ambitions are vast: to upgrade physical infrastructure, reduce carbon emissions and improve food and energy security, among other goals. We will explore these below.

Public sector spending is set to rise in many developed markets. In Europe especially, that will deliver a marked change from the decade of austerity in which public sector employees – who in Europe account for large proportions of the overall workforce – suffered significant cuts in their real wages. With widespread strikes now looming across Europe, governments are under pressure to compensate public sector workers, not only for the recent increase in the cost of living but also for the real pay cuts of the last decade (Exhibit 4).

Whatever the near-term outcome, European governments will not be able to depress public sector pay like they did during the last decade. In a tight private sector labor market, their changed approach will be important in lifting not only public but also private sector pay.
History shows quite clearly that fiscal policy has an impact on growth and subsequent inflation and interest rates. Exhibits 5A, 5B and 5C contrast the post-GFC decade (2010–19) with the preceding period (2003–07). Across all regions, the first decade of the 2000s saw greater fiscal expansion, higher nominal GDP growth rates and higher interest rates when compared with the post-GFC period.

The logical conclusion is that the post-COVID economic environment will more closely resemble the one that prevailed before the GFC. We should expect higher levels of government investment, higher nominal growth rates and higher central bank policy rates.

Revealed preferences: Government spending and inflation

COVID has essentially put two economic theories to the test with, in our view, fairly conclusive results. The first theory held that Western economies were destined to experience Japan-style low inflation. Federal Reserve Chair Ben Bernanke forcefully rejected that idea 20 years ago when he stated that “under a paper money system, a determined government can always generate higher spending and hence positive inflation.” COVID proved Bernanke right. Facing the devastating impact of the pandemic, governments were determined to act. Once they did, it wasn’t long before inflation numbers started to rise.

The second idea, which economists have long debated, considers whether higher government spending “crowds out” or “crowds in” private spending. The crowd-out camp has argued that government largess results in higher interest rates that in turn crimp private sector demand. This narrative has been embraced over the years by so-called bond vigilantes, who demand higher rates from governments with unsustainable deficits. But we see limited real-world evidence that deficits and prevailing interest rates are highly correlated. Certainly, of the two theories, the crowd-in argument better describes the experience of the last two decades.
In sum, the COVID era has reminded us that high levels of government spending can indeed be inflationary, while also providing real-world evidence that such spending need not crowd out the private sector. This may reflect a recognition that the financial burden of debt-financed spending is offset to some extent by inflation. But we should observe with caution the resulting need for higher interest rates and the impact that these rates will have on the broader economy over a longer horizon. As central banks have hiked rates in response to inflation, real yields have swung from negative to neutral to positive, and debt service costs have risen in tandem. If and when inflation recedes in the future, a more costly debt burden may remain.

Nonetheless, we can reasonably assume that governments that got a taste for spending in the pandemic have seen little reason to reconsider this preference. If the monetary authorities are successful in bringing inflation under control without excessively high real rates or a severe recession, the lesson will be further reinforced. For the foreseeable future, then, the idea of “growing out of the debt” will be more politically persuasive than “paying it back.”

**Implications**

The return of fiscal authorities has profound implications for investors. First, we may have transitioned away from the era of the “central bank put,” in which the monetary authorities – acting largely alone – adjust policy aggressively in response to economic and market volatility. Following the GFC, the Fed knew it was the only game in town. Fiscal stimulus was unlikely, so accommodative monetary policy could be deployed without much risk of inflation.

Today, in contrast, we may have evolved to a “fiscal put” model, with active fiscal policy leading a crisis response and the central bank acting to support these efforts – but now forced to consider limiting its intervention to avoid excessive stimulus. On balance, the combined backstop of fiscal and monetary authorities should shift the balance of risks, reducing downside or deflationary tail risks and increasing upside risks to inflation and interest rates.
Chapter five

Multiplier effects: The beneficiaries of government intervention

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Fiscal policy has shifted from a short-term pandemic response to a longer-term public investment model that can be broadly described as an assertive form of industrial policy. Investors need to understand the tailwinds that government intervention in real capital allocation can provide to certain sectors and asset classes. Markets alone will no longer determine winners and losers as the playing field is tilted to produce desired outcomes.

During the COVID era, the U.S. passed two of the most significant pieces of public infrastructure legislation in the nation’s history. Their ambition: to address the country’s infrastructure needs while transitioning to a low carbon economy. The Infrastructure Investment and Jobs Act (IIJA), enacted in 2021, authorizes approximately USD 1.2 trillion in spending – including USD 550 billion toward new investments and programs. As a result, projected federal infrastructure spending as a share of GDP will rise over the next three years to levels close to or above the New Deal.

The second piece of legislation, the Inflation Reduction Act (IRA), was signed into law in 2022, not long after the passage of the IIJA. The IRA allocates over USD 350 billion in federal funding and tax credits that aim to significantly reduce carbon emissions by the end of the decade. The combined effect will help push the U.S. much closer to reaching long-term goals for greenhouse gas (GHG) emissions (Exhibit 1). Among the key elements:

- Long-term incentives for renewable energy (extension of tax credits for renewable energy production and storage for a decade), which will facilitate the construction and operation of wind turbines and solar arrays
- Expansion of carbon capture and sequestration tax credit programs by lowering the annual amount of carbon a facility must capture to qualify, while extending the eligibility timeline from 2026 to 2033
- Creation of a new, USD 5.8 billion program under the Office of Clean Energy Demonstrations (OCED), targeting emissions from energy-intensive industries such as iron, steel, concrete, glass, pulp, paper, ceramics and chemicals

As we consider all the elements of the IRA, we note that it will not be enough to simply spend money on current technology. Reaching long-term carbon reduction goals will require effective and scalable new technologies that can be implemented globally.

**Government policies are critical in achieving climate transition objectives**

**EXHIBIT 1: U.S. GREENHOUSE GAS EMISSIONS (NET MILLION METRIC TONS OF CO₂-e)**

![Graph showing U.S. greenhouse gas emissions](image)

Source: Rhodium Group; data as of August 12, 2022.

Together, the Infrastructure Investment and Jobs Act and the Inflation Reduction Act signal a vigorous return to industrial policy on a massive scale. Many provisions in these laws are designed to crowd in private investments over time and not simply spend public funds on government programs. The stated direct cost of the IRA may be only a fraction of the total, as the various tax credits and other incentives will scale up alongside private investment. Some estimates suggest that the USD 350 billion in government subsidies could reach USD 1.2 trillion, with the multiplier effect generating an even greater amount of private investment – potentially up to an additional USD 3 trillion in private investment over the next 10 years.²

To demonstrate how that multiplier effect might play out, we can point to specific provisions in the IRA that aim to accelerate the shift from combustion engines to electric vehicles (EVs), and to ensure that a significant portion of the manufacturing is done locally. The law offers tax incentives for electric vehicles assembled in North America, requires that a significant amount of EV battery components be manufactured or assembled in North America and removes the manufacturer cap on the number of EVs that qualify for the tax incentive (previously 200,000 per manufacturer).³ These measures have already led to a surge in announced North American battery plant capacity, which is projected to increase 10x by 2030 from 2022 capacity levels (Exhibit 2).³

Battery plant capacity in North America is projected to increase 10x by 2030

Exhibit 2: Announced Battery Capacity (Net Capacity, GWh per Year)

Source: Argonne National Laboratory, November 2022.

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³ To qualify, the percentage of EV battery components manufactured or assembled in North America must be at least 50% in 2023 and will increase 10% per year up to 100% in 2028.

⁴ Argonne National Laboratory, November 2022.
And this is just one aspect of one new law in one country. According to the International Energy Agency (IEA), new climate policies globally should help propel global annual clean energy investment to more than USD 2 trillion by 2030 (Exhibit 3A), a rise of more than 50% from current levels. As vast as that seems, it may not fully complete the task: Under the IEA’s net-zero scenario, as much as USD 4 trillion in new investment will be needed. It will be essential for private sector investments to fill the gap.

Investors have reasons to be optimistic. The growth in net-zero climate pledges from corporations creates a vast customer base for innovative solutions and new technology that can demonstrate effectiveness and scalability (Exhibits 3B and 3C). Venture capital is aggressively funding startups in the space, and as these startups mature, growth equity investors will take over to help them achieve commercial viability.

**Government spending creates a multiyear opportunity for private sector clean energy investments**

**Global clean energy investment is expected to rise by another 50% to more than USD 2 trillion annually, largely as a result of the IRA**

**There was a 3.1x increase in corporate net-zero pledges between 2021 and 2020**

**A USD 4.2 trillion clean energy investment is needed by 2030 in IEA net-zero scenario**

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Putting broader infrastructure needs in perspective

Although the recent legislation emphasizes projects that will support the transition to a low carbon economy, there remains a vast amount of critically necessary investment in legacy infrastructure categories (Exhibit 4). To put this in perspective: Merely to keep pace with projected GDP growth will require an estimated USD 3.6 trillion in annual investment – an amount that is likely beyond the capacity of the government to deliver.

Private capital will need to play a significant role to meet infrastructure spending

EXHIBIT 4: AVERAGE ANNUAL INFRASTRUCTURE NEED (USD TRILLIONS, CONSTANT 2017 DOLLARS)

Source: McKinsey Global Institute, J.P. Morgan Asset Management; data based on availability, as of November 30, 2022.
Government intervention in health care and life sciences

In the earliest stages of the pandemic, government intervention focused on supporting the health care sector in addressing the surge in coronavirus patients. The government devoted vast resources to ramping up the production and distribution of masks, sanitizers, respirators, hospital beds and other medical supplies needed to treat the infected and protect the caregivers. While suppliers may have benefited temporarily, these efforts and the demand they created have largely disappeared as infections have fallen to manageable levels.

More significant over the long term will be the dramatic evolution of the drug development and approval process (Exhibit 5A). A McKinsey analysis of all new drugs and vaccines developed since 2000 shows that the average development timeline – from the start of clinical testing (phase one) to approval – is nearly 10 years. Yet COVID-19 vaccines – developed in part with federal funding – won approval in 11 months as a result of either emergency-use authorization (EUA) or other forms of expedited approval in Europe, the UK or the U.S. (Exhibit 5B).

Although the specific facts of the COVID pandemic will never be repeated, new drug design and development already incorporate lessons learned. They are enabling faster innovation, speedier time-to-market, lower costs and, ultimately, more profitable ventures.

In particular, usage of the “breakthrough therapy designation” increased notably post-COVID. In 2015, only 22% of FDA drug approvals used the designation, a rate that nearly doubled to 39% from 2020–22. The approval process is demanding but remarkably fast: These drugs often received approval within six months of filing. A modernized FDA, coupled with broad-based improvements in drug design and development, should provide a conducive environment for further innovation.

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COVID also spurred the federal government to increase spending on health care research and development. Over the past 50 years, health care as a percentage of total government research and development spending grew from less than 5% to 38% as of 2022, an amount nearly as large as all defense research and development spending (Exhibit 6A). In total, National Institutes of Health (NIH) research funding grew 131% from 2008 to reach USD 292 billion in 2022 (Exhibit 6B).

Among the new initiatives launched since COVID:

- The Advanced Research Projects Agency for Health (ARPA-H) is a new, health care-focused innovation agency modeled on DARPA (the Defense Advanced Research Projects Agency). ARPA-H has received funding of USD 6.5 billion to be invested in potential breakthrough drug therapies over three years.

- Other government initiatives, including Cancer Moonshot and the Biomedical Advanced Research and Development Authority (BARDA), have received increased funding and support from the government.

**Government health care R&D spending has grown to an amount nearly as large as all defense R&D spending**

**EXHIBIT 6A: TRENDS IN R&D BY AGENCY (FY 2022 CONSTANT DOLLARS, MILLIONS)**

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**EXHIBIT 6B: NIH FUNDING FOR VARIOUS RESEARCH, CONDITIONS AND DISEASES (USD MILLIONS)**

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9 Research America’s “U.S. Investments in Medical and Health Research and Development”. January 2022.


11 National Cancer Institute
Collectively, the increased government spending on health care R&D should facilitate more innovative therapies, helping to alleviate disease and further benefit society. Private enterprise, in the form of the private and public life science sector, will be the primary pathway through which these innovations will reach the public.

Not all subsectors of the industry may fare equally well, however. In this context, it is interesting to observe the performance of public biotech companies during the COVID period (Exhibit 7). Following strong outperformance during the early stage of the pandemic, the sector experienced an extended decline that erased those gains, with limited recovery since.

Benefits of increased research funding and a streamlined drug approval process may well accrue more fully to early-stage private life science firms. Their research costs could be subsidized while they gain better and earlier visibility into their approval prospects. More value is likely to be captured by early-stage venture and growth equity investors, as private life science firms are able to reach more scalable business models before exiting through an IPO or M&A transaction.

**Implications**

The fiscal impulse that emerged during the early stages of the COVID era began with broad-based efforts to mitigate the pandemic and support consumer demand. The breadth of these efforts and their brief duration made them difficult to use as a foundation for targeted investing. Many individual firms that were relative winners early in the pandemic have become relative losers as the world returns to a more normal equilibrium. In the equity market analysis that concludes this paper, we identify a series of themes and individual companies that should offer more long-lived post-COVID success.

Recently, government intervention has centered on a more focused set of objectives that have been enshrined in spending and incentive programs that will extend years into the future. On this basis, investors can target economic sectors where the playing field is tilted in their favor. In the post-COVID world, these sectors – infrastructure, climate technology and life sciences – offer a visibly favorable mix of direct government support, constructive regulatory regimes and a robust level of future demand. Within each sector will be winners and losers. Investors with the capacity to use both active public market strategies and targeted private investments will capture the best outcomes.
Chapter six

The urban commuter economy

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Global Fixed Income, Currency, & Commodities
No one can doubt the pandemic’s powerful impact on the patterns of work in and around major cities. Generations of workers had become accustomed to the daily journey from home to office by subway, train, bus and car. A vast infrastructure of urban mass transit, commuter rail and toll-based roads, bridges and tunnels evolved to serve the daily tide of workers to and from the urban core. The arrival of COVID and the subsequent lockdowns severed the link between workers and offices, and in the process upended this highly evolved commuter ecosystem.

A significant part of our analysis examines these impacts and the degree to which they represent a temporary shift or a more permanent rewiring of the system. Think of this narrative as a kind of “Tale of Two Cities.” In regions where work patterns relied on mass transit to deliver workers to dense urban cores, the impact from COVID has been striking. At the same time, in regions where the majority of workers commute by car to more geographically dispersed offices, the changes have proved less severe.

**Car culture vs. COVID**

Here is one interesting takeaway from the COVID era: The pandemic led to relative differences in emigration across urban regions. Where car commuting is the norm, shutdowns early in the pandemic slowed economic activity, but there was little evidence of either temporary or permanent emigration from these regions.

Conversely, dense, high cost urban centers with more widespread use of public transit experienced a more rapid growth of infections, more severe restrictions on activity and more significant emigration during the COVID era. This outward migration has faded but not reversed as the severity of the health threat has lessened. Population changes across Chicago, New York and San Francisco remained negative through 2022 (Exhibit 1). Migration tended to flow both to nearby suburbs and to more distant states, including Florida, Texas and other regions with lower costs of living and other perceived advantages.

**Population change across New York, Chicago, San Francisco, Austin and Miami negative through 2022**

<table>
<thead>
<tr>
<th>City</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>104%</td>
<td>-6%</td>
<td>-7%</td>
</tr>
<tr>
<td>Chicago</td>
<td>75%</td>
<td>-5%</td>
<td>-6%</td>
</tr>
<tr>
<td>San Francisco</td>
<td>87%</td>
<td>-4%</td>
<td>-5%</td>
</tr>
<tr>
<td>Austin</td>
<td>80%</td>
<td>-3%</td>
<td>-4%</td>
</tr>
<tr>
<td>Miami</td>
<td>79%</td>
<td>-2%</td>
<td>-3%</td>
</tr>
</tbody>
</table>

Source: Census; data as of July 1, 2022.

**Toll traffic recovered to or exceeded pre-pandemic levels**

<table>
<thead>
<tr>
<th>Region</th>
<th>2020</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>North TX Tollway (Dallas)</td>
<td>77%</td>
<td>104%</td>
</tr>
<tr>
<td>Bay Area Toll Authority (San Francisco)</td>
<td>75%</td>
<td>87%</td>
</tr>
<tr>
<td>The Port Authority’s bridges and tunnels (New York City)</td>
<td>80%</td>
<td>99%</td>
</tr>
<tr>
<td>IL Tollway (Chicago)</td>
<td>79%</td>
<td>94%</td>
</tr>
</tbody>
</table>

Source: North Texas Tollway Authority, Bay Area Toll Authority, the Port Authority, and Illinois Tollway; data as of December 31, 2022.

Commuting patterns appear to have evolved as well, including a greater reliance on car commuting – even in regions with well-developed mass transit systems. Toll-road travel has rebounded from its 2020 trough in regions as disparate as North Texas, where population and employment are growing, and cities such as San Francisco and New York, where populations declined over the last three years (Exhibit 2). Perhaps we can chalk this up to a change in preferences: Commuters appear ready to drive to work but less willing to take the train.
Will the masses return to mass transit?

The evidence shows that the initial phase of COVID precipitated a collapse in weekly ridership for public transportation systems on a national level. This comes as no surprise, given the widespread closures of urban offices at the time. Three years later, however, ridership in mass transit systems remains materially below pre-pandemic levels.

Exhibit 3 depicts weekly ridership at the national level as well as in two major urban transit systems: the New York Metropolitan Transportation Authority (MTA) and San Francisco’s Bay Area Rapid Transit (BART).

Following the initial drop, MTA has been recovering at close to the national trend (albeit from a very low base), while BART continues to lag its peers (Exhibit 4).

This data clearly support the idea that both New York and San Francisco have experienced an incomplete recovery from the pandemic. The MTA’s projections show that the recovery in ridership in 2021 has been sharply curtailed, initially by new COVID variants but now seemingly on a more permanent basis. The original trend line remains well above actual ridership statistics and won’t be reached for years to come. The more pessimistic end of the range leaves ridership more than 25% below pre-COVID levels more than six years later.

Both New York City and San Francisco have experienced an incomplete recovery from the pandemic

EXHIBIT 3: NATIONAL AND MAJOR CITY COMMUTER RAIL TRAFFIC (WEEKLY RIDERSHIP TREND, FEBRUARY 2018–MARCH 2023)

Source: American Public Transportation Association; data as of May 7, 2023.

Ridership has been weak, but it is tracking ahead of the slow-case scenario

EXHIBIT 4: MTA RIDERSHIP PROJECTIONS AS A % OF PRE-PANDEMIC RIDERSHIP

BART forecasts that ridership in the San Francisco transit system will not recover in the foreseeable future and will reach only 63% of the pre-pandemic level by 2026 (Exhibit 5). The low end of projections stabilizes at levels approximately 25% below those preceding the pandemic. And the longer data series puts BART’s challenge in context: In no prior recession dating back to the 1990s did ridership experience a drop anything like what has occurred recently. This is uncharted territory for transit systems that had enjoyed consistently increasing ridership over decades.

A key risk for transit systems such as MTA and BART: their reliance on fares for revenues. In fact, farebox revenues provided more than half of operating revenue for BART and MTA before the pandemic. (Not all transit systems are equally exposed – most are funded by broad-based taxes that offer greater stability.) Amid the current shortfall in fare revenue, transit systems have been able to fall back on COVID-era federal aid to cover their funding gaps. But this is a temporary fix.

To address operating shortfalls, we expect transit systems to delay capital expenditures while attempting to keep operations intact as best they can. For fare-backed systems like MTA and BART, it’s likely both services and capital plans will be curtailed to some extent as the systems adapt to structurally lower ridership. Given that political support for public transit has been strong historically, there will be some capacity to shift funding to taxpayers in order to maintain an acceptable level of service.

BART forecasts ridership will recover to only 52% of the pre-pandemic level by 2025

EXHIBIT 5: BART SAN FRANCISCO TRANSIT SYSTEM PROJECTIONS IN RIDERSHIP RECOVERY

Source: BART; data as of March 2023.
Mass transit operations and funding sources will be re-imagined moving forward, placing added stress on policy makers, fare payers, and taxpayers broadly. This was demonstrated by an increase in the payroll mobility tax rate in New York to provide additional funding for the MTA. The need for additional, more reliable, funding sources will likely require diverting tax capacity away from other priorities, and if poorly implemented, could exacerbate population outmigration and related fiscal challenges.

**Municipal finances: Quick recovery or Long COVID?**

But how resilient are municipal finances, given the stresses of the COVID era, and would they be able to support this burden? It’s a critical question for the municipal bond market and the commercial real estate sector.

A first-order concern for municipal revenues is population. Municipal revenues are driven to varying degrees by personal income taxes, sales taxes and property taxes. Thus far at least, despite the population loss in some large cities, revenues have held steady, if not improved, throughout the pandemic. Property taxes provide stability to municipal revenues, given lags in property assessments and the long-term trend in property price appreciation.

As shown in Exhibit 6, tax revenue growth in major metropolitan areas has rebounded, resuming its prior positive trend. Why? Broad-based wage inflation and the lack of employment loss among high income earners have supported personal income taxes.

Sales taxes, another key component of municipal finances, have been well supported by robust consumer spending, inflation in goods prices and the expansion of municipal tax bases from better sales tax collection on online shopping. Exhibit 7 depicts the plunge in sales taxes collected in major metropolitan areas when stores were shuttered, as well as the subsequent rebound powered by resilient consumer spending.

But that spending – and the municipal revenue it generates – may not prove durable. High density central business districts that were once filled with daily commuters confront underutilized office towers and diminished street-level retail traffic, raising the prospect of a deeper decline in tax revenue and public services. It may be too early to extrapolate this type of “doom loop,” but the direction is concerning.

In the following chapter, we look more closely at what may lie in store for central business districts.

**Wage inflation and lack of employment loss among high income earners have supported income taxes**

**EXHIBIT 6: REPRESENTATIVE TAX REVENUE GROWTH (YoY %)**

Source: For Washington DC, Los Angeles, San Francisco and New York, the data is from each city’s Annual Comprehensive Financial Report. For Chicago, the personal income tax (PIT) data is from Chicago’s Series 2023A&B General Obligation official statement, and the sales tax data is from the Sales Tax Securitization Corporation’s Series 2023C&D official statement.

**Sales taxes have been well supported**

**EXHIBIT 7: SALES TAX ONLY GROWTH (YoY %)**

Source: For Washington DC, Los Angeles, San Francisco and New York, the data is from each city’s Annual Comprehensive Financial Report. For Chicago, the sales tax data is from the Sales Tax Securitization Corporation’s Series 2023C&D official statement.
Implications

COVID reshaped the daily lives of millions of workers overnight and in the process shattered a commuter ecosystem that had served major urban cores for decades. While the pieces are being put back together, the system remains fragile. Costly, capital-intensive mass transit systems have been starved of the fare revenue needed to maintain service, potentially rolling those costs up a level to the municipal or state fiscal authorities.

State and municipal entities, although able to weather the storm of COVID fairly well, can ill afford to shoulder the burden of money-losing mass transit systems. The lagged effect of property tax declines may add pressure to cut costs and services, raising the specter of a downward spiral in economic activity, further population loss and declining property values. We can take some hope from the fact that previous downturns have proven the resiliency of the urban model, but caution is warranted. The need for cities to serve as a hub of large office populations is being questioned as never before.
Chapter seven

Work and home life after the pandemic

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The pandemic forced employers to confront the challenge of balancing work productivity and employee safety. Most employers and employees expected work from home (WFH) arrangements to be an interim solution, with employees returning to the office post-pandemic. However, that return has been slow and incomplete. Employees generally prefer flexibility, and many firms are still operating under a hybrid model that allows workers to split time between home and office.

Employers have shown different levels of comfort with this new work model, but the acceptance of hybrid schedules has been widespread. In Manhattan in January 2023, 82% of employers indicated that they would have a hybrid schedule in 2023, with only 9% requiring daily attendance. They have raised the number of days employees can work remotely per week from 1.6 days in August 2020 to 2.2 days in February 2023.

We note a persistent gap in expectations between employers and employees. Research shows that workers prefer 2.7 days of remote work per week, while employers prefer 2.2 days (Exhibit 1A). This preference for remote work is also visible in the share of applications for remote work jobs, which has risen throughout the pandemic from roughly zero to 50% (Exhibit 1B).

One reason for this shift: Households relocated out of urban areas during the pandemic and are now resisting the prospect of returning to their time-consuming and costly commutes. On the other side, a growing number of large employers, including Disney, Starbucks, Twitter, Amazon and JPMorgan Chase & Co., are mandating more in-person workdays for some or all employees.13

There is a persistent gap in expectations between employers and employees

EXHIBIT 1A: EMPLOYERS’ VS. WORKERS’ PREFERENCE FOR WORK FROM HOME (DAYS PER WEEK)


EXHIBIT 1B: PREFERENCE FOR REMOTE WORK POSTINGS VS. AVAILABLE REMOTE WORK POSTINGS (%)

Source: LinkedIn research, Abha Bhattarai, “Remote jobs are in demand, but positions are drying up,” Washington Post, November 27, 2022.

12 Partnership for New York City, “Return to Office Survey Results: February 2023.”
Fewer workers, fewer offices

The new hybrid work model raises questions about the economic viability of traditional office buildings. Pre-pandemic, the sector was already under pressure. Office leasing activity was declining as tenants consolidated their office space and reduced the average square footage per employee. COVID accelerated this downward trend, helping to reduce the office sector from 15% of REIT benchmarks in 2018 to 5% in 2023. That makes the office share roughly one-third the size of Prologis, an industrial REIT company.

Specific examples of office space reductions are easy to find. To cite a handful of recent examples: Walmart disclosed plans to shut down three of its technology hubs, leading to the relocation of hundreds of workers; Prudential Financial announced a 50% reduction in its office space; and Meta incurred a financial loss of approximately USD 2 billion to close offices and terminate leases. Large leases are getting smaller: Across the commercial office market, data on leases over 10,000 square feet show a roughly 20% drop in average lease size in 2022 compared with 2019.

Bifurcation of performance is widening between newer, high quality office buildings and other office buildings

EXHIBIT 2A: CUMULATIVE TENANT DEMAND GROWTH SINCE 4Q 2019 (MILLIONS OF SQ. FT.)

EXHIBIT 2B: RENT PREMIUM OF NEW CONSTRUCTION VS. OTHER CLASS A (IN USD)


Source: JLL Research; data as of 1Q 2023.

15 Office weight excludes ARE, a life science company that is included under office in REIT indices.
There is a silver lining for the best properties. In the post-COVID environment, corporate tenants increasingly focus on amenity-rich trophy assets to attract workers back to the office. Such newer, high quality buildings can capture premium rents in what is otherwise a challenged market. We expect this bifurcation of performance between newer, amenity-rich trophy assets and lower quality office buildings will widen (Exhibits 2A and 2B), as the oversupply of lower quality properties will depress rents for some time.

Unfortunately, a sizable share of U.S. office stock may be functionally obsolete and thus require some form of conversion or repurposing.\textsuperscript{17} We expect more conversions of office space to multifamily over the next few years (especially in urban areas for older, less competitive office buildings), but structural challenges mean that only 20% of the buildings will have the appropriate floor plates and desired characteristics to be converted.\textsuperscript{18} Factoring in the regulatory hurdles of zoning, planning and building code requirements, as well as financial viability, it is clear that conversions cannot solve the problem of excess office space.

To put this in perspective, taking completed office conversions since 2016, plus all currently planned conversions (assuming a 100% completion rate), would account for only 2% of current U.S. office inventory.\textsuperscript{19} Owners of functionally obsolete office buildings that cannot be repurposed face a stark choice: charge significantly lower rents (where financially feasible) to attract demand, or simply “go dark” – as some retail malls did in the last decade.

\textsuperscript{17} Cushman & Wakefield research estimates that 25% of office stock (1.4 billion square feet) will be functionally obsolete by 2030, Moody’s estimates that 31% of office buildings (pre-1980 buildings) in the top 80 metro areas are at higher risk of becoming functionally obsolete, and CBRE Research estimates that 10% of all office buildings in markets tracked are “hardest-hit buildings” and will need to be removed, revived or repurposed.


Rapid growth in e-commerce leads to a boon in logistics assets

The growth of delivery-based e-commerce predates the pandemic. But the evolution of the “last mile” delivery model accelerated rapidly as in-person shopping was restricted and online retailers stepped in to provide expedited delivery. Same-day delivery became far more widely available, and in some population centers the rapid delivery model began to appear. Three years after the onset of the pandemic, the growth rate of e-commerce sales penetration has decelerated somewhat, but its overall trajectory remains higher than expectations before the pandemic (Exhibit 3).

The consumer’s embrace of e-commerce is redefining the distribution of goods in the economy: The chain from factory to end consumer has shifted from reaching 1 million retail stores to reaching 150 million doorsteps. Accompanying this shift is a vast expansion of the logistics infrastructure needed to quickly and efficiently reach consumers at home. That infrastructure has long included massive warehouses and distribution centers near ports and major highways, but more recently the sector’s focus has shifted to last mile distribution support spaces, such as industrial outdoor storage (IOS) and logistics terminals located much closer to or within population centers.

The pandemic accelerated the growth of e-commerce

EXHIBIT 3: E-COMMERCE AS A % OF RETAIL GOODS SOLD

Source: U.S. Census Bureau, Euromonitor, Prologis Research forecast; data as of May 2022.
Logistics assets in infill markets such as Southern California and the New York-New Jersey area have outperformed other markets over the last couple of years as e-commerce adoption has increased. These markets play a critical role in the national logistics network due to their proximity to ports and shipping hubs while also serving a large local population. The value of existing facilities is enhanced by the relative scarcity of suitable development sites and competing uses for land in densely populated areas. Limited supply and low construction activity increase the value of infill compared with rural and suburban alternatives.²⁰

Overall, sales of logistics terminals in the U.S. have reached a record USD 1.4 billion, 2x growth over the last four years.²¹ Given the proximity of these distribution support spaces to cities, they benefit from tight development requirements. The constrained supply, coupled with growing demand, has resulted in strong rental growth and low vacancy in logistics terminals and industrial outdoor storage over the last few years (Exhibits 4A and 4B).

Industrial outdoor storage continues to benefit from last-mile storage

EXHIBIT 4A: RENT GROWTH IN INDUSTRIAL OUTDOOR STORAGE

<table>
<thead>
<tr>
<th>Year</th>
<th>Average rent</th>
<th>YoY % change (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>5.0</td>
<td>2%</td>
</tr>
<tr>
<td>2019</td>
<td>6.0</td>
<td>3%</td>
</tr>
<tr>
<td>2020</td>
<td>7.0</td>
<td>4%</td>
</tr>
<tr>
<td>2021</td>
<td>8.0</td>
<td>5%</td>
</tr>
<tr>
<td>2022</td>
<td>9.0</td>
<td>6%</td>
</tr>
</tbody>
</table>


EXHIBIT 4B: VACANCY IN INDUSTRIAL OUTDOOR STORAGE VS. INDUSTRIAL SECTOR

<table>
<thead>
<tr>
<th>Year</th>
<th>Industrial outdoor storage</th>
<th>Broad industrial sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>2019</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>2020</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>2021</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>2022</td>
<td>2%</td>
<td>2%</td>
</tr>
</tbody>
</table>


Aging millennials need to find a home

The first three years of COVID, from 2020 through 2022, marked an interesting time in the residential housing market. Within the first year of the crisis, mortgage rates dropped roughly 100 basis points (bps) to all-time lows. That led to a surge in buying activity, fueled by pent-up savings (enhanced by government stimulus) and the rise of work from home arrangements.

Toward the start of 2021, as COVID vaccines began to be introduced and the economic outlook improved, housing sales activity increased. Household formations were on the rise, driven primarily by an increase in the headship rate (the share of the population heading their own households) as aging millennials (Americans born from 1981 to 1996) abandoned their pre-pandemic living situations (Exhibit 5).

This surge in demand arrived at a time when the housing shortage in the U.S. had risen to multiyear highs. Although construction had increased, it failed to meet the heightened demand for single-family homes, and thus the housing gap widened further. Household formations have since slowed from COVID-era highs. But making a conservative estimate for housing formations and assuming homebuilding continues at an elevated pace, industry forecasters project that it could take decades to balance this sizable housing gap.

Over the next five to 10 years, millennials are expected to make up a significant portion of the target single-family market

EXHIBIT 5: U.S. POPULATION PROJECTIONS, GROUPED BY AGE
BASED ON EXPECTED LIVING SITUATION

Source: U.S. Census Bureau; data as of 2022.

For younger buyers, the cost to own a home as a proportion of income hovers near all-time highs

EXHIBIT 6: TOTAL MONTHLY COST TO RENT AN APARTMENT VS. OWN A HOME

Source: U.S. Department of Labor Bureau of Labor Statistics (BLS), John Burns Consulting, Axiometrics. Cost/rent as a percentage of income determined by taking monthly cost/rent divided by 4x the median weekly income for full-time workers between the ages of 25 and 34 years old; data as of 1Q 2023.

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22 Freddie Mac. Represents the 30-year fixed rate mortgage average in the U.S. As of 1Q 2023.
23 The Joint Center for Housing Studies of Harvard University. As of 1Q 2023.
In 2023, mortgage rates hover around 6% (for high quality borrowers), and median housing prices are up more than 30% over the last three years. The monthly cost to own a home (including mortgage payments and maintenance) has risen significantly, pricing out millennials, a crucial demographic. The monthly cost to own a home has risen to around 80% of the median income for 25- to 34-year-olds who work full time (Exhibit 6).

For many millennials looking to settle down and start a family, there seems to be only one choice – single-family rentals. Renting a home allows them to transition into an environment they like while avoiding the financial burden of ownership. Both investors and institutions have been preparing for this growing trend. Build-to-rent home starts have risen over the last two years, while investor-owned properties made up 28% of total home purchases by the first quarter of 2022, the highest ever recorded, and remained elevated at 26% in the fourth quarter of last year.

Overall, the pandemic has acted as the catalyst for a structural gap in the single-family market that has been slowly building since the financial crisis. With costs to own at multidecade highs, unless there is a material change in the forward-looking rate environment, it may be difficult for younger adults to purchase a home. This economic reality, combined with an increased focus from institutions and investors, should provide a tailwind for single-family rental assets.

Implications

In the coming years, employers and employees will renegotiate how we live and work across the physical and virtual worlds. The need to commute to an office, for generations accepted as a given, is now subject to the question, How much do we really need commutes, or offices? It will be impossible to “unring the bell” and return to pre-COVID work patterns as if nothing has changed.

For the costly and capital-intensive sectors of the economy that served the pre-COVID workforce, the prospects are challenging – particularly mass transit systems and marginal urban offices. Supply exceeds demand and may for quite a while as prices slowly adjust and assets are repurposed to the extent possible.

On the flip side, there is too little logistics infrastructure to serve the evolving e-commerce marketplace and too little residential real estate to serve the population of young families. In these sectors, favorable supply and demand characteristics will deliver strong returns on capital over the long term.

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26 CoreLogic. As of 1Q 2023.
Chapter eight

Positioning, pricing and policy: durable changes in equity markets

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The pandemic affected almost all sectors of the global economy, and the many firms within them, in ways that are still coming into focus. Some short-term gains and losses have already played out, leaving firms largely back where they began. We are looking to identify lasting structural changes that have the potential to benefit specific sectors and firms on a sustainable basis.

We focus on three broad themes – the “three Ps” – that describe how firms may have achieved an ongoing commercial advantage during the COVID era.

**Positioning:** These firms (or in some cases industries broadly) enter the post-pandemic era with elevated growth prospects and improved competitive positioning on a long-term, and potentially permanent, basis.

**Pricing:** Their competitive position has improved during the economic volatility and inflationary surge of the COVID era because of a resilient operating model and the ability to maintain pricing power.

**Policy:** We expect these firms will entrench their competitive advantages and defend both profitability and market share because of the evolving regulatory and policy environment.

This approach allows us to zero in on the types of investments that have the potential to perform well. It can also reveal concerns about businesses for which the post-COVID world should present significant challenges.

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**Positioning: Information technology and emerging market e-commerce**

COVID accelerated the digital transformation of the economy and channeled it in new directions. The rapid transition to remote work required adopting technology for collaboration in a secure online environment. Simultaneously, with customers no longer able to walk into physical locations, online tools for all kinds of business became essential. E-commerce, already a key component of the retail landscape, became even more integrated into daily life.

We discuss three firms that could potentially benefit from these trends:

- **Microsoft**, as a leading provider of cloud services and a key player in the development of artificial intelligence applications
- **Infosys**, which offers scalable and cost-effective information technology services and support to companies around the world
- **Mercado Libre**, the leading e-commerce retailer in Latin America
Microsoft: From the cloud to artificial intelligence

Investors often look to familiar frameworks such as the S-curve to describe the adoption of new technologies. However, the S-curve describes circumstances in which there is a natural limit to usage, often the result of a cap on the population of potential users. After all, there are only so many TVs, vacuum cleaners, computers or smartphones that can be sold before a market is saturated. In contrast, public cloud infrastructure – such as computing, networking and storage – monetizes data, the amount of which doubles every 18–24 months.

Given the exponential growth of data and the increasing efficiency with which it can be used, we think cloud computing adoption is going to look less like the S-curve and more like what is described by the Jevons paradox. William Jevons was an esteemed 19th-century English economist who observed, in discussing the adoption of the coal-fired steam engine, that improving an engine’s efficiency would not reduce coal consumption but rather increase it as more engines would be profitably put into operation. We believe the public cloud will follow this model: As the cost of cloud services comes down, and as the services themselves become more advanced, businesses will move exponentially more workloads into the cloud.

Microsoft is second only to Amazon, and ahead of Google, in the growing cloud computing sector, and it has been increasing its market share recently.

Top cloud computing services have enjoyed strong revenue growth

EXHIBIT 1: BIG THREE CLOUD SERVICES REVENUE (USD BILLIONS)

Source: Company filings and J.P. Morgan Asset Management estimates; data as of April 27, 2023.

EXHIBIT 2: ANNUALIZED REVENUE GROWTH RATES ACROSS BIG THREE CLOUD SERVICES (%)

Source: Company filings and J.P. Morgan Asset Management estimates; data as of April 27, 2023.
Customers of cloud services providers have consistently underestimated the economic and technical benefits of migrating workloads to the cloud vs. building out, staffing, operating and scaling up their own data centers. The pay-as-you-go model large cloud providers offer is a more agile solution that proved its worth during the pandemic. We expect the migration of present-day workloads to continue while new uses emerge.

Significantly, Microsoft is also the lead investor in OpenAI, a developer of the leading generative AI application ChatGPT (generative AI creates new content). ChatGPT runs exclusively through the Microsoft Azure cloud and is embedded within the firm’s Bing search engine. The potential to monetize this new capability is very real. First, driving search activity to Bing can impact revenues: Every 1% gain in search market share Bing takes from its competitors translates to about USD 2 billion in revenues for Microsoft. Though it’s early, there appears to have been a surge in downloads and Bing usage since ChatGPT was rolled out (Exhibits 3A and 3B).

Additionally, Microsoft can package generative AI capabilities as a sort of co-pilot, which leverages large language models to help users become more productive within applications and platforms such as Microsoft 365, Dynamics 365 and GitHub. In this way, the company can potentially raise prices for its offerings. Finally, and perhaps most critically, we believe the largest opportunity for Microsoft’s AI services may be as a platform on which other companies will build their own apps.

There has been increasing usage of the Bing search engine following the roll-out of ChatGPT

EXHIBIT 3A: BING DOWNLOADS

EXHIBIT 3B: BING WEEKLY ACTIVE USERS

Source: data.ai; data as of April 19, 2023.
Infosys: Bringing scale and efficiency to the digital economy

In the urgency of the COVID moment, as businesses’ digital transformation was accelerating globally, many firms chose to outsource this process rather than build their own digital infrastructure and capabilities. While there was no shortage of firms looking to facilitate other companies’ digital transition, those with global scale that could deliver technology solutions efficiently and on time used these competitive advantages to increase market share.

Infosys, based in India and active around the world, was able to meet the needs of customers for digital resources during the early stages of the pandemic shutdown. Within days of the World Health Organization announcing a lockdown, more than 95% of Infosys employees were working remotely. When commercial airlines canceled flights, Infosys chartered aircraft to bring back its employees stranded outside India. Previous investments in digital capabilities paid off, making Infosys the first choice for customers looking to transition to the cloud while adding functionality to their mobile apps by linking to their legacy back-end systems.

Thanks to its processes, large scale and global delivery model, Infosys could offer customers certainty of delivery at reasonable prices. Its annualized revenue growth, which was between 5% and 10% in the pre-COVID era, surged during the pandemic to roughly 20% (Exhibit 4). Although the rate of growth has slowed slightly in the past year, the company’s revenues are growing at nearly twice the rate of global IT spending.

Infosys’ annualized revenue growth surged during the pandemic

EXHIBIT 4: INFOSYS REVENUE AND MARKET SHARE GROWTH, YOY

Source: Company data, Gartner, J.P. Morgan Asset Management estimates.
Notes: Infosys revenue growth is in organic, constant currency terms. Global IT services spend growth in USD. 2012 = year ended March 2013 for Infosys, December 2012 for global IT services spend.
Mercado Libre: E-commerce in emerging markets

COVID’s acceleration of the growth of e-commerce was particularly visible in the emerging markets, where e-commerce had achieved less of a presence before the pandemic than in more developed markets such as the U.S. Skilled e-commerce operators took advantage of the COVID demand surge to increase market share relative to traditional channels:

E-commerce penetration in Latin America more than doubled from 2019 to 2022.

A prominent example is Mercado Libre, the leading e-retailer in Latin America (Exhibits 5A and 5B). Between 2019 and 2022, the company’s gross merchandise value nearly tripled, to USD 38 billion. Margins swung from negative to positive, driven by operating leverage and the fact that competitors have stopped subsidies due to the rising cost of capital.

Mercado Libre transformed its e-commerce business from simply facilitating online transactions between third parties to one built on transshipment (cross-docking) and direct order fulfillment. The company invested in automated sorting facilities and warehouses across the region, chartered more planes for timely long-distance delivery and developed data tools to optimize seller behavior. Mercado Libre continues to add new services – including advertising, payments and lending services – that are synergistic.

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EXHIBIT 5A: MERCADO LIBRE E-COMMERCE PENETRATION

EXHIBIT 5B: % ITEMS SOLD ON MERCADO LIBRE

Source: Company data, Euromonitor, IBGE, J.P. Morgan Asset Management estimates.

Notes: **Cross-docking**: After the buyer orders, shipment arrives at MELI warehouse and is then shipped out immediately. **Fulfillment**: Shipment stored at MELI warehouse in advance of buyer orders. Items that are not cross-docked or fulfilled are shipping directly from the seller to the buyer, and MELI is not involved. This category typically has a worse customer experience than the other two in terms of speed of delivery, reliability and cost.
Price setters: Sustaining pricing power

“The single most important decision in evaluating a business is pricing power. If you’ve got the power to raise prices without losing business to a competitor, you’ve got a very good business. And if you have to have a prayer session before raising the price … then you’ve got a terrible business.” – Warren Buffett

The period of high inflation and supply-demand imbalances of the last two years raised profit margins for many companies, and many have cited pricing power as the explanation. They seemingly had no trouble passing on their increased costs to customers. However, the true winners will be the companies that can sustain their pricing power when inflation abates, costs are reduced and competition increases.

Pricing power usually originates from a few key sources: Companies can consistently set prices because they have a sustainable competitive advantage, play a crucial role in their customers’ operations or simply offer a superior value proposition to their customers. Further, in some industries there is limited competition, as some form of oligopoly enables sustained pricing power.

We highlight two firms that have achieved enhanced pricing power during the pandemic:

- Old Dominion Freight Line, a domestic (U.S.) provider of less-than-truckload (LTL) freight services and logistics
- John Deere, a leading global provider of agricultural and construction equipment

Old Dominion: A superior value proposition

The trucking sector is actually two distinct subindustries: truckload and less-than-truckload. LTL refers to the transportation of goods in smaller quantities, in which many separate shipments are transported on one truck. Historically, the truckload industry has been highly fragmented, with low barriers to entry, a lot of competition and a corresponding lack of price discipline. In contrast, the LTL sector requires far more logistical sophistication and exhibits significantly higher industry concentration, along with superior pricing discipline.

Old Dominion Freight Line stands out in its ability to steadily increase prices over time, a byproduct of the superior value proposition it provides its customers (Exhibit 6). Old Dominion’s commitment to excellent service and its investment in technology have allowed it to exercise price discipline while simultaneously growing market share.

Prior to COVID, Old Dominion was consistently growing revenue faster than the overall industry. But in the past few years, this relative growth has accelerated, indicating an improving competitive position in the LTL business.

Old Dominion Freight Line can steadily increase prices because it offers a superior value proposition

John Deere: Using dominant market share to build competitive advantage

John Deere is well known as a leader in the agricultural machinery business, with a vast array of products ranging from lawnmowers to combine harvesters. Over the past two decades, however, Deere has evolved from a pure manufacturing company to a technology-driven company that leverages data and machine learning to enable farmers to reduce input costs and increase yields.

The combination of Deere’s leading market share (Exhibit 7) alongside its farm management system, which seamlessly pulls in machine data, has left the company in a competitively advantaged position with respect to the collection of data. This in turn helps support a positive flywheel: Deere increasingly brings to market data-driven functionality while creating a higher moat around its hardware as farmers increasingly rely on the integration of John Deere hardware with John Deere software to support their data collection efforts. In a consolidated industry, Deere’s competitive advantage is supported by the evolution of precision agriculture technology.


Engaged acres reflect the number of unique acres with at least one operational pass documented in the John Deere Operations Center in the past 12 months.
Fiscal policy, particularly in the U.S., initially focused on supporting individual employment and consumption, and had broad-based benefits for firms across all sectors. Later, however, the passage of significant infrastructure spending packages gave investors greater insight into which specific sectors and firms will benefit from the new fiscal policies – particularly the firms that are building out new infrastructure assets and the suppliers who sell to them.

In our view, strong financials and infrastructure suppliers look to be among the major policy beneficiaries of the post-COVID era.
DBS: Balance sheet discipline and stable financing

The recent spate of failures in the banking system has drawn attention to balance sheet and operational risks in the financial sector. Although these failures have occurred at the tail end of the COVID era, they are very much a product of conditions that prevailed over the longer period.

Specifically, the extended run of low rates leading up to and through the pandemic pushed some banks to increase duration risk in their securities and loan books. As inflation and rates rose sharply, the value of these assets fell while the cost of bank liabilities (deposits) rose. Under normal circumstances, this might have led simply to reduced earnings, but when combined with the rapid withdrawal of deposits, there was no alternative but to shut down.

The combination of asset-liability mismatches (leading to unrealized losses on the securities portfolio) and weak deposit franchises (characterized by high levels of lumpy and uninsured deposits) had left these institutions acutely vulnerable. There will be broader repercussions on the financial system, especially in the U.S. Expanded regulation of small and midsize banks will likely reduce future profitability, as will higher funding costs. Asset valuations will be under pressure from higher rates and stress on borrowers – particularly in key sectors of commercial real estate.

Nonetheless, the broader stress on the banking system can be a net positive for well-run banks with strong low cost deposit franchises and good risk management. Such institutions can maintain profitability while growing their deposit base and overall market share. This is true within the U.S. and globally.

DBS, headquartered in Singapore and the largest bank in Southeast Asia, has a sizable market share and a stable deposit base. The recent rise in interest rates has demonstrated the value of DBS’ low cost funding (Exhibit 8A). The bank’s cost of funds remains well below prevailing short-term interest rates (SIBOR27) while the asset yield has closely tracked rates moving higher. The combined effect on both the net interest margin and the return on equity has been positive.

While rising rates were a tailwind to profitability for DBS, they acted as a drag on global equities and bonds

EXHIBIT 8A: DBS RETURNS RELATIVE TO SHORT-TERM RATES

EXHIBIT 8B: TOTAL RETURNS IN 2022: DBS, EQUITIES AND BONDS**

*ROE adjusted for excess or deficit capital; 12 months moving average
**Indices: Bloomberg Global Aggregate Total Return Index Value Unhedged USD; MSCI World Net Total Return USD Index; S&P 500 Banks Total Return Index

27 Singapore Interbank Offered Rate.
Last year’s sharply rising discount rates (in both nominal and real terms) gave DBS a material tailwind to profitability and helped it deliver positive returns. At the same time, rising discount rates acted as a drag on most asset classes, with global equities and bonds down by 15%–20% (Exhibit 8B). The contrast underscores how banks and other financial stocks whose asset yields rise with interest rates can serve as a diversifier in a multi asset portfolio.

In volatile markets, well-run financials can offer defensive benefits relative to other equity sectors. They can also benefit from higher interest rates improving net interest margins. It is here that active management and bottom-up research can play a key role in finding potential opportunities in the post-COVID world.

The infrastructure impulse:
Key suppliers in focus

As we have discussed, the U.S. Inflation Reduction Act is an important fiscal policy that will accelerate capital spending over the next 10 years in areas aimed at the energy transition. The CHIPS and Science Act, while more targeted, will also lead to an upswing in capital investment. Although the broad terms of the legislation are known, we expect additional clarity on the rules in 2023, allowing investors to size potential revenue opportunities more accurately. Some firms stand to gain meaningfully from the uptick in infrastructure investment.

NextEra Energy is positioned to grow its renewable generation capacity while also broadening and scaling its operations to become an energy services and clean solutions provider to utilities, municipalities, and commercial and industrial power customers. These offerings should help customers meet their net-zero targets. The IRA also increased tax credits for carbon capture and sequestration, which should lead to greater adoption of blue hydrogen as an alternative fuel for industrial and residential heating applications.

Eaton looks similarly well placed to help supply the infrastructure expansion. Its electrical business should benefit from grid modernization, growth in renewables and rising EV penetration. Ingersoll Rand, a manufacturer of flow control equipment, should benefit from the construction of the clean manufacturing facilities needed for semiconductors that are supported by the CHIPS Act.
Implications

Across time, the multitude of firms within the global equity markets are engaged in a competitive process to gain market share, grow revenues and increase profits. We tend to assume that within each market or sector the playing field is fairly level and individual characteristics will differentiate performance across firms. Deep research is needed to identify those that are likely to outperform their competition.

Occasionally, however, the playing field shifts in such a way as to confer advantages on specific firms or sectors. In some cases, the strong become stronger; in others, new leaders can emerge. COVID represents just such a moment for the global equity markets. The post-COVID world, outlined in earlier chapters of this paper, has tilted in favor of those that operate in more favored sectors, that have demonstrated pricing power and that have the tailwind of government intervention at their back.
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