

Global Insights

5 QUESTIONS FOR 2024

No single question seems likely to dominate the 2024 macro discourse to the extent the debate over a “hard” or “soft” landing commanded our attention in 2023. But last year’s developments raise a new set of questions for the year ahead, including the timing and magnitude of rate cuts and the state of the economy likely to give rise to them.

We also wonder:

If office attendance at roughly half of pre-pandemic levels is the new equilibrium, will the market value of office properties be transferred to residential real estate in proportion to the shift in the underlying economic activity?

What does China’s emergence as the world’s top auto-exporting economy in 2023 portend for the future of competition in the sector and value of legacy production networks?

And what will the likely policy response mean for the future of global trade and capital flows?

We expect to see broad productivity gains as businesses operating across the economy embrace Generative AI, but will investors’ increasing reluctance to fund losses place constraints on the growth of new firms in the space that were largely absent during the QE era?

I What if the Fed doesn't cut rates in March?

In the press conference following the November 1 FOMC Meeting, Fed Chair Powell indicated that further rate hikes wouldn't be necessary *if* financial conditions remained tight. Market participants heard the first part but largely ignored the second. Stock prices soared, credit spreads narrowed, and longer-term bond yields fell. In other words, financial conditions eased massively. But instead of threatening to hike rates to counteract the unwelcome market repricing, Powell egged it on. First by describing short-term interest rates as “well into restrictive territory” and then acknowledging that the Federal Open Market Committee (FOMC) had begun to consider rate cuts.

Inflation eased massively over the course of 2023, with outright declines in the prices of components, parts, and other key inputs like chemicals and chips that fueled so much of inflation's rise in 2021-22. Pricing power also returned to more normal levels across most of the economy (Figure I). By August 2023, our portfolio data indicated that there was no case for additional rate hikes. But with total spending in the economy still above levels the Fed believed was consistent with its 2% inflation target, it seemed that rates might need to remain near current levels for some time to come.

Figure 1. Sharp Fall in Inflation Rates

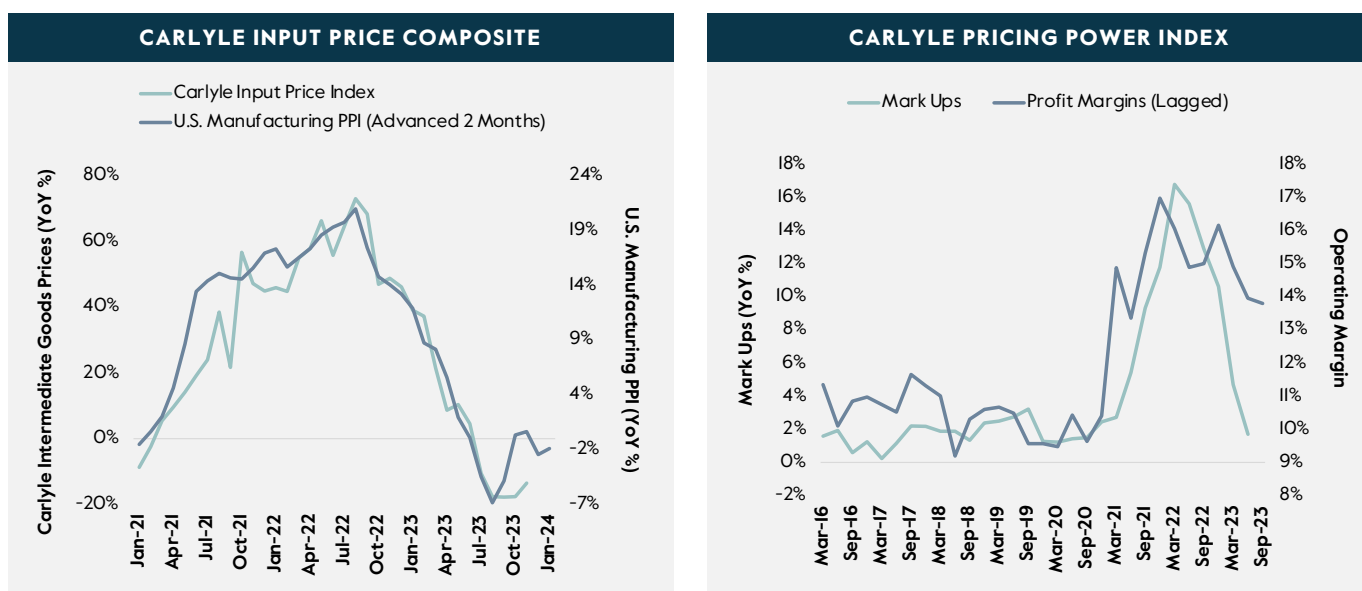


Figure I. Source: Carlyle Analysis of Portfolio Company Data; BLS, November 2023. Presented for illustrative purposes only. There is no guarantee any trends will continue.

In the intervening months, the Fed began to worry that if inflation continued to decline (as policymakers want and expect), real short-term interest rates would reach levels that badly dent economic activity (as policymakers wish to avoid). This makes sense. If annual inflation were to fall to 2%, real interest rates would reach nearly 3.5% if the fed funds rate remained at current levels. That would put it 400bp above the average for the decade prior to the pandemic and well north of any estimate for the “equilibrium” rate necessary to stabilize inflation at full employment (Figure 2). If you believe contemporary macroeconomic models, substantial demand destruction would seem inevitable at such high real rates.

But how well have these models captured the recent disinflation? Tight policy is supposed to restrain spending, deter investment, and depress labor demand. There are signs of all three, but not of the magnitude necessary to

explain the easing of price pressures, which seems mainly the result of rebuilt capacity and shifts in consumption patterns. Aggressive discounting to liquidate unwanted goods inventories has been the main driver of the overall fall in inflation. Now that spending patterns have normalized and inventories have stabilized at long-term averages (Figure 3, page 5), we’re likely to get a truer sense of the inflation and growth to expect at these interest rates.

Multiple rate cuts should be in everyone’s “base case” for 2024. But six, as implied by the futures markets? Arriving in the context of “consensus” expectations for 1.5% GDP growth and an 11% increase in corporate earnings (Figure 4, page 5)? These outcomes may not be mutually exclusive, but they don’t typically arrive simultaneously. Markets seem to be priced for a growth scare that forces decisive Fed action but doesn’t materialize.

Figure 2.
Fed Worried Real Interest Rates May be Too High

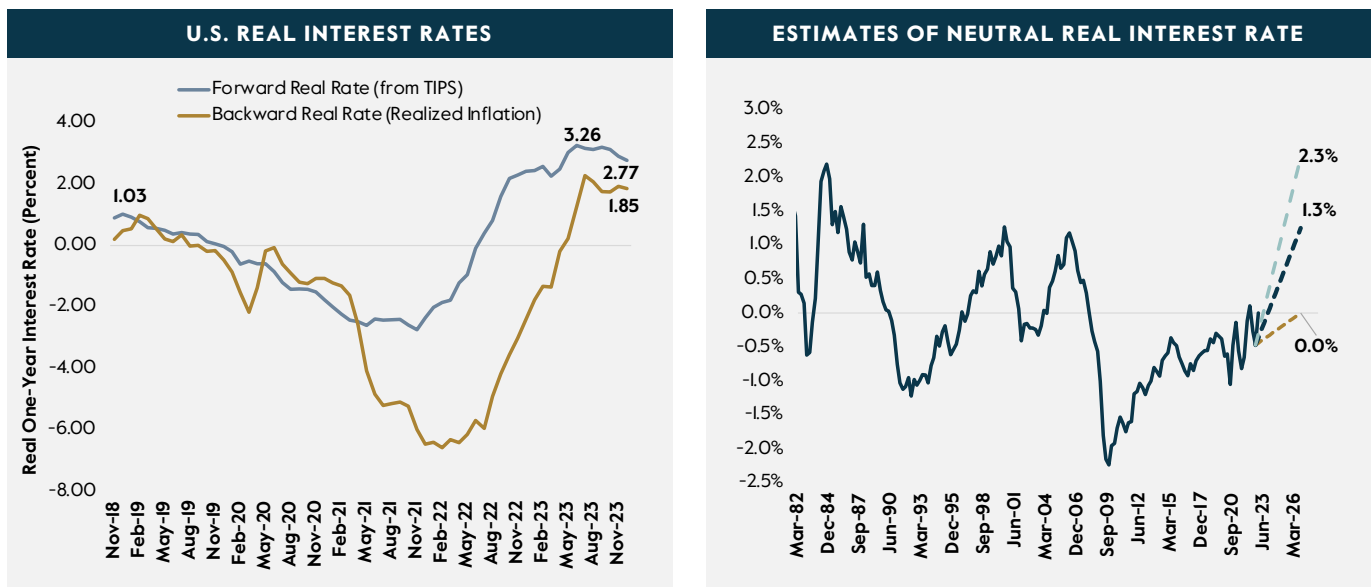


Figure 2. Source: Carlyle Analysis; Federal Reserve Data, December 2023. There is no guarantee any trends will continue.

Figure 3.
Aggressive Discounting May Have Ended

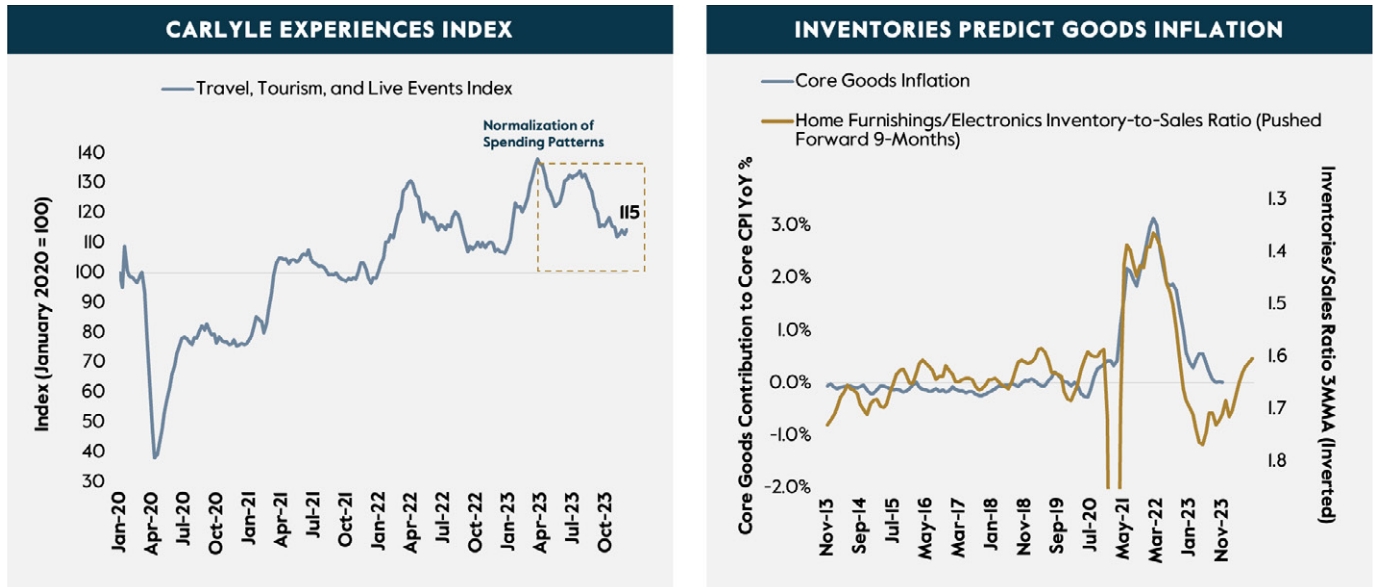


Figure 4.
Markets Priced for Aggressive Easing & Impressive Earnings Growth

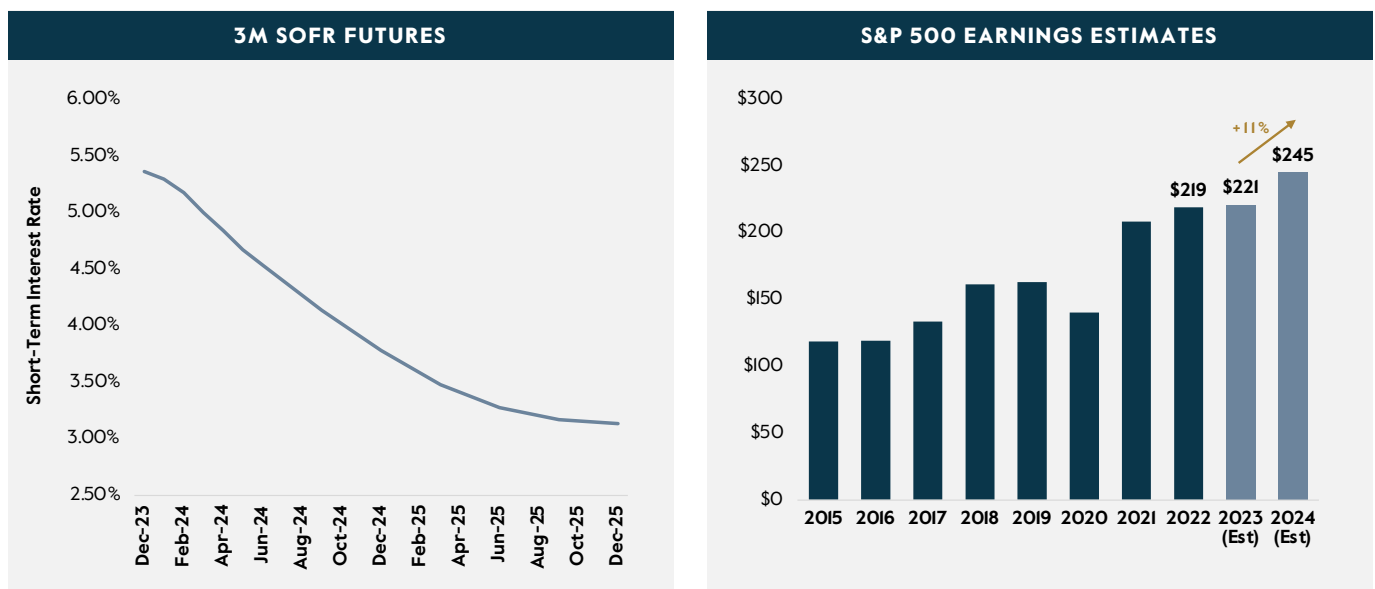


Figure 3. Source: Carlyle Analysis of Portfolio Company Data; Bloomberg, Federal Reserve Data, December 2023. There is no guarantee any trends will continue.
Figure 4. Source: Carlyle Analysis; Bloomberg, FactSet, December 2023. There is no guarantee any trends will continue.

2 Has the market value of office space been transferred to residential real estate?

The market value of commercial real estate (CRE) varies with the market value of economic activity that occurs on premise. That may seem obvious. Yet many CRE investors operate in an alternate paradigm that assigns value to the structure itself. Such thinking achieves its fullest expression in the “replacement cost method.” If you could buy a building for \$50 million that would cost \$100 million to construct today, you might have a steal. Or you may instead discover the discount was illusory because the structure no longer attracts the economic activity that would justify rebuilding it for even \$30 million.

Some CRE assets have an easier time retaining tenants than others and this is surely the result of property-specific amenities. But let’s peel back this onion a bit: if a high-end mall or fashionable shopping center succeeds in an era when online sales have disrupted much of the retail sector, that’s thanks to the gross receipts still generated on that square footage, not something intrinsic to the structure. Maybe the aesthetics and location are what draws the foot traffic and commerce, but it’s the commerce itself that ultimately matters for the value of the asset.

Conceiving of the value of CRE assets as derivative of on-premises economic activity holds some sobering implications for the future of the office sector. While there’s no cash register to measure office commerce directly, the value of office properties is predicated on the \$10 trillion in annual revenue generated by office-consuming sectors of the economy.¹ That economic activity is still occurring – indeed, the revenues of these sectors increased by 6% in 2023 – but much less of it happens at the office. U.S. office attendance finished 2023 at half of levels that prevailed prior to the onset of the pandemic, and people spend far less time at the office

when they do go.² Job postings indicate that higher income employees – presumably those responsible for a larger share of the revenue generated by office-consuming sectors – are far more likely to work from home (Figure 5, page 7).

In many cases, the decline in in-person economic activity hasn’t yet manifested in property cash flows. Leases are long-term contracts. Going concerns can’t stop paying their rent any more than they can stop paying the coupons on their bonds and loans. But when those leases expire, some property owners may face a reckoning. The market value of office REITs has declined by about 40% since the onset of the pandemic.³

We may find that value hasn’t been destroyed so much as transferred. What once distinguished residential from commercial real estate was the absence of economic activity on premises. Rent (primary or imputed) reflected the market value of “shelter services.” Today, residences not only consume household income but facilitate its generation. That should be reflected in higher residential real estate values. Fully capitalizing savings from two fewer days commuting would imply 15% upside to residential real estate.⁴ And one would expect savings on office rent to be at least partly reflected in higher employee compensation, which could further increase the value of residential real estate at constant rent-to-income ratios.

Surveys suggest CEOs want their employees back at the office,⁵ and many firms have announced a resumption of five-day workweeks. But these statements seem aspirational and have rarely been corroborated by attendance data. The real-world business continuity test of 2020 proved that much office work can be done from home and this lesson is not likely to be unlearned.

1. Bureau of Economic Analysis, GDP by Industry, December 2023.

2. CNBC, “People are over the 40-hour workweek,” March 2023.

3. S&P Office REIT Index, December 2023.

4. Bankrate, “Average cost of commuting in 2023.” U.S. Census Bureau, New Residential Sales, December 2023. Bureau of Labor Statistics, Consumer Price Index, December 2023.

5. Forbes, “CEOs Predict a 5 Day Work Week by 2026,” October 2023.

Figure 5.
Shift in Economic Activity from Offices to Residences

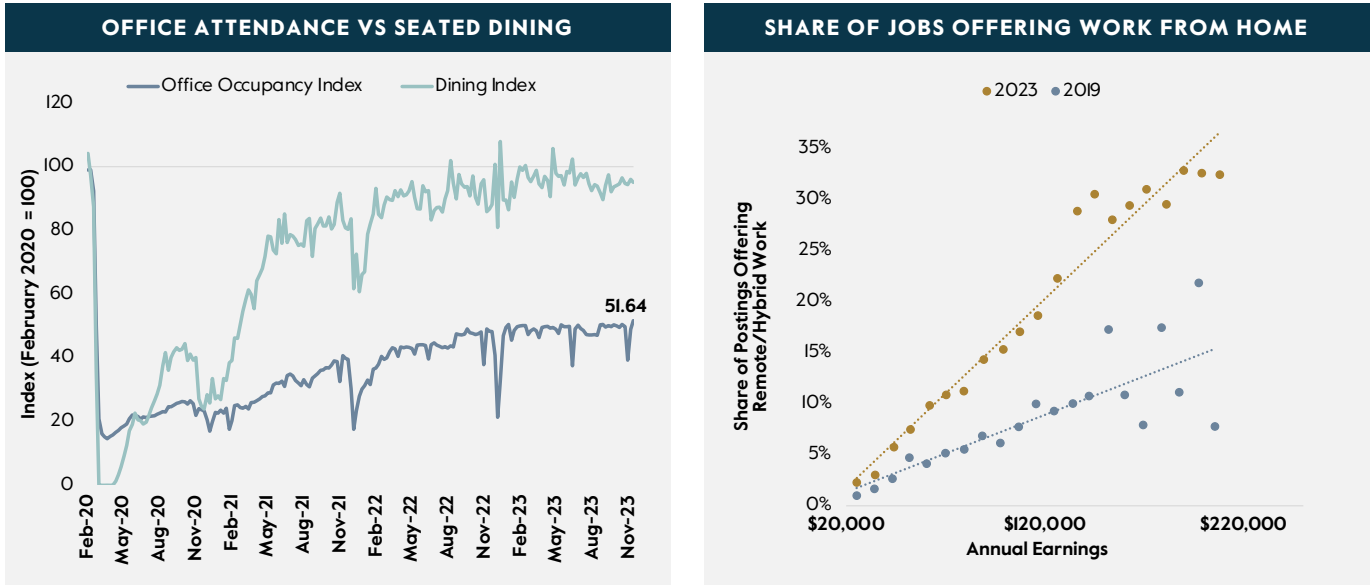


Figure 5. Source: Carlyle Analysis; Kastle Systems Data, OpenTable, Harvard Business Review, December 2023. There is no guarantee any trends will continue.

3 What are the market implications of the emergence of China’s electric vehicle sector?

In 2023, China overtook Japan as the world’s largest auto exporter thanks to a four-fold increase in foreign sales since the pandemic (Figure 6). Over the same period, Chinese automakers increased their domestic market share by 20 percentage points and now account for over half of all passenger vehicle sales in China. The sector’s growth is closely tied to the energy transition. Electric vehicles (EVs) comprise one quarter of China’s auto exports and more than a third of domestic auto sales. Over half of global EV sales involve Chinese brands.⁶

In many markets, EV adoption has been constrained by high prices (and, in many places, concerns about charging infrastructure). EV sales are growing, with more than one

million units sold in the U.S. in 2023, up 50% from the prior year. Unfortunately, production of new EVs has grown even faster, causing EV inventory-to-sales ratios to double over the past year to levels that are 60% higher than for the U.S. new car market as a whole.⁷ As Ford noted in a statement accompanying its Q3-2023 earnings, “many North American customers interested in buying EVs are unwilling to pay premiums for them over gas or hybrid vehicles.”^{8,9}

EV sales in China generally do not depend on consumers’ willingness to pay such premiums. The cheapest EV in Europe and the U.S. costs about twice as much as the cheapest internal combustion engine (ICE) vehicle; in China the cheapest EV sells at an 8% discount.¹⁰ And Chinese EV manufacturers

Figure 6. Growth of Chinese Automotive Sector

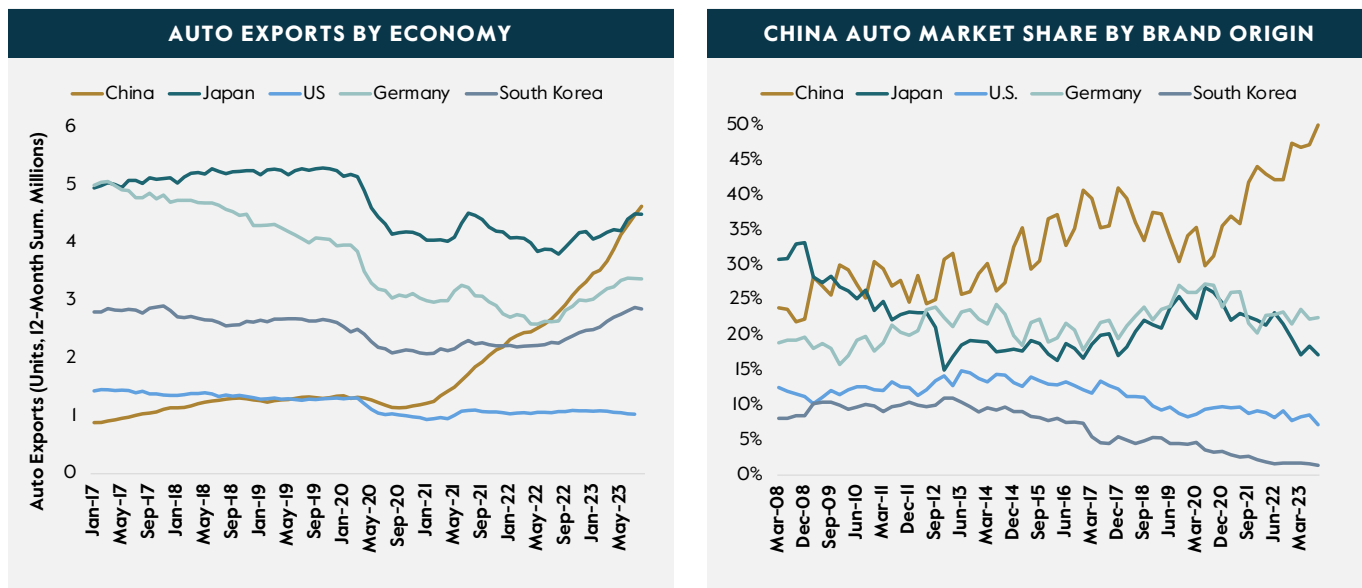


Figure 6. Source: Carlyle Analysis; CEIC, Lowy Institute, Bloomberg, December 2023. There is no guarantee any trends will continue.

6. Bloomberg, November 1, 2023.

7. Cox Automotive Report, December 14, 2023.

8. Reuters, October 27, 2023.

9. In the U.S., limitations on sourcing battery components from Chinese suppliers may complicate EV adoption further as such requirements are directly tied to which models are eligible for the credit. Another complicating factor is Beijing’s recent ban on the export of technology needed to mine and separate rare earth minerals.

can deliver these EVs profitably. Market-leading BYD reported that it earned \$1.4 billion in Q3-2023, an 82% increase from the prior year.¹¹ Affordability also explains export performance, especially in Emerging Markets.

The manufacture of EVs requires a mix of human and physical capital that differs from the endowed stock of ICE incumbents. While EVs have roughly the same suspension, tires, and wheels as ICE vehicles, they share little else in common. EVs employ an entirely different form of propulsion, with motors that transform electrical energy from batteries into mechanical energy rather than engines that convert hydrocarbons into mechanical force. A unified computer architecture replaces a patchwork of separate processors and control systems. EVs rely on 60% fewer components and parts than ICE counterparts (~13,000 compared to over 30,000), with no exhaust systems, alternators, fuel injectors, starters, or (multi-speed) transmissions. There's little overlap between basic materials, supply chains, and assembly processes.

Focusing exclusively on EVs has allowed some Chinese firms to engineer integrated production processes that deliver a

25% cost advantage relative to Western competitors.¹² Some of this is attributable to cheaper lithium-ion battery packs, which cost \$126 per kilowatt hour in China compared to \$141 to \$150 in the U.S. and Europe.¹³ Cross-border trade in EV battery packs is constrained by their weight and bulk, which means they generally need to be manufactured near vehicle assembly lines. About 80% of EV battery cells are manufactured in China, backed by a domestic value chain that mines, refines, and processes the requisite metals and materials. China's dominance in EV battery packs is just an extension of the economy's market lead in overall battery production (Figure 7).¹⁴

It's no coincidence that BYD started as a battery manufacturer before transitioning into autos. In some ways, EVs look like a more natural adjacency for battery or software companies than for ICE vehicle manufacturers. And that may become even more obvious over time as EV manufacturers compete on battery performance, vehicle range, and self-driving systems and other AI applications. Incumbent automakers are hardly out of the game, but changing consumer preferences and EV mandates pose a difficult question: if the future is electric and ICE vehicle production and supply networks have a limited role to play in it, are these just "stranded assets," akin to coal-fired power plants?

Figure 7.
China's Dominance of Battery Market

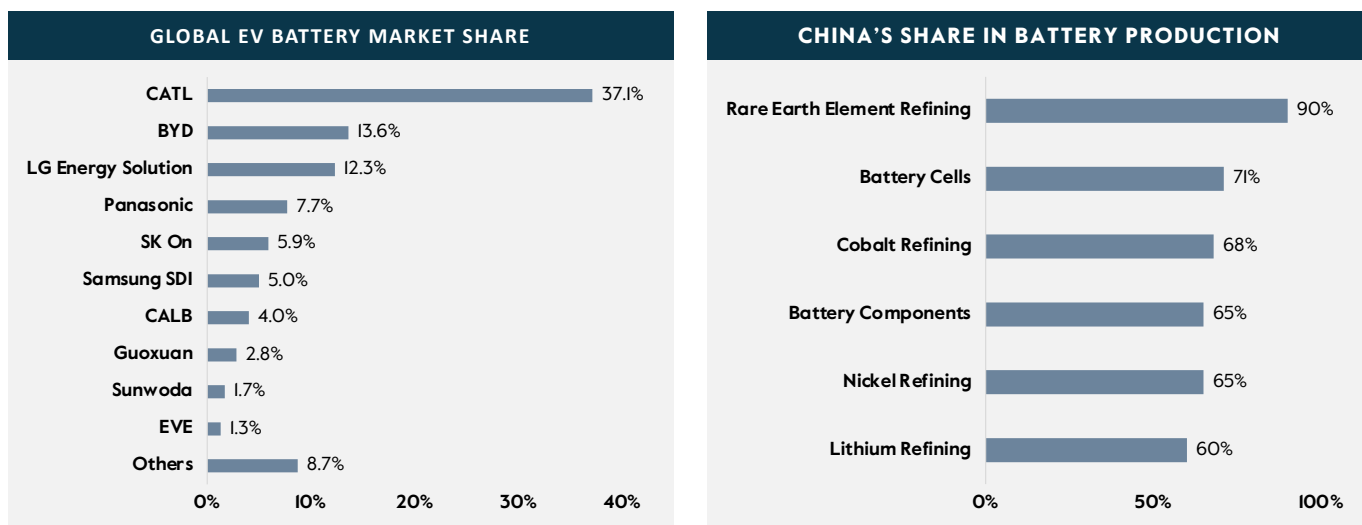


Figure 7. Source: Carlyle Analysis; Bloomberg, December 2023. There is no guarantee any trends will continue.

10. JATO Dynamics, "EV price gap: A divide in the global automotive industry," October 2023.
 11. Reuters, October 30, 2023.
 12. Patrick Hummel and Paul Gong, UBS, August 31, 2023.
 13. BloombergNEF, November 26, 2023.
 14. China's Dominance in Strategic Minerals Goes Beyond Ore, November 1, 2023.

4 ...and will it accelerate the fracture of global trade?

China’s trade balance in autos flipped from \$35 billion deficit in 2020 to nearly \$30 billion surplus last year. This remarkable turnaround has not gone unnoticed by European Union officials, as it has been part of a broader shift in bilateral trade balances. Since the onset of the pandemic, China’s exports to the EU have grown more than 70% and the EU’s trade deficit with China has doubled to €400 billion (Figure 8). EU leaders see this deficit as “unsustainable” and have threatened tariffs and even a trade war if left unaddressed.

About one-third of China’s EV exports go to Europe. In September, the EU launched a probe into China’s EV subsidies to address the “flood” of “artificially low”-priced autos entering the bloc. Though many models of Chinese EVs are priced twice as high in Europe as in their domestic market, they still sell at a 20% average discount to the offerings of European rivals, a price disparity expected to cause China’s share of the European EV market to double to 15% over the next two years (these figures include Tesla EVs manufactured in China). EU tariffs on Chinese EVs could be announced by July, would be set in proportion to size of the estimated subsidies, and come on top of an already-imposed 10% import duty.¹⁵

Figure 8. Shifting Trade Balances

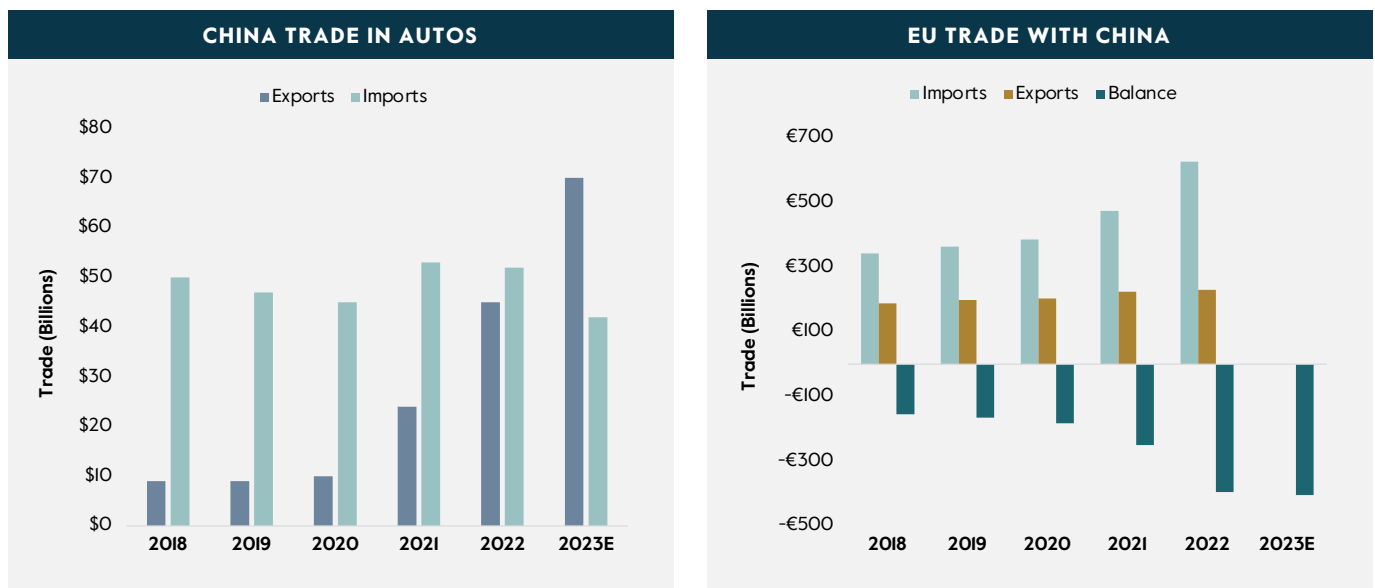


Figure 8. Source: Carlyle Analysis; CSIS, Eurostat, December 2023. There is no guarantee any trends will continue.

15. All data from Bloomberg, December 2023.

The main driver of the widened bilateral deficit has been EU imports of other “green industry” products like solar modules and batteries. Since the onset of the pandemic, European imports of Chinese solar modules have grown nearly five-fold, to 111 GW of capacity in the 12 months ending June 2023 (Figure 9, page 12), roughly equivalent to the entire installed PV solar capacity of the United States. Over the past two years, the share of Chinese batteries in EU imports increased by 50%.¹⁶ A recent European Commission report warned that at current trends, the EU could become as dependent on China for batteries and fuel cells as it was on Russia for oil and gas prior to the war in Ukraine.¹⁷

Europe absorbs nearly 60% of all China’s solar module exports. Chinese firms have focused on Europe because the U.S. market has become so inhospitable to them. Due largely to tariffs, U.S. imports of solar modules from China stood at just 0.5% of EU levels in 2023. Tariffs similarly limited U.S. imports of Chinese EVs to 8.5% of EU levels.¹⁸ Recent news reports suggest U.S. tariffs on Chinese solar modules, EVs, and lithium-ion batteries could be raised further in 2024.¹⁹ And while the U.S. Inflation Reduction Act (IRA) welcomes Japanese and Korean investment in domestic battery manufacturing capacity, its “foreign entity of concern” provisions make similar investment from Chinese firms impracticable. As a result, much of their foreign direct investment (FDI) has been directed to Europe (Figure 9, page 12).

It is difficult to overstate the complexity that the simultaneous intersection of geopolitical rivalry, energy transition, and industrial transformation introduces to the global economic picture. U.S. efforts to limit Chinese firms’ access to its market have redirected Chinese trade and investment flows to Europe to an extent that’s not likely to prove politically tenable. The looming EU response is now likely to introduce third and fourth order effects. Governments wish to transition to clean energy fast and cheap enough to meet net zero commitments, but also slow and expensive enough to protect domestic industries. Subsidies, mandates, and trade barriers are embraced to counteract subsidies, mandates, and trade barriers.

“Free trade” has always been more of an idea than a reality. But the era of relatively unfettered global trade and capital flows premised on that idea facilitated an unprecedented rise in global prosperity. Since the agreement to establish the World Trade Organization (WTO) was signed in 1994, global incomes rose 2.75x in real terms, the price of durable goods declined by nearly 40%, and the U.S. share (25%) of this much larger global pie was roughly unchanged from the pre-globalization days of 1980 (Figure 10, page 12). Times don’t always change for the better.

“It is difficult to overstate the complexity that the simultaneous intersection of geopolitical rivalry, energy transition, and industrial transformation introduces to the global economic picture.”

16. Carlyle Analysis, EuroStat Data, Rhodium Group, “Opening Salvo: The EU’s Electric Vehicle Probe and What Comes Next,” October 2023.

17. Reuters, September 2023.

18. Bloomberg, December 2023. China exported 48,000 EVs to the U.S. through October 2023, compared to 564,000 to the EU.

19. Wall Street Journal, “Biden Administration Explores Raising Tariffs on Chinese EVs,” December 21, 2023.

Figure 9.
Green Industry Trade & Investment Flows

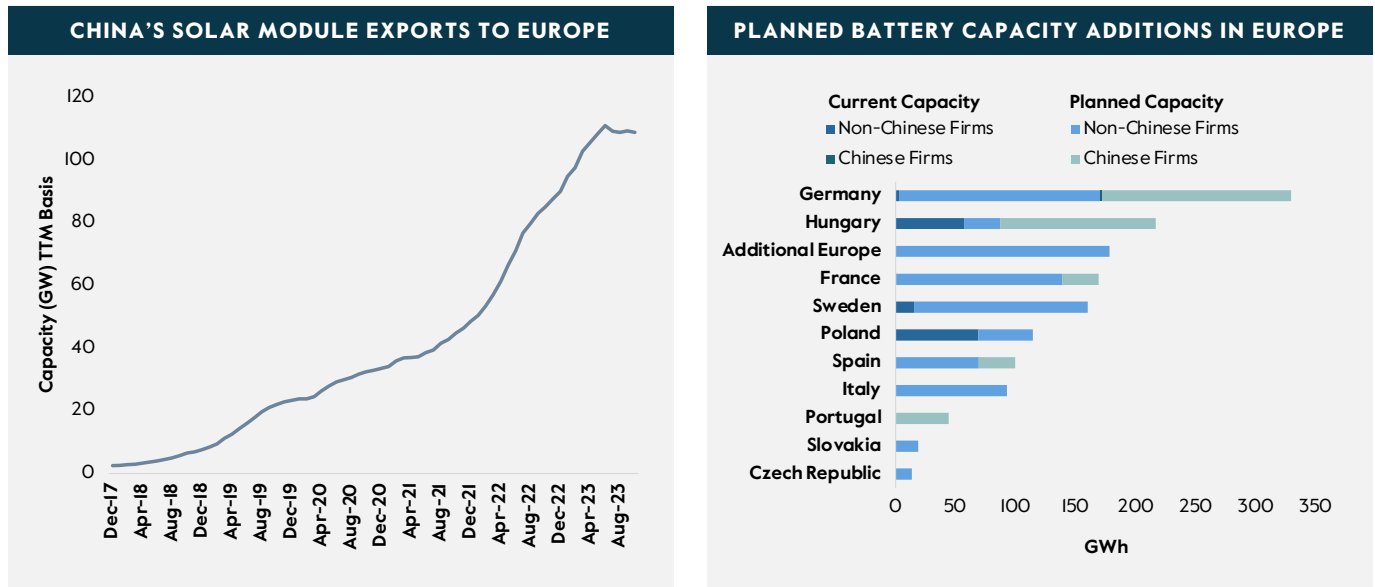


Figure 10.
Impact of Globalization

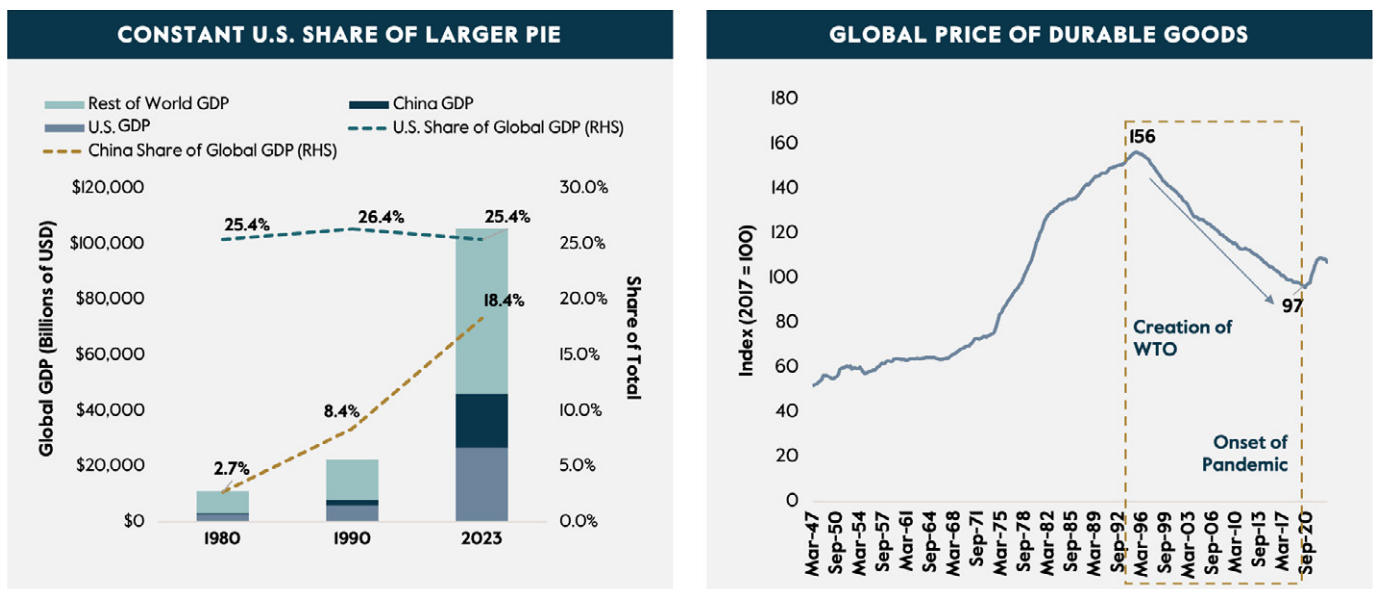


Figure 9. Source: Carlyle Analysis; Eurostat, Rhodium Group, December 2023. There is no guarantee any trends will continue.

Figure 10. Source: Carlyle Analysis; IMF WEO Database, Federal Reserve Data, December 2023. There is no guarantee any trends will continue.

5 How will post-QE era influence AI business models?

The EU's investigation into China's EV subsidies will focus mainly on purchase subsidies paid to manufacturers, direct government support in the founding of over 500 EV manufacturers, and exemptions from the vehicle purchase tax assessed on ICE vehicles. But most analysts agree that the biggest source of subsidization in China comes from below-market debt and equity financing.²⁰ Satisfactorily proving the existence of these subsidies can be challenging. The petitioner must stipulate a counterfactual expected return that the bank or equity investor *would have demanded* had the transaction occurred on more neutral terms.

At the 2010 Jackson Hole Symposium, Fed Chair Ben Bernanke described quantitative easing (QE) as a *de facto* subsidy for private borrowers and equity issuers. By buying longer-dated Treasury bonds and mortgage-backed securities (MBS), the Fed reduced their availability, pushing private portfolios into other types of assets and depressing their expected returns.²¹ Bernanke believed this "portfolio balance channel" would not only affect close substitutes for Treasuries, like high-grade corporate bonds, but also filter through to higher stock prices and tighter credit spreads.²²

While empirical work has had difficulty disentangling the portfolio balance channel from the effects of sustained periods of zero interest rates, there is broad evidence of an increase in risk-seeking behavior. If investors' return targets are anchored at some fixed level, lower returns on safe assets naturally push them to assume greater risk and adjust strategies in response to the Fed-induced repricing. Of particular interest has been the market's affinity for "growth" stocks, which some researchers see as evidence of a distortion in price signals that led investors

to "chase" stocks that grow without respect to their underlying fundamentals.²³

Whether or not this amounts to a "subsidy," investors became increasingly willing to fund operating losses at more mature companies with promising technologies. From 2017 to 2022, only about one-fifth of IPOs involved companies with positive net income (Figure II, page I4). Among tech companies with a valuation in excess of \$1 billion prior to the IPO, about half had losses greater than 20% of revenues and one-fourth had losses equal to more than 40% of revenue.²⁴ The amount of equity capital raised to cover cumulative operating losses has been staggering, ranging from \$5 billion to \$32 billion in the cases of many high-profile businesses.

Now that QE has turned into QT (quantitative tightening), that gravy train has ended. Cumulative layoffs in the tech sector since the first Fed rate hike have reached 400,000 as companies conserve cash and narrow losses in anticipation that that next round of equity funding might not be forthcoming. While public equity prices of loss-making businesses have rebounded sharply, in many cases, since the November 1 FOMC meeting, it would be cavalier to expect a swift return to 2021 market conditions. Management teams require a more conservative approach involving a clearer path to profitability.

What does this mean for the boom in Generative AI and related technologies? While the sharp decline in exits has negatively impacted VC fundraising and overall investment, capital deployment in AI remains robust, with the vertical receiving more capital than start-ups in any other sector last year, up 16% from prior-year levels (Figure I2, page I4). Will investors not only be willing to incubate promising

20. OECD, "Measuring distortions in international markets: Below-market finance," May 2021.

21. Bernanke, B. "The Economic Outlook and Monetary Policy," August 27, 2010.

22. C.f. Bernanke, B. (2010), "What the Fed did and why: supporting the recovery and sustaining price stability," *Washington Post* and "Monetary Policy since the Onset of the Crisis," August 31, 2012.

23. See literature review in Tawadros, G. and I.A. Moosa (2022), "A Structural Time Series Analysis of the Effect of Quantitative Easing on Stock Prices," *International Journal of Financial Studies*.

24. "Most Unicorn Startups Will Not Overcome Their Cumulative Losses," July 2021.

technologies, but also fund losses for more than a decade as companies scale their customer base and revenue? Or will sobriety prevail, forcing these companies to accept a discipline that was absent among compatriots in cloud computing, fintech, and e-commerce during the QE era? This

year is likely to see productivity gains as AI gets embraced more fully by businesses operating across the economy,²⁵ but we may also get signs as to whether 2022-23 was a blip on the screen or a reversion to market conditions more recognizable to the audience of Bernanke’s 2010 address.

Figure 11. Swings in the Market for Growth

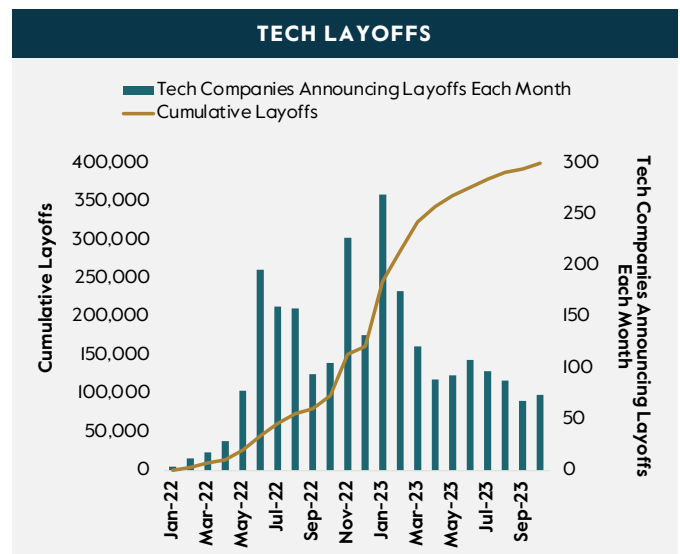
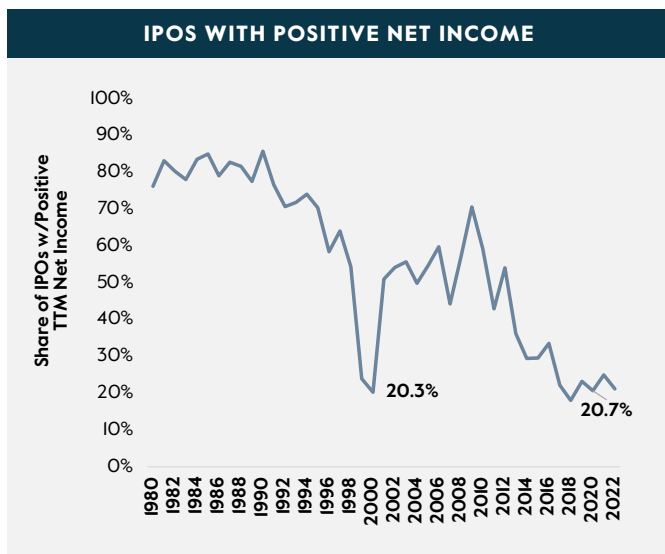


Figure 12. Exits & Capital Deployment in VC Markets

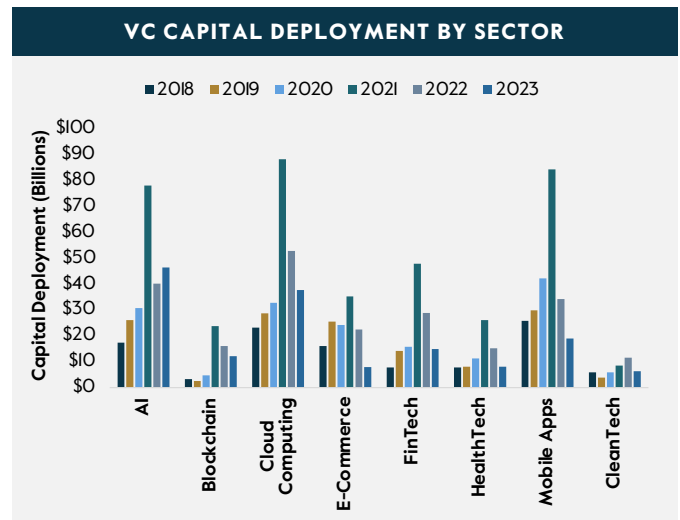
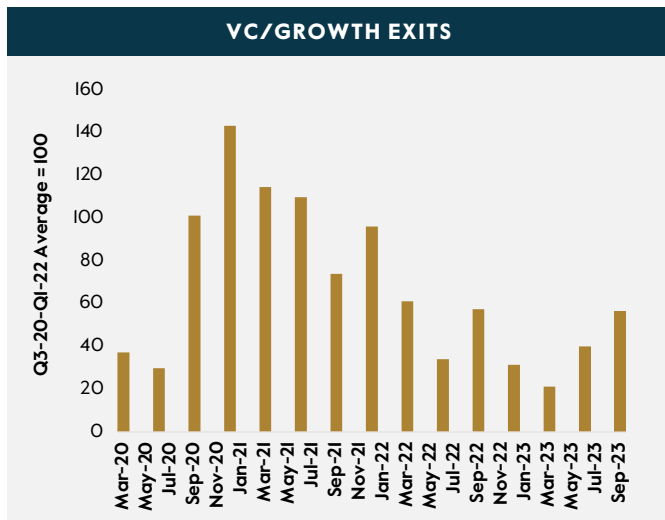


Figure 11. Source: Carlyle Analysis; SEC Data, Prof. Ritter, University of Florida, Layoffs.fyi, December 2023. There is no guarantee any trends will continue. Figure 12. Source: Carlyle Analysis; Precipin, Dealogic, December 2023. There is no guarantee any trends will continue.

25. For fuller discussion on this point, see: <https://www.carlyle.com/sites/default/files/2023-09/Carlyle-Global-Insights-Brave-New-World-AI-and-its-Downstream-Implications.pdf>

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