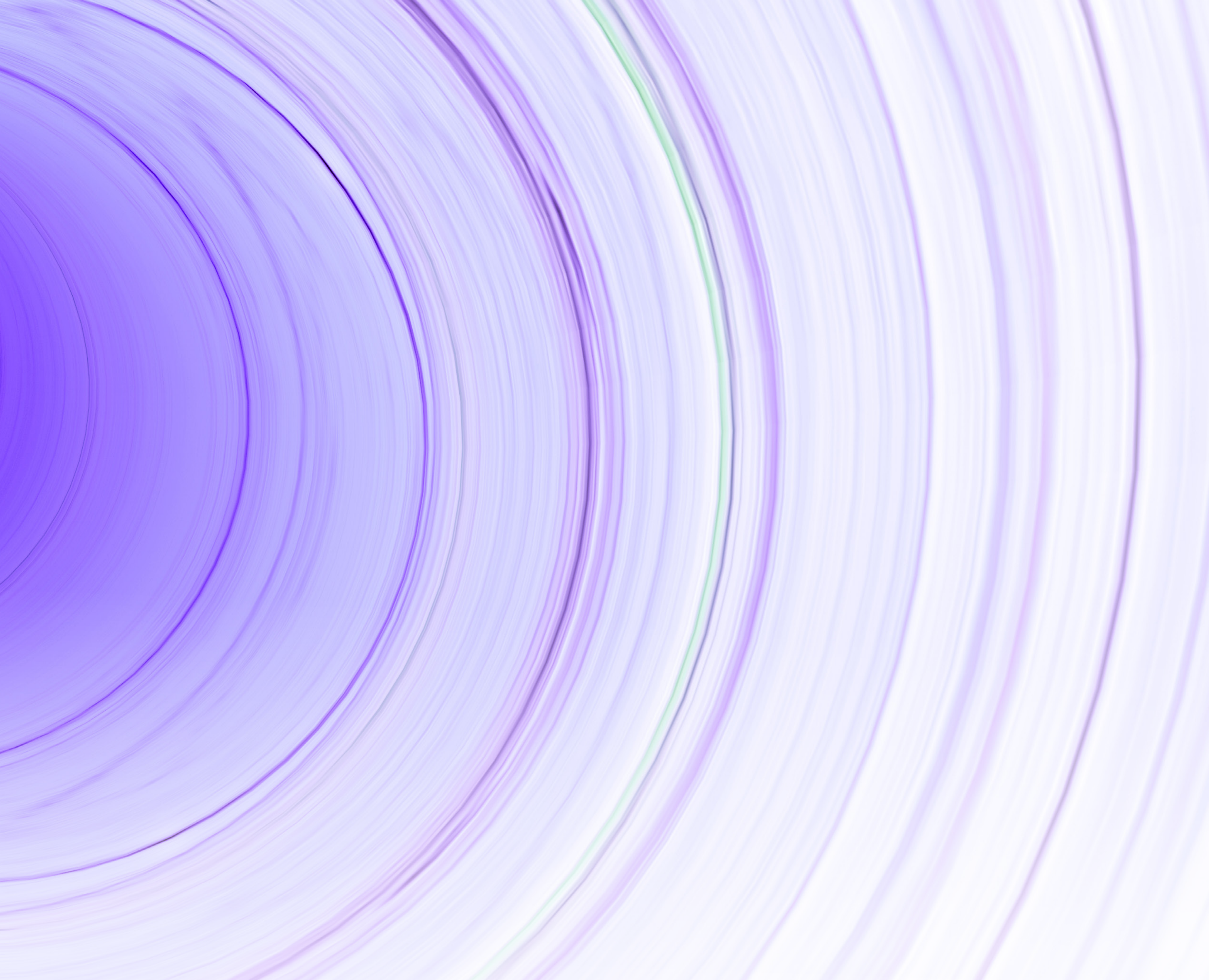
PGIM

RISK

2022 GLOBAL RISK REPORT: TAIL RISKS

Exploring the Unknowns



About PGIM

PGIM is the investment management business of Prudential Financial, Inc. (PFI). PFI has a history that dates back over 145 years and through more than 30 market cycles[1] and is built on a foundation of disciplined risk management. PGIM's more than 1,300 investment professionals are located in key financial centers around the world. Our firm is comprised of autonomous asset management businesses, each specializing in a particular asset class with a focused investment approach. This gives our clients diversified solutions from a leading global institutional asset manager[2] with global depth and scale across public and private asset classes, including fixed income, equities, real estate, private credit and other alternatives.

[1] 30 market cycles represent PFI's asset management expertise through PGIM and its affiliates and its predecessors. For additional information related to market cycles visit: www.nber.org/cycles.

[2] PGIM is the investment management business of Prudential Financial, Inc. (PFI). PFI is the 11th largest investment manager (out of 431 firms surveyed) in terms of worldwide institutional assets under management based on *Pensions & Investments*' Top Money Managers list published June 2022. This ranking represents institutional client assets under management by PFI as of December 31, 2021. No compensation was provided for participation in this ranking.

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"Where risk managers, portfolio managers and economists will fail will be a failure of imagination, if we are not careful."

DALEEP SINGH
Chief Global Economist, PGIM Fixed Income

INTRODUCTION

In January 2020, the world was hit with some jarring news: The first human-to-human transmission of COVID-19 was reported in Europe. According to news reports at the time, a German man acquired the infection from a colleague who had recently returned from overseas. Not to worry, though. According to an epidemiologist in the UK, "the indications are at this stage that onwards transmission will be limited."

Two-and-a-half years later, more than 6.5 million people have died[3] from one of the worst pandemics the world has ever seen.

Risk can come in many forms. Some of it we can see coming, some of it we could never predict, and rarely can we be sure of its ultimate impact (as the doctor quoted above can attest). Of course, some risks are more likely than others, and in some cases past experience can help bolster the response to the next bout of tumult.

Scenarios seen as more likely to occur than other "black swan" events, such as a global economic slowdown or a second pandemic, have historical parallels that may be more easily mapped and modeled. With concerns currently swirling around stagflation, for example, it might be possible to get a general feel for what financial markets might do based on the environment of the 1970s.

But what happens when the risk is less foreshadowed or understood? When a military conflict abruptly breaks out between Russia and the second-largest country in Europe, or when tensions between China and its neighbors escalate? Or when a central bank overreaction drives a sovereign credit event or forced selling situation? It's hard to model for those ultimate outcomes; past lessons are not easily applied due to the uncertain nature of risks, structural and performance constraints, and secondary impacts.

In that vein, PGIM set out to survey institutional investors around the globe to identify tail-risk scenarios with perceived low likelihood of occurrence, but potentially high impact, and low level of preparedness. Our survey aims to provide insights on where these risks may present a weakness for institutional investors — either due to current investments, lack of risk-management oversight, regulatory blind spots or policies that lead to unintended tail events — to discuss lessons learned from the past, and to offer insights on how to best prepare for severe risks.

[3] Johns Hopkins University & Medicine Coronavirus Resource Center (2022) *COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at JHU.* Available at: https://coronavirus.jhu.edu/map.html (Accessed 2022).

INSTITUTIONAL INVESTORS SURVEYED ACROSS THE GLOBE

We canvassed 400 senior investment decision-makers at institutional investors in Australia, China, Germany, Japan, the UK and the US with a combined AUM of more than $12 trillion.

Our findings are broken down into two segments: 1) the top three overall global tail risks, according to the investors we surveyed, and 2) the top country-specific tail risks for each of the six countries where we conducted surveys (see more about our methodology at the end of the report).

Based on our findings, the top three global tail risks are:

1

An unexpected liquidity crunch in key capital markets (US Treasuries, commodities, etc.) that results in a market crash.

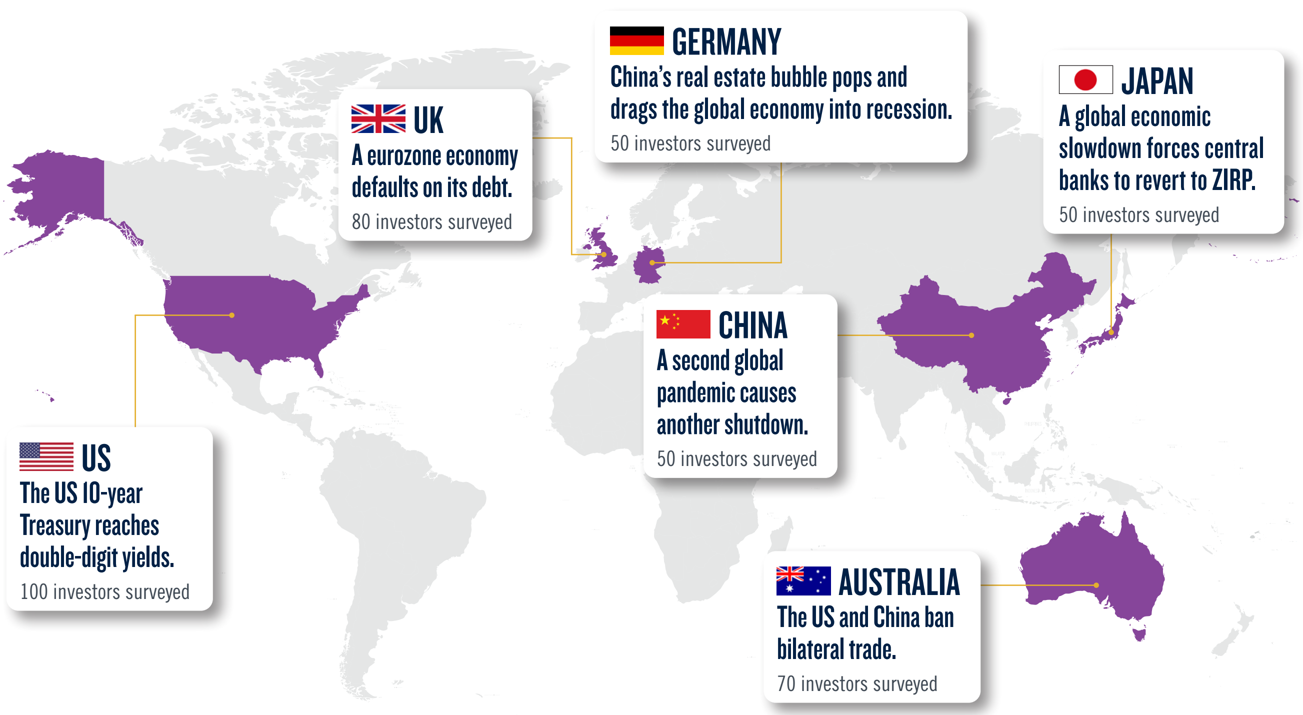
2

A military conflict in the Taiwan Strait or South China Sea.

3

A cyberattack disables a major financial platform or government agency for a significant period of time.

The top country-specific tail risks, as cited by investors in each region, are:



GEOPOLITICS AND ECONOMICS POSE THE GREATEST RISKS TO PORTFOLIOS

We address each of these tail risks in our report, but at an overarching level the predominant concerns of institutional investors center around the relationship between the US and China, questions about market function in times of stress, energy and natural resources, and the pervasive role of technology within the financial markets — and where it can go wrong.

Building on already heightened risk levels, geopolitics and economics present some of the major future risks to portfolios over the next three years, according to our survey. Headline-grabbing topics including inflation, recession and interest rates are top of mind for investors, not surprisingly, which reflects a focus on current and recent crises as opposed to other risks and unknowns.

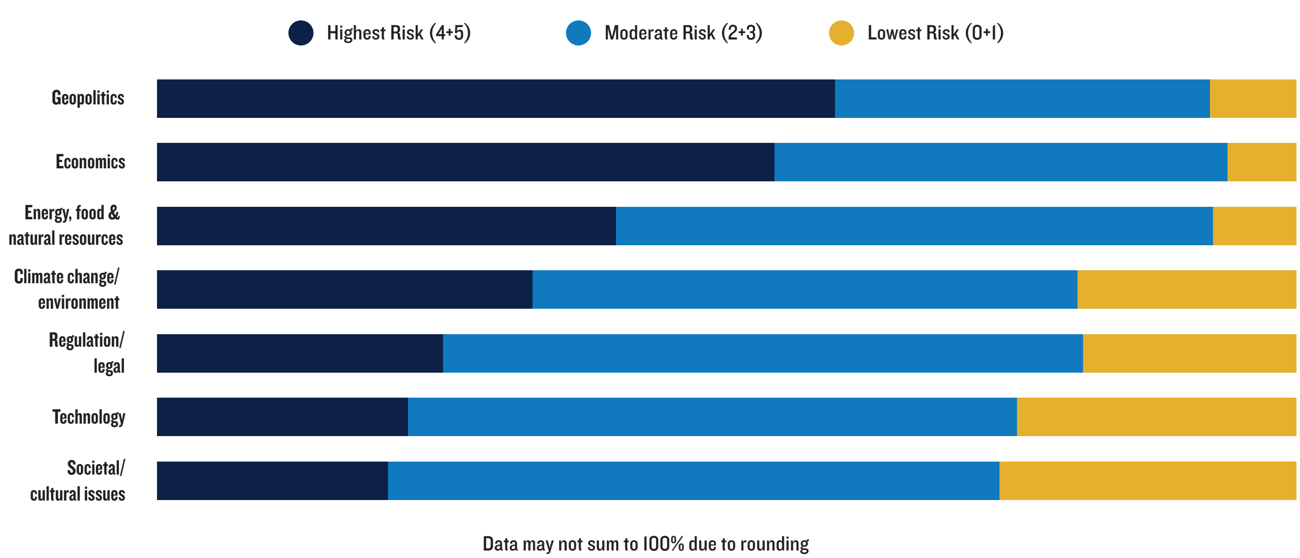
Globally, an unexpected liquidity crunch and a military conflict between mainland China and Taiwan are most consequential due to both severity of impact and low preparedness, but unique findings did emerge at the country level.

Geopolitics, along with energy, food and natural resources, present elevated risks to investors in Europe — likely due to the Russia-Ukraine conflict and its knock-on effects. US investors, meanwhile, are far less concerned about climate risks; nearly four in 10 (38%) rate climate change as "lowest risk," with a 22% net rating — the lowest risk area for the country.

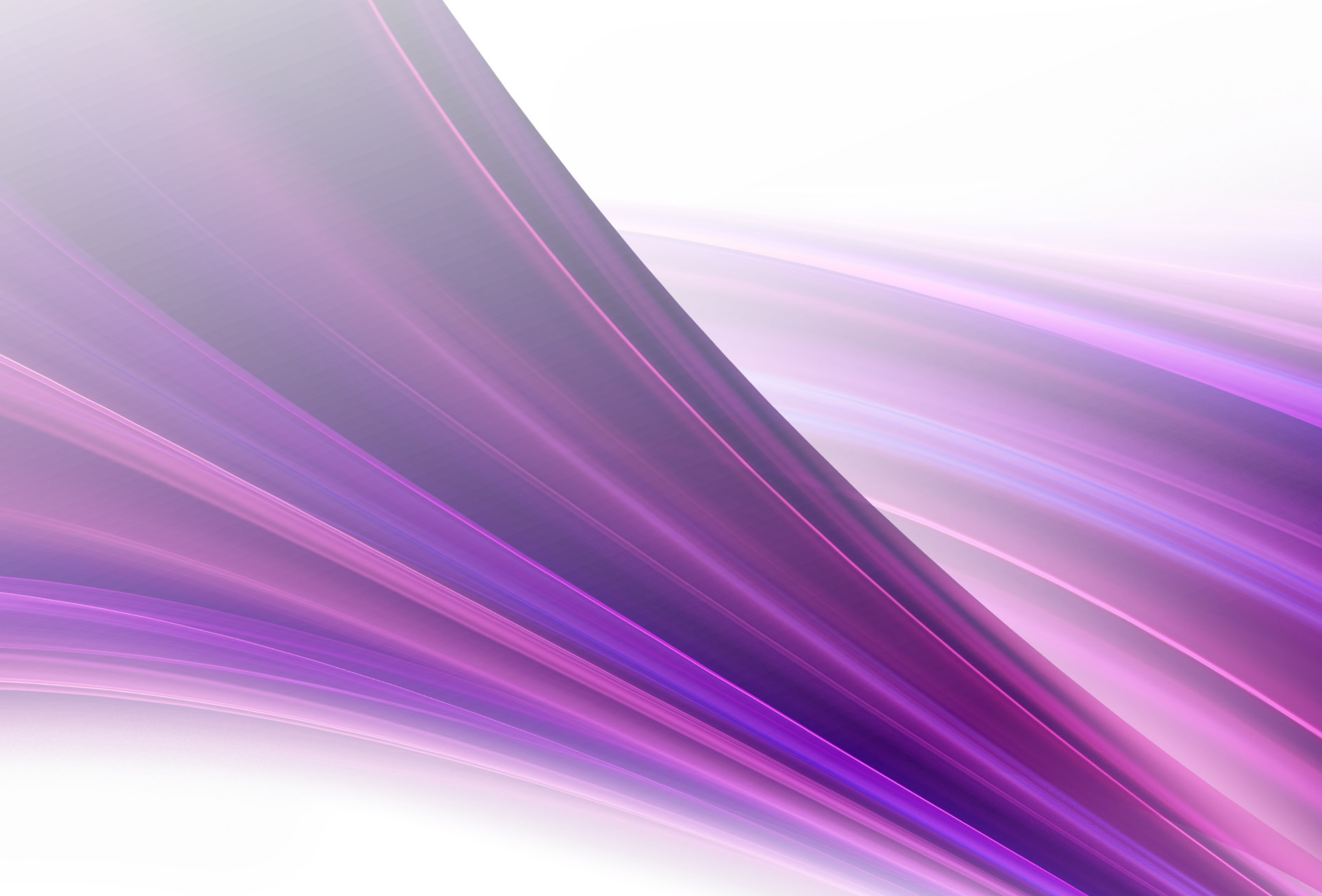
Asia-Pacific (APAC) investors have a more moderate and consistent overview of the risk landscape, with no standout areas of concern. Investors in the region see geopolitics as less of a risk than peers in the US and Europe, though Chinese investors harbor greater concerns about geopolitical risk compared to those in Japan and Australia.

Meanwhile, investors on the conservative end of the risk scale view societal/cultural issues and food, energy, and natural resources as higher risk areas compared to those with a more aggressive outlook.

Exhibit 1: Investors Say Geopolitics and Economics Are Biggest Risks



Source: 2022 PGIM Global Tail Risk Monitor Survey



A few other findings from our survey:

Global investors see inflation as the primary market risk (69% high risk), followed by recession (57%), interest rate risk and stock market risk (both 42%). Inflation and recession risk are considered the biggest market risks across all regions and particularly among investors in the US and Europe.

US investors display more divergent views. Stock market risk is seen as a greater risk — reflecting in part the fact that US markets have been more impacted by the rotation from growth-oriented tech stocks to value stocks. Elsewhere, the US has a much lower currency risk rating and is the only country with a net negative rating on commodity risk.

Country risk — or the potential impact that governments, politics and markets can have on a portfolio — features far more prominently on the risk radars of Chinese and Japanese investors. On a net basis, 40% of China respondents see country risk as high risk compared to 5% globally. Country risk is the joint second-largest market risk for China and the third largest for Japan from a net perspective. In contrast, this risk sits near the bottom of the list for all other nations.

Inflation and recession are viewed as bigger risks by institutions with larger AUM. In terms of organization type, endowments and foundations are less concerned about recession and liquidity risk.

69%

OF GLOBAL INVESTORS SEE INFLATION AS HIGH RISK

Source: PGIM 2022 PGIM Global Tail Risk Monitor Survey.

PART I

GLOBAL TAIL RISKS

Presented with various tail-risk scenarios that were selected to ensure coverage of top general risk areas (i.e., geopolitics, economics, technology, climate, etc.) and a mixture of market impacts (stock market, interest rates, liquidity, credit, etc.), our respondents named the following as their top-three tail risks.[4]

[4]The following tail risks were cited by the 400 global institutional investors surveyed, and their responses do not necessarily represent PGIM's current views.

GLOBAL TAIL RISK I

AN UNEXPECTED LIQUIDITY CRUNCH IN CAPITAL MARKETS (US TREASURIES, COMMODITIES, ETC.) RESULTS IN A MARKET CRASH

Of the investors we surveyed, the tail-risk scenario seen as having the greatest market impact and one for which they are least prepared is a major liquidity event in financial markets.

Kevin Warsh, a former member of the Federal Reserve's Board of Governors, described liquidity as an asset's "ability to be transformed into another asset without loss of value." Put another way, a high level of liquidity means investors can quickly buy or sell "without exerting a material effect on prices."

As for financial institutions, the Bank for International Settlements uses the term "liquidity" to refer to the ease of financing in global financial markets, with credit among the key indicators of liquidity. (As the legendary Salomon Brothers economist Henry Kaufman, aka Dr. Doom, was fond of saying, "Money matters, but credit counts.")

For those investors who were around for the Global Financial Crisis (GFC) or the so-called Taper Tantrum of 2013, it should come as no surprise that a liquidity event is top of mind for CIOs. A sudden drying up of liquidity in some of the most fluid markets in the world can create terrifying moments for investors. Here's partly why: As of 2021, the size of the bond market (total debt outstanding) was estimated to be $119 trillion worldwide, and $46 trillion for the US market, according to the Securities Industry and Financial Markets Association.

While a repeat of the GFC doesn't appear imminent, there are some parallels that can be drawn between last decade's Taper Tantrum and today's environment. Back then it was the Fed's announcement of its intent to rein in its quantitative easing program implemented on the heels of the financial crisis that fueled worries of a liquidity crisis. The market reaction was swift and powerful, despite the fact that the Fed never actually followed through on its intentions; Treasury yields surged as investors worried that the massive liquidity injection of the prior several years was going away.

"

The moment in which one loses confidence in the very instrument that defines risk-free, the ripple effect is massive."

GREG PETERS
Managing Director, PGIM Fixed Income

More recently, investors will remember the COVID-induced "dash for cash" as a result of the economic dislocations tied to the COVID-19 pandemic in early 2020. Global selling pressure was seen across sovereign bond markets, resulting in a deterioration in market functioning of key asset markets, which in turn led to central bank interventions.

Research from the New York Federal Reserve found that selling pressure was more pronounced and broad-based in US Treasuries than in other sovereign bond markets, reflecting the US dollar's role as the dominant global investment and funding currency. Leverage can also amplify liquidity turbulence. The New York Fed noted that differences in leverage dynamics played a major role in explaining why the Treasury market faced larger disruptions to market functioning.

"Stronger pre-pandemic Treasury issuance, as well as supportive financing conditions and other factors, helped pave the way for a heavier build-up of leverage in the Treasury market than in other sovereign bond markets," the bank's researchers concluded. "As a result, the COVID-19 shock catalyzed more de-leveraging, and hence higher selling pressure, in the Treasury market."

A liquidity crunch also struck UK gilts recently, prompting the Bank of England to intervene with a pledge to buy government bonds to calm the market. Rates surged in the wake of new UK tax and energy subsidy plans, and pension funds were forced to sell assets to post additional collateral with liability-driven investment funds (LDIs) — further drying up liquidity in the system. It was a reminder for investors that if tail risks materialize, even de-risking strategies — in this case, LDIs — can get caught up in a market spiral.

Meanwhile, the Fed has already begun ratcheting back its "easy money" policy put in place as a result of the pandemic, while at the same time dramatically raising rates to combat a stubborn and prolific US inflation problem. The result has been a marked increase in volatility, sharply higher bond yields, and growing concern about how it all ends.

Were it to happen, a severe liquidity crisis in arguably the world's most important market (US Treasuries) would have a cascading, ripple effect across global markets. Treasuries are the backbone of the international financial system, widely held by foreign central banks and the gauge off of which rates on many loans are set. A reduction in global liquidity could pave the way for disruptions in the proper behavior of financial markets and, in the worst cases, suppress investor risk appetite to the point it leads to malfunctioning markets. The decline in Treasury issuances since the height of the COVID-19 crisis — when the government issued debt to fund an unprecedented amount of fiscal stimulus — has exacerbated liquidity concerns in the bond market.

$119 TN

SIZE OF THE BOND MARKET AS OF 2021 WORLDWIDE

Source: Securities Industry and Financial Markets Association

What's more, one of the sinister developments of such a scenario is that there would be very few places to hide; even during market-jolting events such as the Russia-Ukraine military conflict, there were corners of the market where investors could find returns, whether it be in energy and other commodities, gold or fixed income. But when global liquidity evaporates, there are very few ports in the storm. One of those ports would typically be US Treasuries, so a liquidity event there — unlikely as it seems — would be devastating. The cascading effects would bleed into assets that investors have moved into heavily and would likely involve counterparty risks. Neither capital providers nor investors would necessarily be prepared for that.

"Think about Long-Term Capital, when you employ a handful of people that have Nobel Prizes and PhDs — the smartest people on the planet — and their whole idea was to pick up pennies off the floor," said one large US investor surveyed. "It would add up to a really nice return. Then a handful of bad circumstances all lined up together in a once-in-a-lifetime event and it took the company down and shook up some pretty large counterparties."

GLOBAL TAIL RISK II

A MILITARY CONFLICT IN THE TAIWAN STRAIT OR SOUTH CHINA SEA

"Strategic ambiguity" may be a thing of the past. And that has investors worried.

The tensions between mainland China and Taiwan appear to be headed to a boil, so it's no surprise institutional investors cited a military conflict as their second-highest tail risk. Based on our survey, it's also one of the risks investors feel least prepared for. And similar to the repercussions of a major liquidity event, a China-Taiwan conflict would have stark ramifications for global financial markets.

For starters, much of the ubiquitous technology and electronic equipment used around the world is powered by semiconductors manufactured in Taiwan. China may be the largest single country market for semiconductors, because it is a manufacturing and assembly hub for most of the world's smartphones and personal computers, but it doesn't have the semiconductor presence it wants. While chipmakers there are increasing their R&D spending, so too are their more established rivals such as Taiwan Semiconductor. The Semiconductor Industry Association says that if Taiwan production was shut down for a year because of military or political circumstances, the cost to annual revenue for device makers worldwide would be $490 billion.

It's likely that US-China relations as it relates to the technology sector will remain one centered on competition. There may be some efforts at harmonizing the US and European approach to the tech industry, but that will be a long-term process. In the US, the emphasis will not likely be on the reversal of tech policy but on finding more sustainable policies. On the Chinese side, the country's geopolitical interests and the interests of many big tech firms there are closely intertwined.

$490 BN

THE COST TO ANNUAL REVENUE FOR DEVICE MAKERS WORLDWIDE IF TAIWAN PRODUCTION WAS SHUT DOWN FOR A YEAR

Source: The Semiconductor Industry Association

Outside of the technology arena, a military conflict involving China would represent something else: a potential shifting in global power. An intensification of the struggle for global power dominance is likely to lead to more frequent conflicts and proxy wars.

Meanwhile, the US recently has increasingly asserted that, should there be a conflict between mainland China and Taiwan, the military would quickly come to Taiwan's defense, a reversal from a years-long stance of "strategic ambiguity."

Sanctions targeting China represent another risk for investors. In the days and weeks following the start of the Russia-Ukraine military conflict, western nations imposed economic sanctions on Russia while dozens of companies ended business operations there. Anticipating a similar response from the US and Europe, China may be preemptively decoupling from western financial markets, institutions and the dollar to establish its own sphere of influence, potentially resulting in a new, bipolar world order. While military action by Russia and a conflict involving China will not look the same, lessons can be drawn from the Russia-Ukraine conflict, especially as geopolitical uncertainty rises with an isolated Russia seemingly becoming more unpredictable.

At the same time, the potential impact to the global supply chain of a conflict between mainland China and Taiwan would be substantial. According to Bloomberg, about half of the world's container ships passed through the Taiwan Strait in the first seven months of 2022. Global supply chains require geopolitical stability and low trade barriers to function properly, the exact opposite of what this tail-risk scenario would deliver.

> **"People just don't pay enough attention to the downside. It may be optimism bias, or the desire not to pay away money in good times. But the same people who buy fire insurance for their house oppose doing the same thing for their portfolio."**

SUSHIL WADHWANI
CIO, PGIM Wadhwani

GLOBAL TAIL RISK III

A CYBERATTACK DISABLES A MAJOR FINANCIAL PLATFORM OR GOVERNMENT AGENCY FOR A SIGNIFICANT PERIOD OF TIME

In 1973, 239 banks from 15 countries got together to solve a common problem: how to communicate about cross-border payments.

The banks formed a cooperative utility, the Society for Worldwide Interbank Financial Telecommunication (SWIFT), which today connects more than 11,000 financial institutions across the world. But in March of 2022, it took just a half dozen or so Russian banks getting kicked off the system in response to Russia's attack on Ukraine to send a wave of worry across global financial markets.

Why? Worries about cyberattack.

The global payments messaging system used by financial institutions around the world, SWIFT supports trillions of dollars every day crossing borders around the world. While individual banks have various levels of protections against cyberattacks, experts were concerned that Russia might try to go straight to the medium of funding — in this case, SWIFT — potentially disrupting the entire financial system.

Notably, only 30% of our respondents said they are prepared for such a major cyberattack — despite this being seen as one of the most likely tail risks to occur over the next three years.

"The things that are happening are so new, they are difficult to anticipate," said one CIO of a US defined benefit plan. "You don't anticipate COVID. So are one-in-10 events becoming now one-in-five events? How can you model that?

"

The world evolves. And the risks change as well. And I would say that the risk that we keep our eyes on the most now is cyber risk."

JEROME POWELL
Chairman of the Federal Reserve

For a glimpse of what the fallout from a cyberattack may look like, investors can look back at technical glitches that brought down trading platforms. In a 2013 incident that became known as the "flash freeze," trading in securities listed on the Nasdaq was halted for approximately three hours and 11 minutes after a glitch left its systems unable to process quotes. Nearly two years later, in July 2015, the New York Stock Exchange went down for about four hours when trading was suspended to deal with a significant technical issue.

While those glitches created brief periods of uncertainty, trading resumed the same day and investors largely brushed off those issues as one-time events with little long-term damage. A major cyberattack is something unfamiliar to investors, and the scope of an attack targeting SWIFT or another financial platform would likely have more severe consequences.

In a July 2022 report, the Federal Reserve warned that "the rising number of advanced persistent threats increases the potential for malicious cyber activity within the financial sector." The impact of a cyberattack on a third-party service provider that compromises the financial system is a significant evolving risk, the report added. Broadly, cyber threats "may result in incidents that affect one or more participants in the financial services sector simultaneously and have potentially systemic consequences."

LESS THAN ONE-THIRD

OF THOSE SURVEYED SAID THEY ARE PREPARED FOR SUCH A MAJOR CYBERATTACK

Source: 2022 PGIM Global Tail Risk Monitor Survey

As history has shown, a cyberattack — and the market risks that come with it — can arise not just from broader conflict, but from what appear to be mundane events. Look no further than the 2014 hack on Sony, which the US traced to North Korea. Why was Sony targeted? Reports suggested it was retribution for the Seth Rogan and James Franco comedy, *The Interview*.

HOW PREPARED ARE INVESTORS FOR TAIL RISKS?

According to our survey, just a tiny proportion (3%) of institutions have a dedicated tail-risk manager, and fewer than four in 10 actively monitor tail risks, although this rises to more than half of large ($50B+) institutions. Only a third actively track and analyze interconnections between risks and prepare specific risk-response plans.

Investors acknowledge a variety of gaps and shortcomings in their investment risk monitoring, chief of which are failure to detect risks early (36%) or react to them speedily (41%). More than a third also say they are unable to predict black swans (36%) and, worryingly, nearly three in 10 identify risk management complacency as a key challenge.

Predictive, AI-powered models for unknown risks are at the top of the wish list for many institutions, while tail-risk hedging strategies are sought after when it comes to information sharing. Subject-matter expertise is key for many to get in front of looming tail risks.

Institutional investors deploy three main approaches to monitor investment risk: holistic monitoring across asset classes (44%), regular risk scenario analysis (41%) and regular evaluation of the effectiveness of risk management processes (41%). Less than four in 10 institutions actively monitor tail risks (38%) or prepare specific risk-response plans (32%).

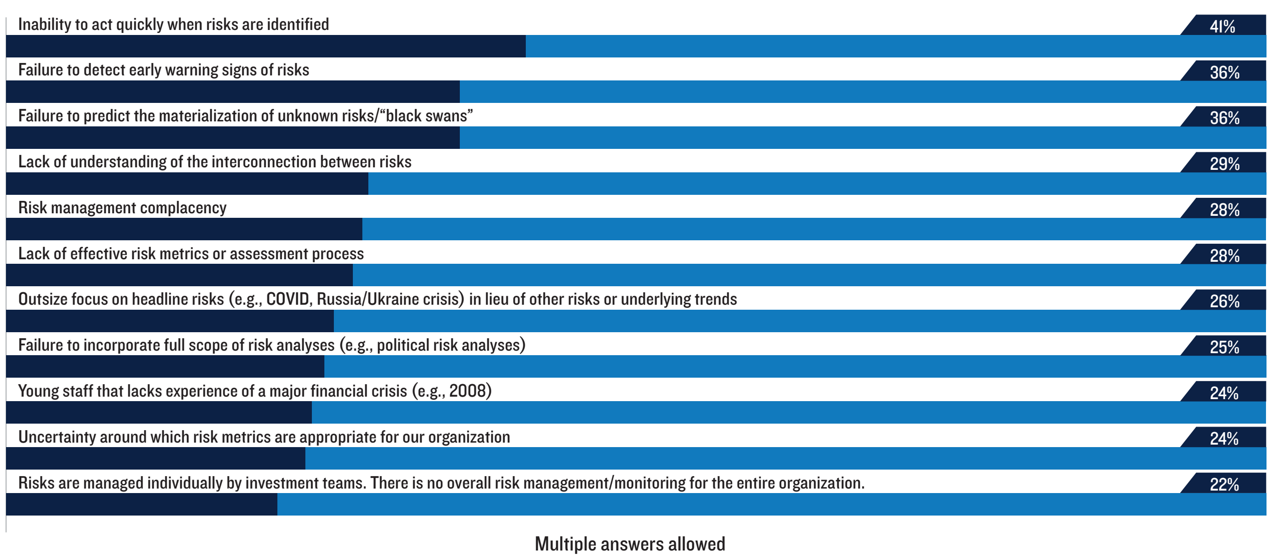
Over half of large institutions ($50B and above) actively monitor tail risks, with this group also more likely to regularly refine or update risk metrics.

However, organizations that actively monitor tail risks do not exhibit better preparedness across the spectrum of tail-risk scenarios, indicating that more help is needed on this front.

A higher percentage (61%) of organizations with an aggressive risk tolerance conduct holistic monitoring across asset classes. These organizations appear more focused on risk management across the board as they look to mitigate the added risk that comes with aggressive approaches.

"I think for our optimization, I'm not that confident that we are better than others in a certain area," said an executive at a large institutional investor in China. "And the reason is not because we're not working hard enough, it's because our portfolio is too complicated and too large."

Exhibit 2: **Detecting Risks Early and Reacting to Them Speedily Are Seen As Greatest Monitoring Challenges**



Source: 2022 PGIM Global Tail Risk Monitor Survey

HOW CAN INVESTORS HEDGE AGAINST RISKS?

In times of uncertainty, asset owners need to employ agile tail-risk hedging strategies and be more dynamic with their investment allocations. But by definition, tail risks are rare, which makes them exceedingly difficult to prepare for.

Making things even more difficult is the cross-border, intertwined nature of today's global financial markets. What started in a relatively small corner of the asset-backed securities markets during the GFC, for example, cascaded into virtually every nook of the publicly traded debt and equities markets.

The best insurance against such rare and complex events is perhaps found in two tried-and-true investment mantras: taking a long-term view and diversifying portfolios. Remaining diversified across asset classes, investment styles, and time frames, and choosing solutions with a low beta to traditional markets over a full market cycle, remains imperative. And liquid alternative solutions that combine trend following with directional and relative value strategies can be advantageous diversifiers in any market environment.

For those scenarios when equities are performing especially poorly, a dynamic multi-asset defensive solution that uses macro tail risk and capital preservation to address volatile market environments can provide reliable diversification. And one of the most sensible ways of building portfolios is to diversify across investment opportunities with low correlations to one another.

Due to the uncertain nature of tail risks, it also makes sense for institutional investors to maintain a long-term outlook. Not only are the outcomes of many risks uncertain, but the time horizons are likewise unclear. For example, putting the human catastrophe aside, the COVID-19 pandemic bear market that had some observers at the time talking of a years-long drought was instead measured in weeks. Knowing that, investors would have likely behaved differently.

"I think one important lesson we've learned is that you have to differentiate what kind of crisis it is," said the institutional investor in China. "Is it a 'V-shaped', 'U-shaped', or 'L- shaped' crisis? That's very important because it defines your different tools and ways that you can deploy to protect your portfolio."

Meanwhile, though some investors may oppose paying for tail-risk "insurance" — whether it be through puts or volatility exposure — due to the expense, it can be valuable when the markets turn against them. Active managers can build

Guarding Against Risk

- Remaining diversified across asset classes, investment styles, and time frames, and choosing solutions with a low beta to traditional markets over a full market cycle, remains imperative.
- A dynamic multi-asset defensive solution that uses macro tail risk and capital preservation to address volatile market environments can provide reliable diversification.
- Liquid alternative solutions that combine trend following with directional and relative value strategies can be advantageous diversifiers in any market environment.
- Monitoring leverage, collateral arrangements, and liquidity positions through these shocks can help investors avoid becoming a forced seller while the event is unfolding.
- Investors should also consider stress testing as opposed to looking at traditional statistical measures that make assumptions that may not be realistic for some exposures.

portfolio strategies that will protect investors in a variety of scenarios. Monitoring leverage, collateral arrangements, and liquidity positions through these shocks can help investors avoid becoming a forced seller while the event is unfolding.

“You have to have a mixture of bets, because what happens will be different than anything you plan for, and where you think you have protection you might not,” said Sushil Wadhwani, CIO of PGIM Wadhwani.

When considering risks that are subject to extreme outcomes (and potentially not diversifiable), investors should also consider stress testing as opposed to looking at traditional statistical measures that make assumptions that may not be realistic for some exposures. Instead of contemplating all of the potential risks that may arise (an impossible task), view risk management through the lens of actual exposures, then work backwards to see what risk events would be most detrimental.

Of course, investors can’t reliably predict when equity market pullbacks will occur, when recessions are forthcoming, or certainly when a particular tail risk will emerge. But knowing they will occur and being creative in planning for such events is vital to ensuring that the damage inflicted can be mitigated.

“We can’t just focus on failures that we remember,” said Daleep Singh, PGIM Fixed Income’s chief economist. “No one’s going to forget this pandemic. We have not forgotten the great financial crisis or the dot-com bubble. Where risk managers, portfolio managers and economists will fail will be a failure of imagination, if we are not careful. So we’ve got to really commit to a process of thinking about scenarios across the entire probability distribution outcomes, especially tail scenarios.”

PART II
COUNTRY-SPECIFIC TAIL RISKS

We canvassed 400 senior investment professionals across the globe with a combined AUM of more than $12 trillion and unveiled the top country-specific tail risks, as cited by investors in each region.

AUSTRALIA

THE US AND CHINA BAN BILATERAL TRADE

China is the main cog in the engine powering Australian trade. Therefore, if trade between the US and China is dissolved, investors fear Australia could get caught in the middle.

A trade ban between the world's two largest economies also would threaten to weaken growth prospects and market sentiment across the globe, a potentially destructive force for a wide range of asset classes. This places a US-China ban on bilateral trade at the top of the risk-management list for Australia's institutional investors.

At over 30% of overall trade in 2021, China is by far Australia's biggest trade partner — more than three times the size of its next largest partner, Japan. The trade relationship with China is fueled by exports, particularly commodities like iron ore and natural gas. Trade with China is also growing faster than Australia's other trade relationships, expanding 11.9% over a five-year period ending in 2021.

11.9%

GROWTH IN TRADE WITH CHINA OVER A FIVE-YEAR PERIOD

Source: Australian Government Department of Foreign Affairs and Trade

Exhibit 3: Australia's Top Two-Way Trading Partners (AUD in millions)

Rank	2019	2020	2021	% Share of Total	% Growth 2020 - 2021	% Growth 5-Year Trend
1. China	251,235	246,182	282,188	30.7	14.6	11.9
2. Japan	86,557	66,222	87,242	9.5	31.7	4.5
3. United States	80,840	73,181	68,183	7.4	- 6.8	1.4
4. Republic of Korea	41,267	34,898	51,074	5.6	46.4	2.7
5. Singapore	33,170	26,516	35,923	3.9	35.5	7.1
6. India	29,172	24,319	34,317	3.7	41.1	5.6
7. New Zealand	30,945	23,639	24,316	2.6	2.9	- 1.9
8. Taiwan	20,159	16,227	23,917	2.6	47.4	9.5
9. Malaysia	23,905	19,343	23,351	2.5	20.7	3.0
10. Germany	23,134	21,483	22,866	2.5	6.4	1.7

Source: Australian Government Department of Foreign Affairs and Trade

Exhibit 4: **Australia's Goods and Services Trade with China 2021**

Exports		Imports	
Item	**A$B**	**Item**	**A$B**
Iron Ores & Concentrates	126.8	Telecom Equipment & Parts	8.8
Natural Gas	18.5	Computers	8.1
Gold	7.0	Furniture, Mattresses & Cushions	4.1
Confidential Items of Trade	5.1	Prams, Toys, Games & Sporting Goods	3.4
Education-Related Travel	4.4	Plastic Articles	2.6
Personal, Cultural and Recreational Services	3.4	Electrical Machinery & Parts	2.2
Wool & Other Animal Hair (incl tops)	2.5	Other Textile Clothing	2.2
Total	**188.9**	**Total**	**93.3**

Source: Australian Government Department of Foreign Affairs and Trade

As a result, investors in Australia are understandably sensitive to the tail risk that trade is banned between the US and China, considering the potential spillover effect for Australian markets and the economy.

Should the US-China trade relationship break down, market participants are braced for significant fallout, as 47% of Australian investors expect an extremely severe impact on their portfolios. Yet 62% believe their organizations are unprepared to handle the fallout, five points above the global response.

In the event of a trade ban, prices for certain commodities in the US and China could rise. In Australia, commodity producers could emerge as winners if global prices rise and export demand holds strong.

Broadly, prices for a wide range of assets, such as the companies that produce goods locally that are in short supply during a trade ban, would likely appreciate. This phenomenon has become more acute for investors after navigating the factory closures and shortages of materials and finished goods during the COVID-19 pandemic.

However, for companies that produce and sell goods globally, the impact could be a triple play of bad fortune: revenues, margins and earnings could all come under pressure. On the opposite end, companies that make and sell their goods domestically could present an opportunity for institutional investors. To manage risk from a trade ban, investors should consider which category a company would fall under to determine the short- and long-term impact on certain equities and corporate bonds.

Long-term investors should also consider the potential drag on global economic activity and commodities demand, a ripple effect that would create headwinds for financial markets and damage sentiment around the world. An economic slowdown in China — the US is its biggest trade partner — would have a negative effect on Australia's commodity exports and other trade flows, weighing on the valuations of local producers.

Despite the risk of economic contagion stemming from a trade ban, Australian investors say economic and recession risks are more moderate when compared to other investors. Only 34% say geopolitics are a high risk to their investments, compared with 59% globally. Australians are also less concerned about inflation, with 59% of investors there labeling it a high risk to their portfolios whereas 69% agree globally. By contrast, 43% say commodity risks are high, 13 percentage points above the worldwide average.

Australians are also more likely than investors in five other regions to say they made changes to their portfolio based on a change in their assessment of technology-related risks. The survey found that 34% of Australian investors say their organizations believe there is a higher level of risk pertaining to technology than there was 12 months earlier.

More than nine in 10 investors in Australia look to asset managers to help prepare for tail risks, particularly in the areas of reporting and the provision of specific tail-risk products. Only 30% of Australians employ holistic risk-monitoring efforts across asset classes, compared with 44% worldwide.

"I don't think we're any better at preparing for risks in the future, and I think that's the pity," said one CIO at an Australian corporate pension. "I think people still haven't really learned lessons and are still looking to make money in areas where they probably shouldn't be."

47%

OF AUSTRALIAN INVESTORS EXPECT AN EXTREMELY SEVERE IMPACT ON THEIR PORTFOLIOS SHOULD THE US AND CHINA BAN BILATERAL TRADE

Source: 2022 PGIM Global Tail Risk Monitor Survey

CHINA

A SECOND GLOBAL PANDEMIC CAUSES ANOTHER SHUTDOWN

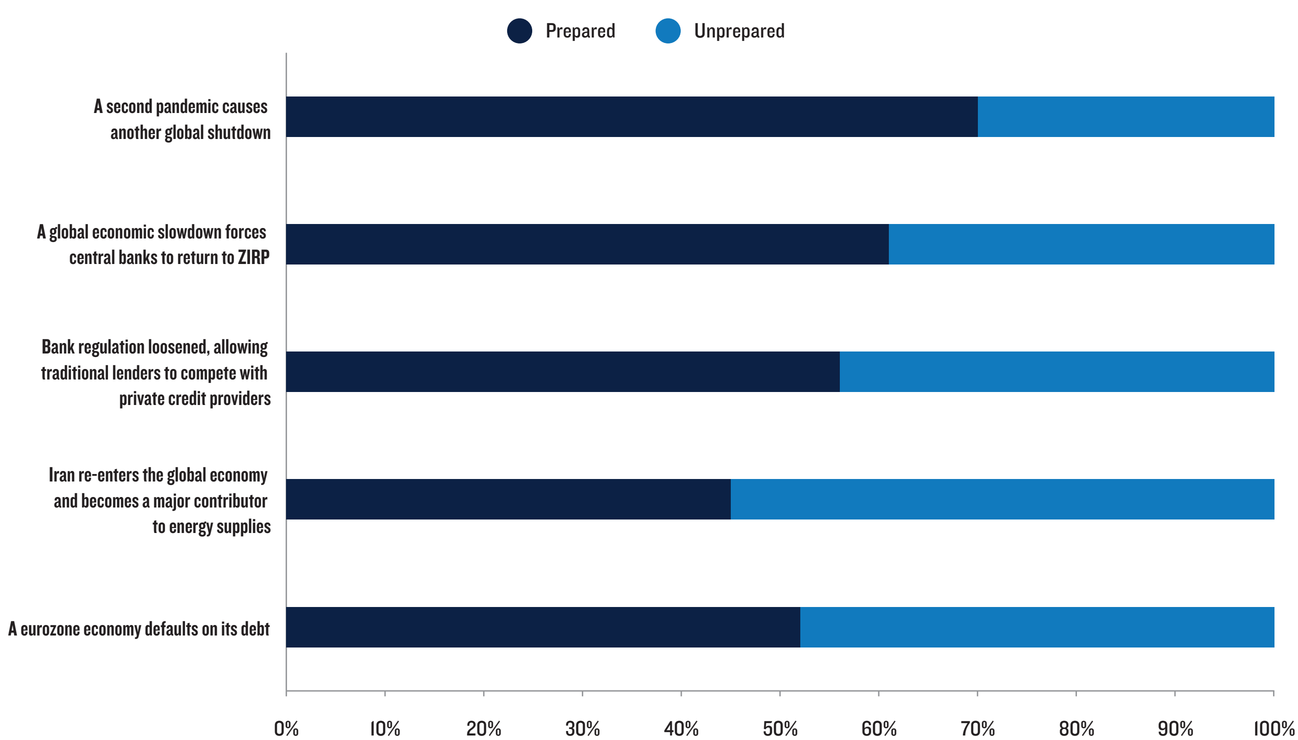
Investors have seen this movie before. A highly contagious virus begins to spread through the global population before it can be contained. People stay home and businesses shut down. Market repricing goes into overdrive as investors assess the economic fallout.

What happened at the start of the COVID-19 crisis was well off everyone's radar. Few people, if any, could have envisioned a global pandemic that would bring economies to a sudden halt and initiate a risk-off moment in financial markets.

Then there are the secondary effects of the COVID pandemic, including supply-chain bottlenecks, fiscal stimulus on a massive scale, surging inflation and, most recently, policy tightening by central banks. The pandemic's economic fallout has been felt across the globe, including in China. Institutional investors there understandably have a heightened sense of risk should a second global pandemic prompt new shutdowns around the world.

Investors are evenly split, 45% to 45%, on whether a second pandemic and global shutdown would have a severe or extremely severe impact on their portfolios. And investors do not feel any more or less prepared for this scenario than their global peers, with 70% feeling as though their organizations are ready to handle the fallout from a second pandemic. Globally, investors feel more prepared for only one other tail risk in the survey — a return to zero interest rates prompted by an economic slowdown.

Exhibit 5: **Chinese Investors Feel More Prepared for Second Pandemic**



Source: 2022 PGIM Global Tail Risk Monitor Survey

As with other black swan events, investors should remain diversified to hedge against downside risks if a new global shutdown creates tumult in financial markets. Economists are still parsing the surge in inflation and how much it was caused by supply shocks or the economic policy response to the pandemic itself. Still, there are lessons to be learned from COVID-19's immediate aftermath, as real assets rise in value while the equity and bond markets experience volatility.

"Even during 2008, you could also fly to quality, fly to US Treasuries," the institutional investor in China said. "But in 2020 you just had no hedges, cash was the only thing to hold on to." This investor added: "I wonder if I had wanted to sell and fly to safety, or if I wanted to hold cash, what were the things that I should sell first? And what were the things that I better just hold on to? This type of understanding to the portfolio is very important."

The world's experience with COVID-19 would inform the economic and investment outlook in a second pandemic. If the event is deemed to be a short-term crisis, investors are more likely to look past it. Keeping some dry powder available gives long-term investors the flexibility to buy the dip and increase gains during a market recovery.

"The lesson we've learned from 2020 is that you have to tell if it is V-shaped and also if things are intercorrelated, because when the Fed is giving helicopter money, it could probably be a V-shaped event, and in a V-shaped event, as a large asset owner — a longtime investor — used to say, stay put," the institutional investor in China said. "Whenever you did something in the week of March 9 or March 16, then you were highly likely to miss the bounce back on March 24, 25 and 26. So if you hadn't done anything, then you would probably be fine because our portfolio actually had a double-digit positive return in the year of 2020."

44%

OF CHINESE INVESTORS ARE FAR MORE CONCERNED THAT A SECOND PANDEMIC AND GLOBAL SHUTDOWN IS LIKELY TO OCCUR OVER THE NEXT THREE YEARS

Compared to 27% Globally

Source: 2022 PGIM Global Tail Risk Monitor Survey

When looking ahead at the next three years, a majority (56%) of Chinese investors rated recession risks as moderate, standing in contrast with investors globally who showed greater concern over a downturn.

Overall, Chinese investors are more apt to implement changes to their portfolios based on their risk outlook yet feel less prepared for several top tail risks in the survey when compared with other investors globally.

Compared with their global peers, institutional investors in China say their organizations are almost three times as likely to rely on external consultants for tail-risk management. However, almost half currently struggle with tail-risk complacency, suggesting that gaps exist in their efforts to manage risk from black swan events.

GERMANY

CHINA'S REAL ESTATE BUBBLE POPS AND DRAGS THE GLOBAL ECONOMY INTO RECESSION

The ripple effect from recent turmoil in China's real estate market was felt throughout global financial markets and forced asset allocators to consider the investment implications of a broader collapse of a critical sector of the Chinese economy. Given China's financial ties to the rest of the world, further stress in its property sector would likely spread beyond its borders. That caught the attention of investors in Germany, one of China's biggest trade partners.

The probability of a bubble in China's real estate sector has been the subject of debate among investors. Over the last several decades, the Chinese government has enacted policies aimed at supporting the growth of its cities while tamping down a sharp rise in property values, including expanded credit access for developers and a reduction in residential mortgage requirements. These policies, combined with an aging population and shrinking workforce, have cast a cloud of uncertainty over the property sector.[5]

Risks tied to Chinese real estate appeared to surface during the COVID-19 pandemic as China Evergrande Group, the world's most indebted developer and at one time the largest property developer in the country, missed bond payments and struggled to shore up its balance sheet. The crisis fanned fears of contagion, as real estate investors moved to the sidelines and adjacent industries, such as heavy machinery manufacturers, began to feel downstream effects. By the end of the first quarter of 2022, real residential property prices in China had fallen to their lowest level since the onset of the COVID-19 crisis.

If a Chinese real estate bubble pops and drags the Chinese and global economies into a recession, 47% of German investors expect the impact to their portfolios would be extremely severe, and 59% say their organizations are unprepared to handle the fallout.

It remains to be seen what the fallout might look like, particularly if an aftershock reaches western economies in the form of a rise in loan defaults. China itself would likely be hit hardest. But in the wake of the Global Financial Crisis, investors became accustomed to developing a playbook for how policymakers would react to limit the damage from a variety of shocks to financial markets. Chinese authorities would likely move quickly to allay liquidity concerns in the event of a pending collapse of the real estate market.

However, it is crucial for institutional investors to analyze this risk within the context of the global economy. A full-blown real estate crisis in China has the potential to weaken market sentiment and cause a downshift in the issuance of debt across the globe, creating a drag on economic growth.

The Federal Reserve's Financial Stability Report published in May 2022 noted: "Given the size of China's economy and financial system as well as its extensive trade linkages with the rest of the world, financial stresses in China could strain global financial markets through a deterioration of risk sentiment and disruptions to economic activity."

[5] PGIM Quantitative Solutions (2022) *Distress in China's Real Estate Sector: Whose Default Is It?*, March 2022.

To prepare for a Chinese real estate collapse that spills over into global markets, institutions should be invested across asset classes while maintaining ample liquidity to gird their portfolios against market stress. By holding liquid assets, investors can quickly increase their cash position in the event of contagion.

Given the two countries' economic ties, investors in Germany are generally more concerned about tail risks tied to China. Seventy-one percent anticipate the impact to their investments would be extremely severe if there is a military conflict involving China, and 65% say their organizations are very or somewhat unprepared for that scenario.

They also show greater concern over geopolitical forces than peers in five other countries. Eighty-two percent say geopolitics present a high risk to their portfolios over the next three years. Globally, 59% of investors hold the same opinion. Geopolitics pose a greater risk to their organizations when compared to the same time a year earlier, according to 80% of respondents in Germany, and 89% say they made changes to their portfolios because of this assessment. These were also the highest levels recorded in the survey worldwide.

Portfolio risks related to energy, food and natural resources are another area of concern for German investors amid the war in Ukraine. Meanwhile, 67% say a recession is a high risk, 10 points higher than the global average, and nearly half (46%) say credit risks to their organization's portfolio have risen over the previous 12 months.

The results suggest German institutions focus heavily on headline risks such as the COVID-19 pandemic or the Russia-Ukraine crisis, increasing investors' demand for tail risk-specific products and services from asset managers.

47%

OF GERMAN INVESTORS EXPECT THE IMPACT TO THEIR PORTFOLIOS WOULD BE EXTREMELY SEVERE IF CHINESE REAL ESTATE BUBBLE POPS

Source: 2022 PGIM Global Tail Risk Monitor Survey

JAPAN

A GLOBAL ECONOMIC SLOWDOWN FORCES CENTRAL BANKS TO REVERT TO ZIRP (ZERO INTEREST RATE POLICY)

Japan is perhaps the most notable outlier during a period of rampant inflation around the world. At a time when war in Europe, supply-chain disruptions, and fiscal and monetary stimulus enacted during the COVID-19 crisis are contributing to a surge in consumer prices in the US and Europe, Japan has experienced a comparatively modest rise in its inflation rate.

With this as the backdrop, investors in Japan show milder concerns about the risks that inflation, interest rates and a recession pose to their portfolios than investors globally. In Japan, the tail risk that investors believe presents the greatest threat is a return to zero interest rate policy (ZIRP), a scenario that could prompt a reversal of the growth-to-value rotation evident in major equity markets during a new era of tighter monetary policy.

Economic trends suggest that a global downturn, should it materialize, could look more like the 1970s, when policymakers mounted a years-long battle against stagflation, than recessions in the proceeding decades. This would suggest a return to ZIRP is less likely even if the global economy falls into recession — so a sudden, dovish shift could present challenges for investors. Today, as central banks raise interest rates to tame inflation, the odds of a prolonged slowdown in Europe appear to be greater than those in the US, given the impact of the Russia-Ukraine conflict and costly investments in new energy infrastructure that will likely be required. In the US, households benefit from strong balance sheets underpinned by higher real estate values, potentially softening the blow from economic headwinds.

While inflation is on the front burner for most investors globally, only 44% of those in Japan say it represents a high risk to their portfolios over the next three years — the lowest level of the six countries represented in the survey. By September 2022, Japan's core consumer inflation rose to 3% year-over-year, the quickest pace in eight years, with a weaker yen contributing to price pressures in the country. However, inflation remained stronger in other major economies such as the US, where inflation has run near 40-year highs.

Likewise, less than a third anticipate that risks tied to interest rates and a recession will be high. Japan has yet to fully emerge from the depths of the COVID-induced economic downturn, and the Bank of Japan has held firm in its position that rates will be kept low to support the recovery. That stands in contrast with other major central banks that have tightened policy.

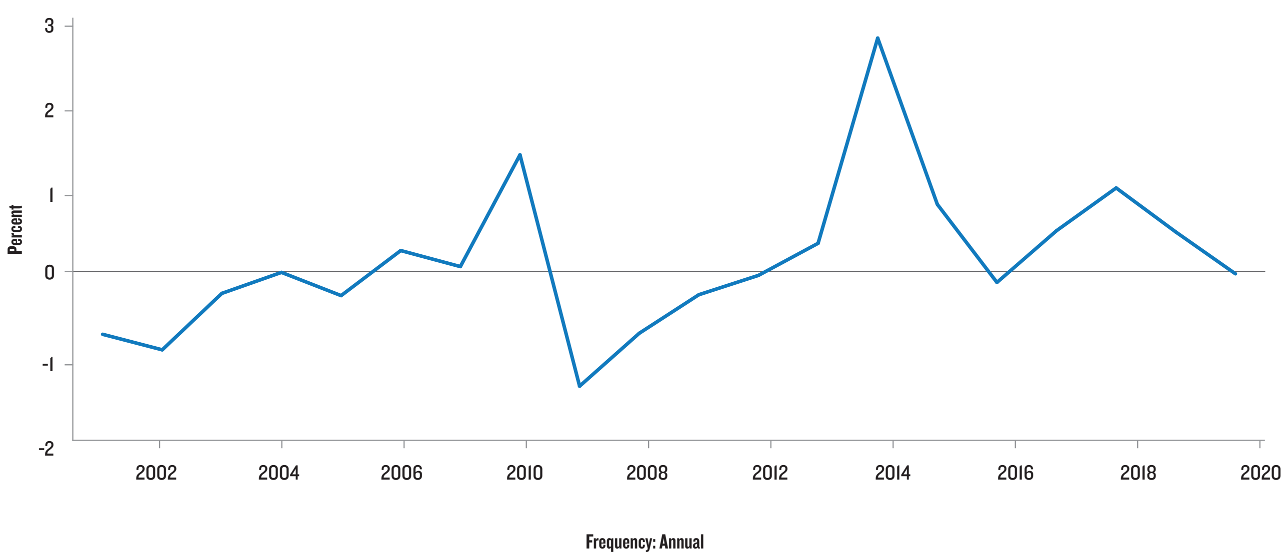
If the global economy downshifts and prompts a return to ZIRP, half of Japanese investors say the fallout would be extremely severe for their portfolios, well above the global average of 34% and the highest percentage recorded worldwide. Still, 73% believe their organizations are prepared to handle the investment implications of a return to ZIRP, possibly drawing on recent experience with domestic economic trends and monetary policy.

Running a diversified portfolio could help institutional investors build downside protection against an economic slowdown. In the current inflationary environment, investors who maintained a long-term view and held commodity allocations in their portfolios likely performed well. Should central banks revert to ZIRP, growth stocks such as the technology sector could benefit after leading the market selloff with interest rates rising. In fixed income, while initial returns for investors who own government bonds would be strong, the forward-looking return prospect would turn rather bleak once yields fall.

For investors in Japan, the prospect of a return to ZIRP around the world serves as an alarming scenario considering yields have been largely absent from Japanese markets for at least 25 years, which has pushed some investors to search for yield elsewhere. If those options dry up, investors may be forced to seek yield in riskier markets. Investors could hedge against this risk by creating a portfolio with a high probability of generating large capital gains as a slowdown begins to take hold.

Japan has long struggled with disinflationary trends, and the outlook remains that Japanese inflation will remain tepid with interest rates remaining lower for longer. For this reason, an inflationary Japan could also present a tail risk for investors. Even a small change in interest rates would make it challenging for the Japanese government to service its debt, which exceeded 200% of GDP in 2020. The health of financial institutions — the primary owners of Japanese government bonds — could also come into question.

Exhibit 6: **Consumer Inflation in Japan**



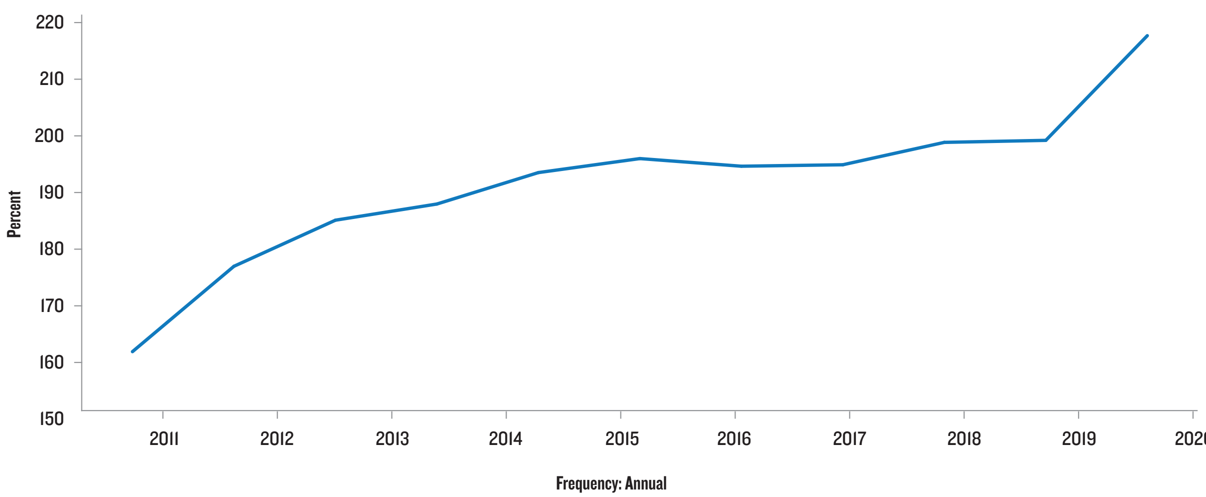
Source: World Bank

Only 36% of investors in Japan consider economic trends to be a high risk to their portfolios, the smallest proportion compared with five other major regions. Japanese investors are also less likely to label geopolitics a high risk but more likely than any of their global peers to say risks related to credit, climate change or the environment, liquidity, and currencies are high. In September 2022, the Japanese government embarked on its first intervention in the foreign exchange market since 1998, seeking to bolster a currency that had grown weaker under a dovish monetary policy outlook combined with hawkish moves beyond the country's borders.

Japanese institutions assign greater tail-risk management responsibility to investment committees, as none of the organizations represented in the survey have a specific tail-risk manager. Also, fewer Japanese investors say their organizations actively monitor tail risks compared with their global peers. Half feel challenged by a lack of an effective process, saying they struggle to act quickly once risks are identified.

This sheds further light on the results in PGIM's survey in Japan. The tail-risk scenarios that investors feel are more likely to occur or have severe portfolio implications are generally not the same as the scenarios with high levels of preparedness, indicating that Japanese investors are missing opportunities to mitigate the impact of potentially more predictable tail risks.

Exhibit 7: **Japan's Government Debt-to-GDP**



Source: World Bank

UK

A EUROZONE ECONOMY DEFAULTS ON ITS DEBT

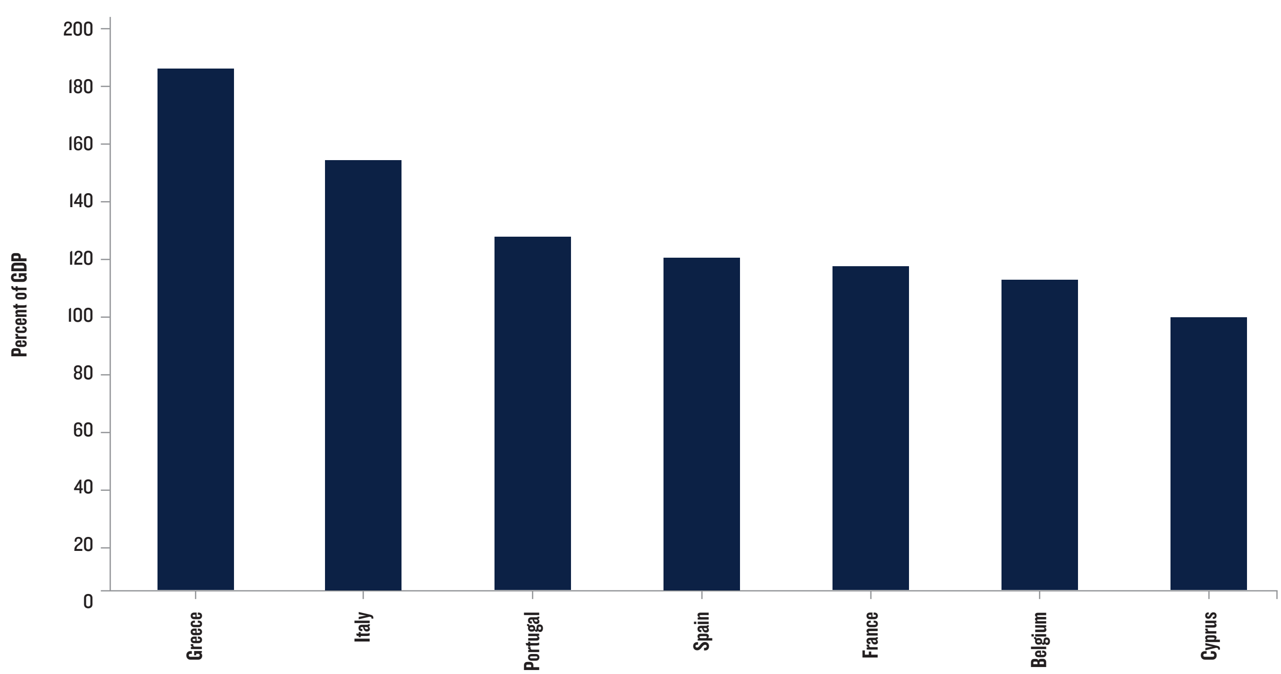
Facing a debt crisis in the early 2010s, European central banks leapt into action to prevent financial contagion. With debt levels elevated and interest rates rising, some economies could enter similar crises as global growth begins to slow. The risk of a default in Europe is one that UK investors are monitoring.

The survey's results show that debt-related market risks remain fresh on the minds of institutional investors following Europe's sovereign debt crisis. Lessening the threat of a default are the fiscal backstops available to European nations, exemplified by the actions taken by the European Central Bank, the International Monetary Fund and others to control the fallout from the 2010 debt crisis.

The policy response to another debt crisis remains a significant variable, and asset allocators in the UK expect a default would have severe consequences for their investment portfolios, with 60% predicting an extremely severe outcome. Meanwhile, less than half (47%) believe their organizations are prepared for that scenario.

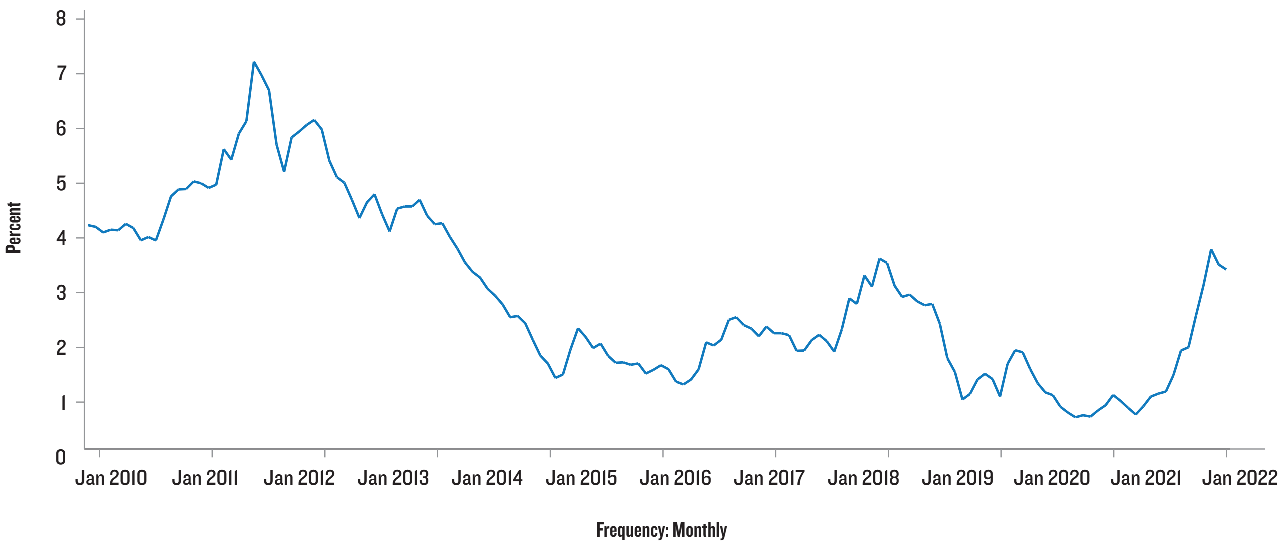
That assessment highlights the need for asset allocators to manage potential risks tied to European sovereign debt, particularly as central banks begin to shift from a period of ultra-low rates to more restrictive monetary policies. This hawkish turn led UK investors to identify interest rates as the second-biggest macro risk to their portfolios. As rates rise, countries with heavy debt burdens — Italy and Greece among them — may come under further fiscal pressure, due to an increase in the cost of servicing their debt. In the summer of 2022, as the ECB moved to tighten monetary policy in response to rising inflation, Italy's borrowing costs hovered near eight-year highs.

Exhibit 8: **The Highest Debt Levels in the Eurozone (As of Q2 2022)**



Source: Eurostat

Exhibit 9: **Yield on Italy's 10-Year Government Bond**



Source: Organization for Economic Co-operation and Development

Around the same time, the ECB unveiled a new bond purchase program, the Transmission Protection Instrument (TPI), to counter a surge in borrowing costs for European governments as the central bank tightens policy. TPI conceivably serves as a lifeline to the single-currency bloc's most indebted nations and reduces the chances that one of its members reaches the point of default.

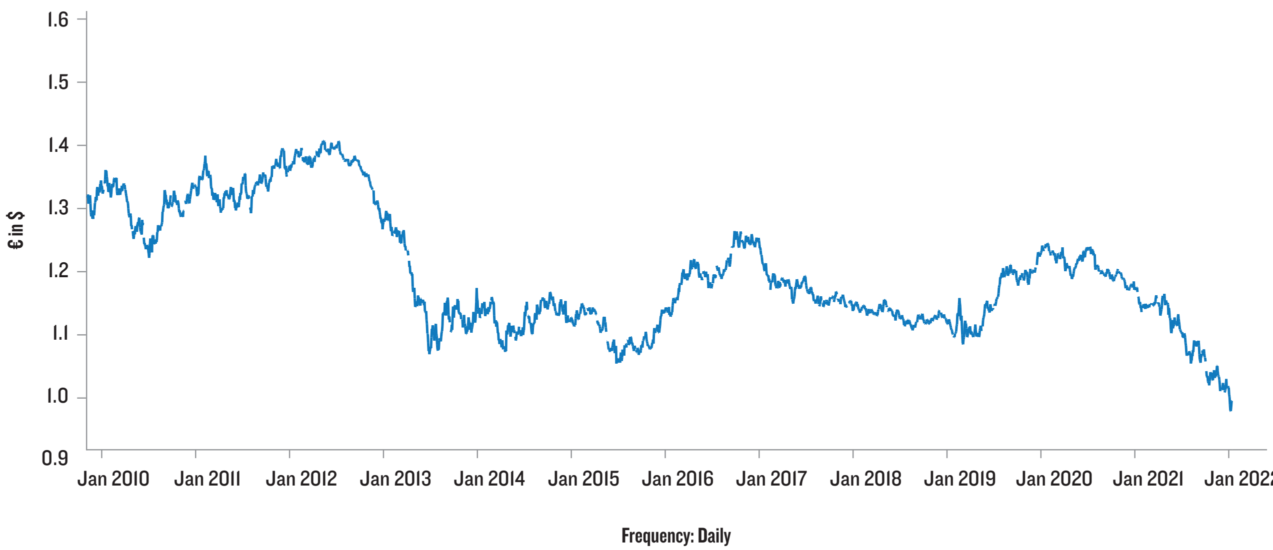
If the risk of a default anywhere in the eurozone becomes significant, markets would likely attach a risk premium to the euro as well. While there may be uncertainty over the policy response, investors can anticipate that a default scenario would exert downward pressure on the currency. The euro reached parity with the US dollar in 2022 for the first time in two decades, reflecting the onset of inflationary trends, weaker growth prospects and rising energy costs in the aftermath of Russia's attack on Ukraine.

60%

OF ASSET ALLOCATORS IN THE UK EXPECT A DEFAULT WOULD HAVE EXTREMELY SEVERE CONSEQUENCES FOR THEIR INVESTMENT PORTFOLIOS

Source: 2022 PGIM Global Tail Risk Monitor Survey

Exhibit 10: **The Euro's Path to Parity**



Source: Board of Governors of the Federal Reserve System (US)

Investors can mitigate market risks from a default by creating a portfolio strategy that will generate positive returns when economic turmoil strikes countries such as Italy and Greece but holds little downside risk when times are good. Going short France and long Germany is one such trade.

Concerns related to sovereign debt were not limited to Europe. Fourteen percent of UK investors say they anticipate reducing their allocation toward emerging market debt within the next three years, more than double the average response globally.

UK institutions are also more likely than others to identify geopolitics and energy, food and natural resources as significant risks to their portfolios in the next three years, reflecting the impact of the Russia-Ukraine military conflict and the ensuing energy crisis on financial markets. Surging prices in the region, driven by a shortage of oil and gas, have 85% of UK investors warning that inflation represented a high market risk, the most of any country represented in the survey.

When compared with their global peers, a greater share of UK investors (41%) report that a failure to incorporate the full scope of risk analyses, including those related to political risks, is one of the most significant risk-monitoring challenges facing their organizations.

Nearly all UK investors seek the support of asset managers to prepare for tail risks, but only one-third of asset allocators in the country already deploy holistic risk monitoring across asset classes. As a result, almost half say they struggle to detect risks early or predict black swan events.

US

THE 10-YEAR TREASURY REACHES DOUBLE-DIGIT YIELDS

The US Treasury market has long been a haven for investors during times of market strife. More recently, sovereign bonds have not provided a strong hedge against a decline in equities, leading asset allocators to reassess a traditional 60-40 portfolio construction and address longer-term risks should rates remain higher for longer. With inflation surging to a 40-year high, the outlook for rates has changed significantly in 2022.

Still, the 10-year Treasury yield is six presidents and two *Top Gun* films removed from the last time it saw double digits in 1985. A return to those levels would have significant investment and risk-management implications.

In our survey, US investors give greater weight to economic and inflation-related risks, reflecting recent market trends including a sharp rise in consumer prices and the Federal Reserve's moves to tighten monetary policy. Given heightened interest rate risks, the yield on the 10-year Treasury note rose to 4% for the first time since 2008 in May. Just two years earlier, it was hovering around 0.64%, near its all-time low.

If the 10-year yield does reach double digits in the next three years, US investors believe it would have a significant impact on investment portfolios, with 62% predicting an extremely severe outcome. Globally, less than half (48%) offer the same forecast.

Such a scenario could materialize if elevated inflation becomes entrenched and causes a wage-price spiral, prompting the Fed to increase interest rates well above current levels. During periods of higher inflation uncertainty, yields can rise even further due to an increased term premium to protect longer-duration investors from inflation surprises.[6]

The survey results suggest that investors are far more fearful than they were in the 1970s, when expectations for where bond yields were going proved to be much lower than what ultimately transpired.

"I think everyone's still worried about possible inflation issues," according to the CIO of a US endowment fund. "Do they quiet down here temporarily, and then come back?"

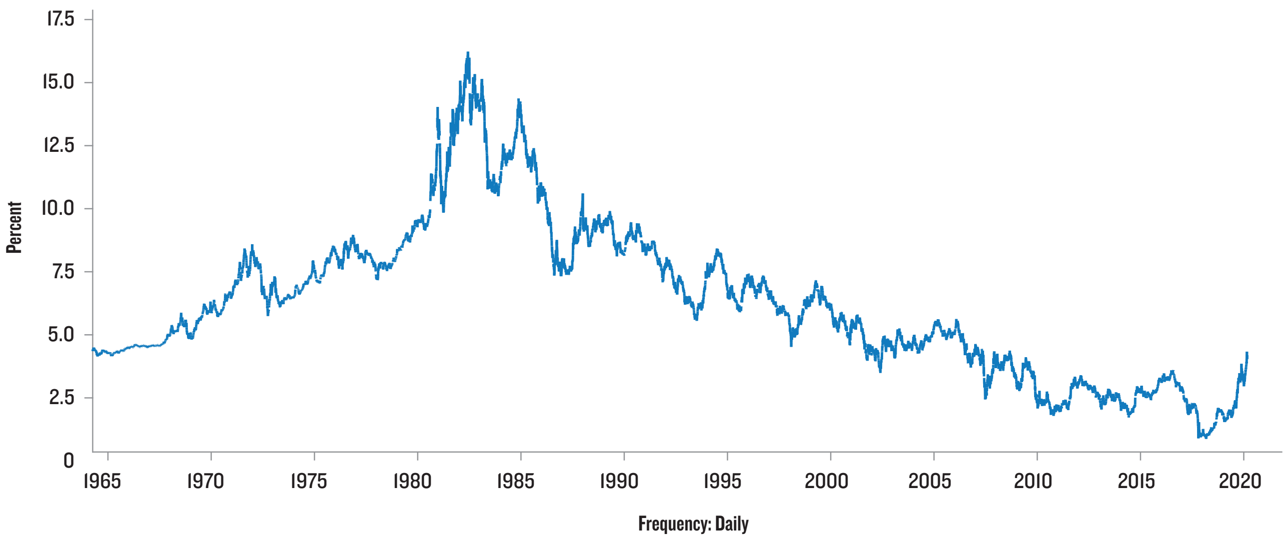
Eighty-five percent of respondents in the US say inflation now poses a greater risk to their organization's portfolio compared to a year ago, well ahead of the 69% of global respondents who have the same view. Meanwhile, 76% say interest rate risks have also grown, 16 points higher than the global average.

"I think probably most recently it's been the quick and rapid turnaround in fixed income, so the fact that we went from basically having, you know, sub-2% long-term interest rates to now the rapid rise particularly on the short end," the CIO of a defined benefit pension fund in the US said when asked about unforeseen tail-risk events over the last 15 years. "So for people who aren't hedged, that may actually be working in their favor if they're managing it well. But at the same time, equities are getting kicked."

A majority (55%) of those in the US believe their organizations are somewhat or very prepared for what double-digit yields would bring for markets — suggesting that investors feel they are better positioned to handle the fallout given the sharp rise in rates that already has sent a ripple through financial markets in 2022.

[6] PGIM Quantitative Solutions (2022) *Portfolio Implications of a Higher US Inflation Regime,* May 2022.

Exhibit 11: US 10-Year Treasury Yield



Source: Board of Governors of the Federal Reserve System (US)

However, the fallout for global financial markets could be catastrophic. Investors look toward Treasuries as their safe yield. A bond selloff of this magnitude could trigger a dash for cash, causing other asset prices, particularly equities, to fall and leaving investors with few options. An investment landscape redefined by double-digit yields on the 10-year note could be supportive of Treasury inflation-protected securities (TIPS) and commodities if inflationary pressures are strong.

Investors must also consider the fallout in Washington. Given that US debt levels now exceed $30 trillion, each increase of one percentage point in borrowing costs would add more than $300 billion in interest payments — making the country's public debt near unserviceable if rates surge to double digits. This would no doubt raise questions over the sustainability of the US government's debt burden.

Facing persistent levels of high inflation, coupled with tighter monetary policy and disruptions to global supply chains, 71% of US investors say the economy represents a high risk to investments over a three-year period, well above survey results observed in every other country. US investors are also more concerned about geopolitical impacts but less worried about other areas, including climate change and societal or cultural issues.

To prepare for future market risks, the defined benefit pension CIO's fund is reviewing its current asset allocation to determine how it would have performed against historical shocks. "They're all so different and they all had such a different impact on the market, and rarely do you get double whammies. We still have COVID, and we get Ukraine," the CIO added.

Across most of the tail risks presented in the survey, US investors generally feel more confident in their levels of preparation than international peers. Despite this confidence, a large majority (86%) still seek support with tail-risk preparation from asset managers.

The survey also found that US institutions have slightly greater demand for thought leadership from asset managers. None of the respondents say their institution employs a dedicated tail-risk manager, and US investors show a greater propensity to use external services or consultants to navigate market risks.

About our methodology

The study gathered the views of 400 institutional investors globally from defined benefit pension funds, corporate pension funds, sovereign wealth funds, central banks, endowments and foundations. The online survey was conducted by CoreData Research between June and July 2022, along with eight qualitative interviews conducted globally across a similar mix of institution types. Investors evaluated the following possible tail risks according to likelihood, severity and preparedness:

- A second global pandemic causes another shutdown
- The European Union (EU) breaks up
- North Korea collapses and reunites with the South
- Iran re-enters the global economy and becomes a major contributor to energy supplies
- A global economic slowdown forces central banks to revert to ZIRP (zero interest rate policy)
- The US 10-year Treasury reaches double-digit yields
- A eurozone economy defaults on its debt
- China's real estate bubble pops and drags the global economy into recession
- Nuclear accident
- Nuclear attack occurs in a major economy
- Bank regulation is loosened, allowing traditional lenders to compete with private credit providers
- Satellites are disabled, causing a global disruption in GPS and telecommunications
- The US and China ban bilateral trade
- Cyberattack disables a major financial platform or government agency for a significant period of time (e.g., SWIFT, NYSE, IMF)
- Cryptocurrency causes a global financial contagion
- Global collapse of the internet
- Northern Ireland and Scotland break away from the UK
- A military conflict in the Taiwan Strait or South China Sea
- An unexpected liquidity crunch in capital markets (US Treasuries, commodities, etc.) results in a market crash

Institutional investors surveyed are from six countries: US, UK, Germany, Australia, China, and Japan. Respondents are aged 30-70 and have been in their current role for at least one year. The investors surveyed are responsible for managing total assets of over $12 trillion. Almost all (94%) investors are from firms with at least $1 billion in current AUM. A further 2% are from US endowments & foundations with current AUM of at least $250 million.

The study was blind with no mention of PGIM or Prudential. Respondents were offered an incentive to participate (a financial payment, charitable donation or tracked planting of trees).

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