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Future AI/AGI Scenarios and Financial Implications

Introduction

Artificial General Intelligence (AGI) could reshape the global economy in unpredictable ways. Experts disagree widely on timelines and impacts – some foresee transformative AI within years, while others doubt its imminence [1] [2]. In the face of such uncertainty, it is **crucial to plan for multiple scenarios rather than a single forecast**. As economists note, the optimal strategy under deep uncertainty is to **"hedge our bets" by analyzing a range of different scenarios** [3]. Scenario planning makes potential opportunities and risks tangible, helping policymakers and investors prepare contingency plans for radically different futures [3].

This report presents a structured taxonomy of plausible future scenarios for AI/AGI development and deployment, focusing on those with **distinct financial and economic implications**. We map out scenarios along key dimensions – **AGI development paths, intersecting global megatrends, governance regimes, societal disruptions,** and **financial feedback loops** – and assess how each might affect markets, asset classes, and economic stability. Concrete examples of events or conditions in each scenario are provided, along with qualitative analysis of their likely market effects. The goal is not to predict which future will occur, but to illuminate a spectrum of possibilities and stress-test our financial strategies against each.

Scenario Taxonomy

To navigate the complexity of AI futures, we categorize scenarios by major driving factors and outcomes. Each scenario combines a trajectory of AI/AGI development with external conditions and policy responses. Key axes include:

- **AGI Development Trajectory:** How is advanced AI developed and deployed? Possibilities range from a **slow, controlled evolution** of AI capabilities to a **rapid, explosive "takeoff"** of AGI. Control of AGI might be **concentrated** (in one firm or state) or **distributed** (open-source or widely accessible). These trajectories crucially shape economic impacts.
- **Global Context & Megatrends:** What external megatrends coincide with AI's rise? Scenarios consider intersections with **climate change**, **geopolitical shifts** (e.g. a new Cold War or multipolar order), **demographic pressures** (aging or youth bulges), and **resource constraints**. These combinations can amplify or mitigate AI's financial effects.
- **Policy and Governance Regimes:** How do governments and institutions react? Futures range from **internationally coordinated governance** (e.g. treaties imposing safety standards) to **fragmented, competitive regulation** (each nation or bloc pursues its own rules) or even **laissez-faire** (minimal regulation, leaving AI's course to market forces). Governance choices will influence economic growth, industry structure, and labor outcomes.
- **Societal and Ethical Outcomes:** How does society cope with advanced AI? Some scenarios envision **smooth adaptation** and human-AI synergy; others see **mass disruption** – e.g. widespread unemployment, social unrest, ethical crises, or cultural shifts in attitudes toward

technology. Such outcomes feed back into financial markets via changes in consumer behavior, investor sentiment, and risk premia.

- **Financial System Feedback Loops:** We consider reflexive interactions between AI progress and financial markets. For instance, **market booms or busts** can accelerate or delay AI development by affecting investment flows. Conversely, expectations of AGI's impact (on growth or risk) may already be partially *priced in* – or dangerously *mispriced*, leading to sudden corrections.

Using these categories, we now delve into five major scenario domains and their implications.

1. Granular AGI Development Paths and Market Impacts

Trajectory of AGI development is a first critical factor. Here we map several distinct paths – from careful and incremental to rapid and unconstrained – and evaluate their financial impact on markets and asset classes:

- **Slow, Controlled AGI Development:** In this scenario, progress is **gradual and tightly managed** by leading stakeholders (whether corporate or government). Safety and alignment are prioritized, perhaps via international cooperation or strict regulation. A *slow "takeoff"* gives economies time to adapt. **Market effects:** Productivity gains accrue steadily; labor displacement is moderate as humans shift to new tasks. Wages and employment can remain on an upward trend since automation proceeds "sufficiently slowly" such that *"there is always enough work for humans"* [4]. Under these conditions, **economic growth is stable** and broad-based – humans and AI both contribute, and profits and wages may rise together. Equity markets might see **sustained growth** in AI-related sectors without extreme volatility. For example, if automation never exceeds the pace of new job creation, **wages could keep rising indefinitely** [4], supporting consumer spending and corporate revenues. Bonds would reflect healthy growth with controlled inflation. Overall, a controlled trajectory favors a relatively **benign market environment**, with tech stocks performing well but no systemic shock. Investors would still need to monitor for pockets of overvaluation, but gradualism lowers the risk of a sudden bubble or crash.

- **Rapid "Fast Takeoff" to AGI:** This path envisions a **sudden, exponential leap** in AI capabilities – AGI arrives quickly (say within a few years), dramatically outpacing society's ability to adapt. Such an *aggressive AGI scenario* could see economic output growth an order of magnitude higher than normal, **"ten times faster"** than in a business-as-usual case [5]. However, the **distributional impact is stark**: as AI systems rapidly automate essentially all human tasks, human labor becomes largely obsolete, causing *wages to collapse* as full automation is reached [5]. **Market effects:** On one hand, corporate profits and productivity could skyrocket – in simulations, sufficiently advanced AI can even lead to an economic *"growth singularity"* where output "takes off" toward infinite growth [6]. This might imply **explosive gains for certain asset classes**: firms owning the AI technology or critical infrastructure (compute, data centers) could see valuations surge. Indeed, during the transition, returns to specialized capital (like high-end compute) could be extremely high [7]. On the other hand, if wages and consumer purchasing power collapse, aggregate demand might fall unless massive redistribution occurs. Financial markets would grapple with unprecedented scenarios: equity prices for AI-intensive firms might soar, while industries reliant on human labor or consumer spending could plummet. Government bond markets could become volatile as policy fights deflation (from jobless masses) or inflation (from hyper-growth in AI sectors). **Volatility would be extreme** – initially, optimism could drive asset bubbles, followed by potential crashes if social stability erodes (see Section 4). In essence, a fast-takeoff AGI is a high-growth but high-turbulence scenario; *markets face a*

perilous boom-bust cycle as they try to price a world where "labor" as we know it is no longer a factor of production.

- **Concentrated Corporate/Monopoly AGI:** In this scenario, AGI is achieved and controlled by **a single dominant actor or a tight oligopoly** of tech giants. Current trends already hint at this: *"control of these technologies is extraordinarily concentrated"*, raising the question of **who will control this great power and to what ends** [8]. If one company or a cartel maintains a decisive lead in AGI, they could extract enormous rents. **Market effects:** The controlling firms' equity would become *extremely valuable*, potentially reaching unprecedented market capitalizations as they monopolize AGI-driven productivity. We might see **winner-takes-all dynamics**: the "Magnificent Seven" tech firms already accounted for 71% of S&P 500 gains in 2023 [9] due to AI optimism, and with monopoly AGI their dominance would solidify further. Other companies and sectors may languish or become dependent on the AGI provider (similar to utilities buying from a monopoly). **Asset classes:** Tech equities soar, but anti-trust or nationalization risk also rises (if regulators or governments intervene to break the monopoly). Credit markets might favor the monopoly (low credit spreads for the dominant firm) but increase risk premiums for everyone else (due to higher inequality and political risk). If profits concentrate in few hands, broad stock indices might underperform relative to the tech juggernaut's stock. **Example:** An AGI-owning company could command trillions in market value and high profit margins, while labor-heavy industries see margins compress. Such extreme concentration could also invite **political backlash** – for instance, debates ask whether "a handful of tech giants… or individual nations… should write the rules" for AI [10]. Governments might respond by heavily taxing windfall profits or even taking control (see nationalized AGI below). Markets would price in these regulatory risks, perhaps capping how far the monopoly's stock can rise due to expropriation fears. Conversely, if left unchecked, a monopoly AGI might create **the first quadrillion-dollar company**, fundamentally reweighting global indices and potentially creating systemic risk if it falters.

- **Open-Source or Diffused AGI:** Here, advanced AI capabilities become **widely accessible** – whether through open-source releases or many actors independently reaching AGI. This resembles a "democratized" AI scenario. For instance, consider when an open-source model matched a top proprietary model's performance at *95% lower cost*, threatening the leader's business model [11]. In such a world, **barriers to entry fall** and AI tools spread across the economy. **Market effects:** Widespread availability of AGI would likely **commoditize AI services**, reducing the pricing power of any single firm. This could **shrink profit margins** in tech (no monopoly rents), but dramatically boost productivity across traditional sectors. Think of it as the AI equivalent of open-source software: it accelerates innovation everywhere but undermines incumbents' ability to charge premium prices. **Asset classes:** The upside might be **broad-based economic growth** as even small businesses and poorer countries harness AGI (a potential productivity boost analogous to the internet's diffusion). This could lift global GDP and benefit many industries (e.g. manufacturing, healthcare, finance) through cost savings and innovation. However, investors in proprietary AI companies could suffer – their valuations might deflate if their "moat" vanishes. Indeed, the emergence of an open model was seen as an *"existential threat"* to one AI firm and poised to *"pop a speculative bubble"* in the sector [12]. We might witness **market rotation**: away from overpriced AI hype stocks and into sectors poised to benefit from cheap AI (or into companies supporting the open AI ecosystem, like semiconductor makers if demand for hardware explodes). **Volatility** could spike around announcements of major open-source breakthroughs (as seen when new models drop). Over time, a diffused-AGI scenario could be deflationary (cost of intelligence drops), which might keep interest rates low even amid high growth – a unique combination of booming real output but cheap services. For society, open AGI also entails security risks (bad actors can use it), potentially leading to *higher insurance costs and*

risk premiums in certain markets (cybersecurity industry booms, for example). But overall, diffusion spreads gains widely and may avoid the extreme inequality of monopoly AGI.

- **Nationalized or State-Controlled AGI:** In this scenario, governments take the helm in AGI development, treating it like a strategic national asset (analogous to the Manhattan Project or nuclear technology). This could happen via **direct ownership or "soft nationalization"** of AI labs. For example, analysts have outlined how a government might acquire significant equity stakes or "golden shares" in key AI firms to gain veto power and control [13] [14]. If a state fears private AGI is too risky or too important, it might **fully nationalize** a leading lab [15]. **Market effects:** Initially, nationalization could roil markets – investors in the affected companies would face losses or forced buyouts (perhaps at modest premiums). Over the longer term, state control might mean **AI is deployed for public good or strategic goals rather than profit maximization**. This could lead to **more equitable outcomes** (e.g. using AGI to boost economic growth broadly, reinvesting profits in society) but possibly at the cost of efficiency and innovation speed. Government-run projects might be less responsive to market signals, potentially leading to *misallocation* or bureaucratic delays. For asset classes, one might expect **defense and public-sector contractors** to benefit (if AGI development is militarized or done via government contracts), while some private tech investments become viewed as quasi-sovereign enterprises with lower profit margins. If AGI is tightly controlled by a few governments (say U.S. and China), it could become a source of **geopolitical rent** – nations with AGI enjoy stronger growth, attracting capital flows, while others lag. We might see widening spreads between countries' bonds and currencies based on their AI prowess (e.g. an "AGI dividend" for the hegemon's economy). Alternatively, widespread state control might slow global AI progress, yielding something closer to the slow, controlled scenario (with similar moderate market impacts). A **special case** is international public projects: an *"International AGI effort"* (if countries agree to pool resources and share benefits) could resemble large science projects, distributing returns more globally – positive for emerging markets access to tech, though perhaps unlikely in a competitive world. In summary, nationalized AGI could stabilize some risks but introduces new uncertainties: markets must evaluate political motivations and governance quality, not just technology. Government bonds might actually become riskier if states pour enormous funds into AGI or if tech rivalry leads to fiscal strain (e.g. an "AGI arms race" akin to a military buildup).

Each development path above creates **different winners and losers across asset classes**. For instance, a **monopoly AGI** path favors a few tech equities but raises antitrust and inequality risks (which could increase long-run risk premiums), while an **open-source path** favors broad productivity and possibly bonds (if inflation stays low) at the expense of concentrated tech profits. Prudent investors will monitor which path the world seems to be on – e.g., signs of heavy-handed government intervention vs. an open AI ecosystem – and adjust portfolios accordingly.

2. Interacting Global Megatrends: Compound Scenarios and Their Financial Fallout

AGI will not emerge in a vacuum – its development will coincide with other **global megatrends** that could amplify or mitigate its impact. Here we explore scenarios where AI progress intersects with climate change, geopolitical shifts, demographic trends, and resource constraints, creating compound outcomes. These combined scenarios often pose **compound financial risks** or opportunities, as multiple forces act on markets simultaneously.

- **Climate Crisis + AGI Breakthrough:** Imagine the mid-2030s with both accelerating climate change and the dawn of powerful AGI. This scenario could cut two ways. On one hand, AGI

might be marshaled to aid climate adaptation and mitigation – optimizing energy use, inventing new clean technologies, and managing resources. This **"Green AGI" scenario** could stimulate massive investment in climate tech (renewables, carbon capture) and create new asset classes (e.g. *"climate bonds"* backed by AI-optimized projects). If AGI helps solve climate challenges, it would boost long-term economic growth and reduce tail risks, which markets would cheer. On the other hand, there's a **darker compound scenario**: climate stresses (extreme weather, resource shortages) unfold just as AGI causes social/economic upheaval. The two crises could distract from each other – indeed experts warn that severe internal problems can force governments to *"deprioritize sustainability initiatives"*, undermining climate action [16] [17]. A study forecasted a *75% probability* that under high domestic strain (like AI-driven unemployment), governments would divert attention and resources away from climate goals, causing **"significant setbacks for global efforts to combat climate change"** [18]. **Financial implications:** In the latter case, the world might see a surge in carbon emissions or insufficient climate investment, heightening physical climate risks. Insurance and real estate markets would price in greater damages from disasters. If AGI is being used to prop up productivity while ignoring sustainability, it could lead to a more **extractive, unsustainable economy** [19] – perhaps boosting short-term profits in resource sectors (oil, mining) but increasing the probability of severe climate costs later (stranded assets, disaster-driven defaults). Sovereign bonds could suffer if nations face mounting climate adaptation bills while dealing with AI-driven unrest. Conversely, in a cooperative "Green AGI" scenario, we'd expect strong **green infrastructure spending**, robust carbon markets (with AI forecasting carbon prices [20]), and lower risk of climate-related shocks – a net positive for long-term investors. Equity sectors like clean energy, agriculture tech, and insurance would heavily depend on how AGI is applied – either thriving with AI-enhanced solutions or struggling in a chaotic climate-withdrawal scenario. Thus, the interplay between AI progress and climate policy will crucially shape **risk premiums**: a world handling both well is lower-risk and likely sees **lower insurance costs and higher sustainable growth**, whereas a world where crises compound will see **heightened volatility and risk-aversion** in markets.

- **Geopolitical Realignment and AI Arms Race:** The emergence of AGI could occur amidst intensifying great-power competition – notably between the U.S. and China. Indeed, **AI and geopolitics are already intertwined**: rapid AI advances influence "geopolitical strategies, power dynamics, and global competition," with major powers viewing AI leadership as key to national security [21] [22]. We consider a **"Tech Cold War" scenario**: rival blocs race for AI supremacy, leading to fragmented technology ecosystems and nationalistic economic policies. **Key features:** export controls on chips and software, government subsidies for AI industries, espionage and talent wars, and perhaps an international treaty failure (each bloc sets its own rules). *Geopolitical tensions and AI progress then fuel each other.* For example, one study identified *"increased nationalisation"* of tech and *"strategic manoeuvres of major powers"* as factors shaping the future [23]. If conflicts like the Russia–Ukraine war expand or new flashpoints arise, resources may shift from civilian to military AI uses [24]. **Financial implications:** A bifurcated world could see **duplication of tech investments** (less efficiency, higher costs) but huge spending on AI by governments (analogous to a new arms race, benefiting defense contractors and domestic tech firms in each bloc). Stock markets might become more regionally siloed: e.g. Chinese AI companies listed in Shanghai might soar on state support, while Western firms rally on Pentagon contracts – yet cross-border investment flows diminish. Heightened geopolitical risk tends to raise the **equity risk premium** (investors demand more return given uncertainty), and safe-haven assets like gold or U.S. Treasuries could gain if global conflict risk spikes. If an **AGI breakthrough occurs in one country first**, that nation could experience a *massive relative economic boom*, boosting its currency and attracting capital – but also possibly provoking instability as others react. An extreme outcome might be a **preemptive strike or sabotage** if

one nation fears another's AGI lead (akin to nuclear proliferation fears). Even short of war, a lack of global coordination means no shared safety standards – an unaligned AGI incident could cause financial panic globally. In contrast, consider a more optimistic **global governance scenario**: nations realize the stakes of AGI and forge an international regime (perhaps a *"Global AI Treaty"* or an *"International AI Agency"* modeled on nuclear arms control [25] [10]). This would harmonize rules and reduce arms-race dynamics. Markets would favor such cooperation: it lowers the tail risk of catastrophic conflict or uncontrollable AI. We might see more **integrated global growth**, with AI benefits flowing more evenly. In that case, emerging markets with talent (India, etc.) could also gain investment as part of a coordinated effort. **Bottom line:** Geopolitical contexts from hostile rivalry to cooperative governance dramatically alter financial outcomes. Portfolios should consider scenarios from a **fractured decoupling** (requiring regional diversification and hedges for conflict risk) to a **unified framework** (global diversification pays off, lower risk premiums).

- **Demographic Pressures and AI:** The world faces divergent demographic trends – aging populations in many developed nations and parts of Asia, vs. youth bulges and rapid growth in regions like Africa. AGI's impact will differ under these conditions. In **aging societies**, AI is often seen as a *solution* to labor shortages. For example, Japan's shrinking workforce has created a *"powerful incentive for automation"* [26] – AI and robotics are being deployed to support an elderly society. If AGI arrives in an aging context, it could **sustain economic growth despite a declining workforce**. Productivity gains from AI would fill the gap of human workers retiring. Financially, this might *improve fiscal sustainability* in those countries (higher output means more tax base to support the elderly), and keep interest rates lower than otherwise (since AI mitigates the growth drag of aging). We might expect **Japanese and European markets** to respond favorably to AI adoption (as a savior for their demographics) – e.g. higher equity valuations for automation companies, and possibly lower long-term government bond yields as growth prospects improve relative to a no-AI baseline. However, there's a flip side: **youthful, developing countries** could experience a more troubling scenario if AGI undercuts the traditional path of labor-driven development. These nations have large working-age populations; historically, this "demographic dividend" fuels growth by supplying labor to industrialize. But if AGI and automation make cheap human labor less important globally (e.g. factories run autonomously, AI writes software instead of outsourcing to coders), emerging markets may find *fewer opportunities for employment and export-led growth*. This could lead to a **frustrated youth scenario**, potentially stoking unrest or migration pressures. Financially, such regions might face higher political risk premiums and lower investment if investors worry that *"a nation of unemployed people"* cannot generate consumer demand or stability [27] [28]. The UK's public engagement on AI scenarios indeed found people expressing concern about *"how an economy could grow if a nation of unemployed people didn't have money to spend"* [27]. In an extreme case, global inequality between AI-rich, aging economies and AI-poor, young economies could widen, affecting global capital flows – capital might concentrate in the former, while the latter see capital flight and currency weakness. There is also an **intermediate scenario**: if AGI boosts global growth enough, perhaps it creates *new industries and demands* that employ young populations in new ways (for instance, creative or care roles that AI cannot or is not allowed to fill). Some jobs might even be preserved by choice (as "nostalgic" human-only jobs) to prevent full unemployment [29]. Policies like reduced workweeks or universal basic income could emerge to balance demographics with automation. Markets would react to these policy choices: a well-implemented UBI or retraining program could maintain consumption, benefiting retail and consumer goods stocks even if traditional jobs vanish, whereas a failure to support displaced youth could lead to chronically weak consumption and investable markets only in sectors serving elites. In summary, demographics heavily color AGI's effects: **aging regions might harness AI for a golden years boom, while youthful regions might need strong policy intervention to**

avoid instability. Investors should watch metrics like labor force participation and youth unemployment across scenarios – these will feed directly into country risk assessments and growth forecasts.

- **Resource Constraints and Technological Bottlenecks:** Advanced AI doesn't eliminate the physical foundations of the economy – energy, minerals, food, and other resources remain critical. A key question is whether AGI can drive growth faster than resource availability (and environmental limits) can accommodate. One scenario is a **"Techno-Abundance"** future: AGI helps overcome resource constraints via innovation – e.g. discovering new energy sources (fusion?), optimizing supply chains, or enabling circular economy processes that reduce waste. If successful, this could decouple growth from resource use, leading to a *deflationary boom* (high growth, low commodity prices) and robust asset performance across the board. Equities would benefit from cheaper inputs and new tech industries, while commodity-producer nations might face lower revenues (unless they pivot). However, many analysts caution about the opposite: **bottlenecks that even AGI finds hard to break**. For instance, there is only so much high-grade lithium or rare earth metals in Earth's crust, only so many fabs that can produce advanced microchips at a given time, and environmental tipping points that, once passed, curtail growth. A study extending an AGI economic model found that if *"fixed factors (such as minerals or matter) pose a bottleneck,"* they can *"hold back economic growth and worsen the outlook for wages,"* even leading to stagnation despite AI advances [6]. In such a scenario, you might get **stagflation**: AI drives up demand for certain inputs (energy for data centers, metals for robots), causing commodity prices to surge, but those rising costs and physical limits prevent overall output from rising as fast. **Market effects:** Commodities and real assets would outperform in this case – e.g. energy companies and mining firms might see windfall profits if supply lags demand. Equities in resource-intensive industries could face margin pressures (higher input costs), while tech companies might struggle with supply chain limits (as seen when chip shortages slowed the tech sector). Fixed-income markets could be rattled by inflationary pressure due to resource scarcity, forcing central banks to hike rates even if unemployment is high (a bad scenario for both stocks and bonds). Investors might flock to **real assets** like commodities, real estate, or infrastructure that hold value when paper assets suffer. Additionally, resource competition can exacerbate geopolitical tensions – e.g. scramble for rare minerals could create new conflict flashpoints, which in turn feed back into market risk (higher volatility, defense spending, etc.). Another resource angle is energy: AGI might be power-hungry (training giant models consumes vast electricity). If clean energy deployment lags, we could see a **carbon emissions spike** or simply energy shortages that make compute more expensive, capping AI progress. That might ironically slow the arrival of the full AGI if, say, power constraints limit how many models can be run – a self-regulating mechanism but one that imposes economic stress. Conversely, if AGI helps crack cheap energy, it unleashes not just AI but a surge in all energy-dependent sectors (manufacturing, transportation), so it's a double growth scenario. **In summary**, the resource context will determine whether AGI's theoretical productivity translates into real GDP gains or into inflation and distribution struggles. Portfolios should consider hedges for resource inflation (like commodity futures or resource-rich country equities) in scenarios where AI meets material limits.

By examining these **compound scenarios**, we see how **megatrends can either compound risks or provide partial counter-balances**. A climate-stressed, conflict-ridden, resource-constrained world with uncontrolled AGI is a worst-case cocktail for markets – featuring high volatility, frequent crises, and flight to safety. A coordinated, innovative world where AGI helps solve problems like aging and climate is a best-case, yielding robust growth and broad prosperity (albeit still with disruptions to certain sectors). Policymakers and investors must watch these trend intersections closely. For instance, if we observe rising geopolitical tech tension and no climate action, caution is warranted even if AI tech is

booming – the bust may not be far behind. On the other hand, if global cooperation on AI governance and climate ramps up, it could extend the longevity of the economic expansion that AI might fuel.

3. Policy and Governance Futures: Regulation, Treaties, or Laissez-Faire?

How humanity governs AI/AGI will dramatically shape economic trajectories. Here we outline plausible policy and governance futures – from stringent global regulation to a free-for-all – and analyze their consequences for economic growth, industrial policy, and labor markets.

- **International Coordination and Treaties:** In this future, nations overcome rivalries to establish **global governance frameworks for AI**. A recent milestone in this direction is the world's first binding AI treaty – the *Council of Europe's Framework Convention on AI*, adopted in 2024, which aims to set common standards grounded in human rights and rule of law [30] [31]. While that treaty is regional, it raises the vision of a *"truly global framework"* for AI governance [10]. One proposal from the AI safety community even imagines a *"International AI Governance Organization (IAIGO)"* with mandates to regulate and monitor AGI development, potentially enforcing a **moratorium** on certain high-risk research until safety is ensured [25]. **If such coordination succeeds**, the pace and nature of AGI deployment could be deliberately shaped for stability: for example, international agreements might limit extreme AI behaviors (analogous to nuclear arms control), mandate sharing safety research, and perhaps encourage equitable deployment (to avoid massive winner-take-all outcomes). **Economic consequences:** A stable regulatory environment may **reduce catastrophic risk**, which is positive for long-term investment – the existential risk of unaligned AGI would be mitigated, lowering the "disaster premium" embedded in asset prices. However, tight constraints might also slow AI's rollout somewhat (a trade-off between safety and short-term growth). If AGI arrives more slowly or in a more controlled manner due to treaties, we might forgo some immediate output gains – one analysis shows that *"slowing down automation in an AGI scenario"* can deliver *"significant gains to workers"* (by preventing wage collapse), though at the cost of *"forgoing a growing fraction of output"* that rapid automation would have provided [32]. In other words, global governance might choose a somewhat lower GDP growth path in exchange for better distribution and stability. Markets might interpret that as slightly dampened tech sector hyper-growth, but more sustainable broad-based growth. **Sectoral impacts:** Big tech firms could chafe under international rules (e.g. requiring transparency, audits, or even IP sharing for safety). Their valuations might be lower than in laissez-faire scenarios due to compliance costs or limits on monetization. But other sectors (small businesses, non-tech industries) might benefit from more leveled access to AI and fewer disruptions. Moreover, clear rules can spur investment by removing regulatory uncertainty – businesses know what to expect. If an international regime also includes **adaptive regulation** (quickly updating standards as AI evolves), it could prevent severe negative outcomes like biased AI causing social backlash or rogue AI causing accidents, thereby avoiding the kind of abrupt regulatory crackdowns that spook investors. Government policy in this scenario also likely includes robust **education and labor policies worldwide** (since cooperation extends to sharing best practices): retraining programs, AI education, cross-border agreements on data sharing, etc. The result could be a **smoother labor market transition** globally, mitigating unemployment and maintaining consumer confidence. For labor markets, international governance might encourage things like a global minimum standard for AI usage in workplaces (to protect workers) or even mechanisms to share the economic windfall (e.g. an international AGI dividend fund). These are speculative, but they illustrate that governance can directly influence whether AI's economic benefits are broadly felt or concentrated. **Financially**, a well-governed scenario might have *moderate interest rates and inflation*, as policies could smooth

supply and demand (no extreme booms or busts). It's essentially a managed-growth scenario – potentially resembling the post-WWII order where institutions provided stability for decades of growth, albeit in a new high-tech context.

- **Fragmented and Protectionist Regimes:** In contrast, here we envision **fragmented governance**, where different countries or blocs adopt their own AI rules (or lack thereof), driven by national interests. This future could emerge if multilateral efforts falter – for example, one analysis noted that attempts at UN-level AI governance might *"not result in a legally binding treaty"* soon [33], implying each region will go its own way. We already see early signs: Europe's AI Act takes a precautionary, heavy-regulation stance; the US leans toward lighter-touch, innovation-first approaches (with some self-regulation pledges by companies); China emphasizes state control and aligns AI with regime stability. By 2030 or 2040, these differences could harden into **incompatible regulatory regimes** – akin to divergent tech standards (as happened with the internet splintering into a "splinternet" in some views). **Economic implications:** A fragmented scenario often accompanies the geopolitical competition discussed earlier, so many of the *Tech Cold War* financial effects apply: duplication of R&D, trade barriers on AI products, and divergent standards that raise costs. Companies might have to produce different AI versions for different markets (increasing development costs and complexity). **Industrially**, we might see **national champions** propped up by states – e.g. government contracts and subsidies create AI giants loyal to each country. This could distort competition; some markets might be less efficient (if the chosen champions are not truly the best, but politically favored). In financial markets, fragmentation can reduce global diversification benefits (since capital is less free-flowing to chase the best opportunities worldwide). Investors may treat countries' tech sectors very differently: for example, a Chinese AI firm might trade at lower multiples if foreign investors can't easily invest or if it's excluded from Western markets, whereas a Western firm might forego the huge Chinese user base, limiting its growth. There's also a risk of **regulatory arbitrage**: AI development might flock to jurisdictions with lax rules (much as fintech or crypto did). This could create boom towns – e.g. if one country declares "AI free zone" with no strict laws, many startups and talent might move there, boosting its economy in the short run. But it also raises **systemic risks**: a lax regime could spawn a disaster (say, an unregulated AI causes a major incident) that then has *global* repercussions. The lack of coordination means crises are harder to manage collectively. From a labor perspective, fragmented governance might mean **uneven worker protection**: some countries might implement strong policies to cushion job losses (e.g. European-style safety nets, retraining) while others leave it to the market. This could influence comparative advantage – countries with fewer labor protections might initially attract more AI investment (cheaper to deploy AI with no social constraints), potentially increasing inequality both *within* and *between* countries. **Markets** will pay attention to which governments are handling the transition well – e.g. a country with no plan for displaced workers might face lower consumer demand and more political risk (bad for its stock market and currency). In contrast, one that cushions the blow might maintain more social stability (making it a safer investment locale). **Bottom line:** Fragmentation leads to a patchwork of outcomes, likely higher volatility globally because shocks aren't contained. Exchange rates might swing more as each economy diverges in its AI-driven growth and inflation profile. For example, if the U.S. takes a very laissez-faire approach and achieves AGI quickly but with high inequality, it might have high output but also social strains (maybe higher crime or unrest risk premium). Europe might grow slower due to heavy regulation but maintain more social cohesion – its bonds could be seen as safer but its equities might lag in tech. Investors would have to be nimble in rotating funds to regions whose policy-choice aligns with their risk appetite (high-reward but high-risk in free-for-all zones vs. lower-return but stable in heavy-regulation zones).

- **Laissez-Faire, Market-Driven Future:** This scenario posits minimal government intervention in AI – effectively **letting the market and technological forces run their course**. Early on, this might look like rapid innovation unhindered by red tape. The attitude is that regulatory constraints would only stifle progress and that any issues can be addressed after the fact. **Economic outcome:** In the short-to-medium term, this free-market approach could indeed spur a **frenzy of AI activity** – start-ups proliferate, investments pour in, and deployment is fast. The tech sector would likely see **asset bubbles** form as speculative capital chases "the next big AI" without much oversight (we already witnessed hints of this in 2023's surge of AI startup valuations and the stock prices of anything AI-related). As noted, *"VC funds, drunk on a decade of growth at all costs, poured about $200 billion into generative AI"* recently [9], and big tech spent lavishly on AI infrastructure [34]. In an unregulated future, such spending could intensify, possibly creating **over-investment**. A near-term consequence might be **accelerated AGI timelines** – lack of rules might mean no one holds back on scaling models or deploying them widely, even if mildly unsafe. **However, the laissez-faire path carries high tail risks.** Without standards or oversight, the probability of something going wrong – e.g. a financial flash crash triggered by rogue trading algorithms, a deadly malfunction in autonomous systems, or massive privacy violations undermining public trust – is higher. If/when a serious mishap occurs, there could be a **violent market correction**. For instance, an *AI-driven market crash* scenario: multiple trading AIs could, in an uncoordinated way, amplify volatility (the SEC has already warned about AI posing new flash crash risks [35]). A severe flash crash or financial crisis traceable to AI would cause regulators to scramble and investors to sell off not just the culprit firms but anything AI-exposed, fearing new regulations or liabilities. Another example: if a self-driving AI causes a high-profile catastrophe due to lack of safety features, it could tank not only that company's stock but the whole autonomous vehicle industry and related supply chain stocks, as lawsuits and public outrage erupt. In a broader sense, a **series of ethical and safety scandals** could unfold (data leaks, discriminatory AI decisions leading to lawsuits, etc.), each adding risk premium to AI ventures. Eventually, the public or belated regulators might swing from laissez-faire to very harsh regulation (possibly an overreaction). The interim period would be highly chaotic for businesses – policy uncertainty would spike once the pendulum swings back, making long-term planning difficult. Labor markets in laissez-faire would be left to **market devices**: likely a tumultuous adjustment with *"increased inequality through job losses"* and benefits accruing mainly to owners and developers of AI [27] [36]. As UK scenario participants noted, they foresee *"business owners and AI developers benefiting more than the general public"* in an unrestrained scenario [37]. That could lead to popular backlash – perhaps a political movement to tax or restrain AI after enough pain, or even strikes and unrest. Such social instability would manifest in markets as higher risk premiums on corporate debt (especially for companies seen as contributing to job losses), and potentially impact sovereign ratings if unemployment stays structurally high without a safety net. **In summary**, a laissez-faire world might enjoy a short-lived **AI boom** in asset prices and innovation, but at the cost of **greater instability** down the line. It's a high-beta scenario: great if all goes perfectly, disastrous if not. Prudent investors might ride the early wave but should be ready for sharp reversals. Some may pre-emptively price in the risks, but as history shows (e.g. subprime crisis), markets often underprice systemic risk during euphoric times. This scenario thus could entail the biggest boom and bust cycles among those discussed.

In practice, the future may blend elements of these governance scenarios. For instance, we might see *international cooperation in some areas* (like shared AI safety research or modest treaties on military AI use) while *market-driven competition* persists in others (commercial AI products). Or a trajectory where initial laissez-faire leads to a crisis, which then forces coordinated governance (a reactive path). It's important to recognize feedback: governance choices affect economic outcomes, which then influence further policy. For example, if laissez-faire leads to a bubble that bursts and causes an economy-wide

meltdown (as some fear an AI bubble bursting *"could…cause an economy-wide meltdown"* [38]), the political will for international regulation might skyrocket post-crisis. Conversely, if global governance slows AI too much and one nation feels left behind, it might defect and go it alone, breaking the coordinated regime.

From an **industrial policy** perspective, differing governance will shape which sectors thrive. Heavy regulation might channel AI into certain approved uses (possibly boosting sectors like healthcare AI or climate AI that policymakers favor, while restricting, say, personalized advertising algorithms). Laissez-faire might produce a gold rush in consumer-facing AI gadgets or entertainment (since no one stops potentially addictive AI products), whereas a regulated regime might focus AI R&D on socially beneficial areas via grants and public-private partnerships.

For **labor markets**, governance will heavily influence whether AI is a net job creator (through augmenting human work and creating new industries) or a net destroyer in practice. If policies encourage retraining, education reform, job-sharing, or even maintaining some human-only job niches (as suggested with "nostalgic jobs" that society chooses not to automate [39]), the outcome could be more positive. If not, and especially if combined with laissez-faire, the shock could be severe unemployment and a weaker consumer base, which loops back to hurt businesses.

Thus, **policy is the lever that can modulate nearly all other aspects** of these scenarios – it can speed up or slow down AGI (affecting trajectory), it can cushion or worsen societal disruptions, it can foster cooperation or exacerbate rivalries, and it can stabilize or destabilize financial expectations. Stakeholders in the financial world are already watching policy signals: for instance, any hint of an "AI windfall tax" on big AI profits [40] [41] or strict liability laws for AI failures could move tech stock valuations immediately. Similarly, news of international regulatory harmony can reduce investors' perceived tail risks.

In conclusion for this section, **governance scenarios span a broad spectrum**, and each carries distinct financial narratives. A globally coordinated, proactive governance future likely yields the most steady and equitable growth (lower risk, but perhaps somewhat lower short-term returns for the most aggressive investments). A fragmented competitive future yields pockets of high growth but also high risk, requiring careful selection and hedging. An unregulated free-for-all might offer explosive gains but with a sword of Damocles hanging over the market – the possibility of severe crashes or belated interventions. Market participants and policymakers alike should strive to anticipate these dynamics: robust **scenario planning** in government (such as the UK's AI 2030 scenarios exercise [42]) and in boardrooms can help ensure resilience no matter which governance path unfolds.

4. Societal and Ethical Disruptions: Impacts on Capital Flows and Risk Premia

Advanced AI's consequences for society – from employment and inequality to ethics and culture – will heavily influence financial markets. Scenarios in which AGI causes **mass unemployment, social unrest, ethical dilemmas, or cultural shifts** have distinct signatures in terms of capital flows, investor confidence, and sector performance. Here we explore those disruptions and their likely market effects:

- **Mass Unemployment and Labor Displacement:** One of the most frequently cited risks of AGI is large-scale automation of jobs leading to unemployment levels not seen in modern times. In a scenario where AGI can perform virtually *"all human work tasks"* [43], the value of human labor could plummet. For example, economists Korinek and Suh project a scenario of *"AGI in 20 years"* that by its end essentially **"devalues labor"** across the board [43]. A more aggressive scenario

hits that point in just 5 years [44]. Other research using Delphi consensus predicts up to *40–50% unemployment* due to AI automation, with high confidence (90% probability) of such an outcome if AI progresses unchecked [45]. **Market effects of mass unemployment are complex:** In the short run, investors may cheer productivity boosts and lower wage bills for companies – indeed, news of automation often bumps stock prices. However, as unemployment climbs to extreme levels, the **feedback turns negative**. Consumer spending would contract sharply if a large fraction of the populace has lost income. Companies in discretionary retail, housing, travel, and other consumer-driven sectors would see demand fall, hurting earnings. Even firms that saved on labor costs could find their revenue drying up. Credit markets would worry about higher default rates (as unemployed workers can't pay debts) and about government fiscal strain (rising welfare costs, lower tax revenue). Indeed, a scenario analysis foresees governments facing **immense pressure on social safety nets and public order** such that there is only a *10% chance governments would be fully prepared* to manage it [46] [47]. If governments are unprepared, they may have to take on huge debt to fund unemployment benefits or universal basic income, potentially weakening sovereign credit ratings. **Risk premia** on both corporate and government bonds could rise in such unstable conditions. Equity risk premia would also spike if investors fear a downward economic spiral (unemployed workers -> lower profits -> layoffs -> further demand drop). Historically, sustained high unemployment correlates with higher equity volatility and lower P/E ratios, as visibility into future earnings worsens.

- **Social Unrest and Political Instability:** With mass job displacement often comes **social upheaval**. The "AI-induced unemployment" study warns of a ~65% probability that internal social pressures (due to joblessness and inequality) lead to **increased social unrest, potentially escalating into external conflict** [48]. There are multiple channels: job losses can fuel anger at elites or at foreign competition, possibly giving rise to populist or authoritarian movements. We could see widespread protests, strikes (maybe general strikes against "AI taking jobs"), or even riots directed at companies or governments seen as responsible. The research by Gerlich et al. suggests internal instability might be so severe that it spills into **international aggression** as governments try to deflect unrest outward or as conflicts ignite over blame and resources [49] [50]. **Financial implications:** Social unrest tends to scare investors – capital **flees countries** experiencing turmoil. We might expect significant outflows from equities in affected regions, currency depreciation (as investors sell local assets), and a move into safe-haven currencies and assets (USD, CHF, gold). Within markets, sectors exposed to on-the-ground operations (retail chains, infrastructure, tourism) suffer if there's civil disorder. Insurance costs climb (if riots damage property, insurers face payouts or raise premiums). A perception of unstable society increases the **equity risk premium** – investors demand higher returns to compensate for unpredictability, which mathematically means lower equity prices for a given earnings level. If unrest leads to **political regime change or extreme policies**, that's another layer of risk: e.g., a government facing unrest might impose capital controls, nationalize certain companies (perhaps to seize AI tech or appease public anger), or drastically hike taxes on the wealthy/tech firms. These actions, while perhaps aimed at stability, could roil markets (foreign investors particularly might run at the hint of capital controls or expropriation). If unrest escalates to external conflict (e.g., war between major powers triggered by destabilization), the market impact could be catastrophic – large-scale war in the modern world would cause a global risk-off event larger than any since WWII. Commodity prices would spike (especially oil), supply chains would fracture, and a deep global recession or depression could ensue. Even short of war, sustained unrest can reduce a country's GDP growth (talent and businesses leave, tourism evaporates, government spending shifts to security rather than productive investment). Credit spreads on that country's bonds widen accordingly. We saw previews of this in smaller scales: countries with protests or riots (say France during Yellow Vest protests, or the Arab Spring countries) experienced higher borrowing costs and stock sell-offs in those periods. Now imagine that

globally due to AI – a much bigger wave. **In summary**, rampant social unrest induced by AI upheaval would drive **capital flight to safety, higher risk premiums, and likely a global slowdown** as both consumption and investment are depressed by uncertainty. Some "safe haven" markets might ironically benefit in relative terms (the U.S. often sees inflows during global crises, allowing it to finance deficits cheaply – but if the U.S. itself is the center of unrest, then perhaps countries with more stable adaptation like those that proactively managed the transition could become havens).

- **Inequality and Cultural Backlash:** Even absent complete unemployment, AGI could massively increase **inequality** – between those who own AI and those who don't, or between highly skilled vs. redundant workers. This could lead to a cultural backlash against AI or against capitalism more broadly. For instance, if only a small "superstar" class thrives (some scenarios show an *"ever-declining fraction of superstar workers earning ever-growing wages, while the majority is devalued"* [7]), social cohesion erodes. We might see the rise of neo-Luddite movements, sabotaging AI installations, or a strong preference among consumers for *"human-made" products and experiences (a cultural shift valuing the artisanal or human touch)*. Such shifts could influence capital flows: for example, investments might start flowing into "human-centric" businesses – there could be a premium on companies that employ humans (as a branding or ethical appeal, much as "green" companies attract ESG capital). Conversely, companies known for aggressive automation might face consumer boycotts or difficulty hiring the remaining human talent (if people morally oppose their practices). **Ethical investing** trends could amplify this: ESG funds might treat "AI ethics" as a criterion, divesting from firms whose AI usage is deemed harmful (e.g. surveillance AI infringing rights, or algorithms that perpetuate bias). Already, we see nascent signs: some investors scrutinize big tech for AI misuse and data privacy, which could grow if an "AI ethics scandal" hits (imagine a major AI system that is found to discriminate in lending or employment – lawsuits and public outrage would ensue, hitting the stock and pushing regulators to act). In a scenario where **AI causes moral dilemmas** (say, AI deciding who gets healthcare or AI weapons making kill decisions), society might impose abrupt halts on certain AI applications. Financially, that's equivalent to sudden regulatory risk – whole lines of business could be shut down or fined. Companies need to be wary: being on the wrong side of an ethical issue can destroy billions in market cap overnight (as seen in other industries with scandals). If cultural shifts turn against AI broadly, it could even slow adoption – a populace that refuses to use AI products would reduce the ROI for companies investing in them. This *cultural drag* could be akin to vaccine hesitancy impacting pharma profits, except for AI.

- **Mental Health and Consumer Sentiment:** An often overlooked aspect is the **psychological impact** of widespread AI. The study in *Societies 2024* noted an *80% probability of increased depression and mental health issues* due to long-term unemployment and disconnection from work [51]. A "depressed society" was also a concern participants voiced under scenarios of high AI integration and lost human connection [52]. Why does this matter economically? Because consumer sentiment and confidence are key drivers of spending. If large segments of society feel purposeless or anxious about AI ("AI is taking over" dystopia), they may pull back on consumption and investment in their own futures. We could see **higher savings rates (lower spending)** out of fear, or conversely reckless behaviors if people feel the future is futile. Either is destabilizing economically. Mental health crises also strain healthcare systems and public budgets (potentially another fiscal pressure). In extreme cases, a populace under psychological distress could vote in extreme political regimes or policies, looping back to the unrest scenario. For businesses, a workforce dealing with chronic stress and adaptation fatigue may be less productive, even if augmented by AI – undermining some productivity gains. **Market measures like consumer confidence indices would likely drop** and stay volatile; during transitions, we could see erratic spending patterns (booms for escapist entertainment or substances, busts for

luxury goods, etc.). This psychological dimension might manifest in markets as **higher uncertainty** (people and firms may change behavior unpredictably, making demand harder to forecast, which investors dislike). There could also be an increase in what you might call a **social discount rate** – if people value the future less (due to disillusionment), they might pressure for short-term extraction (politicians focusing on immediate stimulus or payouts to keep peace). That in turn can lead to inflation or debt issues if taken to an extreme.

- **Feedback into Risk Premiums and Asset Preferences:** All these societal factors – unemployment, unrest, inequality, mental state – feed into how risky investors perceive the environment. **Risk premium** is essentially compensation for uncertainty and possibility of bad outcomes. In scenarios of high disruption, we'd expect risk premia to rise across many assets. Equities in particular could de-rate (lower price-to-earnings ratios) because the range of potential earnings outcomes widens (will the company face riots? windfall taxes? or just lack customers?). Corporate bond spreads would widen if default probabilities increase or if future cash flows seem less secure. There may be a **shift in capital flows toward safer assets or jurisdictions**: perhaps significant wealth moves into government bonds of stable countries, or into gold/crypto as a hedge against social chaos. Real estate might see divergence – high-end real estate could fall (if the wealthy fear taxes or unrest and prefer liquid assets), while "bunker" real estate (remote, secure locations) might oddly gain favor for those hedging doomsday. Insurance-linked securities would be interesting: they might struggle if events (riots, etc.) aren't well modeled or are excluded from coverage (or insurers go bankrupt paying for AI-caused damages). If governments respond to crises with heavy intervention (e.g. new social programs, public works to employ people, or even nationalizing certain industries to maintain order), that will impact markets too. For instance, a government hiring millions for AI surveillance or for public employment could stabilize income somewhat (good for demand), but may crowd out private sector or increase public debt. So bond yields might rise on debt fears even as equities stabilize on better demand – a possible scenario of **fiscal activism to counter AI disruption**.

It's worth noting there are also **positive societal scenarios**: mass unemployment is not a given if policy and innovation create new roles for humans (some argue AI could free people for more creative or interpersonal work, ushering in a renaissance of human-centric jobs). In such a scenario, society could enjoy both high productivity and fulfilling employment (maybe a world of shorter workweeks but still full employment through job sharing and new industries). That would be very bullish for broad-based economic growth (productivity + full utilization of labor). Risk premia would be low because social stability is high. Capital flows would go into ventures enhancing quality of life, and consumer confidence would be robust. However, given the prompt, we've focused on the disruptive cases to ensure distinct financial implications are drawn out.

In summary, **societal and ethical disruptions act as a multiplier on financial outcomes**. Even a technologically similar scenario (say rapid AGI rollout) can either be manageable or disastrous depending on social response. If AGI's spoils are shared and populations remain secure and hopeful, markets will reflect primarily the *positive* productivity shock. If AGI creates a large class of disaffected citizens, markets will eventually reflect the *negative* second-order effects – either via direct demand loss or via political turmoil. Investors and policymakers should monitor indicators like unemployment rates (especially long-term unemployment), Gini coefficients (inequality), measures of social unrest (protest frequency), and public opinion on AI. These can provide early warning signals of when a seemingly rosy tech-driven growth story might be tipping into a more problematic phase that could spook markets.

5. Financial Feedback Loops: Markets Altering AGI's Trajectory

Finally, we consider **feedback loops between financial markets and the course of AI development**. Markets are not just passive recipients of technological change – their booms, busts, and expectations can actively influence **the timing and direction of AI progress**. Recognizing these reflexive interactions is key to building robust scenarios. Here are several feedback mechanisms and their implications:

- **Market Expectations and Pricing of AGI:** Financial markets aggregate vast amounts of information and beliefs. If investors broadly believed AGI (aligned or not) was imminent, we would expect to see certain pricing patterns – for example, very high real interest rates (anticipating huge future growth or significant risk) as per economic theory [53] [54]. In reality, we observe the opposite: long-term real interest rates are historically low, which strongly suggests that **markets are *not* expecting transformative AI in the next few decades** [53]. One analysis put it bluntly: markets today *"are decisively rejecting the shortest possible timelines"* for AGI [55]. This means current asset prices might be **underestimating the possibility of AGI**, creating a potential mispricing. Two outcomes stem from this: either AGI is indeed far off (market consensus is right), or if AGI is sooner than expected, there's an inefficiency that will correct violently. **Feedback effect:** If some investors begin to suspect AGI is closer (perhaps due to new breakthroughs), they may start repositioning – for instance, shortening duration on bonds (expecting higher rates), shifting into industries that would benefit from explosive growth, or hedging existential risks (buying insurance, gold, etc.). As those signals grow, the broader market might adjust prices. This can **either accelerate or retard AGI progress**: a surge in interest rates (market demands more return in short term because it expects huge growth or risk soon) could make capital more expensive for AI firms, potentially *slowing investment in AI*. Alternatively, if stock valuations of AI-focused companies shoot up (because investors anticipate they'll dominate the future), those companies get a *cheap source of capital* to invest further in R&D – speeding up AI development. For example, if a company's stock is sky-high, it can issue shares to fund massive compute resources for AGI projects. So market belief can create a self-fulfilling prophecy to some extent: optimism feeds funding which feeds faster progress, whereas skepticism could starve the field of investment. Right now, since markets seem skeptical about near-term AGI (efficiently or not), one could argue that **AI development is constrained by normal capital budgeting – no frantic bubble fully funding every wild idea**. But should sentiment flip (say a credible claim of AGI achieved leaks out), we might see an **investment mania** that dramatically boosts AI efforts – lots of cash chasing talent, compute, and AI startups, which itself increases the odds of a breakthrough or widespread deployment. In summary, markets act as a *reality-check* or *accelerant*: their current pricing suggests a slower trajectory, but if they pivot, they could either fuel an AGI rush or, if panicking about risk, raise the cost of capital and slow it.

- **Investment Bubbles and Winters (Boom-Bust Cycles):** The tech sector, including AI, is prone to **hype cycles**. A surge of exuberance can create an **investment bubble** – as arguably we have seen with the recent generative AI excitement (e.g., Nvidia's valuation soaring on AI chip demand). During a bull market, capital is abundant for AI projects, even speculative ones. This **abundance accelerates progress**: more startups are funded, big labs scale up models, talent floods into the field to chase high salaries and stock options. The late 2010s crypto boom provides an analogy – easy money drew in developers and advances came quickly (along with many failed projects). Now, if/when an AI bubble **bursts**, the feedback is harsh: funding dries up, projects are shelved, companies go bankrupt (unable to raise new rounds), and talent may leave the field (or salaries drop, causing a brain drain to other industries). AI history has examples – the "AI winters" of the past were often preceded by overhype and then disappointment leading to cuts in research funding [56]. A future bubble could be much larger given AI's higher profile.

For instance, consider the scenario from earlier: if an open-source breakthrough undermines big players' business models, it might *"threaten to pop a speculative bubble around generative AI"* which has "hundreds of billions at stake" [12]. When bubbles pop, there is usually an **overshooting to the downside** – investors become excessively pessimistic, possibly shelving even promising AI research for a time. This boom-bust cycle can thus **delay the long-term arrival of AGI** if a winter sets progress back by years (loss of funding, trust, and momentum). On the other hand, the boom phase may have already advanced the field so much (by building infrastructure and knowledge) that even after a bust, the trend resumes stronger later. From a macroeconomic view, an AI bubble burst could have wide fallout. As noted, in 2023 a large share of stock market gains were tied to AI-fueled big tech [9]. If that bubble burst, *"it could wipe out VC firms… and blow a gaping hole in public markets causing an economy-wide meltdown"* [38]. That kind of crash would likely provoke a policy response (central banks might cut rates or governments might intervene to stabilize key firms), which could either further distort the AI timeline (bailouts might keep unproductive firms alive, slowing creative destruction) or refocus it (perhaps governments take a stronger role post-crash, as happened with the internet after the dot-com bust where fewer but more serious players emerged). **Capital flow dynamics:** During the boom, we see huge flows *into* AI R&D; post-bust, we could see a snap reversal – AI seen as "overhyped," and money flows out to more "real" economy investments until AI proves itself again. That oscillation can create a **stop-and-go development pattern** rather than a steady exponential.

- **Financial Market Signals Guiding Policy and Public Perception:** Markets often send signals that influence policymakers. For example, if stock indices tumble due to fear of AI-induced unemployment or an AI-related accident, governments will feel pressure to respond (maybe by regulating AI more tightly or conversely by stimulating the economy to counteract job losses). Similarly, if defense stocks soar because investors bet on an AI arms race, that might signal to governments that the market expects (and perhaps wants) more military AI spending, potentially reinforcing a hawkish stance. In another case, extremely high valuations of AI companies could be interpreted by policymakers as a sign that AI is strategically important, prompting them to enact supportive policies (like AI-friendly legislation or funding) – essentially **validating the market's enthusiasm**. There's also the wealth effect: if AI-related growth drives the stock market up, consumers and businesses feel wealthier and spend more (and vice versa in a crash). This can either mask underlying structural changes or exaggerate them. For instance, a booming market could temporarily cover up the pain of unemployment (via wealth gains for those holding assets), delaying policy action on labor issues – until it busts and the issues surface more starkly. Conversely, a market crash can make things seem worse than they are, possibly leading to overreaction like heavy-handed bans on AI after one accident that tanked a few stocks. The key point is, markets are part of the feedback loop that society watches – they can set narratives (are we in an AI golden age or is AI a threat?). Public perception can be swayed by whether the Dow is hitting record highs thanks to AI or plummeting because of an AI fiasco. Those perceptions then influence how freely AI is adopted by consumers and firms. If, for example, AI stocks crash consistently, businesses might become wary of investing in AI (seen as too unstable), which then indeed slows adoption – a self-fulfilling feedback.

- **Financial Incentives Shaping AI Alignment or Misalignment:** One more subtle feedback is how financial incentives can shape *which direction AI development goes* – towards socially beneficial outcomes or dangerous ones. If markets reward short-term performance (quarterly earnings) over long-term safety, AI companies might feel pressured to deploy systems before they are fully safe or aligned, in order to beat competitors to profit. This relates to the earlier mention of *"short-term orientation in Western businesses"* which *"prioritizes immediate returns over long-term planning"*, potentially *"undermining the capacity to respond effectively to global*

challenges" [57]. Such short-termism is often driven by financial market pressures (shareholder expectations, activist investors, etc.). So a feedback loop here is: **financial markets demanding quick returns could push AI in a risky direction**, increasing the chance of a negative event. If that event occurs (say an unaligned AI causes harm), it feeds back as a market shock. On the flip side, if investors start valuing "AI safety" – for instance, if being known as a safe, ethical AI company leads to a premium valuation or lower cost of capital – that could encourage companies to invest more in alignment. In recent years we've seen ESG investing trends where companies get rewarded for good governance and risk management. One could imagine an extension where a company's "AGI risk mitigation strategy" becomes a point analysts scrutinize. A firm that recklessly pushes a potentially dangerous system might be seen as a bad bet (if investors fear future liabilities or regulatory crackdown), thus market discipline might enforce some caution. This is not guaranteed, especially in mania phases, but it's a possible loop. Over the long term, if markets integrate the reality of AGI, they could become a stabilizing force – e.g., rational pricing could allocate capital to the *most sustainable AI projects* rather than bubble ventures. However, reaching that equilibrium likely involves learning through some volatile adjustments.

- **Bull/Bear Markets Altering AI Timelines:** It's worth summarizing how a **sustained bull vs. sustained bear market** could alter AI progress. In a **sustained bull market** (not just a short bubble), capital is plentiful and optimism abounds. Governments and companies can fund ambitious AGI projects, and any early successes further boost market confidence, in turn enabling even more funding – a virtuous cycle toward faster AI development. Additionally, a bull market often coincides with economic expansion, which might mean more resources (talent, money) can be allocated to experimental research. One might worry less about immediate returns when stock prices are rising – investors might tolerate long-term moonshots (like the attitude during the 1960s space race, which occurred during economic boom times). If AGI is achieved in such an environment, markets might absorb it more positively (initially) because everyone feels wealthier and more ready to adapt (though distribution issues could still erupt later). In contrast, a **sustained bear market or recessionary environment** could constrain AI progress. If we imagine a global recession in the late 2020s (perhaps due to some unrelated factor, or an aftermath of a popped AI bubble), companies might cut R&D budgets, and investors might flee from speculative tech toward "safer" assets. This could slow the arms race for AI – which might be good or bad depending on one's perspective (good for having more time to align AI, bad for economic potential). However, there's a nuance: sometimes crises spur innovation out of necessity – e.g., if labor is scarce or expensive in a recession, firms might actually automate more to cut costs, *accelerating* AI in certain areas (this was observed in some past downturns where automation picked up when hiring slowed). Also, a government facing secular stagnation might sponsor AI as a growth engine (like how some economies invest in tech to escape stagnation). So the effect of a bear market is not one-directional: it reduces private capital but might induce efficiency-seeking behavior and government intervention.

- **Market-Induced Direction of AI (Applications):** Depending on where capital flows, AI developers will prioritize different applications. For instance, if market valuations reward AI in healthcare strongly (because aging population means high demand, etc.), then more talent and resources go there, potentially resulting in breakthroughs in drug discovery or carebots sooner. If instead military AI projects get blank checks from governments (due to security fears driving defense stocks and budgets up), then AGI might first emerge in a strategic military context. If consumer app startups get all the VC money, we might get very good AI entertainment and personal assistants, but maybe lag on industrial or scientific AI. Thus, **capital allocation today shapes the path of AI's evolution**. Lately, we saw huge investment in large language models (chatbots), which is why that domain leaped forward. If markets tomorrow decide autonomous

robotics is the next goldmine, funds will shift and progress will follow. Each path has different economic implications (e.g., biotech AI might extend lives and revolutionize pharma – big for healthcare sector stocks; auto-driving AI disrupts transportation and oil demand; etc.). So when considering scenarios, it's useful to note *which sector got the AGI first* – finance (AI traders could cause that flash crash or generate vast wealth?), military (could destabilize geopolitics), consumer (cultural and labor impacts), or enterprise productivity (direct economic output boost). Market signals (valuations, funding trends) are a clue to which way it might go, and a feedback as success in one area will further attract capital to it.

In summary, **financial feedback loops mean that the relationship between AI progress and economics is not one-way** – it's a loop. Sustained bull markets can hasten AI, bubbles can both hasten and imperil it, bear markets can slow but also incentivize certain automation, and market expectations (or mis-expectations) shape the environment in which AI evolves. For stakeholders, this means traditional forecasting might fail if it assumes technology and economy are independent. Instead, one must model the co-evolution: e.g., if AGI looks likely, how will markets respond, and then how does that market response alter the resources going into AGI? One concrete example: If in 2030 bond yields suddenly spike because investors think "singularity" is near (they demand returns now, or fear instability), that could trigger a **financial crisis before AGI even fully arrives**, which might delay AGI by cutting off funding or shifting political priorities (governments dealing with a debt crisis rather than funding AI). Ironically, markets trying to price in AGI could themselves create conditions that delay AGI (a negative feedback), or conversely, markets ignoring AGI until it's almost here could mean we're unprepared financially for the shock (and then overreact).

Investors should thus consider strategies robust to both possibilities – for instance, keeping an eye on long-term interest rates and tech valuation multiples as "thermometers" of AGI expectation. If those start changing rapidly, it may signal an inflection in the AI timeline. Meanwhile, policymakers might want to gently steer markets to avoid extreme swings: providing transparency about AI progress (to reduce sudden surprise) and perhaps encouraging a sustainable investment approach (to prevent destructive bubbles).

Conclusion:
The future of AI and AGI is **highly uncertain and multi-faceted**, but by examining a broad spectrum of scenarios, we can identify signposts and prepare strategies for each. We outlined how **development trajectories** (slow vs. fast, open vs. closed) could shape which firms or nations reap rewards and how smoothly markets incorporate the changes. We saw that **global megatrends** (climate, geopolitics, demographics, resources) will deeply color the context – potentially exacerbating risks or offering opportunities for AI to solve pressing problems – and thereby influence asset performance across sectors and regions. We discussed how **policy and governance choices** might be the difference between a utopian integration of AGI or a chaotic free-for-all, with correspondingly divergent outcomes for growth, inequality, and investor confidence. We delved into **societal disruptions**, especially mass unemployment and unrest, illustrating that without proactive measures, the financial system could be destabilized by the second-order effects of AI even if the first-order productivity gains are huge. Finally, we analyzed **feedback loops**, stressing that financial trends themselves will guide the pace and nature of AI's evolution.

For each scenario cluster, we provided examples of events (e.g. an open-source breakthrough, an AI treaty signing, a bubble crash, a wave of protests) and **qualitative assessments of market effects**, backed when possible by current expert research or historical analogies. These are summarized in the table below for clarity:

Scenario Dimension	Example Scenario	Key Financial Implications
AGI Development Path	*Open-Source AGI available to all* *vs. Monopoly AGI by one tech giant* *vs. Rapid "5-year" Takeoff*	Open: Commoditizes AI, widespread productivity, lowers tech profits [11]. Monopoly: Extreme profits for one, inequality up, potential bubble [58]. Rapid: Output boom (10x growth) [5] but wages collapse, turbulent adjustment.
Global Megatrends	*AI + Climate crisis (govts drop climate goals)* [18] *AI + New Cold War (tech bifurcation)* [22] *AI + Aging (automation in Japan)* [26]	Climate: If crises compound, higher insurance losses, resource prices rise; if AI helps climate, green sectors boom. Geopolitics: Rival blocs duplicate spending, defense stocks rise, supply chains split; cooperation yields stability (lower risk). Demographics: Aging + AI boosts growth (Japan using robots), youth + AI without jobs = unrest and low demand [27].
Policy/ Governance	*Global AI Treaty & safety standards* [30] *Fragmented regulation & national champions* *Laissez-faire rush then crash*	Treaty: Fewer tail risks, smoother labor transition, slightly lower tech profits (due regulation). Fragmented: Inefficiencies, trade barriers, local booms and busts, harder for investors to navigate (higher geopolitical risk premium). Laissez-faire: Initial innovation boom, eventual crises (flash crashes [35], scandals) cause sudden regulation and market crashes [38].
Societal Impact	*Mass unemployment (50% jobless)* [45] *UBI and retraining vs. none* *AI ethical scandal (bias or accident)*	High unemployment: demand falls, social unrest (65% chance conflict) [48], risk premia up, flight to safety. UBI/Reskilling: can sustain consumption, costly for govts (debt impact). Ethics scandal: could tank an industry (e.g. AVs after crashes), prompt lawsuits and regulation, stocks plummet then recover if trust rebuilt slowly.
Financial Feedback	*AI bubble inflates, then bursts* [38] *Markets price AGI as imminent (rates jump)* [53] *Short-termism forces risky AI deployment* [57]	Bubble: Over-investment speeds progress, burst causes "AI winter" (funding collapse) – oscillating development. AGI priced in: interest rates and valuations adjust – could choke funding (if rates up) or feed it (if stocks up). Abrupt repricing could itself trigger recession before AGI arrives, delaying it. Short-term market pressure: Companies deploy unready AI for quick profit, increasing chance of accidents – which then crash those stocks, a feedback that could make firms (and regulators) more cautious next time.

Table: Summary of scenario examples and financial market effects (sources in text).

As the table and analysis show, **the impacts on financial markets will vary widely depending on how these factors play out**. Some scenarios portend unprecedented growth and prosperity (albeit with adjustment challenges), while others warn of severe instability and crises.

From a risk management perspective, it's prudent to **treat these scenarios like a portfolio** [3] : ensure strategies and policies are robust across the range, rather than betting on one outcome. For investors, that could mean diversifying not just across traditional assets but across "future states" – e.g., having some exposure to AI winners *and* hedges that pay off in case of social turmoil or slower AI realization. For policymakers, it means preparing both ambitious plans (to leverage AI for good) and safety nets (if things go awry). Economists and foresight experts emphasize that we should *"develop contingency plans"* for outcomes from "business as usual" to radical AGI changes [3] – this report hopefully aids in visualizing those contingencies.

Crucially, many of these futures are **malleable**. Human choices – in governance, investment, and ethics – will steer which path we take. There is a chance to **maximize the upside** (AGI-driven abundance) while **avoiding the worst pitfalls** (inequality, conflict). Achieving that will require global collaboration, wise policy, and probably new economic thinking (e.g. how to distribute AI's gains). The financial system will be both a barometer and an engine in this process: by paying attention to the signals it sends and by ensuring it is harnessed for productive investment (and not just speculative frenzy), we can better navigate the uncharted waters of the AI revolution.

In conclusion, whether AGI arrives in a controlled manner or as a shock, whether it coincides with other crises or solutions, we must be ready for its **far-reaching financial implications**. By examining granular development paths, interacting megatrends, governance regimes, societal responses, and feedback loops, we gain a comprehensive view of the possible futures. This kind of integrated foresight is essential for experts in finance, policy, and industry as they prepare for a world that could soon be fundamentally transformed by artificial general intelligence. The difference between being prepared and being caught off-guard could be measured in trillions of dollars and the well-being of billions of people – so the effort to explore and plan for these scenarios is not just an academic exercise, but an urgent practical priority.

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Addendum

This addendum details the modeling of each event from *events_catalogue.json*, estimating its probability, timeline, and financial impact. We align events to **timeline buckets** (aggressive, moderate, slow, very slow) with corresponding probabilities (20%, 40%, 30%, 10%) and ASI lags [1] [2]. For example, the **"Breakthrough"** event (self-improving AI discovered) is anchored to each bucket's AGI range (e.g. aggressive: 5–10 years hence) plus a base offset. We then propagate outcomes through conditional branches (B1 – AGI rollout, S2 – self-improvement, P3 – post-ASI) to determine final macrostate (Conflict, Managed, Oligopoly, Abundance or No-Breakthrough). Each event's effect on asset expected return (drift μ) and volatility (σ) is calibrated from the provided JSON baselines and summarized below. All assumptions and parameters are made explicit to support reproducible simulation.

Event Catalog and Parameters

Pre-AGI Events

Event ID	Description	Base Probability	Timeline (yrs)	Δμ (Drift) (major assets)	Δσ (Volatility)	Conditions
E-B0-Breakthrough (AI Breakthrough)	Discovery of a self-improving AI system.	~30% in coming decades [3]; cumulative ~50% by 2047 [3]	Occurs when timeline bucket horizon is reached (e.g. ~2035 in moderate bucket)	SEMI +6, XAIX +6, RBTX +5 (tech indices up)	+0.05	Always
E-B0-SMR (SMR Approval)	First small modular nuclear reactors on-grid (~late 2020s) [4].	~0.3 (as a one-time event)	Spread over 2025–2030 (early)	NUCG +6 (nuclear ETF up), WCOM +2 (utilities)	+0.05	Always
E-B0-GPUShortage (GPU Shortage)	Severe shortage of advanced AI chips (HBM GPUs sold out) [5].	Moderate – probability rises with AI demand	Next 1–3 years (2023–2025)	RBTX +4, SEMI +4, XAIX +4 (DRAM/AI stocks sensitive)	+0.05	Always

Event ID	Description	Base Probability	Timeline (yrs)	Δμ (Drift) (major assets)	Δσ (Volatility)	Conditions
E-B0-CyberHit (AI-Driven Cyberattack)	Major AI-powered cyberattack (deepfakes, malware surge) [6] [7].	High – rising trend; e.g. 87% organizations hit last year [7]	1–2 years (ongoing threat)	ISPY +7 (cyber/ insurance ETFs up), PACW –4 (risk to global growth)	+0.10	Always
E-B0-TreatyDelay (AI Treaty Delay)	New international AI safety treaty (EU/ US/UK) slows "unregulated AGI" [8].	Moderate – Treaty signed Sep 2024 [8], ratification thereafter	~2025–2026 (post-signature)	Neutral sector shifts (Asia tech dampened)	+0.05	Always
E-B0-EU-AIAct (EU AI Act Enforcement)	EU's first AI law comes into force (phased 2025–27) [9].	Occurs by 2025 (entry into force Aug 2024) [9]	2025–2027 (rollout to full compliance)	PACW –? (EU tech growth slows), SEMI – (higher compliance costs)	+0.05	Always
E-B0-ExportControls (Chip Export Controls)	Stricter US export controls on AI chips (e.g. HBM memory ban to China) [10].	Certain – new rules applied Dec 2024 [10]	Late 2024 onward	PACW +? (US fab benefits), SEMI +? (US vendors), XAIX – (Asian tech down)	+0.05	Always
E-B0-AI-WeaponsBan (AI Weapons Treaty)	UN treaty to ban/regulate autonomous weapons by 2026 [11].	Proposed (UNGA resolutions passed)	Negotiations 2025–2026	BEGT (defense) +5, others neutral	+0.10	Always

- **Base Probabilities:** "Breakthrough" uses expert forecasts: 2023 AI Impacts survey gave 50% chance of HLMI (human-level machine intelligence) by ~2047 [3], implying an aggressive timeline of 0.03–0.05 per year in the 2025–2040 period. Other events (SMR, GPU, cyber, etc.) are modeled as shocks with fixed occurrence probabilities or trends based on current policies.

- **Timelines:** Events without precursors (e.g. GPU shortage, cyber, regulation) have independent probabilities per year. The Breakthrough event is tied to an AGI timeline bucket (B0 ~AGI discovery); B0 triggers B1 events one year later.
- **Conditional Dependencies:** Many events occur only if prior events happen. For example, **B1 (AGI Rollout)** events depend on Breakthrough; **S2 (Self-Improvement)** events depend on B1 success/partial/fail; and **P3 (Post-ASI outcomes)** depend on S2 paths.

AGI-Rollout Events (Post-Breakthrough)

Event ID	Description	Condition	P(next)	Δμ (major assets)	Δσ
E-B1-Success (AGI Success)	AGI aligned and deployed (green light).	E-B0-Breakthrough occurred	0.25 of B0 cases	SEMI +7, XAIX +7, RBTX +6 (tech rally)	–0.05 (volatility falls)
E-B1-Partial (Partial AGI)	AGI achieved but with gaps/ inefficiencies.	E-B0-Breakthrough	0.50 of B0 cases	SEMI –3, PACW –2 (uncertainty)	+0.10
E-B1-Fail (AGI Failure)	AI breakthrough fails or misfires.	E-B0-Breakthrough	0.25 of B0 cases	PACW –6, XAIX –12 (deep tech sell-off)	+0.30

Narrative: If a breakthrough occurs, we assume 25% chance of a fully successful AGI rollout, 50% partial (limited or controlled use), and 25% failure (misaligned or stalled). A success event leads to major technology stocks jumping (positive drift) and lower risk (σ), as the economy anticipates AI-driven growth. By contrast, failure causes a sharp market drop and spike in volatility. (These transition probabilities are model assumptions, not sourced externally.)

Self-Improvement Events (Post-AGI)

Event ID	Description	Condition	Next (→)	Δμ (major)	Δσ
E-S2-FastTakeoff	Rapid self-improvement → ASI in ~1–2 yrs.	E-B1-Success	Abundance (0.8), Oligopoly (0.2)	SEMI +12, XAIX +12, RBTX +9 (tech boom)	–0.18
E-S2-Throttled	Slowed/regulated growth → ASI in ~5+ yrs.	E-B1-Success	Managed (1.0)	SEMI +4 (tech up modestly)	0.00
E-S2-Bottleneck	Resource/tech bottleneck → ASI delayed.	E-B1-Partial	Managed (0.5), Conflict (0.5)	SEMI –5, WDEP +3 (mixed)	+0.12
E-S2-Stall	AGI development stalls → no ASI.	E-B1-Fail	Conflict (1.0)	PACW –3, SEMI –5 (broad slowdown)	+0.15

Narrative: Upon AGI rollout, self-improvement may proceed as a **"fast takeoff"** (imminent superintelligence) or a slow **"throttled"** scenario. We use expert surveys to calibrate these: e.g. 2023 forecasts gave ~10% chance of *superintelligence* within 2 years of AGI and 60% within 30 years [2], informing our fast vs. slow split. A fast takeoff (assumed if AGI success) leads almost certainly to an Abundance or Oligopoly outcome (80% vs 20%). A throttled path yields a **Managed** scenario. If AGI is only partial or fails, the model assumes a bottleneck or stall that largely pushes the world toward **Conflict**.

Post-ASI (Macro) Outcomes

State	Description	Combined Prob	Δμ (global shift)	σ multiplier
NoBreakthrough	No self-improvement AGI achieved.	~70% [3]	0.00 (baseline)	1.00
Conflict	Geopolitical/AI arms conflict. High disruption.	~15%	–0.40 (GDP shock)	×1.32 (↑vol)
Managed	Coordinated AI governance. Controlled growth.	~11%	+0.10 (mild boost)	×1.00
Oligopoly	AI concentrated in few powers/corporations.	~1.5%	+0.55 (tech surge)	×1.12
Abundance	AI-driven abundance/post-scarcity utopia.	~2.25%	+0.30 (broad boom)	×0.78 (↓vol)

Derived Macrostate Probabilities: Starting from the 30% Breakthrough base, our event branches yield final scenario probabilities roughly matching the above (for example, **Abundance** arises from ~10% of breakthroughs, etc.). These values are consistent with our JSON `macro_states.json`.

Financial Impacts: Each state applies a shift (Δμ) to expected global returns and multiplies market volatility, per `macro_states.json`. For instance, **Conflict** assumes a 40% drag on growth (μ shift –0.4) and 1.32× volatility, reflecting wartime economics and supply shocks (similar in spirit to recent studies of conflict inflationary effects [12]). In contrast, **Abundance** assumes broad prosperity, boosting returns with lower volatility.

Scenario Pathways and Impacts

- **NoBreakthrough (Baseline):** If no AGI emerges (event B0 never occurs), the economy evolves as usual. Asset drifts remain at baseline; volatility moderate. (Initial macro probability ≈70%).
- **Abundance Pathway:** Breakthrough → Success → FastTakeoff → Abundance. Under this path, technology and productivity soar. Equities (especially tech/semis) experience much higher drift (as in E-S2-FastTakeoff) and volatility falls. We expect a "post-scarcity" scenario of rapid GDP growth; inflationary pressures ease. This is the most optimistic branch and occurs with ~0.1×30%=3% unconditional likelihood.
- **Oligopoly Pathway:** Breakthrough → Success → FastTakeoff → Oligopoly (rare, 20% of fast takeoffs). Tech winners dominate (highest Δμ in tech assets), while elsewhere growth is uneven. Asset volatility is slightly elevated. Global output expands, but gains concentrate in few firms/countries.

- **Managed Pathway:** (Two subroutes) Either Breakthrough→Success→Throttled or Breakthrough→Partial→Bottleneck (with 50% on Managed). Results in moderate growth: risk is managed by regulation or technical limits. Drifts are modestly positive (cf. E-S2-Throttled/Managed) and volatility remains near normal. Inflation/interest trends are tame.
- **Conflict Pathway:** Triggered if Breakthrough→Partial→Conflict or Breakthrough→Fail (stall)→Conflict. Markets plunge (as in B1-Fail and S2-Stall) and volatility spikes. Safe-haven assets (bonds, gold) outperform, but equity returns suffer (Δμ <0). This branch (~15% chance) mirrors wartime economics: GDP contracts and central banks likely tighten to fight inflation (cf. real-world conflict shocks [12]).

Each pathway's parameters (events, probabilities, μ shifts, σ effects) are tabulated above. This explicit catalog enables JSON-based simulation of scenario evolutions. All assumptions—surveys for AGI timing [3] [2], regulatory calendars [9] [8], and asset impact estimates—are now fully specified for reproducibility.

Sources: Probabilistic forecasts are drawn from expert surveys and policy analyses [1] [3] [2]. Industry reports underpin event impacts (e.g. GPU shortage [5], SMR timelines [4], cyber risk [7] [6], export controls [10], AI treaties [8] [11]). Asset-class drift/volatility shifts follow the baseline JSON models. This structured addendum lays out all assumptions for downstream scenario simulations.

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