

Speculation Fiction Contest 2023

October 29, 2029: Black Hole Monday

The high school principal states over the microphone, "Please congratulate the class of 2063. They are officially graduates and are ready for the next stage in life!"

At the graduation party that night, Aunt Betty curiously inquires, "So Michelle, what are you going to school for?"

Dad proudly speaks up, "She is following in my footsteps! She is going to Maryville University in St. Louis to study actuarial science. She just finished taking a class over her first module."

Michelle responds, "Dad is pretty excited that I picked this path if you can't tell."

Aunt Betty asks, "What is the module cover?"

Michelle excitedly answers, "The history of insurance and its current state."

Dad asks, "Betty, I am going to get a beer. Do you want one?"

Aunt Betty, "Yes!"

Aunt Betty scoots to Michelle and says, "Tell me about this class."

Michelle asks in a shy voice, "Are you sure?"

Aunt Betty, "Yes, you are much better at telling stories than your father. Tell me about your favorite part of the class."

Aunt Betty, "It was our conversation of 2020 to today. The years in which dad was an actuary. Do you remember COVID-19 and early 2020?"

Reminiscing

Aunt Betty replies, "Oh my god, do I! It was a crazy time. Your dad and I were in college. Luckily, weed was being legalized around the US to calm us down. We had the capital riots, and China seemed poised to take over the world. But then it seemed overnight that China appeared to disappear. We had growing supply chain issues during that time, so it was hard to order things. Inflation was of little concern before COVID-19, but it was stubborn, like in the late 1970s. It got even worse!

One hundred years to the day of the 1929 stock market crash, we had the 2029 stock market crash. Also, there were a series of aftershocks throughout the 2030s and early 40s. There was famine worldwide. It started breaking out due to economies collapsing, and the world was in constant turmoil. Your uncle Marty McFly died in 2038 at age 45 because he could not find the doctor he needed, and the medical device was on backorder. I was unemployed for several years, and so was your dad. It was hard!"

Demographic Impacts of Globalization

Dad comes back with the beer and hands it to Aunt Betty. Dad shockingly says, "Why did you slam that down? Normally you are a sipper."

Aunt Betty replied, "We just started discussing the Great Deglobalization, which was like the Great Depression 2.0. The Great Deglobalization brought back some rough memories!"

Dad said, "Man! Those were rough years. Michelle, this is why you were not born until 2045, and I was in my mid-40s. We had to wait for that storm to blow over. Globalization planted in humanity a virtual virus that acts like Shingles. The virtual virus laid dormant for 84 years. The rapid increase in population and industrialization was our immune system. Globalization allowed for an increase in technology, which extended life spans. Much of the global population's growth was due to people living longer and not increasing birth rates. When the population started collapsing due to old age, our weakened immune system caused the virtual virus to attack with a vengeance due to our global interconnectedness!"

Michelle excitedly replies, "Deep, dad! We talked about why this happened. It is pretty fascinating as an observer. Aunt Betty, there was a good reason for the supply shortages. During globalization, the Chinese did not have enough children to replace the outgoing population due to urbanization and Mao's one-child policy in the late 1970s. This policy was a double whammy! Population replacement takes birth rates around 2.1 kids per couple. China's birth rate plummeted to around 1.3 per couple.

As the Chinese died or could no longer work in the late 2020s, the working population could not keep up with China's pre-COVID production levels. This working-population collapse meant supply shortages started slowly and then cascaded over the decade as the population collapse accelerated.

Global Dependence

During globalization, we optimized all our supply chains, which meant there was very little diversification of suppliers. The emerging market countries industrialized, specialized, and monopolized certain exports. A shortage of a single link could muck up the entire supply chain, a significant source of rampant inflation. Everyone was hoarding supplies. People had to pay out the nose if they wanted them, which drove costs exponentially higher. This shortage caused a higher demand for products with extended supply chains, further exacerbating the issue.

The economy only worsened during the 2020s as the death velocity increased in China. When no hope was left, labor costs skyrocketed, skillsets died off, and foreign capital rushed out of China. The world depended on China to keep the money flowing, meaning a massive global economy driver dried up almost overnight. When China burst, the system bled a vast amount of cash and liquidity, which led to the worldwide stock market crash on Monday, October 29, 2029. We called it Black Hole Monday because you couldn't escape the aftermath. In 50-60 years, China went from nothing to being on par with the US. Our industrialization was much slower. As the old saying goes, the faster you industrialize, the faster you fall! But other phenomena made this time extremely difficult.

House of Debt

Along with optimizing supply chains during globalization, we went from supplying capital for new investments to providing money to roll over debt. The debt addiction made liquidity and collateral more important than interest rates. The dependence on revolving credit created a high dependency on safe assets, such as US Treasuries. This insatiable dependence made private firms inelastic at the cost of

capital. The Gramm-Leach-Bliley Act of 1999 caused a large concentration among US financial firms and weakened the control of the US Federal Reserve. It didn't make firms too big to fail. It made them too interconnected to fail, which is why the Fed kept raising rates post-COVID in the mid-2020s but couldn't control things. A lot of slack developed outside of the Fed's reach during 84 years of globalization.

Monetary Policy Problems

This problem got so out of hand because, in 2029, we were still using the monetary theory of when we were still on the gold standard. We hadn't switched to Modern Monetary Theory (MMT), which wasn't perfect but explicitly designed for the world's fiat currencies. MMT is most applicable in the US because we are the world's reserve currency. MMT's weakness is that it requires fiscal policy to control the money supply, which implies you need a well-functioning government. We all know how easy that is to come by!

Not switching to MMT meant that politicians were erroneously hung up on the idea that the US was broke; the proof was in the size of the deficit. But in reality, the deficit indicates our dominant power and the dependence on US Treasuries and currency. It is more a sign of strength than weakness! The government can always print money to pay its liabilities. The government needs to monitor inflation, which isn't always easy.

This misunderstanding of the deficit meant politicians had a constant push down on the deficit and constricted the supply of US Treasuries that the world needed to roll over its debt. It made companies illiquid even though they were solvent, which caused, what appeared to be, well-functioning firms to fail. Furthermore, the failed experiment, the 401K, left many dependent upon Social Security and Medicare. To balance the budget meant that the government kept reducing the benefits people were so hopelessly reliant on. The stock market tanked, so there was much less money to buy insurance products to replace these government benefits."

Limited Supply of Safe Assets

Dad, in a proud voice, responds, "Wow! You learned a lot in that module. I remember these issues because this was a financial crisis that the world hadn't seen before. According to the older actuaries when I started, it made the 2008 Global Financial Crisis seem like a minor bump in the road, and Solvency II capital requirements were peanuts. The gut reaction of regulators was to make all insurance companies and banks hold vast amounts of capital, further straining collateral and safe assets.

When the government does not supply enough safe assets, the banks, insurance companies, and other organizations must create them with Rehypothecation. Rehypothecation allows the same US treasuries to be used as collateral to expand the supply."

Michelle interrupts, "Wait, dad. What is Rehypothecation?"

Dad continues, "Rehypothecation is a big fancy word you can use to impress all your friends. It means the same bonds can be used repeatedly in different transactions. This type of transaction can cause trouble in severe downturns. Like traditional loans, volatility and rate hikes, which fluctuate widely, adversely impact these arrangements. Because more than one holder can use the same bond as collateral, the agreements create excessive leverage. When things go wrong, the person holding the

collateral tries to find the source, which means that the whole interconnected chain can collapse while adding to market volatility. Aunt Betty, this was a significant source of our economic aftershocks."

Geographies of Success

Michelle interrupts, "Wait! The shocks were more than just the liquidity issue. The other countries didn't perfectly time with China's collapsing population and supply issues. Other emerging markets and European countries had the same demographic issues as China, but China was the whale in this story. The shocks occurred when other markets collapsed later on. Deglobalization was an unwinding of the world's interconnected rat's nest. The US and other Geographies of Success relocated supply chains because they were the least impacted countries."

Aunt Betty asks, "What are the Geographies of Success?"

Michelle explains, "Geographies of Success are countries with plenty of lands to grow food, fossil fuels within their borders, cheap waterways to transport goods across the country, and a decent military to protect their position. Examples are the US, Australia, New Zealand, Argentina, and a few others.

When companies and capital flew out of China and other emerging market countries, the most highly skilled and strategic supplies moved to the US for US supplies. Everything else for the US moved to Mexico, Columbia, and Argentina to keep the cost structure similar to before the 2029 stock market crash. The supply chains were safe because America's Navy was big enough to protect the Western hemisphere. But the problem was that moving all those factories took ten+ years. It was hard to put Humpty Dumpty back together again when his pieces were scattered worldwide.

The Collective

But the bigger problem was that people with the skills to run the factories were dead or on the other side of the world. For example, Apple has only released 25 versions of the iPhone as of 2063. They released one every year up to 2020 but could only release a new one every four years due to all these continual supply chain issues. A similar problem is why they could not get the medical equipment for Uncle Marty, and he died."

Our teacher used emergence and complexity theory to explain why this was the case, but his explanation was a little hippy-dippy."

Aunt Betty asks, "What's emergence and complexity theory?"

Michelle responds, "It is the study of how agents with simple instructions and decentralized control combine to create complex and coordinated behaviors, like beehives and ant colonies. In an uncoordinated fashion, we all belong to a global collective responsible for collecting the world's knowledge and know-how, which we store in manufactured items and ship worldwide.

Think of planet earth as a beehive. Each person is a bee. Our flower nectar is oil. Our honey is knowledge and know-how. We worker bees exist to gather expertise and bring them back to the hive. Each bee can only collect honey from a small part of the world. They evolve to maximize their collection capability for their area, which forces them to have highly specialized skills. Specialization immensely increases yield and causes geographically concentrated skills. If the environment changes faster than a species can evolve and adapt, the species will likely die out.

Through globalization, this beehive-like behavior allowed everyone to gain highly specialized, geographically concentrated knowledge and know-how. As bees transform nectar into honey through productized digestive processes, we change the oil into knowledge through training using time-consuming experiences and social activities. The expertise concentrated and embedded in our social networks makes it extremely hard to copy and move to other locations. Aunt Betty, how many things in your house could you build from scratch?"

Aunt Betty shockingly responds, "None!"

Michelle says, "How many items can the US build without including the rest of the world?"

Aunt Betty shockingly responds, "Almost none!"

Michelle replies, "Right again! The skills gap and supply chains also explain why 2063 technology is pretty much the same as in 2023. When people die off, so does the knowledge of the collective. Therefore, technology's exponential rise became flat and even negative in some cases, meaning quantum computers, fusion reactors, and self-driving trucks are still out of reach for my generation. Only through the extreme specializations of globalization could our technology grow exponentially."

Labor Dichotomy

We also talked about the dichotomy of employment in the 2030s, when you and dad were unemployed. Due to the skills gap created by the population collapse, you simultaneously had mass unemployment and labor shortages. As the old [Johnny Lee song](#) goes, 'Looking for skills in all the wrong places.' Dad, does this sound about right?"

Dad laughs and says, "I am surprised you know that song! Look, we put Aunt Betty to sleep. She is snoring and drooling."

Michelle laughs, "Dad, we tend to do that to people! Let's take a selfie with her!" Dad and Michelle stop laughing after three minutes and a few snorts.

Dad answers, "You would think we could quickly retrain people with the internet and fix the supply chains. But instantaneously retraining people is impossible. As you learned in class, it takes time for people to learn new skills, especially if the generation with the skills is dying off. Training and retooling people is tremendously challenging. This fact resulted in all kinds of political tensions.

The people on the other side of the world with skills wanted to migrate to countries with Geographies of Success. But the locals were not welcoming due to the mass unemployment. They felt the immigrants were taking their jobs, but the locals lacked the skills for the newly built factories. The people complaining about unemployment were squashing the government's ability to fund free higher education because they feared the increased taxes – even though they needed the instruction to replace the immigrants! This self-defeating circular logic was devastating because they could have had their cake and eaten it too. Increasing productivity would allow free college without increased inflation while narrowing the skills gap. With so much fear and political rhetoric, no one could step back and see the big picture, which plagues the world when they only follow the headlines."

Michelle responds, "Ouch! How did this impact insurance? I am curious about your perspective versus my class."

The Impacts on Insurance

Dad continues somberly, "Those were nightmare years for insurance companies, the economy, and me. Due to regulations, companies had to immensely increase their capital, which killed their surplus and profit. Companies started laying off people and running bare bones, which is how your Aunt Betty lost her job. This gutted actuarial consulting firms because the projects dried up overnight, which killed my job. Given the deficit misinterpretation I discussed earlier, unemployment benefits were non-existent.

Before COVID-19, life insurance companies discussed the acceleration of technology and mortality improvement. But in 2027, the profession started talking about mortality deterioration instead. The labor shortages exacerbated the medical profession's existing issues. After COVID-19, finding medical professionals was a real struggle - especially nurses and doctors. At the same time, the Baby Boomers needed an increasing amount of care. The labor shortages let people go to well-paid professions that were less stressful and time-consuming. Leading to your Uncle Marty not finding a doctor, which led to his eventual death.

Mortality deterioration directly caused havoc for insurance companies. It increased the velocity of death claims, so companies were paying life insurance claims much faster than ever expected. It crippled any company that offered Long Term Care (LTC) because of the rampant medical and general inflation that no one saw coming. The LTC companies tried to raise rates, but given the struggle of the times, the regulators were not going for it. No one wanted to touch those jobs due to the stress and dismal outlook.

The employee benefits space was an odd beast. Premiums rapidly decreased due to layoffs due to a poor economy. They rapidly increased because companies used employee benefits as incentives to find people with the skills they needed. The ones with benefits had better, more expensive benefits. In total, premiums stayed flat.

Amazingly at that time, Obama Care was still around somewhat in its original form. Given the stock market was down and the US citizens' debt intoxication, people could not afford COBRA, so they flocked to Obama Care. The political tension caused a see-saw between parties, and they used Obama Care features and benefits as ammo. The rapid changes kept the health actuaries extremely busy and pulling out their hair!

The twisted saving grace of insurance companies was that many pension and annuity liabilities rolled off their books much quicker than expected. Given a large number of Baby Boomers, this kept the industry afloat. Employers reluctantly brought back defined benefit (DB) plans to entice workers due to labor shortages. The defined contribution fell out of favor because:

1. The current generation saw their parent's lack of retirement savings in their 401K and,
2. The ones that did save got decimated because they stayed in equities trying to squeeze return instead of converting to an annuity.

The DB plan revival increased the demand for pension actuaries.

Property and Casualty (P&C) could no longer insure shipping freight that left the Western hemisphere due to all the fighting in Europe and Asia. The 2022 Ukraine war was only the beginning. P&C also had to contend with climate change too. Population collapse didn't help with climate change because the

collapsed economies could no longer get fossil fuels due to political tensions, which forced them to burn dirtier fuel sources such as trees. The farming techniques were similar to 1900 and massively inefficient land use."

M&A

Michelle says, "Wow, dad! Before this class and your explanation, I had no context as to how a decision in 1979, made 7000 miles away, could unintentionally intensify a population collapse 50 years later and bring down the global economy! Dad, how did you find a job again in all this turmoil?"

Dad replied, "Good question! Due to the deglobalization that was going on, there was a lot of activity in mergers and acquisitions. As the US no longer wanted to or could police the world, old pre-WWII alliances and disagreements were popping up worldwide. Insurance and reinsurance companies that had expanded worldwide were now doing business in hostile countries. Due to the conservative nature of the insurance industry, they started buying and selling blocks of business to consolidate within allied countries.

Reinsurance companies in Geographies of Success and others like Germany and France survived. But everywhere else, they either closed shops because the country had too much turmoil, or the insurance companies, to appear that they were still growing, kept consolidating until they were monopolies. Reinsurance couldn't back these monopolies due to political tensions. Buying and selling blocks of insurance kept a lot of actuaries busy. Luckily, I could jump on this bandwagon and get reemployed."

Michelle says, "Wow! So many things happened over the 40 years. How did the models change?"

The Models

Dad responds, "The models have changed a ton. Luckily, the SOA doubled down on diversity, equity, and inclusion. They declared in 2027 that education was just as important as race, religion, etc.

They invited different professions to present and participate significantly at the SOA conferences, such as climatologists, system scientists, physicists, computer scientists, designers, geopoliticians, and various other technical professions. We had speakers like Mervyn King, David Orrell, Stephanie Kelton, Steve Keen, Peter Zeihan, Steven Wolfram, Adam Grant, and many other interesting, cool people. This change in perspective brought many new ideas and ways of looking at problems. After the presentations, we sat around and shared and debated how we could incorporate the ideas into our work. It was like the coffee houses of the 1700s. It was so much fun!

As much turmoil was going on in the world, this made it exciting to be involved in the profession. The old guard, who hadn't taken exams in years, got reinvigorated! There was a sense of kinship that we could come together and tackle our issues. In the end, what resulted was that our models got a lot less linear and a lot fuzzier. It was great that it happened just before the crash because we needed all the creativity and innovation we could muster."

Michelle looks at him with a weird facial expression and says, "Fuzzier?"

Dad says, "After the Impact conference with Mervyn King, we got on the bandwagon to differentiate risk from uncertainty. We have thought these were synonyms for a time, but they are not. Risk has to do with resolvable uncertainties or, in layperson's terms, games of chance, such as the Yahtzee you played with

your grandmother. The risk applies in situations with well-defined events in well-defined event spaces with stationary processes. Well-defined events and static methods were very short in supply after Black Hole Monday!

Mervyn King talked to us about radical uncertainty, which is uncertainty beyond risk. Outcomes are vague or happen with so little frequency that calculating reliable probabilities is nearly impossible. Probability wasn't applicable in this situation, so we had to move to possibility. The possibility is where fuzzy mathematics comes in. Don't worry; the loss models and risk management exams contain sections on fuzzy mathematics.

Furthermore, with all the chaos and uncertainty in the world, it became mission-critical to move beyond equilibrium models, which exclusively focus on random external shocks. Equilibrium models assume processes will naturally come to rest, and feedbacks dampen oscillations over time. Equilibrium and dampened oscillations were a thing of the past in the deglobalizing hellscape we lived through!

The shocks weren't external and random. They were due to the tightly interconnected structure of the global markets. People weren't independent agents acting in their own best interests. They behaved like scared Wildebeest herds looking for social confirmation of their decisions. All these dynamics forced us to update our modeling techniques, which included topics such as social and economic networks, complex systems, and systems science. Systems science was necessary to understand the emergence, self-organized criticality, and other nonlinear dynamics. Self-organized criticality helped us know when and how markets might collapse once they hit a critical point.

Adding dynamic systems modeling meant that actuaries started significantly increasing agent-based modeling in conjunction with economic scenario generation (ESG). We performed spectral analysis to tease out different signals from the market. We would then calibrate the emergent behavior of our models to reproduce the market signals so that we could understand the sources of various market behaviors.

Once we had a big-picture understanding of the behavior of the market, we would dissect the market into its major structural pieces called regimes. Only after having a good handle on the structural model of the economy would we fire up the old ESG. We wouldn't calibrate the ESG to the market. We had a one-to-one relationship between the regime and ESG. We would calibrate each ESG to the behavior of its regime. Modeling was tons of fun, always interesting, and highly challenging."

Michelle states, "Man! No wonder there are so many exams. There is so much to learn, but it sounds exciting."

The End

Michelle sees that the celebration has moved to a different part of the house and says, "Hey, dad, maybe we should go interact with everyone else."

Dad replies, "Man, I am proud and excited for you to follow in my footsteps. Seeing that you have the same love for my profession was so much fun. I am going to miss you going off to college."

Michelle replies, "Thanks, dad. I love you too. Let's be friendly with everyone else. We should probably wake up Aunt Betty now."

Author's Commentary

Based on the following books, this submission is 20% imagination and 80% extrapolation.

- If Zeihan is correct about global politics and the evolution of global demographics,
- If Howell is right about capital flows and our dependence on debt which makes collateral and liquidity more important than interest rates,
- If Sufi and Atif are correct about how debt plagues firms and households and cascades through the economy,
- If César is accurate about the dynamics of knowledge and know-how accumulation and supply chains,

then as [Bachman Turner Overdrive](#) sang, "You ain't seen nothin' yet. Here somethin' you ain't goin' to forget!" The reality of mass population collapse is pretty scary if it plays out how these books imply it will. No book has all the answers, but put them together, and you get one sobering reality that will unfold in the next 10 – 15 years!

1. Fieguth, Paul. *An Introduction to Complex Systems: Society, Ecology, and Nonlinear Dynamics*. Springer, 2021.
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3. Howell, Michael J. *Capital Wars: The Rise of Global Liquidity*. Palgrave Macmillan, 2021.
4. Kay, John, and Mervyn A. King. *Radical Uncertainty: Decision-Making beyond the Numbers: With a New Preface*. W. W. Norton, 2021.
5. Keen, Steve. *The New Economics: A Manifesto*. Polity Press, 2022.
6. Kelton, Stephanie. *The Deficit Myth Modern Monetary Theory and the Birth of the People's Economy*. PublicAffairs, 2020.
7. Mian, Atif, and Amir Sufi. *House of Debt: How They (and You) Caused the Great Recession, and How We Can Prevent It from Happening Again*. Chicago University Press, 2015.
8. Stoop, Ruedi, et al. *Nonlinearities in Economics: An Interdisciplinary Approach to Economic Dynamics, Growth and Cycles*. Springer, 2021.
9. Zeihan, Peter. *The End of the World Is Just the Beginning: Mapping the Collapse of Globalization*. Harper Business, 2022.