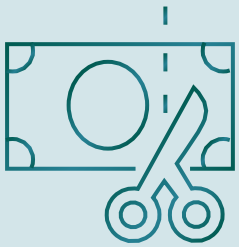
# TRENDS 2025

This is a piece that the team at Davidson Investment Advisors puts together annually and that is meant to provide some insight into exciting, disruptive, or otherwise new developments we anticipate being impactful to businesses, consumers, and society.



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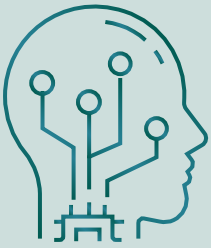
Power Hungry



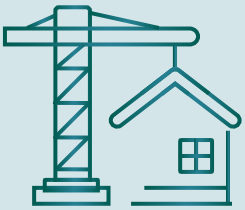
Agentic AI

Baby Bust

Zero Trust

Economic Warfare

Vibecession



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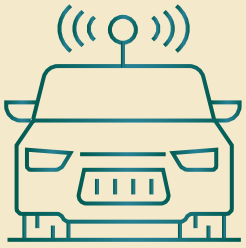

Robotaxi

DAVIDSON
INVESTMENT ADVISORS

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# DOGE

The Trump administration's formation of the Department of Government Efficiency (DOGE) has the stated objective of reducing government spending and burdensome regulation – a frustration of many Americans. President Trump has tasked Elon Musk to lead the effort working with/under the White House Office of Management and Budget. Cutting government spending has been very difficult historically given the political constraints and promises elected officials make on the campaign trail. Unlike the private sector, there are obstacles to head-count reductions such as civil-service protections to consider. That said, long-term changes are needed to address the U.S. federal deficit. Annual deficit spending is approaching $2 trillion, and the two most obvious ways to reduce this number would be to increase tax receipts or cut spending. The success of either approach could be very important to improve the country's fiscal position, and through announcing the DOGE initiative, President Trump is signaling his clear preference to lead with spending reductions. However, the political will to address non-discretionary spending (Medicare/Medicaid, Social Security, and interest on federal debt) is likely a requirement for real progress, as non-discretionary spend is trending toward two-thirds of all outlays. One thing we know is that Trump and Musk enjoy challenging the status quo, and therefore, investors should pay attention to any progress on this effort.



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# Power Hungry

Despite the hope of an Energy Transition (Trends 2024), consumption of all sources of energy is increasing. Whether it be coal, oil, natural gas or biomass (wood), though the share of these fossil fuels as a percentage of energy consumed is going down, the actual amount is increasing. In 2024, the United States reduced coal usage by 55 million tons versus 2023 - and the United Kingdom went to basically zero with the closure of its last coal-fired power plant in October; yet, according to the Energy Institute's Statistical Review of World Energy, global production of coal exceeded 9 billion tons, the highest ever recorded and more than double than at the start of the millennium. Why? China's coal production increased 83 million tons during the first 11 months of this year while India's grew by 66 million tons. The offsets of reduced fossil fuel usage in the (mainly) developed West (U.S., U.K., Germany, etc.) has been more than offset by the increasing needs in emerging markets, particularly in Asia.

Carbon-neutral forms of energy such as nuclear, wind and solar are indeed growing at a faster pace; that said, for the foreseeable future, the world will use these newer sources of energy to add to – rather than replace – existing sources. Case in point, wood, as measured by percent of energy consumed, is at all-time lows, though global energy production from wood reached an all-time high in 2022, more than what was produced in either 1800 or 1900. With the advent of Artificial Intelligence and other power-hungry technologies, societies that fail to accept this fact do so at their own peril, for not only is affordable energy essential to progress, it is also essential to national security.

# Agentic AI

Agentic AI represents a significant evolution in artificial intelligence, moving beyond passive information processing to proactive, autonomous action. In previous years we've highlighted how AI has continued to evolve from machine learning to Generative AI to multimodal AI (see CAIS Trends 2020, ChatGPT Trends 2023, Multimodal Trends 2024.) Unlike traditional Generative AI models, which typically require human prompts to initiate tasks, Agentic AI systems possess built-in decision-making frameworks. This allows them to independently plan, strategize, and execute actions within predefined constraints. This trend has profound implications across various sectors, transforming how businesses, governments, and individuals interact with technology Productivity Boom (Trends 2024).

The emergence of autonomous agents is fueling the rise of "digital labor," providing an always-on, 24/7 workforce. This trend is exemplified by Salesforce, where over 80% of customer service interactions are now resolved through their Agentforce platform. Similar productivity gains are being observed among Salesforce customers who are deploying agents at scale within their own organizations.

While currently confined to the digital realm, Agentic AI is increasingly manifesting in physical forms through robotics. As reasoning and decision-making capabilities within these systems advance, robots will embody the proactive, autonomous nature of Agentic AI. These systems will dynamically adapt their actions based on real-time feedback and learn from past experiences to optimize future performance.

The benefits of Agentic AI are substantial, offering increased efficiency, scalability, and enhanced problem-solving capabilities. However, the deployment of such systems also necessitates careful consideration of ethical and operational challenges, issues related to accountability, trust (Zero Trust, Trends 2025), and the potential for unintended consequences. Despite these challenges, the transformative potential of Agentic AI in redefining operational paradigms and enhancing decision-making at scale, positions it as one of the most impactful trends in the AI landscape.



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# Baby Bust

Birth rates in the U.S. have been declining to below replacement rate and are at their lowest level in over 40 years. Contributing factors stem from trends we have written about in the past (Sex Recession, Trends 2019 and Family 2.0, Trends 2016), involving cultural/societal, scientific/technological and economical dynamics.

The cultural changes include an evolving definition of a nuclear family. Both men and women are marrying late as they place a higher importance on their careers. In some cases, they don't see the need to get married and have babies; they can be married and just have pets as opposed to children or not get married at all. Gender roles are also changing; women used to be primarily homemakers, which led to formation of traditional families. As more women pursue professional careers and independence, they see less need to compromise and get married if they don't find the right partner. There are burgeoning feminist movements such as 4B going on in South Korea that would seem to contribute to this trend of lower birth rates. 4B is an absolutist feminism movement wherein women adhere to the "4 Nos", (Korean language term "bi" for "no".) These are do not date men, do not marry men, do not have sex with men, and do not have children with men. Not coincidentally, South Korea has the lowest fertility/birth rates globally at 0.7 births per woman in 2023; almost one third of the replacement rate of 2.1 births per woman needed to maintain a stable population.

Scientific reasons for lower birth rates are lower sperm counts and lower fertility rates. Contributing factors include obesity and other lifestyle factors such as excessive alcohol consumption and unhealthy diets. In addition, certain medications are now being studied to see if their use is impacting fertility rates. Further, overexposure to more processed foods as well as environmental toxins (such as plastics) are also believed to be impacting fertility. Now more than ever, environmental toxins (generally called endocrine disrupters) are present in everything from plastic packaging and toys to sofa covers and cosmetics. These endocrine disrupters mimic or block the hormones

# Baby Bust

responsible for many of the body's essential functions, including reproduction. Economics, especially in the U.S., can also be a limiting factor. More young couples see having a baby or babies as a luxury that only the affluent can entertain. Childcare costs alone remain an almost prohibitive expense for most Americans. According to a U.S. Department of Labor study, U.S. families can spend up to 16% of their median annual income on full-day care for just one child. Further, affordability related to housing and other amenities is beyond the middle-class to some extent. To take advantage of economies of scale, there are also examples of multi-generational households, where families are living together and saving money by sharing expenses, but at the same time making it more challenging to have babies.

# Zero Trust

Zero Trust is a cybersecurity strategy that assumes that users and devices should not be trusted by default, whereas traditional security approaches assume that anything inside the corporate network can be trusted. The reality is that this assumption no longer holds true. The zero-trust model of security prompts you to question your assumptions of trust at every step. This approach is now befitting of society as a significant decline in public trust towards institutions is occurring both in the U.S. and abroad.

Technology can be both an instigator and a solution. We have written about this erosion of trust in previous trends (Fake News, Trends 2017; DeTrust, Trends 2022) that undermine truth and question identity. The ability of AI to generate realistic fake content (Deep Fakes, Trends 2019) only exacerbates concerns about the spread of misinformation and manipulation of public opinion. However, we have also ruminated on the promises of blockchain technology (Blockchain, Trends 2016, 2018) which requires building a trust layer above trustless technology. Crypto/blockchain technology is seen by many as essential in realizing the productivity gains of decentralized autonomy (Web3, Trends 2022) and Agentic AI (Trends 2025), but this too is at risk from advances in Quantum Computing (Trends 2018) which could compromise its underlying encryption protections.

As Generative AI and other technologies continue to become more deeply ingrained in our society, there is a growing concern about our ability to separate fact from fiction. A lack of trust in institutions can lead to societal divisions and polarization, especially when AI is used in sensitive areas like politics and healthcare. The stakes are high. Low-trust societies devolve to tribalism (smaller “circles of trust”) and are associated with impaired economies, higher crime and corruption, and ill-defined norms. High-trust societies tend to have stronger democracies, richer economies, better health, and fewer social ills.

# Economic Warfare

Economic warfare continues to dominate global policy, with tariffs, sanctions, and regulatory actions shaping the economic and geopolitical landscape. The Trump administration's aggressive trade policies, including a proposed 25% tariff on imports from Mexico and Canada, aim to address trade deficits, illegal immigration, and drug trafficking. These tariffs threaten deeply integrated North American supply chains, particularly in sectors like automotive manufacturing, where components often cross borders multiple times. Such disruptions could drive up production costs, ultimately increasing prices for consumers and straining U.S. manufacturing competitiveness. The tariffs on China, covering $370 billion worth of goods at their peak, sought to counter intellectual property theft and unfair trade practices. While these measures were intended to bolster U.S. industries, they triggered retaliatory tariffs from China, disrupted global supply chains, and contributed to rising inflation domestically.

Meanwhile, the European Union has taken a leading role in challenging the dominance of multinational tech corporations, particularly through its high-profile antitrust cases against Google. These actions reflect the EU's broader strategy to curtail monopolistic behaviors and protect competition within its markets. Adding another layer to this dynamic is the push for a global minimum tax, spearheaded by the Organisation for Economic Co-operation and Development (OECD) and supported by the U.S. and EU. Designed to curb tax avoidance by multinational corporations, this policy represents a coordinated effort to level the playing field and ensure that corporations pay their fair share regardless of jurisdiction. These developments highlight the increasing role of economic policies in reshaping industries and markets, demanding that businesses adapt to a landscape of growing regulation and geopolitical tension.





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# Vibecession

The socio-economic climate today reflects a “vibecession,” a pervasive sense of public dissatisfaction with institutions and the establishment despite strong economic indicators such as low unemployment. This discontent stems from rising inflation, income inequality, and a growing disconnect between policymakers and the realities faced by everyday citizens. While traditional economic metrics suggest stability, the prevailing sentiment is one of frustration and distrust in established systems.

The recent targeted killing of United Healthcare CEO Brian Thompson has brought these anti-establishment sentiments into sharp focus. While many mourn Thompson’s death, others view the act as a grim expression of growing anger against perceived exploitation by large corporations, particularly in the healthcare sector. This tragic event underscores the widening chasm between corporations and the public they serve. The healthcare industry, often criticized for high costs and lack of transparency, has become a symbol of systemic inequities, intensifying public dissatisfaction. Social media amplifies these grievances, providing a platform for anger and solidarity that can further escalate tensions. The incident also highlights the dangerous consequences of leaving these sentiments unaddressed, as extreme actions can emerge from unresolved systemic frustrations.
The vibecession reflects a broader cultural and economic shift, where traditional institutions are increasingly seen as failing to address structural inequalities. Leaders are under mounting pressure to not only acknowledge these grievances but to act decisively in implementing reforms that rebuild public trust.

# YIMBY

For the last 18 months, housing affordability for first time homebuyers has been worse than at any time before in the United States, according to an index from the National Association of Realtors. While the homeownership rate is above the 60-year average, many experts still say the U.S. is short somewhere between 3.8 million and 6.8 million homes, according to Vox. This has given rise to the Yes In My Backyard, or YIMBY, movement whose aim is to encourage and incentivize more housing mostly through the reduction or elimination of zoning barriers. Another key aspect of the movement is to provide representation for a wider demographic of people, many of whom are not homeowners, at local planning meetings, a forum often dominated by homeowners. More scalable solutions are also being explored including litigation and pushing certain zoning decisions to a state level from a local level. Via their persistence, the YIMBY movement has given political cover to local officials to loosen or rewrite local zoning laws in many jurisdictions across the country. This has led to many creative solutions such as Accessory Dwelling Units (ADUs) and repurposing older commercial buildings such as malls and their anchor stores as condos and apartments.

# Robotaxi

2024 will be considered the year that Autonomous Vehicle (AV) services finally found traction in the U.S. economy. Companies such as Tesla have promised some level of Full Self Driving (FSD) since as early as 2018; and even though Tesla still failed to completely deliver what they promised even in 2024, they did achieve some progress, and companies such as Waymo (a subsidiary of The Alphabet Company) made considerable progress. We shared Elon's enthusiasm in 2018 for FSD as we wrote about it in a piece wherein we espoused how the trend of a Passenger Economy (Trends 2018) will have profound implications for industries such as auto, insurance, technology. We were a bit early, but we finally saw that happen in 2024.

There are two flavors of Robotaxis, or AV, that are coming to the fore. One is a driverless fleet service that companies such as Waymo are offering, featuring vehicles armed with an expansive sensor suite with 29 cameras (in case of Waymo), LiDAR's, and radar that take passengers around. LiDAR, in particular, adds depth perception that a camera lacks. Currently, Waymo is the only viable option, as Cruise was initially banned in San Francisco due to an accident. Ultimately, their funding was pulled by General Motors. There are others such as Zoox by Amazon, but they are notably behind. Waymo's vehicles are estimated to cost anywhere from $100k to $200k currently, but those costs are expected to come down over time. Waymo operates primarily in the cities of San Francisco and Phoenix currently, and will be launching in Austin and Atlanta in partnership with Uber. This is a Level 4 AV approach in which the car is truly driverless, but is expected to be driven under limited conditions and not to be operated unless all conditions are met. The second approach is a FSD one by Tesla in which currently the driver is passive and not engaged with the steering wheel but must be available to drive when the system requests. This is currently a Level 3 FSD approach. Tesla is not using expensive hardware such as LiDAR or radar,but is relying mainly on

# Robotaxi

cameras and a machine learning/Artificial Intelligence model to ultimately achieve Level 5 FSD which involves a driverless car and ability to drive. This is a much cheaper option as Tesla cars are supposed to cost only $30,000-$40,000 and have a large installed base of 5-6 million cars. But it carries considerable risk as relying on cameras alone has proven to cause quite a few accidents and Tesla's disengagement rates are an order of magnitude inferior to their peers. Ultimately, Tesla plans to allow all existing Tesla owners to have their cars participate in the AV fleet and earn passive income.

Going forward there will be lots of puts and takes as systems scale and we get more data. Waymo has already taken 22% of share in the city of San Francisco (per Yipit data) after starting from close to zero a year back. That is identical to the share of Lyft, trailing Uber at 55%. For Robotaxis, hardware and operating costs will eventually come down but profitability will be sensitive to utilization rates and minimizing dead time, which again has to be balanced by the fleet size to match peak loads. There are also considerations of what kind of business model Waymo might employ; will they partner with the likes of Uber and just license their software or take on the cost of building and maintaining the infrastructure and fleet operating costs? Over time, as the costs of the AV system goes down with scale, the costs of the ride sharing networks are expected to go up due to labor as well as insurance costs rising. In terms of Tesla, if they succeed with their camera-only and AI-model approach and improve their safety data, they could become the low-cost provider and end up with the majority of market share. Regulation will be an area that they will need to overcome, as providers such as Waymo have been working with regulators for north of 10 years. It will be interesting to see how the Robotaxi industry and eco-system evolves over the next 5 years.



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# Appendix

# Energy Transition

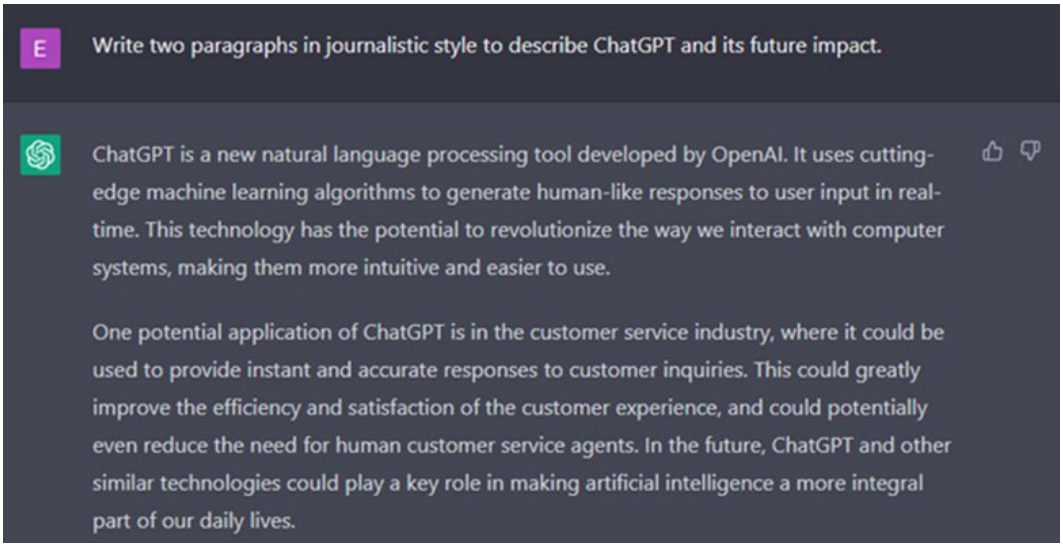
In response to climate risk and mounting social pressure for sustainability, energy production is undergoing a dramatic transition to replace fossil fuels with renewable energy sources such as wind, solar, hydro, and nuclear. Net Zero initiatives are calling on governments, companies, and other organizations to commit to becoming carbon neutral by the year 2050. Wind and solar sources are leading electrification efforts by growing capacity and improving efficiency, fast becoming cheaper than fossil fuel alternatives. The term “electrification” refers to technologies adopting electricity as an energy source as opposed to fossil fuels – for example, electric vehicles.

In previous trends, Solid-State Batteries (Trends 2021) and Picogrids (Trends 2018) we’ve highlighted how advancements in technology are shaping the future of energy. Perhaps the pinnacular energy source for the future is nuclear fusion, providing virtually limitless clean power. Unlike fission, fusion is two atoms slamming together to make one heavier atom, resulting in large amounts of energy. Recent breakthroughs in nuclear fusion mark a significant step in being able to replicate the power of stars. In theory, nuclear fusion produces significantly more power than fission without producing radioactive waste, a major drawback to current nuclear energy production. Last December, the National Ignition Facility (NIF) achieved a decades-long goal of “ignition”, the process where a fusion reaction expels more energy than was originally input, resulting in a net energy gain. Since then, the process has been replicated several times with significant improvements to efficiency, able to produce 3.88 megajoules of energy from 2 megajoules of energy input, about as much energy as 1.5 pounds of TNT. However, utilizing nuclear fusion for grid scale energy production is still likely years, if not decades, away.

# ChatGPT

A prototype artificial intelligence chatbot (ChatGPT) developed by OpenAI and released on November 30, 2022, has captured the imagination of the public and has provided a glimpse of what's to come. OpenAI (an artificial intelligence research lab also responsible for DALL-E2 which interprets natural language inputs to create images of realistic objects) counts among its founders tech luminaries Elon Musk and Sam Altman.

In CAIS (Trends 2020), we discussed advances in machine learning and introduced the concept of comprehensive AI services. It may have seemed like a distant scenario that would emerge over time, but ChatGPT appears to be a step change. Perhaps, we'll let ChatGPT speak for itself. Below is ChatGPT's response to the query, "Write two paragraphs in journalistic style to describe ChatGPT and its future impact":



# Multimodel AI

In November of 2022, ChatGPT (Trends 2023) captured the imagination of the public and offered a glimpse of what was possible with generative artificial intelligence (GenAI). Since then, it has been a race to invest and gain advantage. While the viral "blue duck" video introducing Gemini by Google DeepMind risked overselling the technology, multimodal AI will be an important evolution for artificial intelligence. Multimodal AI is artificial intelligence that combines multiple types (or modes) of data input that make it possible to generate more insightful or nuanced conclusions about real-world questions. Until now, most AI systems have been unimodal, designed and trained to work with one type of data exclusively and tuned for that modality. For example, the original ChatGPT uses natural language processing (NLP) algorithms to extract meaning from text content and produce a textonly output. Multimodal AI, instead, accepts and processes data from multiple sources, including images, video, speech, sound, as well as code and text.

Multiple inputs allow for a more detailed, refined assessment of a particular environment or given situation. A multimodal NLP, for example, may identify signs of emotion in a user's voice and combine that with facial expressions to better interpret a query and tailor a proper response. In this way, multimodal AI more closely resembles human perception.

Multimodal AI will be central to the development of autonomous vehicles (Passenger Economy, Trends 2018) and robotics (Rise of the Machines, Trends 2014) that need to interact with real-world environments. Multimodal AI uses data from cameras, microphones, GPS, radar, LiDAR, and a host of other sensors to better understand and more successfully interact with its surroundings. Likewise, multimodal AI will enable more effective and intuitive human-computer interaction through the use of sensors and wearables (XR Trends 2023) that may even extend to the (Metaverse Trends 2022).

# CAIS

Recent advances in machine learning and deep learning have captured the public's imagination. Computer algorithms are mastering capabilities and applications once believed limited to humans, such as image classification, and vision, speech, and language translation. New barriers are being broken where forms of artificial intelligence (AI) can beat world champions at strategic games like chess and GO and detect cancers better than human doctors. Even creative barriers are being breached using generative adversarial networks (GANs) where two neural networks compete with each other - the contest between one network learning to generate new data and the other learning to discriminate true, "real" data from those fabricated by machine. GANs can be used to create photorealistic images for design, computer landscapes, and even human faces and figures in place of models or actors.

This progress is generating both excitement and fear, fueling a debate on the development of artificial general intelligence. In his New York Times bestseller, Superintelligence: Paths, Dangers, Strategies, Nick Bostrom warns of superintelligence as potentially highly dangerous to humans. Whereas Eric Drexler's concept of comprehensive AI services (CAIS) assumes that specialized, narrow AI will continue to improve (as it has) for specific tasks and that the range of tasks that algorithms will be able to perform will become wider and so comprehensive that it will begin to resemble a general intelligence. Rather than an artificial "superintelligence being," general AI would be more like a search engine, looking among the tasks it can perform for a match to the request. Indeed, engineers at Google know a thing or two about search and have indicated ambitions to build AI systems that can generalize to a new task, using much less data and with much less computation.

# Sex Recession

The U.S. is in a birth recession. Since 2010 the total number of births has declined almost every year. According to The Atlantic Magazine, there were some 500,000 fewer American babies born in 2017 than in 2007, even though more women were of prime childbearing age. The birth rate set a new record low, dropping 3% to 60.3 births per 1,000 females aged 15-44. The total fertility rate, which estimates the number of births a woman would have over her lifetime, dropped to 1.77 children per woman (below the replacement rate of 2.1). However, it is important to note that the United States has been below this theoretical rate since 1971.

So, why the decline? The December 2018 issue of The Atlantic may shed some light on this question. They conjecture the U.S. is in the midst of a Sex Recession. Despite the changes in society's view of sex or the general perception that people are having more sex, they are in fact, not. In addition, fewer people are marrying and those that do are marrying later. According to anthropologist Helen Fisher, who conducts Match.com's annual "Singles in America" study, young people are dating less, resulting in a decline in couple hood.

Why is this important to investors? One of the simplest constructs of economic growth is: Gross Domestic Product growth = (population growth) x (productivity). Population growth is the combination of immigration growth and birth rates. If we assume immigration and productivity stay constant, declining birth rates could, theoretically, have a detrimental impact on GDP growth. In addition, declining birth rates means lower household formation, which in turn could negatively impact housing demand. Social benefits, like Social Security and Medicare, depend in part on a young, vibrant working population. Finally, families are the bedrock of society. According to a Pew Research Center survey, one-in-ten Americans say they feel lonely or isolated from those around them all or most of the time, resulting in weak communal ties. This feeling is consistent across most major demographic groups, except one -- those who are married.

# Family 2.0

The concept of “family” is changing. Societal norms are shifting. The “nuclear family” is becoming less common. In the 2015 Ford Trend Report, they noted just 20% of U.S. households fit the conventional definition of “nuclear family” versus 40% in 1970. As a result, our communities are changing and evolving. Regardless of one’s view of these changes, they will have implications for housing, consumption, elderly care, and population growth, to name a few. Families are the basis of our societies and our economies. If the concept of “family” is changing, what bearing will those changes have on our economy in the future?

# Fake News

Fake news is the deliberate publishing of misleading information, propaganda, or deception – typically via social media – with the hope of driving web traffic for either financial or other gains. Some describe it as a form of psychological warfare, especially if it is coming from foreign governments. It is a consequence of the polarization of society as people begin to feel – and then believe – that mainstream media (MSM) no longer reports information in a balanced, unbiased way. Debate is normal in a society, but for debate to be productive a common basis of fact needs to be established. Historically, MSM played an important role in searching out those facts. They have editors and fact checkers to verify the information they report. If they are wrong, which is not uncommon, they correct or retract it. As a reward for their effort, MSM gains credibility; however, if they are wrong, they can be held liable and sued. The major social media platforms are beginning to address the issue primarily through use of algorithms and fact-checking services. What isn't known is if they will publish corrections or retractions. What's at stake for society is its ability to find consensus and adapt to changes in a timely manner.

# DeTrust

Kenneth Arrow, a Nobel-Prize-winning economist once said, “Virtually every commercial transaction has within itself an element of trust.” Since the pandemic began, many surveys have found that trust was eroded by the shift to remote work, with supervisors trusting employees less and coworkers having the same experience with peers. In fact, as of November 2021, demand for employee monitoring software was 54% higher than it was before the pandemic, according to top10vpn.com. Meanwhile, trust between firms has also eroded as supply chain issues have suppliers questioning their customers’ orders and said customers have unfulfilled demand. Without trust, companies can’t plan or invest for the future, a portion of demand goes unmet, and bosses can’t focus on their most important tasks, leaving productivity - and by extension growth - lower than it otherwise would be.

DeFi, or decentralized finance, is an attempt to use blockchain technology (see Blockchain, Trends 2016) to overcome traditional barriers to trust and remove the intermediaries that have brokered it in the past. Potential use cases include loans, insurance, derivatives, betting, stablecoins, decentralized exchanges, and more. Gavin Wood, co-founder of Ethereum, the main platform DeFi applications are built on today, has recently said, “We want less of that [trust], and we want more truth, which what I really mean is a greater reason to believe that our expectations will be met.” When it comes to financial transactions and applications not under real-world constraints DeFi shows real promise. It remains to be seen how it can overcome recent developments in distrust that stem from lockdowns and different actions taken by sovereign nations that have snarled the supply chain and created artificial barriers to business.

# Deep Fakes

In an era of “fake news,” who can you trust? Unfortunately, the answer no longer includes your own eyes. Deep Fakes are an artificial intelligence-based synthesis of a video superimposed on a real video, usually of a famous person, presenting the speaker as saying or doing something in the video that they have not actually said or done in reality. The simulated videos are stunningly realistic, with lip movements and voice modulation of the target being synched to the speech of the perpetrator in real-time, allowing the deep fake creator to impersonate presidents, celebrities, or business executives for interviews or speeches.

Deep fakes have been used to spoof President Trump speaking about climate change in a commercial in Belgium that fooled many viewers. Actor Jordan Peele worked with Buzzfeed to create a viral President Obama deep fake to demonstrate the power of the technology. A deep fake hobbyist used images of Carrie Fisher to create a more convincing version of her younger self in a recent Star Wars film than Hollywood was able to produce using the resources of Disney. Numerous Hollywood stars have been the victims of a deep fake sub-genre that creates pornographic content using their faces. Now, deep fakes have gone mainstream, with apps available to every smart phone owner to create their own content, similar to face swapping technologies or adding “dog ears” as an Instagram filter. With a big enough data set of images, the app can create a deep fake of anyone.

Deep fakes pose real-world risks, as the technology can be weaponized to violate privacy, norms, and to influence behavior. Imagine seeing a video of a President declaring war on North Korea that later turned out to be fabricated. Or a political ad that comes out just before an election, of a candidate “saying” something deeply racist. There are no libel or defamation laws that comfortably address deep fakes, and it will be up to the courts and lawmakers to confront this new un-reality.

# Blockchain

In our 2016 Trend report discussing blockchain technology, we focused on its impact on the financial system and potential for medical records, transparent elections, and for identity validation. The last 12 months have provided countless examples where a blockchain ledger has helped alleviate the complexity of living in a modern society. Distributed ledgers, such as blockchain, allow for transparent, verifiable, public records of transactions, assets, and contracts. Blockchain could have provided immediate irrefutable elections results to remove uncertainty and the need for recounts. The technology also enables globally verifiable identification, particularly in the case of refugees who often have to flee on short notice without legal documents. And of course, bitcoin, the best-known example of blockchain often referred to as the “internet of value,” had a resurgence of interest as Chinese citizens flocked to the cryptocurrency as a means to protect their assets from a depreciating currency and circumvent capital control measures from the government.

Future applications of blockchain could help stem the tide of fake news by verifying facts on distributed ledgers (similar to how Wikipedia relies on many users to verify submitted content). Blockchain could be used to verify reviews on sites like Amazon and Yelp, or it could be used to guarantee advertisers that the clicks they receive on their Facebook page are legitimate people and not bots.

The potential uses for distributed ledger far exceed our imaginations, and we will continue to watch how this evolves.

# Web3

Web3, first coined by Ethereum co-founder Gavin Wood, is an umbrella term for a new iteration of the World Wide Web (WWW) that is based on decentralization and built using blockchain (see Blockchain, Trends 2016) technologies. The early days of the Internet in the 1990s were Web1.0 and primarily about data transmission protocol (TCP/IP) and access to information. Then came Web2.0 in the mid-2000s, which brought us social media and e-commerce, but facilitated by platforms (dominated by a handful of companies like Google, Amazon, Facebook, and Twitter) that serve as a middleman between producers and consumers. The current Internet, with its client-server-based data infrastructure and centralized data management, has many unique points of failure and suffers from recurring data breaches. In Web2.0, individuals don't have much control over their data or how it is stored. Data are typically owned, controlled, and often monetized by the companies in charge of platforms. In contrast, blockchain reinvents the way information is stored and managed.

In Web3, data are stored in multiple copies of a P2P (peer-to-peer) network. To the average Internet user, nothing much will change; Web3 is primarily a backend revolution, whereas Web2.0 was a frontend revolution.

Web3 also has implications for how applications are developed or how companies are financed and built. In Web3, dapps (decentralized apps) are built and run on blockchains (decentralized networks of many P2P nodes) and can have associated tokens, which may not only pay for services, but can act like voting shares that govern the applications' development. Blockchain data are public and open, providing purchasers or investors more transparency. This contrasts with buying equity in private or centralized businesses where many things are not made public. This infrastructure may allow for DAOs (Decentralized Autonomous Organizations) as an alternative way to finance and build what we traditionally thought of as a company.

# Quantum Computing

In traditional silicon computers, data is represented in binary bits that are always in one of two states: either a 1 or a 0. However, in a quantum computer each quantum bit, or “qubit,” can represent both a 1 and a 0 at the same time through a principle called superposition. What this means is that a quantum computer can perform multitudes of calculations simultaneously; harnessing millions of qubits could, in a matter of minutes, process data and solve problems that would tie up today’s fastest supercomputers for a century.

Since 2016, when we first began tracking successful experiments of quantum computational operations executed on a very small number of quantum bits, more companies (such as Alphabet, IBM, Microsoft, and Nokia Bell Labs) have been moving from the lab to engineering development and even commercial experiments. The implications of large-scale quantum computers will be staggering. With such orders of magnitude improvement in computing power expect to see leaps forward in machine learning, artificial intelligence, and simulation modelling. At the same time, quantum computing could pose a threat to traditional encryption security measures that operate on the fundamental assumption that the encryption is too complex to break in a reasonable amount of time given prevailing computing speeds.

While it’s still early days and many challenges exist in the development of Quantum Computing, we cannot help but imagine the possibilities which could have a fundamental disruptive impact on the current technology market as we know it.

# Passenger Economy

The auto industry and passenger economy are experiencing paradigm-shifting changes not seen since the birth of the automobile. Today the industry looks like this: the current auto industry produces approximately 80 million cars per year at an average price of approximately $19,000 for a total addressable market of $1.5 trillion dollars. Toyota has the largest market share globally at 13%, sells approximately 10 million cars and generates about $250 billion in annual revenue (a milestone that took the company over 70 years to achieve).

As autonomous driving and electric vehicles are gaining relevance, the business model for the auto industry is transforming and technology companies are taking a fresh approach with the idea of shared mobility. The future auto market, from their perspective, looks like this: approximately 10 trillion miles globally are driven annually at a cost of approximately $1 per mile for a total addressable market of $10 trillion dollars. A ride sharing model company with a nominal 1.7% market share globally would be traveling 170 billion miles a year at a price of $1.50 per mile, generating approximately $255 billion in revenue (some companies view this milestone as achievable in less than 7 years).

The average car is only used 4% of the day, massively under-utilized. The theory goes that by increasing the utilization rate of the car through shared mobility, the cost per mile goes down significantly. With the addition of autonomous driving the cost per mile goes down even further. As the cost per mile goes down many believe that miles driven will increase exponentially.

A study, prepared by Strategy Analytics, predicts autonomous vehicles will create a massive economic opportunity that will scale from $800 billion in 2035 (the base year of the study) to $7 trillion by 2050. An estimated 585,000 lives could be saved due to autonomous vehicles between 2035 and 2045, the study predicts.

Even as reclaimed parking spaces may fuel a downtown building boom, autonomous vehicles will encourage builders to push deeper into the suburban fringe, confident that homebuyers will tolerate longer commutes now that they don't have to drive, according to the report, sponsored by a unit of Capital One Financial Corp. The potential impacts are profound for the auto, insurance, technology, media, airline , retail, real estate and energy industries.

# Productivity Boom

We have written previously about Unproductive People (Trends 2023) and other disturbing trends that have weighed on productivity, such as "quiet quitting" in the U.S., "lying flat" in China, Great Resignation (Trends 2022), Playing with FIRE (Trends 2019), and the tragic epidemic of addiction. Productivity growth in the U.S. has stagnated to just 1.2% per year on average over the past decade, despite many technological innovations over the same period. Perhaps advancements like smartphones and social media may have distracted workers and spurred more consumption of content than production of goods and services. However, Multimodal AI (Trends 2024) and GLP-1s (Trends 2024), in contrast, may be advancements that finally usher in a significant, sustained resurgence in productivity. Artificial Intelligence (AI) and GLP-1s will have broad implications for businesses and the economy, but perhaps its most significant may be to accelerate labor productivity. According to data from the National Health and Nutrition Examination Survey (NHANES), over one third of Americans are obese and according to the Association of American Medical Colleges (AAMC), more than 21 million have a substance abuse disorder. While GLP-1s have grabbed headlines for effective weight loss, studies have also observed a reduction in addictive behaviors. The promise of a wonder drug such as GLP-1s could dramatically change the healthcare landscape and society, potentially making a greater portion of the U.S. population healthier and more productive. Additionally, AI will help to automate and scale many tasks humans currently perform. Companies such as Salesforce and Microsoft report seeing as much as a 50% productivity improvement using GenAI tools. As new GenAI tools roll-out to different industries and job functions it will be important to monitor how much of a productivity lift they see. According to J.P. Morgan Market Insights, most analyses posit 1.5-3.0% increase in labor productivity per year globally over the next decade. Importantly, this does not factor AI's potential to accelerate innovation, which could provide further upside to estimates.

# Solid-State Batteries

A solid-state battery differs from today's lithium-ion or lithium polymer batteries in that it uses solid electrodes and a solid electrolyte, instead of liquid or polymer gel electrolytes. As both the electrodes and the electrolyte are solid state, the solid electrolyte also behaves as the separator, allowing volume and weight reduction due to the elimination of certain components. In addition, the removal of flammable liquid electrolytes can be an avenue for safer, longer-lasting batteries as they are more resistant to changes in temperature and physical damages which occur during usage. While the concept has been known for decades, implementation has been challenged in the past by short lifetimes and slow charging rates. However, in 2020 Volkswagen-backed QuantumScape announced a breakthrough of its single-layer solid-state battery cells with much higher energy density, significantly increasing the drivable range per charge of electric vehicles, as well as the ability to fast charge to 80% in 15 minutes. According to Kent Helfrich, Executive Director, Global Electrification and Battery Systems at General Motors and other known experts in the industry, there is potential for at least a 50% reduction A solid-state battery differs from today's lithium-ion or lithium polymer batteries in that it uses solid electrodes and a solid electrolyte, instead of liquid or polymer gel electrolytes. As both the electrodes and the electrolyte are solid state, the solid electrolyte also behaves as the separator, allowing volume and weight reduction due to the elimination of certain components. In addition, the removal of flammable liquid electrolytes can be an avenue for safer, longer-lasting batteries as they are more resistant to changes in temperature and physical damages which occur during usage. While the concept has been known for decades, implementation has been challenged in the past by short lifetimes and slow charging rates. However, in 2020 Volkswagen-backed QuantumScape announced a breakthrough of its single-layer solid-state battery cells with much higher energy density, significantly increasing the drivable range per charge of electric vehicles, as well as the ability to fast charge to 80% in 15 minutes. According to Kent Helfrich, Executive Director, Global Electrification and Battery Systems at General Motors and other known experts in the industry, there is potential for at least a 50% reduction in battery pack cost over the next several years, putting the cost of an electric vehicle at or below parity compared to the internal combustion engine. This could be a game changer for electric vehicles.

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# Picogrids

What started as a trend in the Military decades ago (needing to ensure power reliability in a decentralized system) has spread to remote communities such as Alaska, that are far off from the traditional grid. New technologies, such as fuel cells and battery storage systems (to store extra power produced by renewables), along with more sophisticated software, have led to “nanogrids,” which Walmart and other megastores have begun to adopt. Now, “picogrids” are becoming increasingly common in places such as university campuses and hospitals. The falling cost of renewable energy in some areas is helping fuel this trend and transforming the electricity markets. Wind and Solar account for almost 30% of the power in Germany; in Hawaii, its 25%. Utility companies in particular may face challenges in evolving their businesses. In Texas, among many other places, prices occasionally turn negative when the wind is blowing hard, meaning companies are paying customers to use the electricity they generate.

As more and more people rely less on the traditional grid for power (while still interconnecting with it to help ensure reliability), policymakers and companies will need to create new regulatory systems and business models. Some states, such as New York, have embraced these changes, aggressively promoting decentralization by rewarding companies that invest in decentralized systems. But no one has yet worked out a detailed plan for how to integrate new grids with traditional power systems.

The long-term implications of nanogrids and picogrids could be significant from a global political, economic, and environmental standpoint.

# Rise of the Machine

When we first wrote about the advent of autonomous machines several years ago, we highlighted areas for investment, new capabilities, and the promise for productivity-enhancing economic gains; however, there is another perspective to consider. Over the coming decade, up to half of all manufacturing jobs may be replaced by disruptive technologies including 3D printing, autonomous machines, and factory automation. Jobs thought to be “automation proof” are also coming under fire as advances in sensors and processing allow for machines that can do much of the work of lawyers, doctors, waiters, financial advisors, farmers, journalists, and even artists. This will shift the beneficiaries of globalization away from economies that can provide cheap labor, such as emerging markets, to economies that can provide cheap capital, historically the developed countries. Advances in technology that disrupted industries in the past would often lead to new and better jobs being created to service the new technology, but we may be approaching a point where the only beneficiaries of rapid technological change are greater overall economic productivity and the owners of capital.

# XR

eXtended Reality (XR) is a catch-all term for technologies that enhance or replace our view of the world. This is often through overlaying or immersing computer text and graphics into real-world and virtual environments, or even a combination of both. XR encompasses augmented reality (AR), virtual reality (VR), and mixed reality (MR) – technologies we first introduced in Alternate Realities (Trends 2017). A central feature of all XR wearable devices is the ability to use visual input methods such as object, gesture, and gaze tracking to navigate the world and display context-sensitive information. However, XR devices vary based on the type of AR, VR, and MR experience and the complexity of use case that they are designed to enable.

Apple Inc.'s focus on AR/VR has ramped up over the past few years and will likely make the technology mainstream. As XR technology continues to advance, we expect it to play a crucial role in the development of the Metaverse (Trends 2022).

# Alternate Reality

Virtual reality (VR), a completely fabricated reality, entered the mainstream during 2016 with the launch of the Oculus Rift, HTC Vive, PlayStation VR, Gear VR, and Google Cardboard. Augmented reality (AR), or the overlay of data on top of your current world view, has been in existence for many years through heads-up displays and Google Glass (see our 2016 trend “GUI to NUI”). Mixed Reality (MR) is still in its infancy, and lies somewhere between AR and VR, projecting fabricated elements on to existing real world structures and spaces. The most advanced MR technologies are Microsoft’s HoloLens and a company called Magic Leap, backed by Google, Qualcomm, and Alibaba. The magic of VR is “presence”, or the ability to trick your brain into believing it’s somewhere it’s not. VR has so far been relegated to entertainment. AR has been more focused on utility, overlaying information on to the real world, allowing the perception of both synthetic light and natural light bouncing off objects. Mixed Reality is the best of both worlds and could potentially have the most obvious path to mainstream consumer adoption. MR overlays completely synthetic visuals and anchors them in the real world, allowing a shark to swim through your kitchen for example, or displaying a three-dimensional castle on your desktop that you could walk around to explore. MR clearly has applications in entertainment but can also be used to create virtual computer desktops on any surface, allows for three-dimensional design work, or even aiding surgeons while working in patients. There are also implications for electronics, real estate, employment, industry, and media.

# Metaverse

Over the last year, the Metaverse (see Metaverse, Trends 2021) has gained significant notoriety as Facebook (now Meta) has made it a key strategic priority. Meta is investing $10 billion into its Metaverse vision to build out the critical hardware and software infrastructure, as Mark Zuckerberg believes it to be the next major technology platform. Key debates remain about what the future Metaverse will look like. While the amount of time we are all spending in digital worlds is increasing (from Zoom calls to Roblox games), many of these use cases are what we would consider a Metaverse 1.0 user-interface. The next iteration, Metaverse 2.0, we believe will require more lifelike experiences and interaction. Video game developers and companies such as NVIDIA, Unity Software, and Epic Games continue to push the boundaries of making the digital almost indistinguishable from the physical. Real-time 3D capabilities is one of the biggest trends in the media industry and increasingly media consumption is moving from a static, passive 2-dimensional experience to a 3-dimensional experience where the viewer can interact, change and customize the content. Already many television and movie studios are aggressively integrating these real-time 3D capabilities into their content. More ways of engaging in the Metaverse continue to grow from Augmented Reality glasses to Virtual Reality headsets, allowing the user the ability to choose how they will engage in the Metaverse. Humans are social creatures by nature and the last two years of relative isolation during COVID has taught us that virtual environments remain a highly relevant and necessary platform for social interaction.

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# Metaverse

The term Metaverse originates from Neal Stephenson's science fiction novel, Snow Crash. In the novel, human beings interact as avatars in a three-dimensional space based on the real physical world. For most people today, the film adaptation of the Ernest Cline novel Ready Player One demonstrated a vision of what the Metaverse might look like. Coinciding with our previous years' gaming trends (see "eSports" trend from 2018 and "Cloud Gaming" trend from 2019), the idea of a Metaverse is now an evolving trend to watch over the next several years. Advancements in 3D graphics, computing power, artificial intelligence, virtual reality, and social gaming are colliding creating early, small Metaverses. Gaming and digital worlds, such as Fortnite, are the forum for many young people today to experience a significant part of their social connections. Other companies such as Roblox even have thriving economies built inside of them, where players build virtual goods and games, generating income in the form of the platform's digital currency, the Robux. The COVID-19 pandemic is pushing the idea of a Metaverse even further as we are all forced to interact more in a digital world than a physical world. Concerts, meetings, birthday parties, weddings among many other events have all moved into the Metaverse during the pandemic. Time will tell if the Metaverse becomes a normal part of our daily lives, that is, if we are not living in a simulation already.

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# E-Sports

E-Sports have arrived. This year, about 191 million people worldwide are expected to watch an e-Sports competition at least once a month, more than double the number in 2012, according to Newzoo BV, a global market research and predictive analytics firm with a primary focus on games. By 2020, the research firm expects that viewership to climb to 286 million. The International Dota 2 Championship, the richest e-Sports tournament in the world, had a total purse for the event of over $20 million, nearly double the total payout of The Masters.

The global games industry, according to several forecasts, is on course to exceed $100 billion in annual revenues this year and continues to grow faster than the broader entertainment sector. Some are even pushing to have e-Sports as an Olympic event by 2024. Alex Lim, secretary-general of the International e-Sports Federation, explains, “One generation grew up kicking a ball in the back yard, the next grew up with choices that included video games. We live in a digital culture that most people accept is redefining a whole range of things: sport is one of them.”

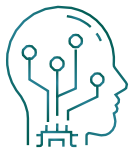
Most of the e-Sports trend is evolving out of Asia, as 57% of e-Sports viewers come from China. Advertisers are constantly looking to get in front of younger demographics, especially as the media industry continues to move away from traditional forms of entertainment. Companies are taking note; according to Jefferies & Co., media rights for e-Sports are expected to increase from $95 million in 2017 to $340 million in 2020 and 600 sponsorship deals have been struck since the beginning of 2016, including major advertisers such as Red Bull and Coca-Cola.

With traditional sports leagues such as the NFL encountering ratings declines for the first time in their history, expect more companies to capitalize on the rapidly growing e-Sports trend.

# Cloud Gaming

As we saw with the eSports trend we cited last year, video gaming is going more and more mainstream. According to industry tracker Newzoo BV, the global games industry is on track to reach $134 billion in annual revenues this year while growing faster than the broader entertainment sector. The cloud is the future for video gaming and promises to expand the addressable market for an already enormous business. Pricey hardware may no longer be necessary for top-tier games when streaming via the Internet (i.e., the cloud) allows users to access vast computing power online using smartphones and smart TVs. According to Barron's, the number of households that own either a dedicated console or high-end gaming PC is estimated at 300-400 million worldwide, whereas the universe of all gamers (including the casual ones who play on their phones) numbers in the billions.

Cloud Gaming can also mean "Gaming-as-a-Service" (GaaS) and could potentially lead to steady and more-predictable recurring subscription revenues like the monthly fees that Netflix and Spotify collect for video and music services. However, there are unique challenges to streaming games. Unlike movies and music, games are interactive and can involve sophisticated real-time rendering of images and latency issues. If successful, cloud gaming could lead to more engagement and competition for consumers' time, diverting more hours away from movies, music and other media. With a convergence of technologies and new business models ahead, Ken Moss, Electronic Art's Chief Technology Officer predicts, "There's going to be more change in video games in the next five years than there has been in the past generation."



# Unproductive People

The US economy is currently at one of its lowest unemployment rates in history and has around ten million unfilled job positions according to the US Bureau of Labor Statistics; however, labor force participation rates remain historically low, and is at the lowest level ever recorded for prime-age males. Though perhaps exacerbated by the COVID pandemic, the trend was well-established prior to 2019 and may be associated with other trends such as Great Resignation (Trends 2022) and Playing with FIRE (Trends 2019). What gives? Perhaps Tyler Childers got it right in his song Whitehouse Road, “Get me higher than my grocery bill.” Whether it be loneliness, lack of job skills, substance abuse or a combination of all three, there is a significant portion of the US population that has gone from forgotten, to unproductive, to becoming a serious drain on public resources. According to the Association of American Medical Colleges, 21.2 million Americans have a substance abuse disorder. The US Department of Health and Human Services estimates that 760,000 Americans have died of drug overdoses since 1999 and 10.1 million Americans over the age of 12 misused opioids in 2019. Relatedly, the homeless issue in many large US cities is only getting worse despite the billions of dollars being spent. According to the Hoover Institute, San Francisco alone is spending $852 million in its current budget year on homeless and supportive housing for its estimated 8,000 homeless people. That equates to $106,500 per homeless individual- this in a city that spends roughly $19,500 annually per student in its public schools. It simply is not sustainable. The US is facing a structural labor deficit despite a growing population, and those remaining in the workforce are not becoming more productive despite widespread use of technology. This lack of productivity appears more severe in the US, but it is a global issue. Whether it be work-from-anywhere (WFA Trends 2021), lying flat in China, or quiet quitting, the world needs to address this issue if it hopes for satisfactory economic growth going forward.



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# Great Resignation

In 2021, whether they were fed up with a daily commute to the office, or tired of working hard jobs for little pay, or simply using the labor shortage to find a job that better suits their preferences, Americans quit their jobs at record rates. This phenomenon is not a uniquely American one. In China, young workers and professionals are opting into the “lying flat” movement, rejecting the promise of consumer fulfilment and the accompanying struggle for workplace success. In a trend synonymous with the Financially Independent Retire Early movement (see Playing with FIRE, Trends 2019), workers around the world are showing a desire for an improved work-life balance, more time for themselves and their families, and more autonomy in their daily life, not to mention the savings produced by a lack of a commute. In addition to the desire for greater autonomy in their daily routines, workers are also struggling with childcare dilemmas and taking the opportunity to retire early. According to economist Miguel Faria-e-Castro at the Federal Reserve Bank of St. Louis, more than 3 million people have retired early due to the COVID-19 crisis. All these factors have led to a shortage of labor, often referred to by economists as full employment. The current shortage may have placed workers in a relatively strong bargaining position for the time-being, but it’s noticeable that wage growth still trails inflation and over time, companies grow more likely to respond to higher wages with labor-saving investments.

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# Playing with Fire

The new wave of spending less and saving more prioritizes time and experiences over income and things. Financial frugalness is gaining traction among a small but growing cohort of primarily millennial households' intent on "hacking retirement" by substantially increasing their savings rate in an effort to be Financially Independent and Retire Early (FIRE). In some cases, adopters of the FIRE movement look to save over 50% of their annual income, invest aggressively and find new ways to minimize expenses.

While the desire for financial independence isn't new, the motivation for living a life of experiences and having control of your own time - rather than consumerism and things - is more unique to the current wave. Often, this means downsizing houses/cars/etc., moving to cheaper neighborhoods/cities, and generally cutting back on expenses to maximize savings rates in a battle against lifestyle creep and the stresses that can come with it. Many who pursue this path are tired of high-stress jobs, or places where they feel unfulfilled – and they're not willing to "grind it out" for a good paycheck. They choose to live well below their means in a life rich on time, but short on other luxuries.

# Wonder Drug? GLP-1

Obesity is one of the most significant health challenges around the world. Biopharma company Novo Nordisk estimates more than 750 million people globally are living with obesity, which not only contributes to higher mortality, but also to more than 200 related health complications. Weight management drugs have been studied for decades with very little success until Novo Nordisk launched its GLP-1 (glucagon-like peptide-1) drug, Ozempic, for Type 2 diabetes in 2021. This class of drugs limits the amount of sugar that the liver releases into the bloodstream and slows down how long food stays in the stomach. GLP-1 drugs contribute to weight loss by suppressing appetite and making you feel full sooner when you eat. Ozempic and other approved GLP-1 drugs such as Wegovy (Novo Nordisk) and Mounjaro (Eli Lilly) are seeing patients typically lose 15-22.5% of their body weight.

While losing weight is a great benefit of using these drugs, recent studies show health benefits outside of diabetes and weight management. Most notably was the SELECT trial in August 2023 which demonstrated that patients on Wegovy had a 20% lower incidence of heart attack, stroke, or death from heart disease.

Other benefits that patients observe include a reduction in addictive behaviors from alcohol to smoking to even nail biting. The promise of a wonder drug such as GLP-1 could dramatically change the healthcare landscape and society as a whole, potentially making as much as 70% of the U.S. population healthier and significantly more productive.

Long-term studies of GLP-1s are ongoing regarding potential negative side-effects, and there remain major issues regarding the cost and affordability of such drugs. While cost is indeed a factor, GLP-1s could have a transformative impact on our society and economy beyond just losing a few pounds.

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# TRENDS 2021

## WFA

As COVID-related office closures extend beyond their initial expected lives, both employers and employees have learned to embrace the concept of Work from Anywhere (WFA), a new reality where if an employee has internet and cell service, work can be done. This newfound freedom relaxes the need for employees to make time-consuming and expensive commutes to the office and reduces the need for employers to provide designated office space for each employee as the availability of low-cost, easy-to-use video conferencing services provides a viable alternative to in-person meetings.

The effects of this rapid shift to remote work continue to develop. Employees are now empowered to relocate to less expensive or more desirable locales, with the need to physically commute to the office no longer as necessary. They are also investing more in creating a conducive work environment in their home, both through expansion of designated working spaces and investment in home office equipment. Employers are considering reducing office footprints, investing more in resources to allow for a safe and efficient remote working environment, and learning that perhaps providing a flexible work environment and expecting employee productivity are not mutually exclusive concepts. While the need for collaboration and creativity continue to exist, a new equilibrium between autonomy and accountability seems to be forming between employers and their employees.

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