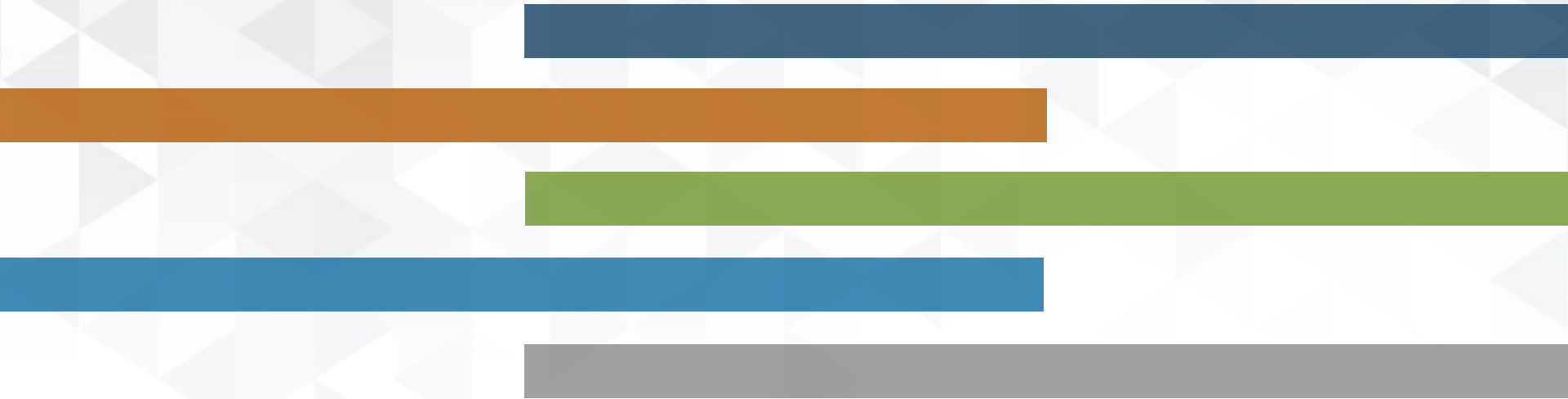


OUR **LONG-TERM INVESTMENT THEMES**



STIFEL

THE FIVE THEMES

2

Our major investment themes are **five inter-related megatrends that are likely to influence the direction of the economy and markets longer term.**

These themes impact all aspects of our world, including shaping the way we live, interact with each other, and consume goods and services.

THE FOURTH INDUSTRIAL REVOLUTION

SECURING STRATEGIC RESOURCES

SHIFTING DEMOGRAPHICS

THE NEW CONSUMER

PRODUCTIVE COMPETITION



FOURTH INDUSTRIAL REVOLUTION

Technological innovation has broken down the boundaries between the physical, digital, and biological worlds.

Data as an Asset
|
Enhanced Computing
|
Smart World
|
Workforce Optimization



SECURING STRATEGIC RESOURCES

Companies and governments are prioritizing the development and protection of critical industries, resources, and services.

Food and Water Security
|
Modern Energy Systems
|
New Materials
|
Circular Economy



SHIFTING DEMOGRAPHICS

Changes in global population dynamics will bring about challenges and opportunities.

Millennials
|
Global Middle Class
|
Aging Population
|
Future of Health



THE NEW CONSUMER

Consumer preferences, expectations, and behavior are altering business models and corporate strategies.

Reimagined Convenience
|
Digitalization of Human Connectivity
|
Future of Finance
|
Future of Leisure



PRODUCTIVE COMPETITION

Rivalry ultimately drives innovation, improves quality of life, and creates value for consumers and the economy.

Power Play
|
Geopolitical Tensions
|
Space Race
|
Transforming Business Models

Technological innovation has broken down the boundaries between the physical, digital, and biological worlds.

Data as an Asset

Data's ability to provide **insights into consumer behavior, market trends, and operational efficiencies** is invaluable for **decision-making**. The size, speed, and complexity of the data we generate requires **significant processing power, storage capabilities, and security**, presenting opportunity for long-term investors.

328 billion gigabytes (GB)

of data are created each day.
That's equivalent to roughly
2.6 billion 128GB iPhones

The U.S. has **10x more data centers** than any other country

\$1.5-\$2 trillion
estimated **cybersecurity**
addressable market size

Source: CloudScene, McKinsey & Company

Enhanced Computing

The development of **powerful computing systems**, such as **artificial intelligence** and **quantum computing**, will allow us to process the vast amounts of data, tackle complex problems, and drive innovation.

The AI model powering **ChatGPT** was trained on around **570 gb of data**

42% of enterprise scale **businesses** worldwide have actively **deployed AI**

In **200 seconds**, a **quantum computer** can solve a problem that the world's current **fastest computer** would need **10,000 years** to compute

Source: IBM, McKinsey & Company

Technological innovation has broken down the boundaries between the physical, digital, and biological worlds.

Smart World

The **intersection of software and hardware** across a range of industries including transportation, energy, infrastructure, and health care to deliver an enhanced **quality of life**.

Predictive Maintenance

Evaluate **data** from **sensors** on equipment to **predict failure** before it occurs, **limiting down time**



Augmented Reality

Use AR to assist technicians with **real-time, hands-free, interactive 3D wiring diagrams**



Health Monitoring

Use AI for real-time, data-driven health **insights**, image **analysis**, and patient **monitoring**

Precision Forecasting

Analyze data from satellite systems to deliver actionable **insights** for the maritime, aviation, and weather industries

Workforce Optimization

Improving **productivity** and **efficiency** through technology, automation, and data.



~50%

of **current work activities** are technically **automatable** by adapting current technologies

Improvement in a worker's **performance** by using **Generative AI** to automate manual and repetitive tasks

40%

80%

Improvement in productivity through the **use of robots** in the **automotive industry**

Sources: IBM, Precedence Research, Google

Companies and governments are prioritizing the development and protection of critical industries, resources, and services.

Food and Water Security

The **global food and water system** faces mounting pressure from a growing population, climate change, and geopolitical tensions.

7.8 billion

people to feed today



9.7 billion

in 2050

60%

more food needed



19%

increase of **agricultural water consumption**



The **majority of arable land** is concentrated in **Oceania** and the **Americas** compared to the **majority of the population** living in **Asia**.

All potentially arable land – 24% of total ice-free land

44%

offers **no serious limitations to agriculture**

56%

is **not farmed** because of **inherent soil problems and man-induced problems**

Sources: European Commission, United Nations

Source: The Encyclopedia of World Problems & Human Potential

Companies and governments are prioritizing the development and protection of critical industries, resources, and services.

Modern Energy Systems

Society's increased awareness of our **carbon footprint** combined with **increasing energy demands** from a **growing population** and a **digitalized global economy** is creating **opportunities in companies and sectors** that focus on improving energy efficiency and promoting innovation in new technologies.



Meeting future electricity demand will require a significant spend on electricity generation – between **\$19 trillion and \$26 trillion** worldwide by 2050

40

The average age of the regional U.S. power grid

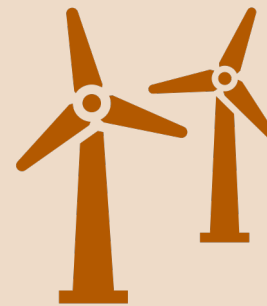
0% Average U.S. power demand growth in the last decade



2.4% Estimated annual electricity demand growth through 2030

9%

Estimated **data center consumption** as a percentage of total U.S. electricity generation by 2030, tripling from 2024



While **fossil fuels** will remain **dominant**, the share of **renewables** in electricity production will continue to increase.

What are some areas of innovation?



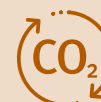
Hydrogen



Solar



Nuclear



Carbon Capture and Storage



Wind



Battery

Source: World Energy Council, Electric Power Research Institute, Goldman Sachs

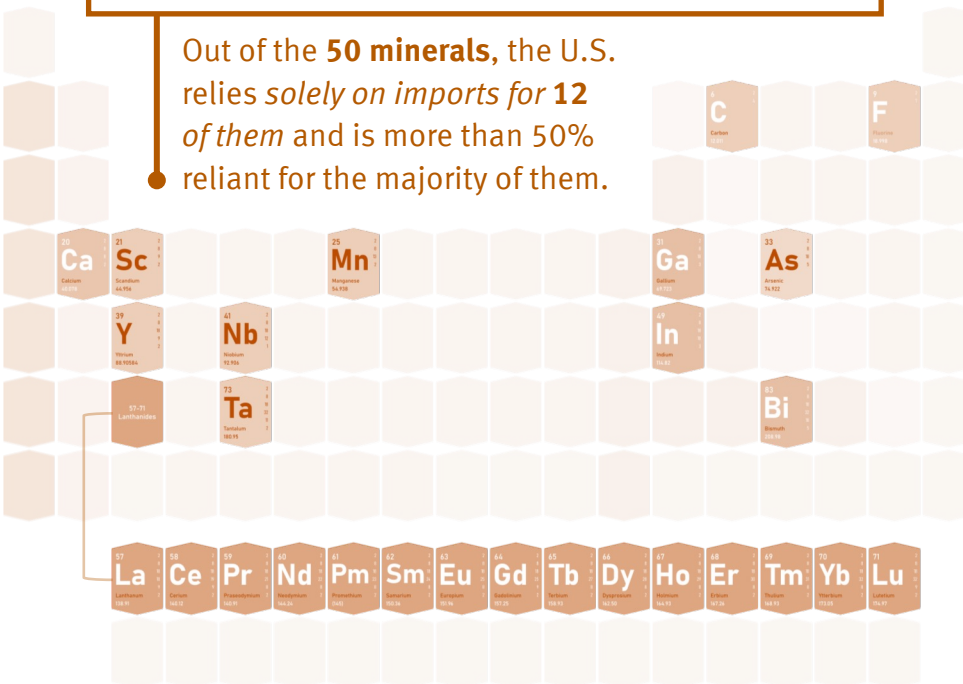
Companies and governments are prioritizing the development and protection of critical industries, resources, and services.

New Materials

An array of raw materials underpin the transition to a **digital economy**, **modern energy systems**, and **security** in general. However, the global supply of these resources is often limited and **concentrated**, posing economic and geopolitical risks.

The U.S. Geological Survey in 2022 released a list of **50 mineral commodities critical to the economy and national security.**

Out of the **50 minerals**, the U.S. relies *solely on imports for 12 of them* and is more than 50% reliant for the majority of them.



Source: U.S. Geological Survey

Research and innovation in manufacturing is enabling the **replacement** of some of these minerals and materials. For example, steel and aluminum is being replaced in some areas with **lighter and stronger composites.**

Potential future use cases for composites include



Companies and governments are prioritizing the development and protection of critical industries, resources, and services.

Circular Economy

A production and consumption model focused on resource management where products are designed for **sharing, reusing, recycling, and regeneration** in order to **maximize their lifespan, creating long-term value while reducing costs and environmental impact.**

Around **90 billion tons of natural resources are extracted every year** to support the global economy. That's equivalent to **more than 12 tons for every person** on the planet.

The world uses **75% more resources each year** than what the Earth can regenerate.

The transition toward a circular economy is estimated to represent a **\$4.5 trillion opportunity by 2030.**

Sources: National Geographic, World Economic Forum

Changes in global population dynamics will bring about challenges and opportunities.

Future of Health

The future of healthcare will be shaped by the **convergence** of the **millennial generation** and the **aging population** and cater to the evolving needs of these distinct demographics.

Drug Discovery:

AI's role in drug discovery marks a pivotal shift towards more **efficient, faster, and potentially less expensive** development processes for new medications



Personalized Medicine:

38-75% of patients do not respond to drug treatments for many of the common diseases



Robotic Surgery:

Robot-assisted procedures accounted for **15% of all general surgeries**, up from just 1.8% in 2012

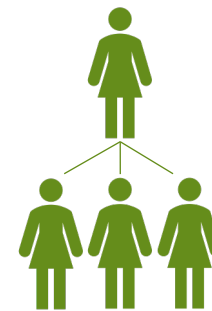
Aging Population

We identify opportunities that address the **expanding senior population** worldwide and contribute to **enhancing lifespans** and improving the overall **quality of life**.

BY 2050

1.5 billion

people worldwide will be 65 and older



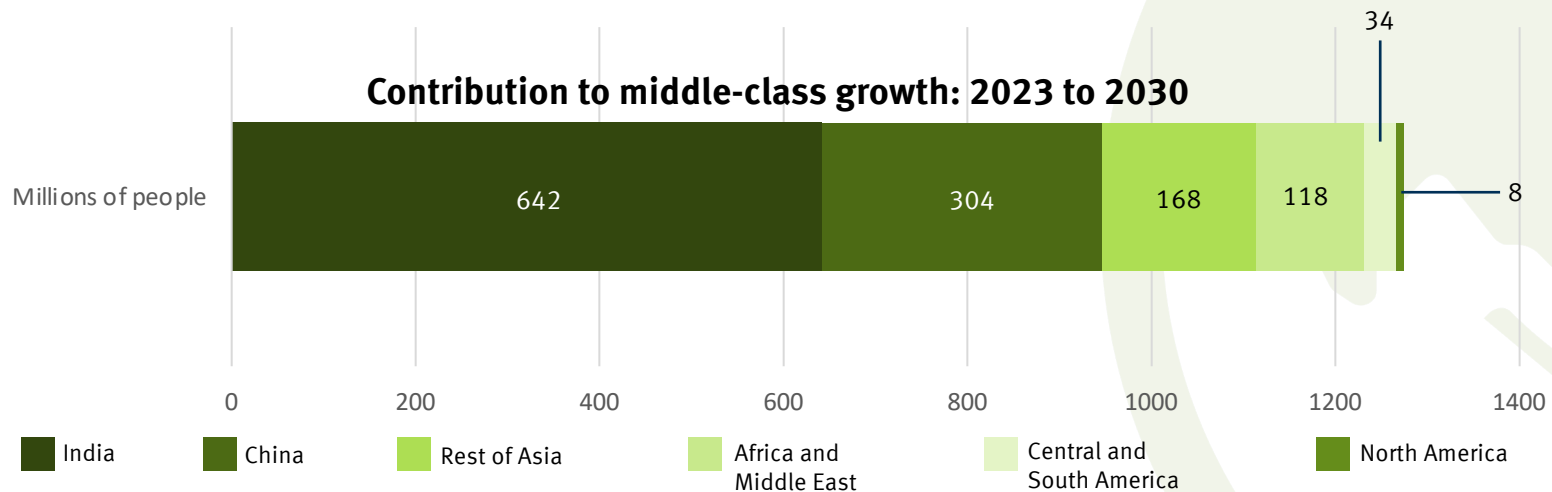
The number of people aged 80 or over will

triple

Changes in global population dynamics will bring about challenges and opportunities.

Emerging Global Middle Class

Rising disposable income in developing countries is driving **demand for a range of products and services**. Companies are vying to capture the attention and purchasing power of this expanding consumer base, from **luxury goods** and **travel** to **entertainment, technology, and wellness**.



The middle class

households where per-capita spending is between \$11 and \$110 a day ...

... amount to **3.75 billion people**

... and are expected to increase by over **1 billion by 2030**.

Sources: Brookings Institution, J.P. Morgan Asset Management

Changes in global population dynamics will bring about challenges and opportunities.

Millennials (individuals born between 1981 and 1996)

This group's habits, preferences, and consumption behavior will **wield influence on economies and shape the demand for goods and services for decades to come.**

Household Formation

As household formation increases, companies can tap into spending preferences spanning housing, credit, childcare, and more.

89% of millennials want to own a home

35
Median age of first-time homebuyer

Millennials represent the largest (and growing) share of homebuyers in the U.S. at **38%**

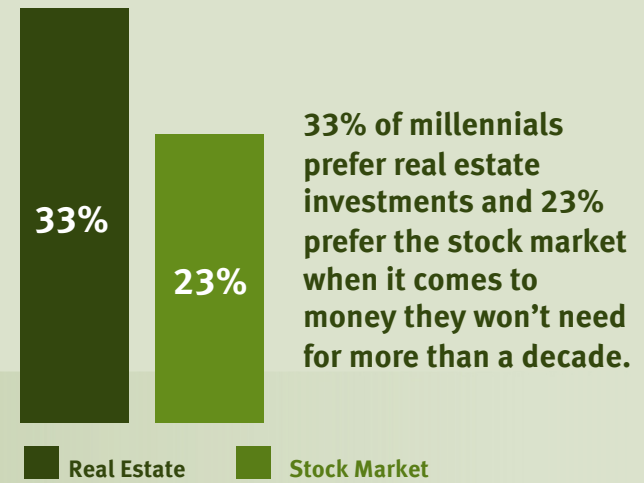
Peak home-buying years

25_{y/o} → **45**_{y/o}

Sources: FreddieMac, National Association of Realtors (NAR)

Wealth Transfer

Millennials stand to inherit a substantial portion of the \$90 trillion net worth held by baby boomers, setting the stage for a **significant intergenerational wealth transfer.**



Source: Knight Frank, Bankrate

Consumer preferences, expectations, and behavior are altering business models and corporate strategies.

Reimagined Convenience

Companies are meeting consumers where they are by adapting to digital platforms and engaging with customers through multiple channels. Artificial intelligence and big data are enabling businesses to better understand their customers and provide tailored recommendations.



Personalized experience

Our digital footprint will allow businesses to **better understand our tastes** and provide relevant product or service recommendations.



Contactless shopping

Consumers will be able to enter a store, grab what they want, and get going.

SIZING THE OPPORTUNITY

E-commerce sales accounted for close to **15%** of total U.S. retail sales in 2022

There are more than **2,000 commercial drone deliveries** every day worldwide

79% of consumers **shop online** at least once a month

71% of shoppers expect companies to deliver **personalized interactions**

Sources: Census Bureau, McKinsey & Company



Smart everything

The **Internet of Things (IoT)** will allow for things like our house lights to automatically adjust to our preferences and digital assistants to anticipate our needs.



Near-instant fulfillment

Drone delivery will allow products to reach our **doorstep in minutes.**

Consumer preferences, expectations, and behavior are altering business models and corporate strategies.

Future of Leisure

Consumer preferences are evolving toward an increased focus on health, wellness, and experiences.



Experience economy:

76% of all consumers would rather spend their money on **experiences** than on material items

Healthy consumer:

The global wellness market is estimated to be more than **\$1.5 trillion**, with annual growth of 5% to 10%



Humanization of pets:

One-third of pet-owning Americans have a social media account for their pets

Digitalization of Human Connectivity

The integration of **technology** into various aspects of **human interaction, communication, and relationships**, such as social media, online dating, and virtual/augmented reality.

2 out of 3 people worldwide are on social media platforms



397 minutes the average time individuals spend on the internet per day

Sources: Consumer Affairs, McKinsey & Company, Audacy

Sources: Sprout Social, Oberlo

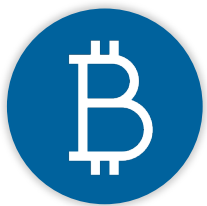
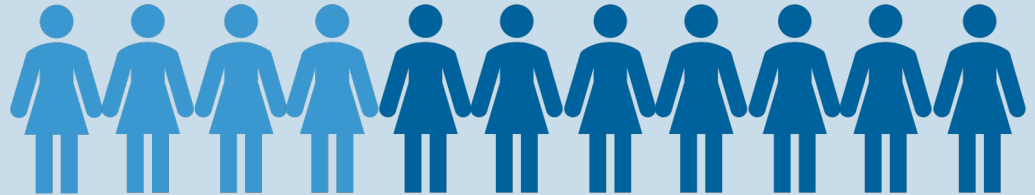
Consumer preferences, expectations, and behavior are altering business models and corporate strategies.

Future of Finance

The payments ecosystem is supporting the build out of the digital economy and fostering innovation, resulting in more **efficient, inclusive, and personalized financial services**.

Cashless society:

Roughly **four in ten Americans (41%)** say that none of their purchases in a typical week are paid for using cash



Digital currencies:

More than **half of global central banks** are exploring the creation of **digital currencies**



Digital wallets:

Allow for convenience and accessibility while tapping the underserved and **unbanked population of the world**

1.7 billion people in the world don't have a bank account

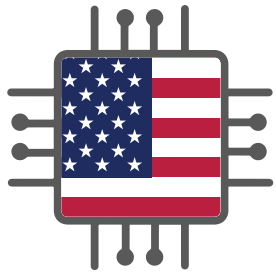
Sources: Pew Research Center, International Monetary Fund (IMF), World Bank

Rivalry ultimately drives innovation, improves quality of life, and creates value for consumers and the economy.

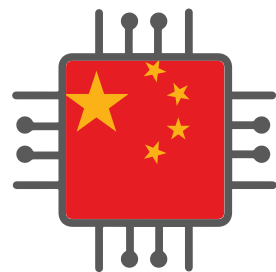
Geopolitical Tensions

Increased geopolitical tensions are translating into a greater need for self-sustainability and **protection of critical industries** like **technology, manufacturing, agriculture, and energy**.

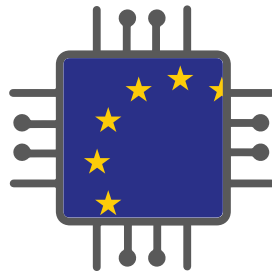
All Chips on the Table



\$50 Billion U.S. CHIPS and Science Act aims to boost domestic research and manufacturing of semiconductors in the U.S.



Made in China 2025 – China set a goal of meeting **70% of its semiconductors** needs through domestic supply



\$47 Billion European Chips Act – the EU plans to become self-sufficient and double the region's global market share in **semiconductors from 10% to 20% by 2030**

Power Play

U.S.-China strategic competition for economic and social influence is deepening global divisions and **creating a multipolar world**.

The **BRICS nations** (Brazil, India, China, and South Africa) collectively **surpass the G7 countries** (U.S., Canada, U.K., France, Germany, Italy, and Japan) **in economic size**

“The People’s Republic of China (PRC) remains our most **consequential strategic competitor** for the coming decades”
– **2022 U.S. National Defense Strategy**

China’s trade with Russia hit a record **\$190 billion in 2022**
– a 30% increase from 2021

82% of Americans have an unfavorable view toward **China**

Sources: Department of Defense, Pew Research Center

Rivalry ultimately drives innovation, improves quality of life, and creates value for consumers and the economy.

Space Race

The new space race is defined by the emergence of **private companies** and new **spacefaring nations**, joining **traditional space agencies**. This renewed competition is expected to drive significant innovation.

The **global space economy** could be worth **\$1.8 trillion** by 2035, up from \$630 billion today.

20,000 additional active **satellites** could be **launched by 2030**.

CATALYSTS FOR INNOVATION

Assisting Astronauts

Advancements in AI and robotics, including 3D printing, can ultimately have practical applications on Earth projects.

Space Infrastructure

Long-term space missions necessitate the development of infrastructure to make space more livable and cost efficient.

Life in Space

Research to enable humans to better withstand our solar system and microgravity can lead to advances in medicine and genetic technology.

Transforming Business Models

Identifying companies that are at the **forefront of innovation**, leveraging **new technologies**, or capitalizing on shifting societal trends **to transform existing industries or create entirely new ones**.

Camera
Phone



*Previous
NASA Innovations*

CAT Scans



Wireless
Headsets



Insulation



Laptops

Sources: McKinsey & Company, Quality Space

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