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INVESTING IN A WORLD OF CHALLENGED GROWTH

Diverging population dynamics, profound generational changes and urbanization pose complex challenges for economic growth. We expect the unprecedented low growth environment to persist—creating a significant challenge for today’s global investors. Company lifecycles are shortening. Technology is becoming ubiquitous across sectors. Companies are staying private longer thereby increasing the importance of private markets. In this environment driven by secular thematic trends, we believe a thematic allocation in a diversified portfolio can be a critical alpha driver.
The challenge of putting capital to work has never been greater. Bespoke exposures beyond traditional style and factor allocations are increasingly important as traditional portfolios often fail to capture independent sources of excess return. Often tethered to converging global benchmarks, traditional approaches are invariably backward looking and may contain hidden risks. Mellon’s thematic research framework is focused on creating forward-looking building blocks in an effort to augment client portfolios with emerging, long-term growth engines.

Critically, we believe sources of excess return will not be explained by traditional country, sector, industry or style factors but by the cycle of innovation and disruption. Innovation, broadly defined, creates a new market and value network that can eventually disrupt an existing model, displacing established market-leading firms and products. Mellon’s thematic investing seeks to invest around the accelerating cycle of innovation and disruption.

By combining traditional fundamental research with an innovative thematic framework, we believe we have built a distinctive, repeatable process that powers a thematic investment engine. Utilizing both fundamental and quantitative insights, we identify investable trends as well as companies material to those trends. Combined with innovative alternative research including geopolitical, investigative and private market research, our best-in-class platform drives active, smart beta and beta thematic solutions.
1. TRANSFORMATIONAL TRENDS

Transformational trends are powerful forces that reshape the global economy, business and society in a way that alters virtually everything we do. It is disruption and innovation in its broadest setting. Driven by changes in population, shifting demographics, a fragile environment and technological advances, these broad, macro shifts are slowly altering the world we live in. These trends will play out over decades, driving numerous sub-themes and cycles over time. These trends frame our research agenda at its highest level.

2. INNOVATION THEMES

Each transformational trend drives innovation themes, which are designed to capture specific opportunities related to these far-reaching trends. Innovation themes are rapidly changing the way investors look across even traditional economic sector classifications. As technology becomes more prevalent, innovation has transformed virtually all sectors/industries and often forms the building blocks of investable portfolios for our clients.

3. INNOVATION SUB-THEMES

At the most granular level of thematic research, we follow emerging companies that will provide critical inputs for an idea to become reality. At this level, analysts, who are the innovation subject-matter experts within their thematic coverage, conduct bottom-up stock selection. Our team of global fundamental research analysts review the constantly evolving investable universe with the assistance of quantitative neuro-linguistic programming (NLP) and machine learning (ML).
BUILDING BLOCKS OF INNOVATION

1. TRANSFORMATIONAL TRENDS
2. INNOVATION THEMES
3. INNOVATION SUB-THEMES
INNOVATION & TRANSFORMATION

Take a closer look at our innovation themes and the transformational trends that drive them.
Four investable mega trends are forging a new path for healthcare; we put these trends under the banner, HEAL. Rooted in technological advancements and an improved scientific understanding, these trends weave together proven therapeutic and consumer uses for cannabis, the rise in connected, digital healthcare, a revolution in diagnostic capabilities, and gene therapies. We believe these four mega trends have a sizeable, growing total addressable market and have the potential to deliver many years of intriguing investment and growth opportunities.
CANNABIS

Cannabis science is also coming full circle with advances in neuroscience, pain management and autism research, not to mention the explosion of CBD use cases in consumer health and recreation.

CONNECTED HEALTH

Connected Health aims to seamlessly connect patients to physicians, medical facilities and records with the ultimate goal of improving patient outcomes more efficiently and with better accuracy. Whether its robotics in surgery, continuous glucose monitoring for diabetics or telemedicine, the number of applications of health connectivity technology are expanding exponentially.

DIAGNOSTICS

Major diagnostic advancements allowing for the detection of genetic mutations have paved the way for the diagnoses of far more subtle variants of a disease, like cancer. This allows the physician to choose the optimum therapy for that specific disease variant, dramatically improving outcomes. Whether its genomics, proteomics or genetic sequencing, the diagnostic revolution is just getting started.

GENOMICS

The ultimate personalized medicine may exist in one’s genome. The genomics revolution offers the promise of permanent cure for many devastating diseases, some of which have no standard of care. Here, editing or replacing errors in a patient’s genetic code could cure Hemophilia, Muscular Dystrophy or numerous other diseases. We believe the advancement of this technology presents a new paradigm that will likely disrupt the entire biopharmaceutical industry’s way of approaching chronic therapy.
SECURE

IDC estimates there will be over 41 billion connected devices by 2025 with exponential growth in devices relative to the Internet of Things (IoT).¹ These devices are an integral component as this engine generates the data that helps fuel the digital economy. Consumers are increasingly driving the move toward a digital economy as they use more connected devices for work, shopping and leisure activities across an array of digital channels. Enterprises are increasingly adopting remote work policies to create flexibility for their employees to be productive and collaborative while offsite. From a customer perspective, enterprises are enhancing product performance, delivery tracking, supply chain management and dynamic pricing, among many other technological enhancements, in order to improve the customer experience.
**BLOCKCHAIN**

This distributed ledger technology (DLT) is expected to store approximately 10% of global GDP by 2027. This technology has been closely associated with Fintech as it serves as the technological backbone for Bitcoin, perhaps the most well-known form of decentralized digital currency. Documentation, security and trust are three key attributes that have made Blockchain an attractive solution for financial transactions across the spectrum and inclusive of an entirely new set of digitally oriented currencies and assets. Blockchain has expanded its presence into areas such as supply chain management, healthcare and pharmaceutical documentation and multiple identity-management solutions.

**FINTECH**

The quickly evolving Fintech industry, which includes digital currencies and assets, peer-to-peer (P2P) money transfer, digital wallets, robo-platforms and many other financially related technologies, illustrates how technological innovation can solve for a better and more secure consumer and enterprise experience.

**SECURITY**

Although the digital economy provides consumers and enterprises with greater utility and convenience, it also adds risks of vulnerabilities to data breaches, identity theft and privacy loss. A combination of more connected devices and more data can create a potential hotbed of opportunity for bad actors to attempt to breach security protocols. An increased need for cybersecurity and next-generation security protection has subsequently led to significant innovation within the security industry. Whether the security solutions are local or network-based, software or hardware implemented, they all carry a level of importance that aligns with the goal of protecting against and curbing attacks that seek financial gains, damage or unauthorized access to data.

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RENEW

The global population today finds itself at an environmental tipping point, and without major behavioral changes over the next decade, human-inflicted damage may be irreversible. With 18 of the world’s warmest years in the past 20 years, climate change is here and solutions require investment for a meaningful solution. The global population, despite modern economic growth and technology development, remains divided by wealth and culture. Efforts to reach underserved populations are increasing the focus of regulatory bodies while also opening up vast new potential market opportunities.
CLEAN RESOURCES

As climate change looms, many stakeholders and regulators are pushing for lower carbon-emitting solutions. With continued technological and competitive economic improvements, replacing today’s energy resources is a massive challenge with zero-emissions technologies like wind and solar just beginning to gain share and scale. Solely relying on these renewable resources is a long way off, but on the path, there are multitudes of direct and indirect investment opportunities that can take share from more traditional carbon-emitting resources. The speed of this transition has increased in recent years and is accelerating in 2020 with announcements of major climate goals and targets for large corporations and sovereign entities.

HEALTH & WELLNESS

Living standards are lifting for large populations globally, improving their quality and extending life expectancies. As these large populations transition out of poverty, they require and consume greater degrees of healthcare services and products. As a proportion of consumer income, spending on health and wellness has the potential to accelerate global GDP growth. This growth could provide a significant tailwind to healthcare providers, technology and equipment, as well as related services. The addressable market is substantial and fairly universal, providing multi-year investment opportunities across various geographies.

SOCIAL EQUALITY

Trends for greater access and equality continue to gain momentum across industries and geographies, as evidenced by a shift toward populist politics and an increased focus from global organizations, specifically the United Nations (UN). The UN’s Sustainable Development Goals provide an intense focus on issues that will lift many people out of poverty and improve their quality of life. Technology is a major enabler for reducing many large, historic barriers to entry to prosperity. Additionally, large corporations are increasingly placing value on their own employee workforce and the communities where they operate as they work toward greater social equality. The opportunities here are vast and extend across almost every industry.
MOVE represents the disruptive, transformational shift in how we use, power and control all means of mobility, profoundly impacting businesses, governments and consumers by materially altering interactions across the mobility landscape.
MOBILITY

We are seeing rapid innovation across the mobility landscape, and it is being deployed across a wide array of increasingly intelligent vehicles, transportation systems and supporting infrastructure. Companies are leveraging these innovative new solutions to address the challenges of rising environmental and social problems posed by the trend of global urbanization. New forms of mobility are expanding the opportunity set well beyond the traditional auto market; we expect penetration across the truck, bus, train, drone and aircraft markets over the next decade. This revolution is not limited to the earth’s surface...

SPACE

Space represents a new and early stage opportunity, from tourism and communications to mining. No longer the exclusive territory of military and government players, the market is rapidly changing as commercial players enter and disrupt the industry with innovative, reusable platforms.

Over the next several years, we believe investments will primarily focus on national defense and satellite-based internet access for underserved populations and geographies. Demand from these markets could provide a platform for reusable rocket developers to continue to improve their products, further lowering costs. In time, innovation will drive lower prices, increased safety and improved efficiency that can expand access to space and enable the final frontier to flourish.
As the mega trends of automation, IoT, and artificial intelligence continue to evolve, we see a transition to ever more advanced forms of sensing and connectivity that are critical enabling technologies for many Innovation Themes.
5G

The proliferation of 5G will enable a massive increase in connected devices, from smartphones to self-driving cars. 5G will usher in much faster speeds, higher connection density and lower latency. 5G services are deploying increasingly worldwide, and the technology is necessary to support the quality of service required by autonomous vehicles, among other mission-critical devices. A coincident, dramatic increase in both the number of pervasive and connected devices, combined with an explosion in 5G speed and bandwidth, will generate vast new avenues of data.

ARTIFICIAL INTELLIGENCE

This data explosion will feed the ever-advancing capabilities of machine learning and artificial intelligence. These technologies improve efficiencies, accelerate economic growth and provide real-time data in novel ways. Artificial intelligence is the next-generation technology and will enable broad advancements in everything from industrial robots and smart cities to healthcare and consumer services.

AUGMENTED & VIRTUAL REALITY (AR/VR)

AR/VR creates new, immersive digital experiences through data. These applications will spread well beyond gaming to new ways of distance learning, remote work and connected healthcare. Technological change, shifting demographics and the related desire for more on-demand, virtual and interactive lifestyles drives evolutions in consumer behavior. As consumers have an increasing number of choices at their fingertips, they are regularly choosing experiences over material goods.

SENSORS

Across agriculture, automobiles, manufacturing and personal devices, sensors are a mission-critical building block to cognitive computing. Sensor count is rising across virtually all areas of the economy; monitoring, collecting and connecting data to IoT networks and platforms. Sensors are at the heart of the fourth Industrial Revolution: Cyber-Physical systems, where sensors are the front line in collecting data from the physical world so that embedded systems can process and transmit that data.
The advancements in data capture, information flow and technology have allowed us to live in an age of digitization and automation. Machines are performing more tasks on their own, and furthermore, actions that once seemed complex are now becoming trivial. These same machines are generating mountains of valuable data, enabling smarter decision making, increased efficiency, and most importantly, material improvements in our way of life. Modern day consumers want it all, and fortunately, our technology can quench their thirst.
3D PRINTING

Fortunately, the onset of 3D printing unleashes a new model for engineering design and manufacturing. New build-design-test cycles lead to reductions in cost, time and material waste. Increasingly complex components and parts can be accurately designed and built, creating shorter supply chains and reduced manufacturing footprints.

AUTOMATION

Automation has penetrated nearly every aspect of our lives. Robots and cobots (collaborative robots) are transforming our factories, warehouses and workplaces, driving higher productivity, quality, uniformity and flexibility. The secular trends of changing demographics, growing urbanization and greater needs for energy efficiency are only speeding up this acceleration.

SMART EVERYTHING

“Smart Everything” is a mid- to long-term theme that is a poster child for the new age we live in and touches a broad range of segments such as factories, cities, warehouses, security, agriculture, healthcare and the environment. Utility companies have access to remote monitoring, real-time controls and advanced analytics. The use of connected devices, 5G, AI and IoT has enabled significant improvements in both our workplace and our quality of life. Today’s buildings are becoming more energy efficient while providing a better experience for tenants. Smart agriculture has led to higher and more resilient yields, driven by sensor-based fertilization and timely irrigation. This new wave of “Smart Everything” and automation has driven a greater need for precision engineering.
Today’s consumers expect perfection, goods and services delivered where and when they want them, and personalized curated experiences to fit their every need. This dynamic shift has led to clear winners and losers, which means potential opportunities to generate alpha in investments across many sectors, including consumer, technology and communications.
CIRCULAR ECONOMY

Increased knowledge and understanding of the negative impact consumer purchases have on the environment are leading to more aligned interests between consumers, brands and governments to alleviate the strain. More informed consumers are holding brands to higher standards, governments are adopting stricter guidelines, and companies are setting ambitious goals to participate in the circular economy. This trend is in its infancy. Younger generations, who are more connected to brands through digital media and more conscious of brands’ environmental impact, are demanding changes in corporate behavior, seeking to better the world through their purchasing decisions. As investors, we will continue to engage with brand leaders to encourage the use of more sustainable and recycled materials, production of goods with a longer useful life, reduction of carbon emissions and water usage, and better treatment of their employees.

NEW CONSUMER

The new consumers of today thoroughly research products and brands without physically interacting with any goods. As data proliferation drives a greater degree of transparency for both consumers and producers, it’s opening the door for consumer-facing companies to forge meaningful competitive advantages that vary from the past. This creates the opportunity for fundamental research analysts to differentiate between long-term strategic winners and losers. In addition, consumers are starting to value their time and money differently, which is driving a major shift in how they interact with brands and how they allocate their spending. As a result, companies are being held to much higher social, environmental and quality standards.
<table>
<thead>
<tr>
<th>Strategy Name</th>
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<td>Theme Composition</td>
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Co, Se, Au, Sm, G, Ar, S

Mobility Innovation
M, Sp, Se, Ci, Pr, Au, Sm, G, Ar, S

Blockchain Innovation
Bl, Fi, Se, Pr, Ar, A, S

Remote Life
Co, D, Fi, Se, Au, Sm, N, G, Ar, A, S

Intelligent Consumer
M, Fi, Se, H, Sm, Ci, N, A

Modern Manufacturing
D, Pr, Au, Sm, G, Ar, S

Quantum Computing
Fi, Se, G, Ar

Smart Cures Genetic Innovation
Co, D, Ge, H

Circular Economy
Ci
ABOUT MELLON

Mellon is a global multi-specialist investment manager dedicated to serving our clients with a full spectrum of research-driven solutions. With roots dating back to the 1800s, Mellon has been innovating across asset classes for generations and has the combined scale and capabilities to offer clients a broad range of single and multi-asset strategies.

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