Eight investment themes for global growth

MELLON’S US SMALL MID CAP EQUITY TEAM
Over my nearly 30-year investment career, I’ve learned the value of scrutiny and reflection. That may seem counterintuitive in today’s market environment where information flows more continuously and rapidly than ever before. While the investment landscape today is unrecognizable from 30 years ago, one thing remains the same: we must respond to and plan for the future, rather than react to the latest headlines. In my view, those who don’t maintain a long-term view will surely succumb to the very pressures that are sinking Fortune 500 companies in rapid succession.

Businesses need to be dynamic and nimble, as the time it takes to define success or failure is more compressed than ever before. In 1958, the average lifespan of an S&P 500 company was approximately 60 years. That figure has fallen to less than 20 years today.¹ Viewed through a different lens, 52% of Fortune 500 companies in 2000 no longer exist due to bankruptcy or acquisitions. The accelerated pace of change creates both risks and opportunities for investors, but navigating this rapidly changing landscape can be challenging without the benefit of a secular view.

The velocity of information, risk and change create an environment where reactions masquerade as decisions. We have developed a framework that combines our sector expertise with a holistic cross-sector view to navigate these continuously changing waters, and we believe it is key to investment success. Our “themes” filter and identify those unnoticed but ubiquitous characteristics connecting companies we believe are poised to successfully displace today’s corporate giants — this is the principal pursuit of our research process. Thematic research helps us understand how those characteristics shape the investing landscape and create opportunities for companies to succeed or fail. Further, the themes we follow are crossing sectors with complex direct and second-order effects.
“While the investment landscape today is unrecognizable from 30 years ago, one thing remains the same: we must respond to and plan for the future, rather than react to the latest headlines.”

We follow established themes for years, but often new themes emerge and grow in importance and pervasiveness. One such giant is sustainability. It is the first topic covered because of its all-encompassing nature. Corporate leaders today recognize the fragility of market share and the need to build more durable business models. It starts with company culture. Executives across industries are more focused than ever on creating an exceptional workplace environment. Other issues important to building a sustainable business model include demonstrating values that your consumers can support and producing products that are conscious of the environment. Market share and sustainable competitive advantages are also becoming more elusive due to the increasingly digital orientation of our economy. From energy service providers to retailers and financial institutions, companies are focused on data collection and analysis to create the edge that is required for success.

We are pleased to share our evolving views on what's changing in the investment landscape, why, and how we seek to position our portfolio to benefit from those hidden advantages. Our investment themes are outlined above.

“Strengthening societal systems is not only the responsible thing to do — it maximizes business value.”

KATHLEEN MCLAUGHLIN
Chief Sustainability Officer for Walmart
A convergence of trends is forcing corporate America to focus on sustainability. In a recent report, Deloitte states, “[Corporate citizenship] is now a CEO-level business strategy — defining the organization’s very identity.” Consumers are demanding sustainable products and services. The planet needs a focus on sustainability. In many cases, technology is enabling responsible corporate citizenship to be accretive to the bottom line. Investors are increasingly allocating capital to companies and funds with sustainable mandates or guidelines.

**Ground Zero: The Consumer**

Consumers are more consciously directing their dollars to sustainable firms. According to the Hartman Group, sustainability impacts 87% of adult consumer values, attitudes and actions. Demographics play a large role. Generations Y (millennials) and Z are much more aware of the environment than prior generations of their age, and with the advent of social media, they have more access to information to make informed decisions, often selecting cleaner products, with fair supply chains and socially responsible messages. Traditional barriers to entry, like TV advertising and brick-and-mortar shelf space, are breaking down. Smaller companies with a more “authentic” sustainability message are taking market share from large multinational corporations.

The era of personal responsibility also applies to lifestyle choices. Generations Y and Z feel more personally responsible for their health and wellness. They are choosing modern wellness and brands that are listening are coming out on top. As one example, Halo Top Creamery, an ice cream brand that boasts lower-calorie, vegan and dairy-free options, has emerged as the best-selling pint in America after just six years.

But it doesn’t stop there. Frustrated with political solutions to societal problems, consumers are embracing social change. According to Larry Fink, “[People are] turning to the private sector and asking that companies respond to broader societal challenges.” Management teams are being held to higher standards for diversity and inclusion and corporate boards are taking notice of how embracing those standards can drive positive results.

We believe women’s increasing role in the business world is at the forefront of that adoption. Racial and gender diversity in the workforce were determining factors for Amazon’s new headquarters (HQ) choice of DC, according to Bloomberg. California also recently passed a requirement for publicly traded companies to have at least one female board member by the end of 2019. We are researching the impact of gender board composition.
on stock performance and have found that greater degrees of diversity can potentially positively influence stock performance, especially in the technology industry.

JUST Capital conducts survey work on what the American public values most in corporate America. Shareholder returns and profits were a low priority. While other factors such as employee well-being (i.e., wages), product quality, customer treatment including privacy, environmental friendliness, fair supply chains, local community support and job creation were much higher priorities.

JUST Capital uses its survey results to compile company rankings and we’ve begun integrating similar metrics from company review providers like Glassdoor into our bottom-up company analysis. These review services provide valuable insights about management teams, and we think it’s a worthwhile tool to uncover bad behavior before it goes viral. Qualitative inputs from companies such as these have become more important to our research process.

The Middle Class and a Rising Government Accountability

A rising middle class is also increasing their focus on sustainability. The Brookings Institute states that, “At a global level, we are witnessing the most rapid expansion of the middle class the world has ever seen.” A burgeoning middle class in emerging markets is fueling this growth. These consumers are starting to hold governments more accountable, which brings us to the second sphere of influence on sustainability: central governments. China is leading this charge with India following. China’s President Xi Jinping has pledged to build a “beautiful China” and improve living standards. China’s focus on limiting air, water and soil pollution has created headwinds and tailwinds both abroad and at home. For example, environmental restrictions on the production of so-called “dirty” commodities like steel, coal and aluminum have significantly impacted global prices, while China’s decision to effectively stop importing single-stream recycling is disrupting the global waste industry. We see opportunities for companies able to provide environmentally friendly products and services, particularly those that address the increasing water scarcity and pollution problem in emerging markets.

In 2015, global leaders took a major step forward and formalized sustainability standards with the United Nations (UN) Sustainable Development program. This widely followed blueprint for a better and more sustainable future contains 17 sustainable development goals (SDGs) in the hope of a better world by 2030. Companies often use the blueprint to target a few of the UN’s goals, and corporate sustainability reports (CSRs) are almost as commonplace as corporate annual reports. Many are focused on reducing carbon emissions due to the irrefutable evidence of global warming, but they are also addressing renewable energy, environmental footprints, responsible sourcing, employee well-being and waste.

Apple’s revolutionary new campus, Apple Park, is proof of corporate America’s commitment to bettering quality of life and the environment. Designed to inspire employees and benefit the environment, the facility combines cutting-edge energy and water efficiency and employee wellness in the form of fitness facilities, walking trails and natural air, to name a few. Steve Jobs was a legendary visionary and he wanted Apple Park to inspire future generations of office parks. Apple’s new headquarters is powered entirely by renewable energy.

“Organizations now operate in a highly transparent world where good behavior is easier to see and bad behavior is almost impossible to hide.”

TODD W. WAKEFIELD, CFA
Senior Portfolio Manager,
US Small Mid Cap Equity Team
The Development of Corporate Citizens

We view corporations as the third major sphere of influence on the future of sustainability. President Trump’s controversial decision to withdraw from the Paris agreement in mid-2017 appears to have increased corporate America’s focus on environmental risks. Corporations’ focus on global warming has huge implications for fossil fuels, renewable energy and the electrification of things (EoTs). Due to the rapid urbanization of emerging markets, peak oil demand appears to be at least ten years into the future. That said, investors are already recalibrating fossil fuel terminal values for loss of demand to cleaner energy sources. We believe renewable energy will benefit from growing electricity demand and a continued shift away from coal.

The Durability of Sustainability

Sustainability is becoming ingrained in the inner fabric of society and technology is making it easier to adopt sustainable policies and practices that benefit both society and the bottom line. The localization of supply chains is a major opportunity that spans industries. Automation (factory and supply chain) is one enabler of localization and it reduces opportunities for labor arbitrage that has sent many manufacturing plants overseas where labor and environmental laws are less strict or not followed at all.

Technology also helps consumers find local products. Take, for example, the food industry. Consumers increasingly desire fresh products with simple ingredients and packaging. Typical food supply chains in the US source from California or South America. For someone on the East Coast, typical grocery store produce sits in a damp truck for 3,000 miles, but that’s changing due to hydroponics. “Vertical” farming startups are combining plant science, computer science and mechanical engineering to produce significantly higher crop yields while remaining close to local consumers. Hydroponics consumes a significant amount of electricity. Fortunately, the cost of renewable energy has measurably declined, enabling a cost-efficient process. The result is meaningfully lower emissions without the need for freight and large agricultural equipment, reduced water usage, fewer pesticides, and food with more freshness and taste.
The Electrification of Things (EoTs) is growing rapidly, admittedly off of a small base. Battery technology is the EoT enabler, and we expect continued improvement in battery efficiency. The development of electric vehicles offers one of the greatest opportunities to reduce carbon emissions. We are bullish on this long-term opportunity, but expect slow adoption until the large auto original equipment manufacturers (OEMs) truly deliver electric vehicles that consumers love to drive.

Investors have noticed these sustainability trends. An increasing amount of capital is flowing into strategies with socially responsible investment (SRI), environment, social and corporate governance (ESG), or impact investing as part of their mandate. The historical view that social or responsible investing offered inferior returns is changing rapidly. As social issues grow in importance, the expected returns of responsible companies are thought to be advantaged, not disadvantaged. Deloitte's findings suggest, “An organization's financial performance appears to be linked to its citizenship record.”

The sustainability theme encompasses a broad investment universe and is creating opportunities across our investment landscape. We expect that a wide range of companies will see secular sustainability “taxes,” while others will see tailwinds due to the products and solutions they offer. We continue to be excited about the opportunities and expect to discuss this theme for years to come.

We continue to track the rise of the millennial consumer in an increasingly mobile and connected world. Combined, these forces are changing today’s marketplace into a digital, on-demand economy where we are noting the rise of the digital consumer, or Gen D. In the face of this shifting landscape, businesses must adapt and invest in digital transformations, including customer-facing marketing and sales and service-related infrastructure, to help them scale their businesses and satisfy these always-on digital consumers.

According to IDC, 5% of the world’s GDP is transacted through digital channels like smartphones and PCs. However, the world is increasingly migrating from offline transactions to mobile, on-demand ones. This transformation is taking place at coffee shops and fast food chains where mobile ordering enables customers to preorder, skip lines and save time while earning loyalty points. Mobile orders account for over 10% of some chains’ sales and that traffic makes them sizable mobile payment platforms. This shift is not surprising since consumers spend increasingly more time on their smartphones, and adults average 5.9 hours per day on digital media.

Holiday sales in 2018 provided further evidence of the shift to a digital economy. According to Adobe Analytics, Thanksgiving weekend online sales grew 28% year over year, and mobile devices accounted for 54% of total online sales in the US. Consequently, brick-and-mortar stores continued to lose share, and foot traffic declined by 1% year over year during this same period.

To prepare for this continued shift to the digital economy, consumer-facing industries are investing in digital infrastructure to better attract, identify and service customers. Companies increasingly employ digital assistants to boost productivity and reduce friction to accelerate e-commerce transactions and fulfill support requests. As of 2017, only 3% of online customer experiences were handled by a conversational agent, or chatbot. However, global research firm Gartner thinks that number could potentially increase to 30% by 2022. Even now, some contact center leaders are deploying bots to automatically fulfill and deflect 10% to 15% of inbound requests away from live agents.

Consumer-facing companies increasingly use customer data to enhance products and services. Netflix’s recommendation engine analyzes customer data with machine learning algorithms to make viewing suggestions. Netflix reports 80% of streamed hours are based on its recommendations. The engine is also key to user engagement because users only spend an average of 60 to 90 seconds searching for a title before losing interest.
According to IDC, digital channels will comprise more than 50% of global GDP by 2021. Given the potential for robust continued growth in the digital economy, we are focused on identifying drivers of innovation in this digital supply chain. Many of them collect, analyze and secure data that companies are increasingly reliant upon for building businesses and boosting productivity.

Budgets for these emerging technologies are being reallocated from legacy ones serving traditional, on-premises applications. These legacy technologies keep data trapped in silos where value cannot be easily extracted by artificial intelligence (AI) and machine learning (ML) techniques.

As the global economy moves toward digital channels, companies are increasingly challenged to protect data and maintain customers' trust. We remain positive on the prospects for cybersecurity-related solutions amid rising global regulatory pressures to ensure data privacy.

"This transformation is taking place at coffee shops and fast food chains where mobile ordering enables customers to preorder, skip lines and save time while earning loyalty points."

Source: Crystal Valentine, PhD. Next-gen consists of cloud, big data, software and hardware related expenses.
The Internet of Things Gets Smart

In recent years, we highlighted the rise of low-cost, reliable connectivity, and its driving role in the internet of things (IoT). Recently, we’ve observed new trends surrounding “smarter,” more interactive IoT thanks to insights from AI- and ML-driven advancements and voice recognition. The internet of smart things (IoST) is becoming embedded into the daily fabric of consumers’ lives, ranging from luxury sedans that create custom settings for individual drivers based on their mood, to facial biometric applications that can identify individuals as they enter buildings.

IDC estimates IoT will reach 50 billion connected devices by 2020 and 80 billion by 2025. Given the breadth of scope of the deployments, IDC estimates that consumers will interact with these devices 4,800 times per day by 2025. We expect opportunities for customized services and security to increase alongside its capability to personally identify individual users. This trend is creating openings for companies that deliver the connectivity, security and intelligence that IoST solutions require.

Evidence is mounting that IoT is transitioning to IoST. More devices now include digital signal processor (DSP) semis, which enable voice recognition, than ever before. Additionally, demand for sensors, which enable devices to be aware of their surroundings, has increased from 6% to 12% growth year over year in the past twelve months.

The transition to IoST not only requires upgrades to smart endpoints but also to networks that can quickly and efficiently transport and process the data from these devices. As IoST takes hold, incremental computing will take place at the edge of networks rather than at the core. Investments in 5G wireless and optical metro network technologies will likely support this move to an “intelligent edge.” Improved wireless network speeds of 10x to 100x will provide the performance necessary to support new applications like self-driving or autonomous cars that demand immediate decision making for navigation and crash avoidance. This need for low latency will drive demand for dense, local data center networks that have only 5–10 millisecond roundtrip latencies.

Consumer-facing IoST applications and devices are already in use due to their quick time-to-market life cycles. Ultimately, we believe industrial and commercial ones will be introduced more broadly over the next few years in places like factory floors to boost productivity. There are opportunities for factories to upgrade machine tools with intelligent sensors to increase utilization and quality while reducing costs. According to the Industrial Internet Consortium, a typical factory deletes 99% of its data and derives no value from it. Adopting collaborative robots (cobots) could also help realize some of this progress. Cobots include AI, logic, vision and cloud-based features that work in conjunction with a human employee to simplify tasks without the need for complex programming.

We are still in the very early stages of IoST and applications are just beginning to come to market. According to Gartner, more than 50% of enterprises will include edge computing principles into their budgets by 2020. We think the internet of smart things is much closer than people think.
Over the past several years, venture capitalists (VCs) attempting to disrupt the traditional financial services sector invested heavily in financial technology (FinTech) startups. In the US, this funding approached $7 billion in 2018 as of mid-year. VCs targeted a wide cross-section ranging from insurance, money transfer, wealth management, lending and payments to equity crowdfunding, placing a particular emphasis on companies targeting the small- to medium-sized businesses (SMBs) and personal market segments. To date, we have seen a handful of FinTech IPOs, and we suspect many more businesses in the space will seek capital from the public equity markets in the coming years.

Apart from startups, incumbent technology companies have launched financial services. Traditional financial institutions are also looking to participate, launching digital services such as mobile banking app Marcus by Goldman Sachs and peer-to-peer digital money transfer service Zelle by a consortium of banks including Bank of America, Wells Fargo and JPMorgan Chase. As the financial services sector digitizes, we have two key views. First, FinTech will increase access to financial services. And second, FinTech startups, incumbent tech companies and legacy financial institutions will all play a role in the financial service industries of the future.

FinTech offerings increase businesses’ access to financial services in several ways.

**EXAMPLES INCLUDE:**

- Mobile payment solution providers that allow SMBs and micro merchants to accept credit card payments economically.
- Money transfer and currency conversion services facilitate low-cost international business transactions for small businesses.
- Online lenders can provide capital to businesses too small to borrow from traditional banks.

A startup can now even raise early stage capital through crowdfunding sites online. We believe increased financial access enabled through these FinTech business models fuels entrepreneurship and benefits the economy as a whole.

FinTech is also driving the democratization of finance for consumers. The foremost example is mobile payments, which allow people without bank accounts to transfer money around the globe from their mobile phones and convert currencies at a lower cost than banks charge. In the unsecured personal loan arena, online platforms allow consumers to refinance high interest credit card debt and student loans.

Online lenders are also adapting their business models as the marketplace matures. The conventional online lending model, which competes directly with bank and non-bank lenders, faces funding and credit disadvantages. Increasingly, industry players are employing an asset-light approach by partnering with traditional lenders instead of selling, securitizing or holding loans on their balance sheet.
By licensing their technology platforms, next-generation lenders capitalize on their low-cost, data-driven infrastructure to provide a much needed outsourcing solution to the banking industry. It is a rational evolution for the banking industry, which has been challenged by the cost and complexity of originating, underwriting and servicing personal loans. By leveraging their partner’s size, scale and cost of funding advantage, the emerging online lending model reduces credit risk, increases loan volumes and improves capital efficiency.

While FinTech startups continue to disrupt traditional financial services companies, we anticipate the relationship will become more collaborative over time. The cost, complexity and compliance risk of navigating the regulatory environment are proving to be tall barriers to entry for startups. At the same time, the historical lack of technological innovation makes the financial sector a prime candidate for disruption. Both startups and incumbents are recognizing that working together can lower costs, reduce risk and create a better customer experience. Options for investing in public FinTech companies remain limited, but the number of forward-thinking financial institutions that embrace innovation and invest in technology is growing.

Source: PitchBook Data, Inc., as of August 2018.
5 | Productivity

Depressed labor productivity in the US has been well documented. The key question is whether productivity has entered a period of secular stagnation or if it is simply suffering from cyclical pressures. We believe the problem is largely cyclical. Corporate America underinvested in capital expenditures this business cycle, particularly in physical plants and equipment, because capacity adequately met demand. However, we believe damage from the Great Recession and increased regulation held back investments in productivity as management preferred to buy back stock rather than invest in productivity and organic growth.

Over the long term, we firmly believe businesses prefer to invest in growth over buying back stock. Corporate tax reform and deregulation should support higher returns. There has been a noticeable step-up in capex spending in 2018 that, if done wisely, should lead to higher future productivity. Economically speaking, the US is desperate for higher productivity. It is the only way it can sustain GDP above the 1% to 2% range experienced for most of the past decade. Demographics and the aging workforce make the future productivity stakes even higher.

“\nThe smart factory represents a leap forward from more traditional automation to a fully connected and flexible system.\n”

DELOITTE

The “old” economy has been the biggest productivity drag, but we are in the early stages of the next industrial revolution. In the first industrial revolution, colossal rewards were bestowed upon companies that used water and steam to mechanize production. The second industrial revolution saw electricity enable mass production. Automated production characterized the third industrial revolution. The ongoing fourth industrial revolution seeks to transform the physical economy with information.

Digital transformation extends across the entire economy, including old stalwarts like energy, industrials and utilities. The factory of the future will need to intersect digital technologies and process automation. Product design and planning will likely take place in virtual reality. Data will be collected, handled and analyzed throughout the manufacturing process. Machines, with the help of engineers, will adapt in real time to changing supply chains, manufacturing conditions and custom orders. The result will be improved timeliness, quality and productivity in a more environmentally sustainable way.

This transformation has triggered a secular rise in spending on intellectual property (IP). We expect this trend to continue or even accelerate. IP investments can have long lead times, but we are confident these investments, past and present, will result in higher future productivity. At the same time, we are cognizant that IP investments should increase the asset efficiency of the physical economy and put downward pressure on the need for incremental physical capacity.

The tools needed to enable the factory of the future are available today. However, the manufacturing industry has only recently begun to integrate those tools in the cohesive manner needed to realize its potential. Auto manufacturer Audi is one corporation adopting changes. Management identified the need to move its manufacturing process from mass production to mass customization. In 2015, Audi introduced its Smart Factory 2035 strategy to enable the “digital and sustainable production of the car of the future.” Striving to “make processes efficient, flexible, highly automated and future proof.” To facilitate this radical change, they must digitize and network innovative technologies and create an environment where humans and machines can work together. Key enabling technologies include data towers that act as the central nervous system for a plant, cutting-edge metal 3D printing, autonomous factory transport systems, robots, and exoskeletons for factory workers. Audi’s Smart Factory 2035 holds great promise, but we are a long way from the digital maturity of the factory floor.

Similar to past revolutions, incumbents often get hurt, and the redistribution of economic rents creates new opportunities for investors. As investors, our job is to identify productivity enablers as well as companies that can effectively deploy technology to increase productivity. We are most interested in companies that can provide rapid prototyping services, machine vision, sensors, predictive analytics, radio-frequency identification (RFID), advanced robotics, machine learning and advanced materials for better manufacturing.

Secular Rise in Intellectual Property Spending

![Graph showing the secular rise in intellectual property spending from 1999 to 2017.](image)

Demographic trends are important for investors to understand, particularly the demographic impact on future spending levels and habits. When the baby boomers reached their formative spending age of 45 to 54, there was an extended period without a consumer recession and record levels of home ownership. In subsequent years, as they aged out of peak spending, the US experienced below-normal consumer spending growth and lower home ownership rates.

The influence of Generation Z is on the horizon. As defined today, it is a significant demographic, but with an average age of 14 spending power is limited. We are studying the implications for education and retailers as well as their impact on the workforce. A study by PEW indicates that Gen Z is much less likely to work during high school than prior generations, which could...
Generation X is squarely in their peak spending years. Unfortunately, Gen X is a relatively small cohort, and they are largely unprepared for retirement. We expect a higher-than-normal savings rate from this generation until they begin to inherit wealth from their boomer parents.

Baby boomers have accumulated tremendous wealth. Although out of their peak earning years, they control 30% more aggregate spending than millennials. But, like millennials, their discretionary spending is increasingly being directed toward experiences and creating memories over material objects, as evidenced by national park visits and concert/show attendance. In our view, marketers have prematurely shifted their focus toward millennials and away from baby boomers. The similarities between the two cohorts should not be overlooked, and companies that target boomers in the context of “longevity” over aging are better positioned to serve boomers who are seeking vitality and to experience life at a higher level. As one example, some companies are repositioning hearing aids to fight the stigma of old age and increase adoption levels. The rapidly growing “hearable” category adds functionality, like fall detection, and may make consumers feel more embraced.

In aggregate, we believe demographics will pressure consumer spending growth rates by 1.0% to 1.5% per year due to fewer peak spenders and higher savings rates. The composition of spending dollars will likely be impacted even more dramatically.

“Baby boomers have accumulated tremendous wealth. Although out of their peak earning years, they control 30% more aggregate spending than millennials.”
For the third time in the modern era, health care in the US is going through a dramatic change. In the 1970s, we employed a cost-plus payment model, and in the 1980s, we moved to a fixed-price system. Now, we are in the early stages of a shift to contingency-based payments. Most literature refers to it as value-based care, and the history books will claim it began around 2012. It appears we have reached an inflection point because quality, not just price, is finally getting its fair share of attention.

The concept of value-based care is sound — pay a fair price for the level of care you receive — but we would argue it is just beginning to apply to health care. Until now, the overwhelming emphasis has been on lowering costs. Federal and state governments and commercial insurers and providers have historically focused on price in an effort to bend the cost curve with limited success. Now, the approach is shifting to focus on better quality health care and improved outcomes because healthier people ultimately cost less.

From an investment perspective, we are at a critical juncture. We believe there are four simultaneously occurring factors that create an investable theme around quality and outcomes for years to come.

**Factor 1**
Payment models from both government and commercial payers increasingly include outcomes as a determinant of payment rates.

**Factor 2**
Providers are entering risk-based contracts where they are economically responsible for upstream and downstream quality of care.

**Factor 3**
Quality and outcomes measures are being shared, leading to changes in market share.

**Factor 4**
The data and tools available are reaching a point where they can be used to drive clinical decisions.
New Payment Models

Insurers are creating new models to economically incentivize providers to deliver better quality care. In Medicare’s value-based purchasing model for home health agencies, providers are evaluated annually on the quality of care delivered. These evaluations are aggregated and result in a relative ranking for each provider. Reimbursement levels are then adjusted based on these rankings, resulting in higher payments for those who deliver higher-quality care. By 2022, the potential reimbursement adjustment will reach ±8%.

Payment models similar to HHVBPM are being applied across the provider landscape, ranging from home health and nursing homes to hospitals. The example below highlights a government model, but we are seeing similar approaches from commercial insurers as well. In our opinion, the key to these models is an economic incentive to deliver higher-quality care.

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<th>Payment Year</th>
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Source: CMS.gov, as of December 31, 2018.
Risk-Based Contracts

Providers are entering contracts where they assume some of the economic risk around a patient or group of patients. These models range from modest risk-sharing arrangements to full capitation. To illustrate, a hospital may receive a flat rate from an insurer for a patient’s hip replacement surgery. Now responsible for the full spectrum of care for that patient, the hospital needs to partner with upstream and downstream providers, sharing the flat fee as appropriate. This cost structure may force a greater degree of accountability and incentivizes the parties involved to be concerned with the level of care delivered by their partners. Hospitals will seek to avoid nursing homes with high readmission rates; likewise, nursing homes will avoid patients from hospitals with high infection rates. Importantly, this dynamic will extend to device manufacturers, suppliers and pharmaceutical companies whose fortunes will increasingly be tied to their direct contribution to higher-quality outcomes. The result is an interdependent ecosystem where market share will naturally shift toward providers who enable better care.

For illustrative purposes only.
Ratings

Quality is being measured, and the results are becoming increasingly available. This information will have a direct impact on market share. Medicare’s star ratings system is currently the most visible, but we anticipate additional rating and reporting systems going forward. Employers are the driving force here, and they will increasingly use quality measurements to determine who will serve their employees. We expect to see increased use of “centers of excellence” and “preferred providers” resulting in narrower networks. Providers will need to show better quality care in order to qualify for these networks. The dynamic here will be very similar to that described above, where providers’ efforts to improve outcomes will influence partnerships and protocols as well as devices, pharmaceuticals and technology. The entire ecosystem will increasingly look to provide tangible evidence that they contribute to better quality care or risk being excluded from “high-quality networks.”

Data

The previous three factors would merely be interesting concepts if not for the improvement in the availability and integrity of data. Health care has lagged the overall economy on this front, but it is progressing. The much-maligned electronic health records have resulted in increasing amounts of data, and those on the leading edge are starting to use it. Payers, providers and employers will increasingly be able to determine who has the best outcomes. Pharmaceutical companies are working to predict on which patients their drugs will be more efficacious, and device manufacturers are looking to determine the best patient subsets for a particular device. If everyone in the ecosystem is measured on outcomes, then data use will increase to measure and improve those outcomes. In our view, the more data is used, the better it will become, and the more useful it will be. We think we are at the beginning stage of a virtuous circle where better data will enable better outcomes.

Of course, price is still a significant factor, but quality is garnering more attention. Employers, insurers and providers are increasingly focused on quality and outcomes, which directly impacts market share and profitability. We think change will occur faster than historical rates due to leading-edge employers breaking the path, and we expect a proliferation of new care delivery models with more emphasis on outcomes. Large employers will increasingly take control, forcing providers, insurers and suppliers to respond. Administrations will come and go, political winds will shift, and the buzzwords around health care will change, but once the industry digests the quality and outcomes data, there is no turning back. Quality matters.
Emerging Themes

The first seven themes present compelling trends where we can put meaningful capital to work today. While much of our focus is on deep due diligence on current actionable ideas, we also have an eye toward emerging trends. On the following pages is a brief discussion of a handful of frontier themes that don’t offer meaningful investment opportunities yet, but we think they bear close watching.

Wearable Diagnostics

An EKG on your Smart Watch? Not viable in its current form, but a sign of things to come because wearable diagnostics are on the way. New entrants are pushing design limitations and developing smaller, more sensitive devices that will likely change medicine. Device manufacturers, health systems, employers and insurers are developing new business models to drive adoption.

The diabetes market is a good example of how these devices are changing the standard of care. By wearing a continuous glucose monitor (CGM) the size of a thick bandage, a diabetic can get real-time glucose readings without the traditional finger prick. CGMs can communicate these readings to a patient or caregiver’s phone, providing alarms when clinically appropriate.

The key for these devices is their small size, sensitivity and ability to provide real-time data. Couple that data with sophisticated software algorithms that interpret signals and the potential for these devices to provide clinically relevant information is significant. Imagine a device that provides hospital-quality vital signs to a doctor connected via a telemedicine visit, a heart monitor that recognizes an arrhythmia in real time, or a device that proactively monitors lung function in an asthma patient. Insurers recognize the potential, and we anticipate health care providers will increasingly integrate wearable diagnostic devices into clinical protocols.
Navigating the health care headlines can be challenging, but what is clear is that innovation and investment are coming from new directions. While the Amazon, Berkshire Hathaway and JPMorgan Chase triumvirate grabbed the most attention, there are many other examples of new, seemingly unorthodox health care entrants venturing into health insurance, medical devices and software via traditional venture capital (VC) investments as well as partnerships and internal development.

Uber is strategizing ways to transport medical patients. Walmart is operating health care clinics, and Amazon is acquiring pharmacies. Apple has been conducting a heart study with Stanford. Google and IBM are investing in biotech and Intel in diagnostics. Not to be underestimated, many of these companies are also exploring new alternatives to deliver health care to their own employees, in many cases, bypassing traditional health care models. Perhaps the best indicator of the intentions of these new entrants lies in who they are hiring — increasingly, high-profile and highly accomplished health care executives, and they’re saying yes.

We are not ready to predict that these titans will revolutionize health care and disintermediate the traditional players, but we believe they will challenge the status quo at a faster pace than ever before. Incumbents will respond or be left behind. The result will likely be an acceleration in the pace of innovation and collaboration across the entire ecosystem. Increased investment and novel approaches from new entrants will likely result in a dramatically different health care landscape a decade from now.

Cannabis legalization efforts are taking root globally, slowly correcting the dislocation between public opinion and policy. Several fundamental developments in 2018 have increased our optimism for the budding industry’s growth trajectory in the coming years. In June, the FDA approved a cannabis-derived treatment for two rare seizure indications, effectively contradicting the US government’s classification of marijuana as a Schedule I narcotic, which presumes a drug has no accepted medical treatment. Additionally, major consumer staples companies have formalized their intentions to enter the space, with several companies making billion-dollar deals signaling a perception of fading regulatory risk in the near term and an opportunistic view of global market penetration. Perhaps most notably, Canada, a country with nearly 30 million adults, legalized adult use in October, becoming the first G-20 country and the second country ever to regulate recreational consumption.

Recently, the World Health Organization (WHO) announced a reassessment of its classification of cannabis as a Schedule I narcotic — another potentially positive catalyst for a softening approach toward the plant in the European Union (EU). Momentum to legalize recreational use in the United States also continues, as Michigan became the tenth state to legalize adult use. Along with more relaxed posturing at the state level, we anticipate a spate of favorable upcoming legislation for the industry in 2019, with the 2018 Farm Bill, STATES Act, Marijuana Justice Act and VA Medicinal Cannabis Research Act of 2018 offering varying degrees of regulatory thawing at the federal level.

We think global legalization efforts will gain more traction over the next one to two years. While public companies experienced tremendous hype ahead of Canada’s legalization, the remaining catalysts and runway for global opportunities keep us engaging with management teams and monitoring the space closely for potential investment opportunities.
Individual consumers and businesses are not the only potential beneficiaries of a digital economy. As cities employ new digital workflows, they too can see improvements in outcomes for their citizens. In fact, we see smart cities as a consequence of the IoT trend.

McKinsey estimates smart cities can improve living standards by 10% to 30%, as benefits from harnessing smart city technology for transportation can reduce accidents, traffic and pollution, and smart hospitals and factories can improve health care and safety. We see an opportunity to invest in a wide array of infrastructure ranging from meters, to lights, to drones, which will enable city officials to monitor and manage conditions on a real-time basis.

“American gamblers wager $150 billion in illegal sports bets annually.”

THE AMERICAN SPORTS BETTING COALITION

American attitudes toward sports betting have also changed. For years, most Americans opposed sports betting on moral grounds and worries of addiction. They doubted that sports betting and integrity in the game could co-exist. Today, however, after years of fantasy sports and online gambling, Americans have rethought their skepticism. Even professional sports leagues have changed their tune, embracing legalized sports betting and the significant revenue opportunity it may provide.

How big could the sports betting market be? The size will depend on which states legalize betting, the populations of those states, and the sports they allow. In addition, it will depend on how successful operators are in enticing illegal gamblers to wager legally. If states could attract these wagers and retain 5% of the sports book rate, sports betting sales would total $7.5 billion annually.

Although the outlook appears promising, for some states the legalization process may be long and difficult, requiring amendments to state constitutions, passage of ballot initiatives and negotiations with Native American tribes. As states consider legalization, Congress is also debating whether to regulate the industry at the federal level. Major professional leagues want a federal framework potentially mandating “integrity fees,” arguing that they deserve a cut of the proceeds to offset the expenses incurred to ensure the games’ integrity. Most casino operators oppose this, arguing the leagues already stand to benefit greatly from enhanced fan engagement.

We continue to monitor developments in this dynamic market. Some potential beneficiaries of this growing industry are casino operators, gaming technology companies, sports betting businesses, sports teams, media companies and restaurants with sports concepts.
Transformational change is underway in the $180 billion global video game industry: Shifting demographics, evolving gameplay preferences, and new distribution models geared toward accessibility are redefining the ecosystem.

**ENGAGEMENT**

Video games have been thrust back into mainstream popular culture thanks to the combined success of Epic Game’s Fortnite and the growing popularity of live-streaming platforms among younger, more affluent and internet-native generations. Fortnite’s developers broke the traditional video game mold — by placing a heightened emphasis on player engagement versus incumbent peers, by offering a free-to-play battle royale game monetized via in-game cosmetics, making it device-agnostic and playable across platforms and immersing players in an environment that quickly updates the item set available to players along with the strategy of gameplay. They also proactively listened to the community and regularly adopted the input that filtered through social media channels. Just as important are the various storylines and touches of popular culture interwoven throughout the fast-paced cadence of Fortnite's regular 10-week seasons, which each see transformational map updates based on a particular theme. On the live-streaming front, platforms have created completely new economic models for top players who live-stream their daily play to thousands of followers seeking to learn from the best. The interactive streaming environment also serves to socialize a previously isolating activity, connecting both enthusiasts and casual players. For content creators, these streaming platforms allow a greater number of touch points with their communities, providing a new channel to market and extract feedback from active players in real time.

**COMPETITIVE PLAY**

eSports, or competitive gaming, continues its quest to rank among long-established professional sport incumbents. Lowering the opportunity cost for top players to invest time optimizing their skillset around a particular game, we view the prize money available to eSports athletes as well as its growth trajectory as an important underlying indicator of the industry’s health and near-term outlook. In 2018, prize money reached $151 million, growing 32% over 2017. In 2019, Epic Games has already committed $100 million in prizes for Fortnite alone, giving players some visibility into how big the pie can grow and where time spent practicing is most likely to be rewarded.

Having signed a number of eSport broadcasting deals and acting as a single portal for the most famous independent streamers, Amazon’s live video-streaming platform Twitch remains at the epicenter of competitive play, enabling multiple revenue and marketing opportunities for professional athletes, sponsors, leagues and eSport franchises. Nonetheless, pure-play public companies benefiting from the monetization of competitive play remain elusive, as the majority of the economics are currently captured in media rights, advertising, and sponsorships. We are, however, closely observing the formation of Activision’s experimental eSports league, based on the first-person shooter video game Overwatch, as this more structured format backed by major sporting franchises lends itself to the cadence of traditional sports broadcasting, scheduled gameplay and more regular opportunities to ticket and sell merchandise. 2020 will be a critical year for the Overwatch League as franchises begin hosting games in their home cities for the first time.
ACCESSIBILITY

While at least one more console generation is widely anticipated, the $19 billion in annual console sales are increasingly at risk as cloud-based gaming-as-a-service and subscription distribution models begin shifting consumer attention and expenditures toward streamed gaming, free-to-play (F2P) content and in-game currencies supporting digital goods economies (e.g., cosmetic items). As internet and computer technology advance, direct-to-consumer models are upending traditional consumption behavior, bringing with it the opportunity to access a broader casual-gamer base across more devices and setting up hardware and content providers for an uncertain transition.

Although changes in player engagement, competitive play and accessibility will likely evolve over independent timelines, when taken together over the coming years, we anticipate a transformed video gaming industry, with value accreting the most to the end users, eSports athletes, streamers and content creators. We are focused on all of these sub-themes as each represents an opportunity to either generate outsized returns or at a minimum, understand disruptive competitive threats to incumbents within the industry.

Blockchain Technology

The cryptocurrency mania in early 2018 captured headlines, but we focused our attention on enterprise-grade distributed ledger implementations designed to create new revenue opportunities and cost structure efficiencies in our domestic small- and mid-cap equity universe. Organizations should continue their digital transformations and leverage shared data streams to enhance the security and velocity of financial and IoT transactions, improve supply chain visibility, advance the interoperability of sensitive health care interactions, and record digital identity. We anticipate that blockchain technology will be the foundation of this digital fabric. Although adoption is not as rapid as some have expected, IDC forecasts that worldwide spending on blockchain technology will reach $11.7 billion in 2022, a 73% compound annual growth rate from 2017. We expect the addressable market will expand based on the depth of use cases across a diverse set of global industries and the technical validation from some of the largest US corporations.
We believe a new Space Age has begun. According to the Satellite Industry Association, a record 345 satellites were launched in 2017. In that same year, the satellite industry — which includes satellite services such as broadband and radio, manufacturing, ground equipment and launch — accounted for 79% of the $348 billion space economy with government space expenditures and commercial human spaceflight comprising the rest. We expect the space economy to grow significantly for decades to come, driven by rapidly falling launch costs.

Over the next several years, we believe investments will primarily focus on national defense and providing satellite-based internet access to unserved populations and geographies. Demand from these markets will provide a platform for reusable rocket developers to continue to improve their products, further lowering costs. In time, cheaper access to space should enable other ventures exploring the final frontier to flourish. Among the more aspirational are space tourism and resource extraction. Current opportunities for public equity investors to invest in the growth ahead are fairly scarce. There are some avenues for exposure through aerospace and communication system suppliers, major technology companies with investments in the area, and launch insurance providers. This should change in the next few years as more established private industry players and space startups seek capital to pursue this enormous long-term growth opportunity.