

THE REAL ECONOMY

INDUSTRY OUTLOOK

VOLUME 3
WINTER 2020

THE POWER OF BEING UNDERSTOOD
AUDIT | TAX | CONSULTING





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The Real Economy: Industry Outlook provides a collection of sector-specific insights developed by our RSM US LLP senior industry analysts, a select group of professionals dedicated to studying economic and industry data, market trends and the emerging issues faced by middle market businesses.

Each outlook offers a data-driven approach to industry research, examining the impact of economic factors including earnings, competitive landscape, consumer behavior, capital flows, mergers and acquisitions, supply chain, labor and more.

Should you have questions about any of the following content, please [contact us](#).

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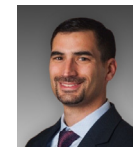
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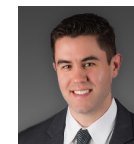
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Margin compression will be in the spotlight throughout the year as retailers tackle labor challenges, tariffs and other cost pressures.



OUTLOOK: CONSUMER PRODUCTS

BY CHRIS SHAKER, PETER CADIGAN AND
KAREN GALIVAN

From customer pressure for the latest and greatest online or in-store experience to healthier and more socially responsible products, consumer companies face myriad challenges in 2020. Against the backdrop of a volatile trade war that could affect their supply chains and ultimately, squeeze margins to the overall economic slowdown, retailers, restaurants, fashion and health-and-beauty companies are seeking ways to shore up their operations, become more nimble and protect the bottom line.

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RETAIL

The year ahead in the retail ecosystem will be affected by many of the same trends that shaped 2019. While not likely to reach the pace seen in 2019, retail sales will continue to grow in 2020, with a continuation of the trend toward new and expanding sales channels. Margin compression will be in the spotlight throughout the year as retailers tackle labor challenges, tariffs and other cost pressures.

ELECTION YEAR SENTIMENT AND RETAIL SALES GROWTH

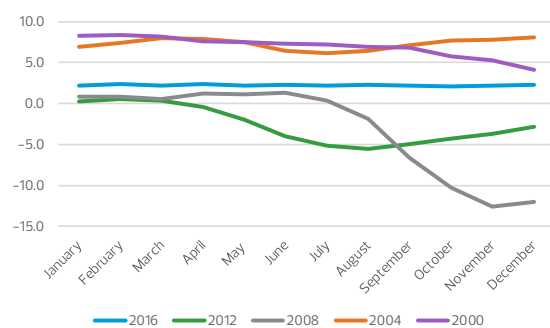
In all recent election years, there is a demonstrated pattern of consistency of retail sales growth in the early part of the year as the political landscape sets up and polls begin to roll out. The decline in retail sales growth in both 2008 and 2012 were likely due to a combination of the election year impact to sentiment, as well as other macroeconomic factors. Heading into 2020, there are a number of macroeconomic headwinds that have the potential to have a similar impact to

KEY TAKEAWAYS

- Digital transformation and leveraging e-commerce will make a big impact in retail and other consumer products sectors.
- The labor market will continue to have a significant impact on the retail and restaurant ecosystems.
- Cost pressures resulting from the increased labor costs likely means consumers could see higher prices.
- Consumers demand healthier plants and proteins, while healthier snacking increasingly replaces full meals.
- Controversial plant-based ingredients face increasing scrutiny.
- Embracing innovation could be costly for fashion businesses.
- The middle market faces key challenges integrating digital, in-store experiences.
- Beauty and personal care is likely more resilient during a slowing economy.

sentiment and ultimately, retail sales. With continued strength in the labor market, retail sales growth will likely remain stable in the early part of 2020. As we progress further into the year, how the trade dispute with China progresses, as well as how the presidential election plays out, will have the largest impact on consumer sentiment and retail sales.

ELECTION YEAR RETAIL SALES LESS AUTOS (SA) (YOY % 3-mos avg. annual)



Source: Bloomberg LP

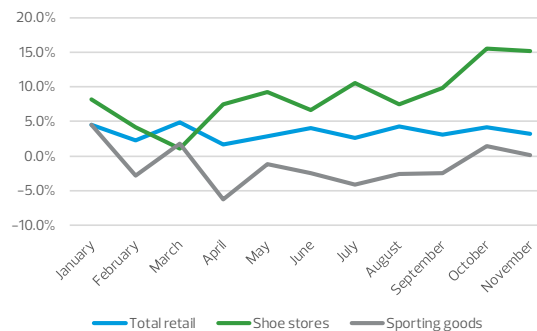
DIGITAL TRANSFORMATION TO CONTINUE IN 2020

While there may be some deceleration in economic growth and retail sales in 2020, the pace of change will continue to accelerate. Nonstore retail sales growth through the third quarter of 2019 was nearly 15%. Many are quick to point out that retail sales across all retailers, which includes both nonstore as well as omnichannel retailers, still represent only approximately 10% of all retail sales, and they are correct. However, a closer look at the data highlights the fact that some sectors, such as shoe stores, have online sales growing at a faster pace, while others, such as sporting goods, are lagging behind. Retailers with a strong digital strategy in 2020 can take advantage of the consumer preference for a seamless omnichannel experience, especially in those sectors with online sales that are outpacing the rest of the industry.

The continuously evolving retail landscape is more than just a one directional shift from brick and mortar to online sales. Many digitally native brands continue to open brick and mortar locations in an effort to strengthen their brand and to offer customers a seamless experience across all channels. According to a study published by Retail Dive, digitally native brands will open 850 stores in the next five years. However, retailers are trending toward smaller footprints with storefronts under 5,000 square feet representing over half of the leased retail in 2019. While malls across America will continue to see store closings, lifestyle centers and flexible retail spaces will be the home to many of these omnichannel retailers.

This trend will certainly continue in 2020, and it highlights how important a digital strategy is to the future success of all retailers. In fact, in RSM's recent survey on digital transformation, nearly half of all CEOs cited a digital strategy as the single most important strategic priority.

2019 MONTHLY E-COMMERCE SALES GROWTH

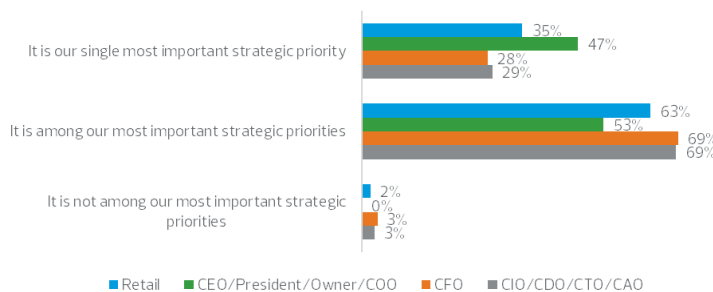


Source: Bloomberg LP

PRIORITIZING DIGITAL STRATEGY

Most retail leaders place digital investments among most important strategic priorities; nearly half of CEOs most often view digital as single most important strategic priority.

DIGITAL INVESTMENT PRIORITY



Source: RSM Retail Digital Transformation Survey

LABOR

The labor market will continue to have a significant impact on the retail ecosystem in 2020. With unemployment dropping as low as 3.5%, it's possible that the economy hit a cyclical low for unemployment in 2019. However, the number of unemployed persons remains at historic lows and wages remain strong. According to the Bureau of Labor statistics, the largest age demographic represented in the retail ecosystem is individuals ages 24-35 years old. In that demographic, wages have continued to grow at a rapid pace through both 2018 and 2019.

Strong wages have a dual impact on the retail sector. The additional income promotes continued retail spending from one of the industry's key age groups.



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RESTAURANT

Like the retail sector, the food service industry hopes to capitalize on what has been a resilient consumer heading into 2020. How well operators manage rising labor costs, reduced foot traffic and changing customer preferences will separate the winners from the losers in the restaurant ecosystem, especially in the middle market.

RISING LABOR COSTS

The restaurant sector will focus on the challenges of the same labor environment we see in the retail ecosystem. The greater focus in the food service sector will be the margin impact of rising labor costs. Minimum wage continues to rise across the country and operators or franchisors, like McDonald's, are also incurring increased benefits costs as they try to compete for scarce resources. Larger multiunit operators may be able to lean on technology to help mitigate the margin impact and reduce reliance on human capital. Middle market operators will need to look for similar opportunities in order to remain competitive with slowing foot traffic and compressed margins in the year ahead.

STATES WITH RISING MINIMUM WAGES IN 2020



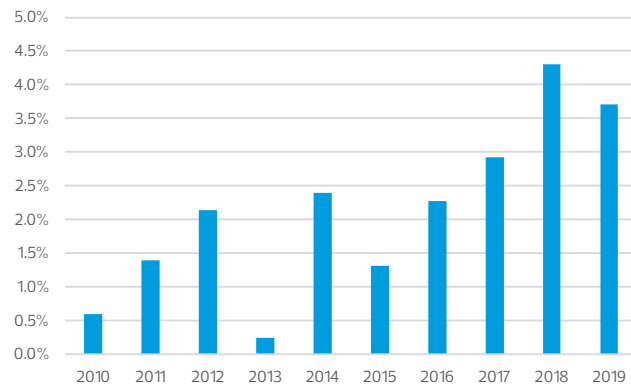
Source: NCLS and Bloomberg Intelligence

The impact of a rising minimum wage goes well beyond minimum wage staff. According to Harris's Hospitality & Food Service Wage Inflation Survey, 82% of restaurant operators gave wage increases to their nonminimum wage workforce in order to maintain an appropriate pay gap.

RESTAURANT TRAFFIC AND SALES

Cost pressures resulting from the increased labor costs likely mean that consumers will continue to see higher prices in 2020 as operators raise prices in an effort to mitigate the margin impact. The combination of higher prices, a decline

PERCENT GROWTH IN MEDIAN WEEKLY EARNINGS (AGES 25-34)



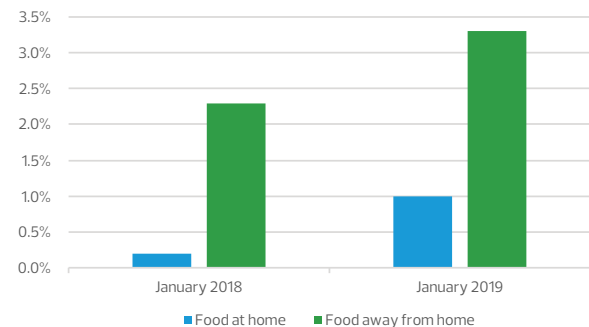
Source: Bureau of Labor Statistics

At the same time, it results in increased costs for retailers. Retail will undoubtedly continue along its digital transformation journey, which can help alleviate some of the labor challenges. However, labor will still remain one of the largest operating expenses in the ecosystem in 2020.

LIKE THE RETAIL SECTOR, THE FOOD SERVICE INDUSTRY HOPES TO CAPITALIZE ON WHAT HAS BEEN A RESILIENT CONSUMER HEADING INTO 2020.

in consumer sentiment, and the increased ease and popularity of free grocery delivery will make it more attractive for consumers to eat at home rather than out. Larger grocery chains are not stopping at delivering unprepared groceries. Kroger announced in December 2019 that it will start Kroger Delivery Kitchen, which will prepare meals made from scratch and deliver them right to a customer's door. All of these factors point to a continued decline in overall foot traffic in 2020.

THE COST PREMIUM TO EAT OUT VERSUS AT HOME IS GROWING (CONSUMER PRICES YOY% SA)

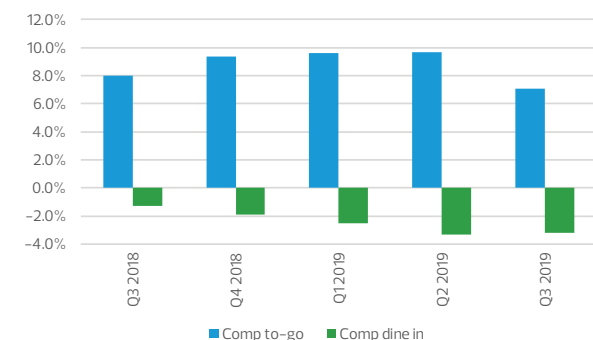


Source: Bloomberg LP

DIGITAL TRANSFORMATION: NOT JUST A RETAIL PHENOMENON

Opportunity does exist for restaurant operators to compete for customers, especially those that have a strong digital strategy and can cater to changing customer preferences. The recent trend has favored to-go orders over dine-in orders. Technology will continue to play a critical role in to-go restaurant orders in 2020, as more and more customers default to mobile devices for ordering.

COMP TO-GO AND DINE-IN SALES



Source: Black Box Intelligence, TDn2K

The significance of the digital evolution in the restaurant sectors doesn't stop with online ordering. The gig economy continued its push into the food service sector in 2019. Third-party delivery allows customers to order food on their handheld device and have it delivered anywhere, and just about any time.

Millennial and Gen Z consumers live life on the move and rely heavily on their mobile devices to help them keep pace. To accommodate, the food delivery trend has evolved to locations other than home. Many gyms offer separate space within the building to allow their customers to have food delivered just in time to replenish their energy storages after a workout.

Those operators that can adapt to changing customer habits and tackle the margin challenges associated with third-party delivery in 2020 have the best opportunity to improve same-store sales growth, especially in the fast casual space.

FOOD AND BEVERAGE

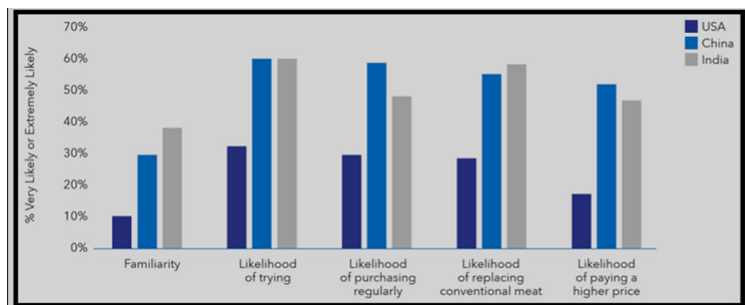
Consumer tastes and preferences are constantly changing and food and beverage companies need to develop innovative products and strategies to grow in 2020. Consumers continue to be health conscious and craving all things natural. It is significantly changing how and what they eat.

PLANTS AND PROTEINS

Plant-based items are growing in the food and beverage industry. Sales of plant-based beverages made from soy, almond, oat and palm have grown significantly over the last 10 years. In light of the recent bankruptcy of Dean Foods due in part to increased demand for plant-based milk, it is anticipated that plant-based protein products will experience similar growth. Growing consumer demand for healthier protein alternatives as well as more environmentally friendly choices has plant-based meats showing up in many fast food chains and grocery stores. According to Nielsen, U.S. retail meat sales dropped 0.4% while plant-based meat sales grew 8%. The consumer acceptance of plant-based meats is encouraging innovation to cell-based meat products produced in labs. Cell-based meat products will have to overcome high production costs and consumers' willingness to try the alternative to be competitive, but the sustainability is attractive, especially to areas with large populations.

This has caught the attention of the beef industry who is now trying to decelerate the growth of both plant- and cell-based products by suggesting legislation on the definition of "meat" and questioning the overall safety of the new products. The Food and Drug Administration and U.S. Department of Agriculture have agreed to regulate cell-based products conjointly.

LIKELIHOOD OF CONSUMING CELL-BASED MEAT PRODUCTS



Source: The Good Food Institute

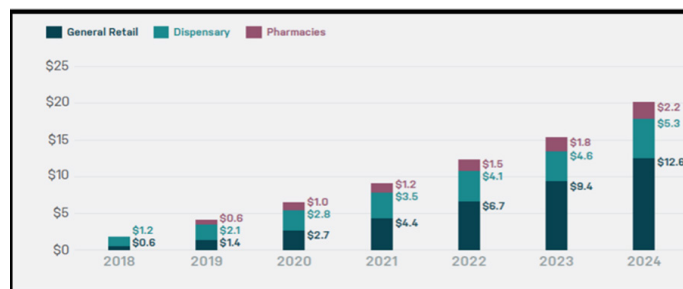
SNACKING REPLACES MEALS

In a recent study conducted by The Harris Poll, Mondelez International released its "State of Snacking" report. According to the report, 59% of adults prefer snacking to meals because snacks are convenient and can be low in fat and sugar. Snack food manufacturers are focusing on healthier options to meet consumer demands for more nutritious selections. The plant-based trend is entering the snack bar market with increased vegan varieties. Natural ingredients and transparent packaging in bagged snacks is also taking over market share. While the overall trend favors a healthy snack, there is also a contingent of adults that still enjoy the occasional indulgent snack as well as cookies and treats that have a nostalgic spin. According to the Wall Street Journal, there are a host of "snackgrammers" who regularly post on social media about new and yet-to-be released cookies and candy, providing manufacturers viral publicity. Overall, food and beverage manufacturers will need to review formulations and ingredients to meet consumer demands and increase market share.

CONTROVERSIAL PLANT-BASED INGREDIENTS FACE INCREASING SCRUTINY

As margins are shrinking, food and beverage manufacturers are trying to take advantage of consumers' increased interest in CBD as a natural health aid. Cannabidiol or CBD is the nonpsychoactive component of marijuana and hemp that many believe reduces pain and anxiety. Many food and beverage manufacturers are contemplating or already including CBD in their products, and it is estimated that revenues will continue to increase as CBD-infused products will not only be sold at legal dispensaries, but will also make their way to larger grocery and retail chains. Still the FDA remains hesitant. At the end of November, the FDA released a statement listing several potential health risks, concerns over unsafe manufacturing practices and deceptive marketing to consumers regarding the overall benefits of CBD. Regardless, consumer interest continues to grow in this area as do opportunities to gain revenue in an untapped market.

ESTIMATED CBD SALES BY OUTLET



Source: Arcview Market Research/BDS Analytics

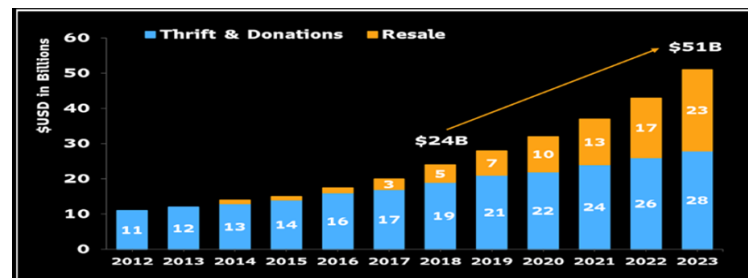
FASHION, BEAUTY AND HOME FURNISHINGS

Heading into 2020, businesses in the fashion, beauty and home furnishings sectors will feel initial margin pressures despite relief on Chinese imports from what's being called Phase One of a trade deal between the United States and China. Most Chinese imports within the sector are still subjected to tariffs ranging from 7.5% to 25%. The burden and uncertainty of the tariffs have been somewhat offset by the strong U.S. economy. However, while consumer spending remains strong, consumer confidence showed signs of attrition in 2019. If the rate of wage growth and consumer sentiment continues to erode in 2020, leaders in the sectors will need to look toward innovation to maintain profitability.

EMBRACING INNOVATION COSTLY FOR FASHION BUSINESSES

Consumers are increasingly concerned with the values of the companies they purchase from (58% of Gen Zs are more likely to buy from brands that back a good cause), in addition to demanding value when making purchasing decisions (52% of Gen Zs compare the retail prices of competitors). Apparel companies, particularly those that have embraced the fast fashion trend, have faced increased public scrutiny for poor human rights and sustainability practices throughout their supply chain. Consumers are now expecting higher quality, ethically sourced fabrics, and are often looking to purchase products from companies that are passionate about the environment. A focus on quality and sustainability has also led to emerging business models, including the sale of recycled and used clothing, as well as the rental of special occasion and everyday fashion pieces. As these new channels rise in popularity, fashion companies will need to be open to new ways to fit into the consumers' evolving closets.

SECONDHAND APPAREL MARKET FORECAST



Source: GlobalData, ThredUp

MIDDLE MARKET FACES KEY CHALLENGE INTEGRATING DIGITAL, IN-STORE EXPERIENCES

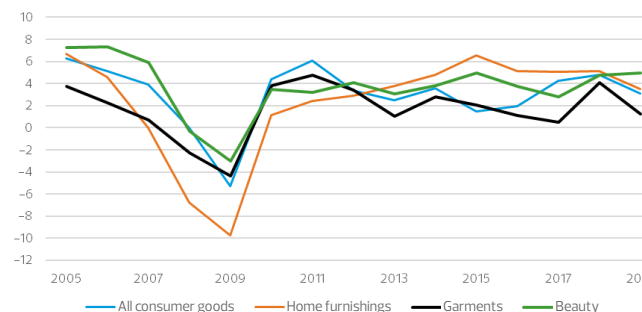
The integration of digital and in-store shopping experiences will also be costly. Legacy fashion companies risk losing out on valuable customer data by neglecting to invest in digital direct-to-consumer platforms, while their digitally native counterparts look for the right physical footprint for consumers to interact with their products. While innovation creates the opportunity for smaller disruptors as well as established brands, middle market companies may not be as nimble or have the capital or economies of scale to effectively implement new products and technologies in light of the uncertain global economic headwinds.

BEAUTY, PERSONAL CARE MORE RESILIENT DURING SLOWING ECONOMY

While beauty and personal care businesses face the same consumer demands and need for innovation, the sector itself is more resilient to deteriorating economic conditions and is poised to embrace innovation. During previous economic downturns, the decline in consumer spending on beauty products was less severe than drop-offs in spending on other categories. Some categories within the sector, such as cosmetics and skin care, are expected to see five-year growth rates above 15% according to Euromonitor. While the sector is dominated by a handful of large players, smaller private equity-backed organizations may be better suited to take advantage of trends in innovation.

E-COMMERCE IS AN AREA OF INNOVATION WHERE MIDDLE MARKET HOME FURNISHING BUSINESSES CAN ALSO CONTINUE TO CAPITALIZE, AS CONSUMERS ARE GROWING MORE AND MORE COMFORTABLE WITH MAKING HOME PRODUCT PURCHASES ONLINE.

YEAR-OVER-YEAR CHANGE IN CONSUMER SPENDING



Source: Bloomberg LP

OPPORTUNITY AWAITS WITH PRIVATE EQUITY, VENTURE CAPITAL BACKING

Similar to their packaged food peers, large industry leaders may be restricted by dividend and debt obligations, which may prevent them from investing in new products with a natural and sustainable focus, and refreshing their established brands. This could be an opportunity for middle market companies with private equity and venture capital backing to fill the innovation void. Additionally, the large industry leaders may look toward smaller acquisitions as beauty multiples continue to rise. The consumers' willingness to purchase beauty products online creates another opportunity for middle market beauty brands willing to invest in their direct-to-consumer businesses. Marketing in this sector has historically been dominated by advertising and in-store product testers; however, this shift allows for the emergence of digitally native companies to control their brand experience and scale up quickly, without having to give margin share to retailers or develop their own physical footprint.

CAPITALIZING ON E-COMMERCE

E-commerce is an area of innovation where middle market home furnishing businesses can also continue to capitalize, as consumers are growing more and more comfortable with making home product purchases online. The trend allows middle market organizations, without the physical footprint of established home furnishing retailers, to reach customers across the country and abroad. Strategic partnerships with digital retailers like Wayfair and Amazon have made it easier for mid-sized companies to reach a broad range of consumers. Advancements in 5G networks and augmented reality coupled with eased return policies should only accelerate the digital growth in 2020.

This volatile environment comes on top of structural changes already taking place in the financial services industry.



OUTLOOK: FINANCIAL SERVICES

BY KENNEDY CHINYAMUTANGIRA, ANTHONY DECANDIDO, BRANDON KOESER, JASON KURUVILLA AND DAVID MAMANE

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Middle market business leaders in the financial services sector are coming off a year of whipsaw change in which they felt the ripple effects of volatility over trade, a slowing global economy and fluctuating monetary policy. As they look to 2020, they can expect more of the same, but this year, a presidential election will only add to the uncertainty over policy.

This volatile environment comes on top of structural changes already taking place in the financial services industry, whether it is the global trend toward negative interest rates, the continuing effect of low interest rates on insurers or the profound disruption taking place in the retail brokerage industry.

KEY TAKEAWAYS

- Broad financial services: Financial conditions will again provide roller-coaster ride.
- Private equity: Middle market on edge as policy reform looms.
- Banking: Negative interest rates pose challenges.
- Insurance: Low interest rates will continue to create headwinds.
- Fintech: Retail brokerage disruption headed to banking.

U.S. FINANCIAL CONDITIONS IN 2020 SET TO FOLLOW SAME BUMPY RIDE AS 2019

Financial conditions in the United States have been on a roller-coaster ride for much of 2019, and this is likely to persist into 2020.

As measured by Bloomberg's U.S. Financial Conditions Index, 2019 started with tight conditions carried over from the stock market retreat of late 2018 when trade war concerns and uncertainty over Federal Reserve rate policy roiled markets. The stress eased throughout the first quarter and peaked in early May to very accommodative levels. Another bout of market panic set in to leave the index closer to neutral levels by the beginning of June.

Conditions rebounded to be very accommodative in the middle of the year before a sharp decline in early August and fluctuated at lower levels for the remainder of the year. August and October saw the index drop below zero into restrictive territory, albeit close to neutral levels.

BLOOMBERG U.S. FINANCIAL CONDITIONS INDEX IN 2019



Source: Bloomberg LP, RSM US LLP

The Bloomberg U.S. Financial Conditions Index reflects the financial stress within the U.S. money, bond and equity markets—all vital plumbing systems for the funding of U.S. economic activity. Middle market business leaders should pay attention to this indicator to gauge the availability and cost of financing in the capital markets.

MIDDLE MARKET INSIGHT

After a roller-coaster ride in financial conditions over the past year, middle market business leaders can expect more of the same in 2020.

MONEY MARKETS

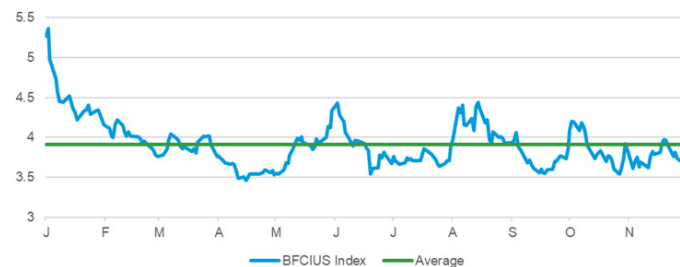
The money market component of the financial conditions index is reflected in the form of short-term money market spreads. These were largely accommodative in the middle of 2019 but have been on the rise ever since the start of the Fed's easing cycle in July. This rise is mostly attributable to the sharp declines on the short end of the Treasury curve following the Fed's three rate cuts and does not seem to represent mounting funding stress. Despite brief episodes of pressure such as the one that saw spikes in the repo markets in September because of technical reasons, U.S. money markets have been relatively stable, and there is currently no clear reason to suggest this should change going into 2020.

BOND MARKETS

The U.S. bond market component of the financial conditions index that more closely aligns with middle market credit spreads is the U.S. high-yield/10-year Treasury spread. The search for yield has benefited companies rated below investment grade by allowing them to borrow at fairly affordable pricing relative to higher quality borrowers. Despite some intra-year volatility, the average for the year and spreads toward the

end of 2019 were relatively low, given some of the economic headwinds. Unless the economy deteriorates sharply and there is a prolonged period of rotation to safety, lower-rated companies should continue to enjoy the benefits of this reach for yield in 2020.

BLOOMBERG BARCLAYS U.S. CORPORATE HIGH YIELD AVERAGE OAS



Source: Bloomberg LP, RSM US LLP

EQUITY MARKETS

Volatility in U.S. equity markets was the main source of swings in financial conditions in 2019. Even periods of widening credit spreads during the year were largely precipitated when equity markets were spooked and money poured into Treasuries in what was otherwise a bull market year for stocks. Expect 2020 to be more of the same as the fragile backdrop that has sustained the stock market run continues to prevail. Even if the United States and China secure a phase one trade deal, posturing over phase two, other trade war frontiers, election-year uncertainties, geopolitical tensions and global economic growth will occasionally sour stock market sentiment.

Overall, with the Fed most likely to be on hold unless a significant deterioration occurs, monetary policy will take a backseat and the focus of capital markets

S&P 500 INDEX AND VIX INDEX



Source: Bloomberg LP, RSM US LLP

will be on the U.S. administration's policy actions and economic data. This should set the tone for fluctuating financial conditions given that the twists and turns on trade policy and the mixed economic data will most likely continue to signal a sideways trend, punctuated by short-lived spells of market jitters (moderately tight to neutral conditions) and bullish sentiment (very accommodative conditions).

POLICY REFORM WOULD BRING SWEEPING CHANGE TO MIDDLE MARKET PRIVATE EQUITY

Private equity managers have taken a keen interest in the 2020 election, in no small part because a victory by a Democrat could bring significant changes to their industry. Among those candidates promising widespread reform is Sen. Elizabeth Warren, the progressive senator from Massachusetts, who has joined the leading ranks of Democratic contenders. She envisions nothing less than a full-blown overhaul of the private equity industry. Three of her proposals, if enacted, would have an immediate impact: a top income tax rate of 39.6% (from 37%), a new 14.8% tax for Social Security and an added annual tax of up to 6% on accumulated wealth and capital gains.

The result, private equity managers say, would be a disincentive to take risks and invest capital. According to Bloomberg, middle market buyout funds, or those with \$100 million to \$5 billion in assets under management starting in 2015, earned a median internal rate of return of 11.5%. This means that a wealthy investment manager of a \$500 million middle market firm would be subject to \$22.8 million in federal tax on income of \$57.5 million, and would owe an additional \$33.5 million of new wealth tax, for a total tax of \$64.7 million. This amounts to a 113% effective tax rate. Private equity managers seeking to drive profitability through efficient tax planning would not be able to strip out the same wealth they have under previous tax law.

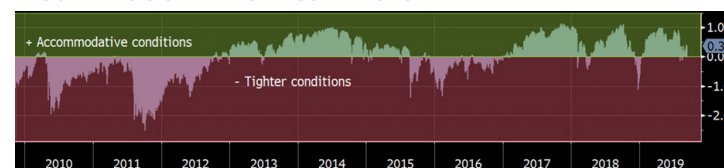
The goal of this policy change is no mystery: It takes money from wealthy managers to pay for other policy changes like health care, child care, housing and education, and addresses a major societal issue of income inequality that has America's richest top 5% owning two-thirds of the wealth, according to the National Bureau of Economic Research.

But it would come at a cost, managers say, by creating an economic environment that discourages wealthy managers from investing at a similar pace. Private equity attracted an abundance of capital in the past 10 years. According to data from Bloomberg, these firms held a record level of uncalled capital through the most-recent June 2019 reading, the fourth time in as many years. If middle market managers were to shy away from private equity investing, there would not be enough shops to absorb all the available capital. What might follow would be bad actors who are less qualified to drive the type of earnings that Main Street Americans have enjoyed through their pensions and retirement plans.

Likewise, those managers that remain may instead make allocations to other asset classes like tax-free bonds or certain tax-efficient exchange-traded funds.

Another possible outcome may be further reductions in portfolio company investment. With interest rates so low, private equity has taken on more debt, which would seem to spur more investment and economic growth. But according to RSM's fourth quarter 2019 [Middle Market Business Index](#), only 46% of executives polled say they expect to increase capital spending during the next six months, down from 50% a year ago. Private equity remains the largest of all private markets, but this may change if these wealth taxes are passed. The same private equity owners who ignited economic growth over the past 15 years may be demotivated by new possible wealth taxes.

BLOOMBERG U.S. FINANCIAL CONDITIONS INDEX



Source: Bloomberg LP

But to Warren, this is a small price to pay for what she views as much-needed reform. She contends that private equity firms need to take more responsibility for the companies they control and have fewer downside protections in the event their investments fail. Her Stop Wall Street Looting Act bill intends to close the loopholes that allow private equity firms to capture all the rewards of their investments while insulating themselves from downside risk. If passed, her bill would require private equity firms to share in the responsibility for potential liabilities of companies under their control, including debt, legal judgments and pension-related obligations.

MIDDLE MARKET INSIGHT

If passed, Sen. Elizabeth Warren's reform bill would require private equity firms to share in the responsibility for potential liabilities of companies under their control, including debt, legal judgments and pension-related obligations.

In current practice, private equity firms are on the hook only to the extent of their dollar investment but are free of any personal financial risk if the company goes belly up. For example, if a middle market manager makes a \$20 million investment, the downside risk exposure is \$20 million, but if this bill were passed, the possible losses could exceed \$20 million. This would require middle market firms to reformulate risk-adjusted targeted returns understanding that there would be more exposure on an already risky private equity bet.



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Also, in this bill, Warren aims to prevent firms from passing on dividends to investors for the first two years after the company is acquired. According to Preqin, 47% of private equity funds launched in 2010 and later have used subscription credit facilities. By comparison, just 13% of funds launched before 2010 used the short-term financing tool. Since an increasing number of private equity firms use leverage, present day managers have spurred superior returns to investors, which this bill would make harder to do.

In November 2019, the U.S. Chamber of Commerce pushed back on Warren's private equity plan. It asserted that if the bill were enacted there would be widespread job losses, declining tax revenues, and lower investment returns for pension funds and other investors, and that a substantial loss of jobs would follow. Even if she was to win the 2020 presidential election, there is the chance that her bill never gets through Congress; still, middle market managers must acknowledge that the way they have done business may change.

NEGATIVE INTEREST RATES

As the global economy continues to evolve in the wake of the Great Recession, monetary policymakers are asking what can be done to increase the pace of growth. Enter negative interest rates.

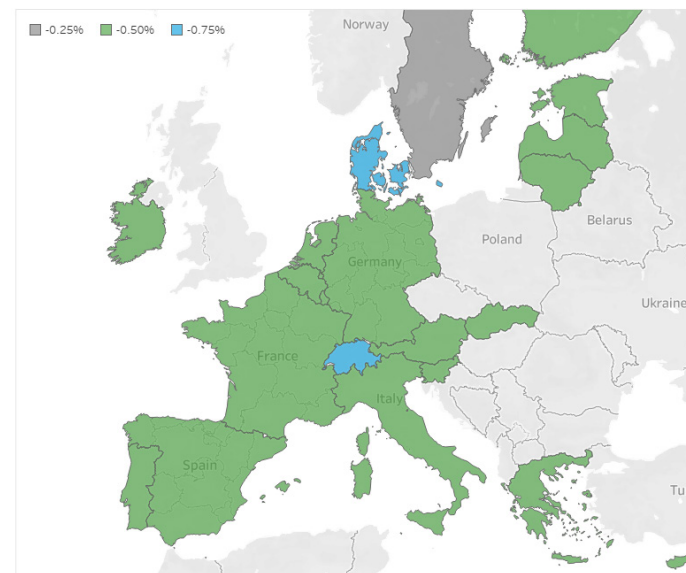
In periods of slow economic growth and low inflation—like today's environment—central banks around the world have few arrows in their quiver to boost economic output. They have lowered interest rates to historically low levels and further added money to their economies through quantitative easing, all to an increasingly limited effect. Now, some central banks are pushing into new territory by lowering interest rates below zero.

In its simplest form, the concept of negative rates involves a charge to member banks in order to hold their reserves with a central bank.

The negative rate experiment, while starting in Europe, has spread to other developed countries like Japan. The hope was that by cutting a hole in the floor of interest rates, or zero lower bound, it would allow rates to fall into negative territory, which in theory would encourage banks to lend rather than leaving cash idle in reserves at a central bank. The idea is that more lending leads to economic growth, and ultimately, an increase in inflation.

Still below zero

Five years after negative interest rates first appeared, they were still in place in most of Europe, including the countries that share the common currency.



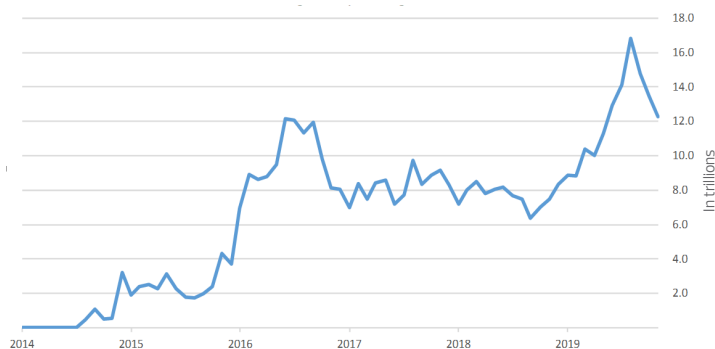
Source: Bloomberg, European Central Bank, Swiss National Bank, Riksbank, Danmarks, Nationalbank

NEGATIVE REPERCUSSIONS

But as negative rates have persisted, the impact has spilled over into what some had considered the safest place to hold money—government debt and savings accounts.

As investors pulled excess funds out of banks, the logical place to put that money was fixed income debt instruments. As demand for such instruments increases, the prices go up, causing the yields to drop. What happens in these countries with negative rates when institutions and individuals with trillions of dollars are looking for such instruments? Yields fall below zero. As of November 2019, there was \$12.3 trillion of negative-yielding debt, but at the peak in August 2019, there was nearly \$17 trillion.

NEGATIVE YIELDING DEBT



Source: Bloomberg LP, RSM US LLP

The savings of businesses or wealthy individuals held in banks outside the United States are not immune to the impact of negative rates either. In Europe, banks are beginning to announce that they will no longer shoulder the burden of negative rates. Large banks like Deutsche Bank AG are announcing that they will pass on the cost of negative rates to their larger corporate clients or deposit accounts of wealthy individuals, sparing the pain (for now) for retail customers.

For countries that are experimenting with negative rates to spur growth and boost inflation, the interest rate outlook is pointing to a new reality. Domestically, some consider the idea of negative rates as preposterous. But when taking a longer-term view of the economy, available cash in the markets and the eventual need for more price stability for those entering retirement unless the government increases spending, the question is not when we will return to the zero bound of interest rates, but how far can they fall beyond zero.

The concept of negative rates can no longer be avoided. The global macroeconomic picture, clouded further by domestic trade uncertainty and persistently negative interest rates in some of the world's most developed countries, are a clear indication that this reality shouldn't be overlooked and thought of as just a possibility. Time to panic? No. Time to plan? Yes.

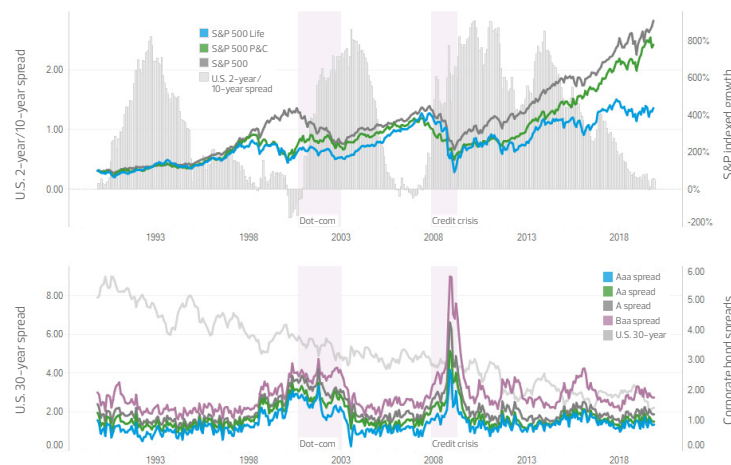
MIDDLE MARKET INSIGHT

The concept of negative interest rates can no longer be avoided. Time to panic? No. Time to plan? Yes.

INSURANCE CONTINUES TO BEAR THE BRUNT OF LOW INTEREST RATES

The insurance ecosystem will continue to feel the burn of low interest rates into 2020. But as corporate bond credit spreads remain relatively stable despite previous Fed rate cuts, the real impact is more likely to resemble the modest effect of the 2001 dot-com bust rather than the 2008 credit crisis.

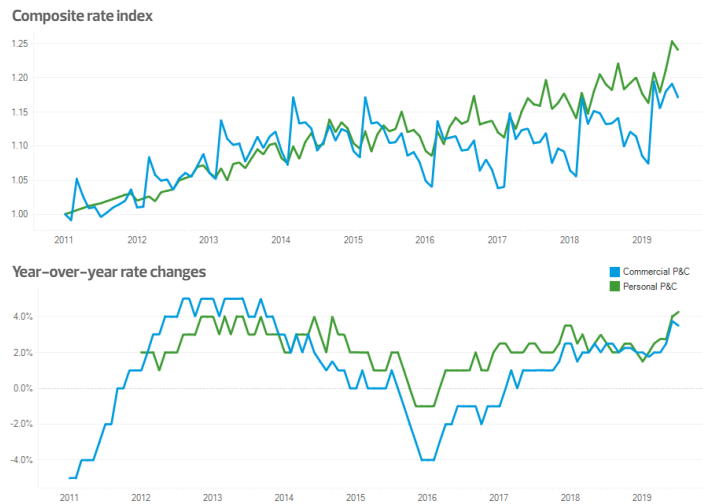
INSURERS VS. BROADER MARKET



Source: Bloomberg LP, RSM US LLP

Low interest rates will continue to drag on investment income in 2020. Companies may feel some earnings relief as the insurance markets continue to harden and premiums increase; however, the relief may be temporary if claim trends continue to increase. With some companies reporting unfavorable reserve development in liability lines in the last two quarters, emerging concerns of an about-face in the reserving cycle may be cause for further price increases into 2020.

HARDENING MARKETS MAY ALLEVIATE PRESSURE ON EARNINGS CAUSED BY LOW INVESTMENT INCOME



Source: Bloomberg LP, MarketScout, RSM US LLP

LOW-YIELD ENVIRONMENT BRINGS OPPORTUNITY FOR INSURERS

In an environment of a flattening yield curve and 10-year rates below 2%, insurance companies will be affected in several ways. Property and casualty insurers, and health insurers, need to be more reactive to new yields to protect short-term profits because of their higher reinvestment frequency; however, life insurers stand to lose more in the long term. With a proactive approach to managing their risk exposure, insurers can thrive in a sustained low-yield environment.

Existing bond portfolios are likely to see significant mark-to-market gains with the decrease in yields in 2019; however, lower new money yields will cause a drag on investment income as the portfolio turns over. Management teams should increase the credit quality of their bond portfolios into shorter-term government holdings while the yield spread is low and diversify their investment strategy into higher-yielding instruments like private debt, preferred shares and common equity to compensate for

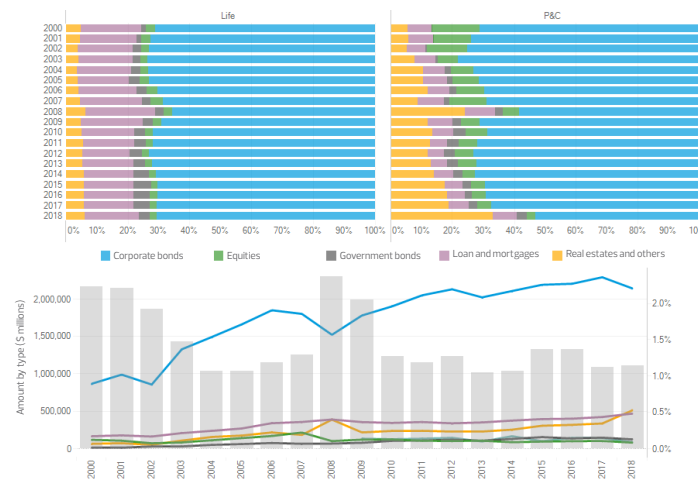
declining interest rates. If a company's investment policy does not allow for this flexibility, its management team should consult its board and make necessary revisions in the coming quarters.

MIDDLE MARKET INSIGHT

Insurers should increase the credit quality of their bond portfolios into shorter-term government holdings while the yield spread is low and diversify into higher-yielding instruments like private debt, preferred shares and common equity.

In an economic downturn, insurance companies that underwrite large commercial businesses and directors and officers liability insurance may be exposed to correlated downside risks between their assets and liabilities. As the economy slows and spreads widen, corporate bond portfolios may drop in value at the same time companies experience a rise in D&O exposure. In light of the pending economic slowdown, insurers should take this opportunity to review their individual fixed-income holdings and proactively adjust their portfolios where necessary to mitigate these exposures.

PROACTIVE INSURERS WILL REDUCE THEIR CORPORATE BOND HOLDINGS WHEN FACED WITH AN ECONOMIC SLOWDOWN



Source: Bloomberg LP



Finally, investment yield assumptions underlying insurance product pricing, particularly for long-duration contracts, will be difficult to achieve in a low-yield environment. Management should review product pricing, particularly for long-duration contracts (life and disability insurance), as soon as possible to ensure lower long-term investment yields and maintain underwriting profitability.

FINTECH: RACE TO ZERO HEADING TO BANKING

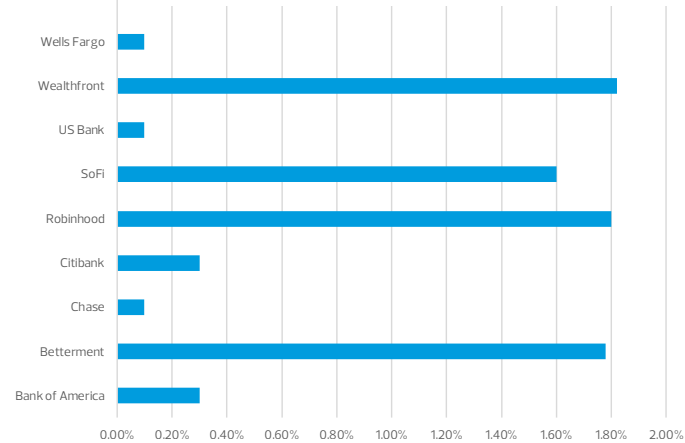
The last quarter of 2019 saw major retail brokerages eliminating commission fees for online trading and other brokerage activities. After Charles Schwab in October announced zero-fee commissions, other firms such as Fidelity, TD Ameritrade, Interactive Brokers and E-Trade followed Schwab's lead. The fintech sector was the primary reason these traditional firms adjusted their fee structure. The speed of technology, changing global demographics and geopolitics are some factors that are disrupting this sector.

As fintech companies move into banking, it appears likely that the disruption occurring within retail brokerage will spread into this sector. A number of small banking fintech companies are offering zero fees and better rates on savings accounts. As long as the U.S. economy keeps doing well and interest rates do not fall further, the difference in savings rates and banking products will be vast between fintech and traditional banks.

A study by the Consumer Financial Protection Bureau found that college students paid \$27.6 million in account fees in 2016 thru 2017. As we are about to undertake the largest intergenerational transfer of wealth in history, these college students are expected not to rely on their parents' advisers but look toward technology to find a packaged solution provider that can be accessed by their mobile phone. Examples of fintech (wealthtech) companies that offer products that are free and user friendly are Betterment, Wealthfront and SoFi.

In addition, there is a significant difference between the rates offered on savings products by fintech companies and existing banks. This disparity in rates will create some pressure on existing banks to raise interest rates or risk the chance of losing customers.

SAVINGS RATES



Source: Company websites as of Dec. 9, 2019; RSM US LLP

A majority of revenues generated by middle market banks consists of shrinking interest income, lending and other customer-generated fees. With the potential change in the banking platform, many middle market banks will have to either collaborate with a fintech, merge with a competitor or make the appropriate capital investments. The last of the three is a concern based on the fourth quarter RSM Middle Market Business Index, which showed capex spending slowed with only 46% of companies noting an increase in spending.

MIDDLE MARKET INSIGHT

As fintech and banking continue to evolve, many middle market banks will have to either collaborate with a fintech, merge with a competitor or make the appropriate capital investments.

One fintech company that garnered a large customer base for its zero-fee stock trading was Robinhood, which attracted the attention of existing market participants. As Robinhood shook up the retail brokerage sector, there were a number of fintech companies looking to do the same in the banking sector. According to the Fed, 22% of the population in 2018 was unbanked, which provided an opportunity for new entrants to compete for their business. Time will tell if these digital banks can force the incumbents to revert to a new strategy that leverages technology, maintains low costs and increases their depositor base with higher savings rates. The battle for the banking customer will be exciting to watch as we head into 2020.

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Driven by increased digitization, consumer demand for value-based care and increasing transparency, health care providers are working to enhance their use of data to improve service and bring down costs.

OUTLOOK: HEALTH CARE

BY RICK KES, MATT WOLF AND
JESSIKA GARIS

The health care industry is nearing an inflection point. Driven by increased digitization, consumer demand for value-based care and increasing transparency, health care providers are working to enhance their use of data to improve service and bring down costs. The health care industry is a strong innovator, and is gaining efficiencies through important techniques such as telemedicine and self-managed care aided by technology.

Meanwhile, the industry struggles with a lack of skilled professionals and is looking for alternative sources to cultivate new talent. Strong deal flow will continue as the still-fragmented health care ecosystem looks to gain more economies of scale through consolidation.

KEY TAKEAWAYS

- Digitization of health leads to new and augmented services for the industry.
- Value-based care continues to gain momentum.
- Strong mergers and acquisitions deal volume will continue.

DIGITIZATION OF HEALTH

The explosion in digital health data creation, storage and processing will lead to new and augmented health services as well as legal, regulatory and ethical discussions on the use of that data. Participants across the health care ecosystem, including newcomers, must leverage these tools in strategic ways as they seek to provide better care to more people at a lower cost.

International Data Corporation estimated the amount of data in the global datasphere to be 33 zettabytes in 2018 and will grow to 175 zettabytes by 2025, which represents a compound annual growth rate of 27%. For reference, according to IDC, it would take a person 1.8 billion years to download 175 zettabytes of data on an average U.S. internet connection.

The growth of health data is set to outpace general data growth: 36% from 2018 through 2025 compared to the aforementioned 27%. This growth will be driven by an increased number and quality of data images, growth of wearable and internet of things-enabled technology and advancement in data analytics. Effectively harnessing the potential of this data flow will become more important as providers look to improve operations and capture additional volumes, particularly among the commercially insured populations.

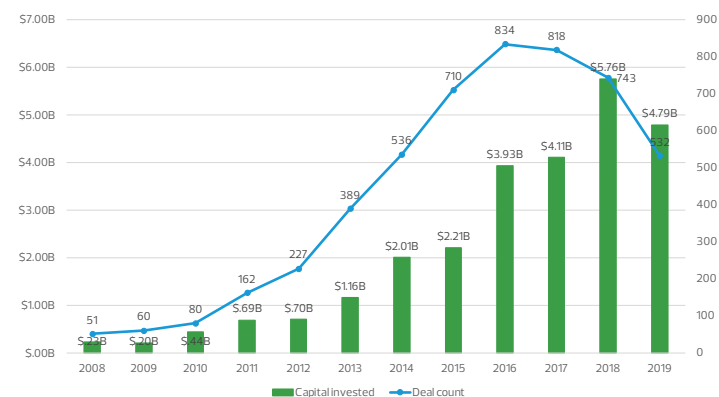
The growth of health data and increasing consumer trends in health care have also attracted new, tech-first entrants; companies that are not incumbent health care players. These companies, which are primarily startups, have attracted increased levels of funding. Of the nearly \$26 billion invested in digital health since the financial crisis, 57% has been invested in the last three years.





We expect high levels of digital health investment to continue through 2020. Some of the emerging areas we're watching focus on wellness and mental health and include companies working to improve sleep, monitor and interpret consciousness, and create brain-machine interfaces.

HEALTH CARE INVESTMENT AND DEAL COUNT



Source: PitchBook Data, Inc.

The industry is at or near a virtual health inflection point. We have seen a surge of private investment in the space. Ninety-four percent of commercial health plans and 92% of Medicare Advantage plans offer at least some type of [virtual care service](#), and 96% of providers plan to [expand virtual care services](#). We expect to see rapid consumer and physician adoption of these technologies in the near-term, and rapid expansion of available services. Providers must lean into virtualized health as they seek to expand access and improve outcomes.

As virtual services expand and allow greater insight into our health and coordination among providers, payers and patients, we expect heightened conversations around health data privacy and ownership. Regulators and governments are keen on tackling this issue as preemptively as they can in the wake of the data scandals that recently roiled major U.S. tech companies.

The central question for governments, industry players and patients will be: Who owns health data? While the dialogue may extend beyond 2020, we expect it will result in patients owning their data consistent with themes of the EU's General Data Protection Regulation. We will watch to see the ecosystem that evolves around that decision. Will patients have control over who can use their data when and for what purposes, or will that data find its way into one or more private or government data lakes where all participants in that silo can use that data as desired with little friction?

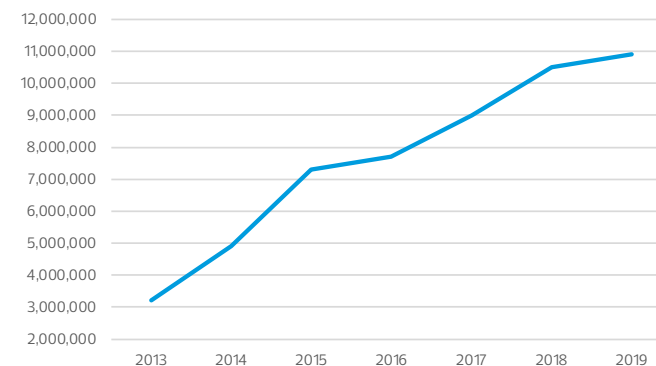
We expect 2020 will see some type of HIPAA modernization, whether administrative or legislative. We will watch to see how the update addresses this crucial question.

As data becomes more prolific and is shared among organizations, we also expect to see more cybersecurity breaches or missteps. This will have a significant effect on smaller providers because the costs of those breaches are generally much higher. According to our recent study compiled in partnership with NetDiligence, the average cost of a breach for an organization with over \$2 billion in revenue is \$128,000. [The average cost](#) for an organization with revenue under \$2 billion is nearly 25 times higher at \$3,183,000. Providers, especially those in the latter group, will need to evaluate their cybersecurity infrastructure and response plans as they begin using more and more data.

MARCH TO VALUE

Value-based care continues to gain momentum throughout the U.S. health care industry and is likely to carry into 2020. With over 10 million Medicare beneficiaries (18%) assigned to an accountable care organization, it seems that health care organizations are moving away from the traditional fee-for-service care model and adopting some form of a value-based care program.

ASSIGNED BENEFICIARIES IN MEDICARE ACOS



Source: CMS

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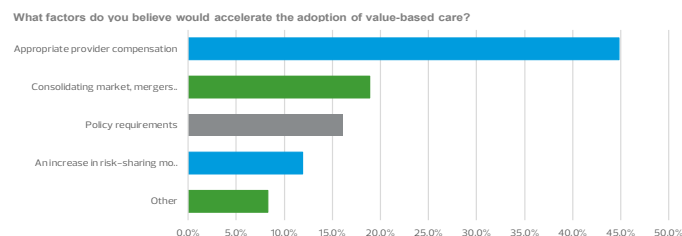


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As regulatory standards begin to ease, we will see more organizations shifting to some form of a value-based care program, such as accountable care organizations. On Oct. 9, 2019, the U.S. Department of Health and Human Services announced proposed changes to Stark Law and the anti-kickback statute. This proposed rule further shifts the care model paradigm by allowing health care providers who participate in value-based arrangements to coordinate patient care with other providers. This initiative strives to increase the quality of care provided to patients by facilitating outcome-based payment arrangements that reward improvements in patient health. According to Centers for Medicare and Medicaid Services, the changes would also make it easier for physicians and other health care providers to ensure they are complying with the law by offering specific safe harbors for these arrangements.

Definitive Healthcare polled approximately 800 health care leaders to gain a better understanding of the factors accelerating the adoption of value-based care models. The results indicated that a majority of respondents (~45%) believe an increase in provider compensations and incentives will continue to drive growth. Other factors mentioned included policy requirements, an increase in risk-sharing models like ACOs, and consolidating markets, mergers and acquisitions.

FACTORS ACCELERATING THE ADOPTION OF VALUE-BASED CARE



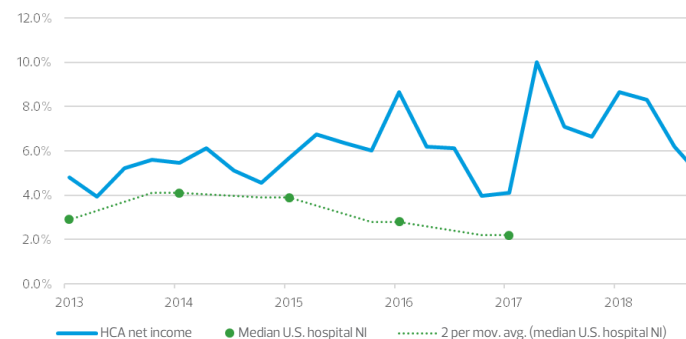
Source: Definitive Healthcare

EVOLUTION OF THE DEAL

We expect strong deal volume through 2020. The past few years were both active and dominated by large deals. We anticipate deal activity to remain consistent or perhaps even increase, and we will likely see fewer, if any, large deals.

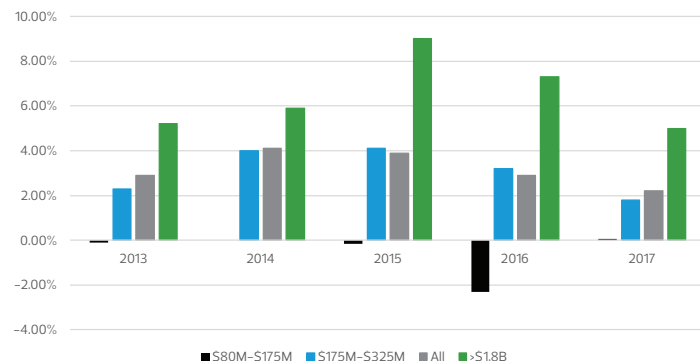
One notable large deal on the horizon is the potential take-private transaction of Walgreens Boots Alliance led by private equity firm, KKR. The deal would be the largest leveraged buyout in history. Analysts estimate it could cost as much as \$80 billion, \$50 billion of which would come from debt (62.5% levered). The largest LBO completed to date was when KKR led a consortium that took Energy Future Holdings Co. private for \$48.4 billion. That deal was financed with approximately 35% debt, or \$17.4 billion. Interestingly, the third-largest LBO occurred when Bain took HCA private in 2006.

MARGIN DIFFERENTIAL CREATES ACQUISITION OPPORTUNITY



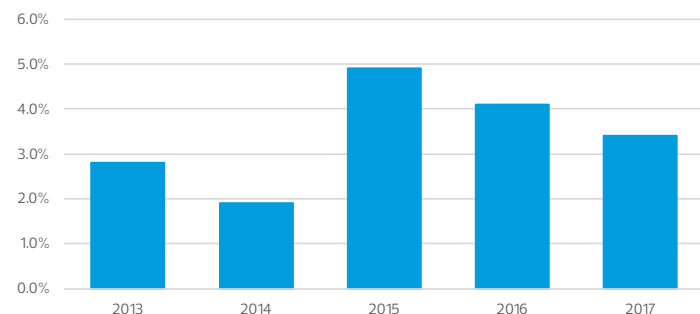
Source: Optum

SMALL HOSPITALS' MARGIN PRESSURE MAY FUEL ACQUISITION



Source: Optum

MARGIN GAP BETWEEN LARGE AND SMALL SYSTEMS



Source: Optum

Particularly among providers, we expect smaller tuck in acquisitions (e.g., large systems buying single hospitals or physician groups) or alternative deals such as creating a venture fund or partnering with organizations from outside traditional health care.

We do not expect to see many, if any, megamergers among traditional health systems in 2020, primarily because many of the megasystems have already been involved in sizable transactions. Furthermore, given the increasing scrutiny over health care costs within the current political environment, these large transactions may face increased antitrust scrutiny.

However, there exists opportunity for effective, efficient and generally large systems to tuck in acquisitions to gain market share in existing geographies or to gain access to new geographies. Additionally, we will be watching for more acquisitions of or affiliations with nonprofit systems by for-profit systems. Since HCA acquired Manorcare in 2018, we expect to see more such deals provided the political climate remains accommodative of for-profit entities' further investment in health care providers.

DIGITAL HEALTH FUNDING (2011-2019)



Source: Rock Health Funding Database

We also expect additional investment in digital health, both from legacy provider, payers and other market participants, as well as organizations outside what is traditionally defined as health care. Both 2018 and 2019 saw significant digital health investment, and we expect 2020 will continue at or exceed those levels. One active area we are watching is assistive tech, technology meant to improve the function of people living with disabilities.

This includes companies like OrCam and Whill, which are developing artificial vision and personal mobility solutions, respectively. These applications have the potential to change what the industry thinks of social determinants of health and comorbidities.

Finally, in the ever-changing world of the U.S.' \$3.5 trillion health care market, we may just see something truly shocking like Walmart purchasing a physician group, Amazon buying a generic drugmaker for its own private label brand or Google investing in its own electronic health record platform. While the private sector may produce some shockers in 2020, we would advise against overreacting to nascent political disruptions, namely so-called Medicare for All. In our view, it is very unlikely such policy will be implemented in the near-term, if at all. While it may be a useful exercise for health care leaders to discuss the potential impacts of such a shift in health care, the possibility of Medicare for All should not generally make or break a deal of any stripe.

BOTH 2018 AND 2019 SAW SIGNIFICANT DIGITAL HEALTH INVESTMENT, AND WE EXPECT 2020 WILL CONTINUE AT OR EXCEED THOSE LEVELS.

Manufacturers face critical investment decisions in 2020 amid slowdown.



OUTLOOK: INDUSTRIAL PRODUCTS

BY JASON ALEXANDER, SHRUTI GUPTA AND
MEGAN HICKS

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MANUFACTURERS FACING HEADWINDS

Manufacturing is in a continual state of transformation, pushed along by rapidly advancing technologies. The last 18 months, in particular, have provided many challenges, including shifting supply chains because of trade tensions, changing customer needs and a shifting competitor landscape. It all leaves manufacturers having to move more aggressively toward investing in technology and talent, as well as partnering with or acquiring businesses to cement themselves as leaders in the Fourth Industrial Revolution. They must do so

all while staying focused on profit margins and revenue growth.

KEY TAKEAWAYS

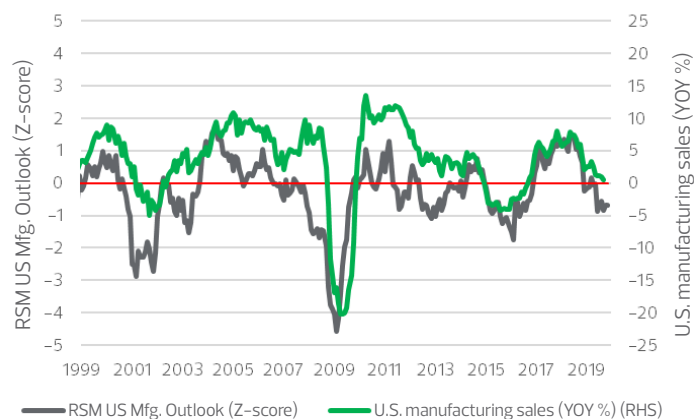
- Investment in technology and talent is critical for growth.
- Trade uncertainty remains a headwind.
- Supply chain evolution demands innovation.
- Labor shortages will persist.
- Optimization of processes is critical for growth.

As the United States continues its longest economic expansion on record (128 months as of December 2019), U.S. and global manufacturing have recently reversed the growth from the beginning of 2018. Continued uncertainty brought on by the U.S.-China trade war has cast a cloud over the sector and increased the chances of a prolonged global manufacturing slowdown. While the JP Morgan Global Manufacturing PMI showed tentative signs of a recovery in November, registering a positive reading of 50.3 after six straight

months of contraction, international trade continued to be a drag on the sector, as new export business decreased for the 15th month in a row.

At the same time, the U.S. November global Purchasing Managers' Index contracted for the fourth straight month, registering 48.1, while hovering near the 10-year low registered in September. The Institute for Supply Management's measure of new orders, which are typically tracked as a leading indicator of a downturn, fell to 47.2 from 49.1 in October, matching the year's low reached in August, and again reaching a level not seen since April 2009. Surveys of manufacturers in six major regions suggest that the decelerating trend in sales—which began in the second half of 2018—is likely to continue. The RSM US Manufacturing Outlook Index has been range-bound for the past six months at 0.7 standard deviations below normal levels. That implies that manufacturing sales growth, which was barely positive in the fall, will have difficulty remaining positive into 2020. The composite index is based on surveys of business sentiment conducted by six regional Federal Reserve banks and can be considered representative of the general direction of national manufacturing activity.

RSM US MANUFACTURING OUTLOOK INDEX AND U.S. MANUFACTURING SALES



Source: Federal Reserve Banks; Census; Bloomberg; RSM US LLP

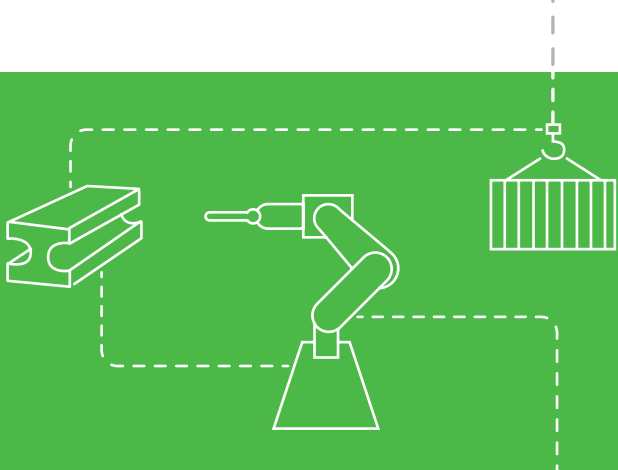
The most frequently mentioned constraint cited by manufacturers is the uncertainty over tariffs and trade agreements, with a particular focus on China and the United States–Mexico–Canada Agreement. Costs throughout the manufacturing supply chain, from steel and aluminum to shipping rates, have all seemingly been affected, and that will continue in the near-term. Labor also continues to be a challenge for manufacturers. Nationally, the unemployment rate has held steady at around 3.6%, but we have seen a steady divergence between the job growth in the service sector versus the manufacturing sector. In 2019, the service sector created 1.39 million jobs while the manufacturing sector created 2,000 jobs. Still, manufacturers are struggling to fill critical jobs because they cannot find workers with the right skills. The uncertainty surrounding domestic and global trade policy, as well as the tight labor market, appear likely to continue into 2020, creating challenges for organizations that do not adapt, while providing significant opportunities for the nimblest organizations.

TRADE UNCERTAINTY LINGERS

Ever since the United States initiated a trade dispute with China, in early 2018, over what it said were unfair practices, manufacturers have had to reduce the impact by evaluating alternative sourcing strategies, creating supply chain efficiencies or implementing new pricing strategies. And there is little sign that these pressures will ease.

It's not just China that has been the source of trade tension. After a much-hyped signing ceremony last year, the United States–Mexico–Canada Agreement still must be ratified by the legislatures of each country. Mexico has approved the deal, and in the United States, Democrats struck an agreement to support the deal after seeking changes in labor and environmental protections. It appears that Canada has been waiting to see how negotiations in the United States played out.

Then there is the auto industry. In 2018, the Department of Commerce launched a section 232 investigation on passenger vehicles and automotive parts to evaluate "whether such imports are weakening our internal economy and may impair the national security." In February 2019, the Department of Commerce submitted its report to the president, but a decision on whether to impose tariffs or take alternative actions still looms, leading to significant uncertainty for automakers and their suppliers. Why does this all matter? According to the Center for Automotive Research, consumers could see the price of all new vehicles rise by \$455 to \$6,875 depending on the tariff level, where the vehicle was assembled and whether the policy provides exemptions for automotive trade with Canada and Mexico. This will affect not only the new vehicle market, but also the used vehicle market as prices may rise because of heightened demand and constricted supply. In addition, higher prices for automotive parts will drive up the cost of maintenance and repair, so even holding on to an existing vehicle will become more expensive for consumers.



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While we expect U.S. manufacturers to continue their outperformance related to world growth, they will continue to grapple with the effects of global trade policies and the associated downturn. Resilient organizations focused on building more flexibility into their investment planning and operations will ultimately fare much better than their industry peers.

MIDDLE MARKET INSIGHT

It is difficult to make supply chain decisions without adequate data to evaluate. Manufacturers in the middle market need to understand the impact tariffs have on their business and anticipate next steps in an increasingly complex environment.

SUPPLY CHAIN EVOLUTION DEMANDS INNOVATION

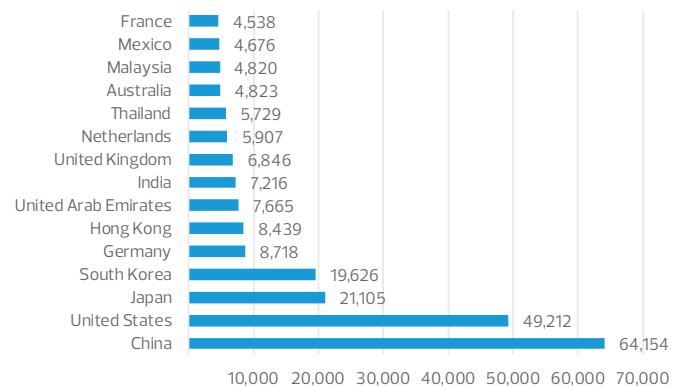
The market is forcing manufacturers to evolve and innovate at a much faster clip, and no place is this more evident than in their supply chains. Whether these changes are spurred by trade tensions or by increasing customer expectations, manufacturers no longer can sit back and play defense. A recent survey of middle market companies by Umpqua Bank found that more than half of the respondents were looking to diversify their supply chains domestically and internationally as a result of current trade policies. The ability to respond quickly in this environment will require manufacturers to look at their supply chains in a different way, focusing on end-to-end visibility to enable real-time decision-making.

MIDDLE MARKET INSIGHT

Middle market manufacturing supply chains have to be nimble. As circumstances change, it is an ideal time to re-evaluate business structures to challenge the norm.

The decision to shift operations away from China is usually made for the long term because of the time and money invested in setting up new facilities and making new shipping arrangements. The new markets are often other emerging Asian countries, led by Vietnam, India and Thailand, where production costs are considerably lower than in China. Vietnam has especially been a major beneficiary of this supply chain shift. China almost tripled the amount of goods they bought last year from Vietnam compared to 2014, while the United States increased its purchases by \$18 billion compared to the same period, according to Bloomberg. In response to the increased demand, Vietnam will have to stay ahead and invest in its infrastructure to ensure that port capacity and customs staff can handle the increased volume.

2018 VIETNAM TOTAL TRADE EXPORTS (\$M)



Source: Bloomberg LP

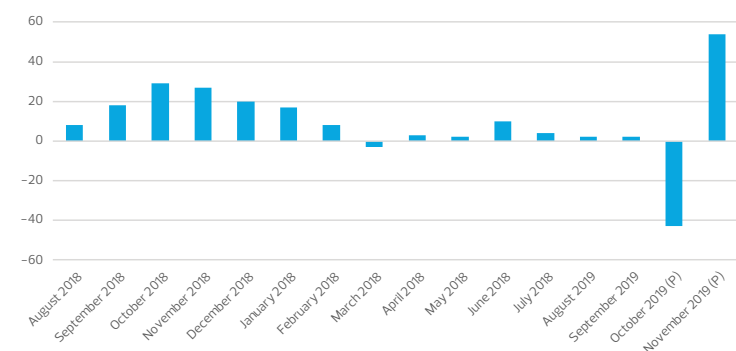
It is challenging and sometimes costly for companies to reconfigure their supply chain. Many American companies have their own factories in China and have had them for decades; shutting them down would prove costly, and in most cases, would not make financial sense. Others, especially middle market companies, use China as a means to mass produce components and have long-term relationships with suppliers that they don't want to break. Given the ongoing political uncertainty, we ultimately believe that more companies will explore outside of China, with new hubs in Southeast Asia and Mexico, as well as domestic suppliers benefiting from these shifts.

MIDDLE MARKET INSIGHT
 To solve supply chain challenges, middle market businesses may need to think critically and creatively. Perhaps an alternative location or new vendor might offer relief in the current environment.

LABOR CHALLENGES WILL PERSIST

Manufacturing firms added about 1.4 million jobs in the United States from the low point of the Great Recession. Now growth is slowing. Manufacturing jobs increased by 46,000 in 2019, slowing from a gain of 264,000 in 2018.

**U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS:
ESTABLISHMENT DATA**
(MANUFACTURING OVER-THE-MONTH CHANGE, IN THOUSANDS)



Source: U.S. Department of Labor, Bureau of Labor Statistics

Even though job growth has slowed, U.S. manufacturers continue to struggle to find talent with the right skills in today's tight labor market. With 469,000 open manufacturing positions as of September 2019, there is less than one unemployed person for every job opening. As the manufacturing industry faces significant change because of digitization, employees will need to develop new skills and become more digitally fluent. While training in process automation tools is relatively easy, training in artificial intelligence tools is much more complex. Companies need to think not only about their internal workforce, but also of an external workforce strategy to identify, attract, recruit and retain technology talent. Adding to the challenge is that this talent has typically not been attracted to the manufacturing sector.

A bright spot for manufacturing employees but a rising challenge for employers is that wages continue to remain steady, with growth of around 3%. Given the difficulty of finding qualified workers, employers are unlikely to reduce wages or lay off workers unless there is a significant slowdown in growth. We expect steady wage growth, as well as a tight labor market to continue in 2020.

OPTIMIZING MANUFACTURING PROCESSES

Industrial production and manufacturing production both rebounded 1.1% in November following the biggest drop in October that we've seen in industrial production since May 2016. The increases in each were driven by the sharp reversal in auto production (12.4% increase), as the United Auto Workers ended the strike at General Motors. While these numbers were positive, the ISM's Purchasing Managers' Index dropped to 48.1 in November, hovering near the 10-year low of 47.8 registered in September. The manufacturing sector, which makes up about 11% of the U.S. economy, has been weakened by the 17-month trade war between the United States and China, and this has been especially tough on middle market manufacturers.

The customer list of most middle market manufacturers will show that the 80/20 rule applies; that is, 80% of their sales are from 20% of their customers—sometimes just one or two customers. Challenges like these create an environment in which forward-leaning manufacturers must focus on streamlining businesses and realigning around key or new markets or customer segments to drive growth.

Manufacturers will need not only apply digital technologies to existing manufacturing processes, but also create new innovative processes to turn their value chains into ones that create customer stickiness. We expect companies to increasingly turn to digital tools and advanced analytics to bolster productivity and drive growth. While some manufacturers are already using advanced analytics to reduce quality issues and error rates in their manufacturing processes, the future will see manufacturers using digital platforms to enable self-service options for customers and to simplify the purchasing process, moving closer to a consumer-product type experience.

MIDDLE MARKET INSIGHT

The customer list of most middle market manufacturers follows the 80/20 rule; that is, 80% of their sales are from 20% of their customers—and sometimes it's just one or two customers.

THE PATH AHEAD

TECHNOLOGY IS KEY

As the broader economy moves from a product-centric industrial economy to a new economy that is customer-centric and empowered by exponential technologies, manufacturing, too, is evolving with technology-enabled business models. Advanced manufacturing technologies like 3D printing, digital twins, augmented reality, industrial internet of things, advanced analytics and co-bots are increasingly becoming part of mainstream manufacturing operations.

- Additive manufacturing is drastically reducing build time from months to hours, in certain instances, and consequently, expediting time to market.
- Real-time data insights strengthened by machine learning and artificial intelligence are able to predict equipment breakdowns and prevent expensive repair and downtime costs.
- Smart factories and connected supply chains are enabling real-time coordination of production and logistic schedules to be more agile, lean and responsive to fast-changing customer needs.
- Robotic automation may not be new to industrial manufacturing but robots' increasing cognitive capabilities and ability to work alongside humans are proving to be viable labor solutions.
- Data analytics is critical to evaluate product profitability, inventory rationalization and product segmentation—all involved in driving value from the production and sales process.

Today's technologies are moving mass production to mass customization and making it possible to quickly deliver tailored solutions direct to the customer. But according to the RSM US Q4 Middle Market Business Index, only about 46% of executives polled say they expect to increase capital spending during the next six months, down from 50% a year ago. With new technology available, both for internal and external efficiency improvements, the challenge for businesses in an industry with so much available new technology may be less about understanding the need for implementation and more about actual adoption. U.S. manufacturers have historically led the world in innovation and efficiency, but that gap is shrinking with China and other countries. A prolonged slowdown in investment may hurt U.S. manufacturers' innovation.

INVEST IN TALENT

While advanced manufacturing increases productivity, improves operational efficiency and enhances customer experience, it needs sufficient capital investment and, more important, talent with the right skill sets to realize these benefits. While manufacturing job openings have been growing at a near historical rate since 2000, and some studies estimate that there may be up to 2.4 million manufacturing jobs unfilled in the next decade, retiring baby boomers and changing skill sets throughout the workforce have caused a shortage of labor. The limited pool of digitally skilled professionals makes it critical for companies to educate and train or retrain employees. The World Economic Forum, in its Future of Jobs Report 2018, estimates that more than half of all employees will require significant reskilling by 2022. Companies need to think creatively to address this issue—internet-enabled training devices and programs, partnerships with educational institutions, multigenerational initiatives to facilitate knowledge sharing, and customized real-time feedback-based approaches are some methods to retrain employees and address the skills gap.

M&A: BUILD OR BUY?

Merger and acquisition activity may pick up in the manufacturing sector in 2020 if the economic downturn causes reduced valuations, making deals more attractive. A desire to strengthen capabilities in their core business could further spur deal activity or investments in joint ventures or startups, especially as they relate to protecting supply chains because of heightened global political tensions. The slowdown in production coupled with any weakness in the economy may create prime opportunities for those manufacturers with the capacity to expand. Large divestitures with a progression toward simplification are the deal trends expected in the coming year. More organizations in the industrial space are targeting technology and software-based acquisitions, as well as adding service to product portfolios, which are all trends we will be watching.

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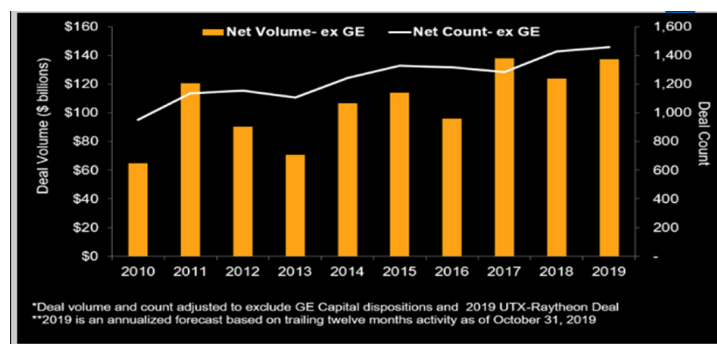
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INDUSTRIALS M&A DEALS AND VOLUME



Source: Bloomberg Intelligence

Companies seeking an M&A opportunity should consider the following:

- **Partner with an adviser.** M&A can be challenging, and it's difficult to know all of the questions to ask or the potential pitfalls. Whether buy or sell side, manufacturers should have a business adviser familiar with these types of transactions to guide them through the process.
- **Optimize and standardize processes.** When positioning a business for sale, the seller needs to make the business attractive; maximize marketability and exit value through a readiness assessment.
- **Technology advantage.** When evaluating potential acquisitions, it's critical to ensure that targets have current technology in the product, customer-facing and supply chain areas. Leveraging and taking advantage of technology can add immediate value.

OPPORTUNITIES FOR 2020

The coming year promises to be a dynamic and transitional one for manufacturers, as they look for growth in an environment with continued volatility in trade policy, workforce challenges, managing input costs and leveraging the impact of technology. While the potential for uncertainty may continue for the foreseeable future, manufacturers will need to continue to evaluate alternative supply chains and evaluate their business models, all while investing in their people and technology. U.S. manufacturers have a long history of resiliency and innovation. But the bar is higher, as we head into 2020, to break out from the competition and invest in the future.

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OUTLOOK: REAL ESTATE

BY LAURA DIETZEL, SCOTT HELBERG AND
TROY MERKEL

Demographic shifts that include the aging of U.S. baby boomers and higher mobility rates among younger generations have led to undersupply in single-family homes, presenting an opportunity for homebuilders in desirable second-tier cities.



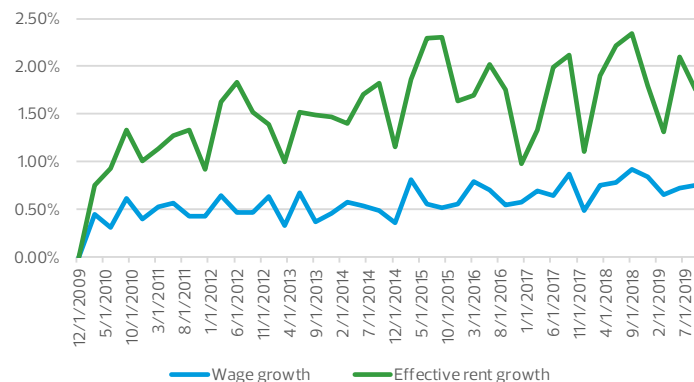
The U.S. real estate market will experience notable trends throughout 2020. Demographic shifts that include the aging of U.S. baby boomers and higher mobility rates among younger generations have led to undersupply in single-family homes, presenting an opportunity for homebuilders in desirable second-tier cities. Meanwhile, a lack of affordability among rental properties and rent control legislation in several major markets is hampering property growth. And the changing face of the American office—underscored by trends that include hoteling and flexible work spaces—have left developers bracing for a slowdown. While capital raises for real estate-focused funds are up sharply as investors seek safe haven opportunities, middle market fund managers are being left out.

KEY TAKEAWAYS

- Affordability, rent control and undersupply present a perfect recipe for housing issues.
- U.S. office market faces significant demographic headwinds.
- Middle market real estate fund managers are missing out on capital raises.

LACK OF AFFORDABILITY— THE NORM AND NOT THE EXCEPTION

Rising property values, skyrocketing rents and the high cost of building additional housing will continue to threaten the ability of major U.S. metropolitan areas to attract and retain the talent needed to sustain economic growth. The overall global trend toward urbanization continues, as 55% of the world's population now resides in urban areas; that figure expected to rise to 68% by 2050, according to a recent United Nations report. North America is the most urbanized region, with 82% of the population living in urban areas. High-priced cities like New York, San Francisco and Seattle illustrate how inequality has become the norm in today's housing markets. In fact, a study conducted by the National Low Income Housing Coalition shows that there is no county in the United States where a minimum wage worker participating full time in the labor market can afford a two-bedroom apartment. Fair market rent in the lion's share of U.S. counties eats up 30% or more of a renter's income (defined as unaffordable). Rents have continued to outpace wage growth for much of the recovery.

RENT GROWTH HAS OUTPACED WAGE GROWTH DURING THE RECOVERY

Source: Bloomberg LP, RSM US LLP

As investors in multifamily real estate seek diversification from core urban markets, they should take heed of another trend: population shifts. While homeownership rates nationally are historically low overall, cities, including Houston, Denver, Dallas, Seattle, Austin, Texas, and Portland, Oregon, are receiving high net migration from more costly core markets like Chicago, New York, San Diego and Los Angeles, where residential pricing is rising more rapidly than the national average. This suggests the desire for homeownership is a catalyst for those migrating. Homeownership rates peaked in 2004 at 69%. The national rate now stands at 64.8%—below the 20-year average of 66%—having recovered from a cyclical low of 63.7% in December 2016.

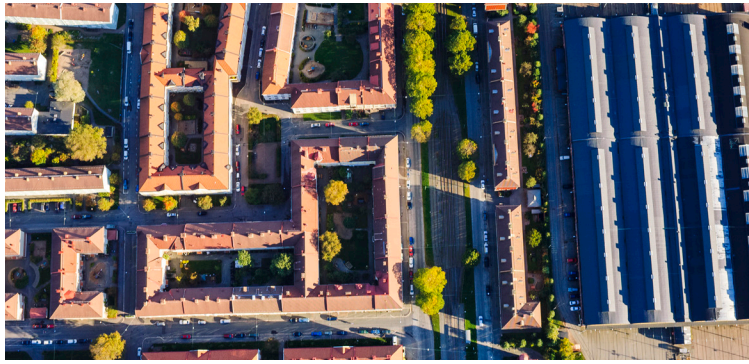
MIDDLE MARKET INSIGHT

With interest rates at historic lows, and the willingness of individuals to chase affordability, investors need to pay attention: low-cost demographic growth markets are more exposed to shifts in preferences for renting versus purchasing a home. While individuals leaving high-cost centers may possess the wherewithal to rent high-end four- and five-star apartment units, they may just as easily opt out of the renter pool.

RENT CONTROL: SHORT-TERM SOLUTION, LONG-TERM PROBLEM

With the presidential election around the corner later this year, candidates are promising alternative policy paths to deal with the issue of affordable housing. New York state, Oregon and California all passed rent control legislation in 2019, and a handful of other states has introduced similar bills. Placing a cap on rent may assist tenants in the short-term by allowing them to stay in their units; but history shows that rent control exacerbates shortages in housing supply, ultimately making it more difficult for real estate investors to invest, operate and refinance in rising-cost environments. The root cause of unaffordable apartments goes back to supply and demand—rent control serves to constrain the supply of new apartment units in the long run and will intensify issues of affordability.

Rent control is also tricky in practice: if the capped rent is too high, rent control does not support the goal of increasing affordability; if too low, it serves to contract development and further constrain supply. Additionally, rent control renders nonrent-controlled units even more unaffordable. Investors are shying away from transactions in rent-controlled areas; in New York, for example, transaction volume is being increasingly driven by market-rate assets, with the city's recent Tenant Protection Act cooling interest in value-added plays. Rent controls, however, could actually have a positive impact on market-rate rent growth going forward since the caps serve to effectively limit market-rate product inventory growth. In order to make a dent in the affordability issue, a holistic approach that includes policies to encourage more housing supply is required.



HOMEBUILDERS: LOW INTEREST RATES AND HEALTHY CONSUMERS AID EXPANSION

Homebuilders find themselves in the midst of the second-longest economic expansion on record, and lower rates will continue to be a broad positive that fuels growth. Low unemployment, modest wage increases and an elevated savings rate near 8% all reinforce confidence that the condition of the U.S. consumer will remain solid in 2020. Homebuilders focused on lower price points will benefit more, as home prices at the high end across the country continue to impair demand.

The long-term average premium of new homes to resale homes has historically averaged around 19%, reaching a peak of 34% in 2014. The above-average premium trend is starting to reverse; new home sale premiums have dropped to 23% of resale homes, aided by the increased focus of homebuilders on the lower end of the market where demand is greatest. This emphasis will further aid affordability as the inventory of less expensive, existing homes for resale remains depressed. New home premiums will continue to moderate, but should stay above the long-term average related to energy efficiencies and smart home capabilities standard in new homes.

STABLE DEMAND ENVIRONMENT

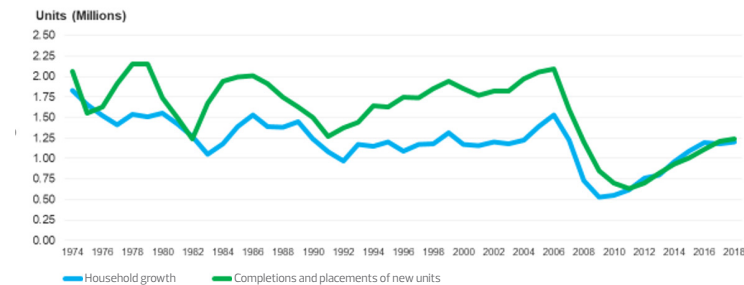
At 3.68%, U.S. mortgage rates are at multiyear lows, supporting continued stable demand for housing. All of 2018 and early 2019 were volatile for the housing market, as interest rates climbed as high as 4.94%, significantly affecting affordability for rate-sensitive homebuyers. Given the upcoming presidential election, it's likely the Federal Reserve will remain on hold with its interest rate policy for the duration of 2020, despite a slower pace of economic growth. The continued low rate environment will be broadly positive across all homebuyer segments, but specifically, the most rate sensitive lower end of the market.

Additionally, a diversified geographic focus outside of the richly valued housing on the coasts, that includes Florida and the U.S. Southwest, will continue to benefit homebuilders, boosted by increased demand due to net migration, will be a positive.

CURRENT SUPPLY ISN'T KEEPING UP

On the supply side, single-family housing starts have risen more than 100% since bottoming out in 2011, but remain well below the long-term annual average to replace aging housing stock. Additionally, the construction of single-family homes has kept pace with household growth for an unprecedented eight years. Because of this, the downside risk for homebuilders in an eventual recession is limited, especially as the industry continues to underbuild relative to demographic shifts such as aging baby boomers and younger generations seeking rental properties. Supply side constraints, including the high cost of land and labor, will continue to keep growth in check and avoid any scenario even remotely close to the downturn in housing experienced during the Great Recession.

HOUSING CONSTRUCTION HAS JUST KEPT PACE WITH HOUSEHOLD GROWTH FOR AN UNPRECEDENTED EIGHT YEARS



Note: Household growth data are three-year averages. Placements refer to newly built mobile homes placed for residential use.
Source: JCHS tabulations of U.S. Census Bureau's Housing Vacancy Survey, new residential construction data

U.S. OFFICE MARKET FACES DEMOGRAPHIC HEADWINDS

Since the end of the Great Recession in the summer of 2009, the office market in the United States has thrived on the confluence of two of the largest generations in history—the baby boomers and the millennials. In 2010, the median age millennial was 22 and just about to embark on a career, while the median age baby boomer was 56, with retirement on the horizon, but still plenty of career years to complete. In 2020, we will see millennials become the predominant economic drivers, having firmly settled into adulthood and the workforce with a median age of 32; meanwhile, boomers, at the median age of 66, are rapidly seeking retirement.

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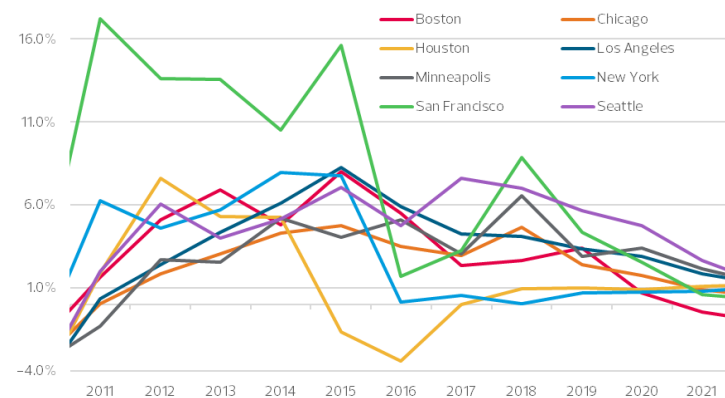
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Still licking their wounds from the fallout of the Great Recession, developers have been hesitant to build, adding on 4.2% of new office space to the market since 2010. Meanwhile, the march of the millennials was unrelenting and U.S. office employment during this time experienced a 23% increase. As such, landlords saw occupancy rise to above 90% and steady rental growth, which rose by 33.5% from 2010 through 2019. This boon in rental growth brought players in flexible office space such as WeWork and Knotel to the market, looking to reinvent the office rental space.

12-MONTH RENTAL GROWTH RATES BY MARKET

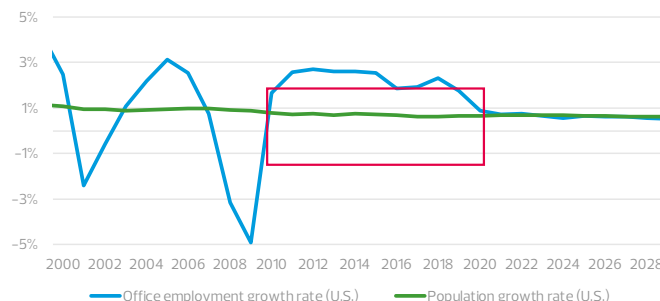


Source: CoStar

In 2020, the tide will turn against the office landlord. Office densification, a mobile workforce and the tight labor market have presented ongoing headwinds for office landlords. While office population has been growing at 2.3% on average for the past decade, total population growth has been a more modest 0.7% during the same period. In 2020, however, the U.S. office population is expected to grow at a more moderate 0.9%, closer to the rate of total population growth. This shift, exacerbated by slowing economic growth and aging workforce, will translate into lower growth for office rents, which could potentially fall below 2% by the end of the year.

Office landlords enjoyed the show as millennials came to the office and learned to coexist with their baby boomer parents. The millennial influx led to new office

BOOMERS AND MILLENIALS LEAD OUTSIZED OFFICE GROWTH



Source: U.S. Census and CoStar

technology, experiential and collaborative spaces, as well as a greater desire for remote work options. While those changes may have caused landlords to reinvent office design, no amount of open floor plans, beer taps, Zen Rooms or cafés is going to reverse the demographic trends in 2020—the good times will not keep rolling.

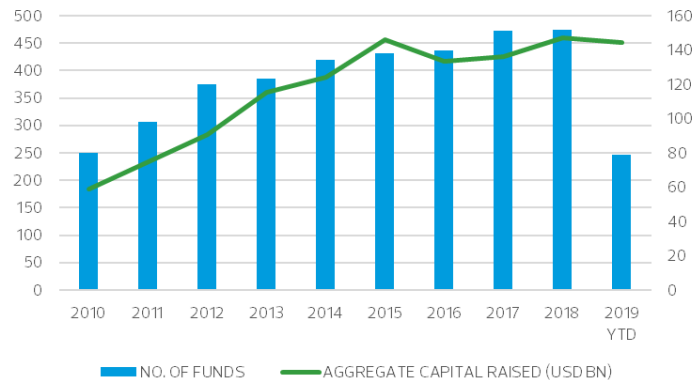
MIDDLE MARKET FUND MANAGERS OVERLOOKED IN NEW FUNDRAISING ROUNDS

With concerns of a slowdown in both the stock market and the overall economy, institutional investors are looking to real estate as the ideal safe haven asset class for conservative investment, made even more desirable by the low interest rate environment. U.S. real estate funds in 2019 were projected to eclipse the record-setting \$147 billion raised in 2018, having reached \$144.6 billion through November 2019. A key concern, however, is the significant decline in the number of funds raising capital. While over 470 funds participated in 2018, this number has nearly halved in 2019.



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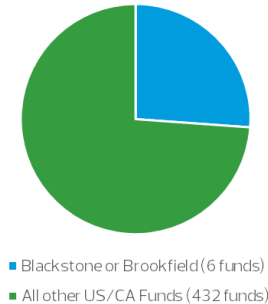
RECORD FUNDRAISING BUT BY FEWER FUNDS



Source: Preqin

A closer look at the new funds established in 2019 should put middle market fund managers on high alert. Private equity behemoths, Blackstone Group and Brookfield Asset Management, oversaw 25% of all new real estate funds coming to market in 2019. While these institutional investors are allocating more capital toward real estate as a conservative investment, they appear to only be comfortable contributing their money to the top-end fund managers. This creates a squeeze for the middle market, and we expect fundraising to be an obstacle for many middle market real estate fund managers in 2020, especially facing the narrative of record fundraising in the space.

BIG B'S TAKING LARGE PIECE OF FUNDRAISING



Source: Preqin

Along with fundraising difficulty, middle market real estate fund managers are also having difficulty deploying the capital already in their pockets. Dry powder, identified as an area of concern in recent years, is expected to continue. Preqin data reflects dry powder at over \$320 billion, up sharply from \$200 billion in 2014. A long run of low interest rates has allowed capitalization rates to compress to historic lows across many real estate asset classes, particularly multifamily and industrial buildings. This is driving property prices up, and making it more difficult for middle market fund managers to find assets that can meet targeted returns. Larger fund managers, on the other hand, have the flexibility and capital to continue to acquire in the high-price environment.

MIDDLE MARKET INSIGHT

As a result of market conditions, fund managers in the middle market will have to become more creative. They will need to adjust fundraising targets or look at co-investment opportunities directly with specific investors. Furthermore, acquisition strategies may need to adapt into more niche asset types or different geographic markets in order to meet desired returns.

Emerging technologies such as 5G, the internet of things, augmented reality and virtual reality will only amplify the ubiquity of technology in business. Change is certain and will continue to accelerate.



OUTLOOK: TECHNOLOGY, MEDIA AND TELECOM

BY VICTOR KAO, DAVIS NORDELL AND
KURT SHENK

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KEY TAKEAWAYS

- Middle market companies have slowed technology investments, but disruptive innovations are on the horizon.
- Tech giants are fully committed to 5G, bringing advancements in computing speed, reliability and availability.
- Technology companies are fighting the labor shortage with digital transformation initiatives.
- Artificial intelligence, machine learning and the cloud remain hot areas, with several potential opportunities for middle market companies.
- The initial public offering window may be closing, as companies choose to remain private for longer.
- With breaches and regulatory scrutiny on the rise, companies must focus on data security and privacy.
- The gaming and esports sectors continue to grow in popularity, with significant expansion and revenue increases projected in coming years.
- Cord cutting shows no signs of slowing down, and the increase in streaming platforms point to a competitive landscape and battle for subscribers.

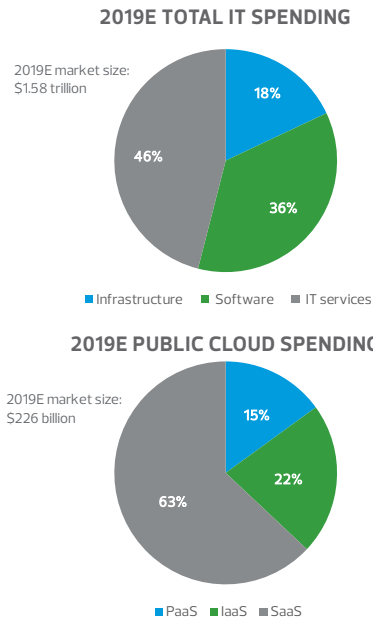
The U.S. technology industry is reaching highs unparalleled since the turn of the century. According to the National Science Board, knowledge-intensive industries have a value-added output of \$24 trillion, making up nearly one-third of world gross domestic product. As we move into a new decade, many companies are looking for new ways to gain an edge on their competitors.

In addition, the media landscape continues to change rapidly, as video gaming and esports expand and evolve and the growth in streaming platforms sets the stage for a highly competitive future. Companies in all sectors are developing strategies to attract and retain customers as disruptors enter the market. However, while focusing on growth, companies must also keep an eye toward data security and privacy regulations such as the General Data Protection Regulation and other emerging standards.

MIDDLE MARKET MAY REDUCE DISCRETIONARY IT INVESTMENTS

The International Data Corporation estimates that \$1.58 trillion was spent in 2019 on information technology. Large enterprises will likely continue to spend on cloud solutions, but small and midsize companies could reduce their spending on discretionary IT investments. History has shown us that the timing of discretionary IT hardware or software purchases often has a degree of flexibility and can be delayed in a weak economic environment. In fact, [a recent survey by RSM US LLP and the U.S. Chamber of Commerce](#) found that middle market leaders have been slow to increase capital expenditures, including those earmarked for technology during 2019.

CLOUD AS A PERCENTAGE OF TOTAL IT SPENDING



Source: IDC, Bloomberg Intelligence

As the United States prepares to enter a new decade, emerging technologies such as 5G, the internet of things, augmented reality and virtual reality will only amplify the ubiquity of technology in business. Change is certain and will continue to accelerate.

THE BIGGEST TECH COMPANIES ARE FULLY COMMITTED TO 5G

North American telecom carriers have committed to accelerate the deployment of 5G networks across the continent in 2020, and are actively aligning with technology companies and cloud computing providers to empower rapid 5G application development and deployment.

Verizon recently announced a partnership with Amazon's cloud platform, AWS, while AT&T announced a long-term strategic alliance with Microsoft and its Azure cloud computing platform. In both cases, all of the companies involved commented that collaboration will provide enterprise customers and developers the ability to quickly, and with scale, bring integrated solutions to the market in the areas of public safety, cybersecurity, collaborative communications, virtual and extended reality, and many other services.

Other telecom hardware providers like Nokia, Ericsson and Samsung are working directly with the likes of Verizon, T-Mobile, Sprint and AT&T to bring this powerful network into reality in the next five years.

Key specifications of speed, latency, network density, reliability and service deployment will enable the combining of wireless technologies and cloud computing power to bring next-generation computing—referred to as edge computing—to the network. The speed and latency enabled by 5G technology allow connected devices to offload computing power to the cloud. In addition, the cloud will be located much closer to the end devices, bringing real-time insights and analysis to enterprise customers to create the real-time enterprise.

NORTH AMERICAN TELECOM CARRIERS HAVE COMMITTED TO ACCELERATE THE DEPLOYMENT OF 5G NETWORKS ACROSS THE CONTINENT IN 2020, AND ARE ACTIVELY ALIGNING WITH TECHNOLOGY COMPANIES AND CLOUD COMPUTING PROVIDERS.

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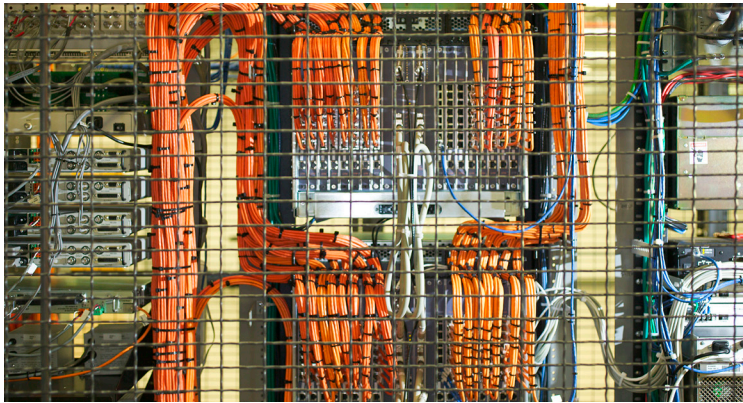
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SO WHAT DOES ALL THIS MEAN?

SPEED

Data transfer speeds, once the 5G networks are built out to maturity, will reach up to 20 Gbps (gigabits per second), which is up to 100 times faster than the fastest 4G speeds currently available.

LATENCY

The time it takes for a packet of data to leave a device, travel across the network to a central processor and back again will be less than 10 ms (milliseconds), up to 10 times faster than speeds currently available.

NETWORK DENSITY

Depending on the configuration of 5G wireless, the networks can have the capacity to handle up to 1 million simultaneous connections without any compromise to the speed and reliability of the network. This density is up to 1,000 times the current density available from most 4G wireless network configurations.

RELIABILITY

As 5G reaches maturity, the reliability of the network connectivity will reach 99.999%, providing enterprise customers and consumers with a wireless network option more reliable than even the strongest fiber and 4G networks currently available.

SERVICE DEPLOYMENT

Built primarily on a foundation of software and given its wireless nature, deploying a 5G network and performing security or feature updates can be completed in a fraction of the time that current networks allow for due to their hardware nature.

EDGE COMPUTING

Edge computing will utilize the cloud's infrastructure and computing power made possible with platforms like AWS and Azure to move the processing and computing power closer to the end devices by utilizing the cloud to integrate directly with the wireless technology right at the edge of the wireless carrier's network. This proximity to the user of connected devices combined with speed, latency and other capabilities of the 5G network will change the paradigm for the development of innovative and transformative business technologies.

WHAT DO MIDDLE MARKET BUSINESSES AND ENTREPRENEURS NEED TO CONSIDER?

The maturity and capabilities of cloud computing combined with the advancements in artificial intelligence and machine learning should lead to a window of rapid development and adoption of 5G-enabled business solutions and should be a part of all middle market technology leaders' digital strategies in the next year or two. The application and use cases to build technology solutions for all components of public and private enterprise will arise and fundamentally change what had been previously possible.

MIDDLE MARKET INSIGHT

What we are about to witness with the wide-scale rollout and adoption of 5G and the related enabling technologies will illustrate what is possible when some of the biggest names in technology come together to collaborate with their respective powerful technologies. It is time for the entire technology ecosystem to take note and take action.

TECH COMPANIES MITIGATE TIGHT JOB MARKET WITH DIGITAL TRANSFORMATION INITIATIVES

The technology industry job market is tight, especially in most metropolitan areas, and the competition for—and cost of—highly skilled technology talent has risen accordingly. As a result, many growing software companies are laser-focused on how they can leverage technology to move from quote-to-cash most effectively and efficiently. Notably, a 2019 study by RSM found that investments in technology were made primarily for efficiency, and not labor replacement, as well as to appeal to younger candidates and employees.

Slow economic growth will not change the rate at which technology is disrupting industry. If a company suspends its technology investments, it could disrupt its own business model and fall behind competitors. Businesses are continually looking to enhance customer relationships, operational effectiveness and their culture. With labor and competitive challenges across the United States on the rise, there has never been a better time to invest in technology.

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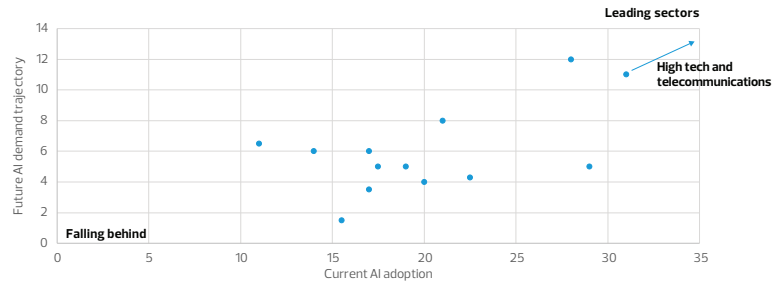
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ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TO REMAIN HOT AREAS

Several large tech giants have a wealth of user data that is being leveraged for targeted digital advertising. A recent Forbes report showed that over 90% of the world's data has been created in the past three years, and Cisco estimates that the amount of data is anticipated to grow at a 25% rate over the next three years. Many are of the opinion that under 5% of available data is being leveraged effectively.

We are in the early stages of leveraging data-rich markets, and the ability to use artificial intelligence and machine learning algorithms to connect with interested parties promises to be incredibly disruptive. Consulting firm McKinsey & Company has noted that the high-tech and telecommunications industry is leading in AI adoption and is expected to be one of the industries with the greatest spend in 2020.

AI ADOPTION AND POTENTIAL, BY INDUSTRY



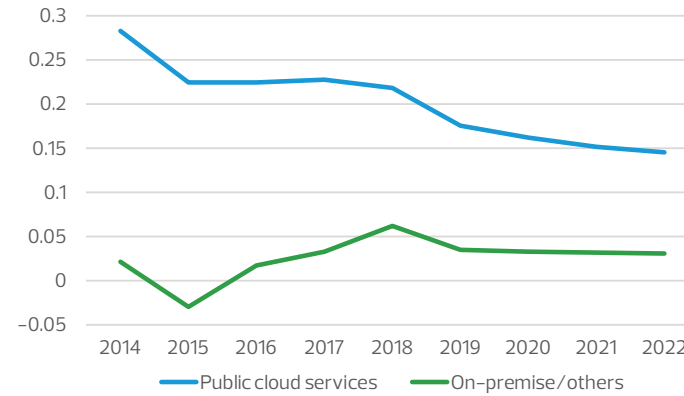
Source: McKinsey & Company

CLOUD COMPUTING WILL CONTINUE TO BE HIGH FLYING

Over the past decade, many software providers have changed their offerings to a software as a service (SaaS) model. In addition to the cost and security advantages of a SaaS offering, investors prefer revenue and earnings consistency from quarter to quarter. Adobe was one of the first companies to make this shift to a SaaS model in late 2013, and its stock has grown by over 400% since the shift.

SaaS offerings saw tremendous growth in 2015, but revenue growth has slowed for SaaS companies since then. Macroeconomic factors, like a cooling economy, could slow SaaS growth, but the anticipated growth is still expected to outpace many other sectors in the technology industry.

CLOUD, ON-PREMISE SOFTWARE GROWTH RATES



Source: IDC, Bloomberg LP

COULD THE IPO WINDOW CLOSE?

Continued access to capital will be important for the technology industry, especially as the economy enters later stages in the growth cycle. It's very possible that a slowing economy, coupled with a significant amount of dry powder among private equity and venture capital firms and the regulation that comes with being a public company, could keep companies private longer. The average age of a company completing an IPO is now approximately 10 years, which is up from five to seven years two decades ago. When companies decide to go public, increased focus will be given to governance policies to ensure that the structure in place does not provide a roadblock for the IPO process.

Companies like Airbnb, one of the largest U.S. unicorns, have highly anticipated IPO plans in 2020. Gitlab also announced its Nov. 18, 2020, IPO date back in 2015, which should be interesting amid uncertainties that could exist in the weeks after the U.S. presidential election.

MIDDLE MARKET INSIGHT

In 2018 and 2019, respectively, Spotify and Slack went public with direct listings rather than IPOs. It's possible that there will be more direct listings by technology companies with solid cash positions on their balance sheets and good brand recognition. Several top investment banks have stated that they support companies that want to pursue a direct listing.

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DATA PROTECTION, PRIVACY AND SECURITY MOVE TO THE FOREFRONT

Data has become more valuable than oil, and companies are spending significantly more time and resources to protect their data from unwanted hands. According to the [2019 RSM US Middle Market Business Index Cybersecurity Special Report](#), 15% of middle market C-suite executives said their companies experienced a data breach in the last year, a significant jump from 5% just four years ago. As data becomes increasingly more valuable, cybercriminal activities continue to rise, creating more aggressive preventative and insurance policy needs to protect companies from making major headline news.

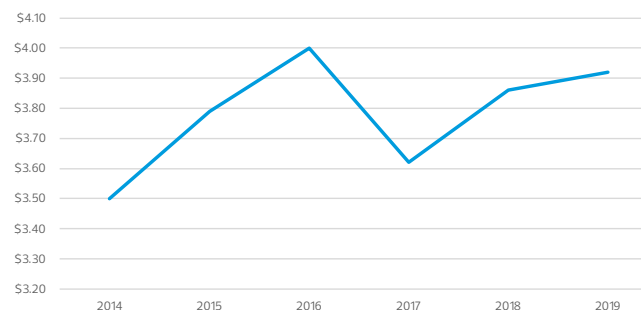
According to the Digital Guardian, a data beach costs companies an average of \$150 per record. From another perspective, the recent 2019 Cost of a Data Breach Report released by IBM Security has calculated the average total cost of a data breach to be \$3.92 million. These astonishing numbers have heightened the awareness of not only chief information officers and chief technology officers, but chief financial officers, the board of directors and audit committees to better understand how companies can better protect themselves.

Long gone are the days in which credit card information was the most valuable data source, nearly a decade ago. Personal and private information continue to be one of the most highly valuable records within the dark web. Due to this, government entities are now starting to intervene to ensure companies are protecting information with legislative acts, such as the GDPR.

MIDDLE MARKET INSIGHT

Given recent privacy issues with Facebook, and now with the upcoming California Consumer Privacy Act legislation, which took effect Jan. 1, 2020, government entities may play a much larger role in creating mandates on how big tech is ensuring the privacy and confidentiality of information, and allowing for more transparency on how data is being used.

GLOBAL AVERAGE TOTAL COST OF A DATA BREACH
 (Measured in US\$ millions)



Source: RSM US LLP, IBM Security

VIDEO GAMING AND ESPORTS POISED FOR EXPANSION AND GROWTH

The gaming industry is projected to close nearly \$150 billion in revenues in 2019 and is on pace to surpass \$200 billion by 2022. 2019 was an exciting year for the gaming industry as a whole, and not just merely from a content perspective with releases such as Call of Duty: Modern Warfare, Diablo Immortal and Cyberpunk 2077, but also because of consumption and the way content is being distributed.

Those growing up playing Pong on an Atari 2600 or Lode Runner on a Commodore 64 would never have imagined gaming content being delivered over a phone line, let alone not having to own a console at all. However, Google Stadia has found ways to completely disrupt the industry and introduce a new way of consuming 4K graphic-intensive video games such as Assassin's Creed Odyssey simply over a T1 connection with no gaming console required.

Not to be outdone, Microsoft released its streaming service, Project xCloud, shortly afterward and is already giving Stadia a run for its money. Of course, streaming is only as good as the connection speed, but once gigabit and 5G connections continue to spread, latency will be a thing of the past. According to Bloomberg, the market size of video game streaming could be roughly \$500 million in 2020, but projected to grow to nearly \$10 billion in 2030 with as many as 45 million subscribers.



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While the video game streaming vertical sorts itself out, many gamers are looking forward to a refresh in gaming consoles for 2020. Both Sony PlayStation and Microsoft Xbox are anticipated to release their latest consoles in November 2020, which could give further lift to console content and revenue. The console sector continues to stay strong as the second-largest gaming category, with nearly a third of the overall market share.

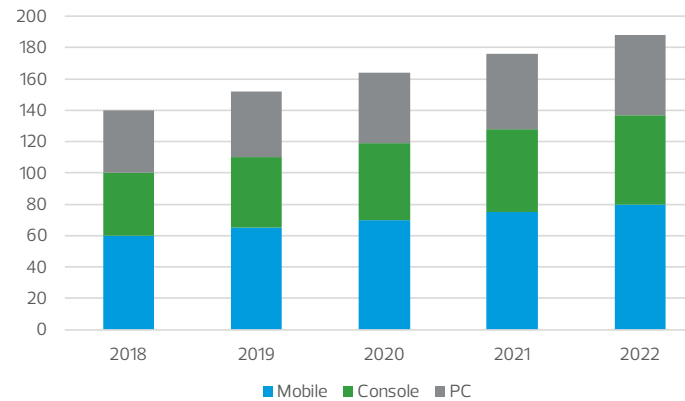
Mobile gaming is the dominant leader with nearly 50% of overall gaming market share, and is only expected to grow in 2020. The way consumers purchase mobile games is also starting to change. In October, Apple released Arcade, a Netflix-like subscription-based platform that allows a user to play as many games on their iOS device for less than \$5 a month. This could potentially cannibalize iTunes sales in the pay-as-you-play model, but arguably the average user most likely consumes less than \$60 a year in iTunes mobile games.

While the platforms continue to compete amongst each other, the one that stands to benefit the most is esports. Competitive video gaming is providing another lucrative source of revenue for game makers, capitalizing on the millions of viewers and the advertising and entry fees that come along with it, generating a market size of close to \$1 billion in revenue for 2019, but forecast to achieve \$1.7 billion by 2021.

MIDDLE MARKET INSIGHT

More individuals are watching esports than Netflix, HBO GO, ESPN mobile and Hulu combined. Much like professional sports, esports is also starting to monetize league formats and franchising fees such as Riot Games' League of Legends and Activision's Overwatch League, and more are to follow suit from Take-Two and Ubisoft.

VIDEO GAMING 5-YEAR PROJECTION (IN BILLIONS)



Source: Bloomberg LP, RSM US LLP

CHANGING CONSUMPTION PATTERNS FOR VIDEO AND STREAMING

2019 was a pivotal year for streaming, and it's safe to say that the traditional methods of consuming television and video via cable and satellite have officially been disrupted. Cord cutting has shown no signs of slowing down, and it is anticipated to only accelerate as powerhouse services such as Apple TV+ and Disney+ enter the streaming market.

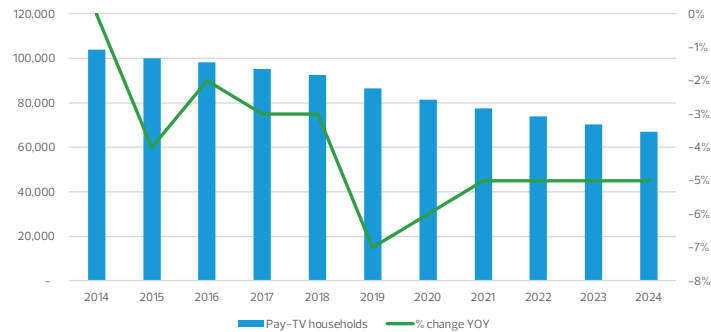
According to Nielsen, one in five pay-TV subscribers officially cut the cord in 2019, setting a record pace of decline year-over-year in subscribers, down 7% to just 85 million. In comparison, digital subscriptions are on track to total 180 million by year-end and will further accelerate now that Apple TV+ and Disney+, have entered the streaming stage.

More content produces more membership, and in 2020 we expect to see significant increases in streaming media consumption as additional options arise, such as NBC Universal's Peacock and HBO MAX—the latter planning to release all HBO content and welcoming the most watched streaming television series, "Friends." However, while Netflix, Hulu and Amazon dominate the streaming stage, Disney will be a significant threat.

Due to the Fox acquisition, Disney now controls Hulu. With livestreaming, sports (i.e., ESPN) and a mega franchise library ranging from Star Wars and Marvel to Disney classics, it has a trifecta recipe to become the dominant player in less than four years.

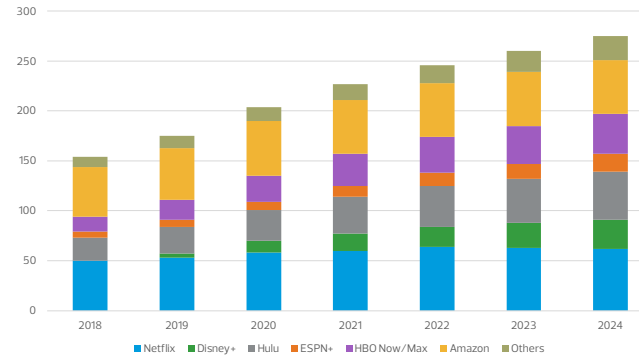
According to a *Wall Street Journal*-Harris Poll, consumers will have an average of four streaming services in 2020. It's difficult to fathom how the average consumer will filter through all the content, and while streaming has fragmented the way we watch TV, history may come back with a solution to consolidate the multiple services again (back to cable again?). Until then, consumers can enjoy deeply discounted subscription fees as the competitive landscape will continue to increase to fight for your membership.

TRENDS IN PAY-TV SUBSCRIPTIONS (IN THOUSANDS)



Source: Bloomberg LP, RSM US LLP

STREAMING PLATFORM PROJECTIONS (IN MILLIONS)



Source: Bloomberg LP, RSM US LLP

NETFLIX, HULU AND AMAZON DOMINATE THE STREAMING STAGE; HOWEVER, DISNEY WILL BE A SIGNIFICANT THREAT.

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OUTLOOK: LIFE SCIENCES

BY ADAM LOHR

In an ecosystem as complex as life sciences, there are many trends affecting the future, as well as social, political and technological developments that will affect the industry in unanticipated ways. And while drug-pricing reform, the expiration of patents, growth of global competition, and the development of novel drugs are significant factors, they will not set the course for the ecosystem. There is, however, one overarching trend that has the potential to shape the entire life sciences ecosystem over the next decade and beyond—the personalization of medicine.

This shift toward highly customized products and services will not only serve as a growth catalyst for life sciences, but it will also significantly alter global ethics, culture, and potentially, the course of evolution. To put

this into perspective for life sciences, we need to consider each of the major sectors—from biotechnology to pharmaceuticals to medical equipment—and how they will be affected by the personalization of medicine.

MEASUREMENT OF EVERYTHING

In the past five years, the number of connected devices has doubled to approximately 30 billion worldwide. By 2025, that number is predicted to climb to more than 75 billion. This growth is made possible by increased processing power and the decreased size of electronics, and is fueled by a shift in consumer demand to always be connected.

KEY TAKEAWAYS

- Consumer demand for personalization and a willingness to trade information for convenience will increase.
- The industry must address an aging population with greater access to health care, and new generations demanding longevity and quality of life.
- Organizations will continue to see advances in computing power, artificial intelligence, machine learning and data analytics.
- There will be increased pressure on companies to produce results, even as competition increases; at the same time, skilled talent will be harder to find, and the scientific, social and political challenges become more complex.

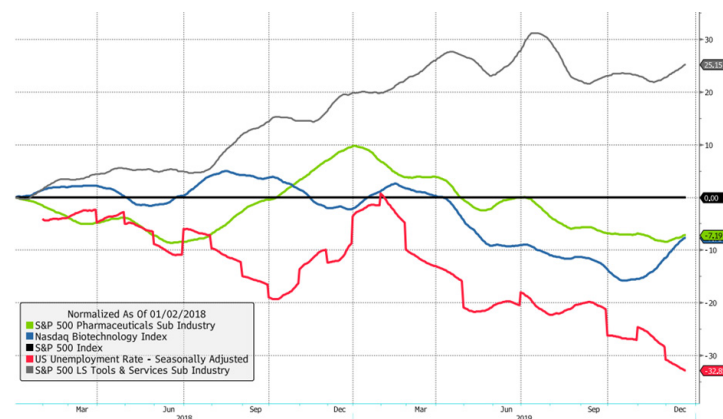


The shift toward highly customized products and services will not only serve as a growth catalyst for life sciences, but will also significantly alter global ethics, culture and potentially the course of evolution.

Pair this technology with changing social norms and consumer habits, and what has been created is a “measure everything” mindset or a “quantified self” movement. As a result, an astronomical amount of data is collected and analyzed every day, including health and medical data. This data was originally collected and used for targeted marketing and consumption strategies, but there is a growing trend among scientists, physicians and data analysts to use this information to better monitor and treat patients, develop and evaluate therapies, and increase the efficiency of research and development.

From a practical perspective, something as ubiquitous as an Apple Watch (cleared by the Food and Drug Administration in 2018 as a Class II medical device) and an application like the Research Kit allows users to anonymously sign up and to participate in clinical trials. Stanford University reported that one of its cardiovascular trials attracted more volunteers in one day by releasing an app than it normally would have acquired in a year. While the scope and reliability of this data still have a long way to go, major life sciences corporations and the FDA are already discussing how such information can be used to support or serve as real-world evidence and accelerate the pace of FDA approval.

LABOR CHALLENGES DRIVE OUTSOURCING



Source: Bloomberg LP

DEALING WITH A LABOR SHORTAGE

The shortage of skilled employees has been a recurring theme in life sciences and health care for years. The problem has been exacerbated by historically low unemployment, tighter controls on visas for skilled workers, and a fundamental shift in the skill sets needed by life scientists. The concern is not that there will be a lack of production, but a missed opportunity for innovation. Within the last decade, the industry has moved from needing scientists with a chemistry or biology core, to those who also understand data analytics, engineering and process development. This happens to be the same skill set sought by Silicon Valley, financial institutions and any other sector that has embraced its digital future.

It also happens that many of these skilled individuals are finding their way to life sciences startups and boutique development centers. Biotech and pharma have been underperforming in relation to their contract research and life sciences service peers. This is driven by a need to outsource portions of the research and development and clinical trial process to third parties that have a leaner and more agile workforce. In other words, the risk and effort of innovation can be outsourced while the companies focus on their core science. This model is becoming ever more present in the broader economy; a challenge in 2020 will be to find reliable outsourced partners and to establish quality controls to manage the development of products and the efficiency of the quote-to-cash process.

MIDDLE MARKET INSIGHT

As more companies contract out research and development, and clinical trials, a challenge in 2020 will be to find reliable partners and to establish quality controls to manage the development of products and therapies.



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AN AGING POPULATION

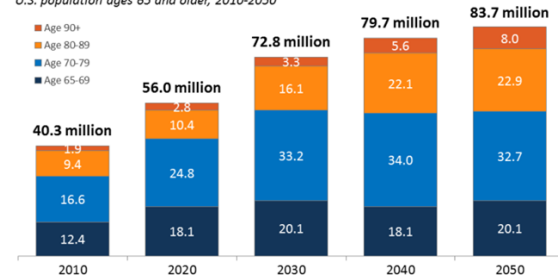
Populations, especially in developed countries, are aging. These populations are generally more affluent, have greater access to medical care and are interested in increasing or prolonging the quality of their lives. This, in turn, is driving up the number of medical procedures, many of which require implants, prosthetics and other medical devices. When aging is seen as a disease to be cured and technological advances can increase the quality and longevity of life, it presents an opportunity for the medical device sector, so long as the political focus remains on drug pricing reform.

MIDDLE MARKET INSIGHT

When aging is looked at as a disease to be cured and technological advances can increase the quality and longevity of life, it presents an opportunity for the medical device sector to reach a significantly larger patient base with a wider portfolio of products.

The aging of the population and rising health care costs are contributing to the growth in Medicare spending over time

U.S. population ages 65 and older, 2010-2050



SOURCE: Kaiser Family Foundation analysis of 2010 population estimates from U.S. Census Bureau, Population Division, Vintage 2011; National Tables, Table 1. Annual Estimates of the Resident Population by Sex and Five-Year Age Group for the United States: April 1, 2010 to July 1, 2011 (NC-EST2011-01); May 2012; and 2020-2050 population projections from U.S. Census Bureau, Population Division, 2012 National Population Projections: Summary Tables, Projections of the Population by Age and Sex for the United States: 2015 to 2060 (NP2012-112); December 2012.

With smaller, faster and smarter devices, and a social acceptance of data measurement, we are entering a decade that will see an exponential increase in the amount of information captured about our lives and our health. This "measurement of everything" movement will be the foundation on which personalized medicine is built.

Sectors poised for growth in the near-term:

- Biometrics and wearables
- Smart prosthetics
- Medical devices
- Virtual physical and mental health
- Contract research
- Contract manufacturing

EVOLUTION OF PHARMACEUTICALS

In addition to basic medical, health and physiological data being collected, there is also a staggering amount of highly personal and valuable data being generated; this is genetic data. With these digital assets, scientists will be able to analyze and model data in ways that allow for new drugs and therapies to come to market at a faster rate, and focus on indications affecting smaller portions of the population. This will be critical for the pharmaceutical industry which has seen a decreasing return on investment of research and development dollars as costs increase, and the target indications are more narrowly prevalent in the population. Put in simple terms, the low-hanging fruit of pharmacology and biological science has been picked.

Realistically, part of the problem is that scientists can explore only a small portion of what is possible. The number of potential drug-like molecules is almost infinite, and understanding how any one of them could interact with our DNA in an intended way is a seemingly impossible task for human researchers. But running through trillions and trillions of possibilities is exactly what machine learning is good at. Trained on large databases of existing molecules and their properties, advanced artificial

intelligence and machine learning can explore all possible related molecules. This has led to breakthroughs in therapy development and treatments that were science fiction only a few years ago. New technologies and market entrants (including big tech) will disrupt the ecosystem as boutique labs focus on novel and orphan therapies in lieu of blockbuster drugs.

THE RIGHT THERAPY, NOT JUST THE BEST AVAILABLE

From a practical perspective, think of a movement from penicillin as a treatment of bacterial infections for the masses, to the development of cystic fibrosis combination therapy (Trikafta) for a small number of affected children, or a gene therapy that can treat blindness brought on by retinal dystrophy (Luxturna). The midterm impact of personalized medicine will mean that patients can receive treatment with a much higher precision and efficacy because of a broader inventory of therapies, and a better understanding of how that drug will interact with their genetics and specific biome.

PROHIBITIVE PRICING

Drug	Length of therapy	Annual cost based on length of therapy
Zolgensma	One time administration	\$2,125,000
Luxturna	One time administration	850,000
Myalept	As indication persists	778,314
Folotyn	As indication persists	745,392
Soliris	As indication persists	641,533

Source: CNBC, company data, Biopharma Dive

Currently, the resources required to develop and administer these orphan and novel therapies are significant and the insurance and health systems have not been able to keep pace. As has been highlighted in RSM's Health Care Outlook contained in this report, drug pricing reform and pricing transparency will present major regulatory challenges in the coming years and the uncertainty of the outcome will continue to put negative market pressure on the pharmaceutical sector.

NEW COMPETITION AND PARTNERSHIPS

The pharmaceutical sector is poised for significant growth but will most likely look very different as the science increases in complexity and operations decentralize. Outsourcing of critical functions will become the norm as companies seek to remain nimble in the face of quickly advancing technology and relevantly skilled labor becomes harder to find.

We have seen Microsoft partner with Novartis to develop tech for specific research and development applications. Google acquired DeepMind and its branch DeepMind Health, which received approval to use five years of patient records (in England) for a health app development and artificial intelligence research. And Duke released a paper outlining how it is leveraging artificial intelligence and machine learning to look at complex data sets and run experiments thousands of times faster than with traditional models. While big tech companies may have enhanced capabilities from a data perspective, they lack experience in the regulated health care realm and in dealing with clinical trials. The coming years will most likely see a greater partnership between the life sciences and technology ecosystems as opposed to direct competition. By leveraging the combined skill set there will be amazing new breakthroughs in the efficiency and efficacy of health care.

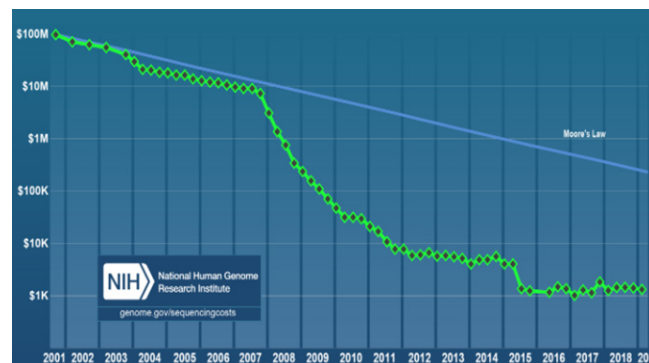
MIDDLE MARKET INSIGHT

The coming years will most likely see a greater partnership between the life sciences and technology ecosystems as opposed to direct competition.

HUMAN GENOME, DECODED

In 1990, Congress established funding for the human genome project which set out to decode a high-quality version of the human DNA sequence, among other goals. The project was completed in 2003 at a cost of \$2.7 billion, and all of the research was made public. The insight it provided had an exponential impact on the cost and effort to decode individual genomes. Now scientists have been able to make major advances in science and health care, and have opened up previously unanticipated markets like the commercial genetics tests through companies such as 23andMe, AncestryDNA and others.

COST TO DECODE HUMAN GENOME VS MOORE'S LAW



Source: National Human Genome Research Institute

QUANTIFYING THE DATA THAT MAKES US HUMAN

Total number of people tested by consumer genetics companies through January 2019, in millions

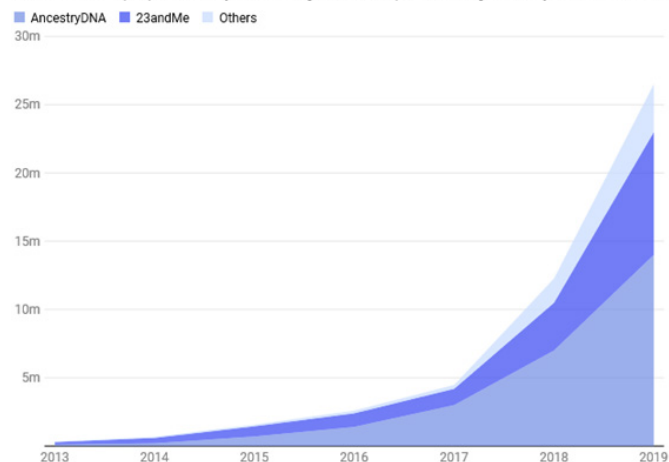


Chart: MIT Technology Review • Source: Company reports, Leah Larkin, ISOGG • Created with Datawrapper

Sectors poised for growth in the midterm:

- Pharmaceuticals
- Artificial intelligence and machine learning centers
- Contract research
- Contract manufacturing

EMERGENCE OF BIOTECH

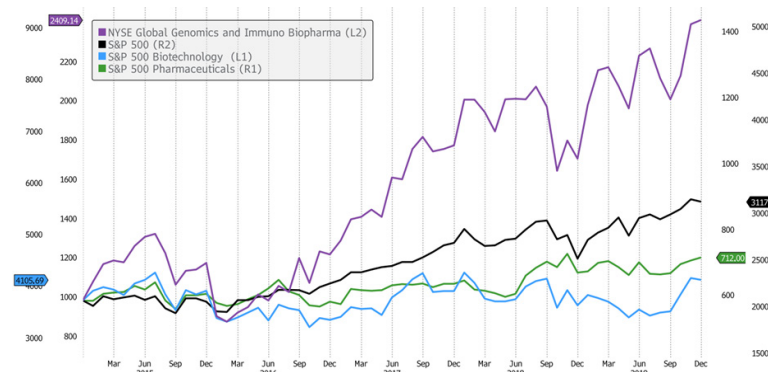
It's important to note how biotechnology, pharmaceuticals and biopharma interrelate. The term biotechnology can be applied to any science or product that results from biological matter. This is different from pure pharmaceuticals, the companies that produce medicines based upon chemical compounds. With breakthroughs in genetics and the ability to leverage large amounts of data to identify how compounds will interact with our DNA, there is a blending of biotech and pharma to create what is referred to as biopharma. While many companies are classified as pharmaceutical or biotech, the reality is that most large drug companies have a pipeline of biological and chemical therapies, and most research and development efforts use biotechnology data and techniques.

THE MOVE INTO TRULY PERSONALIZED TREATMENT

In one of the first examples of truly personalized medicine, in 2019, a 6-year-old girl was found to have Batten's disease, a fatal neurological disorder. Using advanced techniques, scientists in Boston were able to decode and analyze her genome, find the genetic cause and use a third party to develop and manufacture a drug just for her, all in 11 months. This new development model is the epitome of personalized medicine, and it's what the FDA refers to as N-of-1 trials because they apply only to a single individual. Most drugs take a decade or more to reach the market and cost hundreds of millions if not billions of dollars to develop; but they can end up reaching thousands or even millions of patients. Personalized medicine, by contrast, focuses on diseases so rare that they have been abandoned or ignored by drug companies. While biotech companies continue to refine these techniques so they can be more broadly and economically applied, the current issue will be with pricing and deciding who actually receives the treatment.

Even with the high cost of development and potentially limited reach, the rise of biotech companies and specifically those that focus on genetics will be the future of the life sciences sector. The market appears to agree with this hypothesis; indices and exchange-traded funds focused on genomics are far outperforming the biotech and pharma cohorts.

A FOCUS ON GENOMICS AND BIOPHARMA



Source: Bloomberg LP

WHERE DO WE GO FROM HERE?

Biotechnology has been used to genetically modify agriculture and livestock for years, but we are now at a point where recent advances and changing societal norms will fundamentally disrupt the very evolutionary process that has made us who we are as a species. We all know that there have been rapid advancements in reproductive science, but to actually think of what has happened in the past 40 years is astonishing.

In 1978, Louise Brown was the first baby born from in vitro fertilization; the first successful gestational surrogate pregnancy occurred in 1986; in 2013, scientists used CRISPR-Cas9 technique to edit the human genome; in 2017, Josiah Zayner (who sells genetic-engineering supplies to amateurs online) injected CRISPR into himself at a biohacking conference; and in October 2018, twin girls born in China had their DNA edited using CRISPR to make them more resistant to HIV.

While natural selection and selective breeding have long been culturally accepted, the ability to see the genetic makeup of embryos before deciding to carry a baby to term is the source of significant debate, and editing the germline of humans so that those traits are passed on to further generations has seen almost unanimous resistance and a call for a moratorium on the practice until international laws have a chance to catch up to the science.

Advances in biotechnology and the ability to affordably decode the genome of every person will allow for truly personalized therapies in biopharma that not only treat a specific disease for a specific person, but also edit patients' DNA so that they never get sick in the first place. In the long term, all indicators point toward a gene-editing revolution. This prompts a series of difficult questions: Where will the economic opportunities lie? How do we adjust equitably and socially? Do we understand the implications, and are we ready?

Sectors poised for growth in the long term:

- Biotech
- Artificial intelligence and machine learning
- Genetic testing
- Nanotechnology

OUTLOOK AT A GLANCE

NEAR-TERM:

- Consumer preference for the "quantified self" will drive the collection of massive amounts of data.
- Advances in technology and data science will create a better understanding of biology, physiology, chemistry and physics.
- Medical devices and life sciences equipment will become more integrated and ergonomic.
- An aging and affluent population with greater access to health care will drive demand.
- Focus will remain on treating the symptoms with available technology and therapies.

MIDTERM:

- Data will be leveraged in every aspect of life sciences and health care to drastically increase the pace of research and development.
- New technologies and market entrants (including big tech) will disrupt the ecosystem as boutique labs focus on novel and orphan therapies in lieu of blockbuster drugs.
- The pharmaceutical sector is poised for significant growth, but will most likely look very different as the science becomes more complex and operations decentralize. Outsourcing of critical functions will become the norm as companies need to remain nimble in the face of quickly advancing technology.
- Treatment will be tailored to the individual's specific makeup, and there will be more orphan therapies available to treat unique needs. The previous necessity of using the best available drug will be replaced with using the right drug.

LONG TERM:

- Gene editing and genetic therapies will become commonplace.
- The need for medical devices and the pharmaceutical treatment of symptoms will be largely eliminated as treatments are applied to prevention or correction of the underlying anomaly before it has the opportunity to become a health issue.
- Biotechnology will dominate the life sciences space, and will influence other ecosystems such as technology, agriculture, industrial materials and consumer product markets. Think DNA as a data storage media, lab-grown meat and plentiful biofuels supportive of a green economy.

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