Calamos Global Insights

CALAMOS® INVESTMENTS

APRIL 2020

The coronavirus pandemic has put the global economy and financial markets into uncharted and uncertain waters. Although the environment is unprecedented, as investors we continue to believe that volatile markets create opportunities for our active and risk-aware approach. Our time-tested process allies our identification of top-down themes—which provide a wind in the sails during difficult macro climates—with bottom-up research built on a foundation of comprehensive capital structure research.

Here we present a compendium of insights from the Calamos Global Equity Team, including thought leadership on:

> Investing through the coronavirus uncertainty

> Secular themes that are gaining traction during these extraordinary times: bioprocessing, Artificial Intelligence and Big Data, and global payments

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The following pieces were first published in our Investment Team Voices blog on www.calamos.com:

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Investing through Coronavirus Uncertainty: 3 Global Themes Creating Investment Opportunity

Calamos Global Equity Team
March 30, 2020

In challenging environments, top-down secular themes provide "a wind in the sails" that can help companies stay above the economy. As we have discussed in our recent conference call series for financial advisors and in a number of our team's past posts, our approach focuses on combining top-down themes with bottom-up analysis. Businesses that are positioned to benefit from these themes can provide excellent secular growth opportunities, along with the potential for resilience during more volatile markets.

In this post, we'll revisit three themes that we've been bullish on for quite some time: Bioprocessing, artificial intelligence, and global payments. While growth prospects for these themes was strong coming into this crisis, we would expect the rate of disruption and opportunity to only increase as we move through these uncertain times.

1. Bioprocessing: Providing the Pick Axes and Shovels to Combat Coronavirus

Sam Schuette, Research Analyst, International Health Care

The bioprocessing industry is well positioned to benefit as the health care industry seeks a vaccine and treatments to combat Covid-19. Bioprocessing companies are in a position to supply tools and manufacture both drugs and vaccines. They are not tied to the success of any one company, but benefit broadly from the development of treatments.

In our post from October of 2019, "Global Growth Themes: The Opportunity of Bioprocessing," we provided an overview of the industry and identified three themes that we saw driving opportunity: volume, outsourcing and manufacturing. All three should gain traction as the fight against the coronavirus continues.

Volume. We expect volume to grow for biologics as vaccines are being developed to improve the immune system's ability to recognize and fight the virus.

Outsourcing. Biotech and pharma companies have relied on outsourcing, including to contract development and manufacturing organizations (CDMOs), including companies in bioprocessing. We expect the outsourcing rate to increase as small biotechnology companies partner with CDMOs to produce therapies in a fast and cost effective manner.

Manufacturing. We also expect manufacturing to continue moving toward single-use technology, which is more flexible for new biologic development.

> "We would expect the rate of disruption and opportunity to only increase as we move through these uncertain times.

2. AI and Big Data: Asia Uses a Tech-Driven Paradigm to Contain the Covid-19 Pandemic

Nick Niziolek, CFA, Co-CIO, Head of International and Global Strategies

In 2018, our team wrote about China's expansive development of and investment in AI and Big Data analysis. The coronavirus has now brought China's use of AI and Big Data to the forefront, and we've also seen Korea emerging as well. Both countries have instituted testing on a very large scale, but their AI and Big Data capabilities—along with a willingness to use those tools—have played a great role, too.

Korea has developed an app and a website maintained by the government that uses phone activity to track tens of thousands of quarantined residents. Their phones can alert authorities if they leave their homes and also show their movements before being quarantined. Citizens get routine text messages about cases developing in their neighborhoods as well. Names are not used, but demographic data is displayed.

China is taking many similar measures although to an even more drastic level. Phones have QR codes where they are assigned a green, yellow, or red virus indicator, and phones are inspected at the entrance of public places. These have been developed by private internet conglomerates, but in close concert with the government. Individuals can log into an app, type their name and ID and quickly be told of risk from recent contacts. Thermal scanners have been installed at train stations and telecom providers get precise records of user itineraries. Drones have even been used, equipped with speakers to direct anyone socializing outside toward indoors. From a pure technological advancement standpoint, there have reports of testing being done by AI companies in China on tools that allow thermal cameras to detect temperatures and facial recognition ***with masks on.***

Both China and Korea are not out of the woods yet in regards to the coronavirus and face the risk of a second wave like any other country. However, in terms of the severity of measures taken and the capabilities available to force quarantine, they appear to be among the most advanced countries. In our opinion, this gives them greater likelihood of returning to economic normalcy the fastest. We wrote about opportunities in international tech in January, and all reports indicate that China has not lost any focus on 5G capex and its desire to lead in that area. The global coronavirus pandemic could potentially even widen the gap relative to the rest of the world in terms of the speed that they reach those goals.

3. Global Payments Ecosystem: Enabling the growth of Online and Social-distance commerce

Alex Wolf, CFA, Senior Research Analyst, International Financials

Last September, we published "Opportunities in Disruption: Finding Growth Opportunities in the Payments Ecosystem," a post we expanded further in November after attending an industry conference. Companies in the ecosystem will take a hit in the short term from reduced economic activity, especially those exposed to travel and retail. Over the medium to long term, we believe this theme is still very much in place.

The types of companies we have discussed in the past—those that are enabling merchants to move online, and drivers of ecommerce and digital transactions—will continue to benefit. As people are forced to stay home for extended periods, the gradual move to digital and electronic transactions will likely accelerate. Any companies within the acquiring space taking excess merchant risk may struggle to get through this difficult period. However, the best-in-class innovators that are well set up to serve their customers navigating fintech journeys will weather this storm well, and set themselves up for an attractive long term outlook.

Conclusion

As investment managers, we are focused on actively managing our portfolios to capitalize on the long-term opportunities that are borne out of short-term price dislocations. Our team is using volatility to add to favorite names that we believe have been oversold, including in companies tied to secular growth themes we've outlined above.

Global Growth Themes: The Opportunity of Bioprocessing

Global Team Perspectives by Sam Schuette
October 8, 2019

Part of our global team's strategy is to search out investment themes that we think will provide tailwinds for sustainable long-term growth and position our portfolios to benefit from them. For example, currently we are seeing exciting opportunities within the bioprocessing industry. We believe this bioprocessing theme is broadly more attractive than the biotechnology industry due to a better risk profile, since these companies have negligible exposure to any single drug clinical trial result, approval, or launch. We have identified three main themes that we believe will drive future growth in the bioprocessing industry: an increase in biologic volume, a preference for outsourcing, and a change in manufacturing processes.

What is bioprocessing?

Bioprocessing is the manufacturing process for large molecule drugs, which are also known as biologics. Large molecule drugs contain living cells and are more expensive and difficult to develop and manufacture than small molecule drugs, which are made from chemicals. A few biologics marketed by large biopharmaceutical companies include popular cancer, psoriasis, and rheumatoid arthritis drugs.

Bioprocessing Growth Theme 1: Volume

There are two main drivers of biologic volume growth. The first is efficacy. Biologics have been more successful than chemical drugs at treating many complex diseases. They are more effective because they use proteins that are better at correcting or neutralizing specified target areas. This improved efficacy is also occurring in clinical development, where companies are becoming better at removing drugs earlier in the development process due to enhanced technologies and strategies. As a result, biologics have been gaining share of biopharmaceutical company pipelines. They now represent about 40% of pipelines, and 70% of these are small volume drugs for things like rare diseases.

"We believe the bioprocessing theme is broadly more attractive than the biotechnology industry due to a better risk profile, since these companies have negligible exposure to any single drug clinical trial result, approval, or launch.

The second key driver of biologic volume growth is the development of the biosimilar industry. Biosimilars are simply generic biologics but are called biosimilars because they are not exact copies of the originator drug. Unlike generic chemical drugs, biosimilars cannot be exact replicas of the originator since they are made with living cells. These generic biologics are gaining popularity today because the current generation of large-scale, blockbuster biologics are starting to lose patent protection. That loss permits competitors to manufacture and sell biosimilars at a lower cost, which drives greater volume. This also forces developers of the original biologic to create more effective next generation biologics to offset biosimilar competition. Some examples of these next generation biologics include bispecifics, bispecific T-cell engagers, antibody drug conjugates, gene and cell therapies, and others. The biosimilar market is still early in development (especially in the US), but we believe it will play a significant role going forward. A few factors to watch as the industry develops are 1) how supportive the regulatory environment becomes, 2) how competitive biosimilar manufactures are with each other, and 3) how successful the innovators are at positioning patients on to their next generation biologics before their first generation biologics lose patent protection.

Biosourcing Growth Theme 2: Outsourcing

By 2025, just over half of all mammalian cell biologic production will be manufactured in-house by biopharmaceutical companies, while just a few years ago 75% was manufactured in-house. The rise in production outsourcing and the growth of biologics in pipelines will benefit both CDMOs (contract development manufacturing organizations) and their suppliers. Large biopharmaceutical companies are increasingly using a dual sourcing model where a drug is produced both in-house and with a trusted CDMO, while small biotechs are increasingly outsourcing all production.

Reducing risks and managing costs are the main reasons that companies are outsourcing more. Historically, large biopharmaceutical companies have had difficulty forecasting their own internal capacity requirements due to a number of factors including clinical trial failures, drug sales that often deviate from expectations, and patent expirations. It is costly to build and maintain unused capacity, but not having enough capacity can limit a company's growth prospect. As a result, outsourcing has been steadily rising in recent years.

In addition, biologics are getting more complex and difficult to manufacture, which benefits CDMOs that specialize in new manufacturing techniques. CDMOs are moving beyond manufacturing to also supporting companies earlier in the drug development process. Biotechnology firms are launching as virtual platforms that use CDMOs to facilitate all research and development, help with clinical trials, and manufacture commercial supply. Some CDMOs work with companies in the preclinical stage and follow the molecule all the way through development to commercialization. These CDMOs that help with drug discovery may receive royalties on drug sales once they reach commercialization.

Biosourcing Growth Theme 3: Manufacturing

The two stages of manufacturing biologics, also known as bioprocessing, are upstream and downstream. Upstream bioprocessing involves growing the cell protein, while downstream involves filtering, purifying and packaging the final product. Throughout the upstream and downstream bioproduction process, there is an ongoing shift to manufacture products with single-use technology. Presently, manufacturers usually repeatedly grow the protein, one large batch at a time, in a process called fed-batch. This process can be run with traditional large stainless steel bioreactors or with single-use technology, which is rapidly gaining share. Single-use fed batch bioreactors are mostly used for both small-scale clinical and commercial biologic batches. It is especially useful as the industry focuses on developing smaller volume biologics for things like rare diseases.

The advantages of using single-use technology are its flexibility, low capex cost, low energy and water cost, quick set up time, and low production risk. Single-use technology currently has a 15% market share, but it is on track to reach 35% market share over the next few years and eventually move up toward 75%, according to a leading supplier.

Conclusion: Investment Opportunities

While there are many ways to gain productive exposure to the bioprocessing theme, we see attractive investment opportunities in the leading CDMOs (contract development manufacturing organizations). These top companies are growing their moats in a consolidating industry, and improving ROICs as they focus on high value-add products like biologics. Biologic demand is on track to outpace capacity for at least the next five years, especially in the small volume setting. Other key players like the suppliers also benefit from this theme, since they sell the "picks and shovels" to biologic manufactures. Suppliers with more exposure to downstream and single-use technology are best positioned to capitalize from the bioprocessing theme. Lastly, another way to gain exposure to this powerful theme is through the companies that are developing the next generation of biologic medicines and those that are developing biosimilars.

Investing in Technology Innovators: The Benefits of a Global Approach

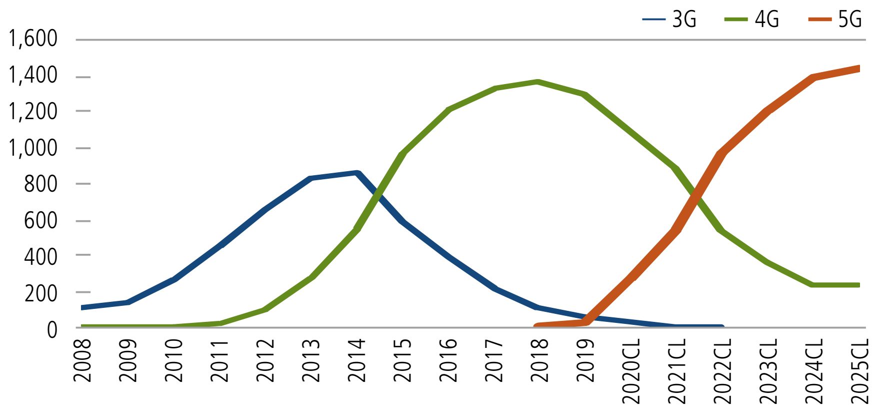
Global Team Perspectives by Alex Wolf, CFA
January 22, 2020

As global growth investors, we see many compelling investment prospects across the technology industry. Currently, we believe the opportunity set may even be more favorable in non-US companies. For example, 5G is an important global theme that many investors are focused on, but the U.S. might not be the best place to access it. China is investing heavily domestically in 5G, and there are also many other non-U.S. companies that have solidified themselves within key parts of the value chain.

China is projected to spend $145 billion on 5G over the next five years,[1] which could be double the 5G spend of the U.S. The first 5G networks have already been turned on in China with the big 3 telecom providers announcing available 5G plans across 50 cities. Expectations are that 28% of China's mobile connections will run on 5G networks by 2025, and the government has announced it expects more than 100,000 base stations will be activated by the end of 2019.

5G is an important next step in the advancement of wireless technology, featuring high bandwidth, low delay, and increased capacity to enable the next steps of digital transformation. It will touch many areas, not just improved connectivity for cell phones. Peak download speeds can be as much as 60x faster than 4G. The increased capability will improve industrial automation, Internet of Things devices, sensors, mobile robots, machine vision and other automated technologies while also enhancing supply chain and inventory management. 5G will also touch connected automobiles, smart retail, remote surgeries, and virtual reality/artificial reality. The reach of 5G is staggering: In 2035, global 5G enabled economic output will be $13.2 trillion dollars, according to projections from IHS Markit.[2]

SMARTPHONE ADOPTION CYCLE BY CELLULAR TECHNOLOGY

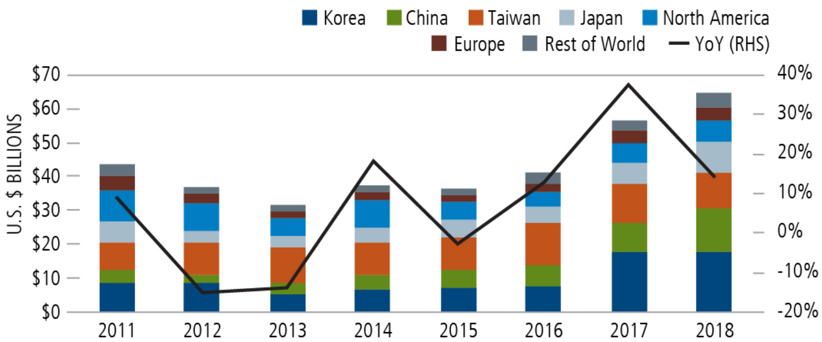


Source: CLSA, "Global technology, Sector outlook," July 19, 2019, using CLSA and CLST.

The buildout of 5G will be a long process before reaching full adoption of the highest frequencies, with earlier stages seeing 5G and 4G acting congruently. We view China as a great setting for the initial adoption of 5G, supported by a political willingness to spend and a digitally savvy population that can adopt tech very quickly.

[1] Reported in China Daily, from an original estimate from a report by the Global System for Mobile Communications Alliance.
[2] IHS Market, "The 5G Economy, November 2019"

SEMI MANUFACTURING EQUIPMENT BILLINGS



Source: CLSA, "Tech in colour: Macro, bottom-up themes forecast blue skies for 2020, January 2020, using SEMI and CLSA.

The economic opportunity spans across consumption of new phones, increased demand of leading-edge semiconductors, and manufacturing equipment and robotics. 5G needs signal towers, base stations, distributed services, and mega-scale centers to house data. The companies that cater to this include many Chinese domestic entities. Many companies outside of China are also participating, although the trends are certainly moving away from U.S. companies as China works to insource its supply chains. Technology players throughout Asia and Europe will benefit, including Japanese automation companies and Taiwanese semiconductor companies.

Around the world, the trade war and globalization tensions have created opportunities for domestically focused companies across many industries and technologies. There are strong desires to build up national industries amidst a growing political frustration with expanding U.S. big tech, creating opportunities for those that can seize them. Examples of this include Germany launching a European Cloud, called Gaia-X, with the sole purpose of giving European firms a non-American or Chinese option to retain sovereignty over their data. This is on top of a vastly changing landscape in Europe, where we've seen the EU impose regulations to guard data privacy and improve competition, while France has threatened a tax against U.S. big tech companies.

Moving beyond these broader themes, our investment process next focuses on finding best-in-class innovators that have cemented their place on the global tech value chain. This is especially evident within the semiconductor industry, where we believe specific companies have built up sufficient moats and economies of scale to allow them to remain at the leading edge for 5G and beyond. Continued evolution and investment in these areas can further bolster the moats these companies have as they widen technological gaps and differentiate themselves versus peers.

Conclusion

The global technology ecosystem is an exciting growth theme—and it's an area where global and international approaches are likely to have a real advantage as the ecosystem continues to evolve and grow.

Field Notes: The Data Revolution and China's Artificial Intelligence Strategy

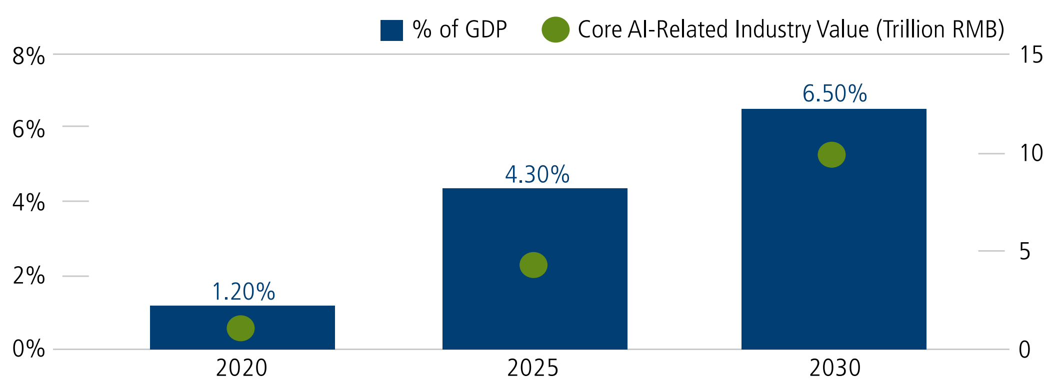
Global Perspectives by Nick Niziolek, CFA
October 2, 2018

Members of our team recently returned from our latest research trip, which included multiple cities in mainland China. We met with company management teams, toured facilities and simply observed. Boots-on-the-ground experiences give us insights into emerging secular trends and investment opportunities, and this trip was no exception.

One of the key takeaways from this trip was the significant progress China is making in its development and use of artificial intelligence (AI) technology. Our experiences traveling through the country as well as our conversations with industry experts underscored China's commitment to being the leader in artificial intelligence. Moreover, as we'll discuss in this post, China may enjoy some competitive advantages in developing AI.

One of the most visible examples of China's commitment to AI is the country's widespread use of cameras and monitoring equipment. We've noticed this technology before but during this trip, the increased presence of monitoring devices was striking—not only in Tier 1 cities, but also in Tier 2 and Tier 3 cities. We saw cameras on almost every light post and observed the extensive use of cameras by private entities. For example, every property management company we visited eagerly showed us control rooms displaying the output of hundreds of cameras installed on their properties. US property companies use similar technology (though with fewer feeds) but in China, these feeds often don't stop with the onsite control room as in the US. Instead, the data also goes to corporate headquarters where teams monitor activities and provide real-time feedback on issues and concerns.

ECONOMIC IMPACT OF CHINA'S AI AMBITIONS



Source: Bloomberg using data from the State Council of the Peoples Republic of China.

Additionally, many Chinese companies provide their feeds to the government, which is compiling a massive database of video, audio, and other types of data. The government in turn, shares its data with a select list of approved private and public entities to help them "train" and improve AI technologies. Through these practices, China is moving closer to the AI Holy Grail of eliminating the need for human intervention. The country's AI capabilities are already apparent: We had the opportunity to observe facial recognition software that identified more than 100 individuals on real-time video feed.

> China's AI approach is important because our team believes data will be a strategic resource in the next stage of industrialization, of similar importance as oil in the initial stages of industrialization.

China's AI approach is important because our team believes data will be a strategic resource in the next stage of industrialization, of similar importance as oil in the initial stages of industrialization. As commerce and industry become increasingly digitized, AI will be more valuable. Companies will need to access, analyze, and manipulate vast quantities of data to compete effectively. A handful of U.S. mega-companies have collected vast data troves during their normal course of business—think internet retail, search engine and social media juggernauts. However, US privacy laws and regulations are intended to protect consumers and intellectual property. New entrants face competitive hurdles because they are unable to access the data the behemoths hold.

Through this lens, our observations in China have far-reaching implications. China has a significant competitive advantage in the next stage of industrialization. The lack of regulation and privacy laws permit the capture and storage of vast amounts of data, both from the public and private sector. While in the US, we are often concerned with the collection and sharing of personal data, many people we spoke to on our trip expressed a different view. For example, some extolled the virtues of facial recognition software to locate a missing child or identify a criminal in matter of hours.

Our team has identified a number of ways to participate in the growth of the data revolution. We've invested in the camera companies that refine algorithms used for the high-speed analysis that is commonplace in China. The base of cameras already installed in China is very high, and we believe an upgrade cycle is imminent. Camera lens-quality is improving rapidly and newer HD/5G technology allows for faster data speed and analysis. Additionally, global chip companies supplying the arms in this race provide another way to access this theme. We're also finding opportunities in Chinese corporations at the forefront of leveraging AI, including online conglomerates and search engines that received access to data the government holds. These Chinese companies will likely come up with unprecedented ways to use this data.

AI's role in future technology is impossible to predict with certainty, but it is clear it will be at the forefront of technology's next generation of products and services. Our team is identifying ways to participate in this exciting growth trend every day.

Field Notes: Insights on the Global Payments Ecosystem

Global Team Perspectives by Alex Wolf, CFA
November 11, 2019

In September, we published a post discussing the global payments ecosystem and the investment potential we believe this theme offers. We recently attended the Money20/20 conference in Las Vegas, an event focused on the future of money, and heard from some of the world's leading experts in payments, regtech, blockchain and cryptocurrencies, and digital trust. These sorts of forums provide an excellent complement to our in-house research, and we gained an even deeper understanding of the global payment ecosystem and its nuanced investment opportunities.

In our September post, we wrote about how payment processors have evolved by providing innovative add-on offerings, such as fully integrated services and data analytics. Coming out of this recent trip, it is even more evident to us how much the industry has developed, moving away from its historic role as an annoying cost center to now enabling businesses to reach new goals. Payment processors play an integral role in many parts of running a business, as well as in helping consumers manage their lives. For a merchant, data provided by payment processors allows for full integration of supply chains and foundational logistics data. Merchants can also use this data to develop deeper and more direct digital relationships with consumers. From a consumer standpoint, payment networks facilitate shopping for financial services products and managing household expenses, by voice or fingertip. The role of a pure processor has shifted to becoming a gateway to much deeper relationships. This is especially true in allowing FinTech companies to reach the historically underbanked population around the world.

"Payment processors play an integral role in many parts of running a business, as well as in helping consumers manage their lives.

In our previous post, we noted that companies with the ability to seamlessly process payments across countries and currencies will have an edge. This has become even clearer to us as we heard from leaders in the industry talk about how difficult it can be to navigate across geographies. It is a treacherous road getting proper licensing and dealing with local regulators. With initiatives like One Belt One Road being crucial to economic development, investments into the payment infrastructures of those channels will play a major role into the success of the initiative. These will include enabling faster payments across countries and better foreign exchange capabilities. Cross-border payments is an important step in this process, where trust and compliance at a global scale is essential. As the global payment ecosystem continues to evolve, the ability to negotiate and navigate complex strategic partnerships will be key to success. With consolidation likely to continue, companies that have the necessary competencies have a great advantage.

Opportunities in Disruption: Finding Growth Opportunities in the Payments Ecosystem

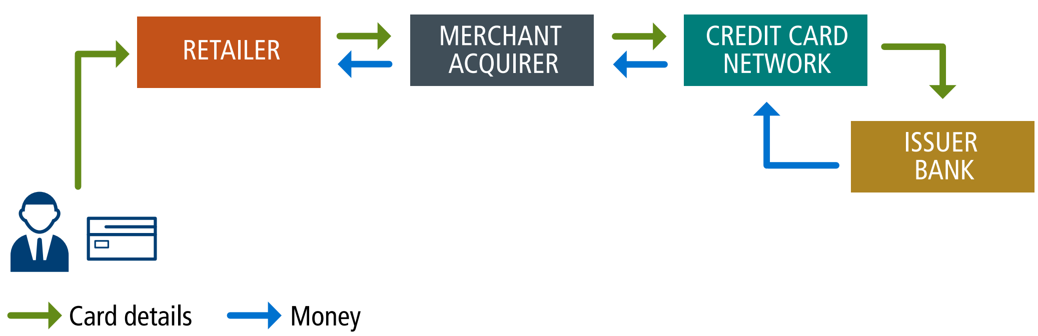
Global Team Perspectives by Alex Wolf, CFA
September 24, 2019

The concept of payments has existed throughout history, with transactions evolving over time from use of bartering, to precious metals, to fiat currencies. The evolution continues today at a rapidly accelerated pace with choices that span from cash, to cards, to mobile or electronic options. Despite all the headlines on newer mediums of payment, cash still dominates a large share of the ecosystem. Per a study by the San Francisco Federal Reserve, cash represented 30% of U.S. transactions in 2017. An ECB study put this number at 75% within the EU,* and we would expect it to be even higher in many other parts of the world. Cash is likely to remain an important part of the system for a significant period going forward, but the evolution of the payments ecosystem provides a long-term steady tailwind for the providers of card-based and electronic options as cash usage slowly dissipates.

Payments Ecosystem

Paying a merchant with a credit card might seem very simple. You can swipe your card and take your merchandise or click a button on a phone and wait for delivery. When you dive deeper, the inner workings of the ecosystem are more complicated. The diagram below shows the flow of data and money in a typical transaction.

FIGURE 1. THE PAYMENTS ECOSYSTEM



> The merchant acquirer will sign up a merchant into payment acceptance agreements, effectively bringing them into the broader ecosystem.

> That acquirer or a different processor company will process the payments, which involves authorizing, transmitting data, security checks, and settlement.

> Next come the networks (card schemes) who essentially act as payment "rails." They connect transactions to issuing banks and set many rules, including governing interchange rates and acceptance rules.

> From there, transactions are processed for the banks, with this step often done by the same or similar company as the first processor or by the bank themselves.

> The flow of data comes to completion at the Issuer Bank who make money on interchange but of course can also capture interest income and late fees from the cardholder.

- From a fee standpoint, the acquirers charge the merchant a gross fee but only get the net amount after network fees, interchange, and processing fees.
- The money is remitted back in reverse order, allowing the merchant to get paid net of fees.

The Opportunity

We believe this is a highly attractive industry globally, with the forefront reason being the pure size of the market. Estimates are that global card payment volumes are already well over $20 trillion. The fees earned by various players can be very complex and vary quite a bit depending on where you sit within the ecosystem and how many services you are providing, in addition to geographical rules and the type of merchant you serve. They can vary from just a few basis points of each dollar transacted to as high as 3% in some countries. No matter how small the take rate, the trillions of dollars in transactions offers quite a high revenue opportunity to try to capture.

In addition to the large existing base of transactions, numerous forces are pushing volumes into this ecosystem and expanding the opportunity. These include global consumer GDP growth in the high single digits, compounded by the shift of cash-to-card and growth of ecommerce on top of that. Ecommerce accounts for about 12% of global retail right now, but we expect many of these forces to help drive ecommerce volumes to grow near a 20% rate over the next few years.

We believe there are enticing investable opportunities across the globe within payments, however Europe offers interesting dynamics that set it up very nicely going forward on a relative basis. To start, Europe is a much less mature payments industry than the U.S. This is evident in the relative share of cash transactions previously mentioned. Even within ecommerce, the use of "cash on delivery" is still very prevalent in Europe. Europe is also a much more fragmented market, in contrast to the U.S. where consolidation is likely at the tail end of a multi-year period. In the U.S. the top 3 players in 2017 captured 75% of the revenue earned by the top 10. This number was only 57% in Europe, but we expect this gap to close over time as legacy players with antiquated technology continue to lose share. Regulations also will help drive this, as over the past several years initiatives have been put in place to eliminate national barriers to payments, reduce transaction costs, foster innovation and competition, along with a desire to educate and increase communication to the population. Additionally, individual governments are working to move payments away from cash to better help restrict money laundering and tax evasion.

Our Favorite Themes

We see attractive investment opportunities in both the networks and the acquiring spaces. We believe these industries offer unique dynamics of technology-driven top-line growth along with scalable models that can achieve attractive margins at relatively early stages of their business lives. The networks have a lot of monopolistic qualities, with built-up brands and competitive moats that put them in a great place to benefit from many of the industry themes already discussed. While broader growth in Europe stagnates, the networks should generate double-digit top line growth in the region.

> The evolution of the payments ecosystem provides a long-term steady tailwind for the providers of card-based and electronic options as cash usage slowly dissipates.

While the networks should offer steady compounding growth stories, it is the merchant acquiring space that offers more dynamic change and ability for disruption. This is where consolidation will play itself out and the best service providers will win. The industry is evolving from merchants taking the easiest route, and often just partnering with the bank they use and rarely negotiating fees. They are moving to a desire to look for true FinTech companies that will partner with them to achieve all of their goals. Chief Technology Officers are playing a larger role in choosing payment partners and evaluating the underlying technologies. Acquirers can differentiate themselves by offering fully integrated services, instead of being just processers of payments. They can link the services as well with full gateway capabilities that provide high quality interfaces on their websites. Newer competencies are also being offered from a data perspective, where payment data can be sent back to the merchants to be easily incorporated into their other systems and drive important business decision-making processes.

As the payments landscape changes, merchants need more than a company that essentially just signs them up to access credit card networks. They require the capabilities to accept various types of electronic payments, some of which are native to other geographies. Global companies need to seamlessly process payments across countries and currencies. With the growth of online marketplaces and fully integrated omnichannel experiences, there are more layers of complexities that payment providers can help their merchants navigate through. Perhaps most importantly, the proper data and systems can drive acceptance rates up through lower false positive rejections, which adds true incremental sales dollars. On the other side, more effective fraud prevention can bring down costly chargebacks.

Unlike many other industries, we see investable companies within the European payments space that are at the cutting edge of this technology and helping to disrupt the market with the same level of innovation or higher that you see at American companies. We also believe that Europe being behind in consolidation offers more opportunities to search out the disruptors that can reach that level of scale. There are certainly risks to these companies, such as new technologies like Libra (see our blog) or the route that China has taken where the whole payments system is dominated by the largest technology companies. These alternative paths create the risk of disrupting many of these business models, but ultimately we believe companies with strong technology and appeal to merchants and consumers will prevail. Our understanding of these dynamics allows us to effectively navigate the rapidly changing market and invest in the companies that are truly adaptable and innovative and ultimately best set up to profit from these themes.

*Sources: Federal Reserve Bank of San Francisco, "2018 Findings from the Diary of Consumer Payment Choice," November 1, 2018, Raynil Kumar, Tayeba Maktabi and Shaun O'Brien; and European Central Bank, "New €50 banknote starts circulating today," April 4, 2017.

The Calamos Global Equity team manages a variety of strategies, including global growth and international growth strategies, as well as risk-managed global and emerging market portfolios that also include investments in convertible securities.

Financial advisors, to find out more how our global and international capabilities can help you address your client's needs, please contact your Calamos Investment Consultant at **888-571-2567** or **caminfo@calamos.com.**

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