Q1 2020

Client Focus

INDUSTRY TRENDS
Stay-At-Home TV Viewing Adds to Explosive Video Streaming Growth

CLIENT PROFILE
Fastly: Delivering Content Over the Internet at Hyperspeed

RESOURCES
Coronavirus Federal Tax Relief Details

William Blair's Biotech Equity Research Head Answers COVID-19 Questions

William Blair

We Are Here For You

The spread of the coronavirus has shown just how connected our world is. We have seen how governments, communities, neighborhoods, businesses, and services have all come together to help others and stop the spread of the disease.

At William Blair we have established a crisis management team, which along with our executive committee, is closely monitoring developments. It led us to implement a stay-at-home work mandate to protect our employees while serving you.

We were well prepared to work from home. Our investments in cutting-edge technology and online resources have allowed us to communicate virtually with clients globally and in real time. Colleagues are using these tools to engage with our clients, conduct online meetings, host sessions with their teams, as well as ensure secure electronic trading. The firm's primary objective is to deliver strong outcomes for our clients, while ensuring the health and safety of staff.

William Blair was built upon strong values of support and has always taken a long-term investment view while navigating the risks clients face. For 85 years we have weathered the highs and lows of the markets and remain committed to meeting your needs and concerns.

Given the fluidity of the situation, we have seen the Federal Reserve take unprecedented action to ensure businesses, individuals, and local governments can get loans to tide them over until economic activity resumes. Washington also pushed through a $2 trillion plus COVID-19 stimulus package that includes billions of dollars for hospitals and state unemployment insurance programs.

Our Q&A with Tim Lugo, who leads William Blair's biotech research team, in this issue of *Client Focus* spotlights the latest trends on COVID-19 from a health and investment perspective. This new world is also a reminder of how much we rely on the internet and social media to stay connected.

So we wanted to take a look at how this phenomenon is affecting our lives in another way: streaming entertainment. Our featured analysis discusses how technology companies are taking on Hollywood as the video streaming era is sweeping through society, particularly in the entertainment industry. As millions use their devices to watch their favorite shows over the internet, media networks are relying on high-tech companies to deliver content without interruptions. One company that delivers that service is Fastly, which William Blair helped take public last year. In this issue we spotlight its founder Artur Bergman.

The innovations of these firms and those of many other companies that our analysts cover are reminders of our commitment to staying focused on the long term. While today's unknowns make us anxious they also fuel new discoveries.

William Blair is here to help you and most importantly we are all in this together. Stay healthy and well.

Sincerely,

John Ettelson
President and CEO

William Blair's Biotech Equity Research Head Answers COVID-19 Questions

Given the spread of COVID-19 and the mounting questions about what it means to society, our featured story in this issue of *Client Focus* is a conversation with Tim Lugo. He leads William Blair's biotech equity research team, which is at the center of what COVID-19 means from a health and investment perspective.

Q | Which companies are ramping up or retooling to meet the immediate needs from the spread of COVID-19?

From the testing side Roche and Thermo Fisher are bringing new high-throughput technologies to the market right now, which should open up our capacity for testing exponentially over the next few weeks. Our diagnostics analysts Brian Weinstein and Matt Larew have been following these testing issues very closely and I suggest everyone read William Blair's research product *Backstreets*. It is published every Saturday and digs into the diagnostics and testing side of the U.S. healthcare system.

Q | What companies are on the frontline of developing a COVID-19 vaccine?

A relatively small biotech Moderna has dosed its first patients with its mRNA-based vaccine the week of March 16. This is a relatively modern approach to vaccine development that leverages the known genetic sequence of SARS-CoV-2, the name for the virus which is now referred to as the cause of COVID-19. The short amount of time a company has been able to move from genetic sequence to the dosing of the first patient cannot be overemphasized. It's remarkable. We only had the first patients present to Chinese hospitals with COVID-19 in late December followed by the first U.S. patient in late January. And now we have a promising vaccine candidate. Johnson & Johnson has also nominated a candidate in partnership with the U.S. Department of Health & Human Services which will enter human testing in September.

I also expect a number of other promising candidates from academic centers and the traditional vaccine developers such as GlaxoSmithKline, Sanofi, and Merck to enter their own candidates into the clinic as there is a clear need for multiple candidates in case one of the candidates doesn't look as promising as originally thought. Vaccine development is like all drug development. Every theory needs to be tested and we can't broadly dose people until a candidate is proven safe and effective. However, it sounds like the regulators are fast tracking development of vaccines and antivirals and hopefully even the aggressive estimates of 1-1.5 years can be reached if not exceeded.

> "The World Health Organization lists over 500 trials currently related to COVID-19."
>
> **—Tim Lugo,** head of William Blair's biotech equity research group

“The short amount of time a company has been able to move from genetic sequence to the dosing of the first patient cannot be overemphasized.”

—Tim Lugo, head of William Blair’s biotech equity research group

Antivirals and other therapies that treat the negative effects of COVID-19 are likely to read out data prior to vaccines as measurements of viral reduction occur relatively rapidly and several large trials are already underway. The World Health Organization (WHO) lists over 500 trials currently related to COVID-19. So the effort to combat this disease is broad and significant worldwide.

Q | William Blair has always taken a long-term investment view. With that in mind, how are you thinking about a post-coronavirus environment?

The disruption may be only several months or maybe a year and a half until we see the first vaccines. Taking a longer-term approach is definitely where investor minds should be as all pandemics ultimately pass through the population and end, sometimes after effective public health measures and a relatively measured impact and sometimes with grave consequences and loss of life. I think the rapid response of the biotech industry will lead to a changed perception of the industry, which for the past years had been a lightning rod for drug pricing despite the obvious innovation behind those drug prices.

Q | How could the spread of COVID-19 affect clinical trials, new drug launches, and FDA timelines? What are you watching?

We’ve already seen disruptions to the healthcare system in select hotspots here in the United States and Europe and with those disruptions come clinical trial disruptions. Developers are trying to ship therapies directly to patients instead of requiring hospital visits and we see developers broadly moving toward online patient interactions. This is similar to companies currently launching new medicines. With any disruptions in patient-to-caregiver meetings we also expect the prescribing of new therapies to be negatively impacted. Hopefully for all of us these interruptions are short-lived.

Q | How do you see private/public sectors planning for the next epidemic?

For many structural issues we have under invested in vaccines, antivirals, and next-generation antibiotics. I believe that is set to change dramatically as a result of the ongoing COVID-19 pandemic. Other themes likely to emerge will be the continued utilization of online meeting tools both within healthcare and by most industries. I also expect more scrutiny to supply chains and manufacturing in the future.

Q | What will you be watching most closely as COVID-19 spreads?

As I touched on earlier, timelines are important. We’ll also be watching new infection rates here in the United States like hawks. We’re hopeful to have a leveling off of new infections after a rough few weeks as our testing capacity catches up to the currently undiagnosed cases. So expect some scary headlines in the next few weeks. However, I believe in our industry and the role it will have in bringing new therapies to the market which will help us through these anxious times.

To receive the firm’s research reports, contact your William Blair representative. Visit **williamblair.com/ResearchCoverage** for disclosure information.

Stay-At-Home TV Viewing Adds to Explosive Video Streaming Growth

As we face stay-at-home measures to slow the spread of the coronavirus, it is a reminder of how much we rely on the internet as a social outlet and for entertainment. This has added to what already has been explosive demand of video streaming—sweeping through society in general and the entertainment industry in particular.

Moreover, the streaming giants are not just headed for dominance in delivery of must-see video. They are quickly dominating featured video production itself.

Just look at this year's film nominations. Streaming giant Netflix led all comers with 24 Oscar and 34 Golden Globe nominations, including two original films touted for Best Picture—*The Irishman* and *Marriage Story*. It was a similar story with television.

The Motion Picture Academy of Arts said last year that worldwide subscriptions to streaming services (613 million) for the first time had surpassed traditional cable (556 million).

"It really began in earnest in the 2013 time frame when Netflix released new TV shows like *House of Cards* and *Orange Is the New Black*," says William Blair analyst Ralph Schackart, who specializes in the digital media and internet sector. "People were scratching their heads asking, 'how can a technology company take on Hollywood?' Now we know."

As Americans stay home because of COVID-19, streaming TV hours are up. For the first three weeks of March, the estimated minutes streamed was 400 billion, up 85% compared to March 2019, Nielsen reports.

Streaming services started challenging the status quo in video entertainment in 2007. That's when Netflix began streaming movies and television shows over the internet. Consumers no longer needed to go to the movies or rent DVDs to access film.

By 2013, driven by rising costs for licensing content and by a vision that its long-term growth would hinge on original content, Netflix released those first two television series "over-the-top"—i.e., via the internet and bypassing cable, broadcast, and satellite television. Both were blockbusters.

Today, Netflix leads the industry in original content, spending $15 billion in cash on content in 2019 alone. Last year Netflix released an amazing 195 new shows, more than its top 20 competitors combined, Schackart says. Its biggest content competitor is now another tech company: Amazon.

The "Amazon effect" is already being felt as the online giant creates its own growing stable of popular original television series, including *The Crown*, *The Marvelous Mrs. Maisel*, and *Jack Ryan*. Amazon in 2019 also expanded its international movie library. With its streaming largely free for Amazon Prime customers, its audience is vast.

"It's been the change in viewing habits and video consumption the last couple of years that finally convinced content creators this direct-to-consumer product is a good way to maximize viewership and advertising dollars," says William Blair analyst Jim Breen, who covers the internet infrastructure sector. "Companies that are delivering content have to morph their businesses to align with the consumer."

Media giants get onboard

Legacy media giants like NBCUniversal, Disney, and WarnerMedia—traditional masters of "content"—largely stayed on the sidelines, relying on cable providers to distribute their shows. But they are now playing catch-up, launching new video streaming services of their own content targeted to match.

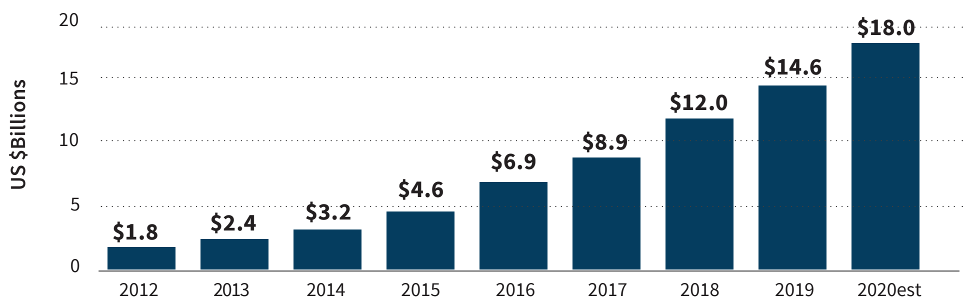
Viewers are watching 17% more video content through internet-connected TV devices in 2019 versus 2018, according to eMarketer research. Additionally, advertising revenues are rising. Market researcher Magna forecast in 2019 that domestic OTT ad revenues to reach $5 billion by 2020, double from their 2018 value.

"More streaming service offerings, such as Apple TV Plus, Disney+, and anticipated launches of NBC's Peacock and WarnerMedia's HBO Max, are likely to push additional consumers through these connected platforms and further drive up viewing hours in the coming years," Schackart says.

"With more than 80% of the market unsubscribed, global demand for streaming services appears healthy and there remains a lot of runway for global growth. That's why you're seeing Disney and these other companies get in the game."

"It's just harder for the traditional TV networks to compete with the technology companies that spend a lot of money on original content," Schackart says. "I don't think they disappear because they have such loveable iconic content like *The Office, Seinfeld, Friends*, there's going to be an audience for that."

Netflix Annual Cash Spent on Original Content



Sources: Netflix and William Blair

A streaming-focused company like Netflix is pouring about two-thirds of its revenues right back into original content where even an iconic brand like Disney faces constraints on resources because of its legacy business models, Schackart says.

"We estimate that in 2020 Netflix is going to spend $18 billion on new shows. By comparison, Disney only has $10 billion of extra cash each year to decide how they want to invest across their whole business—theme parks, cruise ships, TV networks, and so on," he adds.

Cord cutters and "cord nevers"

Driving all this change, of course, is not just the technology. It is a change in the audience. More than 5 billion people worldwide have mobile phones, and over half are smartphones.

"That's the direction we're heading and ultimately it's driven by the consumer," says analyst Breen. "It's the consumer saying to the content provider: 'This is how we're going to take the content from now on. So, you can make us happy and deliver it the way we want it—and we'll pay you for it.'"

The rapid expansion of next generation internet-connected TVs with built-in streaming services and easy access to apps like Netflix, Hulu, and Amazon is also making it easier for consumers to cut their broadcast TV or cable cord.

Roku, the leader in connected TVs with about a third of the U.S. market, saw a 60% year-over-year increase in customer-streaming hours to 11.7 billion, according to the company's Q4 earnings report released in February.

Roku and Amazon Fire TV—each with over 30 million active users—are expanding internationally bringing streaming services to Germany, the United Kingdom, and Brazil.

In August 2019, research company eMarketer predicted nearly 25% of U.S. households will be cord-cutters by 2022.

"That's a pretty staggering figure and likely signals further change in consumer viewing habits with a growing number of 'cord nevers' given the increasing amount of streaming channel choices," says Schackart. "We believe 2020 will again prove to be a strong year for over-the-top video environment," he adds.

Read more onine at williamblair.com/ClientFocus.

Fastly: Delivering Content Over the Internet at Hyperspeed

Artur Bergman
Founder of Fastly

As millions of fans are staying in the comfort of their homes to watch blockbuster TV series or the hottest movie releases, media networks are increasingly relying on high-tech companies to deliver crystal-clear pictures without interruptions.

That viewing quality wouldn't have been possible just a few years ago. One company that is helping deliver that service is Fastly, a "next-generation" edge cloud platform provider.

Fastly went public in May of 2019. William Blair was an underwriter of the shares.

The firm was founded in 2011 in California by Artur Bergman, who then was a web developer at Wikia, the commercial version of Wikipedia. Bergman's breakthrough idea came from understanding how transmitting massive data over the internet relies on actual physical proximity of the local servers to local users.

"At Wikia, a page could be changed anytime by anyone," Bergman told *Client Focus* in an interview. "We needed a solution that when someone changes something we can cache or get rid of the content around the world really fast. The problem was that we couldn't control the content and our customers were waiting 10 minutes, 30 minutes, 2 hours for pages to update."

At the time, the CDN and edge tools Bergman realized he needed to increase speed weren't available. So Bergman developed a solution that included instant purge, programmability, and edge computing. "We dramatically reduced the page load time around the world to 150 milliseconds," Bergman said.

The idea is that you don't want to stream a video, data package, or update web pages through the entire expanse of the internet. Instead, Fastly places its servers at high-density connection points, where those of telecom networks (internet service providers or ISPs) like Verizon, Comcast, or AT&T also live. Fastly caches the valuable content from its customer sources, then moves the data to the servers co-located at the ISPs so the content is delivered lightning-fast straight to the end-user.

Revenue doubled since 2017

The success of that idea has helped drive Fastly's revenue growth, which roughly doubled from $104.9 million in 2017 to $200 million in 2019. Fastly, based in San Francisco with additional offices in Portland, Denver, New York, London and Tokyo, has nearly 600 employees worldwide.

"If you think about the web 20 years ago, there were pictures, some words," said William Blair technology analyst Jonathan Ho. "But today there's real-time bidding for ads, there's analytics, personalization of content…that can slow down the experience as a user if you're not using the right type of CDN."

"So Fastly architected themselves for the kinds of shifts that have happened over that 20-year period. We think that could help them be disruptive in the edge cloud market," Ho adds.

Leadership changes aim at growth

In February Fastly announced leadership changes. Bergman relinquished the CEO role to become chief architect and executive chairperson. Joshua Bixby, who had been president, was named CEO.

"It was natural transition for Joshua so he can do the things that he is really good at and passionate about and I can do the same," said Bergman, who said he will be focusing on the company's edge compute technology and security products.

Read more onine at williamblair.com/ClientFocus.

Coronavirus Federal Tax Relief Details

In response to the spread of the coronavirus, the federal government has approved a $2 trillion-plus stimulus plan, referred to as the CARES Act, and extended deadlines for tax filing and payments. Here is a summary of the latest changes and important dates to remember:

Tax Filing and Payment Extensions

- Federal income tax filings and payments are now due July 15 extended from April 15 for individuals, trusts, and corporations.
- First quarter 2020 estimated tax payments are also due July 15. Relief does not apply to second-quarter estimates which are still due June 15.
- Federal gift tax returns and payments are extended to July 15.
- Deadline for 2019 IRA and health savings account (HSA) contributions is July 15.

Several states have followed the federal extensions. Check your state tax agency for details.

CARES Act

2020 economic impact payments. These are a refundable income tax credit against 2020 income of up to $2,400 for married couples filing a joint return and $1,200 for single filers. Check the IRS for additional details.

Required minimum distributions (RMDs) waived for 2020. RMDs for owners and beneficiaries of retirement plans have been eliminated for 2020. RMDs for individuals who turned 70 ½ in 2019 but deferred their first distribution to 2020 are also waived.

Additional retirement plan benefits.

- The 10% early distribution penalty on up to $100,000 of 2020 distributions from IRAs and company plans for coronavirus-affected individuals* is waived.
- Distributions from employer-provided plans are not subject to required federal withholding of at least 20%.
- 401(k) loan limit is increased to $100,000 from $50,000.

*As defined by the CARES Act

Enhanced charitable deduction. The act eliminates the adjusted gross income limitation (previously 60%) on cash charitable deductions. Individuals may deduct cash of up to 100% of their adjusted gross income in 2020. The act also provides up to a $300 cash charitable deduction for those who do not itemize deductions.

Enhanced net operating loss (NOL) use. NOLs incurred in 2018-2020 can now be carried back up to five taxable years. Also, up to 100% of taxable income in 2018-2020 can be offset by NOLs. Previously, NOLs could offset only up to 80% of taxable income in 2018-2020.

If you have questions about how the new rules affect you, please contact your William Blair representative.

This information has been prepared for informational purposes and is not intended to provide, nor should it be relied on for, accounting, legal tax, or investment advice. Please consult with your tax and/or legal advisor regarding your individual circumstances.

Read more online at **williamblair.com/ClientFocus.**