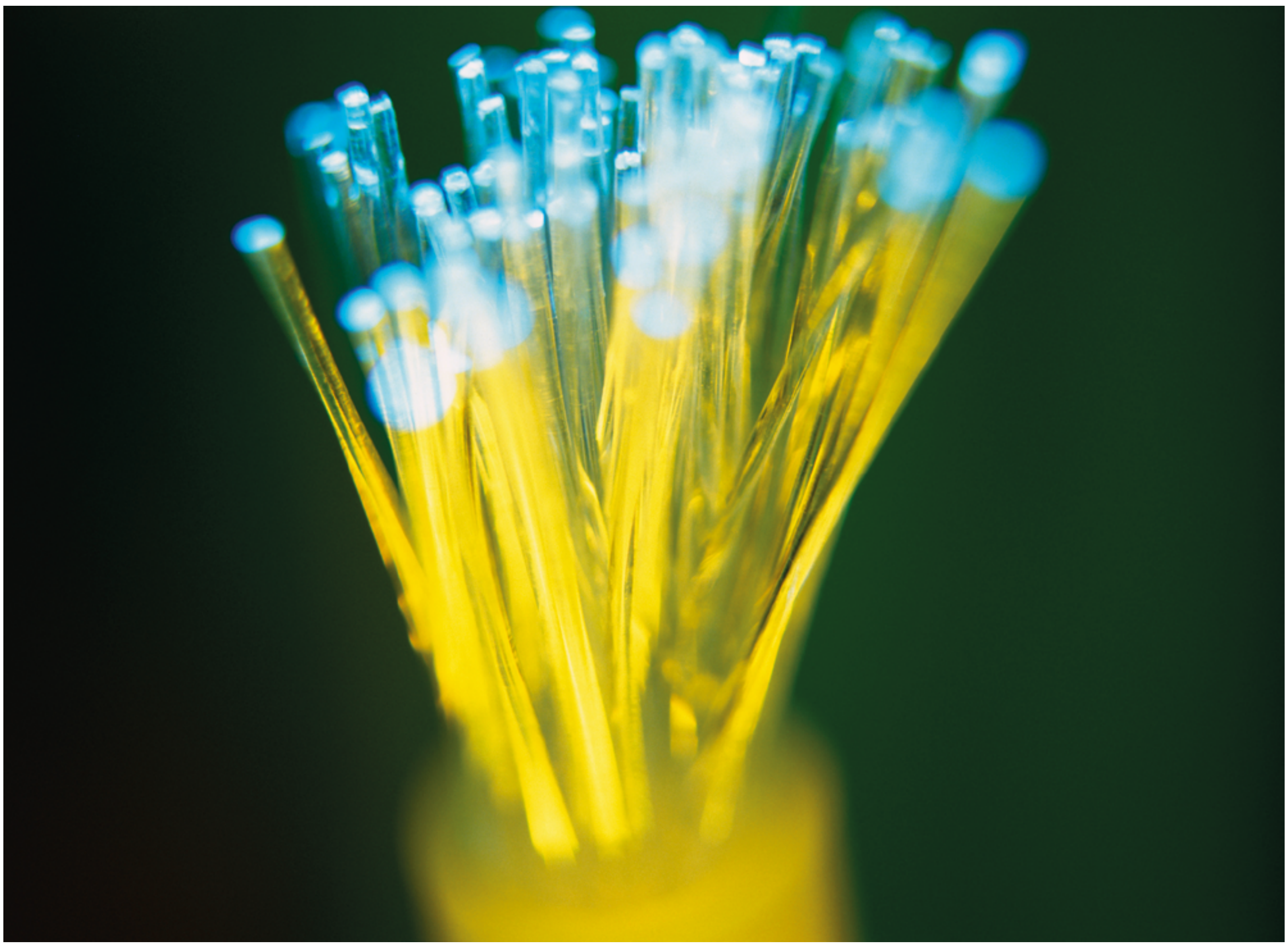
INVESTOR REPORT

JAN - APR 2019 IP-Participações



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PORTFOLIO

The main positive contributions in the first four months of 2019 came from our investments in Apple (+28% in the period), Berkshire Hathaway (+6%), Alphabet (+15%), Facebook (+47%), Bank of America (+25%), Charter (+30%) and B3 (+29%). There were no relevant negative contributions in the period.

The past few months have provided further proof that an excessive emphasis on macroeconomic issues can be highly detrimental to equity investments.

At the end of last year, the consensus among market forecasters was that the Fed would be forced to raise interest rates as the U.S. economic cycle approached its final stages, likely leading to an imminent recession. Economies and markets, however, are reflexive and adaptive systems. Once the Fed threatened a sharper rise in interest rates, market liquidity declined, asset prices dropped, as did corporate and consumer expectations, and, with that, the Fed took a step back and practically ruled out further interest rate hikes in 2019. As a result, the S&P 500 closed April with a cumulative increase of 18% year-over-year.

In Brazil, the consensus at the beginning of the year was that a comprehensive pension reform would be easily approved and the country would begin a longer-lasting growth cycle. The working theory was that the country could not afford to delay the reform's approval, and thus it would inevitably pass through Congress. Asset prices soon reflected a more optimistic outlook and, once again, reflexivity kicked in: with calmer markets and a more harmonious business environment, Brasília felt no pressure to make any moves, and thus did nothing. Lobbying groups contrary to the reform — together with the political establishment — created obstacles for the executive branch, and the hopeful consensus was quickly overshadowed by Brazil's political reality. The lack of urgency with which Brasília dealt with the reform became increasingly clear, and after yet another government threat to interfere in the pricing policy of state-owned companies, market prices corrected to less euphoric levels. The Ibovespa index declined about 8% from its peak, closing April with a cumulative high of 9.6% in the year. In Brazil, one can never be totally sure what will happen, but it is usually safe to expect some turmoil.

At the end of last year, we mentioned that we were finding attractive opportunities to deploy our capital during the U.S. market drawdown. Despite acknowledging the macroeconomic concerns, our sole focus was on the growing disparity between the intrinsic value of a few businesses and their sharply declining share prices. This quarter, the political turbulence in Brazil created similar distortions.

Accordingly, we increased some of our local investments after the recent declines in the Brazilian market. Overall, however, we still believe that market participants pay upfront for a robust growth in economic activity and in corporate results. If a more definitive solution to Brazil's pension problem is postponed, will the country be able to attract the long-term investments it greatly needs? Will the economy enter into the virtuous cycle that projections at current valuations seem to imply? To us, these are still open questions.

Whether in the American or Brazilian market, we will continue to tune out macroeconomic concerns and focus on continually improving our understanding of the remarkable collection of businesses we study and invest in.

In the following section, we discuss one of these businesses in greater depth: Charter Communications.

CABLE

Our first investment in the cable industry was in 2014, when we invested in Liberty Global[1], the largest cable TV and broadband internet provider in Europe. Over time, however, we grew increasingly concerned with the competitive environment and the level of regulatory interference in the European market.

There are notable differences between the European and U.S. markets. The United States, with the Telecommunications Act of 1996, has adopted a facilities-based regulatory framework, where service providers have full ownership of their networks and, therefore, have the incentive to reinvest in infrastructure to remain competitive. European regulators have increasingly adopted a different approach, requiring incumbent operators to lease access to competitors who want to connect to their networks at wholesale rates. This results in markets with tighter margins and incumbents with lower incentives to invest in network upgrades.

Another important difference between both markets is that the average U.S. broadband consumer is far more data-hungry than his European counterpart. Average usage per household in Europe stood at 168 GB per month in 2018[2]. In the U.S., the average consumption was 269 GB per month – 60% higher.

Over time, it became clear that the U.S. offered more attractive conditions for an investment in cable infrastructure: more favorable regulation, more rational competition, increased demand and higher prices.

"If speed is the killer, then speed will be a cable asset."
– John Malone

[1] As discussed in our report for the first quarter of 2015.
[2] According to OpenVault data available at http://openvault.com/openvault-broad-based-broadband-usage-acceleration-across-europe-and-us-in-2018-1tb-power-users-double/

In the U.S. broadband market, cable providers compete with telco operators such as AT&T, Verizon and T-Mobile. There is almost no competitive overlap between two cable companies since the extremely high initial investments required to build a network make it incredibly challenging for a competitor to earn an acceptable rate of return should he decide to overbuild an already serviced region.

Cable operators have a huge infrastructure advantage to compete with telcos: their hybrid network architecture, which uses fiber optics for large distances and coaxial cables for last mile connections, can deliver much higher speeds than competitors, which, with some exceptions, usually still rely on old twisted copper wires to reach households.

In addition to this physical advantage, the technological cooperation that exists between cable operators further amplifies their competitive advantage over telco companies. CableLabs, a non-profit organization that counts more than 60 cable companies in 5 continents as members, is the greatest example of this collaborative culture, functioning as a huge shared research and development lab for most of the industry.

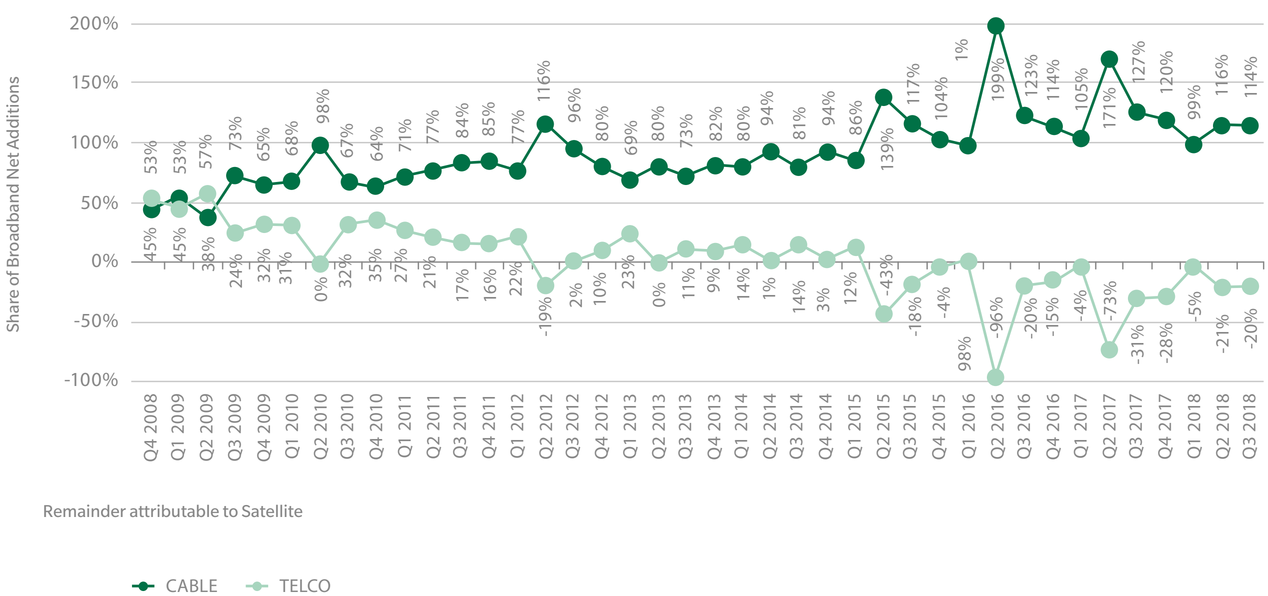
CableLabs' main contribution is the DOCSIS[3] standard. In short, DOCSIS is a protocol for transmitting high-bandwidth data over a coaxial network. Its latest iteration, DOCSIS 3.1, is designed to deliver speeds of up to 1 gigabit per second. The next upgrade[4] will allow download and upload speeds of up to 10 gigabits per second, while the marginal investment required will be much lower than what telcos would have to spend to deliver similar results.

In approximately 70% of the market, cable competes with lesser technologies that run over telephone lines, such as DSL, which provides speeds of 1 to 10 Mbps, and its slightly better variations, DSLAM (15 to 20 Mbps) and VDSL (15 to 100 Mbps). Despite the confusing nomenclature, the conclusion is rather simple: none of these technologies offer real competition to cable.

This superior infrastructure translates into secular gains in market share from telcos: cable operators have been taking share annually since 2008. In the past few years, cable has captured more than 100% of the marginal growth of broadband subscribers in the U.S. market[5]:

[3] Acronym for *Data Over Cable Service Interface Specification*.
[4] Known as DOCIS 3.1 Full Duplex.
[5] In aggregate, telcos had a net loss of subscribers in the period and, therefore, cable additions exceeded the market's total.

SHARE OF QUARTERLY BROADBAND NET ADDITIONS



Source: Company Reports, MoffettNathanson estimates and analysis.

In addition to a more robust infrastructure, cable has a major cost advantage to meet the growing demand for broadband. For a telco to compete on equal terms it needs to replace its copper cables with fiber, an arduous and extremely expensive process. Estimates of the total cost of connecting a household with fiber range from US$1,000 to over US$4,000 depending on expected penetration assumptions.

In contrast, cable companies recently spent only US$9 per household to rollout the DOCSIS 3.1 standard across their footprint and provide connection speeds that are comparable to fiber.

In short, cable is the only infrastructure that can deliver increasing internet connection speeds at a limited marginal cost. We expect market share gains to continue for quite some time.

CHARTER COMMUNICATIONS

One takeaway from our European adventure was left unchanged: our admiration for John Malone and his deep knowledge of the cable business. Malone was the first operator in the industry to realize, in the 70s, that cable assets had the potential to become real cash flow machines. During his 25 years at TCI, Malone transformed the company into the largest cable system in the United States generating a return of 30% p.a. for its shareholders versus the S&P's 14%[6].

In 2013 Malone bought a relevant stake in Charter[7], which at the time was the fourth largest broadband internet and TV provider in the country. The investment was, to a large extent, a bet on Tom Rutledge, the company's newly appointed CEO and one of the best operators in the industry's history.

With over 40 years of experience, Rutledge is widely held as the main factor in turning Cablevision (bought by Altice USA in 2016) into the most profitable cable company in the country. In December 2011, he stepped down as COO to take the helm at Charter. The strategy was simple: Tom would invest in infrastructure, streamline product and packaging and improve the customer service process to drive penetration gains within the company's footprint.

In 2013, execution was going according to plan: after the operational reorganization, growth had accelerated and the company was starting to demonstrate the operating leverage that a business with practically no variable costs possesses. Rutledge, however, as an authentic Malone disciple, remained keenly alert to potential consolidation opportunities.

In 2014, Charter announced it was merging with Time Warner Cable, a company Rutledge had presided over in 2001. As the icing on the cake, Charter also acquired Bright House Networks, a regional operator with a strong presence in Florida and over 2 million customers.

One cannot criticize the company for a lack of ambition. Charter quadrupled its size with the two transactions, going from 4 to 17 million TV subscribers and from 5 to 19 million broadband subscribers and becoming the second largest operator in the country.

"I call investing the greatest business in the world … because you never have to swing. You stand at the plate, the pitcher throws you General Motors at 47! U.S. Steel at 39! and nobody calls a strike on you. There's no penalty except opportunity lost. All day you wait for the pitch you like; then when the fielders are asleep, you step up and hit it."

– Warren Buffett

Though we admired and closely monitored the company, we waited for a more asymmetric opportunity to build a significant position in the fund. This opportunity came in the beginning of 2018.

From September 2017 to April 2018, Charter shares fell 35% from US$400 to US$260. A few factors help explain this sharp decline. First, rumors about the potential acquisition of Charter by players like Verizon, Altice and Softbank, which had contributed to a significant

[6] John Malone's story is further detailed in our report for the first quarter of 2015.
[7] Through his holding company Liberty Media.

advance in the previous months, had cooled. Secondly, the merger integration process pressured expenses and, contrary to most investors' expectations, kept the capital intensity of the business at rather elevated levels, with over 20% of revenue being spent on capital expenditures, to the detriment of near-term cash generation. However, most of the attention was given to the growing losses of TV subscribers, which had been dropping at a rate of 2% p.a. as more video customers decided to cut the cord.

At first glance, the loss of a TV subscriber sounds alarming. When a Charter subscriber decides to cancel his or her TV package, the company immediately loses around US$90 per month in subscription revenue and US$10 per month in advertising revenue. Together, these represent approximately 45% of the company's total revenue. With a leveraged balance sheet and a continually declining subscriber base, it isn't surprising that many investors thought cord-cutting would represent a significant driver of value destruction for the business.

Our analysis indicated a less worrisome scenario. Despite taking the blame for the exorbitant TV bundle prices[8], the truth is that, after decades of content inflation, the margins distributors like Charter extract from pay TV had been eroding for a long time. When incorporating savings from programming costs, paid by Charter to television networks according to the number of subscribers, the impact of a cord-cutter on the company's cash flow drops from US$100 to US$40.

In addition, video is more capital intensive[9] and generates higher customer service expenses[10] — we estimate that Charter saves an additional US$15 per cancellation with these costs. Furthermore, another important element is that when subscribers cancel their TV service, they forfeit their bundled discount and therefore pay more for broadband. This contributes a further US$10 per subscriber.

The combination of all these factors leads us to an important conclusion: <u>the loss of a TV subscriber causes an almost irrelevant impact to Charter's cash flow</u>. Considering the cases where cord-cutters opt for higher speed tiers (after all, they might want faster internet to watch services like Netflix) the loss of a TV subscriber, in some instances, can even be accretive to free cash flow.

Investors' concerns with the capital intensity of the business also seemed excessive. The temporary heavy investments would result in important advances for the integration process. These included the replacement of outdated set-top boxes in most of the acquired units, the highly complex integration of billing structures, the insourcing of call center operations and investments required for the implementation of the new DOCSIS protocol. Fundamentally, the company was repeating Tom Rutledge's playbook — but on a scale four times greater.

[8] We discussed this issue in our report for the first quarter of 2017.
[9] Customer premise equipment, of which set-top boxes are the main component, is the main category of capex spend in the industry.
[10] Service calls and truck rolls related to the TV service, for example, are 2-3x more frequent than those related to the internet service.

Those who had followed Rutledge's trajectory in the industry knew the script: in the short term, higher spending, higher investments and temporarily depressed revenues due to the price equalization between acquired customers. In the long term, however, Charter would have higher service levels, more capacity for the internet product, lower customer churn and a more profitable business. We would have done the same.

We started a position in the fund in April 2018, at an average price of $270. We estimated a high probability of attractive returns at this price level, but recognized that the investment faced meaningful risks. We discuss some of them below:

- **Leverage:** We have always been reluctant to invest in leveraged businesses and Charter has a net debt/EBITDA ratio of almost 4.5x. We closely monitor this risk, which limits the maximum exposure we are willing to have in the fund. However, we believe it is mitigated by certain factors, the most important of which is the business' incredibly high predictability of free cash flow generation. We estimate that over 90% of Charter's cash generation is attributable to broadband internet, one of the most essential services in the modern world, which has seen over 30% usage growth for decades and for which there is limited effective competition. In addition to providing financial stability, Charter's competitive position also enables significant pricing power and a great deal of discretion regarding the timing of investments, which increases the company's flexibility to respond to eventual shocks in the credit markets. Finally, the company pays very reasonable rates on long-term, predominantly fixed-interest debt[11].

- **Regulation:** The possibility of regulation ultimately restricting the company's pricing power is probably the main long-term risk our investment faces. In our view, the U.S. regulatory model of reduced intervention has proved the most effective in equalizing incentives between operators and consumers. The Trump administration, by appointing Ajit Pai as chairman of the FCC, took a further step in this *laissez faire*[12] direction. It is also worth noting that, even in previous administrations with a greater interventionist bias, such as during President Obama's mandate, there were no particularly concerning interferences. Still, the essential nature of the service and the inherent unpredictability of political cycles justifies constant monitoring of this important risk.

- **Fixed Wireless:** A discussion that is gaining traction in the industry is the possibility that telcos, with the advent of 5G, might be able to offer a residential broadband service through their own mobile networks known as fixed

[11] Average cost of debt = 5.2% p.a.; Average maturity = 10.9 years; 83% of the debt is fixed.
[12] An emblematic example was the repeal of the regulatory framework known as "Title II", which allowed greater oversight over internet service providers to the FCC.

wireless broadband. If operationally possible and economically feasible, it might mean a relevant new competitive risk. Nonetheless, despite the growing focus on this theme, we are skeptical about the risk that fixed wireless technology poses to cable operators. There is an inescapable trade-off to consider when discussing data transmission via electromagnetic waves: the higher the speed, the shorter the range. Since higher speeds demand higher spectrum frequencies, which are inversely proportional to the distance over which a wireless signal will travel, range is invariably compromised. Covering continental distances with high-speed mobile internet requires an exponentially denser network, as well as a fixed infrastructure to backhaul an increasingly large amount of data. In the end, the return profile of this type of investment is very similar to that of a traditional cable overbuild. It doesn't surprise us that, despite the persistent marketing of some telco operators, others (such as AT&T) have publicly questioned the economic rationale of this endeavor.

In conclusion, we believe that Charter unites several characteristics we look for in an investment:

- **Monopoly power:** There is limited effective competition to Charter's infrastructure.

- **Operating leverage:** The marginal cost of serving an additional broadband customer is close to zero. Penetration gains generate very high marginal returns.

- **Product superiority:** DSL is slow, fiber is expensive. Cable is fast and cheap.

- **Low technological risk:** Cable's infrastructure advantage is based on physics, not technology.

- **Predictable demand:** Global demand for broadband has been growing exponentially for decades.

- **Untapped pricing power:** The immense customer value of the service, coupled with limited competition, leads to significant pricing power.

- **Outstanding leadership:** Tom Rutledge has the best operating track record in the cable sector. John Malone is the best capital allocator in the industry's history.

- **Attractive valuation:** We paid slightly less than 7x our estimated free cash flow per share 3 years from now.

MISCELLANEOUS

"I want my trillion."
— Paulo Guedes (referring to the possible annual savings from the pension reform bill)

"The stock market has forecast nine of the last five recessions".
— Paul Samuelson

"It is said that the truest mark of bravery is to challenge the practices that made you rich."
—John Kador, author of the book Charles Schwab: How One Company Beat Wall Street and Reinvented the Brokerage Industry

"Today I challenge our top retail competitors (you know who you are!) to match our employee benefits and our $15 minimum wage. Do it! Better yet, go to $16 and throw the gauntlet back at us".
— Jeff Bezos

"You can't have real 5G without real fiber. It's like saying, 'All I need is an airplane. I don't need an airport'. The airplane has to land somewhere."
— Susan Crawford

"In businesses that are valued by present-day cash generation, it's entirely a function of what you believe long-term interest rates are going to be. If you think long-term interest rates are going to be high because of inflation, that's always been kind to our type of industry, because our cost structure is largely fixed. Inflation lets you raise your rates and devalue your liabilities."

— John Malone.

"I have said in an inflationary world that a toll bridge would be a great thing to own if it was unregulated… you have laid out the capital costs. You build the bridge in old dollars and you don't have to keep replacing it."

— Warren Buffett.

"Forget about earnings. That's a priesthood of the accounting profession," (...). "What you're really after is appreciating assets. You want to own as much of that asset as you can; then you want to finance it as efficiently as possible."

— John Malone

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