TECHNOLOGY BUSINESS RESEARCH, INC.

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TOP 3 PREDICTIONS FOR TELECOM IN 2023

Telecom industry will face an unprecedented level of uncertainty and risk in 2023

TECHNOLOGY BUSINESS RESEARCH *2023 PREDICTIONS* IS A SPECIAL SERIES EXAMINING MARKET TRENDS AND BUSINESS CHANGES IN KEY MARKETS.

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COMMUNICATION SERVICE PROVIDERS FACE A CONFLUENCE OF HEADWINDS IN 2023

2023 will likely be one of the most uncertain and challenging periods in the telecom industry's history. A confluence of negative shocks will concurrently impact the industry next year, with telcos and cablecos bearing the brunt of the impact and vendors suffering knock-on effects.

The challenges communication service providers (CSPs) face are large in magnitude, broad in scope and occurring simultaneously. They include the following:

- **Rising interest rates:** After more than a decade of unprecedented low interest rates — thanks to key central banks' quantitative easing (QE) strategies, which were originally enacted to combat the global financial crisis of 2008-2009 — CSPs now face rapidly rising interest rates as central banks aggressively pivot to quantitative tightening (QT) to combat inflation. This reversion of interest rates portends challenges for the telecom industry due to record leverage in the sector.
- **Inflation:** General price increases across the global economy pose a risk to CSPs' input costs, especially around labor and energy. Average revenue per user (ARPU) is struggling to keep pace and new revenue sources remain elusive, squeezing CSPs' margins.
- **Lack of 5G ROI:** Despite spending several hundred billion dollars in aggregate thus far on spectrum and infrastructure for 5G, there remains no clear path to ROI for CSPs, further deteriorating CSPs' business fundamentals.
- **Technological complexity:** New technologies and architectures (e.g., open vRAN and network slicing) are proving to be more complex and expensive to deploy than originally anticipated, posing a business risk and hindering CSPs from evolving into digital service providers.
- **Energy costs:** Supply shortages and rising energy costs pose a risk to the ability to run telecom equipment and are likely to impact CSPs' margins as energy is one of the largest components of CSPs' opex.
- **Supply chain disruption:** Sourcing parts remains a challenge, delaying the timing of infrastructure deployment and fueling inflation. Talent remains in short supply and is expensive, especially for new skills that are required for digital transformation. In addition, the worsening geopolitical environment and continued COVID-19 lockdowns in China threaten to create new and persistent supply chain bottlenecks.
- **New competitors:** Especially hyperscalers, which are capturing new value created from key enablement technologies, including 5G, multi-access edge computing (MEC) and AI and machine learning (ML), as well as upending the traditional connectivity business model
- **Labor strikes:** Strikes are likely to occur as unionized labor rallies for wages that keep pace with inflation. Strikes pose a risk to CSP operations and margins; TBR notes this issue mostly impacts CSPs in the U.S. and Europe, where unions in the telecom industry are most prevalent.
- **Economic recession:** The global slowdown that began in 2H22 (mostly driven by QT) is highly likely to morph into a global recession in 2023, portending adverse demand-side impacts for CSPs and their vendors. Bad debts are likely to increase, and consumers and businesses are likely to optimize the telecom services they purchase.

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The impact of these challenges will be partially mitigated by government stimulus (much of which was greenlighted during the COVID-19 pandemic), which continues to directly and indirectly power the global economy (e.g., subsidize capex, support low-income households, backstop consumer and corporate credit markets), though the impact of the economic support is waning.

TBR's convictions that the telecom industry will look very different by the end of this decade continue to strengthen, with current events laying the groundwork for structural changes in the composition of the telecom industry and the business model for connectivity. Economic gyrations and other challenges have a history of driving significant changes in the market, at a broader scope and much faster pace than what occurs during stable market conditions. The current situation will prove no different.

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PREDICTIONS

GLOBAL TELECOM INDUSTRY ENTERS RATIONALIZATION PHASE

Trend: Telecom industry participants will be forced to make tough financial decisions to mitigate macroeconomic and sector-specific headwinds.

Drivers: Rising interest rates, inflation and economic recession

Result: The telecom industry will ultimately adjust to the new normal market environment.

TBR expects global financial market and business conditions to deteriorate significantly in 2023, with the telecom industry likely to be among the hardest-hit sectors due to structurally high leverage and weakening business fundamentals. CSPs and vendors will be forced to adjust to the adverse market environment and will lead to a variety of outcomes at an increasing frequency over the next few years. These outcomes will include:

- **M&A:** Another round of consolidation leaves the market with fewer, but larger and relatively stronger, CSPs and vendors.
- **Asset sales (aka divestitures):** Towers, other types of real estate, legacy businesses; valuations are likely to drop, and there will likely be some fire sales to clear assets. TBR notes that many CSPs worldwide have already mined their asset bases over the past two decades, evident in tower sale-leasebacks and real estate sales, leaving fewer monetizable items to sell in a potential liquidity crunch.
- **Capex cuts:** Most CSPs are expected to either keep capex flat or reduce capex in 2023. Capex is among the easiest things for CSPs to manipulate, and it is common for CSPs to quickly adjust capex to align with market realities.
- **Share repurchase reductions:** Changing share repurchase initiatives is one of the easiest and fastest ways to free up capital.
- **Dividend cuts:** AT&T recently reduced its dividend by over 40%, and Lumen completely cut its dividend. Dividends are not as easy to cut as capex and share buybacks; companies will only reduce dividends if they are under significant financial pressure to free up capital.
- **Recapitalizations:** Equity raises, white knights, private equity involvement to improve balance sheets

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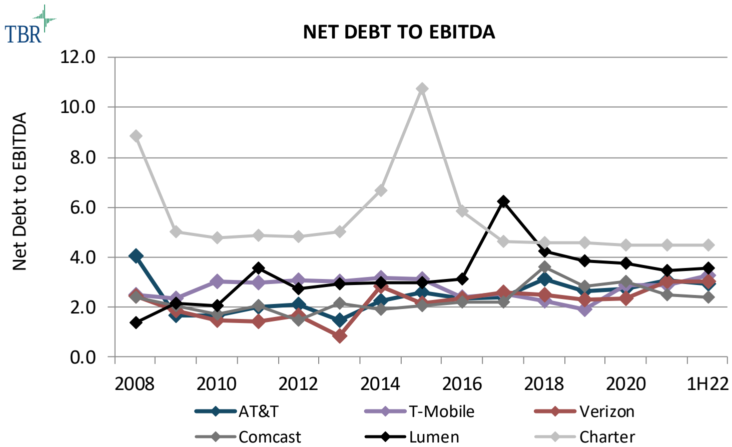
- **Bankruptcies:** Many CSPs and vendors are at a high risk of falling into bankruptcy (either reorganizations or liquidations) in various parts of the world, such as Starry in the U.S. and Vodafone Idea in India.

- **Restructurings:** Companies will implement internal cost-cutting initiatives to realign their cost structures with market realities (e.g., Verizon's recently announced cost savings plan aims to reduce annual expenditure by between $2 billion and $3 billion by 2025).

The financial market adjustment that will play out on a broad scope in 2023 will be a multiyear trend, meaning CSPs are at the beginning of a multiyear asset rationalization. At a high level, these outcomes will be driven by a need to deleverage balance sheets, protect margins and improve cash flow. TBR notes that this will be a global trend, but that the relative impact on a regional and country level will vary.

Generally, companies with relatively weak balance sheets and deteriorating business performance are especially vulnerable to asset-clearing events, whereby M&A, capital infusions from white knights, bankruptcies or major restructurings are implemented. Government nationalizations are also expected to be in play as governments aim to protect jobs and national security interests. Government involvement in the telecom industry will increase, especially in Europe, where the magnitude of economic and other disruptive challenges is poised to be the most acute. Europe is largely unprepared for handling the concurrent shocks it faces.

Meanwhile, CSPs with relatively stronger financial positions are more likely to reduce capex, cut dividends, and implement restructuring programs to rein in costs and continue servicing and paying down debt. Relatively stronger CSPs are also expected to participate in consolidation and emerge as more resilient entities.



SOURCE: TBR AND COMPANY DATA

Using the U.S. market as a proxy, CSPs generally increased leverage (expressed as net debt to EBITDA) since the Federal Reserve began its QE strategy during the global financial crisis of 2008-2009. Specifically, Tier 1 U.S. CSP leverage ratios increased from an average of 2.52x in 2009 to an average of 3.28x as of 1H22.

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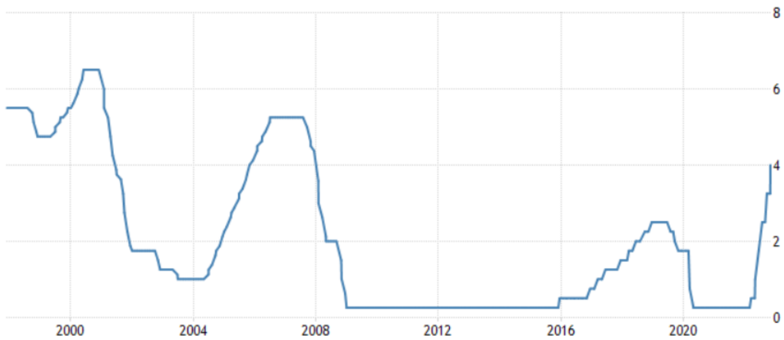
U.S. Fed Funds Rate Over Past 25 Years



SOURCE: TRADINGECONOMICS.COM AND FEDERAL RESERVE DATA

With interest rates rising and business conditions worsening across most of the world, CSPs and the broader telecom industry will ultimately have to contend with these ramifications. TBR notes that CSP leverage ratios in most other key countries are significantly higher than leverage ratios in the U.S., portending more significant structural adjustments will be necessary to bring the global telecom market back into balance.

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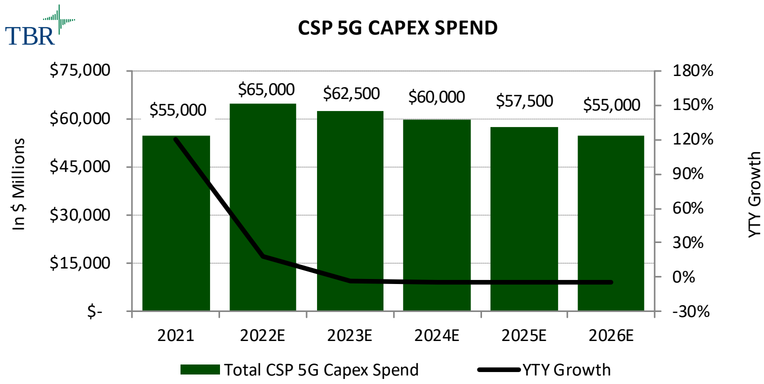
CSP INVESTMENT IN 5G INFRASTRUCTURE ENTERS POST-PEAK PHASE

Trend: Global CSP investment in 5G infrastructure enters post-peak stage.

Driver: Major countries completed bulk of 5G rollouts after unprecedented pull forward of demand in 2022; late adopter countries will deploy 5G more gradually.

Result: Telecom vendors face weaker sales environment.

CSP spend on 5G infrastructure will be post-peak in key major countries, specifically the U.S., China, Japan and South Korea, in 2023 after an unprecedented pull forward in demand during the pandemic. Most CSPs in Europe and developing markets (most notably India) still need to go through their 5G investment cycles, but the spend magnitude will be at a lower level in aggregate compared to the investments made in the key post-peak countries, resulting in a net decline in global spend.



Note: CSP 5G capex spend includes 3GPP standards-based 5G RAN and 5G core, as well as capitalized services attached to this infrastructure, such as deployment, maintenance and professional services.
SOURCE: TBR ESTIMATES

Entering the post-peak phase of the 5G market portends challenges for the vendor community, which is dependent on revenue from new technologies to more than offset reductions in spend on legacy infrastructure to enable continued growth. Additionally, the 5G cycle has not played out as originally anticipated, with many CSPs proving reluctant to invest in 5G standalone (SA) and open vRAN due to high costs and uncertain ROI.

CSPs will continue investing in 5G infrastructure, but LTE will remain the coverage backbone (and mobile core anchor for most CSPs under the non-standalone (NSA) architecture), at least until the ROI to justify broader 5G spend comes into focus.

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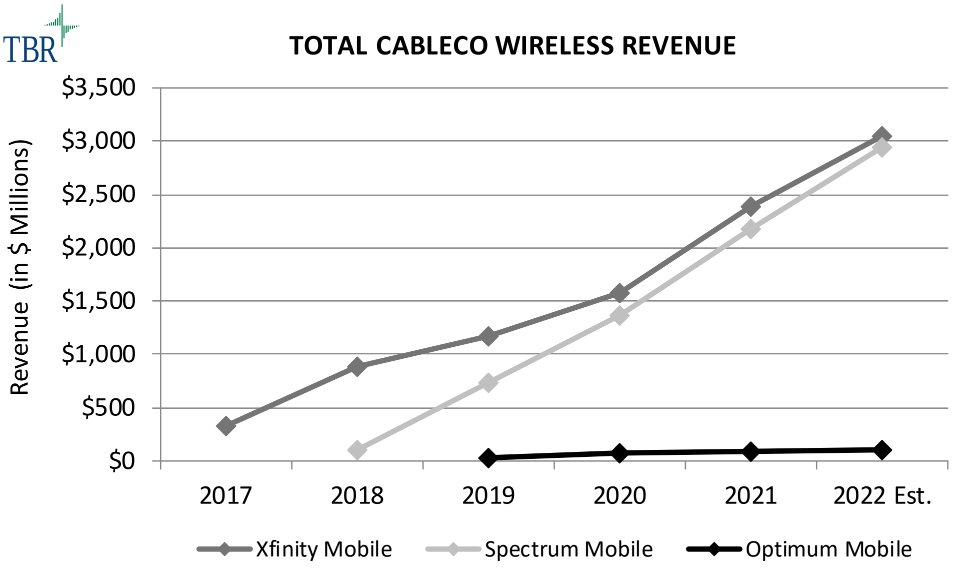
CABLECOs BUILD OUT THEIR OWN CELLULAR NETWORKS IN THE U.S.

Trend: U.S.-based cablecos start building out their own cellular networks.

Driver: Cablecos' wireless businesses are growing rapidly, justifying the network investment.

Result: Cablecos will compete more broadly against telcos in the U.S. wireless market.

Despite the adverse economic climate, leading U.S.-based cablecos are expected to expand commercial deployments of their cellular networks in 2023 after building small-scale sites for trial and offload purposes in 2022. Cablecos — specifically Comcast and Charter, but also potentially Altice to a lesser extent — have been leveraging Verizon's network (Altice uses T-Mobile) to carry their mobile traffic via an mobile virtual network operator (MVNO) agreement signed in 2011 when the cablecos sold licensed spectrum (via the SpectrumCo entity) to Verizon. Since that time, U.S. cablecos' wireless businesses have proliferated, amassing nearly 9.9 million subscribers total and accounting for 2.1% of total U.S. wireless market revenue as of September 2022. The strategic nature and robust growth profile of cablecos' wireless businesses have justified this investment in cellular network infrastructure.



SOURCE: TBR AND COMPANY DATA

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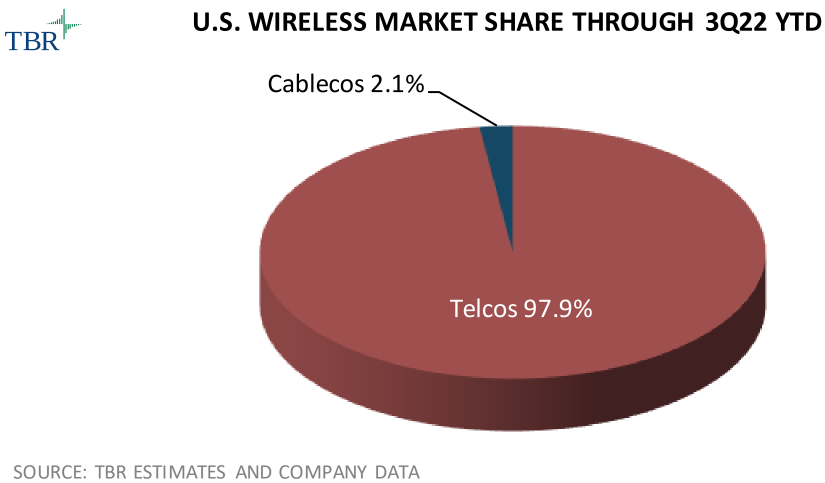

Note: Wireless market share depicted in the pie chart above is based on telco and cableco wireless revenue.

Comcast initially plans to use 600MHz and CBRS spectrum for its fledgling cellular network, with the potential to layer on new spectrum bands over time. The details of Charter's cellular network are currently undisclosed but are expected to be similar to Comcast's approach, which construction beginning in 2023.

Cablecos will continue to leverage their MVNO partnerships for roaming and capacity augmentation, but over time it is likely they will continue to expand the scope of their own cellular networks.

Cablecos' increasing encroachment into the wireless domain represents another challenge for telcos, especially AT&T, Verizon, and smaller-scale players such as UScellular and C Spire, which are especially vulnerable to share erosion by more value-oriented disruptors. T-Mobile is likely to be largely unscathed by the cable threat, owing to the company's strong value proposition.

Cablecos will increasingly tie their wireless offerings with high-speed internet and linear TV offerings to reduce churn and dissuade their more lucrative internet subscribers from defecting to telcos, some of which are wielding price-competitive fixed-wireless access (FWA) offerings.

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