



BDO's 2022 Telecommunications Risk Factor Survey

The wave of opportunity: growing risks
for greater benefits

INTRODUCTION

Telecoms are experiencing unprecedented demand for their services. At the same time, new challenges are appearing with unprecedented speed.

The capital expenditure needed to build out network infrastructure for 5G is a prime example. On one hand, 5G opens possibilities for delivering new products and services. On the other, the vast expenses create economic risks across the board – doubly so during times of increased macroeconomic uncertainty.

Simultaneously, telecoms see competition appearing from angles which would, until recently, have been borderline unthinkable, for example, Elon Musk’s StarLink internet service provider, but many other companies are leveraging cloud and satellite networks to offer communication solutions.

BDO’s 2022 Telecommunications Risk Factor Survey explores how telecoms across the globe view the risk landscape facing them. It charts how the view of specific risks has evolved, and what strategies and initiatives may mitigate said risks.



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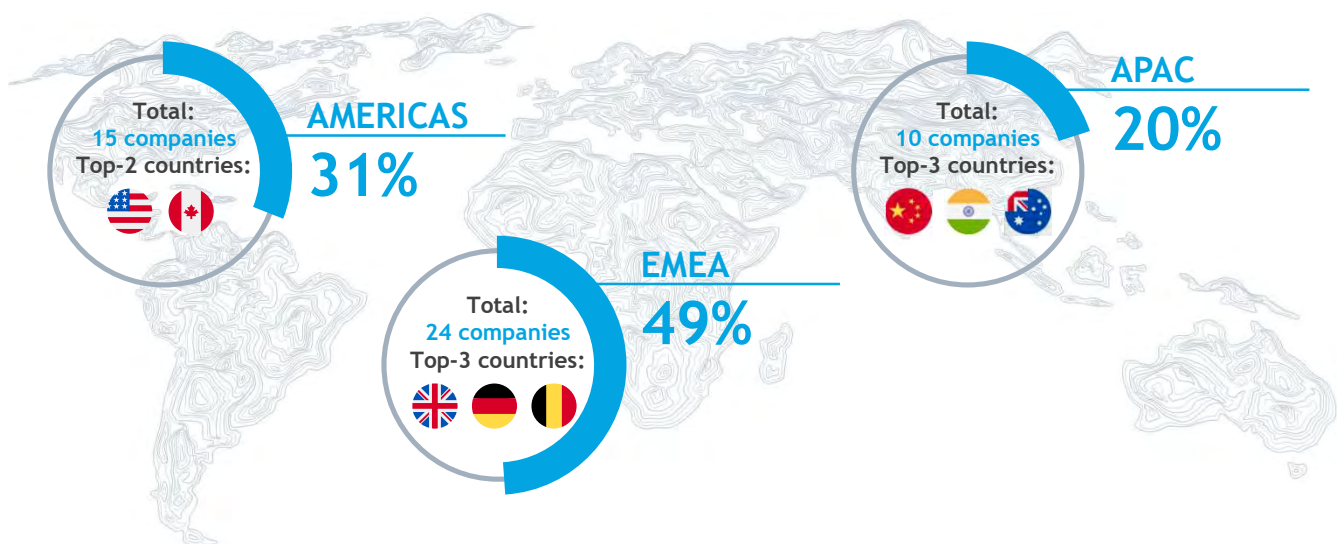
SURVEY METHODOLOGY

Methodology description

The BDO Telecommunications Risk Factor Survey identifies the most commonly reported risks for telecoms across the world in 2021. This edition includes analysis of 49 companies versus 51 for the previous edition. To ensure data reliability, the companies' annual reports were used as the foundation for data collection and analysis.

Global and regional risks were calculated as a percentage of companies that highlighted a specific risk in their reports compared to the total number of companies analysed. In this edition, the risks were split in two main groups: macroeconomic risks and industry-specific risks. The top 5 risks were identified for each group.

Global coverage



Risk factor groups

A comprehensive list of 46 risk factors was collected and analysed. The risks were grouped into two main categories: macroeconomic and industry-specific risks. The approach enables a detailed assessment of risk factors based on their relevance to companies in the telecom industry.



Macroeconomic risks – risk factors relevant to businesses across industries during the normal course of business. Also referred to as market risks or general risks.



Industry-specific risks – risk factors that primarily or solely relate to the telecom industry or are especially significant to companies in this industry.

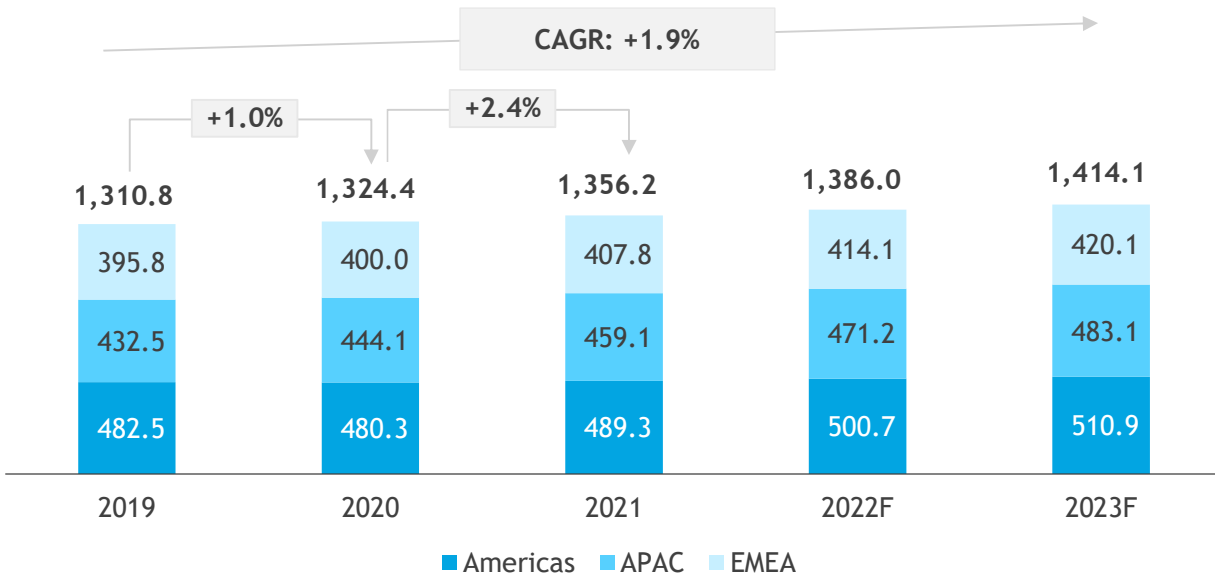


“MOVEMENT TO CLOUD IS EXPECTED TO BECOME THE BIGGEST RISK FOR TELECOM COMPANIES IN THE NEXT DECADE. IF SUCCESSFUL, IT COULD COMPLETELY RECONFIGURE THE GLOBAL WIRELESS INDUSTRY IN THE FUTURE.” — TOM MANNION, LEADER OF THE GLOBAL TELECOMMUNICATIONS TEAM



THE GLOBAL TELECOM INDUSTRY IS EXPECTED TO GROW, REACHING US\$1.4 TN BY 2023

Global market size of the telecom industry by region, Bn US\$¹



The global telecom industry is expected to exceed US\$1.4 tn in 2023, growing at a CAGR of 1.9%. Further market expansion is mainly driven by rising demand for connectivity from businesses and households. A central contributor to the growing demand for telecoms' services is changes

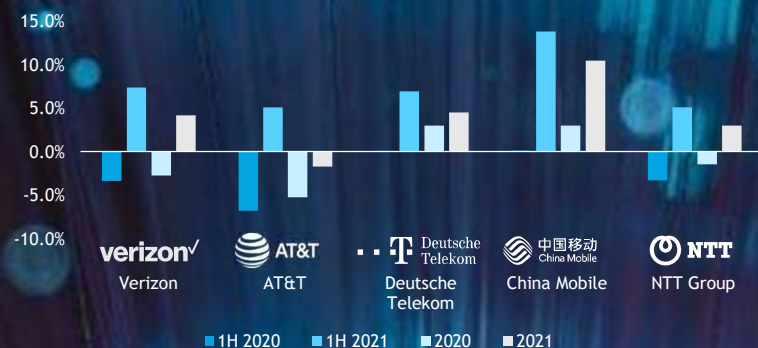
to consumer patterns, accelerated by COVID-19 (remote working, online media consumption, etc.). The increasing adoption of 5G, edge computing, and UCaaS² is expected to boost user demand for advanced telecom services.

Telecom industry dynamics in 2021

In 2021, most telecom companies took advantage of the increased demand for telecom services, which was accelerated by both the pandemic and the post-COVID-19 economic recovery.

Effective risk mitigation measures helped operators navigate uncertain market circumstances and ensure stable business continuity.

Select companies' revenue growth^{3,4} for the first half of the year (1H) and full year, year-on-year



Source: Statista; Companies' websites

Notes: (1) Updated in March 2022; (2) Unified communications as a service; (3) In reporting currency; (4) For Deutsche Telekom, the growth of revenue is assessed in organic terms (excluding the effects of the Group's changing structure)

NEW TECHNOLOGICAL DEVELOPMENTS AND CUSTOMER NEEDS SHAPE THE TELECOM INDUSTRY

In 2021, telecom companies were less affected by COVID-19 than in 2020. Still, the pandemic's impact, and acceleration effect on major pre-existing trends, were felt acutely across the industry. Significant growth in demand for mobile connectivity, digital service consumption, and digital business transformation all brought unique opportunities and challenges in 2021.

In a dynamic regulatory, technological, and competitive environment, telecoms continually adjust strategies and operations to match emerging trends. Developing robust network infrastructure combined with innovative, value-adding services and solutions remains core to meeting evolving customer preferences and generating new revenue streams.

Major trends in the telecom industry

Major market trends



Automation of business operations

The pandemic accelerated companies' digital transformation efforts, as resilience and efficiency were key priorities to weather COVID's impact on business operations. Operators continue to pursue automation to boost the subscriber base and geographical reach.



Deployment of 5G networks

5G technology transforms telecom networks by delivering new levels of coverage, reliability, low latency, and high-speed data transfer, enabling new digital solutions and platforms.



Adoption of emerging technologies

Network infrastructures' growing capacity opens up new revenue streams to telecom operators through the adoption of cutting-edge technologies. Telecom companies are expanding the use of cloud technologies to capture opportunities in an increasingly connected world.



Cybersecurity issues

The implementation of next-generation applications increases the number of vulnerable points of entry for cyberattacks. The rise of cybercrime and access to growing amounts of customer data make cybersecurity one of the top priorities for both service providers and users.



A shift in customer expectations

With many connected devices at home and at work, customers are focused on getting extra value from their operators. In the digital world, where many services can be offered and received online, there is a strong need for advanced connectivity that is stable and secure.

THE RUSSIA-UKRAINE WAR HAS FORCED TELECOM COMPANIES TO RECONSIDER THEIR OPERATIONS

The operating status of leading companies in the global technology and telecom industries is currently changing because of the Russian invasion of Ukraine. The following key factors are affecting companies' strategies:



















- 1 **Widespread sanctions** imposed by the EU and the USA, targeting various aspects of the Russian economy
- 2 **Global corporate boycotts** forcing international companies to cease their operations in the Russian market
- 3 **Geopolitical interests** of foreign companies' home markets defining their strategic positions in the industry

While it is uncertain how the Russian invasion of Ukraine will impact the global telecom industry in the long run, the list of potential risks (security and reputational concerns) is already expanding for companies operating in Russia and causing changes to their international operations.

Foreign firms that decide to exit the Russian market are expected to experience less material losses, as the Russian telecom industry is highly localised, with operators being domestically owned or having minimal input from international stakeholders.

The situation is different for companies opting to continue operating in Russia despite global sanctions and corporate boycotts. They incur risks of being subject to secondary sanctions or losing access to the global market, as collaboration with Russia is no longer tolerated.

Responses of global telecom companies to the Russian invasion of Ukraine¹

<p>Deutsche Telekom </p> <p>Brief overview: The company had a small presence in Russia and did not have networks there or business relations with local companies</p> <p>Actions taken: Shut down operations in Russia </p>	<p>Ericsson </p> <p>Brief overview: The company provided Russian operators with advanced telecom equipment and was involved in the rollout of 5G</p> <p>Actions taken: Indefinitely suspended business in Russia </p>	<p>Nokia </p> <p>Brief overview: The company provided Russian operators with equipment for both mobile and fixed networks</p> <p>Actions taken: Announced an indefinite exit from Russia² </p>
<p>Lumen </p> <p>Brief overview: The internet backbone provider served only an extremely small number of enterprise customers in Russia</p> <p>Actions taken: Shut down Russian operations </p>	<p>Cogent Communications </p> <p>Brief overview: One of the world's largest internet backbone providers served a number of high-profile Russian companies</p> <p>Actions taken: Terminated services to Russian customers </p>	<p>Juniper Networks </p> <p>Brief overview: Network equipment and solutions provider</p> <p>Actions taken: Suspended all sales, product deliveries, and support services for customers in Russia and Belarus </p>
<p>Huawei Technologies </p> <p>Brief overview: The leading provider of mobile and fixed network equipment and cloud solutions to Russian operators</p> <p>Actions taken: Suspended some of the operations in Russia </p>	<p>NTT Group </p> <p>Brief overview: The global technology and business solutions provider</p> <p>Actions taken: No updates on the status of its operations in Russia, but it terminated using Russian anti-virus software (Kaspersky Lab) </p>	<p>KDDI Corporation </p> <p>Brief overview: The company provides services in coordination with vendors and telecom carriers for customers in Russia</p> <p>Actions taken: No updates on the status of its operations in Russia </p>



“WITH THE RAPIDLY DEVELOPING TECHNOLOGIES AND INCREASING DEMAND FOR CONNECTIVITY SERVICES, INTENSE COMPETITION AND CYBERSECURITY ARE AMONG THE TOP RISKS FOR TELECOM COMPANIES.” – TOM MANNION



EXECUTIVE SUMMARY: INCREASING RISKS CONTINUE TO CHALLENGE TELECOM OPERATORS

In 2021, telecom companies focused on the implementation of strategic and transformative initiatives. New opportunities linked to individuals and businesses' rising demand for connectivity gave rise to both opportunities and challenges.

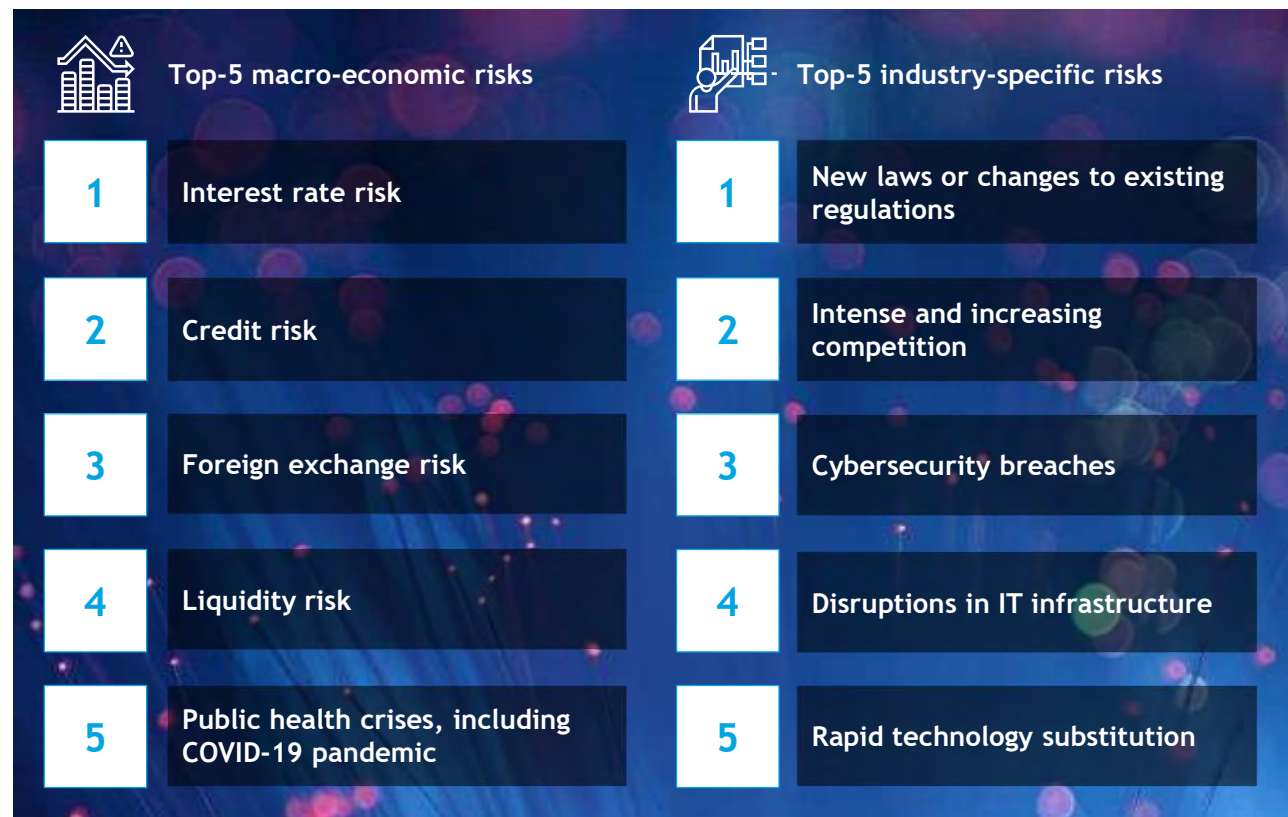
Major trends related to ongoing technological developments and evolving customer preferences also continued to shape the telecom market.

Telecom companies have strengthened their internal processes, reconsidered investment plans, and enhanced service offerings to remain competitive under challenging market conditions. As the industry's business environment becomes ever more complex and fast-moving, developing risk management frameworks remains an integral part of operations.

Top 10 risks identified by telecom companies in 2021

The report explores the risk landscape facing telecom companies. It is split into two main categories: macroeconomic risks and industry-specific risks.¹ This approach enables a deep analysis of specific risk factors.

In this edition, risks relating to interest rates, foreign exchange, credit, increasing market competition, and changes in the regulatory framework remained among the most significant identified by telecoms.



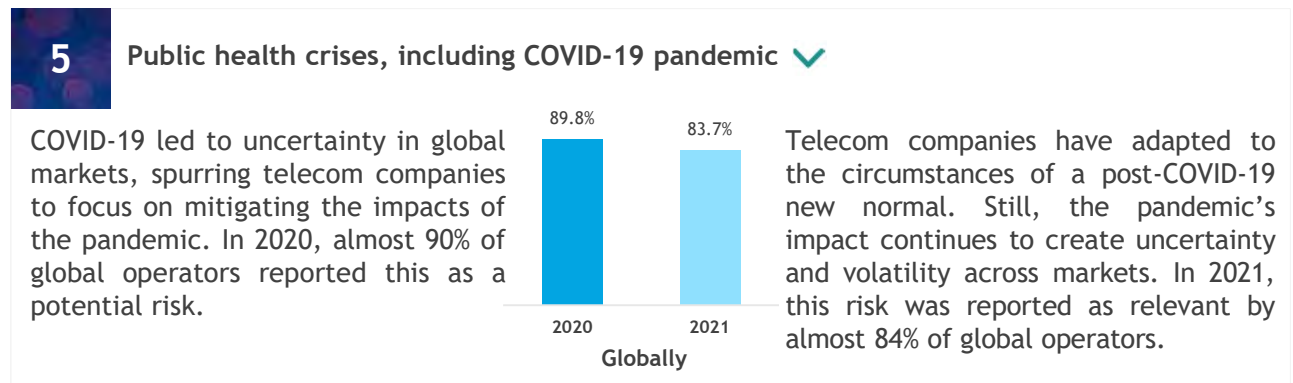
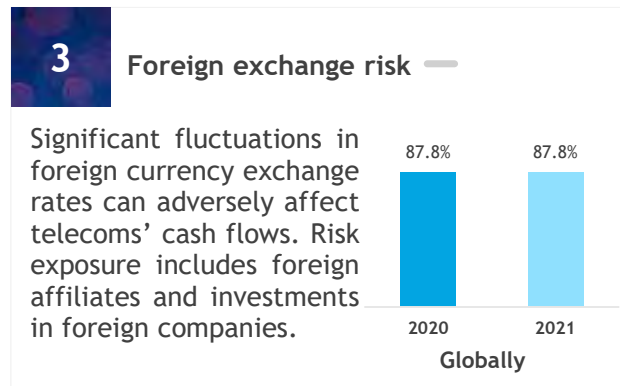
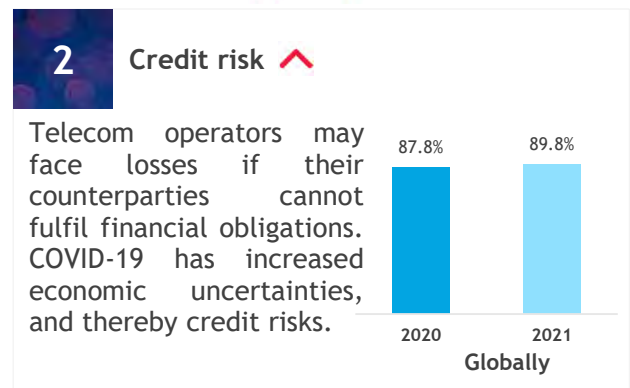
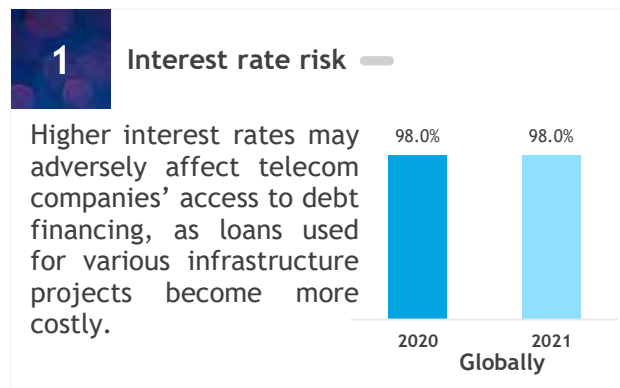
Notes: (1) Survey methodology was changed for BDO's 2022 Telecommunications Risk Factor Survey. The list of top-5 risks was identified for two main categories of risk factors: macro-economic and industry-specific risks. For details, please, refer to page 4

TOP 5 MACROECONOMIC RISKS

The telecom industry is capital intensive and competitive. Market players require significant investments to maintain and develop network infrastructure and next-generation technologies.

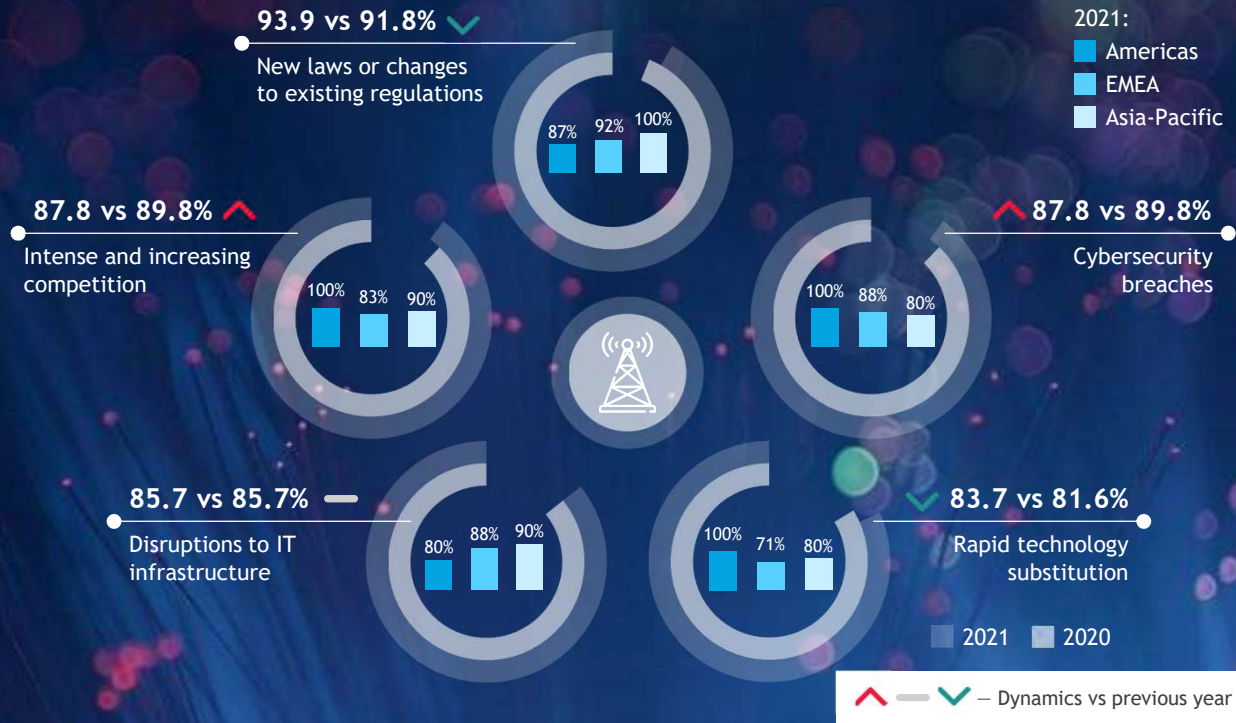
As a result, companies face various market risks, such as interest rate, foreign currency, credit, and liquidity risks. During 2020-2021, these risks were slightly higher, mainly due to COVID-19.

▲ — — ▼ — Dynamics vs previous year



TOP 5 INDUSTRY-SPECIFIC RISKS

Top 5 risks faced by telecom companies in 2020 vs 2021 globally



Telecom risk radar 2021



Apart from macroeconomic risks, telecom companies are also exposed to industry-specific risks. In 2021, the following risks were identified as the most significant:

- 1 New laws or changes to existing regulations
- 2 Intense and increasing competition
- 3 Cybersecurity breaches
- 4 Disruptions in IT infrastructure
- 5 Rapid technology substitution
- 6 Dependence on key suppliers and vendors
- 7 Ineffective strategy implementation
- 8 Outflow and lack of skilled personnel
- 9 Changing imperatives in data privacy
- 10 Unsuccessful investments and transactions

REGULATORY CHALLENGES REMAIN POTENTIAL HURDLES TO TELECOM COMPANIES



1. New laws or changes to existing regulations

Changes to regulatory frameworks create challenges for telecom companies that are strongly regulated by both local governments and international bodies. In 2021, 92% of operators reported changes in the regulations as a risk (in 2020, it was 94%).

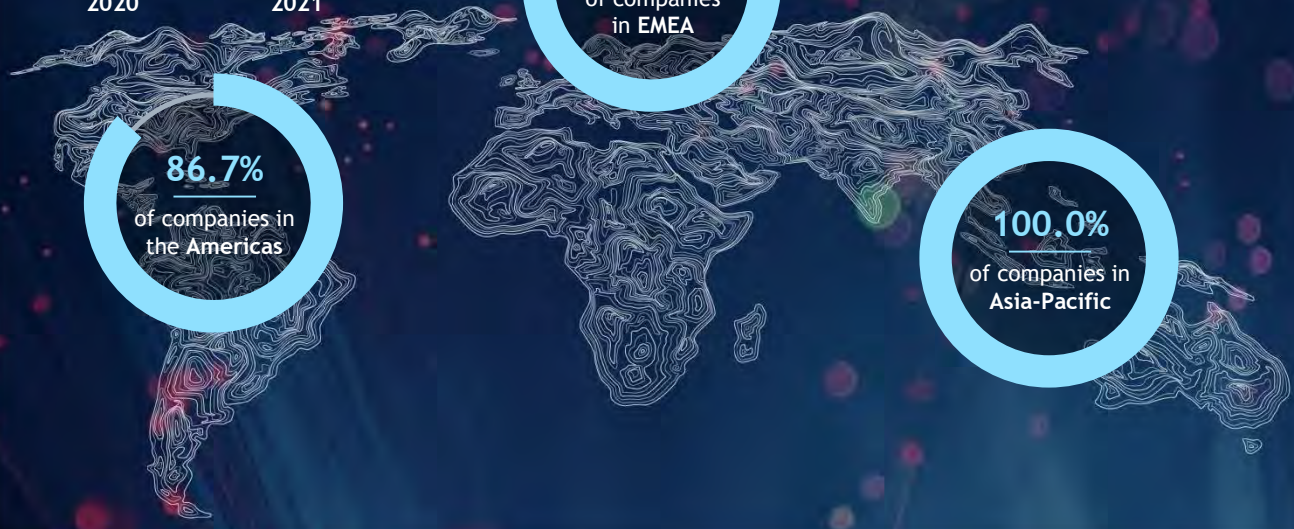
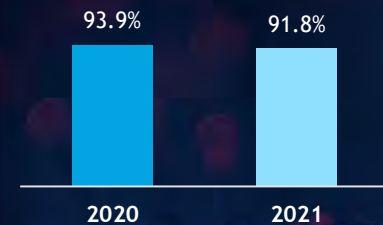
The degree of risk exposure varies by region. Still, all markets are experiencing growing attention from regulators focused on privacy and data protection, open access to ICT technologies (devices and applications), and climate change.

The introduction of stringent regulatory requirements may impact profitability, growth, and delivery of services. Missing compliance can also cause financial and reputational damage.

Telecom companies must navigate continuously evolving laws and regulations governing their industry. Processes and operations governing their industry. Processes and operations must be kept up to date and developed in line with changing requirements.

Share of companies that identify new laws or changes to existing regulations as a risk

Globally



INTENSIFYING COMPETITION AMONG TELECOM COMPANIES PUTS FUTURE GROWTH AT RISK



2. Intense and increasing competition

The rapid development of new technologies, products, and services has accelerated competition in the telecom industry. Currently, telecom companies, cable companies, wireless service providers, satellite providers, technology companies, device providers, and others actively operate in the same market and provide a broad range of competitive solutions.

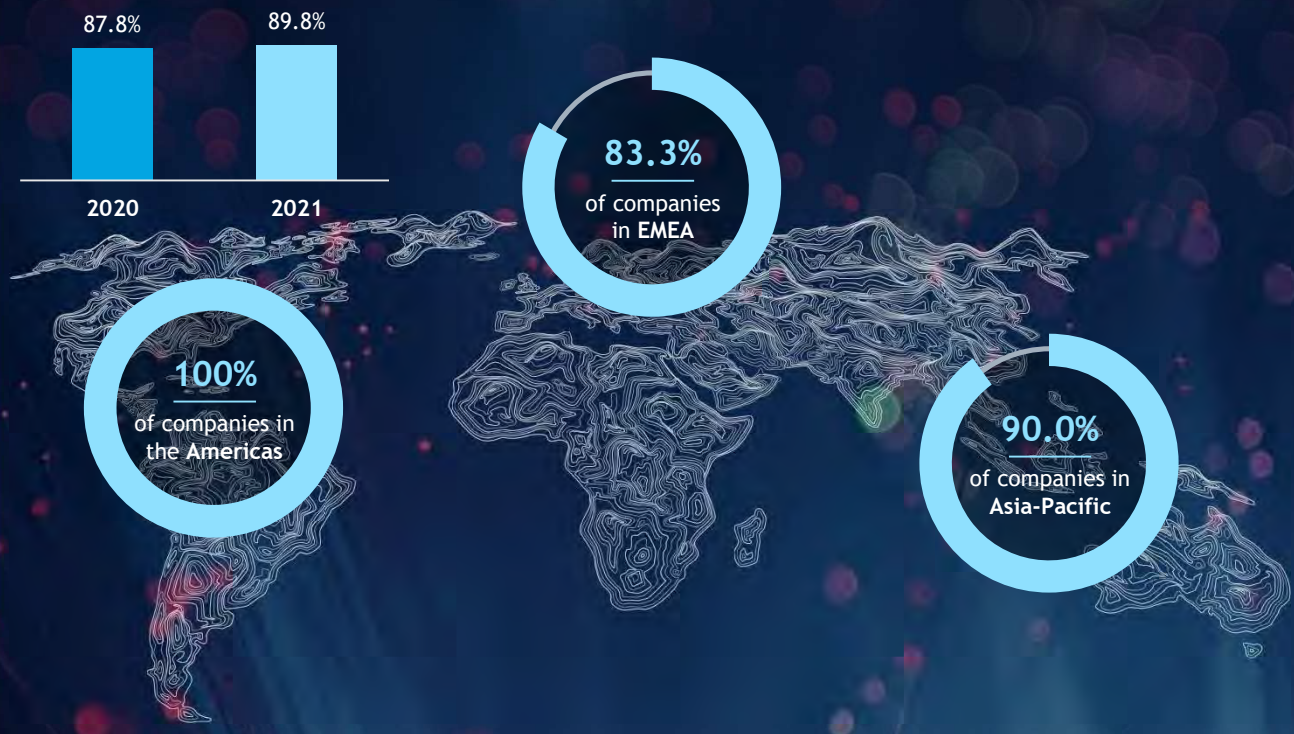
Competition against other companies is a risk for the vast majority of telecoms. Almost 90% reported it as a challenge for their business expansion in the past year (in 2020, 88%).

In response to the intense competition, many telecom companies are adopting strategies to acquire new technologies. The acquisitions are focused on companies that enable bringing competing or complementary solutions to the market faster.

The ability to adapt to emerging business opportunities and changing market conditions (new technologies, business models, customer preferences, economic conditions, etc.) will define companies' future competitive position in the telecom market.

Share of companies that identify intense and increasing competition as a risk

Globally



WITH ADOPTION OF NEXT-GEN TECHNOLOGIES, SECURITY BREACHES EMERGE AS A SIGNIFICANT RISK



3. Cybersecurity breaches

Occurrences of cyberattacks, including computer viruses, hacking, ransomware attacks, malicious social engineering, etc., against companies have increased in recent years. They have also become more sophisticated, making it more difficult to protect networks and systems.

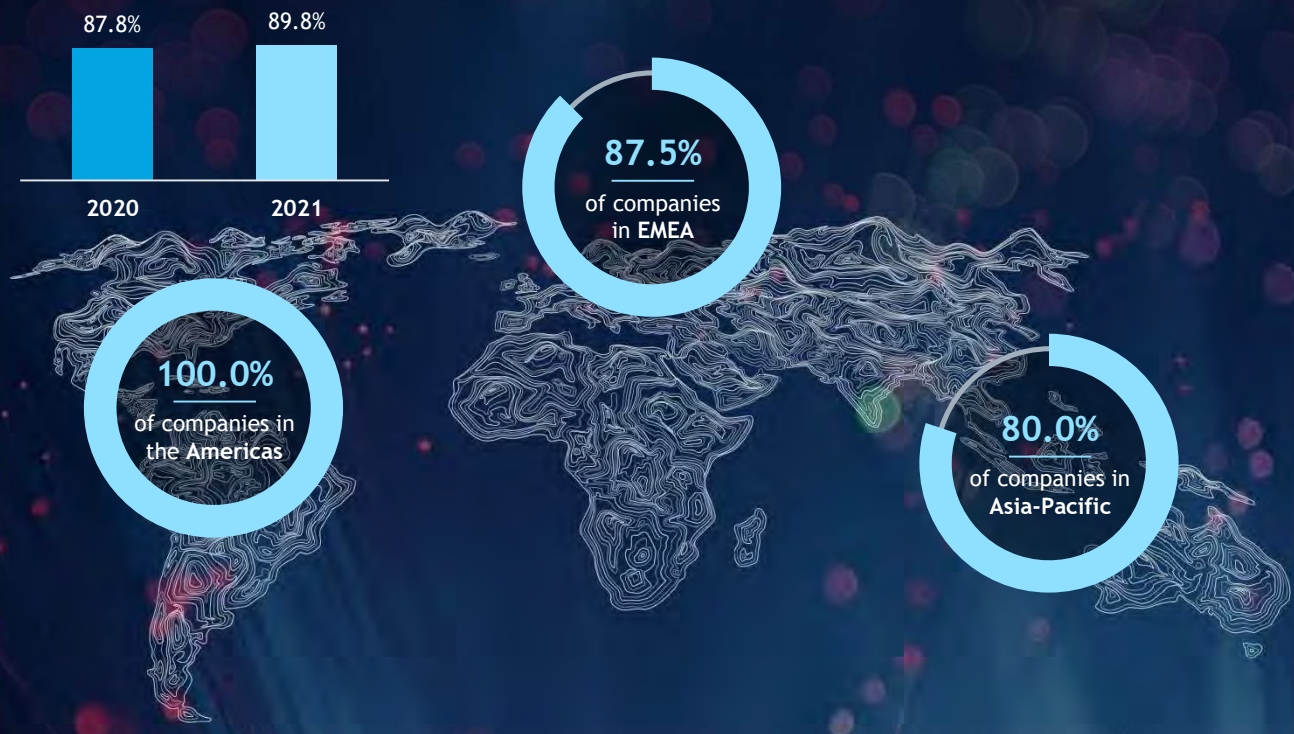
Telecom companies may suffer equipment failures, loss of sensitive information, and disruptions of their own and customers' operations as a result of cyberattacks. In 2021, around 90% of operators reported cybersecurity as a key factor affecting the resilience and continuity of business operations (in 2020, 88%).

The inability to operate or use networks and systems due to cyberattacks, even for a limited period of time, can cause significant financial losses and reputational damages to telecom companies.

In order to mitigate the possible threats and negative consequences, companies are actively strengthening their cybersecurity control procedures and implementing preventive actions to mitigate cybersecurity risks and reduce the effects of cyberattacks.

Share of companies that identify cybersecurity breaches as a risk

Globally



TELECOMS CAN POTENTIALLY LOSE CUSTOMERS AND PROFITS DUE TO INFRASTRUCTURE FAILURES



4. Disruptions of IT infrastructure

Telecom companies' operations and activities are dependent on the availability and reliability of high-quality network infrastructure and information systems technologies. Any significant network outages, infrastructure breakdowns, or service disruptions caused by power disconnections, human-caused threats, technical accidents, natural disasters, or similar events may lead to the loss of customers or revenues.

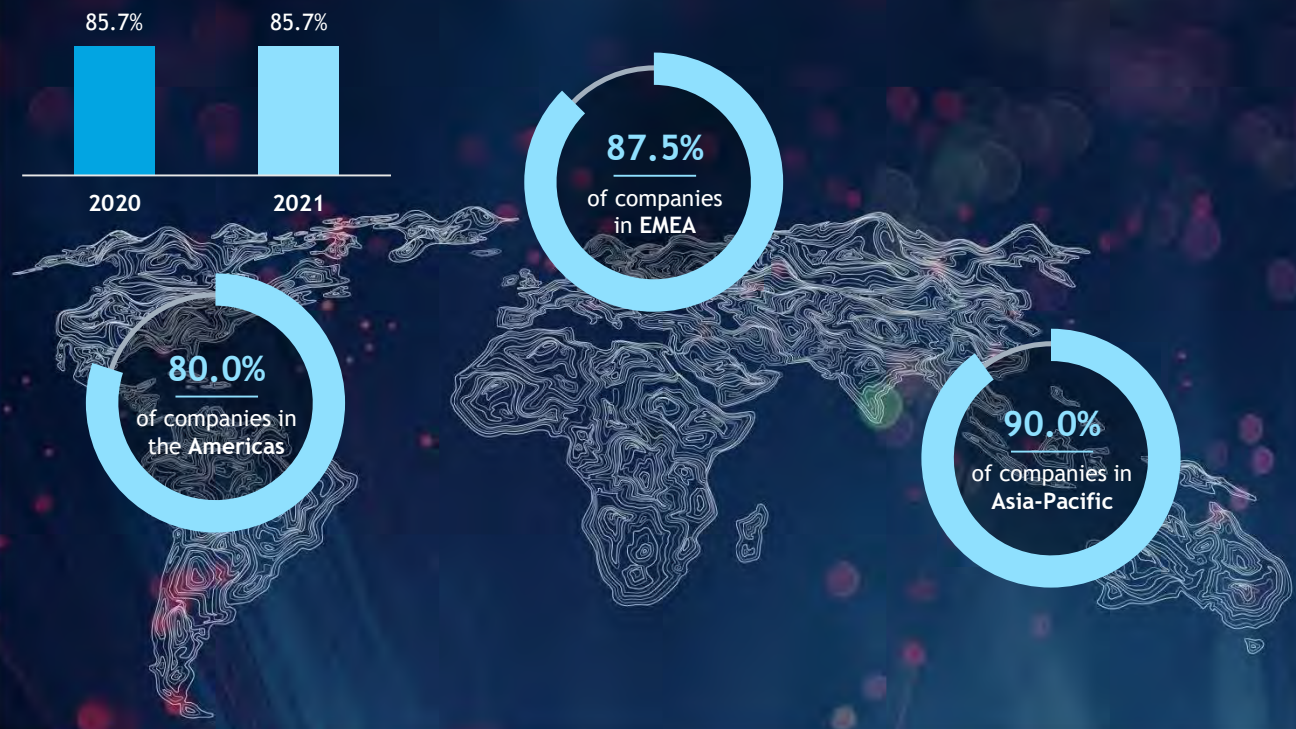
Such events may also cause leakage, accidental release, or loss of information maintained in IT systems and networks, which may damage the company's reputation, credibility, and business activities.

In 2020-2021, almost 86% of telecom companies globally included the risk of possible disruptions to technology infrastructure in their risk management priorities.

Today, operators regularly maintain and upgrade their networks and systems to ensure continuous and high-quality services for their customers. They are also performing more proactive monitoring across their IT infrastructure and implementing disaster recovery plans aimed at ensuring prompt responses to various failures.

Share of companies that identify disruptions in IT infrastructure as a risk

Globally



SLOW UPTAKE OF NEW TECHNOLOGY CAN DAMAGE MARKET POSITION AND SHARE



5. Rapid technology substitution

The rapidly changing global technological landscape facing the telecom industry forces operators to continuously monitor and respond to the challenges arising from the development of innovative new products and services.

To remain competitive, telecom companies must introduce new technologies and enhance existing offerings in a timely manner and at an acceptable cost. Otherwise, they may experience a significant outflow of customers and a decline in revenues.

In 2021, almost 82% of telecom companies worldwide reported the inability to take

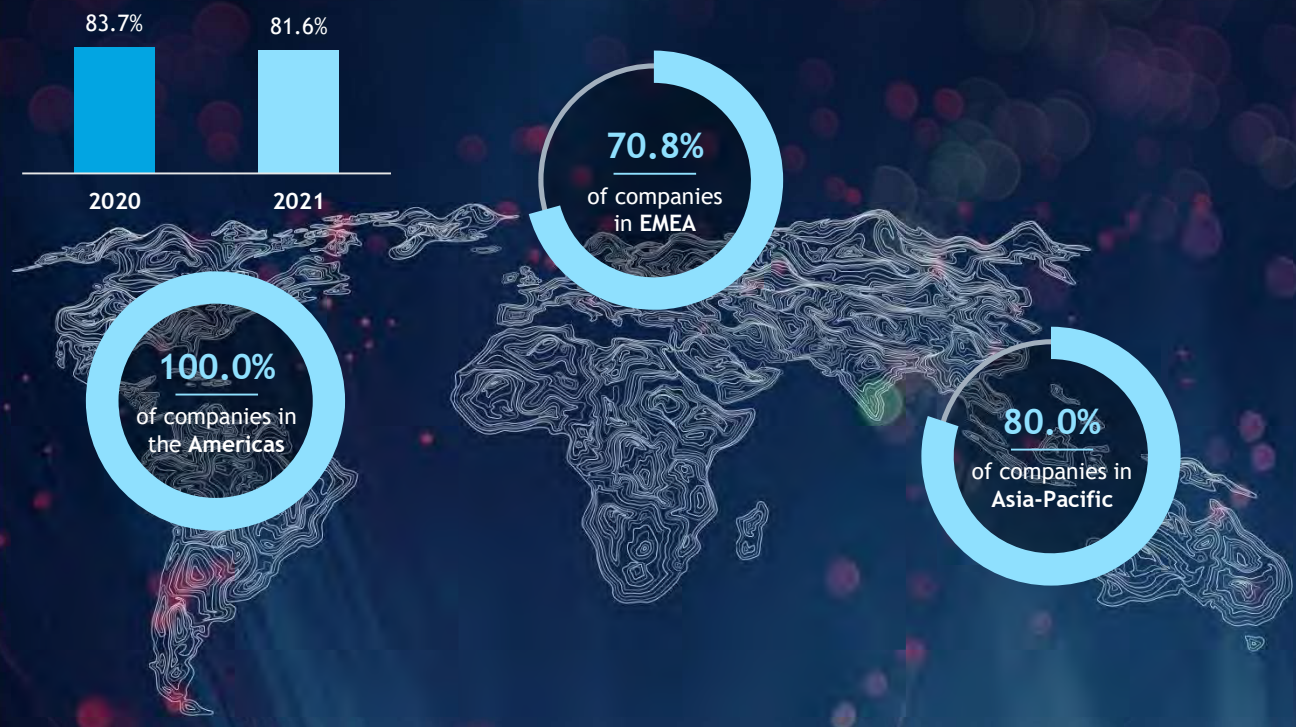
advantage of technological developments as a risk influencing their competitive position in the market (in 2020, 84%).

Being able to keep pace with technological developments is a determining factor for a company's long-term success. It ensures the ability to deliver satisfactory customer experiences over time.

However, the deployment of new technologies is subject to various risks (equipment availability, unexpected costs, regulatory constraints, etc.), which must be managed effectively.

Share of companies that identify rapid technology substitution as a risk

Globally



IN 2021, TELECOM COMPANIES EXPERIENCED SIMILAR RISKS REGARDLESS OF THEIR REGION

TOP 5 risks of 2021

Americas

Risk	Percentage of companies that report this risk	Change in ranking compared to 2020
Intense and increasing competition	100.0%	—
Cybersecurity breaches	100.0%	—
Rapid technology substitution	100.0%	—
Dependence on key suppliers and vendors	100.0%	▲
New laws or changes to existing regulations	86.7%	▼

In 2021, telecom companies based in the Americas mostly reported the same risks that were identified globally. The only difference was an increased level of the risk related to dependence on key suppliers and vendors. Unlike operators based in EMEA and APAC, the companies in the Americas region paid separate attention to ensuring the resilience of their supply chains, especially after COVID-19. Apart from that, there were no other substantial differences or changes compared to 2020.

TOP 5 risks of 2021

EMEA

Risk	Percentage of companies that report this risk	Change in ranking compared to 2020
New laws or changes to existing regulations	91.7%	—
Cybersecurity breaches	87.5%	—
Disruptions in IT infrastructure	87.5%	—
Intense and increasing competition	83.3%	—
Rapid technology substitution	70.8%	—

In 2021, the top 5 risks reported by telecom operators located in EMEA reflected the global trends, yet in a slightly different order. Most companies reported risks arising from changes to the regulatory landscape and possible disruptions of technical infrastructure, especially caused by cyberattacks. There were no significant shifts in risk priorities in comparison with the previous year.

TOP 5 risks of 2021

Asia-Pacific

Risk	Percentage of companies that report this risk	Change in ranking compared to 2020
New laws or changes to existing regulations	100.0%	—
Disruptions in IT infrastructure	90.0%	—
Intense and increasing competition	90.0%	—
Cybersecurity breaches	80.0%	—
Rapid technology substitution	80.0%	—

In 2020-2021, the regional ranking of APAC-based telecom companies matched the global list of risk factors, except for some differences in their order. The ability to follow changing regulations, rapidly respond to disruptions in the IT infrastructure, and compete effectively have been reported as the main challenges by Asian telecom operators for the past two years.

▲ Increased ▼ Decreased — Remained the same



“AS THE RISK LANDSCAPE BECOMES MORE COMPLEX AND FAST-MOVING, TELECOM OPERATORS REQUIRE AGILE AND EFFECTIVE RISK MANAGEMENT TO DELIVER SUCCESSFUL PERFORMANCE.” – TOM MANNION

”

RISK MITIGATION ACTIVITIES HELP TELECOM COMPANIES TO PROTECT THEIR OPERATIONS

Types of risks

Risk mitigation activities



Market risks

- ▶ Liquidity risk
- ▶ Credit risk
- ▶ Interest rate risk
- ▶ Foreign exchange risk

- ▶ Maintain a liquidity reserve in the form of credit lines and cash, as well as continuously monitor forecasted and actual cash flows
- ▶ Ensure dealing with creditworthy counterparties only and obtaining collateral as a means of mitigating the risk of financial loss from defaults
- ▶ Analyse the company's interest rate position and consider the use of hedging mechanisms to overcome the negative impact of changes in interest rates
- ▶ Monitor the risks from foreign currency fluctuations and manage them through the use of relevant hedging instruments



Operational risks

- ▶ Cybersecurity breaches
- ▶ Disruptions in IT infrastructure
- ▶ Dependence on key suppliers
- ▶ Outflow of skilled personnel

- ▶ Invest in the upgrade of the cybersecurity environment across the organisation in order to strengthen the incident detection and response capabilities
- ▶ Maintain and upgrade the IT infrastructure on an ongoing basis and focus on comprehensive business continuity and disaster recovery plans
- ▶ Consider the expansion and diversification of supplier options to improve the flexibility and resilience of supply chains
- ▶ Develop an attractive working environment and provide incentives aimed at attracting and retaining skilled personnel



Strategic risks

- ▶ Intense and increasing competition
- ▶ Technology substitution
- ▶ Strategy implementation
- ▶ Environmental concerns

- ▶ Analyse industry and market trends in order to take competitive advantage of new opportunities and changing market conditions
- ▶ Monitor market value proposition and make timely investments in the development of innovative products and service offerings
- ▶ Develop a comprehensive strategy implementation function, comprising efficient governance, control procedures, and communications systems
- ▶ Implement initiatives aimed at reducing the negative impact of operations on the environment, as well as mitigating the effects of extreme weather events



Financial risks

- ▶ Unsuccessful investments
- ▶ Customer churn
- ▶ Significant amount of indebtedness
- ▶ Increasing costs to provide services

- ▶ Conduct thorough due diligence and investment planning procedures prior to entering transactions and making investments
- ▶ Continuously improve customer experience, as well as adapt to the fast-changing needs and expectations in order to enhance customer satisfaction
- ▶ Monitor and manage debt levels of the company to maintain the balance between obtaining additional financing and meeting financial obligations
- ▶ Develop cost-efficiency initiatives aimed at reducing operating expenses through the optimisation of business and technology models



Regulatory and legal risks

- ▶ New laws and regulations
- ▶ Changes in tax regulations
- ▶ Lawsuits, claims, legal proceedings
- ▶ Governance compliance

- ▶ Continuously monitor and evaluate the impact of changes in the regulatory landscape to facilitate the reengineering of processes in line with new laws
- ▶ Implement control mechanisms that include regular reviewing of all tax matters for changes in law and judicial interpretation
- ▶ Strengthen the legal team inside the organisation to ensure that the business complies with relevant requirements and standards
- ▶ Develop a robust compliance framework in order to overcome the possible breaches of anti-corruption laws and economic sanction programmes

BDO'S GLOBAL TEAM HAS BROAD EXPERIENCE AND EXPERTISE TO SUPPORT TELECOM OPERATORS

Telecom companies around the world are undergoing a period of transformation due to technological developments, regulatory changes, and shifting customer preferences. To remain competitive, companies need to leverage new opportunities, while effectively managing related growing challenges.

At BDO, we work with a broad range of telecom companies, including some of the largest industry players. We understand the challenges and complexities affecting heavily regulated companies in times of significant change. Our global BDO team assists telecom companies with a broad range of services.

Our service portfolio

 Advisory	 Tax	 Business Services & Outsourcing
<p>Corporate Finance</p> <ul style="list-style-type: none"> ▶ Capital markets ▶ Transaction services ▶ Raising finance ▶ Mergers & acquisitions ▶ Valuations ▶ Business restructuring <p>Global Forensics</p> <ul style="list-style-type: none"> ▶ Corruption, financial reporting & fraud investigations ▶ Fraud and anti-corruption compliance ▶ Investigative due diligence ▶ Forensic technology / cyber ▶ Cross-border dispute resolution ▶ Anti-money laundering ▶ Compliance monitorship services <p>Cybersecurity</p> <ul style="list-style-type: none"> ▶ GDPR compliance services ▶ Managed cybersecurity services <p>Global Value Chain</p>	<ul style="list-style-type: none"> ▶ Corporate and business tax ▶ Corporate international tax ▶ Global employer services ▶ Global private client services ▶ Global R&D tax credits and incentives ▶ Global tax assurance and risk management ▶ Global transfer pricing services ▶ Global value chain tax advisory services ▶ Indirect tax ▶ Taxation of the digital economy 	<ul style="list-style-type: none"> ▶ Bookkeeping and international accounting ▶ Global compliance reporting ▶ Information technology consulting and outsourcing ▶ Statutory financial reporting ▶ Payroll services ▶ Company secretarial

Exceptional Client Service at Your Disposal



CLIENT NEEDS: we aim to meet our clients' needs through a combination of global industry expertise and local market knowledge



COMMITMENT: we agree to and fulfil our commitments, meaning that we deliver what we promise every day, for every client



VALUE: our new ideas and innovative thinking help clients contribute to their commercial success now and in the future



PEOPLE: we employ experienced people and empower them to make a difference through the delivery of exceptional services



COMMUNICATION: we are always clear, open, and swift in our communication, meaning short lines of communication



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