Dynamic Competition in Telecommunications: A Systematic Literature Review

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Abstract
Telecommunication is the most competitive and fastest-growing market in the globe. Dynamic competition in telecom is produced by battle among companies to produce more reliable or more economical commodities. All developed countries such as U.S, Canada, and China are developing policies to reduce the rivalry among big corporations. The main objective of this paper is to outline the appropriate studies pertaining to Dynamic Competition in Telecommunications with the intentions of revealing what has already been investigated on this subject, as a medium of conducting future research. Moreover, we will also review the impact of competition on customer satisfaction and service quality in telecom businesses. Our literature review is based on 60 renowned research publications from 1990 to date, synthesizes the crucial details of competitive interaction in the telecom sphere.

Keywords
dynamic competition, telecommunication, monopoly, telecom reforms, customer satisfaction

Introduction
Recent years have witnessed unprecedented growth in telecommunication over significant distances. The tremendous influence of the telecommunication sector is recently examined by many researchers and economists (Katz, 2009). The intent of this systematic review to give an in-depth analysis of dynamic competition state and trend. Although this issue has received less attention in recent years, we have shown that the technique chosen here has unearthed several caveats that were previously overlooked (e.g., greater quantity of papers, higher proportion of empirical papers). In light of this, our research intends to examine dynamic competition in the telecommunications market by analyzing pre-existing statistical data and academic sources via a thorough literature analysis. Telecom has changed almost all roads of individuals such as culture, education, social, and even political lives. Telecommunication has launched many devices such as telecom towers, routers, Voice over Internet Protocol (VoIP), fiber-optics, smart TV, smart radios, antennas, and smartphones. The device which captivated most in the telecom sector is the “mobile phone.” From sending an email to track appointments and contacts, mobile phones have become an indispensable part of individuals (Samaha & Hawi, 2016). Why is telecommunication developing so quickly? Globalization has overcome the distances and accelerated the telecommunication processes on national and international levels (Budimir, 2014). The telecommunications industry has already contributed to economic growth (Jamison, 2009), education, medicine, e-governance, and agricultural development. Almost all the industries nowadays are using Telecom for performing their operations and processes in their best manners.

The era of telecom originated with the discovery of electromagnetic waves by Clark Maxwell, in the 1860s which was later called Radio wave by Heinrich Hertz. It was noticed that these waves can be utilized as information carriers. The very first breakthrough in the telecommunication was First Generation Cellular Network after the invention of the cell phone in 1979 by Nippon Telegraph and Telephone Corporation (NTT). Proper wireless communication is established with 1G in the form of analog signals (Paudel & Bhattacharai, 2018). In 1990, 2G gave an exponential jump in subscribers with the convenience of Short Message Service (SMS) by employing Global System for Mobile Communications (GSM) technology. Some additional features were faxes and voice mail (Ru & Gupta, 2015).

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A hybrid network 3G using Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), and Code Division Multiple Access (CDMA) technologies was an enhancement over 2G as it boosted its speed up to 2 Mbps (megabits per second) and also it presented extra services like live streaming, video calls, 3D gaming, navigational map, mobile TV, and much more. The fourth-generation (4G) renders the fastest communication by packet switching and furnishes a complete IP-based network. It utilizes Orthogonal Frequency Division Multiplexing (OFDM)/Orthogonal Frequency Division Multiple Access (OFDMA) to distribute network resources among possible users and offers ultra-low latency compared to 3G. Long Term Evolution (LTE) and WiMAX (World Wide Interoperability for Microwave Access) are their dominant technologies that guarantee QoS and data rates (Kharbuli & Sultana, 2018). A 5G compromised with hyper-connected vision and the next-generation radio access technology with broader implications and massive Multiple-Input and Multiple-Output (MIMO). Speed comparison of all generations is shown in Figure 1.

To grasp the telecommunication sector’s dynamics, Noam (2010) advises considering three eras of telecommunications: The first being based on copper networks, had a monopolistic market structure and was either owned or controlled by the government. In the 1980s, the partial liberalization of the telecommunications industry in the United States ushered in the second generation, which emphasized commercialization/privatization, liberalization, market access, and competition. Markets in third-generation telecoms are gradually becoming an ecosystem of both licensed and unregulated entities (Fransman, 2010). Technological advancements, most notably the migration to an all-IP world, have facilitated the emergence of new dimensions of competition for conventional telecoms, dubbed “over-the-top” (OTT) competition. Thus, as technology advances, digital platforms provide new issues for regulatory and competition authorities, since applying traditional “one-sided” thinking to two-sided marketplaces may result in incorrect judgments (Belleflamme & Peitz, 2010). This is because digital platforms are bidirectional in nature, which means that platform providers must entice both customers and developers of complementing apps to prosper. Regulation and antitrust enforcement are likely to be successful if they are founded on a thorough knowledge of how two-sided markets work (Belleflamme & Peitz, 2010). Nevertheless, from a dynamic standpoint, the regulator should evaluate the tradeoff between the favorable impacts of access restriction on short-term competition and the detrimental consequences on investment expansion and sustainable innovation. Furthermore, this comprises a raise in competitive rivalry and quality improvement.

Former European Commissioner for Information Society and Media stated that “Effective competition is the key for current and future success.” (“Effective competition in telecommunications, rail and energy markets,” 2011). The telecommunications industry has often encountered a natural monopoly in the market. But now the telecom industry is shifting from monopoly to dynamic competition through the regulatory process. The telecommunications sector has been a very dynamic, innovative, and technology-driven market since the 1990s. Deploying more cutting-edge services will have an impact on future pricing competitiveness simply because competition takes on several dimensions. When the competition escalates, the state lowers the prices of services to construct a fairer market to a wider populace. The regulatory process promotes the competitive market discovery process to circumscribe an acceptable outcome for all the contestants. Price and quality both can be regulated accurately by dynamic competition. Customer acquisition costs are used in the business to produce new consumers and also preserve the existing customer to survive. Privatization and liberalization have changed the telecommunication sector in a phenomenal way globally (Beard & Hartmann 1999). In Latin America and East Asia, privatization, liberalization, or a combination of both played a significant role in telecom reforms (Ratto-Nielsen, 2004). The mobile industry also remarkably expanded over time due to privatization and dynamic competition such as Apple and Samsung (Cecere et al., 2015).
Android which was officially launched in 2007 dominates the global market share having a share of 73% of all smartphone users as of June 2021 ("Cell phone sales worldwide | Statista," 2021). Android had 2.8 billion unique subscribers at the end of 2020. A summary of active users of android and shipment is shown in the Table 1. But recently, Apple’s iPhone 11 and 12 gaining more attention from customers due to their unique characteristics. iPhone has a greater percentage of users in the UK where Android and iOS both fighting for the most market share (Curry, 2021). Top-quality services render customer’s gratification and support to recommend to their friends and family and also lessen criticisms (Mägi & Julander, 1996). Market competition in the telecom industry is based on customer demand which rapidly rotates every day (Klaić & Turek, 2002). For example, Android phone had more demand in the market than Apple’s phone like in 2018, Original Equipment Manufacturer (OEM) partners sold 1.33 billion units of android devices. It can be witnessed that competition between different operators’ awards users with a variety of innovative services at an optimum price (Kavran et al., 2012). Demand for telecommunication services is growing in developing countries due to dynamic competition and income growth (Garbacz & Thompson, 2007).

### Literature Review

This literature review identifies the holes in the past studies and seeks to fill the remaining gaps. The telecom sector has undergone significant changes since 1990. Before the 80’s, Telecom service providers were monopolistic linked with political sensitivity, produced huge entry limits and bans. Many scholars highlighted the inefficiency of the monopoly and explicated the demand for reforms (Melody, 1997). State monopolies greatly hit the telecom sector by delivering poor-quality products and services in the early 90’s. State-owned infrastructure monopolies have encountered depreciating decided facilities, low labor potency, lower service quality, continuous revenue deficits, poor investment, and severe obstacles of fraud (Kessides, 2004). The old telecom industry faced many glitches which are presented in the Figure 2.

The leading monopolists in the early 90’s were American Telephone and Telegraph Company (AT&T) in U.S, Nippon Electric Company (NEC) in Japan, France Telecom in France, Deutsche Telecom in Germany, and British Telecom (BT) in Great Britain in late 90’s. The monopolist in India was Bharat Sanchar Nigam Limited before 1991. (Fransman, 2001).

Domestic and international competition is thriving at all levels. With the rise of globalization, more and more competition is coming from international sources. In the U.S, the extraterritorial implications of competition and antitrust enforcement are becoming increasingly commonplace (Portuese, 2021). Antitrust is also used as a mercantilist and industrial policy weapon by several countries, for instance, China. Antitrust law enforcement must embrace dynamic competition rather than rely on a static model. It’s no longer acceptable for antitrust authorities to ignore the role of innovation in fostering competitiveness. Ultimately, a more practical and less formalized model is needed for antitrust enforcement and institutional principles (Portuese, 2021).

After structural changes, the industry has transformed from monopoly to a competitive market and is still developing (Starr, 2019). Telecommunication reformation initiated with privatization, total liberalization, and dynamic competition (Tobbin, 2010). These reforms intended to inject competition into the markets previously ruled by monopolistic corporations (Yoshimats, 1998). In the UK the duopoly terminated after the publication of the Government’s White Paper, “Competition and Choice.” More clear and appropriate policies were fabricated by the introduction of privatization. Why privatization? Privatization can enhance the firm’s performance and may not suffer from inefficient operation due to political oversight. It was proposed to eradicate the monopoly and develop the effectiveness of the telecommunication sector (Karamti & Kammou, 2011). AT&T ended its monopoly

### Table 1. A Summary Active Users and Yearly Shipment of Android From 2012 to 2020.

| Year | Active users | Yearly shipments |
|------|--------------|-----------------|
| 2012 | 0.5 billion  | 0.8 billion      |
| 2013 | 0.7 billion  | 1 billion        |
| 2014 | 1 billion    | 1.2 billion      |
| 2015 | 1.4 billion  | 1.25 billion     |
| 2016 | 1.7 billion  | 1.28 billion     |
| 2017 | 2 billion    | 1.33 billion     |
| 2018 | 2.3 billion  | 1.3 billion      |
| 2019 | 2.5 billion  | 1.05 billion     |
| 2020 | 2.8 billion  | 0.8 billion      |

Source. IDC, Google, Gartner, Strategy Analytics (2021).

### Figure 2. An overview of the old telecom industry.

Source. An overview of the old telecom industry - World Telecommunication Market (2003).
Table 2. Verizon vs. AT&T.

|                     | Verizon                                                                 | AT&T                                                                 |
|---------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------|
| Unlimited plans     | Start unlimited plan (more cheaper)                                      | Unlimited starter plan (fastest network)                              |
| Family plans        | Better coverage                                                        | Faster data speeds                                                    |
| Coverage            | Almost same with stronger at rural west and Appalachia                   | More reliable than verizon while testing                              |
| Speed               | 32.2 Mbps for download speeds and 12.89 Mbps for upload speeds           | 28.9 Mbps for download speeds and 9.4 for upload speeds                |
| Military discount   | Extends to the whole family                                             | Only for spouses                                                      |
| Devices and phones  | Latest devices from Apple, Samsung, and Google                          | Latest devices from Apple, Samsung, and Google                        |

Source. Abbott (2020).

status by connecting the third-party device to its rented telephones in 1968 (“History of AT&T—Wikipedia,” 2021). Numerous countries have experienced partial or full privatization of telecommunications. Noncompetitive industries with natural monopoly elements cannot channelize ownership from the public to the private sector. Private firms are more efficient due to competition because policymakers recommend that competition can considerably develop monitoring opportunities (Boubakri & Cosset, 1998). For example, the value-added-service market in Australia was almost completely controlled by international members such as Sprint International (US), GE Information Services (US), BT Tymnet (UK), Easylink (owned by Singcom and AT&T—the US), and IBM Information Network in 1996 (van der Vlies, 1996). Structural changes initiated the improvement by introducing competitiveness, liberalization, and privatization which introduced many competitors in the market by diminishing political control. In 90’s, Direct Dial Information (DDI), Japan Telecom, and Teleway Japan were the three main competitors in Japan. On the other hand, Microwave Communications Inc. (MCI) and Sprint were combating AT&T in US (Fransman, 2001). The capital-market discipline and competitive atmosphere enhanced the performance of privatized firms (De Castro & Uhlenbruck, 2018). The 1997 World Trade Organization (WTO) Agreement on Basic Telecommunications Services launched a distinct period for telecommunications competition in 72 countries. That seems to be, as the government’s influence lessens—the extent of privatization rises and the competition between enterprises intensifies. In all these countries, the prices were dramatically decreased due to open market competition and new foreign suppliers (Fredebeul-Krein & Freytag, 1997).

Dynamic competition brought many new players in the market. A “contestable” market encourages new entrants to enter, which in turn encourages innovation and growth in the market. In late 90’s, WorldCom, the world’s best global telecoms network, not only defeated AT&T but also gave a tough time to the Big Four Companies BT, Deutsche Telecom, France Telecom, and NTT. Later on, Qwest, Level 3, Global Crossing, Williams, and Viat also emerged larger than WorldCom. New participants such as City Of London Telecom (COLT), Energis, and Mannesmann performed similarly in Europe (Fransman, 2001). Telecommunications companies must be up to date for gaining customer’s loyalty and satisfaction. Along with the core products, technical solutions and services are also important in the telecom sector (Roos & Edvardsson, 2008). A modern example of this profession is Hewlett Packard (HP) which is now larger than other big giants IBM and Oracle due to its innovative technology and regulatory reforms. A similar case with Vodafone in mobile telecommunication, it has also absorbed many other brands by providing quality services in the telecom industry (Stone, 2015). When competitors are offering similar services, they boost up their value by Value-added services (VAs) such as entertainment, caller tunes and alerts, friends and family packages, missed call alert and call block facilities, insurance coverage, conference call, and online service to develop markets (Nekmahmud & Rahman, 2018). If we compare the two wireless carrier Verizon vs. AT&T in U.S in 2020, it’s hard to decide which one is better as both have added so many perks it can be understood in the Table 2 (Abbott, 2020).

Smartphones have the fastest growing market segment in the telecoms industry. Smartphone competition awakened with the introduction of Blackberry in 2006. Later Apple and Samsung battled on patents and designs in 2009 (Cecere et al., 2015). Smartphones have made communication easier for both urban as well as the rural public (J. Lee et al., 2001). According to The Mobile Economy Report 2020, a total of 6 billion unique mobile subscribers at the end of 2025. Moreover, there will be 1.8 billion 5G connections by 2025 (GSMA, 2021). The smartphone penetration rate is climbing up every day. Before, 38% of the world’s total population was using smartphones in 2018, which was calculated 46.5% in 2020 (“Cell phone sales worldwide | Statista,” 2021). AT&T is a leading company in telecom having total revenue of 171.7 US$ billions but on the other hand China Mobile is prominent in total subscription. Top 10 telecommunication companies in 2021 are given below in the Table 3 with their total revenues and total subscription.

The growth of telecom industry can be observed by statistical analysis of the revenue of China from June 2020 to June 2021 as shown in the Table 4. A report identified that there were more than 1.5 billion mobile users across China by the end of 2020. Main reason behind all these growth in telecom is the competition between big fishes in telecom industry (The Mobile Economy—China, 2021).
The large varieties of the industry during the last decades have totally modified their rules and structures of the telecom market. The most common competition factors in telecom market are Communication and Coverage, VAS, Price and Tariff Structure, Convenience, Customer Service Care, Sales Promotion, and Customer Satisfaction on Loyalty (Cecere et al., 2015; Giachetti, 2013; Minov, 2014; Nekmahmud & Rahman, 2018; Venkatram & Zhu, 2012). Why people use Android phones? Because its user friendly, affordable compared to iOS, and people are satisfied with its size and feature (Haris et al., 2018; Ruqiya et al., 2020). Dynamic Competition always enhances the industry’s economic efficiency, contributes more opportunities for users, and promotes innovative growth of modern telecom services (Huang et al., 2015; Zanfei, 1992). Many researchers have found that in both developed and developing countries, competition played a central role in expanding mobile telecommunications (Jamison, 2009; S. Lee & Marcu, 2007; Waverman et al., 2005). Competitiveness Factors in Telecommunication that are customarily associated are VAS, change in a sales promotion (Nekmahmud & Rahman, 2018), political fluctuations, technology improvements (Feizi, 2019; Dastidar, 2015), deregulation facilitates (Todeva & John, 2002), intensity of rivalry (Lapersonne, 2013) changing customer tastes, globalization, and cultural changes (Lear, 2014; Pandiya et al., 2012), (Baruah et al., 2015). Nowadays firms are endeavoring to capitalize on 5G technology. Key players for 5G technology are Huawei, Fujitsu, Ericsson, Apple, Nokia, Motorola, ZTE, Emerson, and Cisco Systems (Jaisal, 2020). Some companies are using social media tools to gain advantage over competitors in telecom industry (Afful-Dadzie et al., 2014; Thomas & Barlow, 2013). This might be a sign that technological advancements are being spurred on by competition.

According to the literature, traditional monopoly and perfect competition theories may lead to erroneous conclusions regarding market behavior when used in dynamic environments. Our analysis may aid in determining the influence of dynamic competitive processes on market structure, consumer satisfaction, and service quality. It may also be useful, particularly when evaluating the notion of a new fish entering the market; it may be conducted on the basis of other important variables, such as market share, profit, or average staff size. Further study should involve the use of other significant market concentration indicators, such as the index of dominance or the entropy index, to assess changes in the market and competition after the introduction of new fishes into the telecommunications industry.

### Methodology

This research work is designed to measure the relevant studies about Dynamic Competition in Telecommunications with the purpose of exposing what has already been studied in competitive factors. This research is based on renowned research publications from 1990 to date. Primary data was collected from internet by using Google Scholar, ScienceDirect, and main digital libraries such as ACM, Institute of Electrical and Electronics Engineers (IEEE) Xplore, ResearchGate.
In total 60 research papers were selected, 12 about Market Competition in Telecommunications, 8 about Mobile Telecommunications, 8 about Measuring the Competitiveness Factors in Telecommunication, 6 about Impact of Telecoms on Economics, 5 about Telecom Reforms, and 5 about Telecommunication Development, while 11 other studies of Competitive analysis of telecommunication industry. Monopoly in telecommunications were studied from 5 old papers. Our review only deliberated the big competitors in telecom such as AT&T, Verizon Communications, China Mobile, Vodafone, Samsung, Apple, Huawei, and some others. An overview of percentage about all the research topics are showed in the Figure 3. Most of the data were collected from Wikipedia and authentic telecom websites. Majority of our reviewed research studies are post-2015 publications.

### Discussion

This segment addresses the Dynamic competition and impact of competition on customer satisfaction and service quality identified through the systematic literature review in depth. The literature acknowledges that the telecommunication sector has experienced a natural monopoly for a pretty large time. With the passage of time, deregulation, privatization, and liberalization in the telecom industry upgraded productivity, modernization, and consumer welfare. They not only lessened the price but also ensure fair market access to the end-users. Competition is a frequently powerful statement in the telecommunications system. The review showed that there are two prominent reasons which have increased the competition between rivals. The first one is economic globalization and other one is up-gradation in technology. We have seen that vertical separation and monopoly harmed the customers that were assumed to benefit. Telecom industry only fits in dynamic competition rather than perfect competition considerably due to the fact that perfect competition is inherently static, meaning that it does not take into account shifts in technological advancements, innovation, or variations in consumer tastes.

Dynamic competition between market players has promoted allocative efficiency, technical efficiency, and dynamic efficiency. According to this account, the evolution of telecommunications networks is one of increased competition from varied sources, as technological advancement has introduced intermodal rivalry to formerly different forms of network infrastructure (Manne et al., 2021). In the wireless telecommunications industry, this means that individual enterprises have larger incentives to make capital expenditures that allow long-term competition via increased infrastructure and technological ingenuity, which affects the variety, quality, and quantity of services available to customers (Stapp, 2020). Among the most fundamental determinants that affect competition in the wireless marketplace is the introduction, continuous presence (or absence), and customer use of Mobile Virtual Network Operators (MVNOs; Woroch,

### Table 5. Geographical Structure of the Reviewed Studies.

| Number | Country where the study was conducted | Number of research papers |
|--------|---------------------------------------|---------------------------|
| 1      | USA                                   | 14                        |
| 2      | Canada                                | 9                         |
| 3      | UK                                    | 9                         |
| 4      | China                                 | 8                         |
| 5      | Japan                                 | 8                         |
| 6      | India                                 | 6                         |
| 7      | Australia                             | 2                         |
| 8      | Germany                               | 2                         |
| 9      | France                                | 1                         |
| 10     | Denmark                               | 1                         |
| Total  |                                       | 60                        |

Springer Link, and DBLP. We used a snowballing approach to reviewing relevant references from reviewed studies so that we can expand our search results easily. A search was also conducted in the Journal of Telecommunications and Information Technology of different countries, as the majority of papers covering telecom competition were published in these journals. We used search terms as “Dynamic Competition in Telecommunications,” “Competition in Telecom,” “Competition in Telecom Providers,” “Impact of competition on telecom sector,” “Competition Policy in Telecommunications,” “Nature of competition in telecommunications industry,” “Competitive analysis of telecommunication industry,” “Telecommunication competitors,” “Systematic review of telecom industry,” and “Market analysis of the telecommunications market.” All the searches were always linked with “in the telecom industry,” “telecommunication sector,” or “in telecom market” to ensure the domain of interest. After identifying and deleting the duplicates, we next reviewed from the resulting titles in order to locate additional relevant papers. Our review is not restricted to one article per country. We have picked more than one article from some countries such as China, India, UK, and the United States of America.

The systematic review strictly went over a deep selection pattern. Research papers were only nominated from well-known journals of telecommunications to ensure excellence. The scientific paper selection was strict from 1990 till 2021. The selection criteria were more narrowed down to specific regions including U.S, U.K, China, Japan, Germany, India, and some other famous countries only. Moreover, items in English were chosen to be reviewed. All those papers were excluded which has low impact factor and also those focusing on components and functions of telecommunications. In the final procedure, 75 studies were selected from different databases and these papers were reviewed closely based on aforementioned criteria for final selection. The next challenging procedure was the categorizing these studies. A summary of the geographical structure of the reviewed studies is presented in Table 5.
The facets of dynamic competition are that it occurs sequentially (as opposed to concurrently) as a result of technological changes or consumer trends and preference ascertain that such markets are habitually transformed by a new flow of products and services, a technique that not necessarily benefits incumbents (Manne et al., 2021). With dynamic competition, both newcomers and incumbents invest in new product and process development, as well as other changes to adapt (Manne et al., 2021). As a result, it is reasonable to argue that in an environment of dynamic rivalry, innovation, and competitiveness are inextricably intertwined.

When it comes to competitiveness, elements such as competitor number and the existence of one or more dominating enterprises may have an influence on market structure, although this is not always the case. Mobile market competitiveness may be better gauged by analyzing the percentage share of a single operator over time. From a competitive standpoint, the market operator number and their subscribers proportion number are not enough to give the complete picture. Corresponding with the telecommunications sector’s liberalization, spectrum utilization has become a critical aspect in the development of mobile communication services. As just that, spectrum distribution has become a critical vehicle for public policy in terms of expanding access to telecommunications, promoting network expansion, and accelerating digitalization (Woroch, 2020). Additionally, spectrum allotment is a critical instrument for promoting market competitiveness. While several variables impact market performance, market spectrum assignment as a finite resource would be recognized as a key element. Therefore, spectrum management should be guided by a broader vision that prioritizes strategic objectives such as expanding coverage, enabling optimum use, and cultivating market competition, as this is critical not only for the telecommunications sector, but also for the digitalization of all other sectors of the economy and society (Woroch, 2020). As a result, another aspect of spectrum policy to address is its function in competition policy. Similarly, all stakeholders in these types of procedures should collaborate with the competition authorities to ensure that spectrum utilization promotes effective competition.

In the Corona Virus Disease (COVID)-19 pandemic, the competition increased between different companies to deliver quality online learning and remote work. The factors which played an important role in promoting the competition are Technology Innovation, Government Regulations, VAS, sales promotions, number and size of competitors, and brand loyalty. Furthermore, researchers revealed that price structure, quality of service, the influence of friends & family can inspire customers toward telecom brand switching behavior on a national level. On the other hand, dynamic competition also boosted complex challenges for telecom policymakers in past few decades. The main challenges
were the determination of services, financing decisions, and price arrangements. Large national carriers of telecom must consider all the eight key market segments (residential vs. business data telecommunications; national vs. international communications; voice vs. electronic data transmission; fixed-line vs. cellular services) to develop multiple strategies to earn a competitive advantage (Todeva & John, 2002). Our review concluded that two countries USA and China are leading in telecom. World’s largest telecom company by total revenue is AT&T (“History of AT&T—Wikipedia,” 2021). Samsung was regarded as the top smartphone company at the end of the first quarter of 2021. The telecommunications industry is one of the largest donors to the extension of the economy in developing countries. Many countries are continuously striving to improve the industry by declaring reforms and regulations collectively such as International Telecommunication Union (ITU). The most valuable research work for me was “Effective Competition in Telecommunications, Rail and Energy Markets” done by Christian, Paul, Georg, Florian, Günter, Stephen, Benjamin, and Anton. They have discussed the exact matters which are mainly affecting dynamic competition such as dominant players, infrastructure sharing, and network externalities. Operators’ degree of infrastructure deployment is critical for competitiveness and coverage extension. Telecom companies are mainly focusing on communication coverage, sales promotion, and customer service care to survive and growth the market share.

The telecommunications industry, as previously said, is anything from static in today’s world. Schumpeter’s dynamic theory of competition emphasizes the “creative destruction” of old incumbents by newcomers, who are commended with dominating market positions until they are superseded by the next phase of insurgents (Schumpeter, 1942). Innovation and market dynamics are still emphasized in Schumpeterian economic theory today, which goes beyond the typical neoclassical approach of analysis to produce new economic ideas and models. Examining the dynamics of competition in a certain market in order to determine how various firm tactics influence the welfare of consumers is an economics-based approach (Gual et al., 2006). There should be close scrutiny for the long-term welfare of consumers and ingenuity incentives when considering the possibility to develop an interconnection regulatory framework for digital platforms, given their more inventive business style and dynamic competition (Huang & Qiu, 2022). In this review, we support the idea that telecom regulation calls for a “more economic approach” as well. Neoclassical analysis and an emphasis on static efficiency are no longer sufficient for dynamic competition in technology- and innovation-driven marketplaces, which demand a shift in the regulatory framework (Krancke et al., 2012). Competition has a beneficial influence on the preservation of relatively inexpensive, dependable telecommunications services, owing to competitors’ large market share and constraints demanding equivalent cost and dependability.

Conclusion

The telecom sector has encountered a comprehensive transformation in the last few years from natural monopoly to dynamic competition. Most of the telecommunication industries recently underwent rapid deregulation due to rapid technological innovation. The deregulations in telecom have made the home market statuses more competitive in many countries. As the competition is expanding, prominent players are reducing their prices and presenting more quality service to the general public. Due to dynamic competition, telecom operators are trying to discover fresh competitive positioning tactics that would support them to obtain the upper rank in the market. Particularly, big fishes in telecom are creating a position map and defining new boundaries in the market. Moreover, they are also trying to convert the customer experience into value by offering new products and verticals. On the big picture, telecommunications companies are still experiencing a sort of natural monopoly by stopping early entrants from a significant benefit. We can make a final conclusion from our research that telecom industry can increase economic welfare by applying comprehensive analytical framework to escape regulatory myopia.

In near future, telecommunications companies will see more competition as they have already started using neural networks, Blockchain, artificial intelligence (AI), and machine learning with advanced sensory digitization to promote customer service. A 5G and Nano technology are the future of telecom which will play a leading role in shaping the industries of the future. Future trends in 5G will enable Massive machine-type communications (mMTC), VR content streaming, AMCOP, Quantum-Safe Cybersecurity, Cloud Management, and Edge Computing. Cloud computing will provide telecom sectors new chances to grow the ICT value chain in near future.

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