



## INNOVATION AND ECONOMIC FREEDOM IN BRAZILIAN TELECOMMUNICATIONS MARKETS

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### Abstract

Telecommunications markets in Brazil have been very dynamic due to both privatization and technological improvement. Mobile phones have reached the milestone of more than one phone per inhabitant. In the past five years access to mobile internet with 4G technology has increased by 130 millions new clients, and broadband access has increased by 9 million new clients; while cable TV has decreased by one million clients. Regulatory framework has affected innovation and competition. Telecommunication legal landmark still separates pay-TV, content production and providing access. While different countries have upgraded their laws for telecommunications, Brazilian legislation continues a level of obsolescence. When it comes to trademark and patents, the country shows a low degree of development. Intellectual Property systems in Brazil have the worst performance among 76 countries. Despite the difficulties in Brazil, the authors present recent advances that imply improvements in business conditions and telecommunications operations in the near future.

### Keywords

innovation, digital economy, telecommunications, regulation, competition

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## **Introduction**

Brazil is the largest country in South America and one of the largest of the world. According to the latest Census, its population has reached more than 220 million inhabitants. Telecommunications are not only extremely important by technological trends, but they are key to connect the vast Brazilian territory.

The purpose of this case study is to describe the Brazilian telecommunications industry in relation to the changes imposed by the digital economy, and describe the existing barriers in regulation and in patent & trademark systems.

In the current decade, Brazil has had a huge growth in the number of users with mobile access, which, enhanced by 3G and 4G technologies, has allowed access to the internet and broader content, such as video and music streaming.

At the same time, technological advances caused the convergence of various telecommunication media, integrating voice, content and data in a single device. Brazilian regulation in turn, has not been able to keep up with these changes and currently creates obstacles to new investments. Furthermore, the intellectual property and trademark & patent systems are operationally outdated and underperforming, reducing potential technological advances.

On the other hand, changes in regulatory frameworks and trademark & patent procedures are under discussion in Federal Congress; which could lead to potential improvements in the business environment by allowing less state interference in property rights and private decisions.

But there are pitfalls on the same time. For example, Senate Bill Project 57/2018 is about the regulation of streaming services. This could result in increased taxes for direct-to-consumer services and mandatory local content (movies, documentaries, TV series etc.). Streaming (Netflix, Hulu and Amazon Prime Video for example) has been much more attractive to consumers than pay-TV services. Prices have been more competitive than pay-TV and also on-demand services are much more comprehensive

This case study is divided into four parts. Part 1 presents the concept of the digital economy and the information revolution. Part 2 shows the expansion of mobile telephony in Brazil and the decrease in fixed telephony and pay television. Part 3 discusses the main regulatory issues that have affected the telephone industry in the country. Part 4 presents the challenges posed by the current national trademark and patent system.

### **1. Digital Economy and the Revolution of Information**

The effects of new technologies on the characteristics and functioning of telecommunications markets are deep. Fifteen years ago, phones were not 'smart'. Despite having processors, the data bandwidth was small and did not have GPS and other integrated mechanisms and sensors. A typical household separately contracted a cell phone, Internet



access through a data provider, and pay-TV (via cable or satellite). In the absence of fast Internet access through wired broadband, users had only two options: either dial-up access over the telephone network, or access over the cellular network – both with extreme bandwidth limitations for data transport.

Moreover, the prices of the most sophisticated cell phones were restrictive and the most popular handsets had very few functions. In the Brazilian case in particular, most of the population had enough financial and network coverage restrictions to be connected to the internet.

In this context, the telecommunication markets were distinct, a complementarity of demand (e.g. ‘complementary goods’). Telecommunications companies exploited this complementarity by offering bundles that included fixed telephony, pay-TV, and internet access. Contracting for mobile services was done separately.

Communication via text messaging on cell phones was restricted to SMS and it made no sense (and was not even feasible) to send voice messages through audio files, photos or videos. The production of television content, movies and music were little related to the internet. Given the connection speed, there were no large-scale streaming technology conditions. It was common for anyone with internet access to download pirated movies and music for later viewing or listening.

The arrival and spread of the 3G – and later, 4G – network associated with the popularization of smartphones has enabled a revolution that is still underway and will be accentuated with the 5G band. Markets that were once distinct have merged around the internet. Processing capacity of devices and larger data band allowed the transformation of access to television and radio, as well as the way to consume their content. Streaming and on-demand began to characterize the way users consumed television, film, and radio content.

The press media has lost customers to digital media. The advertising market has changed the way it does business; the value of a post on social networks has become greater than the publication of an ad in a major newspaper. Demand for internet access and mobile telephony merged and became a substitute for the demands for fixed telephony, Pay-TV, film and print media.

The regulatory framework, which previously dealt with separate and complementary markets has not been aware of the transformations. Traditional restrictions on horizontal or vertical concentration of markets no longer make sense. As stated by Lucinda & Barrionuevo (2007, pp.17), “...the dynamics of competition in the telecommunications sectors make it necessary to change the model of telecommunications regulation in Brazil. The experience from other countries and also in Brazilian history, tells us that the great process of universalization takes place when there is vigorous competition for the final consumer, associated with well-focused initiatives to enable access in specific areas.”

Today's complexity is even greater because it is not just about higher bandwidth for data transmission. In fact, it is an information revolution that enables new modes of production



and consumption. It is the so-called digital economy and the fourth industrial revolution. Unlike what was called post-Fordism or lean production in the 1980s, the 4th Industrial Revolution or industry 4.0 deals with the way it produces rather than what it produces; and its main objective, as Borlindo (2017) points out, is the ability to offer real-time operation using technology as the primary instrument for instant data collection, recording and processing.

Today, the term IoT (Internet of Things) is associated with the way in which people can interact with their smartphones, smart cars, self-driving vehicles, turning lights on/off, closing the garage door, among other things. Industry 4.0 reinforces the trend towards intelligent systems development for monitoring and decision making, as well as the use of machines communicating with each other. The concept of IoT, according to Borlindo (2017), besides contributing to the development and communication between devices and machines, improves efficiency, industrial safety and reduction of time & costs.

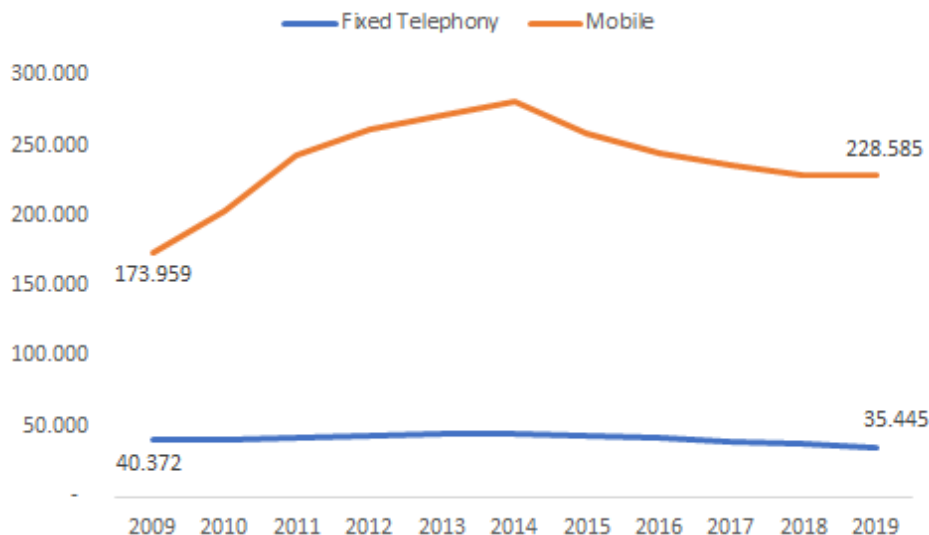
On the consumption side, for example, clothes and shoes made with nanotechnology and IoT will access the internet to inform the user's performance, obtain configuration or even report injuries or heart problems. Traditional and telecommunications markets will be related through new products. The complexity that will be imposed on regulators will be greater.

## **2. Telecommunication in Brazil: Democratizing Access to Information**

Telecommunications markets in Brazil have been very dynamic since privatization in the 1990's and technological improvement over the years. Nowadays, mobile phones have reached the milestone of more than one phone per inhabitant (see figure below).



Figure 1 - Access (in millions of active telephone connections)



Source: Anatel

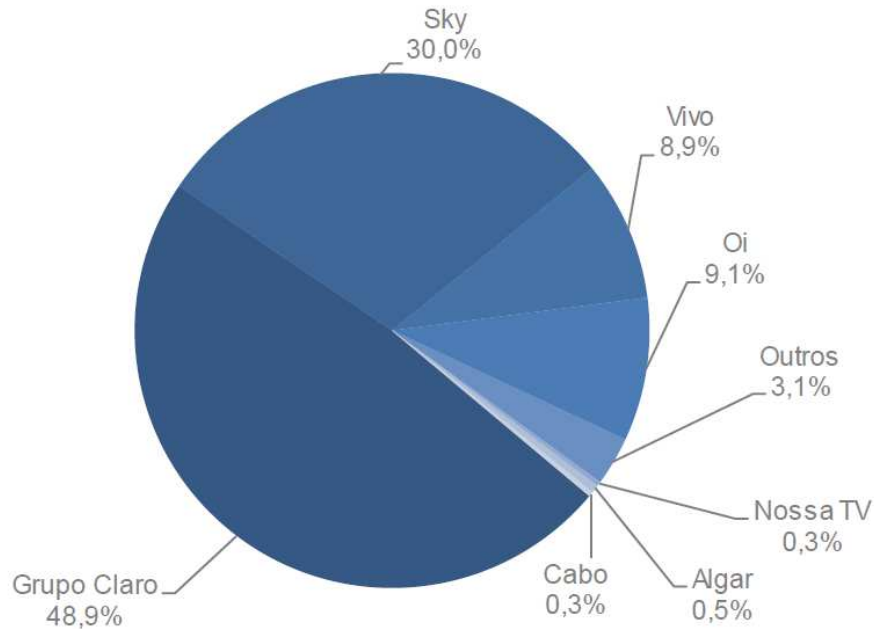
In the past five years, access to mobile internet with 4G technology has increased by one hundred thirty million new clients; and broadband access has increased by nine million new clients; while Pay-TV has decreased by one million clients.

In the telecommunication sector, the main focus is on mobile services that account for the largest revenue share of operators, and has a significant supply of mobile lines surpassing densely populated countries. However, it still has quality problems in services, which have demanded high investments from operators, especially in technological innovation.

From the mid-1990s, the technological structure of the telecommunications industry underwent major transformations that brought pay-TV service closer to telephony services. With this phenomenon, called Triple Play, pay-TV operators now offer pay-TV bundled with fixed-line and mobile Internet service, and thus compete directly with fixed-line operators for all of these services (ESCUDEIRO; LUCINDA; BARRIONUEVO FILHO, 2013).

In Brazil, pay-TV market share is divided between four major operators. Just three of them, Grupo Claro, Vivo and Oi, also provide mobile service.

**Figure 2 - Pay-TV Market Share 2018**



Source: Anatel, May 2019.

### 3. Regulation: Controversial Issues in Brazil

Regulatory framework have affected technological innovation and competition in the telecommunication sector in Brazil. The telecommunication legal framework still treats separately providing access to cable TV from content, such as production, programming, packaging and distribution. While different countries around the world have upgraded their laws for telecommunications, the Brazilian legislation still has a degree of obsolescence, including over-interference by the Telecommunication Regulatory Agency (‘ANATEL’) and the Audiovisual Regulatory Agency (‘ANCINE’). Each one has their own role: Anatel regulates operators and their services, while Ancine handles national video production.

The segment of mobile internet has the highest grade of dynamism where demand for new services, such as streaming, video on demand, IoT and pay-TV by users can be affected by regulation or a lack of free choice and free market in order to arrange the market. In the age of low-cost (or no-cost) streaming applications and services, the barriers to universal access to audiovisual content are no longer economical or technological. They are mainly due to unnecessary state intervention.



Open television remains under the law, dated from 1962, without any rule subjecting it to a converging logic, separating infrastructure from content and setting percentages on regional or independent programming. Contrary to what exists in the world, it is not even thought of as a mode of telecommunications service. There are no regulations for the prohibition of oligopoly and monopoly to stimulate regional and independent production, both provided for by the Brazilian Federal Constitution from 1988.

In Brazil, according to Maciel (2019), the rules that regulate pay-TV services ended up creating unreasonable rules that were born obsolete. Law 12,485 of 2011 establishes, among other things, restriction on foreign capital, which prevented companies such as Vivo and Claro from offering pay-TV service; but the law declares that national audiovisual production and open television must be offered inside the TV bundle.

SeAC (Conditioned Access Service), unifies several rules into a single norme for similar telecommunication services. One of the most prominent aspects according to SeAC is related to regional/local content. The law states that pay-TV content must include local or regional audiovisual content. No matter the nature of the service provider. In practice, this means regulatory agencies decide what the consumer should and should not watch.

The unbalanced competition between Pay-TV subscribers and streaming services creates the chance for telecom operators to push regulatory framework to create barriers, such as different taxes for streaming services. Senate Bill Project 57 of 2018 is about the regulation of streaming services. It affects streaming by imposing regional or local content and also by increasing taxation. Nowadays streaming services do not pay States' value added tax.

On the other hand, good news has occurred recently. On September 11<sup>th</sup> 2019, the Senate approved a bill that changed the 1997 Telecommunications Legal Framework. The bill provides legal authorization of fixed-line operators to migrate from current 'concession contracts' to 'terms of authorization' – as it prevails today for mobile telephony.

The model of 'concession contracts' were defined by the Federal Government for more than 20 years at the time of telephone sector privatizations. Since the advancement of the Internet, this model of contract was outdated as there is not any interest from the private sector. For example, in the concession contract, fixed-line operators have an obligation to make massive investments in public telephones even though most of the population now has access to mobile telephony.



The change to the ‘terms of authorization’ model leaves fixed-line companies free to invest their resources to the best of their ability in line with customer demand. This may attract new foreign investments in the sector.

#### 4. Patents and Property Rights: How Brazil is Overcoming the Difficulties

The guarantee of intellectual property is one of the main factors that determine the degree of competitiveness of a company, a sector and a country, allowing the constant emergence of innovations in both the production processes and products of goods and services offered. For this reason, intellectual property protection rules are used to give innovators protection of their intellectual property.

The offices that act for the formalization of these guarantees in the registration of trademarks and patents, as well as other results of the innovative process, are World Intellectual Property Organizations (WIPO), China National Intellectual Property Administration (CNIPA) and European Union Intellectual Property Office (EUIPO) etc.

In Brazil, the intellectual property protection system is carried out by a federal authority linked to the Ministry of Economy called the National Institute of Industrial Property (INPI). It is up to INPI “to stimulate innovation and competitiveness from technological development.”

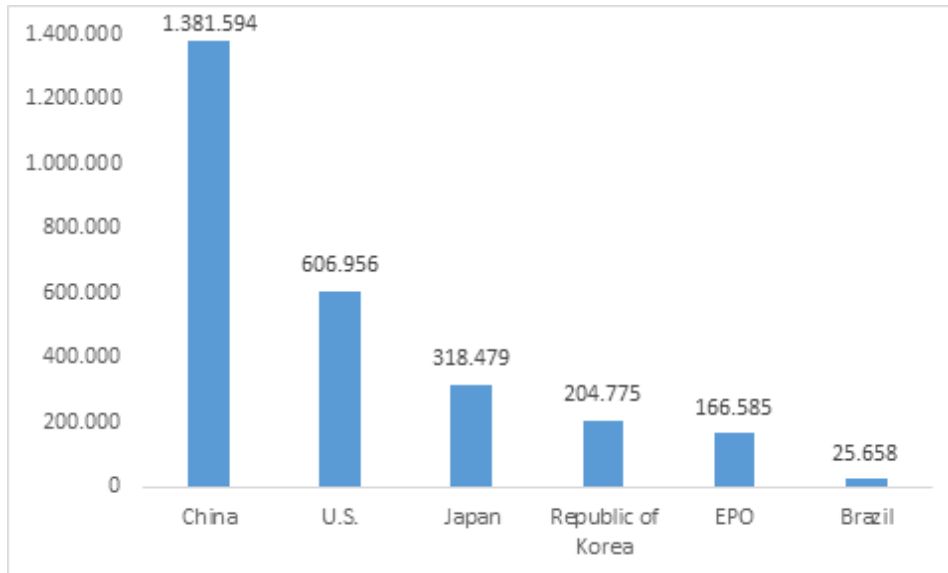
In this sense, INPI is responsible for the registration of trademarks, industrial designs, geographical indications, computer programs & integrated circuit topography, the granting of patents, the endorsement of franchise agreements, and the different modalities of technology transfer.

Some figures from the INPI, compared to the main international offices, show that trademark and patent issues in Brazil still must go a long way so that we can achieve a minimally competitive condition. To get an idea of the overall size of this reality, compare the number of patents required at the world's top registry offices. According to international statistics, China was the country that filed the most patent applications in 2017 – 1,381,594 applications – while in Brazil the INPI registered only 25,658 applications, as shown in the following figure.





**Figure 3 - Patent Applications 2017**

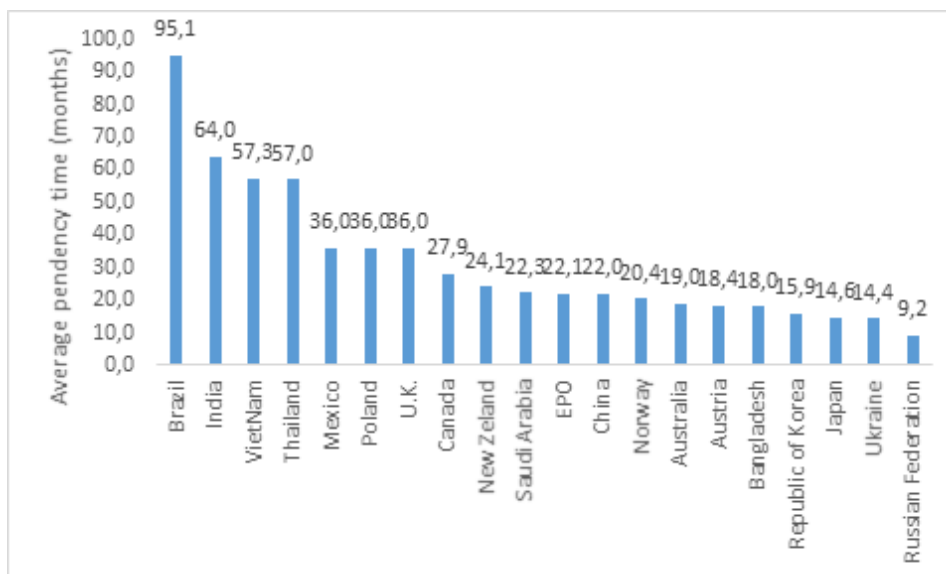


Source: WIPO Statistics Database, September 2018.

Besides the low number of patent registration, other evidence points to a low degree of development of the Brazilian intellectual protection system. Brazil has the worst performance, among 76 analyzed offices, in relation to the average time for patent registration requested. While the Russian Federation – the country with the shortest time – only takes nine months to process a patent, Brazil takes about 95 months to accomplish the same task, as shown in the following figure.



**Figure 4 - Average Pendency Time between First Office Action and Final Decision, 2017**

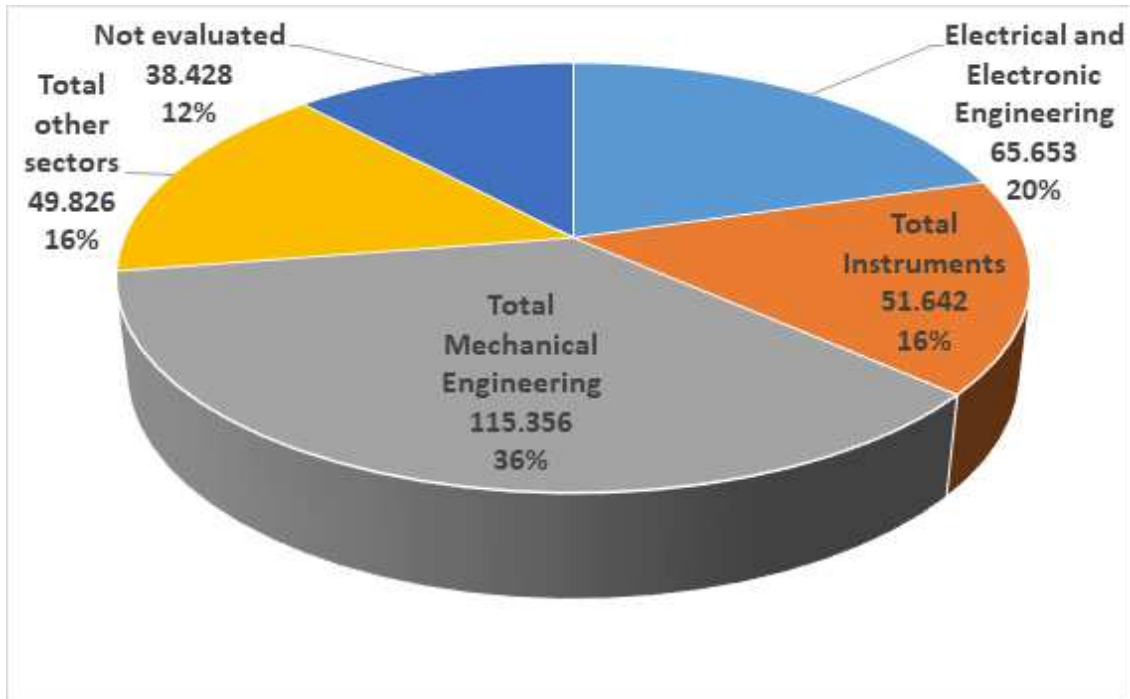


Source: WIPO Statistics Database, September 2018.

Analyzing the Brazilian reality, it appears that among the sectors of activity, requests related to Mechanical Engineering accounted for 36% of the total number of required patents between 2000 and 2017, followed by Electrical and Electronic Engineering and the Instruments sector. For further details see the following figure.



**Figure 5 - Patent Applications Filed at the National Institute of Industrial Property (INPI), by Sector of Economic Activity, 2000-2017**



Source: INPI Activity Report, 2018.

When disaggregated by technological area, there is a relatively equal participation among the main areas that have filed patent applications. The Telecommunications sector ranked 22nd in the ranking, which corresponds to 4.5% of the total orders at INPI. Data for the main areas are shown in the table below.



**Table 1 - Patent Applications Filed at the National Institute of Industrial Property (INPI), by Technological Area (according to IPC), 2000-2017**

Ranking	Technological Area	Total	%
1°	Fine Organic Chemistry	32.332	6,8%
2°	Medical Technology	26.488	5,6%
3°	Pharmaceutical products	24.899	5,2%
4°	Transport	23.280	4,9%
5°	Civil Engineering	21.734	4,6%
22°	Telecommunications	9.449	4,5%

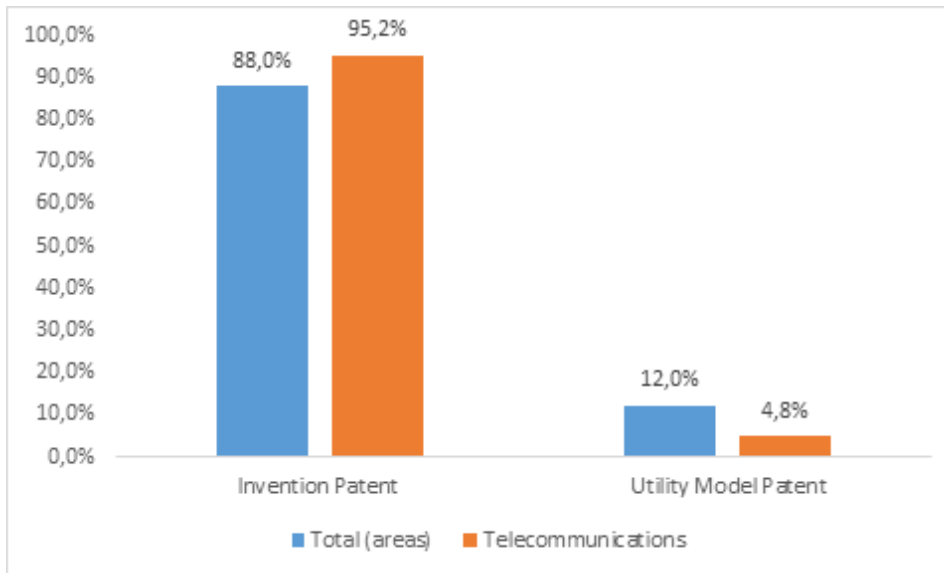
Source: INPI Activity Report, 2018.

Other important evidence to be highlighted regarding INPI applications is that most applications are for the registration of Invention Patents. If we analyzed the information from all areas, 88% of applications between 2000 and 2017 were for Innovation Patents, while 12% were for Utility Model Patents.

For the technology area of Telecommunications, the participation of innovation patents was even higher. Of all filed, 95.2% were for innovation patents, and only 4.8% for Utility Model Patents, as illustrated in the figure below.



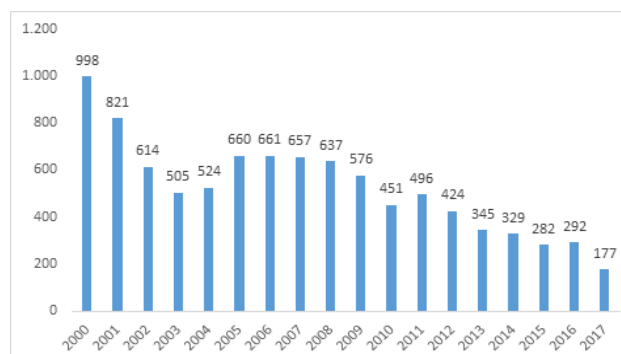
**Figure 6 - Applications for Invention Patents and Invention Model Patents Filed with the National Institute of Industrial Property (INPI), All Technological and Telecommunications Areas, 2000-2017**



Source: INPI Activity Report, 2018.

Finally, it is noteworthy that between 2000 and 2017, 9,449 patents were registered in the telecommunications area, but what is observed is the downward trend over the years. In 2000, 998 registrations were requested, while in 2017 there were only 177 requests, the smallest number in the analyzed series, as shown in the following figure.

**Figure 7 - Applications for Invention Patents and Invention Model Patents Filed at the National Institute of Industrial Property (INPI) of the Telecommunications Technology Area, 2000/2017**



Source: INPI Activity Report, 2018.



The largest number of registrations in 2000 corresponded exactly to the sector's privatization period, which began in 1998 when state-owned Telebrás was split into several other companies. These companies were then auctioned off to the private sector.

Another important highlight to be made in relation to the Brazilian telecommunications sector refers to the high concentration of the market<sup>186</sup>. An example of this is that only four operators control 98% of the country's mobile segment, all of which are foreign capital; which implies, in the field of innovation, technology transfer business strategies developed in their respective countries of origin.

According to Benedetti (2019), in a competitive environment, especially technology-based companies, patents appear to be a strategic issue. Demands for news are frequent and competitors would not hesitate to copy a new technology to incorporate it into their product portfolio if this new technology was not protected. Companies seek support for their research, development and innovation process through a legal instrument in which the State assures them the right to industrial property. However, the inventor's expectation of filing a patent with INPI becomes weakened when he comes across the Brazilian reality: the final result of the analysis of an application which grants the patent letter to his holder taking up to 13 years. There would be countless cases where technologies would already be obsolete upon receiving the patent. This affects the achievement of technological telecommunications solutions proposed by local entrepreneurs. It is worth remembering that one of the first patents deposited for a caller ID device was made in Brazil in 1977 (DENNY, 2018).

Despite the unacceptable scenario regarding the process of obtaining intellectual property in our country, it is noted that INPI has been striving to reduce the backlog of patent applications by giving differential treatment to priority technologies and micro and small business owners.

More good news was the approval by the National Congress of PL 98/2019, whereby Brazil joined the Madrid Protocol, already in force for 30 years, which reduces the bureaucracy of international trademark registration. According to the INPI, the results should start to appear from October 2019, facilitating the registration of trademarks in 120 countries and no longer having to register individually in each country. The expectation of the National Confederation of Industry (aka 'CNI') is that companies will have significant cost and time reduction, reaching up to 75% of what we have today. From the point of view of telecommunications, this is mainly reflected in international content transmitted, ensuring greater legal certainty to the brands conveyed.

## 2 Final remarks

This case study illustrates the importance of mobile telephony for the expansion of access and integration of national territory – allowing broader access to internet content. The current technological evolution requires legal and procedural changes. Despite the difficulties in Brazil, we can see recent advances that imply improvements in business

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<sup>186</sup> More information at TELECO Inteligência em Telecomunicações in:  
<https://www.teleco.com.br/mshare.asp>



conditions and telecommunications operations. This is necessary to ensure the deployment of 5G technology in the coming years. Improvements spread the benefits of the digital economy in a country of regional and global relevance, and must include those of low-income to the benefits of the digital economy.

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