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Charlita de Freitas, Luciano and Vilas Boas de Freitas, Igor

National Telecommunications Agency-ANATEL

17 May 2016

Online at <https://mpra.ub.uni-muenchen.de/71550/>

MPRA Paper No. 71550, posted 25 May 2016 05:45 UTC

Aurora of a new order in the Brazilian telecommunications sector and regulation.

Luciano Charlita de Freitas¹, Igor Vilas Boas de Freitas²

National Telecommunications Agency – ANATEL

SAUS, Quadra 6, Bloco H, 9º andar, 70070-940 - Brasília - DF

Abstract

This study approaches the fundamental aspects of the ongoing debate around the transforming context of telecommunications sector and regulation in Brazil. It departs from the recognition of losing essentiality of fixed-line telephony and the risks of maintaining this service under public regime and how it may jeopardize the prospects of telecommunications development under severe investment constraint and current political and economic circumstances. The objective is to offer an overview of the sector performance and to ponder about some references that granted policy makers and the board of commissioners of the regulatory agency to advocate toward the establishment of a new regulatory framework for the sector.

Keywords: Telecommunications in Brazil; Concession model; De-regulation; Public Regime; Competition.

1. Introduction

The Brazilian telecommunications market has dramatically transformed since its privatization in 1997. While by mid 1990s, the so called ‘*General Directives for the Opening of Telecommunications Market*’ (MINICOM, 1997) justified the choice of fixed-line telephony as universal service, today’s demand for telecommunications is driven by mobile and data communications technologies that in large extent perform as economic substitute for wireline based services.

Historical documents that contributed to conceptually justified the urgency and limits of sector reform played essential role in constituting new paradigms for the sector. Those technical and legal studies comprised virtually all aspects from valuation of the state owned companies to long term demand forecasting (MINICOM, 1995a, 1995b; 1997).

Remarkable references include the available data for voice telephony services. Available records for earlier 1990s indicate that average telephony density in Brazil was of 8.4 accesses per 100 habitants with much smaller margins for underdeveloped regions of the north and northeast regions (MINICOM, 1997).

¹ PhD in Economics. Regulatory Specialist. Corresponding author: lucianofreitas@live.com

² MSc in Economics. Legislative Consultant.

These and other references lead to elect the universalization of the fixed-line services as the fundamental policy objective of the sector for the following 25 years. It also defined several initiatives set to create favorable environment for investment leverage with particular importance assigned to defining a *price cap* regime for tariffs that was framed to cover investment and operational costs while assuring market level return on investments.

To secure the updating of the universalization policy the regulatory agency defined a *general universalization plan* (PGMU) which targets were set to be renewed every 5 years. PGMU functions as an instrument to promote universalization of services under public regime and its renewal rule allows to periodically assessing the progress of the policy.

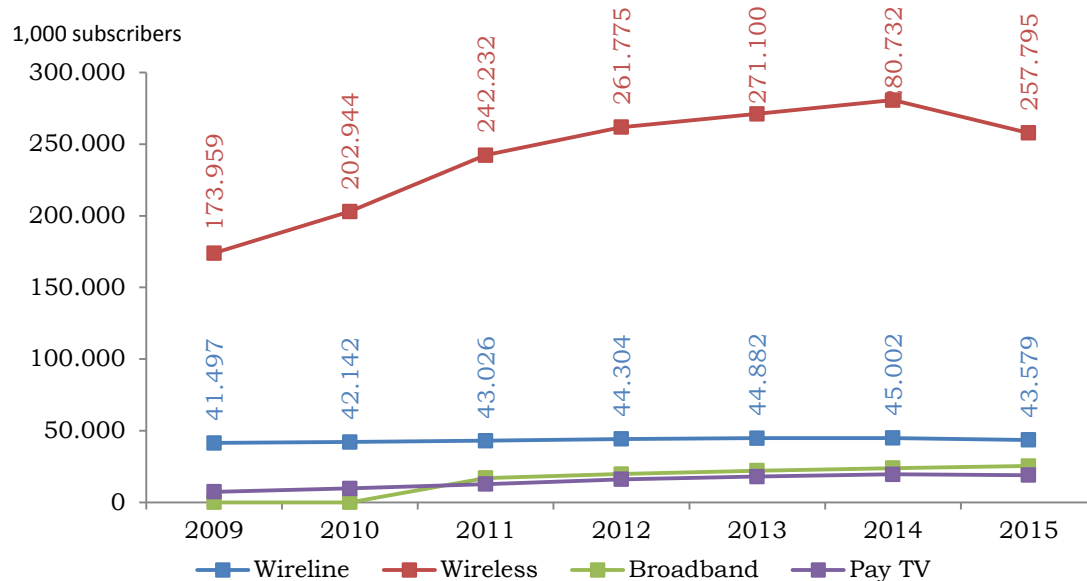
The growth of the sector after the privatization reframed the telecommunications sector in Brazil. By 2010 the universalization was consolidated in a context of scaling down of fixed-line service importance facing the inexorable demand for broadband internet and the popularization of mobile telephony.

This study attempts to summarize the transforming pattern of the sector and the recent trend toward the establishment of a new regulatory framework. Fundamentally it approaches the exhaustion of the current concession of fixed-line telephony services and why the maintenance of this model is deteriorating the sustainability of the concession and reducing competition. The consensual aspects of the regulatory reform are highlighted together with an exam of the current political and economic circumstances.

2. Exhaustion of current concession model

While the fixed-line services was the driver for policy formulation in the first half of the 1990s, the current demand for telecommunications services is mostly oriented to modern value added services developed to suit internet environment and desired request for mobility. References about the shifting service demand are scathing.

Figure 1: Subscribers of telecommunications sector in Brazil



Notes: References are for December.

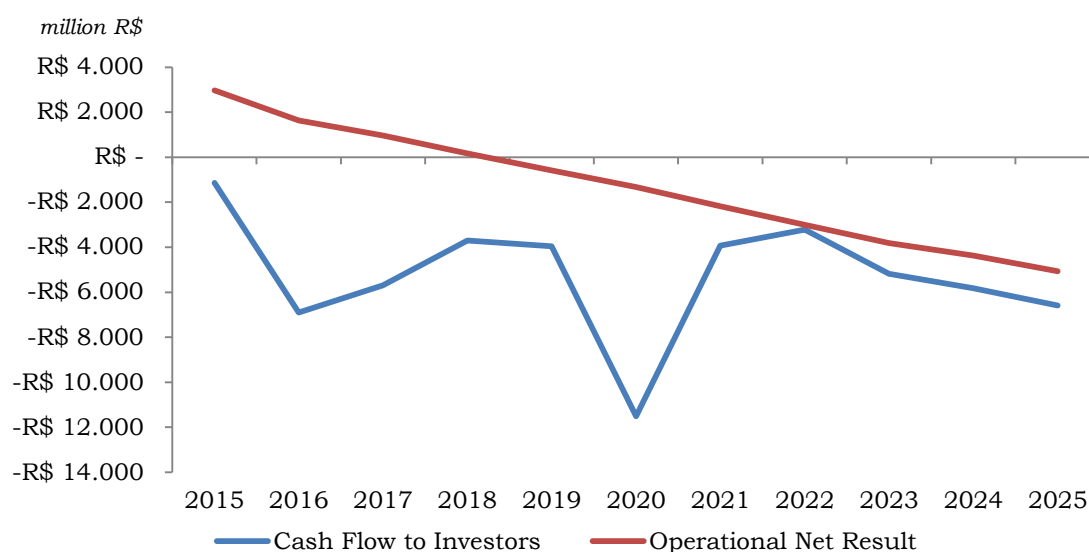
Source: ANATEL, 2016

Figure 1 contrasts the extraordinary performance of mobile services demand and stable fixed-line subscribers. Despite the patterns for services performance, available data addressing their financial outcome points out a vigorous decline on the average revenue per subscriber particularly to fixed-line services (BoAML, 2016).

A recent forecasting of the free cash flow to equity of the concessions states an unequivocal decline of the concession sustainability³ (MINICON-ANATEL, 2016). Following figure outline the aggregated performance of the concessions.

³ Concept of sustainability is explored later in this section.

Figure 2: Forecasting concessions free cash flow to equity



Source: MINICON-ANATEL (2016), with adaptations

The free cash flow of equity is a measure of how much cash a company pays to equity shareholders after expenses, reinvestment and debt repayment. It contracts with the also declining forecasting of operational net result. According to the official forecasting by 2019 the net results of the aggregate of concessions in Brazil would run below its costs. Further references in the report also indicate the lowering of profit margins and increasing cost for investment.

Among telecom services those provided upon mobile platforms have a particular importance to the sector. The regulatory agency recognizes that voice provision using radiofrequencies cover larger area and population than those based on wireline infrastructures. According to FREITAS (2016) mobile coverage reveal that above 80% of the Brazilian population is located in areas with mobile service availability. Following table offers a precise view of such information.

Table 1: Mobile service coverage

Coverage	Domiciles		Population		Municipalities	
	Quantity	%	Quantity	%	Quantity	%
Below 30%	324.262	0,6%	1.306.646	0,7%	89	1,6%
30% a 50%	1.250.568	2,2%	4.941.935	2,6%	373	6,7%
50% a 75%	4.612.397	8,0%	17.197.066	9,0%	1.241	22,3%
75% a 85%	3.589.580	6,3%	12.567.291	6,6%	786	14,1%
85% a 95%	13.710.448	23,9%	44.387.407	23,3%	1.267	22,7%
95% a 99%	20.459.822	35,7%	66.547.226	34,9%	1.030	18,5%
100%	13.373.494	23,3%	43.808.228	23,0%	784	14,1%
Total	57.320.571	100%	190.755.799	100%	5.570	100%

Fonte: ANATEL, 2016

The results confirm the importance of mobile services, offered exclusively under private regime, as the main channel of communication in Brazil. By recognizing this condition it makes sense to formulate arguments towards the analysis of service provision in a technology neutrality basis. Based on this understanding, data provided by the regulatory agency identified that all municipalities in the country are attended by at least one operator. Besides, around 60% of the population counts on at least 3 service providers resuming an extraordinary perspective of competition in a country with severe social and economic constraints and a continent size territory.

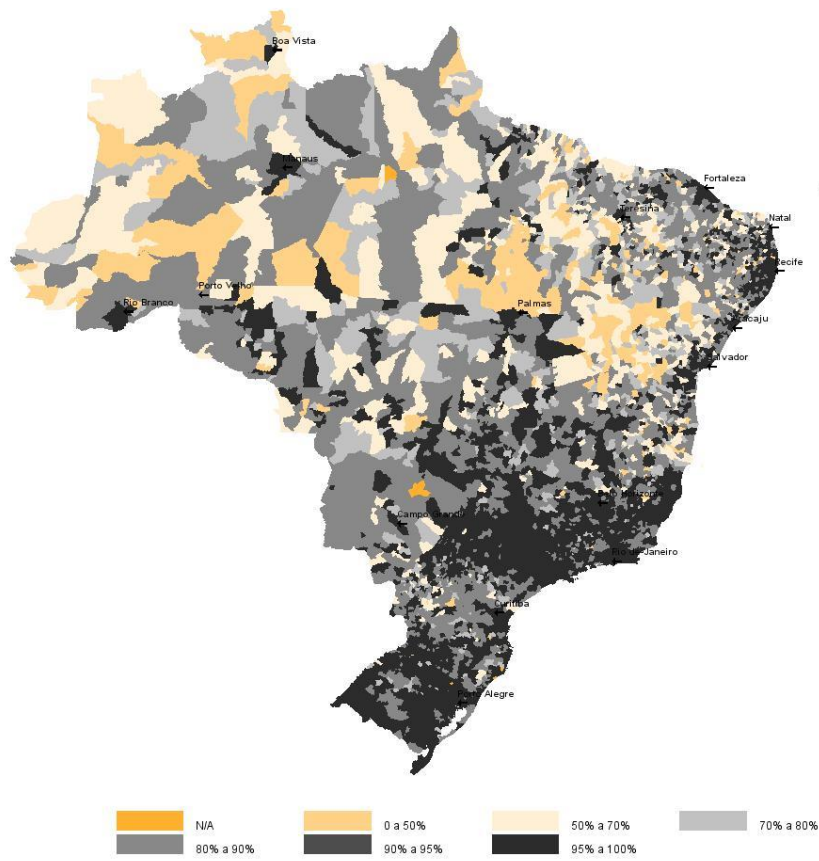
Table 2: Competition the voice provision (2015)

Voice Operators	Municipalities		Covered Population	
	Quantity	%	Quantity	%
2 operators	1.674	30%	84.643.744	41%
From 3 to 5 operators	2.866	51%	37.931.389	19%
From 6 to 10 operators	904	16%	51.047.926	25%
More than 10 operators	122	2%	30.787.464	15%

Source: ANATEL, 2016

Following this understanding, FREITAS (2016) arranged data for mobile service coverage over positioning records of available public telephone booth (TUP). In his attempt author identified that 79,41% of TUPs coexists with mobile services. Following map displays a visual outlook of the overlap between TUP and mobile coverage in the country.

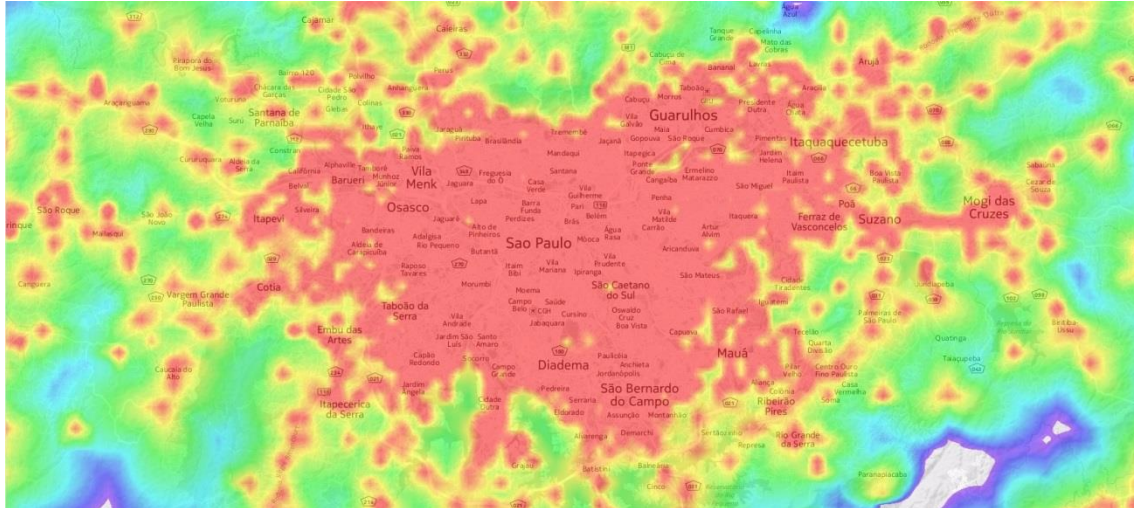
Figure 3: Mobile coverage of Public Telephony Booth (TUP) in Brazil



Source: ANATEL, 2016

The darkened areas correspond to those municipalities where mobile signal overlaps majority of available TUPs. By its turn, the light brown spots correspond to those areas where TUPs are not coexisting with mobile signal. Zooming in the evidences provided by FREITAS (2016) it is possible to identify the robustness of such approach. Following figure offers a visual perspective about the mobile coverage over the São Paulo Metropolitan Region.

Figure 4: Mobile coverage of the São Paulo Metropolitan Region



Notes: It consider 2G, 3G and 4G coverage.

Source: ANATEL, 2016

Combined, these figures display a straightforward message that fixed-line and wireless solutions coexist in the same field of competition. This context has inspired several studies approaching the pattern of competition between these technologies. Remarkable conclusion already settled for mature countries is predominately for setting mobile service as an economic substitute of conventional fixed-line voice (GARBAZ and THOMPSON, 2007; BRIGLAUER et al, 2011; BARTH and HEIMESHOFF, 2012).

Available studies addressing the Brazilian circumstances confirm the magnitude of market transformation and have systematically ratified the international trends. For example, LOBO (2011) identified for 2008 that income-elasticity of the fixed-line voice service was ten times higher than those for mobile telephony.

Other references are equally sounding. A study by CANÊDO-PINHEIRO e LIMA (2009) about the wireline telephony demand in Brazil, based on observations for 2002 to 2004, reveals that a reduction in 50% of the subscription fee would lead to 3,3% increase in service demand.

By its turn, SCHYMURA e CANÊDO-PINHEIRO (2006) concluded for the inefficiency of the PGMU obligations that were inconsistent with the population demand for telecommunications services and implied in a public policy with excessive cost and lower social benefit.

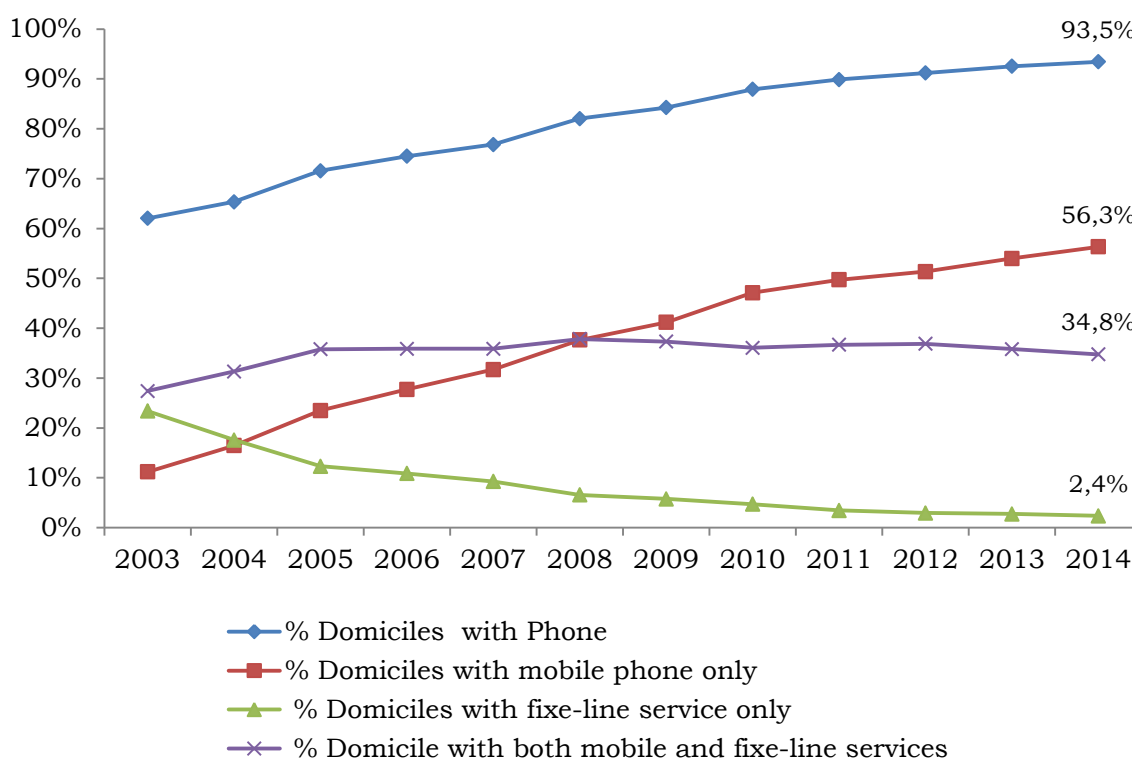
A study by OLIVEIRA (2014) reinforces the consistence of the findings. Based on a broad national survey this author observed that 59,4% of the respondents stated that mobile telephony was used as substitute for wireline telephony. To 20,2% of the sample the reason why not to have fixed-line voice service due to its price, an evidence that was confirmed in other questions

raising the issue that fixed-line voice service is not price competitive.

The perception of quality has also played its stake in the shifting pattern of consumer behavior. For instance, IPEA (2014) has figure out of survey studies that the perception by consumers about the quality of wireline and wireless telephony is closely equivalent. This finding challenges the conventional arguments that the perception of quality of wireline services is better than those of mobile.

Recent data provided by the census bureau about consumers' demand for telecommunications services pictures an accurate view of the current business environment. Following figure 4 indicates that the percentile of domiciles that use exclusively mobile phone as main communication gateway significantly increased over the last decade, passing, in 2009, those with wireline telephony.

Figure 5: Historical performance of the domicile demand for fixed-line voice and wireless mobile services



Fonte: PNAD-Census (IBGE, 2003-2014)

The loss of attractiveness of fixed-line voice service occurs in opposition to the growth of data services demand. Such evidence poses a fundamental challenge over market forces, notably in the supply and demand for conventional telephony services. Following table offers an overview of income-demand relationship for wireline and wireless telephony.

Table 3: Telecommunications services demand by class of income

Income	All	With Mobile and fixed-line voice service	Only with wireless service	Only with fixed-line voice service
Average Domicile Income	R\$4.374,65	R\$7.722,02	R\$2.757,30	R\$2.990,01
Average <i>per capita</i> domicile income	R\$1.639,20	R\$2.818,21	R\$1.035,64	R\$1.502,18

Note: Based on a sample of 57.320.555 domiciles.

Source: Census (IBGE, 2014)

References reveal that lower income families prefer mobile services over fixed-line solutions. Reasons for that might be summarized by decreasing mobile service prices, larger rates of service provision and service plans that suit to consumer's demand.

Sustained on this general collection of evidences one might conclude that the typical services provided by incumbents are under severe competition pressure. It might also explain, despite of the lack of specific studies on the issue, the lowering demand for TUP since user might be better served by cheaper and convenient mobile services. Another example of the cross effect of growing mobile offer is the successive failure of the regulator's attempt to create a popular telephony plan with subsidized price (AICE). By December 2014 the so called AICE subscribers had 159,3 thousand subscribers in a universe of 29,2 million eligible candidates (ANATEL, 2015a).

Moreover, in a context of unprecedented technology transformation, new forms of communication play an essential role towards the shaping of consumer behavior. The diversification of the physical infrastructure and technology standards and the spread of processing capacity through autonomous devices and internet applications are other examples of the recent trends in the sector. Corroborates with this tendency the growing number of subscriptions for voice services and data offered upon hotspots *wi-fi* widely available in the major urban areas of the country what has also contributed to enhance the quality of access and the consumers' cost reduction.

This new business environment has contributed to promote the resetting of the voice market, with new business models and applications that essentially attends consumers' request and cost structure.

Evidences out of competition diagnosis and the paradigmatic transformation of the consumer behavior, that assign higher value to mobile telecommunications rather than wireline based communications.

2.1. *Flaws of the public regime*

The privatization of the Brazilian telecommunications inaugurated the public regime of fixed-line service provision. It refers to a juridical framework that allowed government to franchise the supply of public services to former state-owned companies, the concessionaries, subject to obligations of continuity, universalization and the compliance with predefined standards of quality of services (POSSAS et al., 1998).

As result of the privatization it was defined five concessionaries operating over delimited regions, according to a General Plan of Concession Allocation (PGO). While a concessionary is a private company engaged in the 25 years contract with the state, the concession refers to the company's business unity in charge of carry on the obligations of the public regime.









The concessionaries were set to freely compete in the market with other companies operating under the regular private regime, the so called newcomers. To balance the field of competition these companies must observe specific regulations, including those addressing the conditions of network cession, respect to price cap tariffs, among other.

While such condition allowed to effectively delivering the object of the concession during the first decade of the contract, the transforming business environment later evidenced that regulatory obligations would turn into an excessive burden to the concessionary. Furthermore, historical reliance of policy makers upon concessionaries' network as platform for addressing the most diverse sort of public policies ultimately accelerated the exhaustion the model.

Two concepts are fundamental to define the limits of the economic balance of the sector. First is what is conventionally called in Brazil the '*financial and economic equilibrium of the contract*'. It consists in a legal concept aligned to the legislation of administrative contract that set the preservation of the original conditions of the contract as a precondition to its economic equilibrium. Within this perspective, changes provoked by market trends would not justify the rupture of the contract.

By the other hand the economic conditions of the concession is evaluated according to its sustainability. It is measured according to economic and financial parameters formulated out of market trends, costs and demand for the services, and the capacity of concessions to remunerate investments and assure returns above its costs. Following figure conciliates these concepts.

Figure 6: Concessionary and Concession

		Concessionary	
 	 	Concession is sustainable but the concessionary economics is not balanced	Concession is sustainable and the concessionary economics is balanced
 	 	Concession is not sustainable and the concessionary economics is not balanced	Concession is not sustainable and concessionary economics is balanced

Concession

Source: FREITAS, 2015

This matrix of possibilities represents how concessionaries and concessions are related to each other. The regulatory authority is in charge of monitoring both the concessionary and concession in order to keep the track of their performance and assess the risks to the continuity of the public regime.

Even though official reports addressing the financial and economic conditions of the contract and the sustainability of the concessions are most under confidential rule, available references allow inferring a prognostic about the current situation of concessions sustainability. The reference that definitely put the issue in the decision making agenda was released in June 2015 when the agency publicly disclosed the imminence sustainability risk of the concessions (FREITAS, 2015).

Among the references the agency detailed the systematic revenue loss by concessions and the increasing marginal costs of the service pushed by costly universalization obligations and the maintenance of technology and assets for wireline telephony (FREITAS, 2015).

Table 4: Aggregated revenue of wireline service operators in Brazil.

Revenue (R\$ billion)	2005	2010	2015	Δ 2005-2010	Δ 2010-2015
Subscription fees	R\$11,02	R\$10,51	R\$ 9,63	-5%	-8%
Call fees	R\$23,35	R\$21,04	R\$12,90	-10%	-39%
Interconnection	R\$ 2,88	R\$ 2,18	R\$ 2,30	-24%	6%
Infrastructure sharing	R\$ 1,46	R\$ 2,07	R\$ 3,26	42%	57%
Total	R\$ 38,72	R\$ 35,80	R\$ 28,10	-8%	-22%

Source: FREITAS, 2015.

Historical data for the sector confirms the deterioration of revenues by the sector. Between 2005 and 2010, the aggregated revenues of the sector decreased by 8%. And, in the following 5 years the revenue decreased by unprecedented 22%, led by 40% reduction of calls revenue what evidence the lowering use of voice service. While this reduction was partially compensated by increment in revenues of services as interconnection, the loss in the fixed-line voice service revenue is wide larger than increment in other revenue sources.

References of revenue and demand of conventional fixed-line services endorse the vigorous change in the behavior of consumers. By 2015 it was already recognizable that mobile telephony became an economic substitute of wireline based telephony. Hence, given the status of universalization of voice services it is reasonable to expect the gradual dissolution of the wireline concessions and the loss of essentiality of services object of the concession, raising the concern of changing the current concession contracts in order to avoid a systematic failure of the telecommunications system in the country.

2.2. A glance on the reversible assets

An emblematic example of the onus of public regime is the limited capacity assigned to concessionaries to dispose reversible assets. Few words on the concept of reversibility are worth it since it is a specific component of the Brazilian regulatory framework.

Reversibility consists in an idiosyncrasy of the administrative law that assigns to the State the right to reclaim the property of concessions' assets necessary to provide services under public regime. It was originally designed to be a mechanism to assure continuity of essential services during and after the concession contract term. Therefore, the concessionaries would have the right to explore the available networks, increase and modernize them in order to comply with universalization obligations and then return these infrastructures to the State after the concession completion.

Within the General Law of Telecommunications⁴ the definition of the limits of reversible assets is assigned to the regulatory authority. Therefore, in the attempt to establish the extent of reversible assets, regulators have engaged in a debate which parts are generally arranged in two opposite biases usually referred to as “*patrimonialism bias*” and “*functionalism bias*” (MARQUES NETO, 2004; DE FREITAS et al., 2016). Those affiliated to the patrimonialism approach defend that reversibility embodies all assets independently of the service essentiality.

By its turn *functionalists* recognize that the value payed by investors at the privatizations auction assured the private property of these assets and the reversibility rule would only apply as a pledge to assure the continual provision of services under public regime as long as it was classified as essential. Once the service essentiality ceases companies would be allowed to freely place these assets to other purposes.

As long as the deliberation about the limits of the reversibility keeps unsettled concessionaries are in charge of maintaining these assets by an increasing marginal cost (DE FREITAS et al., 2016). As a matter of fact the repercussion of reversibility has a non-trivial impact over the competition given the fact that it applies only to concessionaries.

Other consequence of unfinished debate is the uncertainty about the extent of reversibility guideline over new investments in the sector. This concern is exacerbated by the odds of infrastructure convergence that allows companies to offer multi-services over a single technology platform.

2.3. *The maintenance of concession in monopolistic areas*

Although it looks reasonable to assume that the service provision has reached majority of population, it is fundamental recognizing the existence of several localities where service availability resumes to those provided by a single operator. Therefore, it is reasonable to set a regional approach of the deregulation in order to protect the right of communication of populations from rural and remote areas.

Keeping the concession in these areas seems to be a reasonable approach towards a smooth transition process and to avert eventual juridical issues and other risks related to contextual aspects of the concession contract. To be consistent and legally consistent this proposal must be set on the premise of negotiable settlement and executory commitments between the concessionary and the State.

⁴ BRAZIL, 1995. General Law of Telecommunications (LGT).

3. Transition in a context of political and economic gloomy

The magnitude of the transition in course requires a thorough adjustment of regulatory approach and a mid to long term review of legislation applied to the sector.

Regarding the regulation, reducing the scope of current concessions implies reviewing the PGO, a reference attached to the concession contract, which is already set to be periodically reviewed according to certain parameters of competition. Reviewing the PGO is a matter of the executive, confirmed by presidential decree.

By its turn, according to the sector legislation, determining the eligibility for essentiality of the telecommunications services is a prerogative of the national congress. It implies in recognizing the necessary congressional approval that would require a reform in the current general telecommunications law.

Both initiatives are subject to the constraints of current environment for decision making in Brazil. Within this circumstance it is unpredictable how fast any agenda about leveraging investments and modernizing the telecommunications sector and regulation would potentially been belated.

Meanwhile, sector crises imposes a exceptional sense of urgency and a positive agenda turned to effectively restore companies' compromise to invest in the sector in order to assure the necessary modernization of the network and to adequate it to new demand standards. References provided by the BNDES (2015) demonstrate that required amount to assure the transition towards the *new economy* exceeds R\$ 141 billion investment for the period from 2015 to 2018. It represents 37,8% real growth over entire investment roll-out for the period from 2010 to 2013.

3.1. From dissension to outbreak decision makers consensus

The recognition that sector in general and the concessions in particular are facing an economic turbulence inaugurated a series of debate about the transition for a new regulatory approach and the resetting of the public policies. By February 2016 the Agency published a first technical analysis approaching the necessity for immediate change in the regulation framework (FREITAS, 2016). It was later reinforced by the considerations by LOUREIRO (2016) and finally the results of the joint report by MINICON-ANATEL (2016) the subject gained relevance and was definitely scaled up to gain the political agenda.

Leading conjectures about the reform of the concession obligations may be segmented in two main approaches. The simplest and now less probable is the maintenance of current concession as it is (ANATEL, 2013; LOUREIRO, 2016).

The second proposal consists in reducing the scope of the public regime to areas where fixed-line voice services is the sole and last resort of communication (FREITAS, 2016). This proposal is consistent with the recognition of thorough competition and reducing relevance for services provided under public regime. By reducing the extent of the concession it implies resizing the attached regulatory obligations what would ultimately lightening the incidence of regulatory costs.

The shifting position of the ministry of communications emerged shortly after the Agency positioned toward the proposal of a new perspective for the sector future. The so called '*Joint report of the Work Group between the Ministry of Communications and the Anatel on the alternatives for the revision of the services and telecommunications model in Brazil*' (MINICON-ANATEL, 2016) came out with elements of the Agency proposal, and a straightforward proposal to lightening the touch over the obligations applied to the public regime.

The summary of the main aspects addressed in the joint report was confirmed in the order n° 1.455/2016 (MINICOM, 2016) that establishes the guidelines for reviewing the concession model and to define a new policy for the sector.

Other initiative with major repercussion to the sector development passes through reviewing the conditions for disbursements of the Fund for the Universalization of Telecommunications Services (FUST)⁵. This fund was created in 2000 with the objective to finance expenses associated with universalization in areas where universalization costs would not be commercially viable. However, its use has been circumscribed to the universalization of fixed-line services what has virtually inhibited its use over the years. Initiatives to turn the use of FUST resources more flexibly and able to address the universalization of modern services are under debate at the national congress⁶.

3.2. What is certain and uncertain about current Brazil's political and economic crises?

Since the turning of current presidential tenure the country has faced its worst economic recession in decades. A proof of that is the rapid declining of

⁵ FUST is mainly funded by a 1% tax on the net operational revenue of the telecommunications companies (BRAZIL, 2000).

⁶ Project of Law n° 1481/2007: Altera a Lei n° 9.394, de 20 de dezembro de 1996, e a Lei n° 9.998, de 17 de agosto de 2000, para dispor sobre o acesso a redes digitais de informação em estabelecimentos de ensino.

investment rate and lowering returns (BoAML, 2016). By its turn consumers and industry confidence have systematically faded out given the increasing inflation and deteriorating credit policy (FGV, 2016).

Despite the uncertainties concerning current political and economic circumstances there are havens of certainty in this framework. One that is particularly akin to the telecommunications reform is the stable mandate of agency commissioners that assure, among other prerogatives, the agency cohesion during the regulatory transition. An argument backing up the Agency's commitment is the current effort towards the establishment of its strategic planning reflecting the legitimate wish to establish a solid foundation for proper development of modern regulatory approach (ANATEL, 2015b).

Updates addressing the reform of economic and finances policies have also provided reliable signs towards a positive agenda for economic recovering. Besides, the perception of bad public governance, originated in the deterioration of ethical relations, conformity, transparency and accountability, are coexisting with an overall perception of relative debility of the State institutions.

3.3. The Industry skepticism

Facing the deterioration of the concessions, concessionaries engaged in several strategies to face the loss of competitiveness in the sector. Specifically they enhanced their portfolio of services and packed it up in combos that would ultimately compensate the decline of market share and increase demand for more value added mobile and broadband services.

However, despite the marketing efforts the increasing marginal cost of carrying obligations of the contract still poses a particular challenge to the incumbents, especially in the highly competitive markets where cost cutting strategies rule. Therefore, it might be expected that industry would be willing to engage in initiatives toward the lightening of regulatory burden.

Despite the willingness of concessionaries and regulator to promote a smooth transition towards a light touch model, uncertainties about this process remain critical. It mainly due to the unfinished debate concerning the transactional mechanism and schedule and the migration methodology that ultimately imply in exchanging a parcel of the onus of the remaining period of the concession contract into investment commitment.

4. Concluding remarks

This study introduces an overview of the current trends in the telecommunications sector in Brazil and the proposal to deregulate fixed voice telephony. It approaches the recognition of weakening essentiality of fixed-line voice services facing the growth of new services and increasing marginal costs of the fixed networks due to loosing scale and excessive regulatory costs.

Remarkable evidences of the sector development and the transformative pattern of technologies trend and consumers behavior are reported taking as references official reports published by the regulatory authority, ministry of communications and census office. Supporting evidences grounds the recognition of urgency towards the establishment of *'lighter-touch'* regulatory systems.

Challenges to address the deregulation of the sector are contextualized by unprecedented economic and political hurdles that impose particular threat to an agile decision making process. Within this context the transition set over a reduced scope of the current concession contracts is placed as a preferential alternative despite the ongoing debate.

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