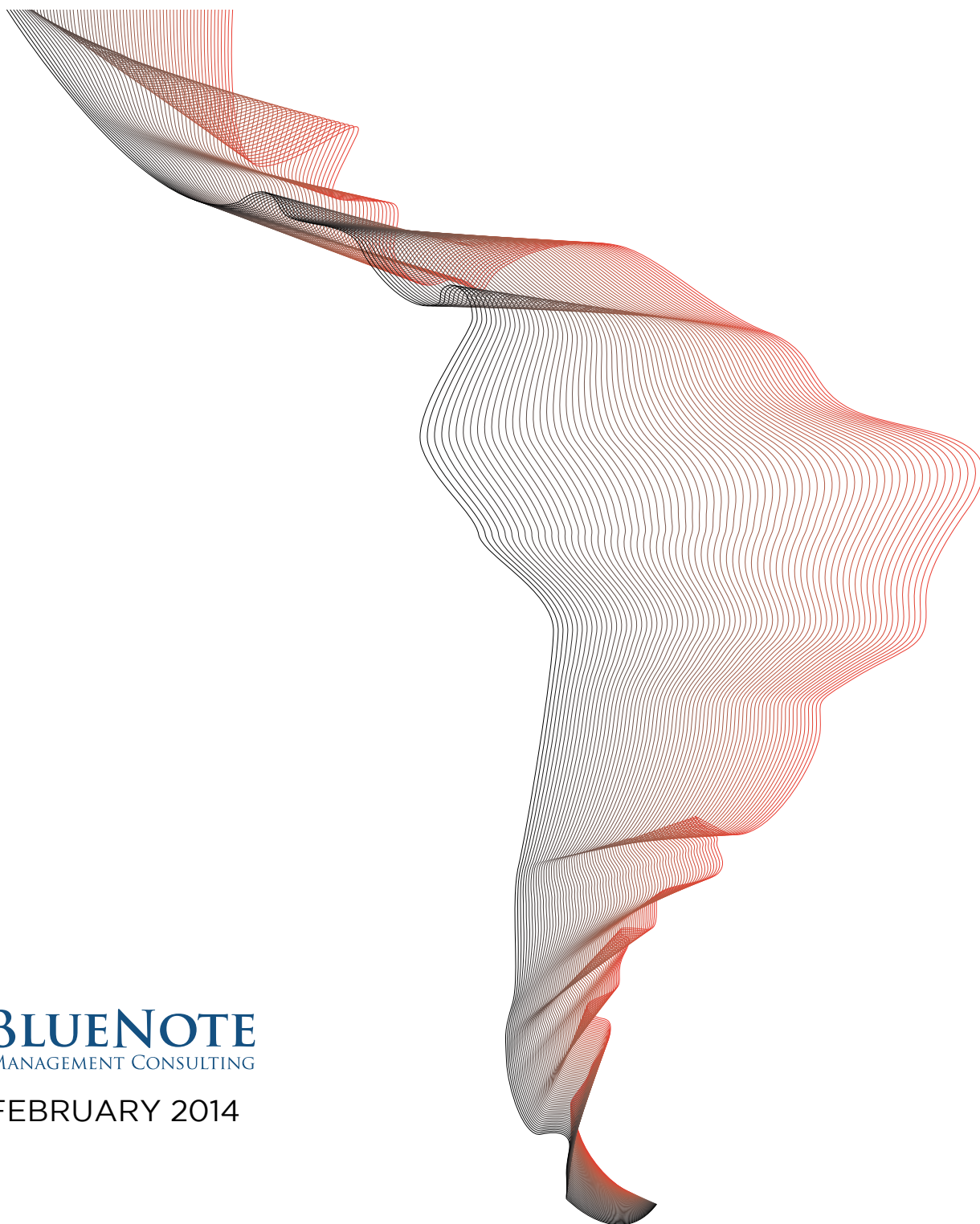


# Licence Renewal in Latin America

Latin America



**BLUENOTE**  
MANAGEMENT CONSULTING

FEBRUARY 2014





Latin America

The **GSMA** represents the interests of mobile operators worldwide. Spanning more than 220 countries, the **GSMA** unites nearly 800 of the world's mobile operators with 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet sectors such as financial services, healthcare, media, transport and utilities. The **GSMA** also produces industry-leading events such as Mobile World Congress and Mobile Asia Expo.

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BlueNote Management Consulting is an international consulting company specializing in the telecommunications and media sector. It mainly operates in Latin America. It provides consulting services to the private sector and public agencies, supporting them during their decision-making regarding high-impact issues: business strategies, policy formulations, technological innovations, and negotiations.

For more information, please visit [www.bluenotemc.com](http://www.bluenotemc.com)

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1.

# Introduction

Within the current framework of upcoming licence renewals for spectrum, GSMA commissioned BlueNote Management Consulting to conduct a study to assess and develop recommendations for renewing cellular mobile phone and PCS operations in Latin America. This study comprises four main chapters and their conclusions. The topics covered in each chapter include:

**GENERAL  
FRAMEWORK**




**BEST  
PRACTICES  
FOR  
RENEWALS**




**1** THIS SECTION INCLUDES A DESCRIPTION OF THE GENERAL FRAMEWORK IN WHICH THIS STUDY WAS CONDUCTED, WITH A CHARACTERIZATION OF THE BUSINESS ENVIRONMENT IN LATIN AMERICA AND AN INTRODUCTION TO THE MAIN ELEMENTS REGARDING LICENCE RENEWAL FOR SPECTRUM.

**2** THIS SECTION INDICATES THE BEST PRACTICES FOR RENEWING LICENCES FOR SPECTRUM IN RELATION TO EACH MAIN ELEMENT. THERE IS A DESCRIPTION OF ALTERNATIVES, THE SITUATION IN THE COUNTRIES OF THE REGION, AND A COMPARISON TO OTHER INTERNATIONAL MARKETS. FINALLY, RECOMMENDATIONS ARE MADE WITH BEST PRACTICES PROPOSED FOR EACH AREA.






THE LAST CHAPTER SUMMARIZES THE CONTEXT IN WHICH THIS PROCESS TAKES PLACE AND HOW IT AFFECTS RENEWALS, AND CONTROVERSIAL ASPECTS OF UPCOMING RENEWALS. FINALLY THERE IS AN ANALYSIS OF THE IMPACT FROM OF UNCERTAINTY IN THE MARKET.



**RISKS RELATED  
TO LICENCE  
RENEWAL FOR  
SPECTRUM**



**IMPACT  
ANALYSIS**



**3** THIS SECTION INCLUDES A DESCRIPTION OF THE POTENTIAL RISKS THE PRIVATE AND PUBLIC SECTORS AND USERS FACE FOR USE OF THE RADIO-ELECTRIC SPECTRUM.

**4** THIS INCLUDES AN ANALYSIS QUANTIFYING THE EFFECT UPON INDUSTRY INVESTMENT LEVELS FROM UNCERTAINTY RELATED TO LICENCE RENEWAL FOR SPECTRUM. THIS UNCERTAINTY COULD RESULT FROM A LACK OF KNOWLEDGE OF THE RENEWAL PROCESS AND CONDITIONS, OR AS THE RESULT OF THIS PROCESS, IF IT IS AN OBJECTIVE SELECTION PROCESS. THE METHODOLOGY EVALUATES THE RISK LEVEL TO THE CAPITAL INVESTMENTS IN THREE MARKET SITUATIONS AND THE ESTIMATED EFFECT ON THE LEVEL OF INVESTMENTS IN EACH MARKET.



## 2.

# General Framework

In the 1990s, mobile telephone service operators were generally granted licences for providing service. They were assigned bands of spectrum required to provide such service. The shortage of the spectrum resource was not as significant then as it is today. Therefore, more emphasis was placed on the licences and/or concessions for providing service than on spectrum use. With the market restructuring that took place in the following decades oriented toward providing more open telecommunications services, the focus is now on licences for use of spectrum instead of licences for providing services.

**THERE WILL BE INTENSE ACTIVITY  
IN THE NEXT FEW YEARS REGARDING  
LICENCE RENEWALS IN THE  
REGIONAL MARKETS**

In addition to the licence renewal process for providing mobile telephone services (TMC, 850 MHz and 900 MHz bands) and PCS (1800 MHz and 1900 MHz), in some Latin American countries and, to a certain extent, in other regions, there have also been processes through which licences for other Spectrum bands (such as 2100 MHz or

700 MHz) were granted for the first time. These generally took place through auctions. However, it is important to distinguish the differences between first-time assignment for the Spectrum and licence renewal. These differences determine different considerations regarding format and conditions under which licences are granted.



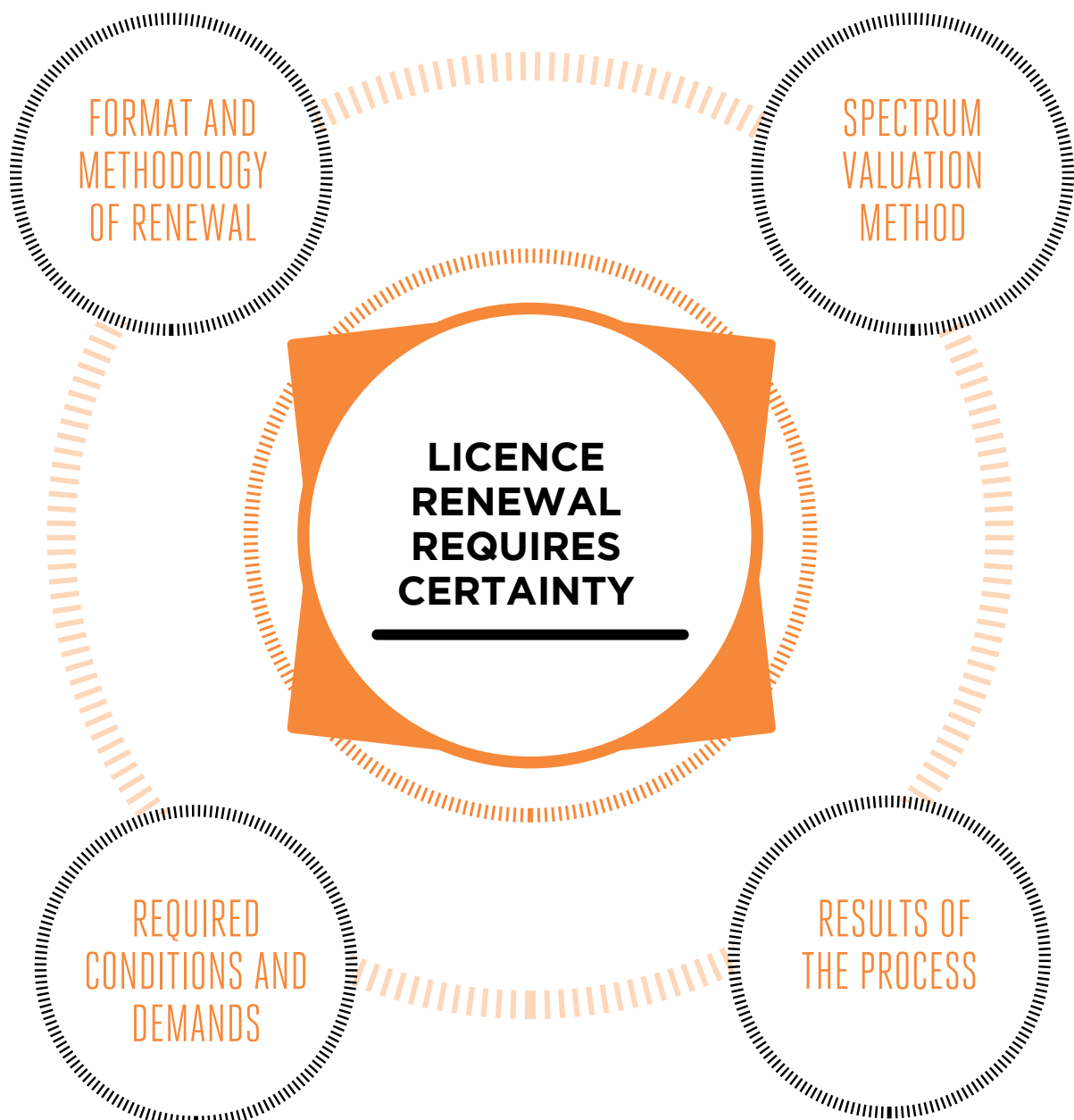
In this renewal scenario, questions arise regarding the review of coverage requirements, quality assurance, the use and deployment of new technologies, the valuation of the spectrum to be renewed according to new market conditions, and method of payment for the spectrum, amongst others.

As a result of these questions, the renewal processes are often uncertain, both for operators and the public sector. Contexts of uncertainty are significantly detrimental to the telecommunications sector, due to the

long time required for recovery of capital investments. This effect is more relevant in contexts in which significant technological replacement is carried out, such as providing 4G services.

The key aspects related to uncertainty to be taken into account upon licence renewal are focused on:

- certainty regarding renewal format and methodology
- certainty regarding the results of the process
- certainty regarding the spectrum valuation method
- certainty regarding required conditions and demands



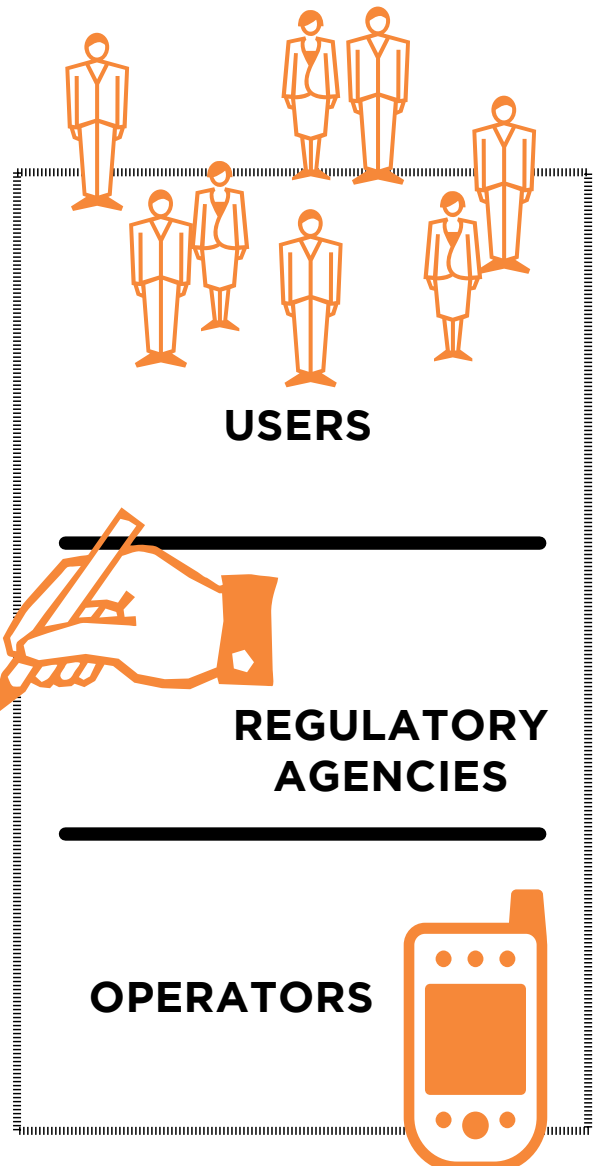


**THERE IS GENERAL SUPPORT FOR A PREDICTABLE, TRANSPARENT REGULATORY ENVIRONMENT THAT IS EFFICIENT AND SATISFIES THE INTERESTS OF THE PRIVATE SECTOR AND THE OBJECTIVES OF THE PUBLIC AGENDA, ENSURING GREATER USER BENEFITS.**

There are three main methods that were adopted in different countries: renewals/extensions of current licences, administrative reassignment, and an objective selection process.

One main aspect to select the implementation method is the distinction between first-time assignment of a spectrum licence and the renewal assignments of the same licence to the same operator. The economic effects are very different. In first-time assignments, there is no rate of investments that could be at risk if the licence is not renewed, as in the case of an incumbent operator faced with successive renewals.

Regardless of the conditions ultimately adopted upon licence renewal, there is general support for a predictable, transparent regulatory environment allowing efficient use of the spectrum that satisfies the interests of the private (operators) and public sectors (regulatory agencies) and users.



**THE DIFFERENT IMPLICATIONS REGARDING FIRST-TIME ASSIGNMENTS OR RENEWALS OF EXISTING LICENCES MUST BE TAKEN INTO ACCOUNT**

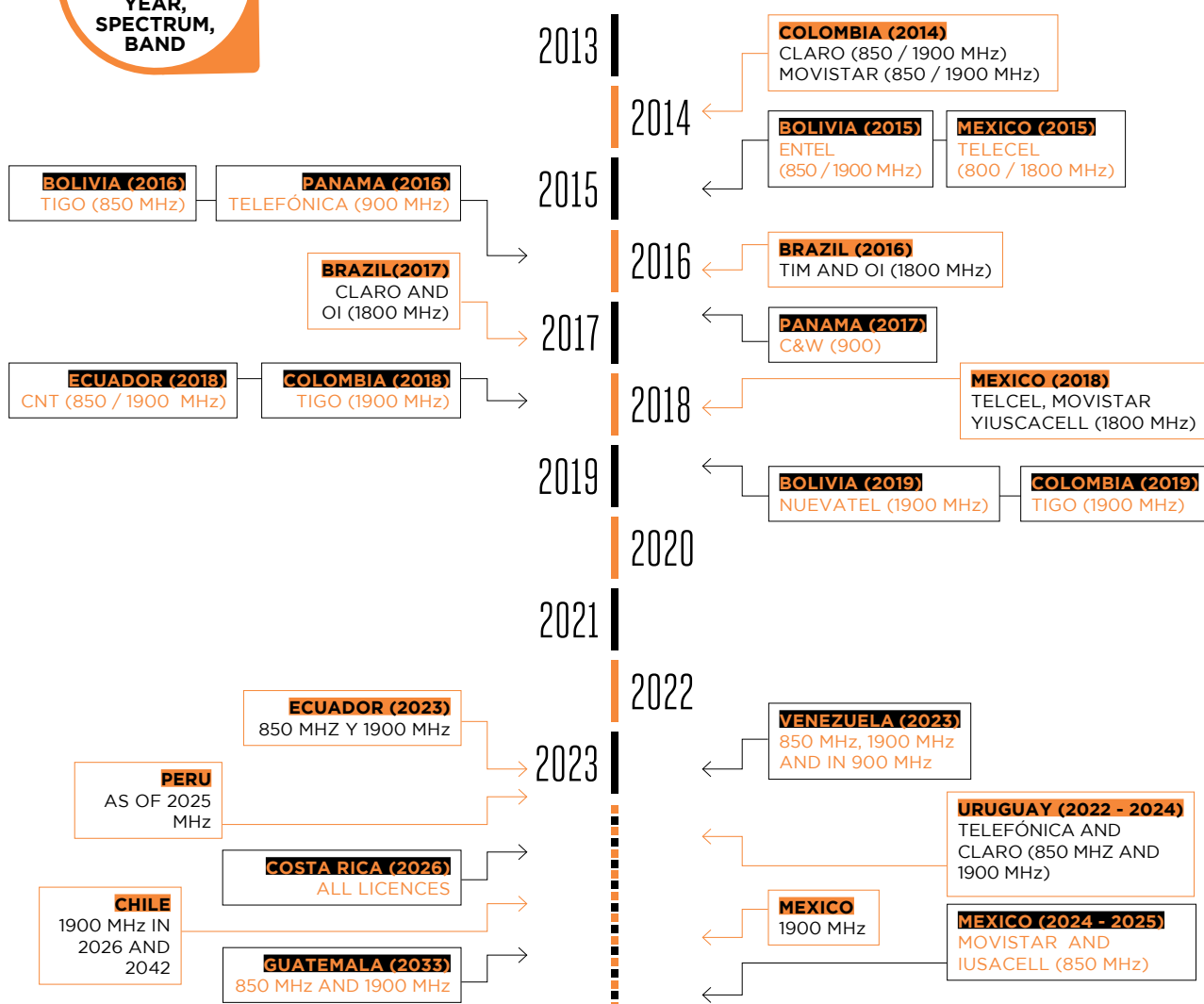


## CONTEXT IN LATIN AMERICA

In Latin America there is no homogeneous, defined line of action regarding licence renewal conditions for TMC-PCS. In general, a first renewal of the original term has been granted in many countries. However, there is still uncertainty regarding how successive renewals will be handled. In any case, it is an imminent issue for debate in the short term, where renewals will happen this year or next year in Colombia, Brazil, Paraguay, Mexico, Bolivia and Panama (Table 1).

The main points to be analyzed in each of these cases will be the administrative processes for dealing with expired licences, terms of duration, valuation and licence payment methods, main requirements and conditions, the potential for developing a secondary market, and the applicability of the re-nationalisation of infrastructure,

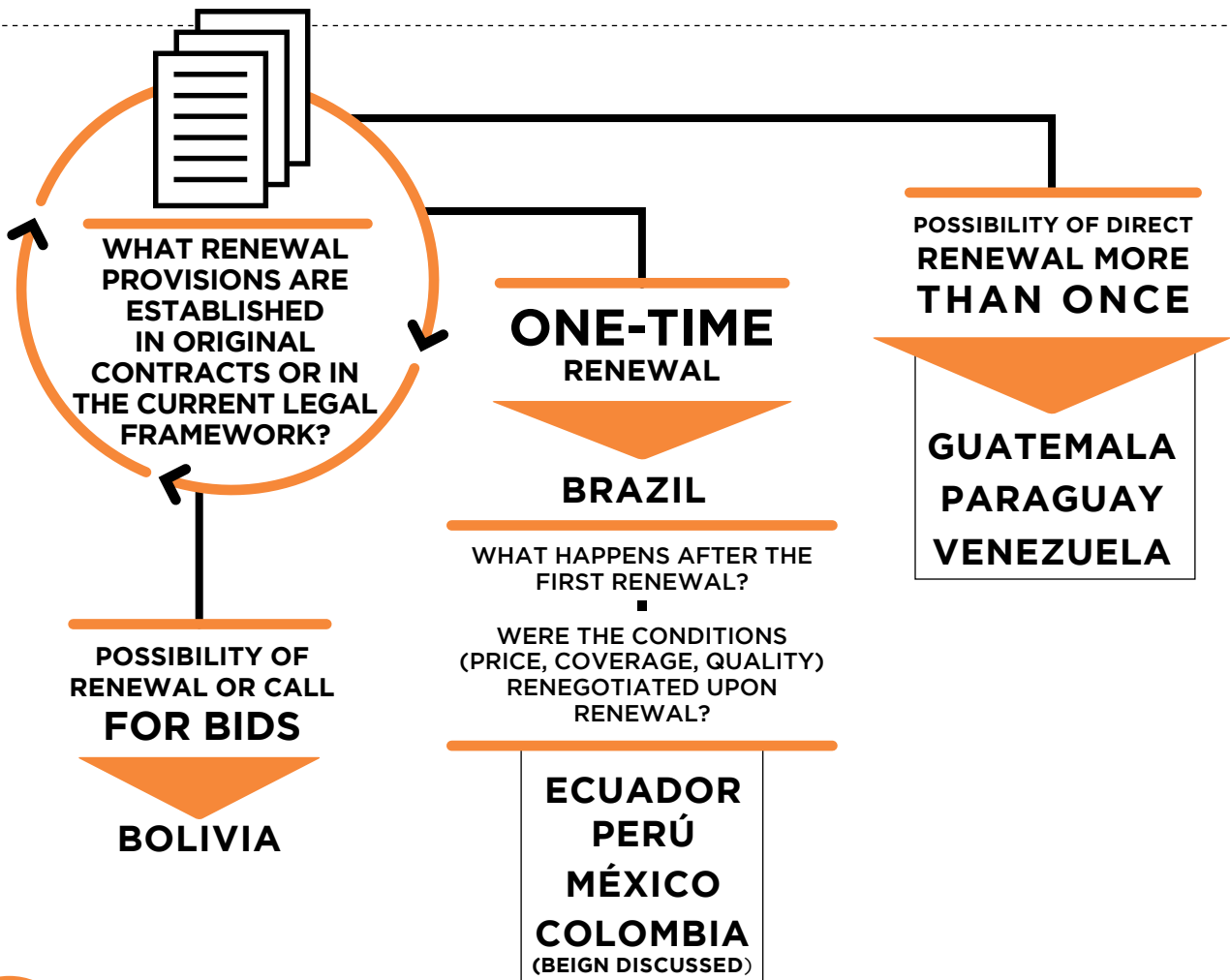
**TABLE 1. SCHEDULE OF UPCOMING RENEWALS IN LATIN AMERICA**



\* PARAGUAY IS NOT INCLUDED, SINCE IT HAS 5-YEAR LICENCES



TABLE 2. RENEWAL ALTERNATIVES IMPLEMENTED



**THERE IS NO HOMOGENEOUS AND DEFINED LINE OF ACTION IN LATIN AMERICA REGARDING THE CONDITIONS OF LICENCE RENEWAL FOR TMC-PCS. THERE ARE MARKETS IN WHICH A SINGLE RENEWAL HAS BEEN ESTABLISHED. OTHERS ALLOW SUCCESSIVE RENEWALS. THE POSSIBILITY OF RENEWAL, OR A CALL FOR BIDS.**

Table 2 shows a summary of the renewal alternatives implemented in the region. It differentiates between countries in which the possibility of multiple renewals exists, those in which renewal is possible only once, and those in which the first renewals have already taken place. It also shows the case of Bolivia, where first renewals still have not taken place and the possibility of renewing or starting an objective selection process (based on sector policies when the licence expires).

As shown in the previous tables, the renewals happened under different conditions, for which reason certain questions persist, thus increasing uncertainty.

The following table shows what generally occurred with, recent first-time renewals in parts of Latin America.



TABLE 3. BACKGROUND OF LICENCE RENEWAL FOR USE OF THE SPECTRUM FOR TMC AND PCS IN LATIN AMERICA

NOT COMPREHENSIVE

SOME COUNTRIES HAVE ALREADY DEALT WITH LICENCE RENEWAL

	YEAR/ FREQUENCY	ORIGINAL TERM	METHOD OF RENEWAL	CONDITIONS OF RENEWAL	SPECIAL CHARACTERISTICS
PERU	2013 850 / 1900 MHZ	20 YEARS	RE NE WAL	AFTER ANALYZING IMPLEMENTATION OF AN OBJECTIVE SELECTION PROCESS AND A LONG NEGOTIATION, THE LICENCE WAS RENEWED.	TELEFÓNICA MADE COMMITMENTS FOR 1.2 BILLION USD
PARAGUAY	SEVERAL 850 / 1900 MHZ	5 YEARS	RE NE WAL	PRESENTATION OF INVESTMENT PLAN AND TECHNICAL PROJECT (SECTION 73, TELECOMMUNICATIONS LAW NO. 642/95)	15-YEAR TERM PROJECT, CONFLICT BETWEEN CONATEL AND PERSONAL
GUATEMALA	2011 850 / 1900 MHZ	15 YEARS	EX TEN SION	THE ONLY REQUIREMENT FOR RENEWAL IS THAT THE FREQUENCY BE USED. RENEWAL ACCORDING TO SECTION 58 OF THE GTL.	NEW TERM: 20 YEARS. THERE IS A SECONDARY MARKET.
BRAZIL	SINCE 2005 850 MHZ	15 YEARS	RE NE WAL  ONE-TIME	ONE-TIME RENEWAL WITH NO CHANGE IN CONDITIONS	FOLLOWING RENEWAL, PAYMENT OF 2 PERCENT OF INCOME FROM PREVIOUS YEAR, BI-ANNUALLY
MEXICO	2009 A 2011 850 / 1900 MHZ	15 YEARS	RE NE WAL	EXTENSION ESTABLISHED IN THE 1995 FTL AND IN THE ORIGINAL LICENCES, FOR THE SAME TERM AS THE ORIGINAL	ECONOMIC COMPENSATION BASED ON 2005 AUCTION VALUES
ECUADOR	2008 850 / 1900 MHZ	15 YEARS	RE NE WAL	CONDITIONS ACCORDING TO CONCESSION CONTRACT AND SPECIAL TELECOMMUNICATIONS LAW	NEW QUALITY REQUIREMENTS, PENALTIES AND COMPENSATION
VENEZUELA	2012 850 MHZ	15 YEARS	RE NE WAL	RENEWALS WITHOUT MAJOR INCONVENIENCES. THERE IS A CASE OF A 10-YEAR RENEWAL	UPCOMING EXPIRATIONS IN 2023



In Brazil, there is a clear process in which the first and only licence renewal occurs in 15 years from the initial assignment, with pre-established conditions (payments, service or coverage clauses). Quality conditions may change in time, since they are not related to the licence, nor are they determined upon assignment of such licence. Uncertainty is linked with the renewal fee (currently defined as a fixed percentage of income, which could lead to double payments upon renewal of other bands) and the applicability of some items that must be paid upon activating network equipment (TFI)<sup>1</sup>. However, in conversations with ANATEL, a proposal was made for the total replacement of these monetary payments by coverage conditions required of the operators.

Peru's renewal background is relevant for future renewals both in Peru and other markets. Upon expiration of its 20-year licence for use of the spectrum in 2013, Telefónica Móviles renewed its licences in the 850 and 1900 MHz bands for another 20 years. Due to prolonged negotiations and demanding conditions for renewal, this renewal created apprehension regarding future renewals in the region. In a press release issued upon reaching an agreement with the MTC<sup>2</sup>, Telefónica officially acknowledged its compliance with its obligations during the initial period of the concession agreements. Telefonica also pointed out, that during that period, it contributed significantly to the growth of the Peruvian mobile telephone industry with greater coverage and more competitive fees. It stated that during the almost 19 years it has operated in Peru, it has invested more than 6.8 billion USD in infrastructure and has shown the benefits of telecommunications as a tool for developing, modernizing, and including distant towns. It also highlighted the fact that the estimated 1.2 million USD required to meet its obligations with MTC are in addition to the regular investments to maintain its competitive position.

Most licences in Latin America have a term of 10 to 20 years, except for Paraguay, where the term is five years, and Chile, where it is 30 years. This term has a direct impact on the attractiveness of the market in terms of investments. Longer terms favor investments with longer payback periods and/or more capital-intensive investments. In Paraguay, there is a bill for an update of the Telecommunications Law that would extend the term to 15 years.

# IN LATIN AMERICA MOST LICENCES ARE BETWEEN 10 AND 20 YEARS



<sup>1</sup> TFI: INSTALLMENT TAX

<sup>2</sup> PERUVIAN MINISTRY OF TRANSPORTATION AND COMMUNICATIONS





**1900  
MHZ**

**850  
MHZ**

**LATIN AMERICAN  
COUNTRIES ADHERE  
TO SERVICE AND  
TECHNOLOGICAL  
NEUTRALITY  
IN THE 850 AND  
1900 MHZ BANDS. THE  
SPECTRUM CAN BE  
USED FOR DIFFERENT  
SERVICES AND  
TECHNOLOGIES**

Regarding the valuation of the renewed spectrum and the payment method, some markets have values calculated as a percentage of earnings (Brazil and Colombia). In others, advance payment is made, in addition to periodical payments determined by other means than turnover (Mexico, Ecuador, Venezuela, Bolivia, and Chile does not apply the advance payment component). In some, a single payment is made (Uruguay, Paraguay and Guatemala). Finally, there are those countries in which, by way of fees, the companies comply with a program of obligations regarding coverage, services, and prices determined by the regulatory agency as a means of valuation (Peru).

The main requirements imposed by regulators on operators are those referring to coverage and quality of service. However, guidelines for service quality tend to be established in documents that are independent of licence agreements.

A secondary market refers to the possibility of transferring a licence for use of the spectrum from one operator to another. In the TMC and PCS bands, at present this is only possible in Mexico, Guatemala, and the Dominican Republic. In other markets, such licences may only be transferred if a company is acquired by a third party. However, in assigning licences for other bands, some elements related to implementation of a secondary market have been introduced. For example, Colombia allows the assignment of the 4G spectrum as of the fifth year after granting the licence. In Chile, the existence of a secondary market is currently being discussed. Secondary markets, in addition to technological neutrality and services and rearming the 850 and 1900 MHz bands, favor competition and activate renewal processes, reducing uncertainty. In general, Latin America adheres to service and technological neutrality in the 850 and 1900 MHz bands. The spectrum can be used for different services and technologies.

The nationalization (or re-nationalisation (??) of infrastructure to the State has only occurred in Colombia and Venezuela. The process remains controversial. The re-nationalisation of infrastructure implies handing the network to the State upon termination and loss of the associated spectrum licence. However, the scope of infrastructure to be yielded is not clear. In some countries although the nationalisation of infrastructure to the State is not required, the State mandates the acquired infrastructure (Mexico) be offered for sale to the new operator by the previous operator (Bolivia and Ecuador). |•



### 3.

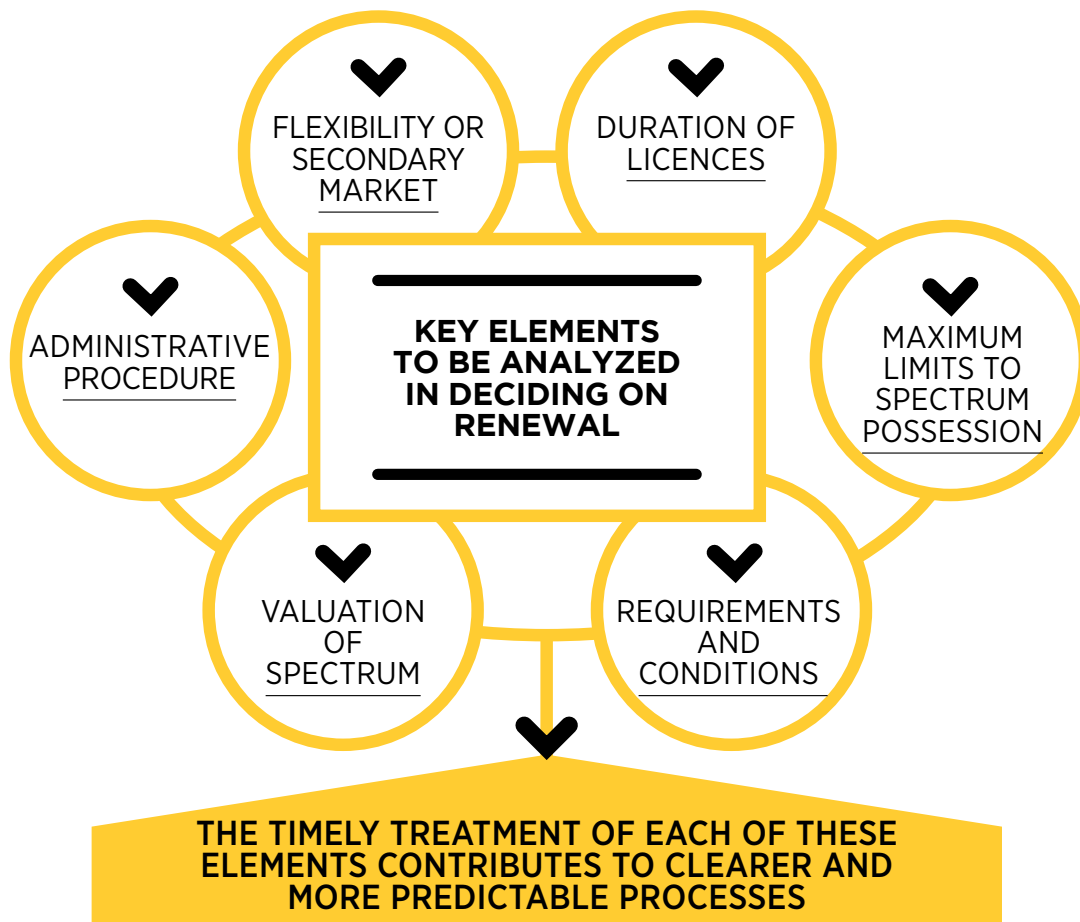
# Best Practices for Renewals

With regard to better licence renewal practices, six key elements have been selected, as Table 4 illustrates.

The timely treatment of these elements contributes to clearer and more predictable processes for efficient use of the spectrum, and as a result, reduces uncertainty. Each of these elements is dealt with individually in the following sections.

**TABLE 4. BEST PRACTICES UPON LICENCE EXPIRY FOR USE OF THE SPECTRUM**

#### KEY ELEMENTS TO BE ANALYZED WHEN DECIDING ON A RENEWAL





## ADMINISTRATIVE PROCEDURE

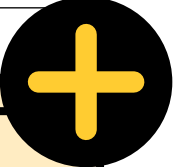
The licence renewal administrative procedure must be transparent, predefined, known, and predictable. Such conditions positively affect certainty in the industry and, therefore, contribute to a favorable framework for investment by operators and efficient use of the spectrum. However, although the first renewals have happened in Latin America with a single format (direct assignment), there is still uncertainty in several countries on the format of subsequent renewals, valuation of the spectrum, and conditions that will be required.

Table 2 shows the expected renewals timeframe within the current legal framework: direct renewal more than once (Paraguay, Guatemala, and Venezuela), single renewal; first renewal has already taken place (Brazil, Colombia, Mexico, Ecuador, and Peru); and renewals in the next few years in which the process and conditions have yet to be determined (Bolivia).

Brazil, Paraguay, and Guatemala have notably clear procedures that all industry players know, although certain areas continue to be controversial. The process in Peru for renewal by Telefónica Móviles took almost two years. In Bolivia, there is still no knowledge on the conditions of the administrative procedure even after two years (which could turn out to be a renewal or an objective selection process).

In Brazil, there have been no significant hindrances regarding the renewals that were granted. The licences are granted for 15-year terms and can be renewed for the same duration. Applications for renewals must be submitted to ANATEL three years before the licence expires, and the conditions, payment structure, or service and coverage conditions cannot change. ANATEL may reject a renewal in the event of noncompliance with the licence. There is ongoing discussion regarding double payment of the tax on network equipment activation (TFI). In addition, there is discussion regarding the payment of a bi-annual fee following the first renewal (defined as 2 percent of the total earnings from the previous year). Since it is impossible to distinguish earnings per band, this could lead to double payment of the fee upon renewal of new bands in the next few years.

In Paraguay, where licences are granted and renewed for five-year terms, operators have already gone through this process more than once. The administrative process for renewal is regulated by CONATEL<sup>3</sup>. In order to apply



**THE LICENCE  
RENEWAL  
ADMINISTRATIVE  
PROCEDURE MUST  
BE TRANSPARENT,  
KNOWN, AND  
PREDICTABLE.**

renewal applications, the previous requirement was that they be made six months in advance, but this term was eliminated. Operators currently submit applications for renewals as soon as possible.

In Peru, the licence renewal process by Telefónica Móviles took almost two years. On expiry of the licence, and following prior service noncompliance, the MTC commissioned consultants to evaluate the options to be made; whether to renew the agreements or submit Telefónica Móviles' spectrum in the 900 and 1800 MHz bands to an objective selection process. The MTC chose to renew the agreements. The difference in the initial valuation of the spectrum led to lengthy negotiations that ended in January 2013. Telefónica Móviles accepted the conditions that the MTC demanded. Telefónica Móviles was granted a licence renewal for use of the spectrum in the 850 and 1900 MHz bands for 20 years. There was a 14-month penalty for the company's service noncompliance, resulting in a renewal for 18 years and 10 months. The conditions do not include the payment of a fee, but Telefónica agreed to comply with certain

<sup>3</sup> PARAGUAYAN NATIONAL TELECOMMUNICATIONS COMMITTEE



requirements within no more than five years. Telefónica Móviles estimated its commitment at 1.2 billion USD. It also estimated a direct and indirect impact on 10 million people of low income.

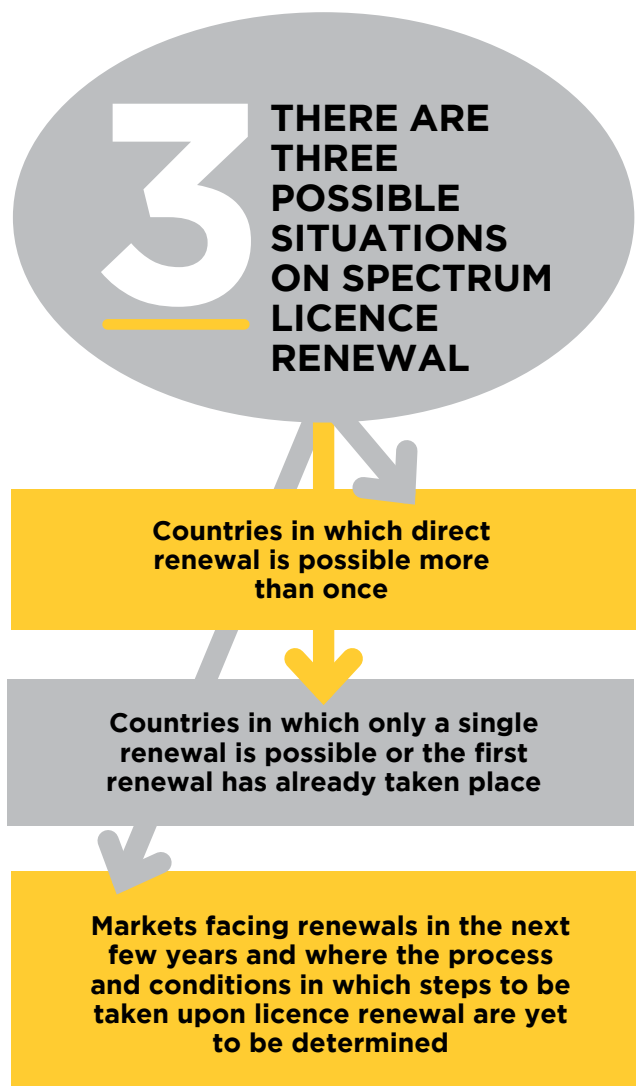
The first renewals will take place in the next two years in Bolivia. Despite the proximity of the renewals, the procedure that will be followed upon licence expiry is still unknown. Upon expiry of the existing licences, the process to be followed will depend on policies in the sector at that time. Hence, it is currently unknown if the procedure will be a renewal or an objective selection process.

In Colombia, TMC and PCS operators Claro and Movistar renewed their licences for the first time in 2004, and Tigo did so in 2013. Since the terms for licences have been set at 10 years, Claro and Movistar's licences expire in April 2014. Regarding these second renewals, conditions of the administrative process, valuation, and conditions to be required have not been established. Regarding Tigo's extension in 2013, the final amount to be paid is still being discussed and will be determined by a court of arbitration.

There is still uncertainty in Mexico regarding upcoming licence renewals that will happen soon (e.g., Region 9). Mexico underwent the process of first renewals of TMC-PCS in 2010, which occurred with changes in economic conditions and service quality. The General Telecommunications Framework is currently under review and is expected to be defined by the end of this year. More clarity is expected regarding the next renewals. Secondary laws in this respect are expected to be ready by December of this year.



## THERE ARE TWO POSSIBLE SOURCES OF UNCERTAINTY REGARDING LICENCE RENEWAL: THE PROCESS OF RELICENSING AND THE FINANCIAL IMPLICATIONS





## 3.B

# DURATION OF LICENCES

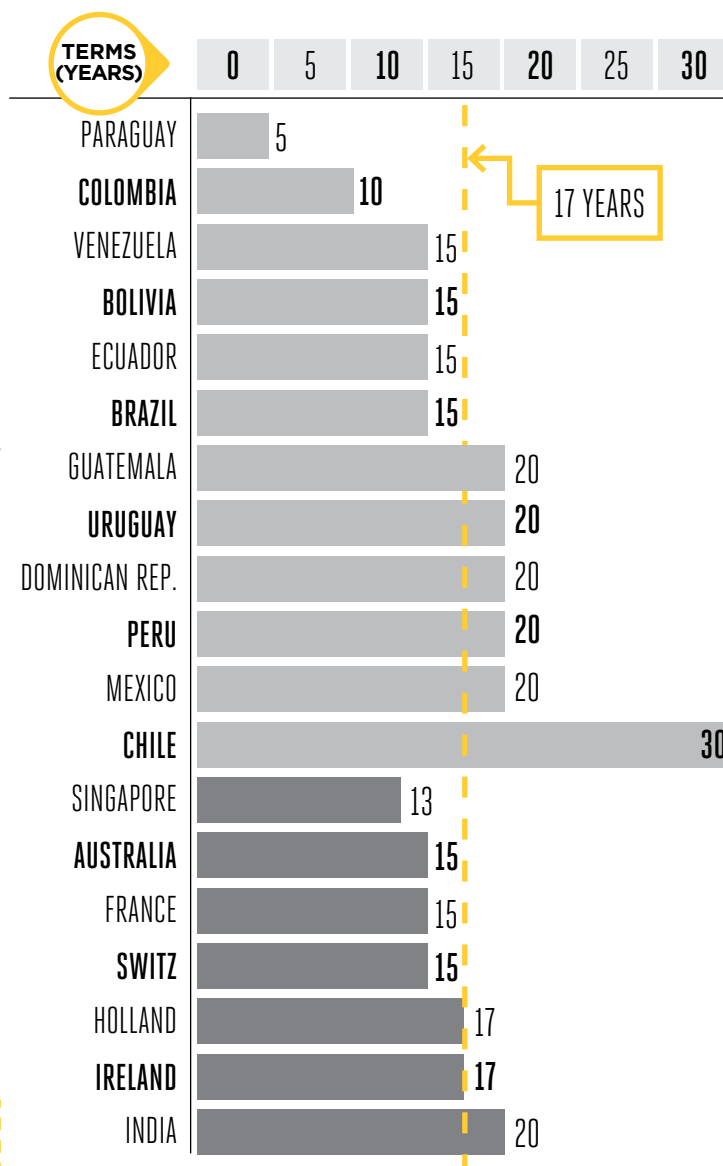
The duration of licences is a key element in the renewals, since investment decisions are characterized by long-term planning, which requires a sufficient payback period. Very short licence terms, with uncertainty regarding renewals, will have a negative impact on these investment decisions. Greater certainty, predictability, and clarity are required in the renewal process in the event of short licence terms (less than 15 years).

Latin American licences are granted with an established duration. The one exception is Argentina, which grants them indefinitely. In general, the countries establish a maximum term during which they grant their licences. The periods range from a minimum of five years (Paraguay) to a maximum of 30 years (Chile). The average term is 17 years, which is consistent with planning in the sector and with those granted worldwide.

As mentioned above, the greater the term, the greater the strategic-planning period and the greater the possible payback period for telecommunications companies. This makes it possible to consider larger investments in infrastructure and the development of new businesses. Licences must include terms of more than 20 years. The optimum term, which is most frequently used globally, is 15 or 20 years. Table 5 shows the licence periods on a regional and global level.

Certainty in the renewal process will naturally be more significant in countries with shorter licence terms (Paraguay, Colombia, Venezuela, Ecuador, Brazil, and Bolivia,), since the companies granted licences in these countries will include the conditions for renewal in their Spectrum valuation plan.

TABLE 5. TERM OF LICENCES FOR USE OF THE SPECTRUM



THE AVERAGE DURATION OF LICENCES, BOTH GLOBALLY AND IN LATIN AMERICA, IS 15 TO 20 YEARS

THE AVERAGE DURATION OF TMC-PCS LICENCES IN LATIN AMERICA IS SIMILAR TO THAT IN THE REST OF THE WORLD

THE GREATER THE TERM, THE GREATER THE STRATEGIC PLANNING PERIOD AND POSSIBLE PAYBACK PERIOD FOR TELECOMMUNICATIONS COMPANIES. THIS MAKES IT POSSIBLE TO CONSIDER LARGER INVESTMENTS IN THE DEVELOPMENT OF NEW BUSINESSES



Licence duration is important when making comparisons related to economic compensation, which is evident when evaluating the cost of MHz per year. Paraguay and Colombia have the shortest licence durations in the region. In Paraguay, the amount to be paid upon renewal is proportional to the investment to be made in its five-year term. In Colombia, the economic compensation upon renewal is calculated according to the market value (which results in a greater cost per MHz per year compared to other markets).



**LICENCES SHOULD INCLUDE PERIODS OF MORE THAN 10 YEARS. THE OPTIMUM TERM IS 15 TO 20 YEARS. THE DURATION OF LICENCES IS A KEY ELEMENT IN RENEWALS, SINCE INVESTMENT DECISIONS IN NETWORKS AND INFRASTRUCTURE REQUIRE A SUFFICIENT PAYBACK PERIOD.**

### 3.C

## SPECTRUM VALUATION

Upon licence renewal, spectrum valuation is a key element for both operators and regulators. For operators, the valuation must allow them to continue operations without risking reduced profitability. For regulators or administrators, this valuation must allow it to collect the required funds to adequately fulfill its role in the market, without detriment to the national treasury.

In the current environment of growing demand for telecommunications, spectrum is increasingly scarce and/or a barrier for entry to the sector. Although spectrum valuation is an essential process, it is not univocal. The process also may not be certain, since different results may come from different assumptions. However, in general, it is assumed that the company that is most willing to pay for spectrum use is the one that could use it most efficiently. Based on this assumption, assignment on the basis of the proposed value is adequate. However, this condition faces a fundamental dilemma related to concentration in the use of the resource. The operators that most value the spectrum will be those who concentrate a greater share of it. Therefore, the control mechanisms implemented by the State and anti-trust agencies are important.

Spectrum valuation by the State can adopt different general approaches, including:

- valuation according to management costs: Collection of income to cover costs required for administration (which

does not initially meet any economic criteria and may result in undervaluing the spectrum).

- valuation according to the value for the licensee: Operator valuation of the spectrum based on the analysis of the business conducted by each licensee.

The best practices for spectrum valuation will require a collaborative approach between the State and operators. Historically, spectrum prices do not provide a sufficient basis for their estimation, since they are associated with the market conditions in which they were granted. In contrast, in order to determine the spectrum value, States must use economic models that take into account the current and future market situations. These models include the effect of different coverage conditions and quality requirements and consider the investment required to continue installing new technologies and services. These must be based on economic and operational data and perspectives that are the property of the operators. Therefore, operators and the State must work together to establish the value of spectrum. High spectrum prices result in poorer network coverage and services due to less CAPEX spend available, while low prices result in the possible participation of inefficient operators that assign a lower value to the spectrum and, potentially use the spectrum less efficiently, leading to the loss of potential income for the State.

In addition to the economic criteria, States may have



**TABLE 6. FEE PAYMENT PROGRAM  
FOR SPECTRUM USE**

	FEE	PAYMENT FREQUENCY
BRAZIL	<ul style="list-style-type: none"> <li>▲ INITIAL: SPECTRUM VALUATION UPON FIRST ASSIGNMENT DEPENDS ON THE CONTRACT OF EACH OPERATOR (UPON ASSIGNMENT)</li> <li>▲ UPON FIRST AND ONLY RENEWAL <ul style="list-style-type: none"> <li>• 2% OF THE PREVIOUS YEAR'S EARNINGS</li> <li>• TFI: INSTALLATION TAX</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▲ INITIAL: 10% AT THE BEGINNING AND THE REMAINING 90% IN SIX ANNUAL INSTALLMENTS FROM THREE TO EIGHT YEARS</li> <li>▲ AFTER FIRST RENEWAL <ul style="list-style-type: none"> <li>• 2% TURNOVER OF PREVIOUS YEAR, BI-ANNUAL</li> <li>• TFI: UPON RENEWAL</li> </ul> </li> </ul>
PERU	<ul style="list-style-type: none"> <li>▲ ONE-TIME PAYMENT OF FEE</li> <li>▲ TELEFÓNICA MÓVILES' RENEWAL (2013): DID NOT INCLUDE THE PAYMENT OF A FEE BUT COMMITMENT TO INVEST 1.2 BILLION USD OVER THE NEXT FIVE YEARS</li> </ul>	▲ N/A
MEXICO	<ul style="list-style-type: none"> <li>▲ FIRST PART OF COMPENSATION: INITIAL FEE</li> <li>▲ SECOND PART OF COMPENSATION BASED ON AN ALGORITHM CONSIDERING MHZ, COVERAGE, POPULATION AND REGION</li> </ul>	<ul style="list-style-type: none"> <li>▲ FIRST PART OF COMPENSATION: SINGLE PAYMENT</li> <li>▲ SECOND PART OF COMPENSATION: ANNUAL</li> </ul>
PARAGUAY	▲ FROM 3-5% OF THE STATED INVESTMENT	▲ EACH RENEWAL IN ADVANCE
ECUADOR	<ul style="list-style-type: none"> <li>▲ INITIAL: RESULT OF THE NEGOTIATION</li> <li>▲ FEE : BASED ON NUMBER OF BASESTATIONS, BANDWIDTH, DISTANCE, ETC.</li> </ul>	<ul style="list-style-type: none"> <li>▲ INITIAL: ADVANCE OR IN TWO INSTALLMENTS (ACCORDING TO OTECEL RENEWAL IN 2008)</li> <li>▲ FEE A: MONTHLY</li> </ul>
COLOMBIA	<ul style="list-style-type: none"> <li>▲ INITIAL: RESULT OF OBJECTIVE SELECTION PROCESS</li> <li>▲ PERIODIC: 5% OF NET EARNINGS</li> </ul>	<ul style="list-style-type: none"> <li>▲ INITIAL: IN CASH AT START OF CONCESSION</li> <li>▲ PERIODIC: QUARTERLY</li> </ul>
URUGUAY	▲ INITIAL: PREREQUISITE FOR AUTHORIZATION	▲ INITIAL: IN ADVANCE AND ONE-TIME
VENEZUELA	<ul style="list-style-type: none"> <li>▲ INITIAL: ACCORDING TO ASSIGNMENT PROCESS</li> <li>▲ ANNUAL FEE: BASED ON ASSIGNED MHZ (&lt; 0.5% TURNOVER)</li> </ul>	<ul style="list-style-type: none"> <li>▲ INITIAL: UPON SPECTRUM ASSIGNMENT</li> <li>▲ PERIODIC: ANNUAL</li> </ul>

other objectives regarding spectrum valuation, such as: incentives for innovation and competition, service quality, and minimum coverage. These criteria must be included in the valuation model to be developed.

Table 6 shows a summary of the economic compensation for spectrum use in different Latin American markets.

In Columbia and Brazil, a percentage of earnings are

paid as a fee. The possibility of identifying the earnings base to be considered for payment is important when annual payments are made in proportion to earnings, since the percentage of earnings received as a result of each spectrum band must be identifiable. Not making this distinction would lead to double payments. An example of this is in Brazil, which will occur, for example, if no changes are made in Brazil, in 2018, after the first renewals of licences for the 1900 MHz band in 2016.



Another approach, which may be also supplement the one described above, consists of establishing social obligations to be met by the operator, as in licence renewal in Peru, in January, 2013. In this case, Telefónica agreed to provide the following:

- Free internet in government institutions such as schools, hospitals, medical posts, and police stations.
- Greater coverage (in all district capitals, which consists of 1,833 locations). In addition, Telefónica Móviles must extend its service over the next four years to a further 1,848 locations where there is currently no mobile telephone service. As a result, cellular phone services would be available in all populated areas.
- Inclusion of the rainforest. Within 12 months, Telefónica must install a wireless network to provide Internet access to the Peruvian rain forest to benefit Amazon, Loreto, and San Martín inhabitants. An estimated 256 areas will benefit from this extension. In addition, Internet access will be provided free of charge during the next three years to 259 areas of the Amazon.
- Social fee (-50 percent for 1 million people) during the first 40 minutes in rural areas of the country
- Safety improvement: Telefónica will connect the video-surveillance control centers from police stations located in 327 districts in the country to a national monitoring point. This will improve citizen safety.
- Training support: The company will provide support in an annual telecommunications course for members of the Armed Forces, to be provided by the Instituto Nacional de Investigación y Capacitación de Telecomunicaciones (National Institute for Telecommunications Research and Training [Inictel])

Compensation has two components in Mexico, Ecuador, Bolivia and Venezuela: an initial payment and a second part related to the assigned MHz, basestation numbers, and population (coverage??) or number of subscribers?. In Venezuela, the initial payment occurs only upon first assignment, but not upon possible successive renewals. Chile's case is similar regarding annual compensation based on the assigned bandwidth, although there is no advance payment upon assignment.


Paraguay requires a single payment for renewal, which must be made in advance and constitutes 3 to 5 percent of the investment commitment. In Uruguay and Guatemala, a single payment is made upon assignment. Considering the time remaining until licence renewal for spectrum use in Uruguay, it has not been determined if an economic compensation will be required for renewal.

In conclusion, given the increasing importance of telecommunications and its social impact, the State and operators should seek to jointly obtain a valuation that maximizes spectrum efficiency amongst other criteria.

In line with the above, regional operators highlight the importance of considering that the industry is starting to



**SPECTRUM SCARCITY IS INCREASING, RESULTING IN A BARRIER TO ENTRY TO THE SECTOR. THE RULES AND POLICIES ADOPTED FOR SPECTRUM SHAPE THE MARKET.**



**SPECTRUM VALUATION REQUIRES COLLABORATION BETWEEN PUBLIC ADMINISTRATIONS AND OPERATORS. HISTORICAL DATA DOES NOT ALWAYS PROVIDE A SUFFICIENT BASIS FOR FUTURE SPECTRUM VALUE ESTIMATES, SINCE THE ORIGINAL PRICE WAS ASSOCIATED WITH THE PREVALENT MARKET CONDITIONS WHEN IT WAS GRANTED.**

supply a commoditized service, resulting in margin erosion. The telecommunications business is becoming controlled by third parties (supplying services provided by data transfer from telecommunications companies) and appreciating the level of prior investments made by the incumbents in infrastructure for developing the network, resulting in a positive effect on society.



## REQUIREMENTS AND CONDITIONS

TMC-PCS licence renewals are commonly used by regulators to introduce and/or change conditions, requirements, and demands on operators. These conditions, originally focused on general coverage requirements, currently include other aspects, such as service quality, providing new services, terminal equipment delivery, and connecting public institutions.

Traditional coverage conditions are associated with the mandatory coverage of rural areas which, due to their limited population, tend not to be profitable for operators. As a result, it is important to note that mobile telephone services in Latin America have not yet

connected rural areas in regions that landlines have also not reached.

The best practices for determining and including new conditions require, on one hand, collaboration between operators and the public sector to determine and analyze the social cost. And on the other hand correctly evaluating the costs incurred by each operator to implement the new conditions.

Table 7 summarizes how the service quality conditions and coverage are determined in some Latin American markets.

**TABLE 7. QUALITY AND COVERAGE REQUIREMENTS IN LATIN AMERICA**

	QUALITY	COVERAGE
BRAZIL	<ul style="list-style-type: none"> <li>▲ SERVICE REGULATION (RES. 447/2007)</li> <li>▲ QUALITY REGULATION (RES 575/2011)</li> </ul>	<ul style="list-style-type: none"> <li>▲ ESTABLISHED IN RULES FOR EACH PROCESS OF ASSIGNMENT OF LICENCES FOR SPECTRUM USE</li> </ul>
PERU	<ul style="list-style-type: none"> <li>▲ ACCORDING TO CONCESSION AGREEMENT</li> <li>▲ E.G., IN TELEFÓNICA'S RENEWAL IN 2013 LOCAL ANTI-TRUST ASOC. CLAIMED THE NON-INCLUSION OF IMPROVEMENTS IN EXISTING NETWORKS</li> </ul>	<ul style="list-style-type: none"> <li>▲ ACCORDING TO CONCESSION AGREEMENT</li> </ul>
MEXICO	<ul style="list-style-type: none"> <li>▲ TECHNICAL PLAN FOR QUALITY OF MOBILE NETWORKS PUBLISHED BY COFETEL</li> </ul>	<ul style="list-style-type: none"> <li>▲ ESTABLISHED IN THE ASSIGNMENT OF LICENCES FOR SPECTRUM USE</li> </ul>
PARAGUAY	<ul style="list-style-type: none"> <li>▲ SUBJECT TO SERVICE QUALITY REGULATIONS APPROVED BY CONATEL (RES. 1232/2003)</li> </ul>	<ul style="list-style-type: none"> <li>▲ EXPRESSED AND MEASURED AS COMPLIANCE WITH INVESTMENT COMMITMENTS AND TECHNICAL-ECONOMIC PLAN</li> </ul>
COLOMBIA	<ul style="list-style-type: none"> <li>▲ CURRENTLY: ACCORDING TO THE PROVISIONS ESTABLISHED BY THE COMMUNICATIONS REGULATION COMMITTEE (RES. 3067 OF 2011 AND ITS SUPPLEMENTARY PROVISIONS AND AMENDMENTS)</li> <li>▲ PREVIOUSLY: TECHNICAL CONDITIONS ESTABLISHED IN PUBLIC TENDER SPECIFICATIONS AND BY AMENDMENTS TO THE AGREEMENT IN 2004</li> </ul>	<ul style="list-style-type: none"> <li>▲ ASSIGNMENTS ALWAYS ACCOMPANIED BY MINIMAL COVERAGE PLAN</li> </ul>
ECUADOR	<ul style="list-style-type: none"> <li>▲ DEFINED IN CONCESSION AGREEMENTS</li> </ul>	<ul style="list-style-type: none"> <li>▲ DEFINED IN CONCESSIONS ACCORDING TO TECHNICAL PROJECT (IN INITIAL ASSIGNMENT AND RENEWAL)</li> </ul>
VENEZUELA	<ul style="list-style-type: none"> <li>▲ ACCORDING TO REGULATIONS (PROVISIONS REGULATING SERVICE QUALITY STANDARDS)</li> </ul>	<ul style="list-style-type: none"> <li>▲ ACCORDING TO INITIAL CONCESSION AGREEMENT AND SUBSEQUENT RENEWALS</li> </ul>
URUGUAY	<ul style="list-style-type: none"> <li>▲ THERE ARE NO REQUIREMENTS. SECTION 4 OF THE LICENCE REGULATIONS ESTABLISHES THE PRINCIPLE OF REGULARITY, ACCORDING TO WHICH "THE PROVISION OF SERVICES IN GOOD TECHNICAL CONDITIONS WITH SATISFACTORY QUALITY, ACCORDING TO INTERNATIONALLY ACCEPTED STANDARDS" IS ESTABLISHED.</li> </ul>	<ul style="list-style-type: none"> <li>▲ ESTABLISHED IN THE CALL FOR BIDS OF 2004 (10% OF THE POPULATION AT THE END OF THE SIXTH YEAR AND 25% OF THE POPULATION AT THE END OF THE TENTH YEAR)</li> </ul>



## SERVICE QUALITY OBLIGATIONS

ARE GENERALLY  
ESTABLISHED IN  
DOCUMENTS INDEPENDENT  
OF LICENCES

COMMON TO  
ALL OPERATORS

MAY BE MODIFIED DURING  
EFFECTIVE TERM OF  
THE LICENCE

## QUALITY OBLIGATIONS

INCLUDED IN  
SPECTRUM  
USE LICENCES

MUST BE CONSIDERED  
FOR SPECTRUM  
VALUATION



**TMC-PCS LICENCE RENEWALS ARE COMMONLY USED BY REGULATORS** TO INTRODUCE AND/OR CHANGE CONDITIONS, REQUIREMENTS, AND DEMANDS ON OPERATORS. THE ECONOMIC IMPACT OF THESE OBLIGATIONS MUST BE CONSIDERED WHEN VALUATING THE SPECTRUM.

Table 7 shows the service quality conditions generally established in documents independent of licences and common to all operators. These conditions may be modified during the effective term of the licence (Brazil, Mexico, Venezuela, Paraguay, and Colombia). Quality indicators measure the service provided by mobile operators. The overwhelming majority of quality conditions are established in each operator's agreement. Other generally established conditions include providing services free of charge at State institutions (such as schools, hospitals, and public offices), and the offer of a lower fee for certain social groups. These service quality and coverage conditions have an economic effect that must be considered when estimating spectrum value.

The last important condition for spectrum assignment is technological neutrality and IMT telecommunication services and, therefore, the possibility of refarming the 850 and 1900 MHz bands. The number of recent

technological developments in telecommunications has affected spectrum use, increasing demands for greater flexibility in use. This new environment has forced replacement of the traditional "command and control" model, based on planning and controlling services and technologies to be developed in each band, by other models that take into account economic efficiency and market economy criteria. Such neutrality also favors competition by counteracting the flexibility of maximum limits to spectrum possession. It is important to note that, as issues arise due to technological IMT service neutrality, there may be some risks of interference as a result of introducing and providing different technologies and services in adjacent bands that may lead to technical inefficiency. In addition, the freedom of operators to decide the IMT services to provide and the dominance of criteria of economic efficiency could put certain services at risk due to their limited economic profitability. Radio broadcasting services is a good example of this.



## SPECTRUM CAPS

Maximum limits for spectrum holdings are important in renewal processes because, as mentioned above, renewals and first-time spectrum assignment in other bands (such as 2500 MHz, AWS, 700 MHz) occur simultaneously. During these processes, maintaining restrictive spectrum limits could create arbitrary barriers for incumbent operators, whether for maintaining the renewed spectrum or acquiring licences for new bands. Spectrum caps in Latin America are far behind other comparable markets, creating a risk of excessively fragmenting the region with too many players, leading to an inefficient, barely sustainable market structure,

Therefore, best practices regarding maximum limits during a renewal require reviewing and increasing maximum limits and/or dividing maximum limits per band type. Dividing maximum limits could prevent fragmentation (such as in Mexico, Colombia), although an analysis must be conducted to determine the specific bands renewed and those that will be auctioned at that time to ensure adequate participation of the incumbents in both processes.

Spectrum caps were established in the United States

to guarantee competition. With additional spectrum assignment and the advent of new mobile wideband technologies, these maximum limits were increased or abolished in 2003 in the United States and in 2004 in Canada.

In many Latin American countries, TMC-PCS band renewals are assigned simultaneously with the assignment of new spectrum bands for 4G service. If the maximum limits on spectrum holdings are not modified in a timely, sufficient manner, so that operators can access renewals or new bands, this will create additional uncertainty in the process and barriers to the efficient use of the resource. An operator could face a dilemma in which the results will always be inefficient, whether through reassignment of new spectrum bands for 4G services or the return of TMC-PCS bands (assuming the loss of investment already made).

Many operators in Europe and the United States have licences for spectrum use that exceed the maximum limits established in Latin America. These limits have been reached by a large part of the operators in the region. Table 8 illustrates this situation.



**MAXIMUM LIMITS ON SPECTRUM POSSESSION WERE ESTABLISHED IN THE UNITED STATES IN THE 1990S, DURING THE FIRST FEW YEARS OF MOBILE TELEPHONE SERVICE DEVELOPMENT TO GUARANTEE COMPETITION.**

**WITH ADDITIONAL SPECTRUM DEVELOPMENT AND THE ADVENT OF NEW MOBILE WIDEBAND TECHNOLOGIES, THESE MAXIMUM LIMITS WERE INCREASED OR ABOLISHED.**

(IN 2003 IN THE UNITED STATES AND IN 2004 IN CANADA).

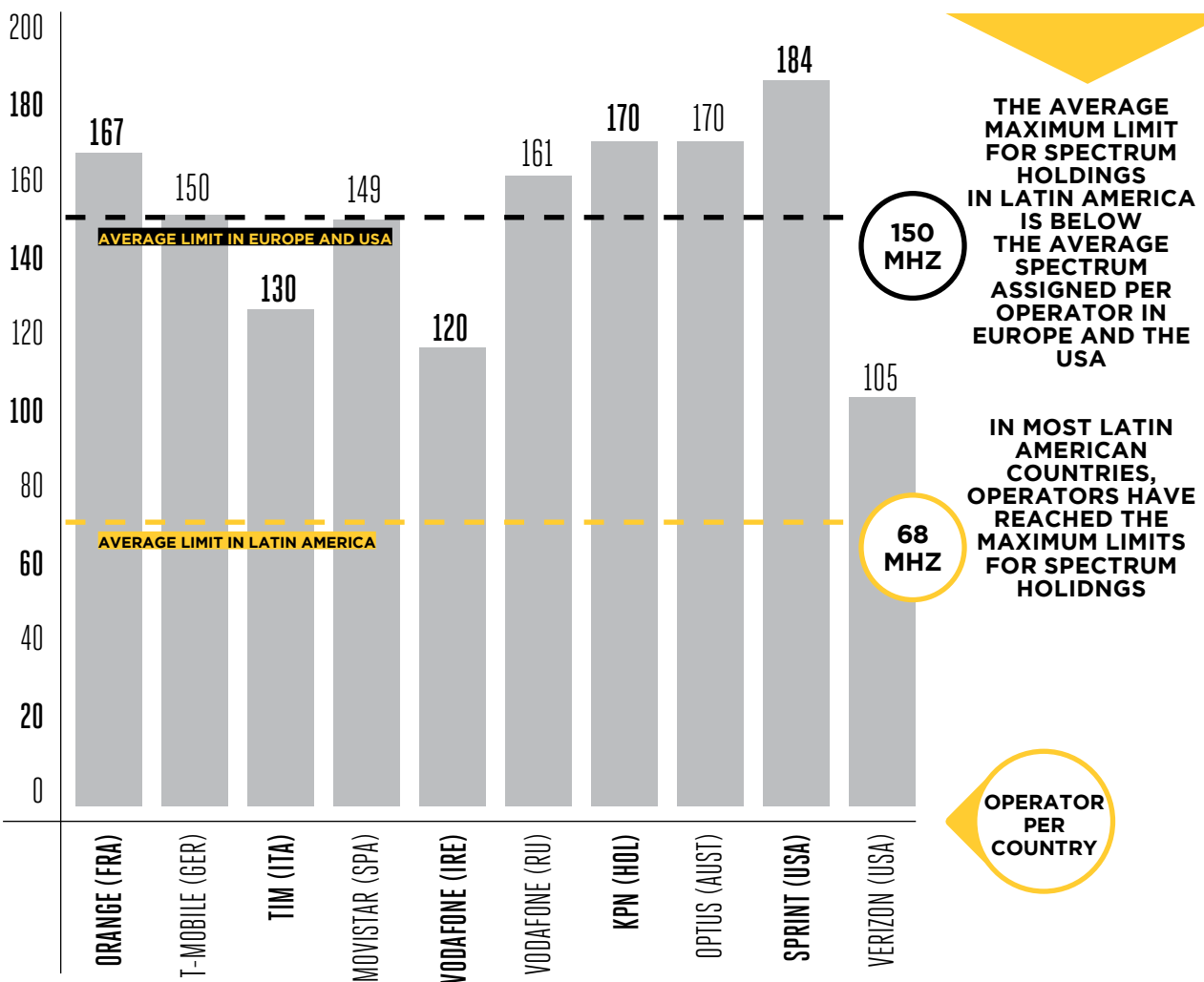




**MAXIMUM LIMITS TO SPECTRUM HOLDINGS IN LATIN AMERICA ARE STILL BEHIND**  
THOSE OF OTHER REGIONS, CREATING A RISK OF EXCESSIVELY  
FRAGMENTED MARKETS, LEADING TO LESS EFFICIENT AND BARELY  
SUSTAINABLE MARKET STRUCTURES.

**SPECTRUM  
ASSIGNED  
IN MHZ**

**TABLE 8. MAXIMUM LIMITS FOR  
SPECTRUM HOLDINGS**



Although regulations on maximum limits for spectrum holdings are mainly aimed at avoiding monopolistic use of this scarce resource, there are other mechanisms. Potential implementation of secondary markets,

development of virtual mobile operations, establishment of favorable conditions for newcomers, sharing infrastructure, and national roaming, in addition to anti-trust laws, guarantee competition.

SOURCE: "POSITION PAPER FOLLOWING DUTCH SPECTRUM AUCTION" - KPN (FEBRUARY 2013); "UK MOBILE SPECTRUM ASSIGNMENTS" - ANALYSIS MASON (MARCH 2013); OPTUS MEDIA RELEASES (MAY 2013); BLUENOTE ANALYSIS



## SECONDARY MARKET

The possibility of assigning the licence for spectrum use within the framework of a secondary market is relevant in the renewal of these previously assigned licences. It allows new players to enter the market and does not limit it exclusively to incumbent operators that originally received licences, while ensuring efficiency in spectrum use. Therefore, an operator with an excess of a certain band, whether or not subject to renewal, can lease their spectrum to a third party that will guarantee its use.

A secondary market allows operators to obtain licences for use of the spectrum from other operators that already have licences from the State. This secondary market maximizes efficient spectrum use since it allows the transfer of licences from an operator with less interest to one that will put it to greater and better use. In all transfers of licences, the terms and conditions under which the original licensee obtained the licence must remain.

The implementation of this market also implies the

adoption of objective market mechanisms that may be more efficient or less controversial than centralized decisions made by the public sector. In particular, the transfer of information and prices will follow objective assessment criteria between interested parties.

Best practices may require including some flexibility mechanisms, which may or may not lead to a secondary market for renewals, in order to guarantee the efficient use of the spectrum and market incentives throughout the entire term of the licence. Market incentives do not imply dismissing public objectives to be achieved by granting licences for use of the spectrum. On the contrary, flexibility of spectrum holdings must be conceived within a framework in which these public objectives are part of the private agreement and with visibility for the public sector.

Table 9 shows Latin American markets in which a secondary market is already transferring licences. The table also includes global examples.

**A SECONDARY MARKET ALLOWS THE TRANSFER OF LICENCES FOR USE OF THE SPECTRUM TO THOSE OPERATORS THAT WILL MOST VALUE IT. IN ALL TRANSFERS, THE TERMS AND CONDITIONS UNDER WHICH THE ORIGINAL LICENSEE OBTAINED THE LICENSE MUST REMAIN.**



TABLE 9. EXISTENCE OF SECONDARY MARKETS WORLDWIDE

NOT COMPREHENSIVE

YES		NO	
■ UNITED KINGDOM	■ FRANCE	■ HOLLAND	■ SINGAPORE
■ AUSTRALIA	■ IRELAND	■ INDIA	▲ ECUADOR
■ SPAIN	■ SWITZERLAND	▲ VENEZUELA	▲ COLOMBIA*
▲ DOMINICAN REPUBLIC	▲ MEXICO	▲ BRAZIL	▲ PARAGUAY
▲ GUATEMALA		▲ URUGUAY	▲ ARGENTINA
		▲ BOLIVIA	▲ PERU
		▲ COSTA RICA	

CHILE —————> UNDER DISCUSSION

\* CONSIDERED IN ASSIGNMENTS OF NEW 4G SPECTRUM BANDS

▲ LATAM  
■ REST OF THE WORLD

THE DEGREE OF IMPLEMENTATION OF SECONDARY MARKETS WORLDWIDE IS SUPERIOR TO THAT OF LATIN AMERICA

IN LATIN AMERICA, ONLY TWO COUNTRIES HAVE IMPLEMENTED SECONDARY MARKETS (DOMINICAN REP. AND GUATEMALA), IT IS UNDER DISCUSSION IN CHILE AND WAS INTRODUCED IN COLOMBIA FOR NEW 4G BANDS

There are only secondary markets in Mexico (after 3 years have elapsed following the assignment of licences), Guatemala, and the Dominican Republic. In some cases (e.g., Colombia), where a secondary market is not taken into account for TMC-PCS, a secondary market is permitted in the assignment of new 4G spectrum bands (after 5 years have elapsed following granting of the licence). In Chile, the discussion on secondary markets is on the regulatory agency's short-term agenda. In the beginning of 2013, Subtel was working on a proposal to allow telecommunications operators to sell, lease, or transfer spectrum frequencies to other companies. This is currently restricted, since the spectrum concessions are not transferable to other operators unless one company acquires or merges with another, and observes the maximum limit for spectrum holdings of 60 MHz.

Global experience shows that the secondary spectrum market is small since there are few transfers. However, it is considered that to avoid the risk of an operator not making use of a licence throughout its effective term, especially if it is recommended that licence be granted for at least 10 years. In addition, as a larger number of bands are assigned, the secondary market would have a more significant role.

On the other hand, the risks of allowing a secondary market include acquisition of part of the spectrum by speculators, its concentration, noncompliance with public goals and the risk of excessive spectrum fragmentation and hoarding?. Therefore, when considering the establishment of a secondary market, mechanisms must be put into place in order to mitigate these risks and guarantee maximum efficiency in spectrum use.

<sup>4</sup> CHILEAN SUBSECRETARIAT OF TELECOMMUNICATIONS



## REVERSION OF INFRASTRUCTURE

The definition of reversion of infrastructure is the return to the State not only of the Spectrum but of all infrastructure installed by the operator at the time of the licence expiry. The thinking behind this is analogous to those of concession agreements in other sectors (such as public road works). So, although the inclusion of these clauses in the original agreements is understandable, their validity is difficult to sustain in the current market conditions and the service characteristics.

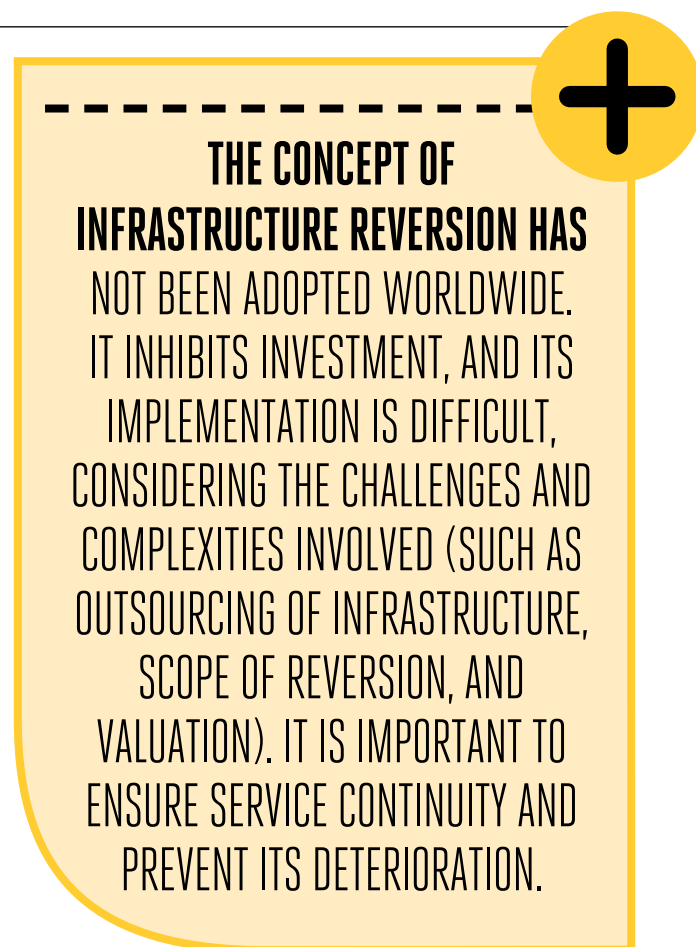
The reversion of telecommunications infrastructure is not seen anywhere else in the world. Furthermore, it would be a significant effort to determine the scope of the reversion, under what conditions, the valuation, service conditions, and liabilities that would have to be examined.

Colombia and Venezuela are the only two markets in Latin America in which the reversion of infrastructure to the State is possible, although it has not yet effectively occurred.

In Colombia, Claro and Telefónica's licence conditions will be renewed in 2014, and there are still no certainties regarding this matter. The incumbent operators consider that only the spectrum must be returned, but the Contraloría General de la Nación [National General Comptroller's Office] considers that both the spectrum and the infrastructure installed in relation to it must be returned to the people and has put the matter before the Constitutional Court. For licences granted since 1997, there is no discussion in this regard, since the law was amended and excludes the reversion of assets. However, there is a grey area for licences granted in 1994, which must be renewed in 2014. In this case, it is not clear which assets must be returned since, in order to increase efficiency and implement economies of scale, many operators outsourced their equipment and infrastructure.

In Venezuela, law states that telecommunications are public services, in which case reversion is part of the concession agreement. Although not expressly established by law or by the concession agreements, the administrative law states that services considered of a public nature, for which concessions are granted, are subject to the reversion of infrastructure so that the State may guarantee continuity in providing public services.

In Mexico, there is no concept of reversion of infrastructure, but in the event of its sale by an operator,



the State has preferential rights to purchase it.

In Bolivia and Ecuador, the reversion of infrastructure to the State does not apply, but if an operator loses the right to use the Spectrum, it must sell it to the incoming operator, which will use the Spectrum according to a valuation determined according to conditions established in each market.

In short, the reversion of infrastructure is difficult to implement when considering the current structure of the market and little precedent around the world. It inhibits investments in infrastructure and is increasingly unreasonable, considering the trend toward outsourcing.

From the State's perspective, the essence of reversion is to guarantee the infrastructure for continuing to provide services. However, the difficulties and complexities of this process could result in a greater risk of service loss, making it more convenient to conduct free negotiations between the parties to reach an agreement. | •



## 4.

# Risks Related to Licence Renewal

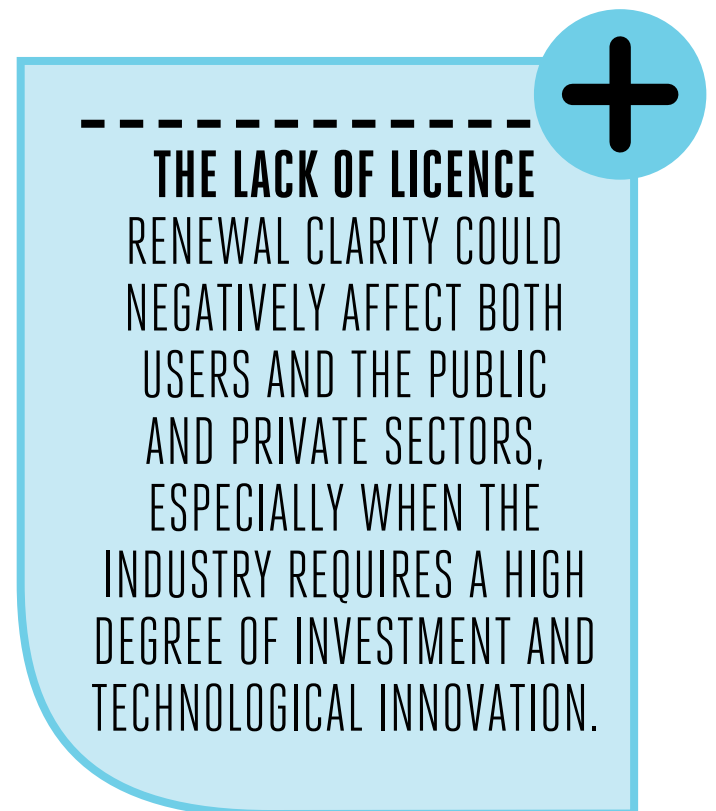
When a spectrum licence is due to expire, regardless if the procedure is renewal/extension, administrative reassignment, or an objective selection process, the main premise should be the efficient use of the spectrum, ensuring a transition free of obstacles and risks to continued service. The main threat to these objectives is the uncertainty in which the renewals could take place.

The possible obstacles and risks involve both the public and the private sector and, as a result, the whole of society as users of telephone services. Table 10 summarizes how these risks affect each of the three sectors.

For mobile telephone service users, the main risks are service discontinuation, an increase in prices, and/or a reduction in service quality. The risk of service discontinuation is related to when there is a change in operators following an objective selection process and during the transition between the outgoing operator and the new operator, when the service is interrupted or its quality decreases. The high valuation of the spectrum, due to high fee requirements or demanding regulatory conditions imposed on the operator, could result in reduced service quality as a result of the payment for use of the spectrum, to the detriment of infrastructure investments or increased prices allowing for maintenance of ARPU and/or business margins of the operator.

The main risks related to the licence renewal process for the private sector could be loss of access to the spectrum or delay of investments if it is not granted a licence following an objective selection process. The latter could be due to uncertainty if the operator does not have clear conditions on the expiry of the licence; a deteriorated competitive position if other operators obtain a greater participation in the licences compared to the previous situation, or an increased churn rate. There may be a resulting negative impact on service quality reduced profitability from an increase in the value of the spectrum and the impossibility of increasing the ARPU (with margin erosion).

Finally, the risks faced by the State during licence renewal are mainly not fulfilling public agenda goals and lack of access to ICT. In addition, there could be reduced public revenue if the economic result of an

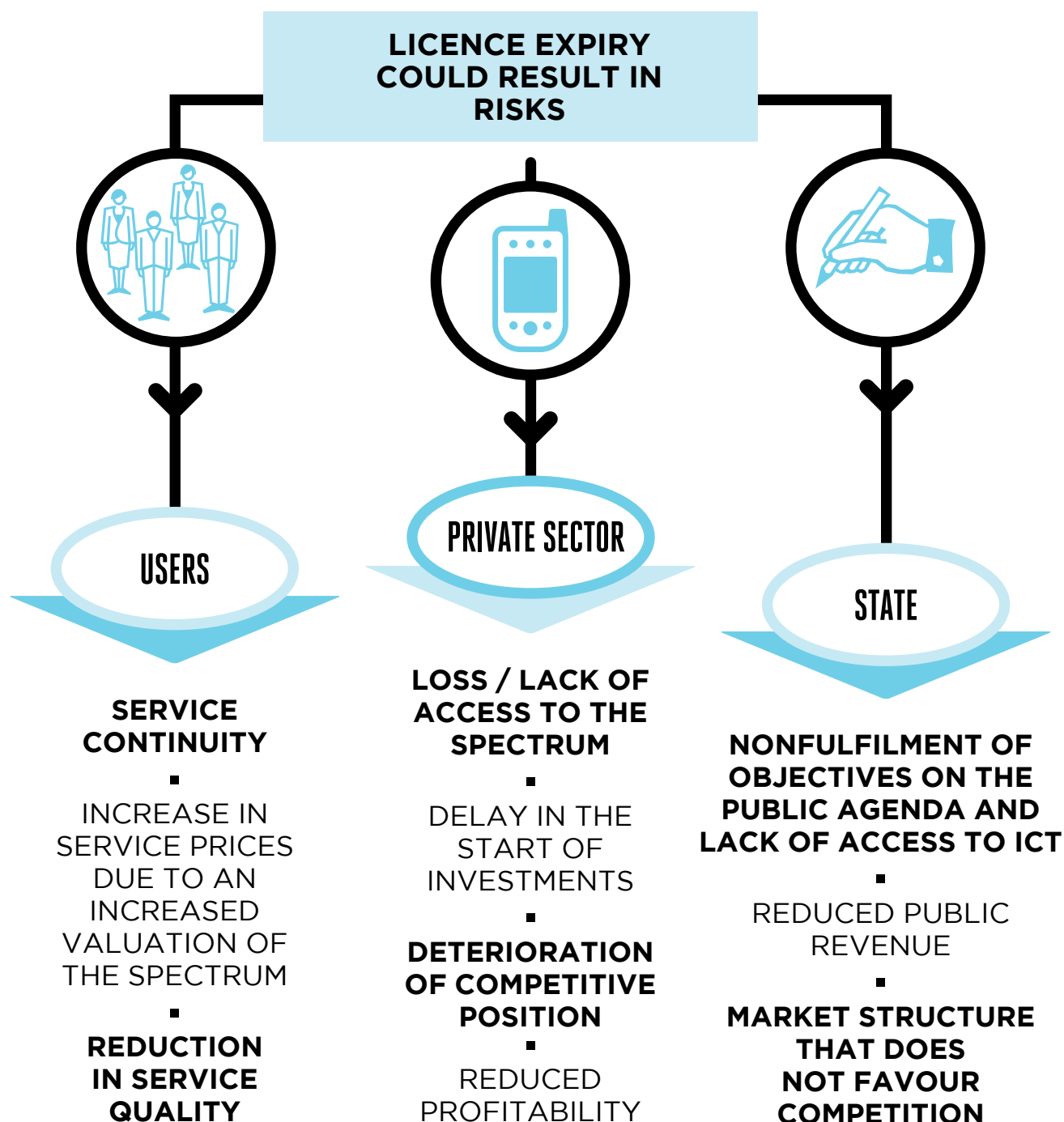


**THE LACK OF LICENCE RENEWAL CLARITY COULD NEGATIVELY AFFECT BOTH USERS AND THE PUBLIC AND PRIVATE SECTORS, ESPECIALLY WHEN THE INDUSTRY REQUIRES A HIGH DEGREE OF INVESTMENT AND TECHNOLOGICAL INNOVATION.**

objective selection process is inferior to expectations or, in the event of a renewal that was not previously established, State revenues also turn out to be inferior to expectations. If the State chooses to conduct an objective selection process instead of renewing licences for use of the spectrum, the result, if not properly designed, could be a market situation that does not



TABLE 10. RISKS RESULTING FROM THE EXPIRY OF LICENCES FOR USE OF THE SPECTRUM



favour competition and does not ensure the efficient use of the spectrum.

Finally, a significant risk for the method of licence renewal is related to the risks of concentration. Operators

evaluate the spectrum differently, depending on their competitive position, size, plans, and financial capacity. An incumbent operator could be granted the licence to the spectrum of another incumbent operator, thus eliminating it from the market and limiting competition. |•



## 5.

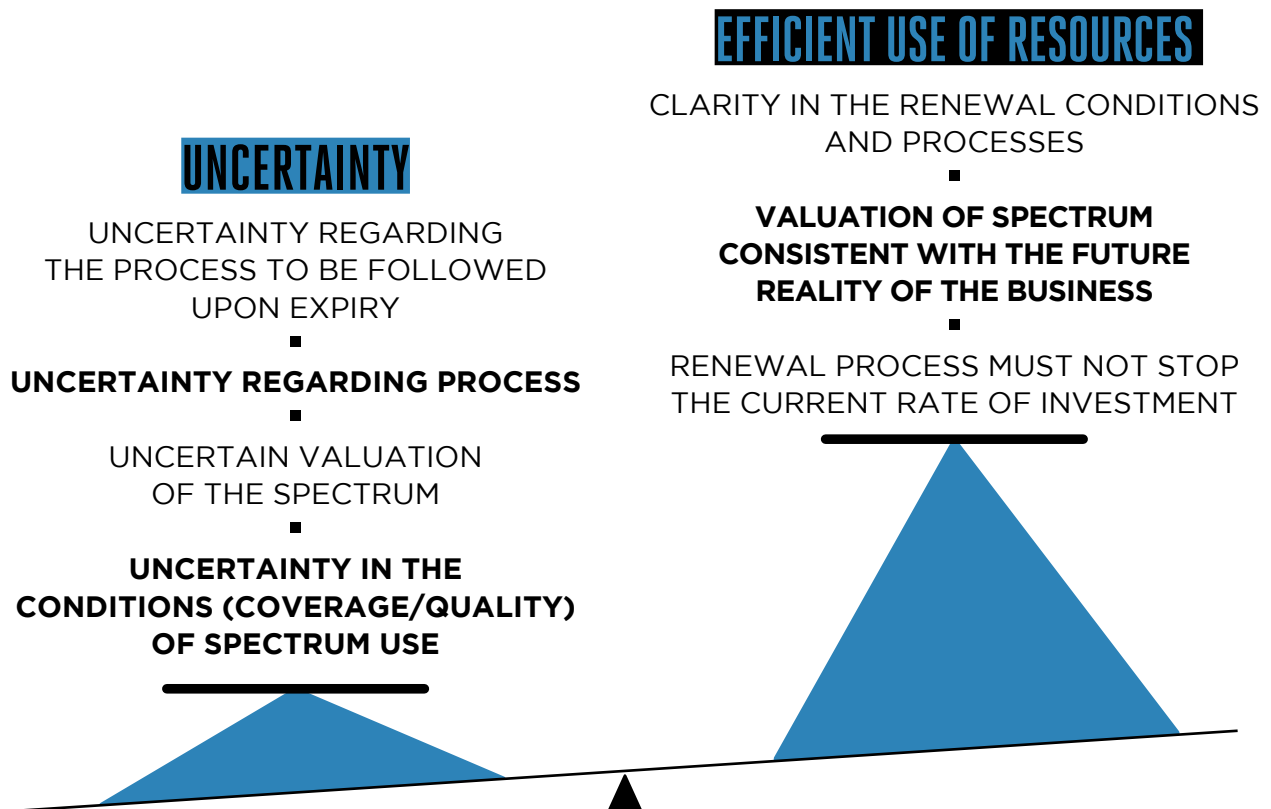
# Impact Analysis

Licence renewal processes for providing TMC and PCS services challenges governments and regulators to establish transparent, predictable regulatory environments. Guaranteeing certainty makes it possible to achieve clear conditions and renewal processes.

Renewals must be defined on the basis of key elements, which could be different for first-time or successive assignments. The economic effects of each case are different. In the case of first-time assignments, there is no investment rate that could be at risk if the operator is not granted the licence, as would be the case of successive renewals.

If governments and regulators do not offer operators predictable environments, uncertainty regarding business continuity increases. The main consequences of uncertainty regarding licence continuity are a slower investment rate as the expiry date approaches, uncertain valuation of the spectrum, and uncertainty in the use of the resource. Table 11 summarizes the main conditions that increase the effect of uncertainty upon licence renewal and conditions that increase certainty, leading to a more efficient use of resources.

TABLE 11. UNCERTAINTY VS. EFFICIENT USE OF RESOURCES





## METHODOLOGY



### THE IMPACT ANALYSIS WILL FOCUS ON

The impact analysis will focus on the relationship between the high levels of uncertainty from renewal processes and their negative impact on the investment levels of incumbent operators.

The lack of definitions regarding the renewal process (including format and conditions, duration terms, valuation, fees and frequency of payment, and coverage requirements) as well as the results of such process lead to increased uncertainty, which affects investment decisions, especially regarding long-term ones.

Companies commonly use the investment cutoff rate or weighted average cost of capital (WACC) for the assessment and feasibility analysis of new projects. If there is greater uncertainty, the cutoff rate increases, requiring a greater return on investments, which limits the number of projects conducted (since there will be fewer that are consistent with the new cutoff rate and the required investment).

In order to determine the operators' sensitivity to uncertainty from renewal, it was associated with general uncertainty indicators of a market in a particular country,<sup>7</sup>

### THE RELATIONSHIP BETWEEN HIGH LEVELS OF UNCERTAINTY CAUSED BY UNCERTAIN RENEWAL PROCESSES

### THE NEGATIVE IMPACT ON INVESTMENT LEVELS OF INCUMBENT OPERATORS

that companies commonly consider in their decisions to invest.

Capital expenditures (CAPEX) were considered a dependent variable. In order to standardize this variable among markets of different sizes, the level of investments per subscriber was used. To standardize it among years with different investments levels, the same period of time was considered as for the risk level.

Finally, an increase was simulated in the first variable (which led to a 1 percent increase in the cutoff rate) to determine the level of elasticity between risk and capital expenditures per subscriber.

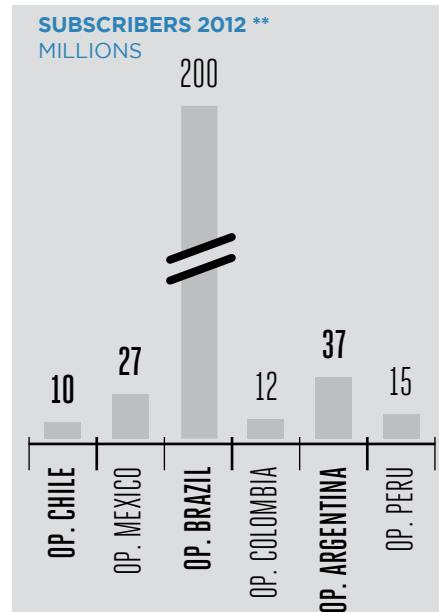
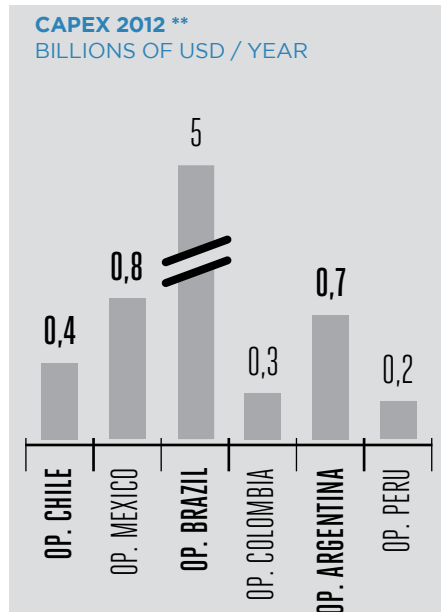
Starting with these relationships, and based on the data collected, the analysis shows that there is an inverse relationship between the level of investment and the level of risk related to uncertainty. The relationship between the variables shows that a 1 percent increase in the investment cutoff rate leads to an average reduction in investments 20–25 percent, per subscriber (approximate elasticity: 1.8x). Table 12 shows the details of the analysis and the relationship established.

<sup>7</sup> THE CREDIT DEFAULT SWAP (CDS) SPREAD WAS CONSIDERED FOR THIS PURPOSE. THE BUYER PAYS A RATE FOR THE INSURANCE STATED IN BASIC POINTS. THE GREATER THE RATE PAID, THE GREATER THE RISK OF DEFAULT BY THE DEBTOR- "THE CDS MARKET: A PRIMER " - DEUTSCHE BANK RESEARCH. FOR THE PURPOSES OF THIS ANALYSIS, THE SPREAD WILL BE REFERRED TO AS "RISK RATE" AND ITS UNIT OF MEASUREMENT IS BASIC POINTS.. IN ORDER TO MITIGATE THE VARIABILITY THAT SUCH RATE MAY HAVE UNDERGONE IN THE PAST FEW YEARS AND, THEREFORE, STANDARDIZE THE VARIABLE, THE 5-YEAR AVERAGE (2008-2012) OF THE CDS SPREAD WAS CONSIDERED.



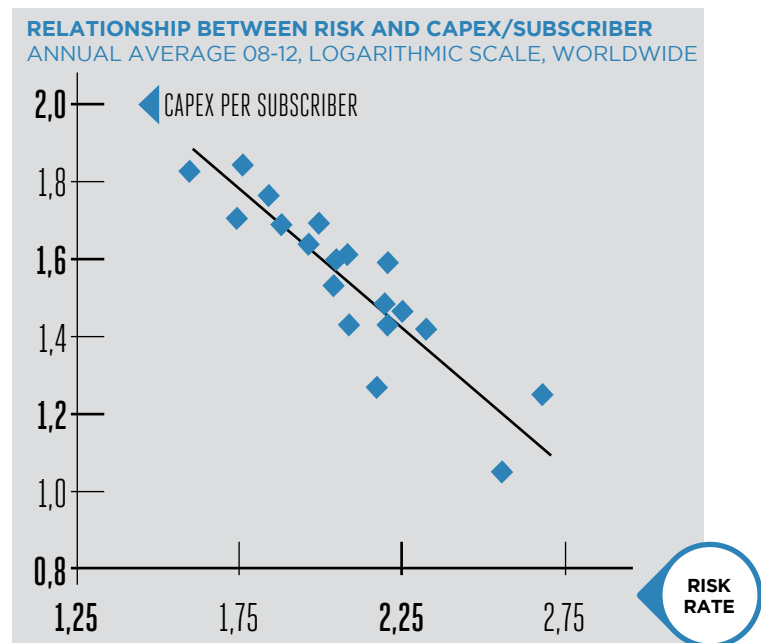
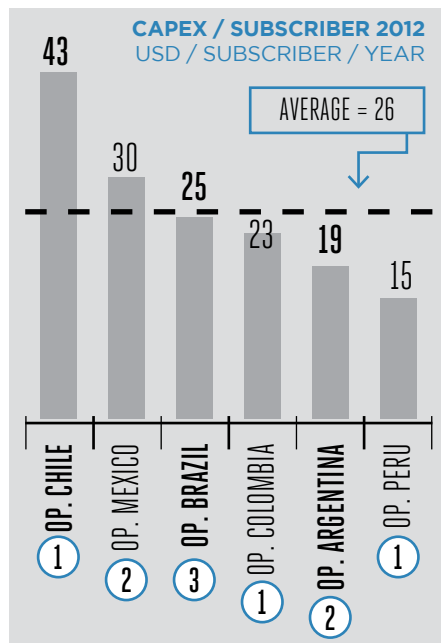
TABLE 12. SIMULATION OF CAPEX PER SUBSCRIBER AS A FUNCTION OF THE RISK RATE

SIMULATION OF THE CAPEX COMPOSITION PER SUBSCRIBER, BASED ON LINEAR REGRESSION AS A FUNCTION OF THE RISK RATE \*



**#**  
NUMBER OF OPERATORS, BASED ON AVAILABLE INFORMATION, CONSIDERED FOR CALCULATION

AN INCREASE OF ONE PERCENTAGE POINT IN THE INVESTMENT CUTOFF RATE LED TO AN AVERAGE REDUCTION IN INVESTMENT OF 20 PERCENT TO 25 PERCENT (APPROXIMATE ELASTICITY: 1.8X)



It is important to note that the analysis proposes a scenario of absolute uncertainty regarding licence renewal for use of the spectrum. In practice, operators have informal channels of information and pragmatic

precedents to reduce such absolute uncertainty, thus mitigating the uncertainty. Such informal channels of information are opposed to the clarity, transparency and predictability required by the industry in these situations.

\* THE CDS SPREAD WAS USED AS A PROXY OF THE PERCEIVED RISK RATE FOR MAKING INVESTMENTS IN A CERTAIN MARKET

\*\* ONLY THE CAPEX VALUES AND RESPECTIVE SUBSCRIBERS OF OPERATORS FOR WHICH INFORMATION WAS AVAILABLE WERE CONSIDERED.



## RESULTS

The analysis was conducted by comparing a certain scenario of automatic, predictable renewal (in which the investment rate was not affected) with an uncertain scenario that assumed the mechanisms of objective selection, in which the process conditions were not defined. The latter creates uncertainty regarding the results of the process and licence continuity, thus increasing uncertainty regarding the results and slowing down the rate of investment.

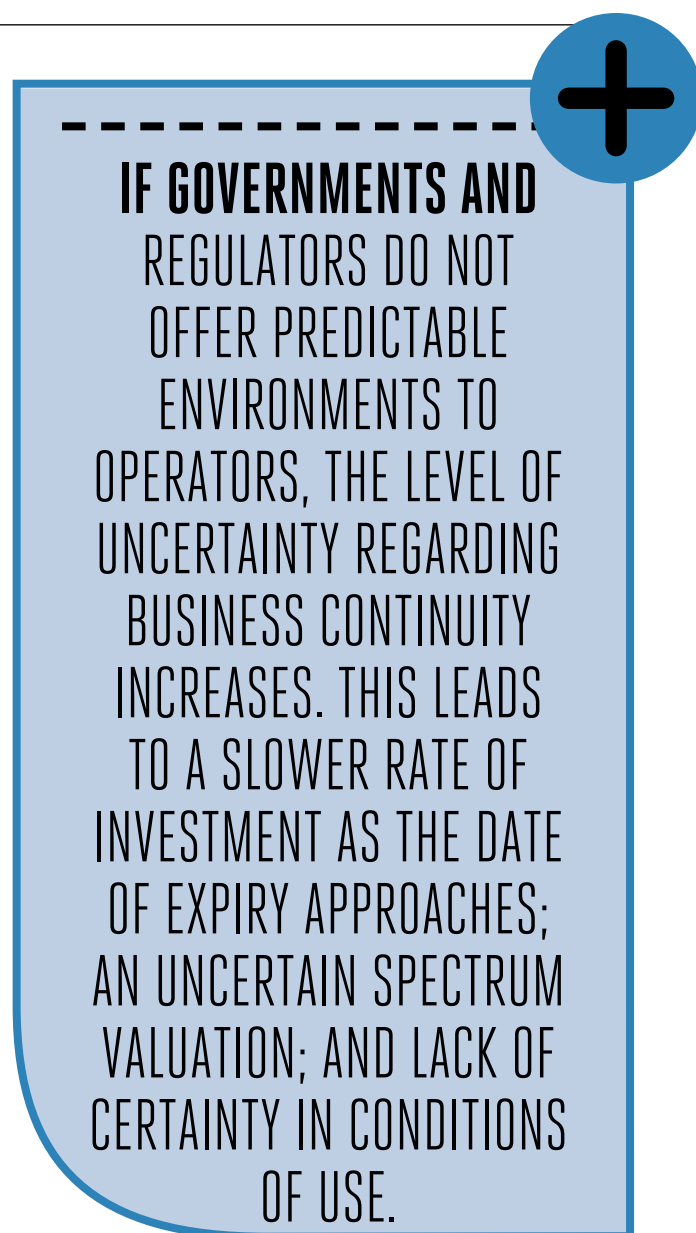
Since the valuation of licences depends on the market conditions in which the operators conduct their business and their position in the market, the final results of the process are related to the market characteristics and the concentration mechanisms of such market. If the licence renewal takes place in an uncertain scenario, an increase in licence valuation by the operators, regardless of their financial capacity, leads to an increase in probability of licence continuity for use of the spectrum.

The impact analysis was conducted in three scenarios, according to level of concentration:

**1 • COMPETITIVE MARKET:** A market with three operators of equal market share. In this case, the valuation of the licences is similar in the three cases, since they have similar market share levels. Therefore, the perception of renewal is the same in the three cases (33 percent). The probability of nonrenewal of an operator's licences is the sum of the perception of renewal of the remaining two participants (67 percent).

**2 • FRAGMENTED MARKET:** A market with five operators of the same size and market share. In this case, the valuation of licences is the same in all cases, but less than that in the competitive market, because the market share is inferior. The perception of renewal is similar for the five operators (20 percent). Therefore, the probability of nonrenewal will be the sum of the perceptions of renewal of the remaining operators (80 percent).

**3 • MARKETS WITH A DOMINANT OPERATOR:** A market with one dominant operator and two smaller operators with an equal part of the remaining market share. Given the greater market share of the dominant operator, its valuation of the licence is greater; while the valuations of the remaining participants are similar but inferior to that of the dominant operator. Based on its greater valuation, its perception of the probability



of renewal is higher compared to that of the smaller operators (in other words, 67 percent). In the case of both smaller operators, their perception of the probability of renewal is 16.5 percent and that of non-renewal is 83.5%.

All the given market scenarios include single-band operators. It is assumed that the valuation is independent of the financial capacity of the operators upon licence expiration for use of the Spectrum. For the purposes of this exercise, we used an initial cutoff rate of 7 percent.



## 5.B.I

# COMPETITIVE MARKET

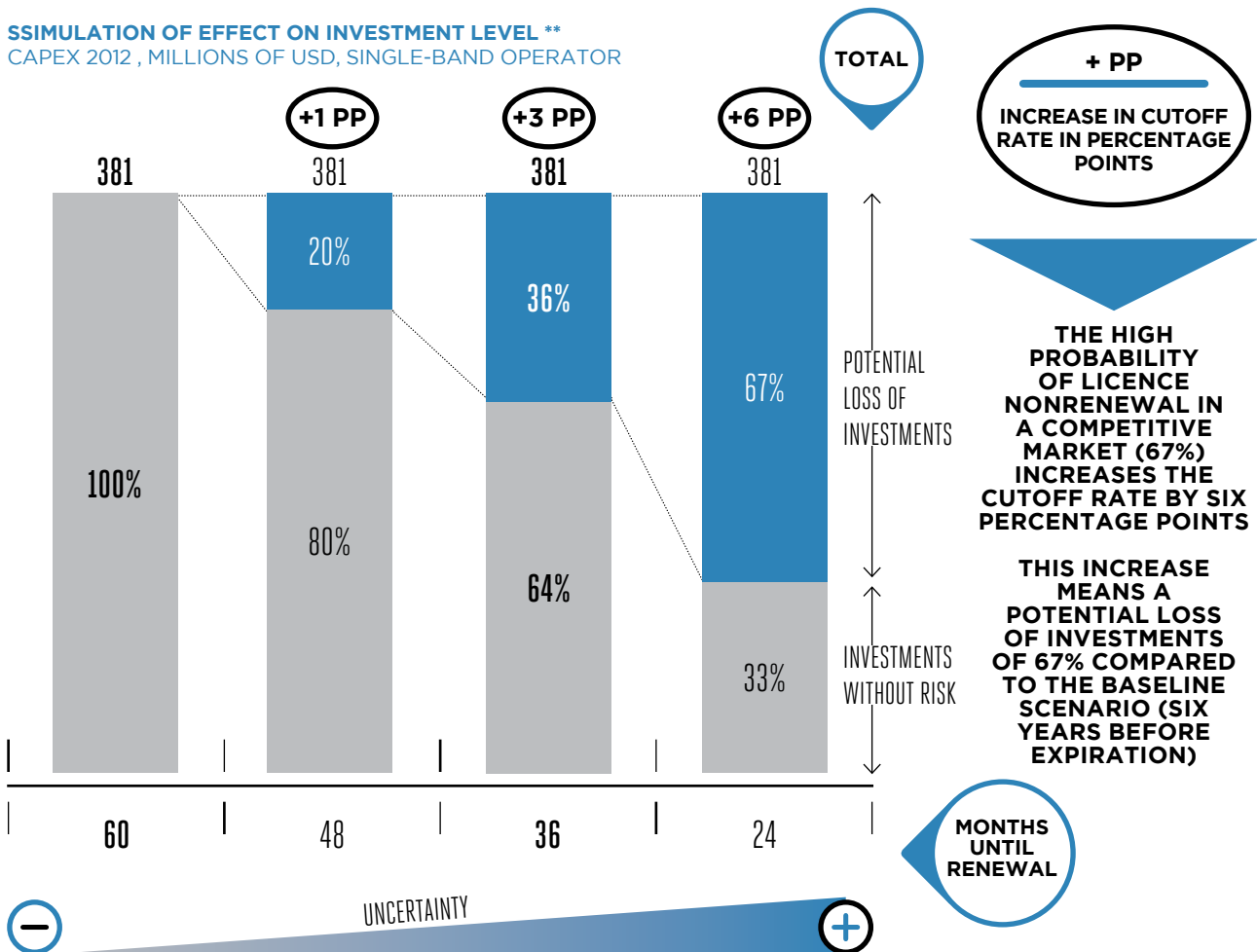
If the licence expiration date approaches, and regulators have not determined the conditions or mechanisms for renewal, uncertainty increases, affecting investment levels. Based on the competitive market characteristics described above, Table 13 simulates the effect of a lack of certainty regarding the conditions for renewal on the

investment cutoff rate when

the remaining term until licence expires is reduced from 60 to 24 months. This value increases by one percentage point; ending with an increase of six percentage points 24 months before the renewal.

**TABLE 13. ANALYSIS OF EFFECT ON COMPETITIVE MARKET**

**SSIMULATION OF EFFECT ON INVESTMENT LEVEL \*\***  
CAPEX 2012, MILLIONS OF USD, SINGLE-BAND OPERATOR



With a term of 24 months until licence expiry, with no certainty regarding the renewal process and/or its results, the potential loss of investments is 67 percent, compared to the investment level observed 60 months before expiration in the event of certainty regarding continuity of spectrum use.

However, the level of uncertainty is reduced when operators have elements that increase their estimated probability of licence continuity (informal channels of information and pragmatic precedents).

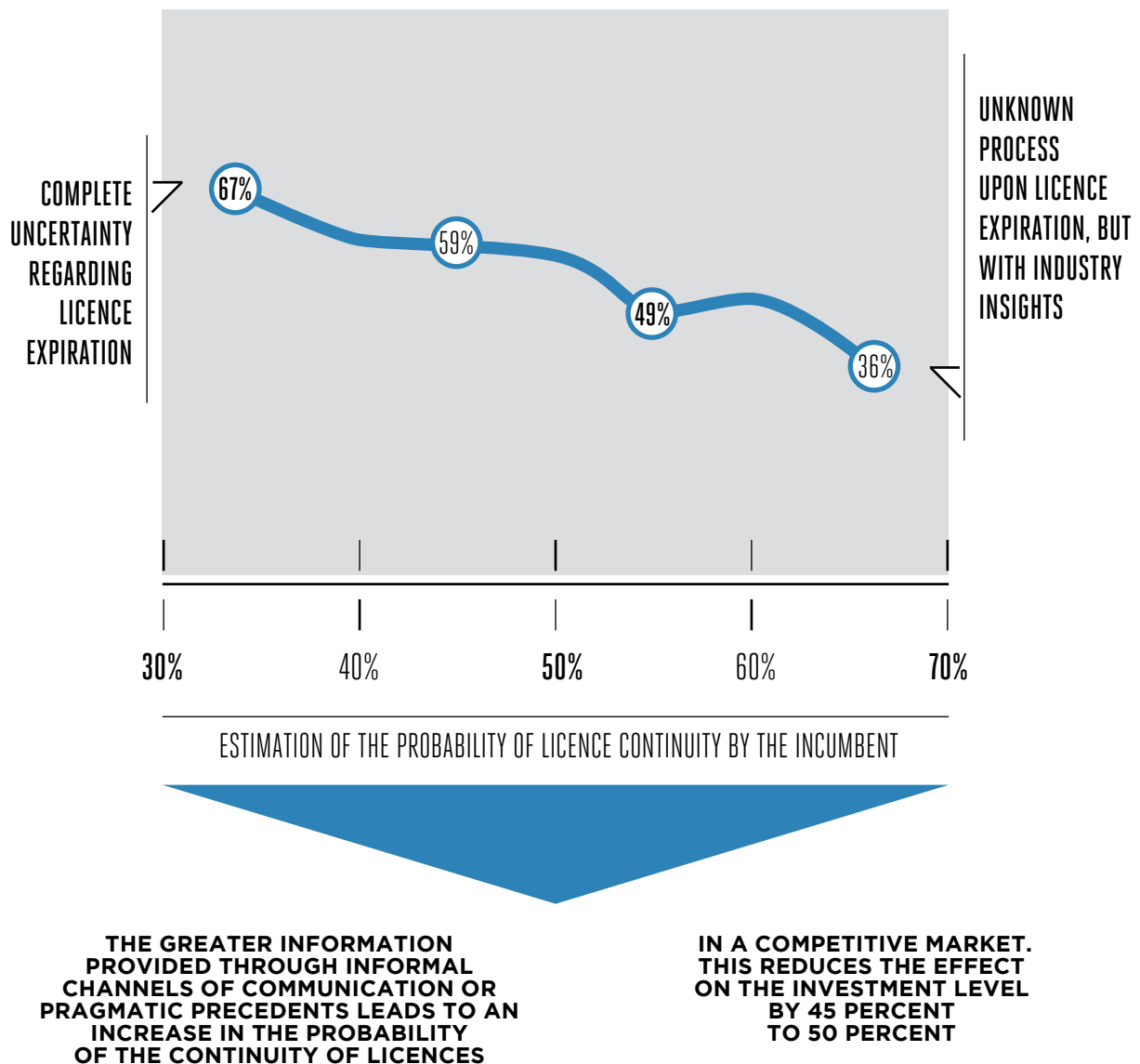
\* THE ANALYSIS DOES NOT APPLY TO THE ONGOING CAPEX, BUT TO THE CAPEX FOR THE DEVELOPMENT OF NETWORKS AND INFRASTRUCTURE

\*\* MARKET HYPOTHESIS: THREE OPERATORS OF THE SAME SIZE, INITIAL CUTOFF RATE IN USD: 7.3%



TABLE 14. **IMPACT SENSITIVITY IN COMPETITIVE MARKET**

INVESTMENT LEVEL WITH POTENTIAL LOSS 24 MONTHS BEFORE  
LICENCE EXPIRATION % (INVESTMENTS NOT MADE), % (PROBABILITY  
OF MAINTENANCE OF THE SPECTRUM ACCORDING TO THE  
INCUMBENT)



In a scenario of complete uncertainty regarding the conditions of the renewal process, the resulting potential loss of investments 24 months before the expiration of licences is 67 percent, compared to the investment level observed 60 months prior to the expiration in the

event of certainty regarding continuity of spectrum use. However, as table 14 shows, if uncertainty is reduced due to informal channels of information, the potential loss of investments drops to 36 percent in the case of the competitive market.



## 5.B.II

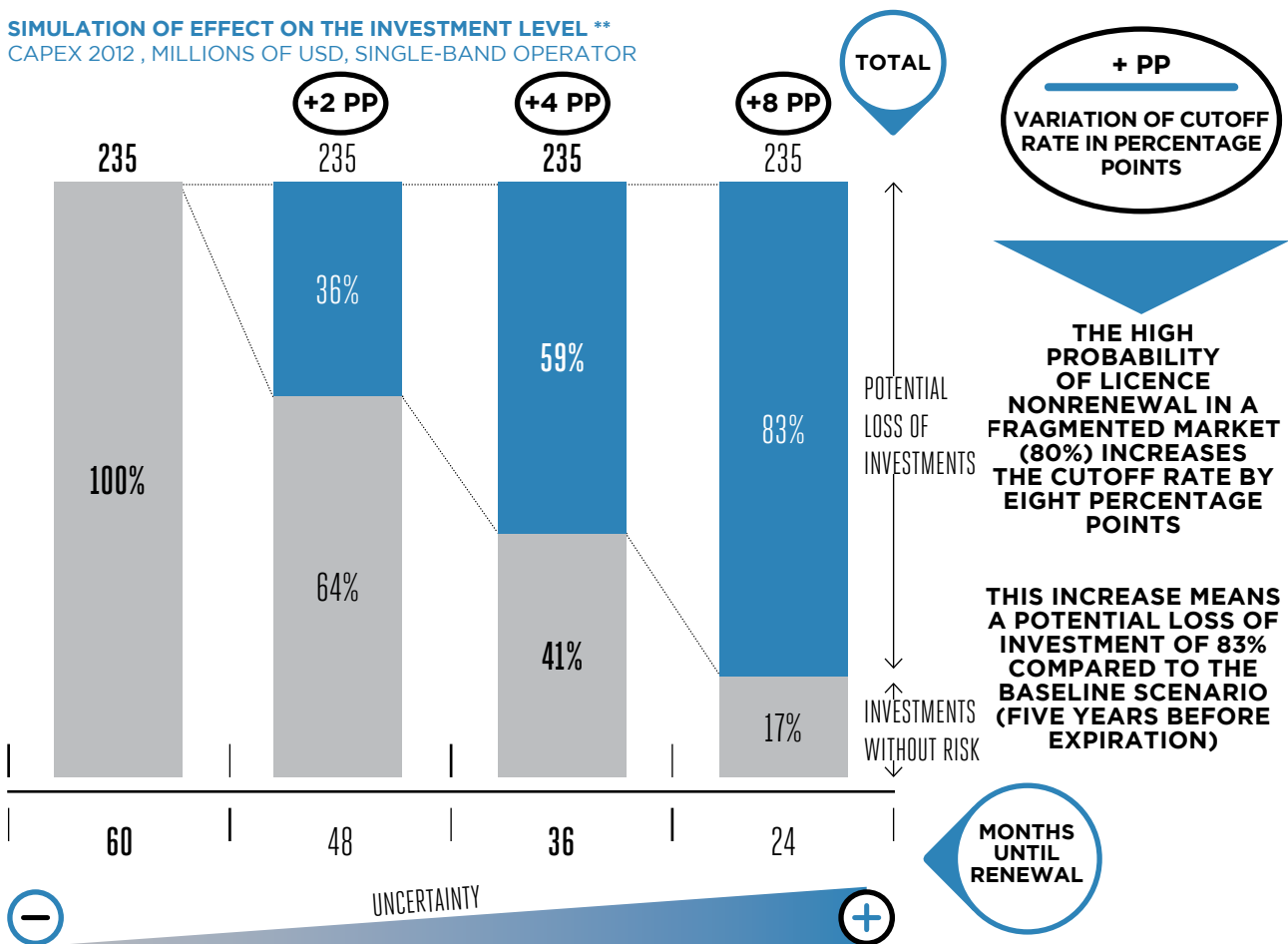
# FRAGMENTED MARKET

In the case of the fragmented market, the effect of uncertainty regarding the renewal process on the investment level is greater than that observed in the previous case. This difference is a result of the larger number of operators with equal market share, and the resulting lower perception of probability of renewal in an uncertain scenario.

Uncertainty regarding licence continuity 24 months before its expiration leads to an eight percentage-point increase in the cutoff rate used to analyze the feasibility of new projects. Table 15 shows the evolution of this impact as the date the licence expires approaches.

TABLE 15. ANALYSIS OF EFFECT ON FRAGMENTED MARKET

SIMULATION OF EFFECT ON THE INVESTMENT LEVEL \*\*  
CAPEX 2012, MILLIONS OF USD, SINGLE-BAND OPERATOR



In the event of uncertainty regarding licence renewal processes 24 months before the licence expires, the potential loss of investments in a fragmented market is 83 percent, compared to the investment level observed 60 months before expiry in the event of certainty regarding continuity of spectrum use. This means a

negative impact on the investment level is 16 percentage points greater than in the competitive market.

Table 16 shows how the 83 percent loss of potential investments drops if operators are able to increase their perception of the probability of licence continuity.

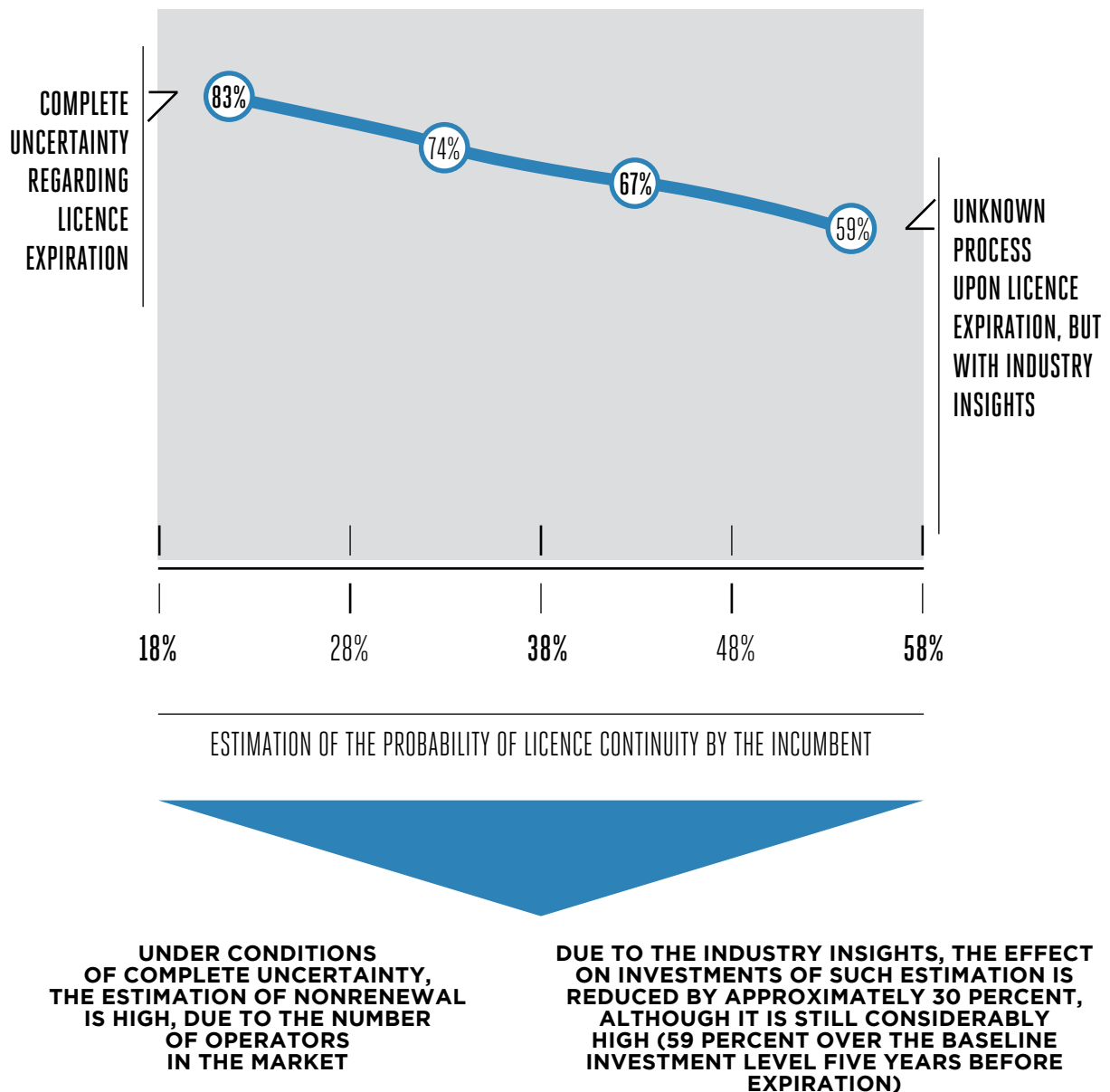
\*THE ANALYSIS DOES NOT APPLY TO THE ONGOING CAPEX, BUT TO THE CAPEX FOR THE DEVELOPMENT OF NETWORKS AND INFRASTRUCTURE

\*\* MARKET HYPOTHESIS: FIVE OPERATORS OF THE SAME SIZE, INITIAL CUTOFF RATE IN USD: 7.3%



TABLE 16. **IMPACT SENSITIVITY IN FRAGMENTED MARKET**

INVESTMENT LEVEL WITH POTENTIAL LOSS 24 MONTHS BEFORE THE LICENCE EXPIRES % (INVESTMENTS NOT MADE), % (PROBABILITY OF MAINTENANCE OF THE SPECTRUM ACCORDING TO THE INCUMBENT)



In a scenario of complete uncertainty regarding the renewal processes 24 months before the licence expires, the potential loss of investments is 83 percent. However, if the

level of uncertainty is reduced through informal channels, the estimation of the probability of licence renewal increases. As a result, the potential loss of investments drops to 59 percent.



## 5.B.III

# MARKET WITH DOMINANT OPERATOR

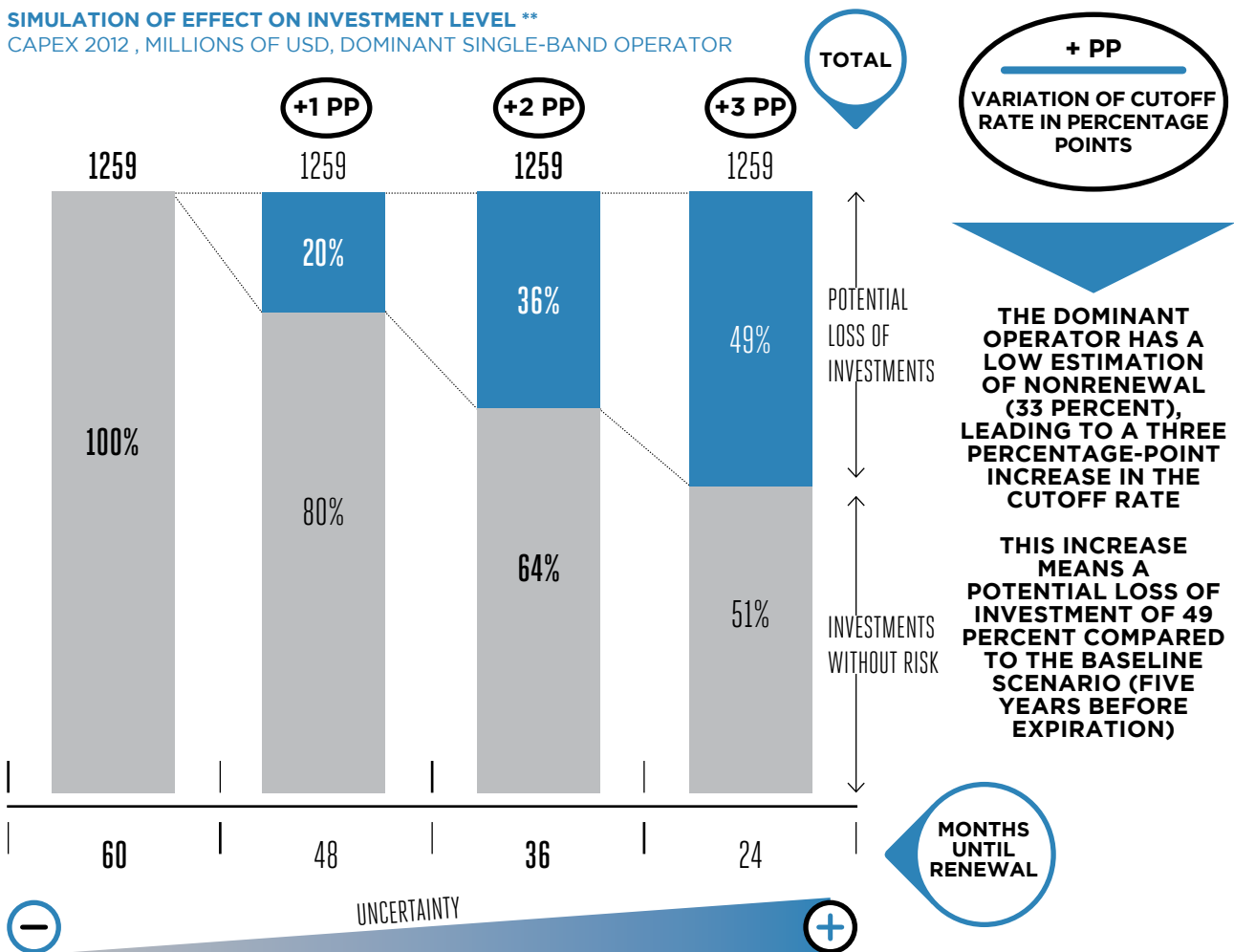
In the case of a market with a dominant operator, given the greater valuation of the licence, dominant operator perception of the probability of licence renewal is higher

than that of other participants (67 percent vs. 16.5 percent, for each of them). Since the nondominant participants have the same market share, their valuations are similar.

**TABLE 17. ANALYSIS OF IMPACT ON MARKET WITH DOMINANT OPERATOR**

### SIMULATION OF EFFECT ON INVESTMENT LEVEL \*\*

CAPEX 2012, MILLIONS OF USD, DOMINANT SINGLE-BAND OPERATOR



For the dominant operator, the impact of uncertainty regarding the licence renewal processes is lower than those observed above. As Table 17 shows, the cutoff rate for the dominant operator increases by three percentage points 24 months before licence expiration with no certainty regarding the renewal process. The remaining two minor operators show a cutoff rate variation of eight percentage points.

This increase in the cutoff rate represents a potential 49 percent loss of investment for the dominant operator compared to the investment level of the baseline scenario (investments made five years before expiration, in an environment of certainty) and without certainty regarding renewal mechanisms. This increased cutoff rate means an 83 percent loss of investment for each of the minor operators.

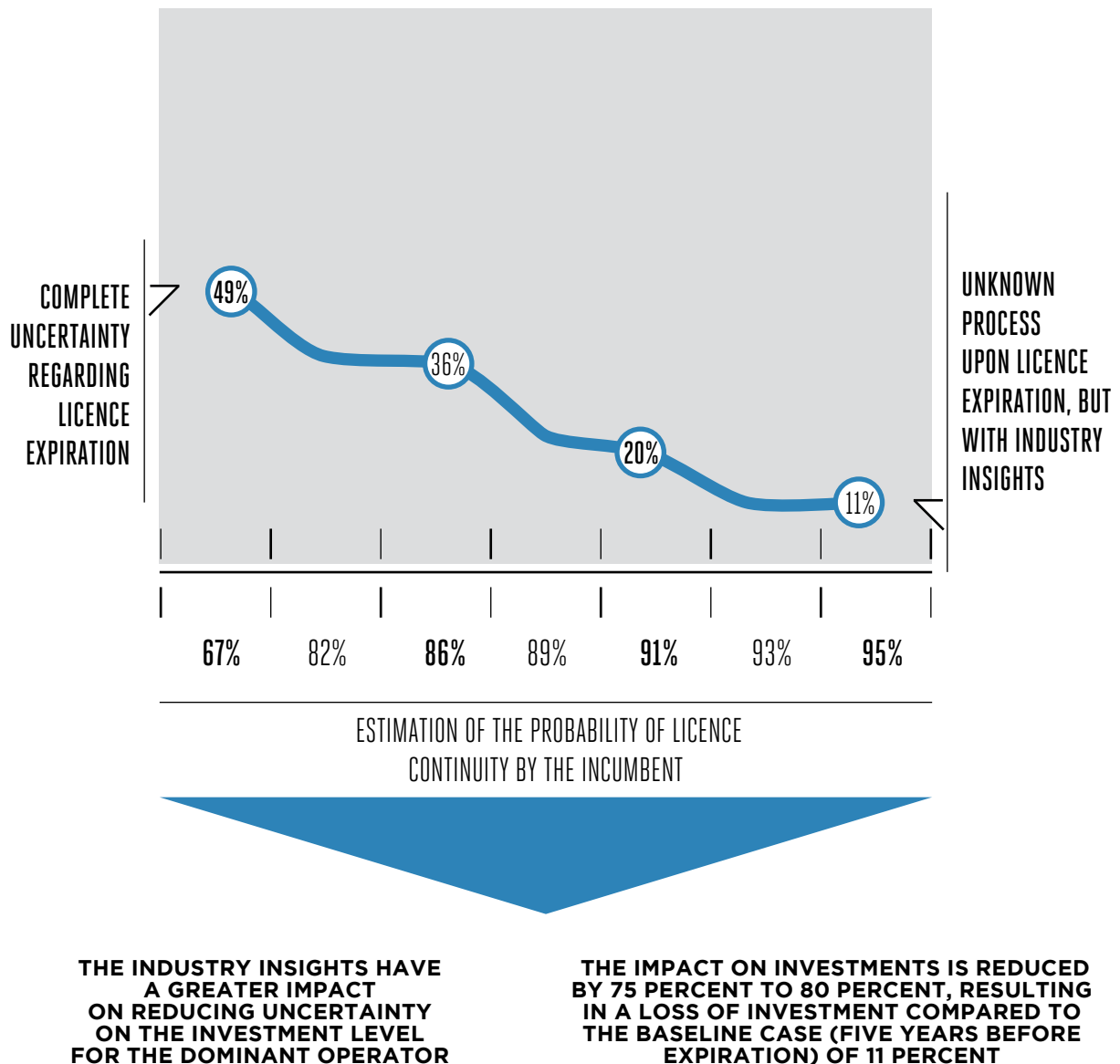
\* THE ANALYSIS DOES NOT APPLY TO THE ONGOING CAPEX, BUT TO THE CAPEX FOR THE DEVELOPMENT OF NETWORKS AND INFRASTRUCTURE

\*\* MARKET HYPOTHESIS: ONE DOMINANT OPERATOR, TWO OPERATORS OF THE SAME SIZE; INITIAL CUTOFF RATE IN USD: 7.3% AVERAGE PAYBACK PERIOD OF 60 MONTHS



TABLE 18. **SENSITIVITY EFFECT IN MARKET WITH DOMINANT OPERATOR**

INVESTMENT LEVEL WITH POTENTIAL LOSS 24 MONTHS BEFORE LICENCE EXPIRATION PERCENT (INVESTMENTS NOT MADE), PERCENT (PROBABILITY OF MAINTENANCE OF THE SPECTRUM ACCORDING TO THE INCUMBENT)



Even in a scenario of absolute uncertainty regarding the renewal process, the resulting potential loss of investments 24 months before the licence expires is approximately 49 percent. If the perception of probability of licence renewal

increases due to informal channels of communication, this impact decreases to 11 percent for the dominant operator and drops from 83 percent to 59 percent for each of the two operators with a smaller market share. | •

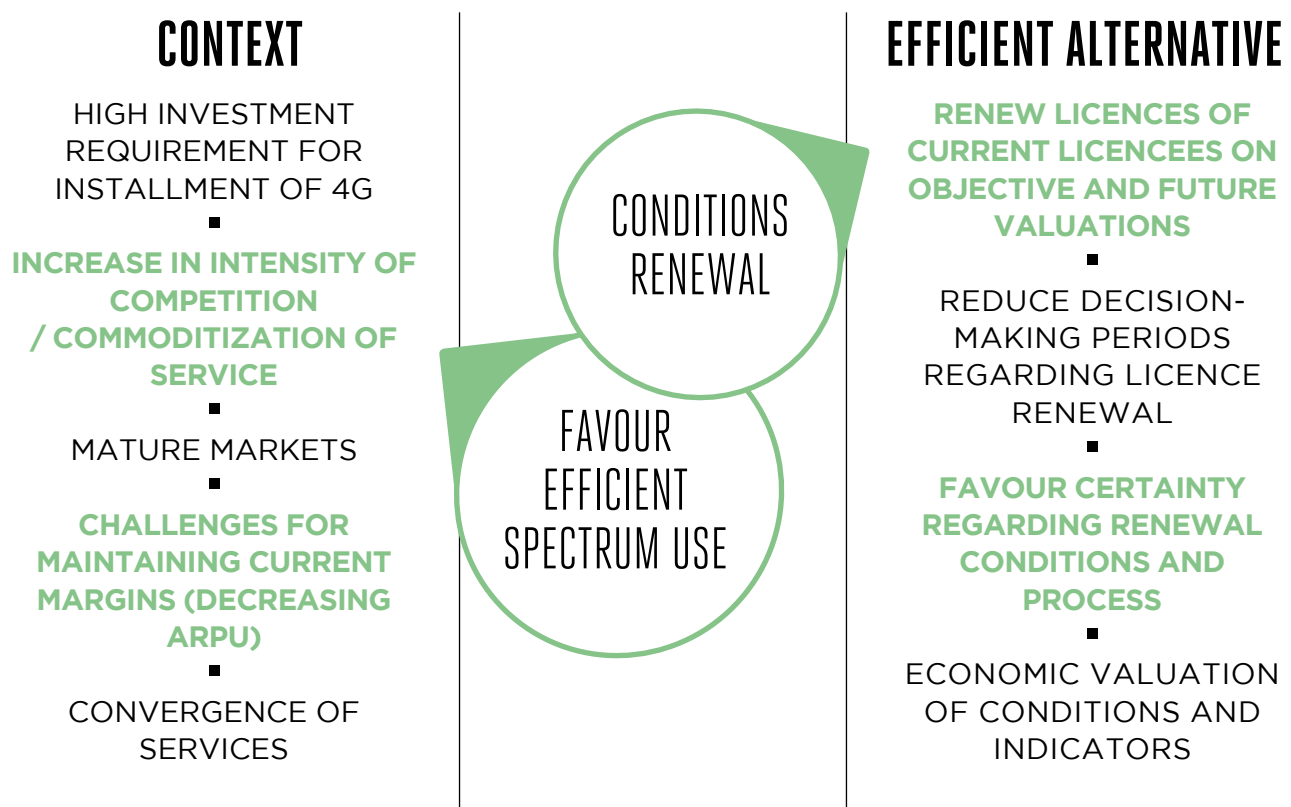


## 6.

# Conclusions

In the current context of the mobile telephone industry in Latin America, where (second) renewals are expected to occur in the short term, certainty regarding the processes and the continued use of the spectrum is a key factor for maintaining the current rate of investment in the sector. However, there is still a series of central aspects that have not been resolved in several countries. Table 19 summarizes the macro-context of the sector in the region.

TABLE 19. LATIN AMERICAN CONTEXT PRIOR TO EXPIRY OF SPECTRUM LICENCES











As mentioned above, the current context of the region of intensive investments for installing 4G, market maturity, commoditization of the service with a decreasing ARPU, and service convergence conditions a procedure to be followed upon licence expiration for use the Spectrum. In this context, it is imperative to reduce decision-making periods regarding licence renewal to favour certainty and renew licences based on

objective valuations that take into account future market conditions and the economic valuation of conditions to be met.

Spectrum valuation, the renewal method, and the imposed conditions are the three main issues that raise operator concerns regarding which, in many cases, there is still no clear position in several markets. (Table 20).



TABLE 20. MAIN CONTROVERSIAL ISSUES REGARDING SPECTRUM LICENCE RENEWAL

 <b>SPECTRUM VALUATION</b>	<ul style="list-style-type: none"> <li>■ Valuation based on a new scenario in the industry in which it is difficult to maintain current margins</li> <li>■ Valuation according to new market conditions</li> <li>■ Increased investment requirements</li> <li>■ Progression towards a structure-supplying industry</li> </ul>	
 <b>RENEWAL METHOD</b>	<ul style="list-style-type: none"> <li>■ Need for a clear, established, transparent process for all players</li> <li>■ Renewal versus primary assignment: Different considerations for determining the assignment method</li> </ul>	
 <b>NEW OBJECTIVES</b>	<ul style="list-style-type: none"> <li>■ Review of objectives (such as coverage) and inclusion of new objectives (such as quality)</li> <li>■ Need to value new objectives and include them in the amount to be paid</li> </ul>	
 <b>OTHER</b>	<ul style="list-style-type: none"> <li>■ Discrimination of payments per band when calculated on the basis of total income</li> <li>■ Reversion of infrastructure: Scope and need for return of infrastructure to the State upon nonrenewal of licence</li> </ul>	

A central aspect for dealing with the conditions of this process refers to the distinction between the first-time assignment of a Spectrum licence and the possibility of successive assignments of the same licence to the same operator. The economic effects in each are very different. In the case of first-time assignment, there is no rate of investment that is at risk of being reduced, as in the case of successive renewals. The renewal option reduces uncertainty for incumbent operators, resulting in maintaining the rate of projected investments, and therefore does not hinder installing a 4G network or affect the quality of service in mature markets of high penetration.

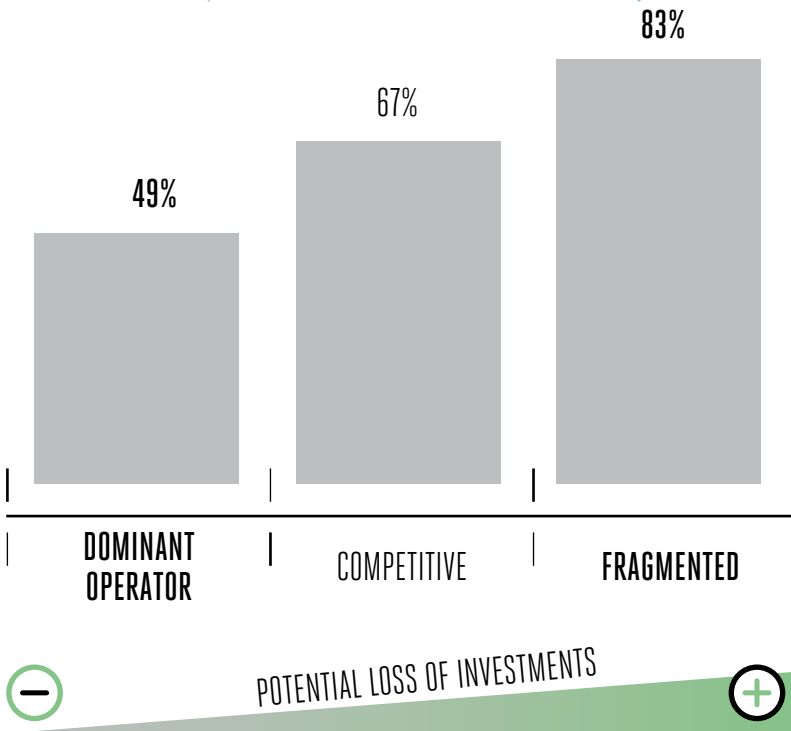
Based on the analysis of elasticity between risk and investment level, we conclude that an increase of one percentage point in the cutoff rate used by operators to analyze the feasibility of new projects resulted in a reduction in the investment level of 20 percent to 25 percent. In the case of licence renewal for spectrum, uncertainty regarding continued use could be caused by lack of determination of the process or by an objective selection process. This uncertainty has a negative impact on the level of investments by incumbent operators.



**TABLE 21. SUMMARY OF EFFECT OF UNCERTAINTY ON INVESTMENT LEVEL**

**POTENTIAL LOSS OF INVESTMENT - MARKET COMPARISON**

IN PERCENTAGES OVER INVESTMENT IN THE BASELINE SCENARIO (INVESTMENTS FIVE YEARS BEFORE THE LICENCE EXPIRES, IN AN ENVIRONMENT OF CERTAINTY)



**IN THE CURRENT** CONTEXT OF TICS IN LATIN AMERICA (INSTALLMENT OF NEW TECHNOLOGIES, MARKET MATURITY, COMMODITIZATION OF SERVICES AND DECREASING ARPU), IT IS IMPERATIVE TO REDUCE DECISION-MAKING PERIODS REGARDING LICENCE RENEWAL TO FAVOUR CERTAINTY AND RENEW LICENCES BASED ON OBJECTIVE VALUATIONS THAT TAKE INTO ACCOUNT FUTURE MARKET CONDITIONS AND THE ECONOMIC VALUATION OF CONDITIONS TO BE MET

**THE FRAGMENTED MARKET SHOWS GREATER POTENTIAL LOSS (83 PERCENT OF BASELINE INVESTMENT) 24 MONTHS BEFORE EXPIRATION, WITH UNCERTAINTY REGARDING PROCESSES**

**OPERATORS IN THE COMPETITIVE MARKET SHOW A POTENTIAL 67 PERCENT REDUCTION IN THE INVESTMENT LEVEL**

**IN A MARKET WITH DOMINANCE, THE MAIN OPERATOR HAS A POTENTIAL LOSS OF 49 PERCENT AND THE OPERATORS WITH A SMALLER MARKET SHARE EACH HAVE A POTENTIAL LOSS OF 83 PERCENT**

The effects on the investment level were estimated with the assumption of absolute uncertainty in the operators regarding the licence continuity for spectrum. As shown in the previous table, the fragmented market shows a greater effect regarding the potential loss of investments. It is important to note that the dominant or concentrated market shows different effects on its operators. On one hand, the dominant operator shows a potential loss that is lower than that of the rest of the participants (49 percent), due to its higher relative valuation. On the other hand, operators with a smaller market share show an 83 percent potential loss of investments.

However, in practice, there is no scenario of absolute uncertainty regarding licence renewal. The use of informal channels of communication and pragmatic precedents makes it possible for incumbents to have more information regarding the prospects and possible future scenarios of the market. Therefore, the perception of the probability of licence nonrenewal decreases, directly affecting the cutoff rate and softening the impact related to potential loss of investments. In any case, it is important to note that such informal channels are often inconsistent with the predictability and transparency required by the industry in these situations. |•



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# Resources

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For further information on Spectrum licensing, please see the following reports:



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## **MOBILE POLICY HANDBOOK - “SPECTRUM MANAGEMENT AND LICENSING” SECTION**

To download the complete report, please visit  
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