TIM S.p.A.
Form 20-F
April 16, 2019
Table of Contents

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 20-F

REGISTRATION STATEMENT PURSUANT TO SECTION 12(b) OR (g) OF THE SECURITIES EXCHANGE ACT OF 1934

OR

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended: December 31, 2018

OR

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from N/A to N/A

OR

SHELL COMPANY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

Date of event requiring this shell company report

Commission file number 1-13882

TIM S.p.A.

(Exact name of Registrant as specified in its charter)

Italy

(Jurisdiction of incorporation or organization)

Via Gaetano Negri 1, 20123 Milan, Italy

(Address of principal executive offices)

Piergiorgio PELUSO

Head of Administration, Finance and Control

TIM S.p.A.

Corso d Italia, 41, 00198 Rome, Italy

+39.06.36.88.1

Carola Bardelli

Head of Investor Relations

TIM S.p.A.

Corso D Italia 41, 00198 Rome, Italy

+39.06.36.88.1

investor_relations@telecomitalia.it

(Name, Telephone, E-mail and/or Facsimile number and Address of Company Contact Person)

Securities registered or to be registered pursuant to Section 12(b) of the Act:

Title of each class	Name of each exchange on which registered
American Depositary Shares, each representing 10 Ordinary Shares (the **Ordinary Share ADSs**)	The New York Stock Exchange
Ordinary Shares (the **Ordinary Shares**)	The New York Stock Exchange*
American Depositary Shares, each representing 10 Savings Shares (the **Savings Share ADSs**)	The New York Stock Exchange
Savings Shares (the **Savings Shares**)	The New York Stock Exchange*
Guarantee of Guaranteed Senior Notes due 2018 of Telecom Italia Capital	The New York Stock Exchange**
Guarantee of Guaranteed Senior Notes due 2019 of Telecom Italia Capital	The New York Stock Exchange**
Guarantee of Guaranteed Senior Notes due 2033 of Telecom Italia Capital	The New York Stock Exchange**
Guarantee of Guaranteed Senior Notes due 2034 of Telecom Italia Capital	The New York Stock Exchange**
Guarantee of Guaranteed Senior Notes due 2036 of Telecom Italia Capital	The New York Stock Exchange**
Guarantee of Guaranteed Senior Notes due 2038 of Telecom Italia Capital	The New York Stock Exchange**

Securities registered or to be registered pursuant to Section 12(g) of the Act:

None

(Title of Class)

Securities for which there is a reporting obligation pursuant to Section 15(d) of the Act:

None

(Title of Class)

Indicate the number of outstanding shares of each of the issuer s classes of capital or common stock as of the close of the period covered by the annual report.

Ordinary Shares 15,203,122,583

Savings Shares 6,027,791,699

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act Yes No

If this report is an annual or transition report, indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934. Yes No

Note Checking the box above will not relieve any registrant required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 from their obligations under those Sections.

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or an emerging growth company. See definition of large accelerated filer , accelerated filer , and emerging growth company in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Emerging growth company

If an emerging growth company that prepares its financial statements in accordance with U.S. GAAP, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standardst provided pursuant to Section 13(a) of the Exchange Act.

The term new or revised financial accounting standard refers to any update issued by the Financial Accounting Standards Board to its Accounting Standards Codification after April 5, 2012.

Indicate by check mark which basis of accounting the registrant has used to prepare the financial statements included in this filing:

U.S. GAAP International Financial Reporting Standards as issued by the International Accounting Standards Board Other

If Other has been checked in response to the previous question indicate by check mark which financial statement item the registrant has elected to follow Item 17 Item 18

If this is an annual report, indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes No

*

Not for trading, but only in connection with the registration of American Depositary Shares representing such Ordinary Shares or Savings Shares, as the case may be, pursuant to the requirements of the Securities and Exchange Commission.

** Not for trading, but only in connection with the registration of the corresponding Guaranteed Senior Notes of Telecom Italia Capital (a wholly-owned subsidiary of TIM S.p.A.).

Table of Contents

TABLE OF CONTENTS

Table of Contents

Table of Contents

INTRODUCTION

Telecom Italia S.p.A., named also TIM S.p.A. , is incorporated as a joint stock company under the laws of Italy. As used in this Annual Report, unless the context otherwise requires, the term Company means TIM S.p.A. the operating company for fixed and mobile telecommunications services in Italy and the holding company of the Tim Group that is engaged principally in the communications sector and, particularly, the fixed and mobile national and international telecommunications sector.

The terms we , us and our refers to the Company, and, as applicable, the Company and its consolidated subsidiaries.

Unless otherwise indicated, the financial information contained in this Annual Report has been prepared in accordance with International Financial Reporting Standards issued by the International Accounting Standards Board (designated as **IFRS**).

Unless otherwise indicated, any reference in this Annual Report to Consolidated Financial Statements is to the Consolidated Financial Statements for the year ended December 31, 2018 of the TIM Group (including the notes thereto) included elsewhere herein.

References herein to TIM websites are textual references only and information on or accessible through such websites does not form part of and is not incorporated into this Form 20-F.

Cautionary Statement for Purposes of the Safe Harbor Provisions of the United States Private Securities Litigation Reform Act of 1995.

The Private Securities Litigation Reform Act of 1995 provides a safe harbor for forward-looking statements. This Annual Report contains certain forward-looking statements.

Forward-looking statements are statements that are not historical facts and can be identified by the use of forward-looking terminology such as believes, may, is expected to, will, will continue, should, seeks or similar expressions or the negative thereof or other comparable terminology, or by the forward-looking nature of discussions of strategy, plans or intentions.

The forward-looking statements in this Annual Report include, but are not limited to, the discussion of the changing dynamics of the telecommunications marketplace, including the continuing developments in competition in all aspects of our businesses from new competitors and from new and enhanced technologies, our outlook for growth in the telecommunications industry both within and outside of Italy, including our outlook regarding developments in the telecommunications industry, and certain trends we have identified in our core markets, including regulatory developments.

Such statements include, but are not limited to, statements under the following headings: (i) Item 3. Key Information 3.1 Risk Factors , (ii) Item 4. Information on the TIM Group 4.1 Business 4.1.7 Updated Strategy , (iii) Ite 4. Information on the TIM Group 4.3 Regulation , (iv) Item 5. Operating and Financial Review and Prospects , (v) Item 8. Financial Information 8.2 Legal Proceedings and (vi) Item 11. Quantitative and Qualitative Disclosures About Market Risks , including statements regarding the likely effect of matters discussed therein.

Actual results may differ materially from those projected or implied in the forward-looking statements. Such forward-looking information is based on certain key assumptions which we believe to be reasonable but forward-looking information by its nature involves risks and uncertainties, which are outside our control, that could significantly affect expected results.

The following important factors could cause actual results to differ materially from those projected or implied in any forward-looking statements:

- our ability to successfully implement our strategy in the future;

- a deterioration of the economic environment in the principal markets in which we operate, including, in particular, our core Italian market;

- the impact of regulatory decisions and changes in the regulatory environment in Italy, Brazil and other countries in which we operate, including the ability of the Italian Government to exercise its power with respect to our ability to enter into strategic transactions;

Table of Contents

- our ability to successfully compete on both price and innovation capabilities with respect to new products and services;

- our ability to develop and introduce new technologies that are attractive in our principal markets, to manage innovation, to supply value added services and to increase the use of our fixed and mobile networks;

- our ability to successfully implement our internet and broadband/ultrabroadband strategy;

- our ability to successfully achieve our financial targets (including debt reduction);

- the impact of fluctuations in currency exchange and interest rates and the performance of the equity markets in general;

- the outcome of litigation, disputes and investigations in which we are involved or may become involved;

- our ability to build up our business in adjacent markets and in international markets (particularly in Brazil), due to our specialist and technical resources;

- our ability to achieve the expected return on the investments and capital expenditures we have made and continue to make in Italy, Brazil and other countries in which we operate;

- the amount and timing of any future impairment charges for our authorizations, goodwill or other assets;

- our ability to manage any business or operating model transformation plans;

- disruptions or uncertainties resulting from the United Kingdom s expected exit from the European Union;

- any difficulties which we may encounter in our supply and procurement processes, including as a result of the insolvency or financial weaknesses of our suppliers; and

- the costs we may incur due to unexpected events, in particular where our insurance is not sufficient to cover such costs.

The foregoing factors should not be construed as exhaustive. Due to such uncertainties and risks, readers are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date hereof. We undertake no obligation to release publicly the result of any revisions to these forward-looking statements which may be made to reflect events or circumstances after the date hereof, including, without limitation, changes in our business or acquisition strategy or planned capital expenditures, or to reflect the occurrence of unanticipated events.

Table of Contents

KEY DEFINITIONS

The following terms appearing in this Annual Report have the meanings set forth below.

EU	means the European Union.
IASB	means the International Accounting Standards Board.
IFRS	means International Financial Reporting Standards issued by the IASB. IFRS also include all effective International Accounting Standards (**IAS**) and all Interpretations issued by the IFRS Interpretations committee (formerly called International Financial Reporting Interpretations Committee IFRIC), comprising those previously issued by the Standing Interpretations Committee (**SIC**).
Ordinary Shares	means the Ordinary Shares, of TIM.
Parent, Telecom Italia, TIM and Company	means Telecom Italia S.p.A., also named TIM S.p.A.
Savings Shares	means the Savings Shares, of TIM.
TIM Group and Group	means the Company and its consolidated subsidiaries.
Vivendi	means the Vivendi S.A. a limited liability company (*société anonyme*) incorporated under French law and subject to French commercial company law including the French commercial Code (*Code de commerce*). Vivendi S.A. is an integrated content and media group. The company operates businesses throughout the media value chain, from talent discovery to the creation, production and distribution of content. For such key definition see also below.

* * *

On May 16, 2018, the Board of Directors of TIM S.p.A. acknowledged that the grounds, under Italian law, for considering Vivendi the entity exercising direction and coordination powers over TIM no longer applied. Subsequently, on June 25, 2018, the Board of Directors approved amendments to the internal procedure governing

transactions with related parties, and updated the relative related party boundary to reflect the new situation, whereby Vivendi no longer qualifies as the *de facto* controlling entity over TIM.

For further details, please see Item 7. Major Shareholders And Related-Party Transactions .

* * *

In addition to the foregoing terms, certain technical telecommunication terms relating to our businesses are defined in the glossary of this Annual Report (see Item 4. Information on the TIM Group 4.5 Glossary of Selected Telecommunications Terms).

In addition, we use the measure Accesses when considering certain statistical and other data for our domestic Italian business. Access refers to a connection to any of the telecommunications services offered by the Group in Italy. The following are the main categories of accesses:

- **Physical Accesses:** in the domestic fixed telephony business, includes retail accesses, as well as wholesale accesses directly managed by TIM, excluding OLOs, for which infrastructure is fully developed, and FWA-Fixed Wireless Accesses;

- **Broadband Accesses:** in the domestic fixed telephony business, includes broadband retail accesses and broadband wholesale accesses directly managed by TIM and excludes OLO LLU and NAKED, satellite, full-infrastructured and FWA Fixed Wireless Accesses. Broadband retail accesses are included as part of physical accesses;

- **Mobile accesses:** number of lines.

Table of Contents

PART I

Item 1. IDENTITY OF DIRECTORS, SENIOR MANAGEMENT AND ADVISERS

Not Applicable

Item 2. OFFER STATISTICS AND EXPECTED TIMETABLE

Not Applicable

Table of Contents

Item 3. KEY INFORMATION

3.1 RISK FACTORS

In addition to the other information contained in this Annual Report, investors should carefully consider the risks described below before making any investment decision. The risks described below are not the only ones we face. Additional risks not known to us or that we currently deem immaterial may also impact our business and results of operations. Our business, financial condition, results of operations and cash flows could be materially adversely affected by any of these risks, and investors could lose all or part of their investment.

We present below:

1) our main objectives as set out in our 2019-2021 Strategic Plan (the **2019-2021 Plan** or the **Plan**); and

2) factors that may prevent us from achieving our objectives. For purposes of presenting our risk factors we have identified our risks based on the main risk categories, set out in the Committee of Sponsoring Organization of the Treadway Commission[1]:

   strategic risks;

   operational risks;

   financial risks; and

   compliance risks.

Our business will be adversely affected if we are unable to successfully implement our strategic objectives. Factors beyond our control may prevent us from successfully implementing our strategy.

On February 21, 2019, TIM s Board of Directors approved the 2019 2021 Strategic Plan (the **Plan**). The Plan focuses on improving TIM s execution and timely delivery of what planned as a key element for the organic transformation of TIM. The Plan provides to re-start from TIM real competitive advantages (network quality, scale and client proximity, technical competences and geographical presence) to guarantee industrial sustainability. On the Technological front, the Plan sets modernization, simplification and artificial intelligence at the core of future investments in order to ensure quality excellence and contain capital expenditures intensity. Quality and reliability on all customer touch points (activation, delivery and problem resolution) are as well at the center of the strategy. These strategic actions will allow to deliver a sustainable return on capital invested, to optimize invested capital and finally to delever the business.

Our ability to implement and achieve our strategic objectives and priorities may be influenced by certain factors, including factors outside of our control. Such factors include:

- a deterioration of the economic environment in the principal markets in which we operate, including, in particular, our core Italian market;

- the impact of regulatory decisions and changes in the regulatory environment in Italy, Brazil and other countries in which we operate, including the ability of the Italian Government to exercise its power with respect to our ability to enter into strategic transactions;

- our ability to successfully compete on both price and innovation capabilities with respect to new products and services;

- our ability to develop and introduce new technologies that are attractive in our principal markets, to manage innovation, to supply value added services and to increase the use of our fixed and mobile networks;

- our ability to successfully implement our internet and broadband/ultrabroadband strategy;

- our ability to successfully achieve our financial targets (including debt reduction);

- the impact of fluctuations in currency exchange and interest rates and the performance of the equity markets in general;

- the outcome of litigation, disputes and investigations in which we are involved or may become involved;

- our ability to build up our business in adjacent markets and in international markets (particularly in Brazil), due to our specialist and technical resources;

[1] CoSO Report-ERM Integrated Framework 2004.

Table of Contents

- our ability to achieve the expected return on the investments and capital expenditures we have made and continue to make in Italy, Brazil and other countries in which we operate;

- the amount and timing of any future impairment charges for our authorizations, goodwill or other assets;

- our ability to manage any business or operating model transformation plans;

- disruptions or uncertainties resulting from the United Kingdom s expected exit from the European Union;

- any difficulties which we may encounter in our supply and procurement processes, including as a result of the insolvency or financial weaknesses of our suppliers; and

- the costs we incur due to unexpected events, in particular where our insurance is not sufficient to cover such costs.

As a result of these uncertainties there can be no assurance that the business and strategic objectives identified by our management can effectively be attained in the manner and within the time-frames described. Furthermore, if we are unable to attain our strategic priorities, our goodwill may be further impaired, which could result in further significant write-offs.

The following sets out more specific factors that may prevent us from achieving our objectives.

STRATEGIC RISKS

Weak global economic conditions, including the continuing weakness of the Italian economy and political conditions in Brazil, have adversely affected our business in recent years. After the economic recovery of 2017, the Eurozone economy has shifted from a recovery boom to an unexpected slower cruising speed. Economic conditions in the Italian economy have shown improvement, however, strong uncertainty persist with respect to the economic outlook, which could have a negative impact on our operating results and financial condition.

Our business is dependent on general economic conditions in Italy and in our other principal market, Brazil, including with respect interest rate levels, inflation, taxation and general business conditions. The weak economic conditions of the last several years have had an adverse impact on our business and result of operation.

The prolonged economic recession that Italy has experienced in recent years has negatively impacted development prospects in our core Italian market.

After the recovery of 2017 with an economic growth of 1.6%, Italy is experiencing a slowdown even stronger than the other EMU member countries: GDP in 2018 grew by 0.9% in real terms and for 2019 an even more modest growth is expected. The slowdown in Italian growth reflects the deceleration of exports (particularly towards the main trading partner, Germany, which in turn has recorded a sharp slowdown in the third quarter) and the expected normalization

of monetary policies. On the domestic side, the uncertainty associated with fiscal policy interventions and the possible repercussions on financial markets and the deteriorating of consumer and business confidence weigh significantly.

During 2018, Brazilian economy presented a lower growth than previously expected, with the GDP growth of 1.1%, according to the Brazilian Institute of Geography and Statistics (**IBGE**), when compared to a previous growth projection of 2.8%, at the end of 2017. This result was directly impacted by political instability due to the presidential election, that led to a historical high of the dollar exchange rate in reais (R$4.19), which, amid other factors, such as the oil price fluctuation in the international market, contributed to a strong growth of the fuel prices, one of the main factors for the 10 days truckers strike, that also contributed directly for the deceleration of Brazilian growth.

Despite that, the inflation, measured by the IPCA continued under control, at 3.75% below the minimum target set by Central Bank, but with a slight growth when compared to 2017 (2.95%). Unemployment has decreased; however, consumer and business confidence still remain sensitive to the new government s ability to approve relevant reforms to fiscal adjustment.

Table of Contents

Item 3. Key Information **Risk Factors**

Vivendi is our largest shareholder and exercises substantial influence over us.

As of the date hereof, the largest single shareholder in the Company is Vivendi S.A. (**Vivendi**), which holds, directly, a stake of approximately 23.94% of ordinary share capital. With a holding of this size, Vivendi can exercise significant influence over matters subject to a vote of the ordinary shareholders of the Company, such as nominations to the Board of Directors (the **Board**), matters involving mergers or other business combinations, the acquisition or disposition of assets, issuances of equity and the incurrence of indebtedness. In addition, Vivendi s significant holding may also have the effect of discouraging others from making tender offers for our shares. See Item 7. Major Shareholders and Related-Party Transactions 7.1 Major Shareholders .

Competition Risks

Alternative infrastructure operators in Italy could pose a threat to us, particularly in the medium to long term

In the fixed market, alternative network operators (**AltNet**), such as Open Fiber S.p.A. (Open Fiber) and Infratel Italia S.p.A. (Infratel), have disclosed and started to implement plans to develop alternative ultrabroadband telecommunications networks in Italy in the main Italian cities and in so-called market failure areas. Similar alternative developments, either on a standalone basis or through partnerships with other licenced operarators (**OLOs**), could adversely impact our businesses, assets and goodwill and, as a consequence, our economic and financial performance. In particular, we face risks with respect to increasing competition in the National Wholesale Market, which could result in losses with respect to our customer base and revenues and a potential loss of retail market share and revenues.

Strong competition in Italy or other countries where we operate may further reduce our core market share for telecommunications services and may cause reductions in prices and margins thereby having a material adverse effect on our results of operations and financial condition.

Telecommunications operators have generally faced challenging market conditions in recent years, principally as a result of the decline in voice traffic and significant pricing pressures resulting from increased competition among operators.

Strong competition exists in all principal areas of the Italian telecommunications business in which we operate. Competition may become even more acute in the coming years, with additional international operators accessing the Italian market.

The Italian telecommunications market is experiencing a phase of heating of the competitive environment, mainly due to the entry of Iliad in the mobile market as the 4th network infrastructured operator. Iliad launched its mobile service in the Italian market at the end of May 2018 and has rapidly gained customers and consequently market share to the detriment of the other infrastructured operators, thanks to a simplified offer particularly aggressive in terms of price and volume of data. The other operators followed Iliad reducing prices and largely increasing GB allowance with an impact not only on the mobile sector with the explosion of overall MNP exchange and ARPU dilution, but also on the fixed, generating a price war to recover customer base lost on Mobile.

Moreover, convergence has enabled lateral competition from Information Technology (or IT), over-the-top (**OTT**), Media and Devices/Consumer Electronic players. This competition may further increase due to globalization and the

consolidation of the telecommunications industry in Europe, including Italy, and elsewhere.

The emergence of alternative infrastructure operators could also pose a threat to us, particularly in the medium to long term.

Competition in our principal lines of business has led, and could lead, to:

- price and margin erosion for our traditional products and services;
- loss of market share in our core markets;
- loss of existing or prospective customers; and
- greater difficulty in retaining existing customers.

Table of Contents

In addition, competition with respect to innovative products and services in our Italian domestic fixed-line, mobile telephony and broadband/ultrabroadband businesses, has led, and could lead to:

- obsolescence of existing technologies and more rapid deployment of new technologies;

- an increase in costs and payback period related to investments in new technologies that are necessary to retain customers and market share; and

- difficulties in reducing debt and funding strategic and technological investments if we cannot generate sufficient profits and cash flows.

Although we continue to take steps to realize additional efficiencies and to rebalance our revenue mix through the continuous introduction of innovative and value-added services, if any or all of the events described above occur, the impact of such factors could have a material adverse effect on our results of operations and financial condition.

Continuing rapid changes in technologies could increase competition, reduce usage of traditional services and require us to make substantial additional investments.

We, like other operators, face increasing competition from non-traditional data services on new voice and messaging over-the-internet technologies, in particular OTT applications such as Skype, FaceTime, Messenger and WhatsApp. These applications are often free of charge, other than charges for data usage and are accessible via smartphones, tablets and computers. These applications provide users with potentially unlimited access to messaging and voice services over the internet, bypassing more expensive traditional voice and messaging services, such as SMS, which have historically been a source of significant revenues for fixed and mobile network operators like TIM. In Italy and Brazil, an increasing number of customers are using OTT applications services instead of traditional voice and SMS communications.

Historically, we have generated a substantial portion of our revenues from voice and SMS services, particularly in our mobile business in Italy, and the substitution of data services for these traditional voice and SMS volumes has had and could continue to have a negative impact on our revenues and profitability.

If non-traditional voice and messaging data services continue to increase in popularity, as they are expected to, and we are unable to address such competition, our average revenue per user (**ARPU**) could decline and we would face lower margins across many of our products and services, resulting in a material adverse effect on our business, results of operations, financial condition and prospects.

We may be adversely affected if we fail to successfully implement our Internet and broadband/fiber/4.5G/5G NGNM strategy.

The continuing development of Internet and broadband/fiber services constitutes a strategic objective for us. We aim to increase the use of our networks in Italy and abroad to offset the continuing decline of traditional voice services. Our ability to successfully implement this strategy may be negatively affected if:

- broadband/fiber mobile coverage does not grow as we expect;

- competition grows to include players from adjacent markets or technological developments introducing new platforms for Internet access and/or Internet distribution;

- we are unable to provide superior broadband/fiber connections and broadband/mobile services relative to our competitors;

- we experience network interruptions or related capacity problems with network infrastructure; and

- we are unable to obtain adequate returns from the investments related to our network development.

However, implementation of 4.5G/5G ultrabroadband mobile technologies is dependent on a number of factors including the following:

- availability and selection of cutting edge technology from our network/platforms and device vendors.

Table of Contents

If we fail to achieve our objectives for the implementation of ultrabroadband mobile coverage in a timely manner, or at all, we may lose market share to our competitors in this strategically important segment.

Any of the above factors may adversely affect the successful implementation of our strategy, our business and results of operations.

Our business may be adversely affected if we fail to successfully implement our Information and Communications Technology (ICT) strategy.

We intend to continue focusing on Information Technology-Telecommunication (**IT-TLC**) convergence by addressing the ICT market, offering network and infrastructure management, as well as application management. In particular, as the market for cloud services continues to grow, the ICT market is expected to become a key element of our strategy.

We expect increasing competition in this market as additional competitors (mainly from telecommunications operators, through the acquisition of and partnerships with IT operators) also enter this market. If we fail to grow our market share or compete effectively, our revenues could be negatively affected.

Our business may be adversely affected if we fail to successfully implement our next-generation networks strategy.

One of our goals is to accelerate the roll-out of a new telecommunications network capable of providing customers with ultrabroadband connections, generally referred to as a next-generation network (**NGN**).

However, implementation of ultrabroadband technologies is dependent on a number of factors including:

- delays in receiving the necessary permissions and authorizations for installation of NGN lines;

- resistance by road administrators to the use of innovative techniques for excavation and the laying fiber optic cables;

- delay in the operation of SINFI (Sistema Informativo Nazionale Federato delle Infrastrutture).

In areas not provided for under our development plan or where implementation of the ultrabroadband plan is conditioned upon the grant of public funds, in addition to those listed above, the following factors should be considered:

- allocation of public funds at the local level;

- fulfillment of technical and economic conditions related to the EuroSUD (a European funding telematic counter) tenders awarded to us; and

- the awarding of tenders for the grant of public funds, which unduly penalize TIM by setting wholesale prices considerably lower than the regulated prices applicable to TIM s similar services which are set in its Reference Offer as approved by AGCom.

If we fail to achieve our objectives for the implementation of ultrabroadband coverage in a timely manner, or at all, we may lose market share to our competitors in this strategically important segment, which may adversely impact our business, financial condition and results of operations.

We are subject to risks associated with political developments in countries where we operate

Changes in political conditions in Italy and in other countries where we have made significant investments (particularly in countries where the political situation is less predictable than in Western Europe) may have an adverse effect upon our business, financial condition, results of operations and cash flows.

The Italian government has exercised, and may in the future exercise, its significant powers with respect to us, including with respect to our ability to enter into strategic transactions

In 2012, regulations relating to the special powers regarding strategic assets in the energy, transport and communications sectors were published and became effective (Law Decree n. 21 of March 15, 2012, adopted with modifications by Law n. 56 of May 11, 2012: the Golden Power Decree).

Table of Contents

Article 1 of the Golden Power Decree (which refers to assets strategic for the defense and national security sector) grants the Italian Government:

- the power to impose conditions and possibly to oppose the purchase of shareholdings by parties other than the Italian State, Italian public entities and other parties controlled by the same, so long as the stake is sufficient to compromise the interests of national defence and security. Until expiry of the period of time within which conditions may be imposed, or the power to oppose the acquisition exercised, any rights other than ownership rights connected to the relevant shares are suspended. Such rights are suspended in case of non-compliance with or breach of any condition imposed on the purchaser, for as long as the non-compliance or breach persists. Any shareholders resolution adopted with the relevant shares providing the decisive votes, as well as any resolution or act adopted that breaches or does not comply with any condition imposed, is null and void;

- veto power (including through the imposition of obligations or conditions) regarding any resolution (by either the shareholders meeting or the administrative bodies of the company) on any merger, demerger, transfer of business unit, relocation of registered office to outside Italy, change of the corporate purpose or winding up of the company. Any resolution or act adopted in breach of these obligations is null and void. The Government may also order the Company and any other party to restore the original condition.

Article 2 of the Golden Power Decree (which refers to strategic assets in the communications sector) grants the Italian Government:

- the power to impose conditions and possibly oppose the purchase, under certain conditions, by non-EU entities, of controlling stakes in companies that hold the aforementioned types of assets. Until the end of a 15-day period from the notice of such purchase, during which the Government may impose conditions or oppose the proposed purchase, voting rights (and any rights other than the property rights) connected to shares resulting in the change of control, are suspended. Such rights are suspended in the case of any non-compliance with or breach of the conditions imposed on the purchaser for as long as the non-compliance or breach persists. Any shareholders resolution adopted with the relevant shares providing the decisive votes, as well as any resolution or act adopted that breaches or does not comply with any condition imposed, is null and void;

- veto power (including through the imposition of obligations or conditions) regarding any resolution, act or transaction that has the effect of modifying the ownership, control or availability of such strategic assets or changing their location, including resolutions on any merger, demerger, transfer of registered office to outside Italy, transfer of the company or a business unit which contains the strategic assets, or their assignment by way of guarantee. Any resolution or act in breach of such obligations is null and void. The Government may also order the company and any other party to restore the original condition at its own expense.

In October and November 2017, the Government designated certain of the Company s assets as strategic within the meaning of the above-described provisions of the Golden Power Decree and imposed various governance and organizational obligations and restrictions on the Company. This and any future exercise of the Government s powers under the Golden Power Decree, or the mere existence of such powers, could:

- adversely affect the Company s ability to conduct its business (including, for example, by limiting the Company s ability to dispose of assets designated as strategic); and

- make a change of control transaction with respect to TIM (whether by merger or otherwise) more difficult to achieve, if at all, or discourage bidders from making an offer relating to a change of control that could otherwise be beneficial to shareholders.

OPERATIONAL RISKS

We face numerous risks with respect to the efficiency and effectiveness of resource allocation. Operational risks related to our business, include those resulting from inadequate internal and external processes, fraud, employee errors, failure to document transactions properly, loss or disclosure of critical or commercial sensitive data or personal identification information and systems failures. These events could result in direct or indirect losses and adverse legal and regulatory proceedings, and could harm our reputation and operational effectiveness.

Table of Contents

We have in place risk management procedures designed to detect, manage and monitor at a senior level the evolution of these operational risks. However, there is no guarantee that these measures will be successful in effectively controlling the operational risks that we face and such failures could have a material adverse effect on our results of operations and could harm our reputation.

System and network failures could result in reduced user traffic and reduced revenue and could harm our reputation. In addition, our operations and reputation could be materially negatively affected by cyber-security threats or our failure to comply with new data protection legislation UE 2016/679 General Data Protection Regulation (GDPR), of which implementation was mandatory by May 25, 2018.

We have executed a deep gap analysis, identified the main issues, and consequently planned and deployed a master plan to reach a full compliance with new General Data Protection Regulation 2016/679/EU (GDPR) requirements, facilitated by the strength of present data protection operative model adopted by the Company. However, deficiencies in full adoption of data security measures, implementing personal data processing and retention requirements and reporting data measures within a narrow mandatory timeframe could lead to disputes with data protection authorities, fines or harm to our reputation.

Our success largely depends on the continued and uninterrupted performance of our IT, network systems and of certain hardware and datacenters that we manage for our clients. Our technical infrastructure (including our network infrastructure for fixed-line and mobile telecommunications services) is vulnerable to damage or interruption from technology failures, power loss, floods, windstorms, fires, terrorism, intentional wrongdoing, human error and similar events. Unanticipated problems at our facilities, system failures, hardware and software failures, computer viruses and hacker attacks, as well as terrorist attacks against our infrastructure, which remains a target, could affect the quality of our services and cause service interruptions. Any of these occurrences could result in reduced user traffic and reduced revenue and could negatively affect our levels of customer satisfaction, reduce our customer base and harm our reputation. In addition, our operations involve daily processing and storage of large amounts of customer data and require uninterrupted, accurate, permanently available, real-time and safe transmission and storage of customer and other data in compliance with applicable laws and regulations. The proper functioning of, including prevention of unauthorized access to, our networks, systems, computers, applications and data, such as customer accounting, network control, data hosting, cloud computing and other information technology systems is critical to our operations. We may be held liable for the loss, release, disclosure or inappropriate modification of the customer data stored on our equipment or carried by our networks. IT system failure, interruption of service availability, industrial espionage, cyber-attack or data leakage, in particular relating to customer data, could seriously limit our ability to service our clients, result in significant compensation costs for which indemnification or insurance coverage may be only partially available, result in a breach of laws and regulations under which we operate or lead to fines and could cause long-term damage to our business and reputation.

Our business depends on the upgrading of our existing networks.

We must continue to maintain, improve and upgrade our existing networks in a timely and satisfactory manner in order to retain and expand our customer base in each of our markets. A reliable and high quality network is necessary to manage turnover by sustaining our customer base, to maintain strong customer brands and reputation and to satisfy regulatory requirements, including minimum service requirements. The maintenance and improvement of our existing networks depends on our ability to:

- upgrade the functionality of our networks to offer increasingly customized services to our customers;

- increase coverage in some of our markets;

- expand and maintain customer service, network management and administrative systems;

- expand the capacity of our existing fixed copper and mobile networks to cope with increased bandwidth usage; and

- upgrade older systems and networks to adapt them to new technologies.

In addition, due to rapid changes in the telecommunications industry, our network investments may prove to be inadequate or may be superseded by new technological changes. Our network investments may also be limited by

Table of Contents

market uptake and customer acceptance. If we fail to make adequate capital expenditures or investments, or to properly and efficiently allocate such expenditures or investments, the performance of our networks, both in real terms and relative to our competitors, could suffer, resulting in lower customer satisfaction, diminution of brand strength and increased turnover.

Many of these tasks are not entirely under our control and may be affected by applicable regulation. If we fail to maintain, improve or upgrade our networks, our services and products may be less attractive to new customers and we may lose existing customers to competitors, which could have a material adverse effect on our business, financial condition and results of operations.

We are continuously involved in disputes and litigation with regulators, competition authorities, competitors and other parties and are the subject of a number of investigations by judicial authorities. The ultimate outcome of such proceedings is generally uncertain. If any of these matters are resolved against us, they could, individually or in the aggregate, have a material adverse effect on our results of operations, financial condition and cash flows in any particular period.

We are subject to numerous risks relating to legal, tax, competition and regulatory proceedings in which we are currently a party or which could develop in the future. We are also the subject of a number of investigations by judicial authorities. Such proceedings and investigations are inherently unpredictable. Legal, tax, competition and regulatory proceedings and investigations in which we are, or may become, involved (or settlements thereof) may, individually or in the aggregate, have a material adverse effect on our results of operations and/or financial condition and cash flows in any particular period. Furthermore, our involvement in such proceedings and investigations may adversely affect our reputation.

If we, or another Group company, face an adverse decision in any of the legal proceedings to which we are a party, and are ordered to pay amounts greater than what we have recognized to cover potential liabilities, we may face adverse effects with respect to our and/or our Group s operations, financial position, income statement and cash flows.

The final outcomes of those proceedings are generally uncertain. As of December 31, 2018, we had, on a consolidated basis, recognized potential liabilities of 508 million euros. In recognizing these liabilities, we took into consideration the risks connected with each dispute and the relevant accounting standards, which require reserves to be recognized where liabilities are probable and can be estimated reliably. The provisions represent an estimate of the financial risk connected with the particular proceedings, in line with the relevant accounting standards. Nonetheless, we may be obligated to meet liabilities linked to unsuccessful outcomes for proceedings that were not taken into consideration when calculating those reserves and the provisions made may not be sufficient to fully meet such obligations through use of our reserves. Such a development could have adverse effects on our business, financial position, results of operations and cash flows.

Risks associated with the use of internet by our customers could cause us to suffer losses and adversely affect our reputation.

Pursuant to applicable Italian regulation, we, as a host and provider of data transmission services, are required to inform competent authorities without delay of any alleged illegal or illicit activity by our customers of which we are aware. We must also provide the authorities with any information we have identifying such customers. Any failure to comply with this obligation could cause us to become involved in civil proceedings or could harm public perception

of our brand and services. Any such event could result in legal and/or regulatory proceedings, make us subject to direct or indirect monetary losses and could materially harm our reputation.

We are exposed to the risk of labor disputes, in particular as a result of our plan to restructure our labor costs.

We have undertaken a restructuring of various aspects of our workforce in an effort to improve standards of service and expertise and achieve greater efficiency and reduce personnel costs.

To that end, we have subscribed a new union agreement on June 11, 2018 at Labor Minister, where parties defined the path and a set of measures to manage the staff and support the 2018-2020 Strategic Plan.

Table of Contents

The Agreement of June 11, 2018 concluded the complex process and the CIGS procedure, during the joint examination sessions pursuant to article 24 of Italian Legislative Decree no. 148/2015, with the signing of an agreement with the Ministry of Labor and Social Policy, which set out a series of measures and interventions geared at supporting the pursuit of the business objectives and management of the 4,500 declared redundancies in connection with the 2018-2020 Industrial Plan, which was approved by the Board of Directors on March 6, 2018, with non-traumatic, socially sustainable instruments.

Negotiations related to the Company Collective Bargaining Agreement are ongoing. See Item 6 Directors, Senior Management and Employees 6.5.2 Industrial Relation for further details.

Relations between us and our workers/trade unions are not generally adversarial and strikes or protests involving a majority of workers are not common, however, such occurrences carry a moderate risk of disruptions in work and/or reduced service. Generally, such occurrences would be expected negatively impact our customers, our business and our reputation.

FINANCIAL RISKS

Our leverage is such that deterioration in cash flow can change the expectations of our ability to repay our debt and the inability to reduce our debt could have a material adverse effect on our business. Continuing volatility in international credit markets may limit our ability to refinance our financial debt.

As of December 31, 2018, our consolidated gross financial debt was 30,972 million euros, compared to 32,864 million euros on December 31, 2017. Our consolidated net financial debt was 25,995 million euros as of December 31, 2018, compared to 26,091 million euros on December 31, 2017. Our high leverage continues to be a factor in our strategic decisions as it has been for a number of years and the reduction of our leverage remains a key strategic objective. As a result, however, we are reliant on cost-cutting and free cash flow to finance critical technology improvements and upgrades to our network, although we are taking steps to raise additional capital to support critical investment.

Due to the competitive environment and the continuing weak economic conditions, there could be deterioration in our income statement and financial measures used by rating agencies, such as Moody s, Standard & Poor s and Fitch, to assess our ability to repay our debt and determine our credit quality.

Although rating downgrades do not generally have an immediate impact on outstanding debt, other than outstanding debt instruments for which the interest expense is specifically impacted by such ratings, downgrades could adversely impact our ability to refinance existing debt and could increase costs related to refinancing existing debt and managing our derivatives portfolio.

Factors that are beyond our control such as deterioration in the telecommunications sector, unfavorable fluctuations in interest rates and/or exchange rates, further disruptions in the capital markets, particularly debt capital markets and continuing weakness in general economic conditions at the national level could have a significant effect on our ability to reduce our debt and refinance existing debt through further access to the financial markets. Because debt reduction is one of our strategic objectives, failure to reduce debt could be viewed negatively and could adversely affect our credit ratings.

The management and development of our business will require us to make significant further capital and other investments. If we are unable to finance our capital investments as described above, we may need to incur additional debt in order to finance such investment. Our future results of operations may be influenced by our ability to enter into such transactions, which, in turn, will be determined by market conditions and factors that are outside our control. In addition, if such transactions increase our leverage, it could adversely affect our credit ratings.

Fluctuations in currency exchange and interest rates and the performance of the equity markets in general may adversely affect our results.

In the past, we have made substantial international investments, significantly expanding our operations outside of the Euro zone, particularly in Latin America.

Table of Contents

Our non-current operating assets are located as follows:

- Italy: as of December 31, 2018 and December 31, 2017, respectively, 47,795 million euros (88.4 percent of total non-current operating assets) and 48,591 million euros (87.4 percent of total non-current operating assets); and

- Outside of Italy: as of December 31, 2018 and December 31, 2017, respectively, 6,300 million euros (11.6 percent of total non-current operating assets) and 7,032 million euros (12.6 percent of total non-current operating assets). Non-current operating assets outside of Italy are primarily denominated in Brazilian Reais.

We generally hedge our foreign exchange exposure but do not cover conversion risk relating to our foreign subsidiaries. According to our policies, the hedging of the foreign exchange exposure related to the financial liabilities is mandatory. Movements in the euro exchange relative to other currencies (particularly the Brazilian Real) may adversely affect our consolidated results. A rise in the value of the euro relative to other currencies in certain countries in which we operate or have made investments will reduce the relative value of the revenues or assets of our operations from those countries and, therefore, may adversely affect our operating results or financial position.

In addition, we have raised, and may raise an increasing proportion, financing in currencies other than the euro, principally U.S. dollars and British pound sterling. In accordance with our risk management policies, we generally hedge the foreign currency risk exposure related to non-euro denominated liabilities, through cross-currency and interest rate swaps.

Furthermore, we are exposed to interest rates risk on that portion of our consolidated gross debt which is subject to the accrual of interest at floating rates; that represents 29 percent both as of December 2018 and 2017.

The decision to keep such a fixed floating rate debt structure goes towards the goal to minimize negative interests impact and is partially implemented through derivatives instruments whereby fixed rate liabilities are synthetically converted in floating rate ones. As of December 31, 2018, and December 31, 2017, we had derivative contracts in place for the sole management of our interest rate risk, including interest rate swaps, for notional amounts of 4,334 million euros. Any changes in interest rates that have not been adequately hedged by derivative contracts may result in increased financial liabilities in connection with our floating rate debt, which may have adverse effects on the results of our operations and cash flows.

An increase of sovereign spreads, and of the default risk they reflect, in the countries where we operate, may affect the value of our assets in such countries.

We may also be exposed to financial risks such as those related to the performance of the equity markets in general, and, more specifically, risks related to the performance of the share price of Group companies.

The potential impact of the UK s departure from the EU (**Brexit**) will depend on negotiations on the separation agreement with the EU, the outcome of which remains uncertain, after the House of Commons rejected the separation plan backed by the UK Prime Minister in March 2019.

Brexit and possible outcomes of the exit negotiations could cause further instability in the global and European financial markets already made delicate by the trade dispute between USA and China.

The potential effects of Brexit could negatively affect our financial condition, our business, and the related economic results and cash flows.

COMPLIANCE RISKS

Because we operate in a heavily regulated industry, regulatory decisions and changes in the regulatory environment could adversely affect our business.

Our fixed and mobile telecommunications operations, in Italy and abroad, are subject to regulatory requirements. As a member of the EU, Italy has adapted its regulatory legislation and rules for electronic communications services to the framework established by the EU Parliament and Council.

Table of Contents

Item 3. Key Information **Risk Factors**

Pursuant to the EU regulatory framework, the Italian regulator, Autorità per le Garanzie nelle Comunicazioni (**AGCom**), is required to identify operators with Significant Market Power (**SMP**) in the relevant markets subject to regulation. On the basis of market analyses proceedings (Market Analyses), AGCom imposes requirements necessary to address identified competition problems. Current requirements are mainly focused on the regulation of our wholesale business, while the regulation of retail markets has been largely withdrawn, with the exception of price tests on retail access offers (for telephone, broadband and ultrabroadband services).

Within this regulatory framework, the main risks we face include the lack of predictability concerning both the timing of the regulatory proceedings and their final outcome and possible AGCom decisions that apply retroactively and their potential impact on expected Group results and on the guidance presented to the market (e.g., review of prices from prior years following the decisions of Administrative Courts, repricing decisions, proceedings that impact technological decisions and return on investment).

In principle, a new round of Market Analyses should be conducted by AGCom every three years, in order to deal with the evolution of market conditions and technology developments and set the rules for the subsequent three-year period. However, the regulatory review process does not always follow the expected schedule.

Regulation is a key factor in evaluating the likelihood of return on investments and therefore in deciding where to invest. Regulatory uncertainty and regulatory changes imposed on us can impact our revenues and can make it more difficult to make important investment decisions.

Moreover, a high level of disputes arising from operators challenging AGCom decisions before Administrative Courts result in an even greater degree of uncertainty with respect to rules and economic requirements.

The Italian Antitrust Authority, *Autorità Garante per la Concorrenza ed il Mercato* (**AGCM**), may also intervene in our business, setting fines and/or imposing changes in our service provision operating processes and in our offers.

Our Brazilian Business Unit also is subject to extensive regulation. Our international operations, therefore, face similar regulatory issues as we face in Italy, including the possibility for regulators to impose obligations and conditions on how we operate our businesses in Brazil as well as taking decisions that can have an adverse effect on our results, including setting, and in particular, reducing the mobile termination rates we can charge. As a result, the decisions of regulators or the implementation of new regulations in Brazil and the costs of our compliance with any such decisions or new regulations, may limit our flexibility in responding to market conditions, competition and changes in our cost base which could individually or in the aggregate, have a material adverse effect on our business and results of operations.

Due to the continuous evolution of the regulatory regime affecting various parts of our business in Italy and in our international operations, we are unable to clearly predict the impact of any proposed or potential changes in the regulatory environment in which we operate in Italy, Brazil and our other international markets. Regulations in the telecommunications industry are constantly changing to adapt to new competition and technology. Changes in laws, regulation or government policy could adversely affect our business and competitiveness. In particular, our ability to compete effectively in our existing or new markets could be adversely affected if regulators decide to expand the restrictions and obligations to which we are subject or extend them to new services and markets. Finally, decisions by regulators regarding the granting, amendment or renewal of our authorizations, or those of third parties, could adversely affect our future operations in Italy and in other countries where we operate.

For further information regarding the matters discussed above and other aspects of the regulatory environments in which our businesses operate, see Item 4. Information on the TIM Group Item 4.3 Regulation .

We operate under authorizations granted by government authorities.

Many of our activities require authorizations from governmental authorities both in Italy and abroad. These authorizations specify the types of services the operating company holding such authorization may provide. The continued existence and terms of our authorizations are subject to review by regulatory authorities and to interpretation, modification or termination by these authorities. Although authorization renewal is not usually guaranteed, most authorizations do address the renewal process and terms that may be affected by political and regulatory factors.

Table of Contents

Many of these authorizations are revocable for public interest reasons. In addition, our current authorizations to provide networks and services require that we satisfy certain obligations, including minimum specified quality levels, service and coverage conditions. Failure to comply with these obligations could result in the imposition of fines or even in the revocation or forfeiture of the authorization. In addition, the need to meet scheduled deadlines may require us to expend more resources than otherwise budgeted for a particular network build-out.

Additional authorizations may also be required if we expand our services into new product areas, and such authorizations may be related to auctions (e.g., in the assignment of spectrum right of use) or otherwise prove expensive or require significant cash outlays, or have certain terms and conditions, such as requirements related to coverage and pricing, with which we may not have previously had to comply. If we are unable to obtain such authorizations within the expected timeframe, at a commercially acceptable cost, or if the authorizations include onerous conditions, it could have a material adverse effect on our business, financial condition and results of operations.

In Brazil we also operate under an authorizations regime. As a result, we are obliged to maintain minimum quality and service standards. Our failure to comply with the requirements imposed by Regulatory Agency for Telecommunications Agencia Nacional de Telecomunicacoes (**ANATEL**) and by the Brazilian Government may result in the imposition of fines or other government actions, including the suspension of the service commercialization for a given period.

Actual or perceived health risks or other problems relating to mobile handsets or transmission masts could lead to litigation or decreased mobile communications usage.

The effects of, and any damage caused by, exposure to an electromagnetic field were and are the subject of careful evaluations by the international scientific community, but until now there is no scientific evidence of harmful effects on health. We cannot rule out that exposure to electromagnetic fields or other emissions originating from wireless handsets will not be identified as a health risk in the future.

Our mobile communications business may be harmed as a result of these alleged health risks. For example, the perception of these health risks could result in a lower number of customers, reduced usage per customer or potential consumer liability. In addition, although Italian law already imposes strict limits in relation to transmission equipment, these concerns may cause regulators to impose greater restrictions on the construction of radio base station towers or other infrastructure, which may hinder the completion of network build-outs and the commercial availability of new services and may require additional investments.

We face the risk that our organizational policies and procedures embodied in the organizational model prepared pursuant to Legislative Decree 231/2001 may fail to prevent certain officers and employees from engaging in unlawful conduct, for which we would be jointly liable.

We have put in place an organizational model pursuant to Legislative Decree 231/2001, in order to create a system of rules capable of preventing certain forms of unlawful conduct by senior management, executives and employees generally that might result in liabilities for us. The organizational model has been adopted by us and by our Italian subsidiaries. A specific version of the organizational model has been adopted by TIM Participacoes pursuant to the anti-corruption Brazilian law (Lei 12.846/13).

The organizational model is continuously reviewed and must be kept up to date to reflect changes in operations and in the regulatory environment. We have established a 231 steering committee to prepare and consider proposals for changes to the model, for submission to the Board for approval.

Notwithstanding the existence of this model or any updates that we may make to it, there can be no assurances that the model will function as designed, or that it will be considered adequate by any relevant legal authority. If the model is inadequate or deemed to be so, and we were held liable for acts committed by our senior management, executives and employees or are found otherwise non-compliant with the requirements of the legislation, we may be ordered to pay a fine, our authorizations, licenses or concessions may be suspended or revoked, and we may be prohibited from conducting business, contracting with the Italian public administration, or advertising goods and services. Such developments would have adverse effects on our business, results of operations, financial condition and cash flows.

Table of Contents

Item 3. Key Information **Exchange Rates**

3.2 EXCHANGE RATES

We publish our consolidated financial statements in euros. References to , euro and Euro are to the euro, the sing unified currency that was introduced in Italy and 10 other member states of the EU on January 1, 1999. References to U.S. dollars , dollars , U.S.$ or $ are to U.S. dollars, the currency of the United States of America.

For convenience only (except where noted otherwise), certain euro figures have been translated into dollars at the rate (the Euro/Dollar Exchange Rate) of 1.00= U.S.$ 1.1456, using the last noon buying rate in The City of New York for cable transfers in foreign currencies as announced by the Federal Reserve Bank of New York for customs purposes (the **Noon Buying Rate**) on December 31, 2018.

These translations should not be construed as a representation that the euro amounts actually represent such dollar amounts or have been or could be converted into dollars at the rate indicated.

For the purpose of this Annual Report, billion means a thousand million.

The Ordinary Shares (the **Ordinary Shares**) and Savings Shares (the **Savings Shares**) of TIM trade on *Mercato Telematico Azionario* (**Telematico**), managed by Borsa Italiana S.p.A. (**Borsa Italiana**) in euro. Fluctuations in the exchange rate between the euro and the U.S. dollar will affect the U.S. dollar equivalent of the euro price of the Ordinary Shares and the Savings Shares and the price of the Ordinary Share American Depositary Shares (**Ordinary Share ADSs**) and the Savings Share American Depositary Shares (**Savings Share ADSs**), on the New York Stock Exchange (**NYSE**). Cash dividends are paid in euro. Exchange rate fluctuations will affect the U.S. dollar amounts received by owners of Ordinary Share ADSs and Savings Share ADSs upon conversion by the Depositary of cash dividends paid in euro on the underlying Ordinary Shares and Savings Shares. See Item 10. Additional Information 10.5 Description of American Depositary Receipts .

Table of Contents

3.3 SELECTED FINANCIAL AND STATISTICAL INFORMATION

The selected financial data set forth below are consolidated financial data of the TIM Group as of and for each of the years ended December 31, 2018, 2017, 2016, 2015 and 2014, which have been extracted or derived, with the exception of amounts presented in U.S. dollars, financial ratios and statistical data, from the Consolidated Financial Statements of the TIM Group prepared in accordance with IFRS as issued by IASB and which have been audited by the independent auditor PricewaterhouseCoopers S.p.A.

In 2018, the Group applied the accounting policies on a basis consistent with those of the previous years, except for the new standards and interpretations adopted by the Group since January 1, 2018, the impact of which is illustrated under *Adoption of the new IFRS 9 and IFRS 15 standards* described in the Note Accounting Polices of the Notes to the Consolidated Financial Statements included elsewhere herein.

The selected financial data below should be read in conjunction with the Consolidated Financial Statements and notes thereto included elsewhere in this Annual Report.

Table of Contents

Item 3. Key Information **Selected Financial And Statistical Information**

	Year ended December 31,					
	2018 (millions of U.S. dollars, except percentages, ratios, employees and per share amounts)(1)	2018(*)	2017(*)	2016(*)(**)	2015(*)(**)	2014(*)(**)
	(millions of euros, except percentages, ratios, employees and per share amounts)					
Separate Consolidated Income Statement Data:						
Revenues	**21,698**	**18,940**	**19,828**	**19,025**	**19,719**	**21,574**
Operating profit (loss)	**643**	**561**	**3,291**	**3,722**	**2,963**	**4,529**
Profit (loss) before tax from continuing operations	**(890)**	**(777)**	**1,777**	**2,799**	**453**	**2,350**
Profit (loss) from continuing operations	**(1,320)**	**(1,152)**	**1,287**	**1,919**	**50**	**1,420**
Profit (loss) from Discontinued operations/Non-current assets held for sale				47	611	541
Profit (loss) for the year	**(1,320)**	**(1,152)**	**1,287**	**1,966**	**661**	**1,961**
Profit (loss) for the year attributable to Owners of the Parent (2)	*(1,616)*	*(1,411)*	*1,121*	*1,808*	*(70)*	*1,351*
Capital Expenditures	**7,341**	**6,408**	**5,701**	**4,876**	**5,197**	**4,984**
Financial Ratios:						
Operating profit (loss)/Revenues (ROS)(%)	3.0%	3.0%	16.6%	19.6%	15.0%	21.0%
Employees, average salaried workforce in the Group, including personnel with temporary work contracts:						
Employees (excluding employees relating to the consolidated companies considered as Discontinued operations/Non-current	54,423	54,423	54,946	57,855	61,553	59,285

assets held for sale) (average number)						
Employees relating to the consolidated companies considered as Discontinued operations/Non-current assets held for sale (average number)				2,581	15,465	15,652
Basic and Diluted earnings per Share (EPS)(3):						
Ordinary Share	**(0.08)**	**(0.07)**	**0.05**	**0.08**	**0.06**	**(0.03)**
Savings Share	**(0.08)**	**(0.07)**	**0.06**	**0.09**	**0.07**	**(0.03)**
Dividends:						
per Ordinary Share (4)						
per Saving Share (4)	0.032	0.0275	0.0275	0.0275	0.0275	0.0275

Table of Contents

Item 3. Key Information — **Selected Financial And Statistical Information**

	2018 (millions of U.S. dollars, except employees)(1)	As of December 31, 2018(*)	2017(*)	2016(*)	2015(*)	2014(*)
		(millions of euros, except employees)				
Consolidated Statement of Financial Position Data:						
Total Assets	**75,173**	**65,619**	**68,783**	**70,446**	**71,268**	**71,596**
Equity:						
Equity attributable to owners of the Parent	22,371	19,528	21,557	21,207	17,554	18,068
Non-controlling interests	2,542	2,219	2,226	2,346	3,695	3,516
Total Equity	**24,913**	**21,747**	**23,783**	**23,553**	**21,249**	**21,584**
Total Liabilities	**50,260**	**43,872**	**45,000**	**46,893**	**50,019**	**50,012**
Total Equity and liabilities	**75,173**	**65,619**	**68,783**	**70,446**	**71,268**	**71,596**
Share capital (5)	**13,274**	**11,587**	**11,587**	**11,587**	**10,650**	**10,634**
Net financial debt (6)	**29,780**	**25,995**	**26,091**	**25,955**	**28,475**	**28,021**
Employees, number in the Group at year-end, including personnel with temporary work contracts:						
Employees (excluding employees relating to the consolidated companies considered as Discontinued operations/Non-current assets held for sale) (number at year-end)	57,901	57,901	59,429	61,229	65,867	66,025
Employees relating to the consolidated companies considered as Discontinued operations/Non-current assets held for sale (number at year-end)					16,228	16,420

	As of December 31, 2018	2017	2016	2015	2014
			(thousands)		
Statistical Data:					
Domestic (Italy) Business Unit					
Physical accesses (7)	18,212	18,995	18,963	19,209	19,704
Of which physical accesses (retail)	*10,149*	*11,044*	*11,285*	*11,742*	*12,480*

Broadband accesses	11,184	10,154	9,206	8,890	8,750
Of which retail broadband accesses	*7,575*	*7,641*	*7,191*	*7,023*	*6,921*
Mobile lines	31,818	30,755	29,617	30,007	30,350
Brazil Business Unit					
Mobile lines	55,923	58,634	63,418	66,234	75,721

(*) Starting from January 1, 2018, the TIM Group adopted IFRS 9 (*Financial Instruments*) retroactively, using the specific exemptions provided for by the same standard and without the restatement of the previous periods compared, as well as IFRS 15 (*Revenues from contracts with customers*) using the simplified retrospective method. Consequently, the economic and financial data for previous years have not been restated. Furthermore, as permitted by IFRS 9, TIM Group has chosen to continue to apply the hedge accounting requirements of IAS 39, instead of the requirements of IFRS 9. For further details, reference should be made to the Note Accounting principles of the Notes to the Consolidated Financial Statements included elsewhere herein.

(**) On November 13, 2013, TIM accepted the offer of Fintech Group to acquire the entire controlling interest of TIM Group in the Sofora Telecom Argentina group. The agreements made in connection with this transaction were subsequently modified in October 2014. As a result, and in accordance with IFRS 5 (Non-current Assets Held for Sale and Discontinued Operations), starting with the fourth quarter of 2013, the Sofora Telecom Argentina group has been treated as Discontinued operations/Non-current assets held for sale. On March 8, 2016, the TIM Group completed the sale of Sofora Telecom Argentina group.

Table of Contents

Item 3. Key Information **Selected Financial And Statistical Information**

(1) For the convenience of the reader, Euro amounts for 2018 have been converted into U.S. dollars using the Euro/Dollar Exchange Rate in effect on December 31, 2018 of 1.00 = 1.1456 U.S.$.

(2) For the purposes of IFRS, Parent , as used in this Annual Report, means TIM S.p.A.

(3) In accordance with IAS 33 (Earnings per share), basic earnings per Ordinary Share is calculated by dividing the Group s profit (loss) available to shareholders by the weighted average number of shares outstanding during the year, excluding treasury shares. Since TIM has both Ordinary and Savings Shares outstanding, the calculations also take into account the requirement that holders of Savings Shares are entitled to an additional dividend equal to 2% of 0.55 euros per share above dividends paid on the Ordinary Shares.

For the purpose of these calculations, the weighted average number of:

Ordinary Shares was:

- 15,039,368,195 for the year ended December 31, 2018 and 2017;
- 15,039,128,128 for the year ended December 31, 2016;
- 14,889,773,009 for the year ended December 31, 2015; and
- 14,851,386,060 for the year ended December 31, 2014.

Savings Shares was:

- 6,027,791,699 for the years ended December 31, 2018, 2017 and 2016;
- 6,026,677,674 for the year ended December 31, 2015; and
- 6,026,120,661 for the year ended December 31, 2014.

For diluted earnings per share the weighted average number of shares outstanding is adjusted assuming conversion of all dilutive potential shares. Potential shares are those securities that, if converted into shares, would increase

the total number of shares outstanding and reduce the earnings attributable to each share. Potential shares include options, warrants and convertible securities. The Group s profit (loss) is also adjusted to reflect the impact of the conversion of potential shares net of the related tax effects.

Dilutedearnings per share was:

- 0.06 for Ordinary Share and Savings Share in 2018; and
- nil in 2014, 2015, 2016 and in 2017.

(4) TIM s dividend coupons for its Savings Shares for the year ended December 31, 2018, will be clipped on June 24, 2019 and will be payable from June 26, 2019.

(5) Share capital represents share capital issued net of the accounting par value of treasury shares; accounting par value is the ratio of total share capital and the number of issued shares.

(6) Net Financial Debt is a Non-GAAP Financial Measure as defined in Item 10(e) of Regulation S-K under the 1934 Act. For further details please see Item 5. Operating and Financial Review and Prospects 5.2 Results of Operations for the Three Years Ended December 31, 2017 5.2.3 Non-GAAP Financial Measures .

(7) Excludes full-infrastructured OLOs and FWA-Fixed Wireless Access.

Table of Contents

3.4 DIVIDENDS

The determination of our future dividend policy, and the amounts thereof, will depend upon a number of factors, including but not limited to our earnings, financial condition and cash requirements, prospects and such other factors as may be deemed relevant at the time.

The following table sets forth the dividends per Ordinary Share and per Savings Share declared by TIM with respect to each of the last five fiscal years and the aggregate dividends paid in such years. Actual dividends paid are rounded to the nearest whole cent.

No ordinary share dividend is being paid for the year ended December 31, 2018.

	Dividends on Ordinary Shares			Dividends on Savings Shares		
Year ended December 31,	Euros per Share	U.S. Dollars per Share(1)	(millions of euros)	Euros per Share	U.S. Dollars per Share(1)	(millions of euros)
2014				0.0275	0.0307	165.72
2015				0.0275	0.0310	165.76
2016				0.0275	0.0307	165.76
2017				0.0275	0.0338	165.76
2018(2)				0.0275	0.0308	165.76

(1) Euro amounts have been translated into U.S. dollars using the Noon Buying Rate in effect on the respective payment dates. For the year ended December 31, 2018, Euro amounts have been translated into U.S. dollars using the Noon Buying Rate in effect on April 5, 2019.

(2) TIM s dividend coupons for its Savings Shares for the year ended December 31, 2018, will be clipped on June 24, 2019 and will be payable from June 26, 2019.

Payment of annual dividends is subject to approval by the holders of Ordinary Shares at the annual general shareholders meeting, which must be held within 180 days after the end of the financial year to which it relates (pursuant to article 18, second paragraph, of the Company s Bylaws). In addition, Article 21 of the Company s Bylaws gives the Board of Directors the power to approve the distribution of interim dividends . Pursuant to Italian law, the distribution may be approved after the final approval of the preceding year s financial statements, and the interim dividends may not exceed the lower of (i) the difference between profits from the preceding fiscal year and amounts required to be attributed to legal and statutory reserves and (ii) available reserves. Once paid in compliance with applicable laws, shareholders cannot be required to repay interim dividends to the Company if the shareholders collected such dividends in good faith. Dividends not collected within five years from the date they become payable will be forfeited in favor of the Company. If profits are not fully distributed, additional reserves are created.

According to the Italian Civil Code, before dividends may be paid with respect to any year, an amount equal to 5% of the profit of the Company for such year must be set aside to the legal reserve until the legal reserve, including amounts set aside during prior years, is at least equal to one-fifth of the par value of the Company s issued share capital. This legal reserve is not available for payment of dividends. Such restriction on the payment of dividends applies, on a non-consolidated basis, to each Italian subsidiary of the TIM Group. The Company may also pay dividends out of available retained earnings from prior years or other reserves.

Dividends in respect of Ordinary Shares and Savings Shares held with Monte Titoli S.p.A. (**Monte Titoli**) are automatically credited to the accounts of the beneficial owners with the relevant participant of Monte Titoli, without the need for presentation by such beneficial owners of any documentation. See Item 10. Additional Information 10.4 Description of Capital Stock .

Arrangements between Euroclear or Clearstream and Monte Titoli permit the shareholders to collect the dividends through Euroclear or Clearstream. Holders of American Depositary Receipts (**ADRs**) are entitled to receive payments in respect of dividends on the underlying Ordinary Shares and Savings Shares, as the case may be, in accordance with the relevant Deposit Agreement.

Dividends payable on the Company s Ordinary Shares and Savings Shares may be subject to deduction of Italian withholding tax. See Item 10. Additional Information 10.6 Taxation . Italian regulations do not contain any specific restrictions on the payment of dividends to non-residents of Italy. See Item 10. Additional Information 10.2 Exchange Controls and Other Limitations Affecting Security Holders .

Table of Contents

Item 3. Key Information **Dividends**

Pursuant to Italian law, in connection with the payment of dividends, participants of Monte Titoli are required to supply to the Italian tax authorities certain information concerning the identity of non-resident shareholders holding Ordinary Shares or Savings Shares. Shareholders are required to provide their Italian tax identification number, if any, or alternatively, in the case of legal entities, their name, country of establishment and address, or in the case of individuals, their name, address and place and date of birth, or in the case of partnerships, the information required for legal entities and the information required for individuals with respect to one of their representatives. In the case of Ordinary Share ADSs and Savings Share ADSs owned by non-residents in Italy, TIM understands that the provision of information concerning the Depositary, in its capacity as holder of record of the Ordinary Shares and Savings Shares, as the case may be, will satisfy these requirements.

The Depositary, in accordance with instructions from TIM, will provide information to beneficial owners of Ordinary Share ADSs and Savings Share ADSs, that are considered U.S. residents for purposes of applicable law. To the extent such owners wish to benefit from reduced withholding tax rates on dividends under an income tax treaty, claims for such benefits must be accompanied by the required information. See Item 10. Additional Information 10.6 Taxation .

Table of Contents

Item 4. INFORMATION ON THE TIM GROUP

4.1 BUSINESS

4.1.1 BACKGROUND

The legal name of the company is Telecom Italia S.p.A. also named TIM S.p.A. .

The Annual Shareholders Meeting held on May 25, 2016 approved an amendment to the Company s bylaws, permitting the company to be named Telecom Italia S.p.A. or TIM S.p.A. .

TIM is a joint-stock company established under Italian law on October 29, 1908, with registered offices in Milan at Via Gaetano Negri 1. The telephone number is +39 (02) 85951. The company is recorded in the Milan Companies Register at number 00488410010, R.E.A. (Repertorio Economico Amministrativo) at number 1580695 and R.A.E.E. (Rifiuti di Apparecchiature Elettriche ed Elettroniche) register at number IT08020000000799.

Our Depositary in New York (JP Morgan Chase Bank N.A.) is presently located at 4 New York Plaza, New York, New York 10004.

The duration of the company, as stated in the company s Bylaws, extends until December 31, 2100.

After the effectiveness of the demerger of Telco S.p.A. (previously the largest shareholder of TIM and whose investors were Assicurazioni Generali S.p.A., Intesa Sanpaolo S.p.A., Mediobanca S.p.A. and Telefónica S.A.), on June 24, 2015, Vivendi S.A. (**Vivendi**), an integrated media and content group based in France, became o our largest shareholder with an ownership stake in TIM equal to 14.9% of Ordinary Shares. In the following months, Vivendi further increased its shareholding in the Company and, as of April 8, 2019, Vivendi holds 23.94% of the ordinary share capital of TIM. Vivendi does not hold Savings Shares (or Savings Share ADSs) and does not have different voting rights in meetings of ordinary shareholders of TIM.

At the Shareholders Meeting held on April 24, 2018, a new Board of Statutory Auditors was appointed for a 3-year term that terminates following the approval of the financial statements for the year ended December 31, 2020. Vivendi s slate obtained the higher number of votes and as a result, 3 out of 5 Standing Auditors were appointed from such slate.

The Shareholders Meeting held on May 4, 2018, established the number of Directors at 15, the duration of their term of office at three financial years (until the approval of the financial statements as of 31 December 2020) and appointed a new Board of Directors. As the slate presented by the shareholders Elliott lnternational LP, Elliott Associates LP e The Liverpool Limited Partnership received more votes, in accordance with the Bylaws, 10 out of 15 Directors were appointed from this slate, while the remaining 5 were appointed from Vivendi s slate.

See Item 6. Directors, Senior Management and Employees 6.1 Directors for further details.

We file Annual Reports on Form 20-F and furnish periodic reports on Form 6-K to the SEC. Our SEC filings are available at the website maintained by the SEC at www.sec.gov.

As described elsewhere in this Annual Report, certain reports, statements and presentations related to TIM can be found on our website at www.telecomitalia.com.

4.1.2 DEVELOPMENT

On February 21, 2019, TIM presented its 2019 2021 Strategic Plan. The 2019-2021 Plan sets out the primary strategic objectives of the TIM Group over the next three years as well as a number of strategic priorities to achieve such objectives.

For more details, please see 4.1.7 Updated Strategy .

4.1.3 BUSINESS

The Group operates mainly in Europe, South America and the Mediterranean Basin.

Table of Contents

Item 4. Information On The TIM Group **Business**

The TIM Group is principally engaged in the communications sector and, particularly, the fixed and mobile national and international telecommunications sector.

The operating segments of the TIM Group are organized according to the respective geographical location of the telecommunications business (Domestic Italy and Brazil).

In 2018, there were no significant changes in the scope of consolidation of the TIM Group.

For further details please see Item 5. Operating and Financial Review and Prospects 5.2 Results of Operations for the Three Years Ended December 31, 2018 5.2.2. Business Segments and Note Scope of Consolidation of the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report.

The following is a summary description of the TIM Group s principal geographical business areas.

Domestic Business Area

TIM operates as the market leader in Italy providing telephone and data services on fixed-line and mobile networks for final customers (retail) and other operators (wholesale).

Olivetti, part of the Business segment of Core Domestic, operates in the area of office products and services for information technology (**IT**), covering the traditional offer areas of the office and retail world as well as the innovative world of IoT, M2M and Big Data.

INWIT S.p.A. operates in the electronic communications infrastructure sector, specifically relating to infrastructure for housing radio transmission equipment for mobile telephone networks, for TIM and other operators.

The **Telecom Italia Sparkle group** operates at an international level in the development of fibre-optic networks for wholesale customers (in Europe, the Mediterranean and South America).

TIM is one of four mobile operators authorized to provide services using GSM 900 technology in Italy and one of four operators authorized to provide services using GSM 1800 (formerly DCS 1800) technology in Italy. It is also one of four operators holding a UMTS authorization and providing third-generation telephony services in Italy and it is one of the three operators that acquired a 800MHz spectrum in 2011 to provide 4G Service in Italy. In addition, TIM possesses 2600MHz and 1450MHz licenses.

The auction for the award of frequencies for 5G services was held during 2018. TIM awarded the largest part of the spectrum, respectively 10+10 Mega at 700MHz, 80 Mega in the 3.6-3.8 GHz band and 200 Mega in the 27 GHz band, strengthening its competitive position in terms of bandwidth and quality of service offered.

At December 31, 2018, the TIM Group had approximately 10,149 thousand physical accesses (retail) in Italy, a decrease of 895 thousand compared to December 31, 2017. The broadband portfolio in Italy was 11,184 thousand accesses at December 31, 2018 (consisting of approximately 7,575 thousand retail accesses and 3,609 thousand wholesale accesses), an increase of 1,030 thousand compared to December 31, 2017 (10,154 thousand accesses). In addition, the Telecom Italia Group had approximately 31,818 thousand mobile telephone lines in Italy at December 31, 2018, an increase of 1,063 thousand compared to December 31, 2017.

Brazil Business Area

TIM Brasil is a telecommunications company that offers mobile voice and data services, broadband Internet access, value-added services, and other telecommunications services and products in Brazilian market. These services are provided through 4G, 3G and GSM technologies. With the acquisitions of 700MHz and 2.5GHz radiofrequencies, focus is on accelerating the development of the 4G network. With the acquisitions of Intelig Telecomunicações (now TIM S.A.), Tim Fiber RJ and Tim Fiber SP (now merged into TIM S.A.), TIM Brasil s portfolio of services has been expanded by offering optic fiber data transmission using full IP technology, such as DWDM and MPLS and offering residential and business broadband services.

Table of Contents

At December 31, 2018, the TIM Group had 55.9 million mobile telephone lines in Brazil, as compared to 58.6 million at December 31, 2017.

4.1.4 Disposals And Acquisitions of Significant Equity Investments in 2018

For a description of disposals and acquisitions of significant equity investments in 2018 please see Note Scope of consolidation and Note Investments of the Notes to the Consolidated Financial Statements included elsewhere in this Annual Report.

4.1.5 Recent Developments During 2019

On April 5, 2019 the rating agency Fitch Ratings downgraded TIM s Long Term Issuer Default Rating to BB+ with a Stable outlook.

4.1.6 Overview of The TIM Group s Major Business Areas

The following is a chart of the TIM Group s Business Units as of December 31, 2018:

(*) Business unit.
(**) Main subsidiaries: TIM S.p.A., INWIT S.p.A., Telenergia S.p.A., Telecontact Center S.p.A., Olivetti S.p.A., HR Services S.r.l, TIMVision and Noverca.
For further details about companies which are part of the Business Units, please see Note List of companies of the TIM Group of the Notes to the Consolidated Financial Statements included elsewhere herein.

For revenues, operating profit (loss) and number of employees of the TIM Group s Business Units please see Item 5. Operating and financial review and prospects 5.2 Results of operations for the three years ended December 31, 2018 5.2.5 Business unit financial data .

4.1.7 Updated Strategy

Strategic Priorities and Objectives for the 2019 2021 Strategic Plan

On February 21, 2019, TIM s Board of Directors approved the 2019 2021 Strategic Plan (the **Plan**).

Table of Contents

The Plan focuses on improving TIM s execution and timely delivery of what planned as a key element for the organic transformation of TIM, while exploiting strategic options to unlock value.

The main objectives over the Plan s horizon are the following:

- delevering the Company;
- simplifying and optimizing processes;
- delivering a sustainable return on capital invested, strengthening cash flow generation through top line stabilization, leaner cost structure and working capital optimization;
- optimizing invested capital through network sharing, key to enhance ROIC;
- revamping Domestic business focusing on quality, TIM s scale and its technical competences;
- enhancing Brasil riding growth waves and continuing towards postpaid migration.

The main strategic priorities in the domestic (Italian) market are:

Consumer:

- restart from competitive advantages: network quality, scale and client proximity, and technical competences and geographical presence;
- shift from number of Gigabytes to quality of Gigabytes ;
- strong push on upselling to put Average Revenue per User (ARPU) on an upward trend.

Content:

- revamp offer as a media aggregation platform with differentiating value proposition versus competitors;

- establish new partnerships to enrich content catalogue.

Business:

- become one stop shop , top quality ICT partner for SMEs;

- evolve towards a real ICT solution provider for the largest clients.

Wholesale:

- defend wholesale accesses market share through fast UBB migration;

- maintain UBB coverage leadership;

- increase of revenues share in not regulated services.

An important contribution to the Plan is also expected from the subsidiaries TIM Brasil, Inwit and Telecom Italia Sparkle, for which strategic priorities include:

TIM Brasil:

- strongly expand its mobile post-paid customers;

- grow its B2B revenues;

- develop the fixed residential UBB customer base.

Inwit:

- strengthen its leadership in Italian wireless infrastructure market with growing tenancy ratio, more customers, new towers;

- establish foundations for 5G monetization (also leveraging on the potential business combination with Vodafone).

Table of Contents

Telecom Italia Sparkle:

- relaunch of the company scaling up infrastructure presence and growing in Enterprise networking and cloud;

- evaluate partnerships to accelerate growth and to unlock strategic optionality.

The strong focus on Execution is one of the key pillars of the plan requiring discipline, focus and simplicity. A streamline organization is needed to promote accountability and improve the way of working. Dedicated Delivery Units have been set up to facilitate and orchestrate the transformation, particularly on transversal topics and to ensure the implementation of the identified cost cutting initiatives. A revised corporate culture capable of building capabilities, fostering talents and engaging the entire employee base will complete the operating platform transformation.

On the Technological front, the Plan sets modernization, simplification and artificial intelligence at the core of future investments in order to ensure quality excellence and contain capital expenditures intensity. It will be finalized the migration to an all-IP network and it will be built a brand new and fully automated 5G network. At the same time the decommissioning of legacy platforms, equipment and applications will be completed as soon as possible.

Quality and reliability on all customer touch points (activation, delivery and problem resolution) are at the center of the strategy. To this aim the most important processes will be redesigned and a central end-to-end factory will lead the process re-engineering effort.

On February 21, 2019, TIM and Vodafone Italia announced to have signed a Memorandum of Understanding and agreed to enter into exclusive discussions for a new network sharing partnership. Both companies intend to enter into an active network sharing partnership for 5G, to consider active sharing for 4G and to expand their existing passive sharing agreement. Vodafone and TIM have also agreed to explore a potential transaction that would entail the parties consolidating their approximately 22,000 passive towers located in Italy into a single business entity, potentially combining Vodafone s passive tower infrastructure with the infrastructure of Inwit, the 60%-owned and publicly listed tower subsidiary of TIM. The partnership would allow acceleration of 5G deployment to have a wider geographic reach and to achieve significant operating expenditure and capital expenditure synergies.

TIM started discussions with Open Fiber to explore all possible options including a full business combination, in order to explore the value creation opportunity that a single network presents. The Company continues to work with its financial advisors on exploring the single network opportunity and on maximizing the value of TIM s fixed network. Convergence of the two networks would carry advantages for all stakeholders, including the companies involved, the market, shareholders and the country as a whole, which would benefit from faster, cutting-edge infrastructure.

There can be no assurance that these objectives will actually be achieved. See Introduction Cautionary Statement for Purposes of the Safe Harbor Provisions of the United States Private Securities Litigation Reform Act of 1995 .

Table of Contents

4.1.8 THE ORGANIZATIONAL STRUCTURE

The following diagram highlights the organizational structure of the TIM Group as of April 8, 2019:

Table of Contents

4.2 BUSINESS UNITS

4.2.1 Domestic

The Domestic Business Unit operates as the market leader in providing voice and data services on fixed and mobile networks for final retail customers and other wholesale operators. Internationally, the Business Unit develops fiber optic networks for wholesale customers (in Europe, in the Mediterranean and in South America).

The Business Unit operates, through INWIT, in the electronic communications infrastructure business, specifically infrastructure for housing radio transmission equipment for mobile telephone networks for TIM and other operators.

Olivetti operates in the area of products and services for Information Technology.

As of December 31, 2018, the Domestic Business Unit was organized as follows:

(*) Main subsidiaries: TIM S.p.A., INWIT S.p.A., Telenergia S.p.A., Telecontact Center S.p.A., Olivetti S.p.A., HR Services S.r.l, TIMVision and Noverca.

The principal operating and financial data of the Domestic Business Unit are reported according to the following two cash-generating units (**CGU**):

- **Core Domestic**: includes all telecommunications activities within the Italian market. The sales market segments established on the basis of a customer-centric organizational model are as follows:
  - **Consumer**: the segment consists of all fixed and mobile voice and internet services as well as products managed and developed for individuals and families and of public telephony; customer care, operating credit support, loyalty and retention activities, sales within its assigned area, and administrative management of customers; the segment includes the companies 4G Retail, Persidera and Noverca;
  - **Business**: the segment consists of voice, data, and internet services and products, and ICT solutions managed and developed for small and medium-size enterprises (SMEs), Small Offices/Home Offices (SOHOs), Top customers, the Public Sector, Large Accounts, and Enterprises in the Fixed and Mobile telecommunications markets; the segment includes the companies: Olivetti, Telsy, Trust Technologies and Olivetti Scuola Digitale (formerly Alphabook);
  -

Wholesale: the segment consists of the management and development of the portfolio of regulated and unregulated wholesale services for Fixed and Mobile telecommunications operators in the domestic market and Open Access operations connected with delivery and assurance processes for customer services. The segment includes the companies: TN Fiber, Flash Fiber, TI San Marino and Telefonia Mobile Sammarinese;

- **Other INWIT S.p.A. and support structures:** includes:

  - **INWIT S.p.A**.: since April 2015, the company has been operating within the Operations area in the electronic communications infrastructure sector, specifically relating to infrastructure for housing radio transmission equipment for mobile telephone networks for TIM and other operators;

  - **Other Operations units**: covering technological innovation and the processes of development, engineering, building and operating network infrastructures, IT, real estate properties and plant engineering;

Table of Contents

- **Staff & Other**: services carried out by Staff functions and other support activities performed by minor companies of the Group, also offered to the market and other Business Units.

- **International Wholesale Telecom Italia Sparkle group**: includes the activities of the Telecom Italia Sparkle group, which operates in the market for international voice, data and internet services for fixed and mobile telecommunications operators, ISPs/ASPs (Wholesale market) and multinational companies through its own networks in the European, Mediterranean and South American markets.

v **Marketing Channels and Distribution**

At December 31, 2018, as a result of the customer-centric approach, TIM utilized the following sales structure for each of its customer segments:

Distribution

The sales structure is organized according to a vertical, multi-channel approach, in which different types of distribution channels are specialized for different customer segments of the market, based on clusters of customers and services. This approach enhances the focus and customization of our products.

· ***Consumer***

Consumer customers are managed by several channels focused on volume and value acquisitions, including:

- the Push channel consisting of an outbound telephone channel called Telesales with a network of 30 partners having a total of approximately 3,500 operators and the Agent channel with approximately 90 Direct Agents and a network of 80 partners with approximately 2,500 sales agents;

- the Pull channel: consisting of the retail network of shops, dealers and large retailers, amounting to a total of approximately 5,000 retail points of sale (at December 31, 2018). Points of sale are geographically widespread and they are of different types: direct (flagship stores and 4G mall stores); franchisee; monobrand; multibrand; organized and specialized large-scale distribution.

In addition to these partners, distribution is also carried out through the Public Telephone channel, consisting of 6 technical partners that provide maintenance and other related services.

· ***Business***

Commercial customers are managed by a single sales unit that addresses customers through both Direct and Indirect Sales. The Sales channel is organized into five different segments. One of these segments is aimed to the main customers, which includes the most important Private enterprise and the Public central government and is managed

only through the Direct Sales Channel. The remaining four manage strategic, large, medium and small regional customers and include both Direct and Indirect Sales Channels.

- ***Indirect Sales Channel***

The company distribution channels include:

- Channel BP-Business Partner (about 60 entrepreneurs with about 100 agencies spread over 4 territorial areas): a network of agents focused on standard offers (small market) with about 2,200 agents (1,300 FTE);

Features:

- The agencies are remunerated on the basis of a commissions plan based on an ordinary remuneration and extra remuneration for the achievement of specific sales targets;
- The agencies have a mandate to acquire new customers and develop the customer base;
- Each agency is exclusively assigned a cluster of value customers (2% of the customer base) on which to develop and maintain.
- Outbound Call Center: 8 partners focused on specific activities of propaganda and customer loyalty;
- Senior Agent: 140 agents focused on medium-sized private clients;

Table of Contents

- Shops: some specific shops (about 900 out of the 2,400 total) that offer products and business assistance.

- **Direct Sales Channel**

As of the end of 2018 more than 1000 sales staff have been working on a individually dedicated customer portfolio to manage and develop, supported by pre sales and post sales teams, according to a strong growth plan of direct sales coverage of the market, that is expected to scale up performances through increased proximity and quality of the relationship. The main activities include supporting the digital transformation journey of private enterprises and public administrations, offering the whole range of services (fixed and mobile voice and data, ICT services and products) and developing custom solutions and projects.

- ***Wholesale***

The Wholesale (W) department manages relationships with approximately 400 other telecommunications operators (Wholesale Market), who can be both customers and competitors of TIM. These customers purchase TIM network and professional services to build services for their own customers.

In order to ensure complete management of the relationship with customers, the Wholesale department is organized to cover all stages of the process:

- analysis of technological innovation, for New Products and Service Innovation Marketing;

- analysis of business evolution in the wholesale market, for Marketing development;

- definition of the offer for wholesale regulated services, such as Interconnection, Data Services, Access Services; the offer is developed by the marketing group according to conditions and rules set by National and European Authorities;

- sales through direct vendors, which are supported by presales and project managers; they are organized into two Commercial Local Areas: one for the North of Italy and another one for Centre and South of Italy;

- contracts definition and disputes solution through specialized personnel; and

- billing, credit and administrative activities, revenue integrity control.

The Wholesale department is set up as an independent department, which allows TIM, along with other conditions (accounting separation, compliance with the resolutions of the Authorities) to manage transparency and fairness in its

relationship with other operators, as well as compliance with all regulatory requirements.

Table of Contents

v CUSTOMER AND LINES

The table below sets forth, for the periods indicated, certain statistical data of the Domestic Business Unit:

	As of and for the years ended December 31,		
	2018	2017	2016
DOMESTIC FIXED			
Physical accesses (thousand)(1)	18,212	18,995	18,963
Of which retail physical accesses (thousand)	*10,149*	*11,044*	*11,285*
Broadband accesses in Italy at year-end (thousand)(2)	11,184	10,154	9,206
Of which retail broadband accesses (thousand)	*7,575*	*7,641*	*7,191*
Network infrastructure in Italy:			
access network in copper (millions of km pair, distribution and connection)	114.4	114.6	114.4
access and carrier network in optical fiber (millions of km fiber)	16.4	14.3	12.6
Total traffic:			
Minutes of traffic on fixed-line network (billions):	58.3	64.0	69.1
Domestic traffic	*46.2*	*50.7*	*55.6*
International traffic	*12.1*	*13.3*	*13.5*
Broadband traffic (PBytes)(3)	9,394	7,848	5,774
DOMESTIC MOBILE			
Number of lines at year-end (thousand)(4)	31,818	30,755	29,617
Change in lines (%)	3.5	3.8	(1.3)
Churn rate (%)(5)	26.3	26.2	22.8
Total traffic:			
Outgoing retail traffic (billions of minutes)	57.0	51.4	44.9
Incoming and outgoing retail traffic (billions of minutes)	85.4	78.1	69.6
Mobile browsing volumes (PBytes)(6)	686.8	417.5	258.5
Average monthly revenues per line(7) (euro)	11.5	12.5	12.4

(1) Excludes full-infrastructured OLOs and FWA-Fixed Wireless Access.

(2) Excludes OLO LLU and NAKED, satellite, full-infrastructured and FWA Fixed Wireless Access.

(3) DownStream and UpStream traffic volumes.

(4) The figure includes the SIM cards used on platforms for delivering Machine-to-Machine services.

(5) The data refers to total lines. The churn rate represents the number of mobile customers who discontinued service during the period expressed as a percentage of the average number of customers.

(6) National traffic, excluding roaming.

(7) The values are calculated on the basis of revenues from services (including revenues from prepaid cards) as a percentage of the average number of lines.

v **MAIN CHANGES IN THE REGULATORY FRAMEWORK**

For a description of the main regulatory events that occurred in 2018 and which may have a significant impact on the operation of the Domestic Business Unit, please see Item 4. Information On The TIM Group 4.3 Regulation .

v **COMPETITION**

The market

During 2018, the Italian TLC market was affected by a downturn due to tougher competition in the mobile sector.

The expansion of broadband and ultra-broadband has been the main driver of market growth, helping to open up new opportunities for telecommunications providers to develop convergent offers that bundle together TLC services with Media & Entertainment services, IT services and Digital services.

The Italian telecommunications market has always been highly competitive; in particular core competition with other operators in the sector is still the factor with the greatest impact on market trends. Telecommunications

operators must also face the challenges from Over the Tops (OTT) and device manufacturers, that operate in the new digital world using completely different assets and competitive strategies to TLC players.

The traditional business models of the various market players are, therefore, changing to exploit new opportunities and meet the challenges posed by the new entrants:

- in the Media & Entertainment segment, as the web takes on growing importance as a complementary distribution platform, OTTs, telecommunications providers and consumer electronics manufacturers are acquiring an increasingly major role;

- in the Information Technology market, the decline in traditional revenues is driving the various players towards cloud computing, with the goal of protecting their core business. Telecommunications providers are strengthening in this sector, including through partnerships;

- Consumer Electronics manufacturers are developing services that can be accessed through the Internet by leveraging handset ownership and user experience management, breaking the relationship between customers and TLC providers;

- OTTs have been leading the transformation in how TLC services are used (including voice services), increasingly integrating them with Media & Entertainment, IT and new Digital services.

With regard to the current positioning of telecommunications providers in converging markets, on the other hand, as partially described above, the following is taking place with different levels of progress:

- development of new Media & Entertainment services (TV, Music, Gaming) and new Digital services (Smart Home, Digital Advertising, Mobile Payment-Digital Identity);

- development of Innovative Services in the IT market, particularly Cloud services.

During 2018, the bidding for the award of frequencies for 5G services took place, which led to an overall outlay for telecommunications companies of over 6.5 billion euros, well above the minimum bid price.

TIM and Vodafone were awarded the largest part of the spectrum: 10+10 MHz at 700 MHz, 80 MHz in the 3.6-3.8 GHz band respectively (the most requested to launch good-quality 5G services) and 200 MHz in the 27 GHz band, thereby reinforcing our competitive positioning in terms of bandwidth owned and quality of service offered.

Based on performance capabilities in terms of speed, latency and number of connected devices, 5G is an opportunity for telecommunications companies with the necessary bandwidth to open new vertical markets (e.g., automotive, smart agriculture, logistics, cloud robotics), provide new services, commence new production processes and increase

the efficiency of optimized product management.

Competition in Fixed-Line Telecommunications

The fixed-line telecommunications market has continued to see a decline in access and voice revenues, while broadband and ultra-broadband revenues have shown continuous growth. In recent years, service providers have concentrated mainly on expanding the penetration of broadband and ultra-broadband services and defending Voice revenues by introducing bundled voice, broadband and service deals in a highly competitive environment with consequent pricing pressure.

Deals and offers are also becoming more competitive thanks to the consolidation, among competitors, of an approach based on control over infrastructure (above all, Local Loop Unbundling (LLU), as well as Fiber to the Cabinet (FTTC) networks). The main fixed-line service providers are also offering mobile services, also as Mobile Virtual Operators (MVOs).

As concerns competition in infrastructure, two providers Open Fiber (an ENEL Group company) and Infratel (controlled by the Ministry of Economic Development) presented plans for the development of their own optic fiber networks as alternatives to the TIM network, which respectively target major Italian cities and areas of market failure.

Open Fiber announced a plan to invest 3.8 billion euros in the development of Fiber to the Home (FTTH) in 271 large Italian towns by 2022, reaching around 9.6 million homes.

Table of Contents

Open Fiber obtained 3.5 billion euros in funding in July 2018. Following the receipt of such funding, the development of the Open Fiber network was stepped up considerably, opening up to 71 Italian towns (as of January 2019), including many major Italian cities, such as Milan, Turin and Bologna, where Metroweb (acquired in December 2016) had previously expanded, as well as Bari, Cagliari, Catania, Naples, Padova, Perugia, Venice, Genoa, Palermo and Florence, and smaller towns that are mainly satellite areas of Milan, Turin and Bologna.

In the meantime, according to media reports, our main competitors in the TLC retail market have signed an agreement with Open Fiber to link their new ultra-broadband customers onto its network, where available.

As concerns areas of market failure the so-called white areas in the C and D clusters of the government s Ultra-Broadband Plan Infratel held three public calls for tenders over the last three years for the development of a UBB network to deliver services to around 7,500 municipalities across 19 regions.

- In the first call for tenders, Open Fiber won all five of the lots offered in the six regions involved (Lombardy, Emilia Romagna, Veneto, Tuscany, Abruzzo and Molise), covering around 3,000 municipalities.

- In the second call for tenders, Open Fiber won all six of the lots offered in the ten regions involved (Piedmont, Valle d Aosta, Liguria, Friuli Venezia Giulia, the Autonomous Province of Trento, Marche, Umbria, Lazio, Campania, Basilicata and Sicily), covering around 3,700 municipalities.

- In the third call for tenders, Open Fiber won all three lots in the three regions involved (Apulia, Calabria and Sardinia) covering around 880 municipalities.

In January 2019, there were approximately 1,174 work sites open for the first two Infratel/Open Fiber contracts, of which 977 for fiber optic connections and 197 for wireless connections (FWA).

Therefore the development of Open Fiber Plans both in major Italian cities and market failure areas will drive a significant shift in infrastructure competition, with the development of various competitive dynamics depending on the overlap and reach of available ultrabroadband infrastructure:

areas with two FTTH networks overlapping FTTC networks;

areas with a single FTTH network overlapping FTTC networks;

areas with FTTH networks overlapping ADSL networks;

areas with FTTC networks overlapping ADSL networks.

Competition in the Italian fixed-line telecommunications market is also characterized by the presence of other service providers besides TIM, such as Wind-Infostrada, Fastweb, Vodafone, and Tiscali, which have business models focused on different segments of the market. In December 2018, fixed accesses in Italy were estimated to be around 20.3 million (including OLO Infrastructured and FWA-Fixed Wireless Accesses) down slightly on the previous year. Competition in the access market led to a gradual reduction in TIM s market share.

As concerns the Broadband market, at December 31, 2018, the number of fixed-line broadband (including both broadband and ultrabroadband customers) customers in Italy was estimated to have reached a penetration rate of approximately 86% of all fixed-line access. The spread of broadband continues to be driven by the penetration of computers and other enabled devices (such as Smart TVs), but also by growing demand for fast connections and access to new over-IP services that are becoming increasingly widespread (Media & Entertainment, IT and Digital services).

Competition in Mobile Telecommunications

The mobile market has continued to see the rationalization of second and third SIM cards for human communications, while sales of SIM cards for machine to machine (M2M) communications are growing.

Moreover, growth in mobile broadband customers has continued thanks to the high penetration rate of LTE on mobile lines, especially as a result of the increasing spread of smartphones.

Alongside innovative services that have already caught on and are under full-scale development, as in the case of mobile apps, there are other market environments, associated with the development of mobile broadband, with major potential for growth in the medium term, such as the Internet of Things and mobile payment.

Table of Contents

The competitive scenario on the Italian mobile telecommunications market in 2018 was marked by the entry of the French operator Illiad, that launched its own service in May, becoming the fourth infrastructured operator in Italy, alongside TIM, Vodafone and WindTre. With a particularly aggressive price and data volume offering, Illiad has rapidly won over customers and consequently gained a market share to the detriment of other infrastructured operators, mainly WindTre and Vodafone, while TIM has shown a greater resilience, thanks also to the contribution from the second brand virtual operator, Kena Mobile, launched during 2017. To best respond to the competitive threat of Illiad, Vodafone also launched its own low-cost operator in June 2018, ho.mobile.

At the same time, mobile virtual operators (MVO), of which PosteMobile is the most important player, also reported a growth trend, taking market share away from infrastructured operators.

This tougher competition following Illiad s entry to the market resulted in a new drop in the spend on services, after several years of relative stability.

4.2.2 BRAZIL

The **Brazil Business Unit** (Tim Brasil group) provides mobile telephone services using UMTS, GSM and LTE technologies. Moreover, the Tim Brasil group offers fiber optic data transmission using full IP technology, such as DWDM and MPLS and residential broadband services.

At the end of 2018, Tim Brasil group s coverage reached 93% of the urban population with its 4G network, achieving 3,272 cities with such technology, a 9.0% increase when compared with the same period of 2017.

TIM s strategy is to fulfill consumers needs by understanding what they value and earn their trust based on three pillars: (i) innovation, which is already in the company s DNA and will continue as a priority, with new plans, offers, partnerships and technologies; (ii) quality, as TIM has worked to become a leader in 4G coverage and maintain strong investments in infrastructure to deliver the best to its customers and be prepared for the future; (iii) user experience, which, in addition to the two other pillars, is important to establish a new relationship with customers and act to give every client the best caring experience, great services and a transparent relationship with the company.

The table below sets forth the number of mobile lines of the Brazil Business Unit:

	As of and for the years ended December 31,		
	2018	2017	2016
Number of lines at year-end (thousands)(*)	55,923	58,634	63,418
MOU (minutes/months)(**)	123.4	109.7	116.6
ARPU (Reais)	22.4	20.2	18.0

(*) Data includes company lines (active SIM cards used by the TIM Brasil group and its employees).

(**) Net of visitors.

Table of Contents

v **MARKETING**

With the rapid changes in the consumption of telecommunications services by Brazilian users, Tim Brasil continued its efforts to innovate its offerings for all customer segments (Postpaid, Control and Prepaid) bringing significant changes in all segments, mostly by providing to its customers substantial internet packages with social media and digital services on top of unlimited off-net calls.

This change aims to help Tim Brasil grow its postpaid base, focusing in lock-in offers to increase loyalty and drive churn reduction, and also to protect and increase the value of the prepaid base (segment which the Company maintain its leadership) by providing more complete voice and data offers, at reasonable prices, which, based on a robust 4G network, driven the traffic on such technology to achieve 76% of Tim Brasil total traffic.

Those efforts are producing important results that can be seen by the migration to more expensive packages (from prepaid to control plans and also from control plans to postpaid ones), with a resilient combined postpaid ARPU, while the prepaid segment shows increasing commitment with average recharges growth and stable ARPU.

v **DISTRIBUTION**

As of December 31, 2018, we had more than 11.5 thousand points of sale through premium shops and dealers (exclusive or multi-brand) and consolidated partnerships with large retail chains. This figure includes Tim Brasil s 159 own stores. In addition to these retail stores, Tim Brasil customers have access to prepaid phone services through supermarkets, newsstands, and other small retailers, totaling more than 332 thousand points of sale throughout Brazil.

For the corporate market, Tim Brasil has more than 429 third-party business partners and 87 employees focused on serving small and medium-size companies and a direct sales force team of 98 employees focused on large companies.

In order to serve the customer base of over 55.9 million customers, Tim Brasil maintains 10 customer care centers. Moreover, Tim Brasil has continuously invested in alternative customer service channels, developing solutions based on interactive voice response and self-service and mobile applications for iOS and Android.

v **MAIN CHANGES IN THE REGULATORY FRAMEWORK**

For the main regulatory developments which occurred in 2018 that may have an economic impact on the Brazil Business Unit, please see Item 4. Information On The TIM Group 4.3 Regulation .

v **COMPETITION**

At the end of 2018, the Brazilian mobile market reached 229.2 million lines 7.3 million lines (or 3.1%) lower than at the end of 2017. Consequently the Brazil Business Unit churn rate in 2018 was 47.2% (53.2% in 2017).

Table of Contents

4.3 REGULATION

As a telecommunications operator, the TIM Group is subject to sector-specific telecommunications regulations, general competition law and a variety of other regulations, including privacy and security, which can have a direct and material effect on the Group s business areas.

This section describes the legislative framework and the recent legislative key developments.

4.3.1 THE EU REGULATORY FRAMEWORK

TIM s operations within the European Union (**EU**) are subject to the EU regulatory framework for electronic communications networks and services, which includes directives, regulations, recommendations and communications. As a Member State of the EU, Italy is required to transpose directives issued by the EU into national legislation. The regulations adopted by the European Commission (**EC**) are applicable and binding on each Member State without the need of further national implementation. Recommendations and communications, on the other hand, are not legally binding although they have to be taken into account by each Member State.

National Regulatory Authorities (**NRAs**) are independent bodies tasked with regulating and supervising the telecommunications sector and compliance with the EU framework in each Member State. In Italy, this body is Autorità Garante per le Comunicazioni (**AGCom**) while the Ministry of Economic Development (**MISE**) is responsible for national broadband plan, spectrum and numbering management, integrity and security of the network.

Until December 19, 2018 the EU Regulatory Framework has been based on five directives (Framework , Access and Interconnection , Authorization , Universal Service and Users Rights and Privacy and Data Protection together, **Directives**) that regulate all forms of fixed and wireless telecommunications and data transmission. In Italy, the Directives have been transposed into the Codice delle comunicazioni elettroniche (Electronic Communications Code **ECC**) which is currently in force.

On December 20, 2018 Directive 2018/1972 establishing the European Electronic Communication Code (the **EECC**) entered into force. The Directive reviews and combines in one document the Framework , Access and Interconnection , Authorisation and Universal Service and Users Rights Directives (the revision of the Privacy and Data Protection Directive, the so-called e-privacy Directive, is ongoing under separate proceedings). On the same date, Regulation 2018/1971 also entered into force, reviewing the former BEREC (Body of European Regulators for Electronic Communications) Regulation (EC) 1211/2009. The transposition of the EECC into the law of each Member State must occur by December 21, 2020.

The EECC includes measures to promote wholesale-only models of investments and stimulate investments in very high capacity network (VHCN), new rules on spectrum (e.g., minimum license duration) to improve certainty on investment return, changes to regulation of services, introducing more level playing field between telecom operators and new over-the-top-players (OTTs), and the introduction, in the scope of Universal Service Obligation (USO), of the affordability for consumers (with low income or special social needs) of adequate broadband internet access service and voice communications services at least at a fixed location.

In addition, the BEREC Regulation, by amending Regulation (EU) 2015/2120, introduces price caps to be applied from May 15, 2019 on Intra-EU international fixed and mobile calls (19c /min) and SMS (6c /SMS) for consumers.

A Recommendation issued by the EC on relevant product and service markets susceptible of ex ante regulation (Commission s Recommendation on relevant markets) completes this set of legal instruments with the definition of a list of relevant markets whose characteristics may be such as to justify the imposition of regulatory obligations . The Recommendation currently in effect (no. 2014/710/UE) was published on October 9, 2014, following updates in 2003 and 2007. The number of relevant markets subject to ex ante regulation has been reduced over time from 18 to 4, following the growth of the competition in the whole sector (see Wholesale Market Analyses).

Table of Contents

Item 4. Information On The TIM Group **Regulation**

In 2010, the EC adopted a Communication, the Digital Agenda for Europe (the **DAE**), setting forth long-term EU strategies for Broadband. The DAE sets non-binding targets on broadband coverage and take-up to be achieved by 2020:

- Broadband coverage at 30 Mbit/s or more for 100% of EU citizens; and
- 50% of EU households having subscriptions above 100Mbps.

In September 2016, through the Gigabit Society Communication, the EC set the following (not binding) additional targets for the year 2025:

- connectivity of 1 Gbps (upload and download) for all socio-economic entities (i.e. schools, businesses, public administration, etc.);
- connectivity of 100 Mbps download for all European households and businesses; and
- uninterrupted 5G coverage for all urban areas and major terrestrial transport routes (as an interim target, 5G should be commercially available in at least one major city in each EU Member State by 2020).

1. International Roaming

Intra-EU roaming services are regulated by the roaming Regulation 531/2012 (the **Roaming III Regulation**), as amended by the Telecom Single Market Regulation 2015/2120 (the **TSM Regulation**) which provides for the abolishing of any roaming service surcharge on top of domestic service prices subject to fair use limits to avoid abuses, starting from June 15, 2017 (Roam Like at Home RLAH regime).

For intra-EU traffic exceeding the fair use limits, operators are allowed to levy a surcharge on top of domestic tariffs. Such a surcharge is capped at the following wholesale caps, established by the Regulation 2017/920, which reviews the Roaming III Regulation wholesale caps.

Voice	**3,2 eurocents/min.**
SMS	**1 eurocent/min.**
Data	7,7 euro/GB from 15/06/17
	6,0 euro/GB from 01/01/18
	4,5 euro/GB from 01/01/19

3,5 euro/GB from 01/01/20

3,0 euro/GB from 01/01/21

2,5 euro/GB from 01/01/22

2. Net Neutrality

The TSM Regulation introduces new rules on Net Neutrality, which have applied since April 2016. In particular, the TSM Regulation:

- establishes the right of end-user access to distribute information and content, use and provide applications and services and use terminal equipment of their choice and forbids internet service providers from blocking or slowing down specific content, applications or services, except in a very limited set of circumstances;

- allows reasonable traffic management aimed at improving the quality of the network based on objectively different technical quality of service requirements for specific categories of traffic. However, such traffic management must be transparent, non-discriminatory and proportionate and it must not be based on commercial considerations;

- allows operators to offer services, other than internet access services, that are optimized for specific content, applications or services only if the network capacity is sufficient to provide them in addition to any internet access services provided and the offering of such services is not to the detriment of the availability or general quality of internet access services for end-users; and

Table of Contents

· allows commercial practices such as zero rating subject to monitoring by the National Regulatory Authority.

The TSM Regulation also places additional transparency obligations on providers of internet access services in addition to those already included in the Electronic Communications Regulatory Framework.

3. Privacy and Data Protection

TIM must comply with the EU Regulation 2016/679, General Data Protection Regulation (GDPR) since May 2018. The new regulation has adopted a risk based approach, allowing a higher flexibility for service providers to process personal data, while ensuring a high level of protection of personal data of individuals. The GDPR introduces administrative fines of up to 4% of an undertaking s annual global turnover for breaching the new data protection rules.

TIM has put in place a specific project to carry out all the activities needed to ensure its compliance with the new rules introduced by the GDPR.

While the GDPR is a horizontal regulation, applying to all categories of providers, TIM must comply also with the complementing sectorial rules (Directive 2002/58/EC, the so called e-Privacy Directive), currently under revision, which imposes additional limitation to the data processing by operators of electronic communications services. The EC proposal aligns the fines for non-compliance to the GDPR s.

4.3.2 THE ITALIAN REGULATORY FRAMEWORK

The main legal references for the electronic communications sector in Italy is the Electronic Communications Code (ECC), which transposed into national law the EU Access, Authorization, Framework and Universal Service directives. Moreover, there are other laws affecting TIM s business which govern non-sectorial areas such as consumer, data and security protection and laws which govern specific aspect of communication sector such as Legislative Decree n. 33/2016 (implementing 2014/61/UE Directive), setting forth measures for costs reductions in UBB networks installations and promoting the use of existing infrastructures.

With the law no. 119/2018 dated December 18, 2018, the Government amended the ECC introducing the power for AGCom to define adequate measures of investment remuneration to incentivize the merger of different access networks put under the control of a non-vertically integrated subject offering only wholesale network services.

4.3.3 MARKET ANALYSES

The EU regulatory framework requires the National Regulatory Authorities to carry out market analyses before imposing obligations on individual operators having a Significant Market Power (**SMP**) according to the specific EU guidelines.

A description of the Italian wholesale market analyses is summarized below together with the main recent developments regarding the electronic communications markets.

v ***Wholesale fixed access markets***

In December 2015 (Decision n. 623/15/CONS), AGCom defined the rules for the access to TIM s copper and fiber fixed networks for the years 2015-17.

The main regulatory measures are the following:

· confirmation of the national scope of remedies imposed on TIM;

[2] Zero-rating (also called toll-free data or sponsored data) is the practice of mobile network operators (MNO), mobile virtual network operators (MVNO), and Internet Service Providers (ISP) not to charge end customers for data used by specific applications or internet services through their network, in limited or metered data plans. It allows customers to use provider-selected content sources or data services like an app store, without worrying about bill shocks, which could otherwise occur if the same data was normally charged according to their data plans and volume caps. This has especially become an option to market 4G networks, but has also been used in the past for SMS or other content services.

Table of Contents

Item 4. Information On The TIM Group **Regulation**

- substantial upholding of Local Loop Unbundling (**LLU**) prices together with a reduction of Sub Loop Unbundling (**SLU**) and Virtual Unbundling Local Access (**VULA** prices);

- disaggregation of ancillary service provision for provision and maintenance (i.e. delivery and assurance) for LLU and SLU lines;

- introduction of new equivalence measures, according to the New Equivalence Model (NEM);

- stricter constraints on the quality of wholesale services (SLAs and penalties);

- commitment to define switch-off rules in case of decommissioning of TIM local exchanges of the copper access network:

  - 5 years for the switch-off of local exchanges where LLU is available;

  - 3 years for local exchanges where LLU is not available, or for local exchanges where LLU is available as long as TIM provides competitors with a service that is technically equivalent to copper LLU for at least 2 years after the switch-off.

The NEM, through the reorganization of both assurance and delivery processes, aims to improve end-to-end performance and to remove any possible internal-external process asymmetries between TIM Retail and the alternative operators (such as differences in internal and external reasons for refusal of delivery orders, provision times, customer data bases and order workflows) that could produce potential discrimination between TIM retail and the alternative operators in the conditions of provision of the wholesale services.

The NEM implementation was completed in April 2017 and the migration process of all operators to the New Delivery Systems was completed in July 2018.

With Decision 623/15/CONS, AGCom also asked TIM to present a proposal to introduce a disaggregation model for the delivery and assurance activities of the local loop and sub-loop unbundling lines. TIM s proposal (sent to AGCom in February 2016 and submitted to public consultation by AGCom in April 2016) is based on the extension of the System Unico (i.e., the recourse to external companies by the competing operators) to the above-referenced delivery and assurance activities. In August 2017, with Decision 321/17/CONS, AGCom defined the technical and organizational conditions of the disaggregation model. According to the approved model, alternative operators can autonomously choose whether TIM or external companies have to carry out the above mentioned ancillary activities for LLU and SLU services. Moreover, the alternative operator can make direct arrangements with the external companies regarding a series of activities, such as the contact policy, the economic conditions for the management of the appointments, etc. The main Italian operators started to apply the disaggregation model between December 2018 and February 2019.

On February 20, 2017 AGCom launched the fourth round of the access markets analysis (Decision 43/17/CONS) to review the obligations and economic conditions of the wholesale access services for the period 2018-2021. The markets analysis also takes into account TIM s voluntary legal separation project in relation to its fixed access network.

On March 6, 2018, TIM s Board of Directors approved the project to voluntarily separate the fixed access network through the creation of a legal entity (NetCo) separate from the rest of the company (ServCo). The new company (NetCo), 100% controlled by TIM, will have its assets (access network infrastructure, from the exchange to customers homes, as well as buildings, electronic equipment and IT systems) and the personnel necessary to provide wholesale services independently. The model is intended to guarantee full equality of treatment, thanks to a single access point; a one-stop shop for regulated and unregulated wholesale services for all operators, including TIM.

On March 27, 2018, TIM notified to AGCom the voluntarily separation project and on June 6, 2018, AGCom found the project admissible. Therefore, pursuant to Article 50 ter of the Electronic Communications Code, AGCom started a coordinated analysis of the different markets related to the access network to assess the effect of the project on existing regulatory obligations.

From January 18 to March 4, 2019, AGCom carried out a public consultation (Decision 613/18/CONS) on the outcome of the coordinated markets analysis.

Table of Contents

In the text under consultation, AGCom gives a positive evaluation of TIM s access network separation project since it strengthens the equivalence conditions and softens the competitive issues found in the previous market analysis. Anyhow, the Authority deems that some vertical integration issues remain (Netco is fully controlled by TIM and ServCo operates directly in the retail market and indirectly in the wholesale market) as well some risks of anticompetitive conduct.

With reference to the separation project, AGCM propose to:

1) adequate the accounting separation obligations to the new organization;

2) repeal the obligation to inform AGCom about contracts concluded in the scope of public tenders to allow AGCom to verify the replicability of the fixed access offers;

With reference to the other aspects of market analysis, AGCom makes the following proposals:

TIM confirmed as having significant market power (SMP) in the access markets on the whole national territory with the exclusion of the city of Milan, where the ex-ante regulation has been withdrawn;

withdrawal of the cost orientation obligation on wholesale prices (except SLU) in the cities clusters considered as competitive (up to 45 in the first year with potential annual update on the basis of the evolution of alternative infrastructures and markets); these wholesale prices are subjected to an ex-ante replicability test;

2018 wholesale monthly rentals for copper and fiber equal to the ones set for 2017;

gradual increase of full unbundling (ULL) and bitstream over copper rates for the period 2019-2021;

stability of the sub loop unbundling (SLU) rates for the period 2019-2021;

gradual decrease of the fiber access rates (VULA FTTC and FTTH) and differentiation of the price of the band for the period 2019-2021 depending on whether the access line is over copper network or NGA;

reduction of decommissioning notice times, whose duration is linked to the NGA networks coverage (FWA technology included) in the area where the switch is located;

vectoring usage allowed in the FTTC cabinets where the SLU is not employed by alternative operators;

withdrawal of the current asymmetries in the transition procedures to another operator between TIM s return process and switching from TIM to alternative operators.

Proposed wholesale regulated prices (/ line / month)

	2018	2019	2020	2021
LLU (copper local loop unbundling)	8.61	8.61	8.79	8.90
SLU (sub loop unbundling)	5.30	5.30	5.30	5.30
WLR POTS (Wholesale Line Rental POTS)	11.06	10.73	10,91	11,02
WLR ISDN BRA (Wholesale Line Rental ISDN BRA)	13,67	13.34	13.52	13.63
Bitstream shared (copper)	4.29	4.35	4.43	4.52
Bitstream naked (copper)	12.46	12.45	12.58	12.69
VULA FTTC naked (30 Mbps)	13.27	13.69	13.21	12.50
VULA FTTC naked (>50 Mbps)	15.02			
VULA FTTH naked (consumer)*	17.25	15.73	15.50	15.20
VULA FTTH naked (business)*		47.19	46.49	45.61

* *price of 100/10 Mbps offer until 2018; from 2019 onwards AGCom proposes differentiated prices for residential and business*

AGCom s final decision is expected in June-July 2019, after the end of the national consultation and the comments by the European Commission and AGCM.

Ø ***Terminating segment of leased lines***

In July 2015, the Italian NRA approved the decision on terminating segment of leased lines services, essentially confirming the rules laid down at the end of the previous round of market analysis. In particular, regarding

Table of Contents

Synchronous Digital Hierarchy / Plesiochronous Digital Hierarchy (**SDH / PDH**) leased lines with capacities less than or equal to 155 Mbit/s and Ethernet over SDH leased lines, TIM is subject to a network price cap (for Access rentals CPI-6%, for Internet Protocol **IP** transport -8.6 %) for 2015, 2016 and 2017. Regarding SDH / PDH leased lines with capacities greater than 155 Mbit/s and Ethernet over optical fiber leased lines, as well as ancillary services, prices are to be oriented to the costs resulting from the regulatory cost accounting.

On February 13, 2017, AGCom began the fourth cycle of market analysis (Decision 44/17/CONS) and on January 16, 2018, AGCom published the public consultation (Decision 507/17/CONS).

AGCom proposes to:

- confirm the use of the network cap for the definition of the prices of wholesale services of terminal segments of leased lines in SDH / PDH technology and in Ethernet over SDH technology, for the years 2018-2020;

- confirm the invariance of the prices of interconnection links for the years 2018 2020, placing them on equal footing to the prices approved for 2013 and confirmed for the years 2014-2017;

- confirm the BU-LRIC model for the evaluation of the prices of ancillary services and of the optical fiber Ethernet circuits, including the backhauling link (fixed annually in the approval process of the relevant reference offer); and

- remove the imposition of access obligations, for new activations, for the following technologies: i) analog terminating circuits; ii) PDH digital terminating circuits with speeds ranging from 1.2 kbps to 19.2 kbps; iii) Ethernet terminating circuits over SDH (all speeds); iv) Ethernet over SDH interconnection flows (all speeds).

Ø ***Wholesale fixed interconnection markets***

In October 2016, AGCom issued the final decision of the third round of analysis of fixed voice interconnection market, specifically fixed call termination, origination and transit services (Decision 425/16/CONS).

AGCom decided to:

- confirm SMP designation for TIM in the origination market, although this market has been removed from the EC Recommendation;

- set stable fixed call termination rates of 0.043 eurocents/min for TIM and alternative network operators valid until the end of 2018, and 0.041 eurocents/min from January 1, 2019;

- exclude from the scope of price regulation the termination rates of calls originated outside the European Economic Area (**EEA**), including the EU member States and Iceland, Liechtenstein and Norway;

- remove the existing obligations imposed on TIM in the wholesale market for district-level transit; and

- remove the obligation imposed on TIM to notify its retail call services that rely on the regulated interconnection services 30 days before the commercialization.

Ø ***Wholesale mobile markets***

On January 22, 2019 AGCom published the final decision on the fifth round of mobile termination market analysis (Decision 599/18/CONS). AGCom determined to:

- identify the twelve operators who provide or are about to provide mobile voice call termination services (MNOs, Iliad included, and Full MVNOs) as having Significant Market Power (SMP);

- confirm the implementation of the cost model specified in Decision 60/11/CONS for the setting of termination rates for the period 2018-2021, also by setting symmetric tariffs for all SMP operators (0.98 c in 2018, 0.90 c in 2019, 0.76 c in 2020, 0.67 c in 2021) on the basis of a WACC equal to 8.55%;

- enforce the price control obligation for the provision of interconnection kits to all SMP operators with retroactive effect from 2018;

- withdraw the cost accounting obligation enforced on TIM, Vodafone and Wind-Tre;

- confirm the absence of a termination price control obligation for calls originating outside the European Economic Area (AEE); however, operators cannot apply higher termination rates than those applied to Italian operators by extra-AEE operators whose tariffs are regulated by the relevant Authorities.

Table of Contents

4.3.4 RETAIL MARKETS

v ***Retail Offers***

Despite AGCom assessed retail fixed markets are no longer susceptible of ex ante regulation, AGCom confirmed that TIM is subject to the following obligations regarding its publicly available stand-alone and bundled retail access offers on fixed network: a 30-day notification prior to the commercial launch and an economic and technical replicability assessment by AGCom (i.e. margin squeeze test and availability of adequate wholesale inputs); if the offer does not meet the replicability requirement, TIM must revise the retail offer conditions.

In the draft analysis of wholesale fixed access markets, put under national consultation on January 18, 2019 with Decision 613/18/CONS, AGCom proposed to confirm the economic replicability obligation on TIM s copper and fiber retail access offers and to revise some methodological guidelines (ex. fiber offers will have to be assessed at the level of the single promotion, as already provided for copper offers). Moreover, in case of TIM s network access legal separation, the obligation to inform AGCom about contracts concluded in the scope of public tenders to allow AGCom to verify the replicability of the fixed access offers would be removed.

v ***28-day billing***

Regarding the 28-day billing proceedings, see Note Contingent liabilities, other information, commitments and guarantees , of the Notes to the Consolidated Financial Statements included elsewhere herein.

v ***Guidelines on line termination and switching costs***

On November 2, 2018, AGCOM published the Decision 487/18/CONS setting the new Guidelines on the charges applicable by Operators in case of customers withdrawal.

Law no. 40/2007 (Legge Bersani) allowed customers the withdrawal from the permanent contract at any time and provided that the costs they have to pay for the line termination or switching shall be real and economically justified (e.g. deactivation costs for the fixed line).

The Bersani Law was subsequently amended by the Italian Competition Law no.124/2017 and Decision 487/18/CONS aims at implementing the new provisions. However, AGCOM introduces additional charges for operators. In particular:

- Withdrawal in case of line termination or switching: the cost to be paid by the costumer is the minimum between the average rental fee (contract value) and the actual deactivation cost.

.

Promotions: in case of early termination (in respect to the duration of the promotion), operators may only charge a share of the discounts proportional to the residual duration of the promotion at the moment of the withdrawal.

- Products with installments offered in conjunction with the electronic communication service: users can decide to pay the remaining installments instead of reimbursing them with a single payment.

v ***Terminal equipment for internet access***

On August 2, 2018 AGCOM approved the final decision (Decision 348/18/CONS) on terminal equipment (modem) for internet access.

With this resolution AGCOM clarifies that the modem is not part of the network and, therefore, the user s freedom of choice must be guaranteed as established by TSM Regulation

From December 1, 2018 the new offers must ensure that the customer can freely choose their terminal.

Decision 348/18/CONS also requires Operators to:

- remove any technical limitations of the modem, to allow the customer to use it for similar services provided by other operators;

Table of Contents

- not request additional charges if the modem, which was provided free of charge and not used permanently by the user, is not returned to the operator;

- change the offer of current subscribers who in the past have been obliged to accept the paid provision of a modem, with a free of charge modem supply or, alternatively, give customers the right of withdrawal without any penalty.

TIM is compliant from December 1, 2018 with the free choice of the modem provision, however TIM deems that the aforementioned additional obligations are illegitimate and unjustified; therefore, TIM has appealed the Decision 348/18/CONS before TAR (Tribunale Amministrativo Regionale). The obligation concerning the change of offer of current subscribers, who in the past have been obliged to accept the paid provision of a modem, has been suspended by Council of State pending the TAR final decision which is expected by the end of 2019.

4.3.5 THE UNIVERSAL SERVICE

The Universal Service (**US**) is a minimum set of services of a certain quality, which must be made available to all customers, regardless of their geographical location in Italy and must be offered at a reasonable price, taking into account specific national conditions. To date, TIM is the only operator obliged by the Code of Electronic Communications (art. 58) to provide the Universal Service under the Universal Service Obligation (**USO**) throughout Italy. Currently the services included in the USO are the provision of access at a fixed location and of telephone service, the directory inquiry service and the directories, the availability of public payphones, and the provision of specific measures for disabled users.

A Fund (The Universal Service Fund), established by the Ministry of Communications, is used to finance the net cost for the provision of Universal Service sustained by the designated operator (TIM) by means of contributions paid by the other operators. All the main companies active in the sector, including TIM, must contribute to this fund.

AGCom is responsible for verifying the net cost of the USO provision and to assess whether this amount represents an unfair burden for the operator. The designated operator can receive compensation only if the burden is determined to be unfair.

AGCom assessed the net cost and authorized the funding mechanism until the year 2005 and did not recognize any contribution for the years 2006 and 2007.

The net cost for the provision of USO for the years 2004-2007 have been calculated on the basis of a methodology established by AGCom in 2008 (decision 01/08/CIR) with retroactive effect, which led to a significant decrease of the amount to be financed.

Following Judgment no. 4616/2015, released on October 2, 2015, with which the Council of State overruled Agcom s Decision 1/08/CIR on the application of the new methodological criteria for the calculation of the Universal Service (USO) net cost related to the years 2004-2007, AGCom initiated proceedings for the review of the calculation with Decision 145/17/CONS for the years 2006-2007 and Decision 207/17/CONS for the years 2004-2005. The proceedings are still on-going.

Furthermore, with Decision 88/18/CIR, published on June 21, 2018, AGCom has set the net cost for the year 2008 equal to zero and the net cost for the year 2009 equal to 11.61 million euros which is to be shared by the fixed and mobile operators.

With respect to past litigation, the Council of State, with a decision published on July 7, 2015, rejected the appeal filed by TIM against the decision of the TAR on AGCom s decisions of 2010 by which AGCom had reviewed the proceedings for the years 1999-2000 and 2001-2003. As a result, the Council of State annulled AGCom s Decision of 2010 establishing a possible new renewal of the proceedings for the calculation of the contributions of the years 1999-2000 and 2001-2003.

Following the State Council decision, Vodafone requested TIM to refund the amounts paid for 1999-2000, 2002-2003 and subsequent periods. The proceedings are still pending.

Table of Contents

4.3.6 CONTRIBUTION FEES FOR THE FUNCTIONING OF AGCOM

TIM and the other operators are required to pay contribution fees to fund the running costs of AGCom. These fees are calculated on the basis of each operator s revenues.

On February 19, 2019, AGCom issued Decision 527/18/CONS on the payment of AGCom contribution for the year 2019 (calculated on the 2017 financial statement data). The guidelines for the calculation of contribution fee are unchanged from the guidelines for the calculation of the 2018 fee. For the year 2019, AGCom decreased the rate from 1.35 per thousand to 1.30 per thousand. On the basis of this new rate, TIM paid, under reserve, about 18.328 million euros.

4.3.7 GOVERNMENT S UBB NETWORKS STATE AID PLANS

In June 2016, the EU Commission authorized the Italian Government UBB State Aid Plan for a total amount of 4 billion euros aimed at covering almost 25% of the population living in about 7,200 municipalities belonging to the so called UBB white areas (areas in which there is no NGA network available and there is no interest of private operators to deploy it in the near future) of Italy. The 7,200 municipalities are grouped into two clusters, C and D. In Cluster C, 70% of connections have to reach at least 100 Mbit/s download and 50 Mbit/s upload, while the remaining 30% have to reach at least 30 Mbit/s download and 15 Mbit/s upload. In Cluster D, 100% of connections have to reach at least 30 Mbit/s download and 15 Mbit/s upload.

On June 3, 2016 Infratel published a first call for tender of 1.4 billion euros for deploying, and managing under 20-year concession an UBB passive infrastructure (ducts and dark fiber) in the white areas of 6 regions (Abruzzo, Molise, Emilia Romagna, Lombardia, Toscana and Veneto). On March 7, 2017, the first tender was awarded to Open Fiber.

On August 8, 2016, Infratel Italia called for a second tender for the ultrabroadband white areas of 10 additional Italian regions (Piemonte, Valle d Aosta, Friuli Venezia Giulia, Liguria, Marche, Umbria, Lazio, Campania, Basilicata and Sicilia) and in the Trento Autonomous Province, for a total public financing of approximately 1.25 billion euros. TIM decided to not submit any bid. On July 28, 2017, the Second Tender was awarded to Open Fiber.

In August 2017, the *Comitato interministeriale per la programmazione economica* approved the so-called Phase II of the UBB Plan with approximately 3.4 billion euros budget, of which:

- approximately 2.1 billion euros are designated for infrastructural investments in **grey areas** (areas in which there is one NGA network available); and

- approximately 1.3 billion euros are aimed to incentivize UBB demand, through the concession of **vouchers** to families and businesses.

On April 4, 2018, Infratel launched a consultation on the public investment plan in grey areas . According to the document under consultation, the aim of the public intervention in grey areas is to support investment projects in networks able to provide 1 Gbps symmetrical (download and upload) speed, thus achieving a step change with respect

to the existing networks. The State aid plan must be yet notified to the European Commission for approval.

On April 19, 2018, Infratel called for a third tender for a total amount of 103 million euros to cover the residual ultrabroadband white areas not covered by private operators plans, in Calabria, Puglia and Sardegna. Tim did not submit any economic offer. On December 19, 2018 the tender was awarded to Open Fiber.

4.3.8 SPECTRUM

In October 2018, the Ministry of Economic Development (MISE) s auction for 5G frequencies was concluded. TIM was awarded the following slots:

2 x 10 MHz FDD in the 700 MHz band;

80 MHz TDD in the 3.6- 3.8 GHz band;

200 MHz in the 26.5-27.5 GHz band.

Table of Contents

The slots in 3.6-3.8 GHz and 26.5-27.5 GHz bands are available from January 1, 2019 whilst the slots in 700 MHz band from July 1, 2022 after the freeing of TV broadcasting service. All the frequency rights of use will expire on December 31, 2037.

The total amount of TIM license fee is 2,399.38 million euro which must be paid in several installments over the years 2018-2022 as reported bellow.

2018	2019	2020	2021	2022
477,473,285	18,342,111	110,052,665	55,026,332	1,738,485,953

4.3.9 ANTITRUST ISSUES

v ***Antitrust in Italy***

Ø ***Legislation on competition***

TIM is subject to Italian competition law, and namely the Law of October 10, 1990 no. 287 (Provisions aiming at protecting competition and the market) which set up the AGCM, or Antitrust Authority .

The Antitrust Authority is responsible for:

(i) applying Law 287/1990 and supervising: (a) restrictive agreements; (b) abuses of a dominant position; and (c) concentrations of enterprises;

(ii) applying, whenever the necessary conditions are met, the relevant EU provisions (i.e., Articles 101 and 102 of the Treaty on the Functioning of the European Union);

(iii) applying Legislative Decree September 6, 2005 n. 206 concerning unfair commercial practices; and,

(iv) monitoring conflicts of interest in the case of individuals holding government positions.

In addition, the Antitrust Authority may:

(i) adopt interim measures; and

(ii) enforce commitments binding upon the proposing parties in order to dispel identified anticompetitive concerns closing the investigation without any finding of a violation.

· ***Pending proceedings before the Competition Authority on restrictive agreements and abuses of a dominant position***

Regarding the pending proceedings A514 and I820, see Note Contingent liabilities, other information, commitments and guarantees , of the Notes to the Consolidated Financial Statements included elsewhere herein.

Ø ***Antitrust issues at the European level***

· ***Legislation on competition***

TIM is subject to the European competition law. European competition policy covers anticompetitive agreements (Art. 101 of The Treaty of Functioning of the European Union TFEU), abuse of dominance (Art. 102 of TFEU), mergers (provided that the annual turnover of the combined businesses exceeds specified thresholds, according to Council Regulation (EC) No 139/2004) and state aid (Art. 107 of TFEU).

The EC is empowered by the Treaty to apply these rules and holds a number of investigative powers to that end (e.g. inspection at business and non-business premises, written requests for information, etc.). It may also impose fines on undertakings which infringe the EU antitrust rules. The main rules on procedures on the implementation of the competition rules set forth in Art. 101 and 102 of the Treaty are set out in Council Regulation (EC) 1/2003.

Table of Contents

Since May 1, 2004 all National Competition Authorities have also been empowered to fully apply EU Antitrust rules (i.e. Art. 101 and 102 of the TFEU) in order to ensure that competition is not distorted or restricted. National courts may also apply these provisions in order to protect the individual rights conferred on citizens by the Treaty. State aids rules, on the contrary, can only be applied by the EC.

As part of the overall enforcement of EU competition law, the EC has also developed and implemented a policy on the application of EU competition law to actions for damages before national courts. It also cooperates with national courts in order to ensure the coherent application of the EU competition rules within the Member States.

4.3.10 TELECOMMUNICATION REGULATORY FRAMEWORK IN BRAZIL

TIM Group s operations in Brazil are subject to the 1997 General Law on Telecommunications (Lei Geral de Telecomunicações **LGT**) and to a comprehensive regulatory framework for the provision of telecommunications services adopted by the Regulatory Agency for Telecommunications Agência Nacional de Telecomunicações (**ANATEL**).

ANATEL is responsible for the regulation and implementation of national policies in matter of telecommunications. It is a quasi-independent body (the relationship with the Ministry of Communication is institutional, but not hierarchical) enjoying financial and operational autonomy and a wide range of functions and powers, to ensure retail customer´s rights, quality of service and competition to avoid concentration of services. The board members have a fixed term, are selected and appointed by the President under approval by the Senate.

ANATEL has the power to impose restrictions, limitations or conditions on concessions, permits or authorizations. ANATEL has the authority to propose and issue legally binding regulations on telecommunications service providers. The rules issued by ANATEL are subject to periodic updates. Any proposed regulation or action by ANATEL is subject to a period of public consultation, which may include public hearings, and can be challenged in Brazilian courts.

ANATEL privatized the former public monopolistic operator and progressively opened the market to competition, in addition to promoting universal access to basic telecommunications fixed services.

With regard to the operational activity of TIM Brasil, ANATEL developed regulations for mobile communication services (Serviço Móvel Pessoal or **SMP**), fixed communications services (Serviço Telefonico Fixo Comutado or **STFC**) and data transmission and multimedia services (Serviço de Comunicação Multimídia or **SCM**).

In 2010 virtual mobile operators were allowed to enter the market upon commercial agreements with the established operators.

In 2016 and 2017 ANATEL issued certain regulations that are particularly relevant to TIM Brasil s operations, including: Resolution No. 663/2016, which modified rules of the MVNO Regulation; Resolution No. 667/2016, which approved the General Regulation of Accessibility in Telecommunications Services of Collective Interest; Resolution No. 668/2016, which modified the STFC Regulation; and Resolution No. 671/2016, which approved the Regulation on the Use of the Radiofrequency Spectrum and modified the Regulation on the Collection of Public Price for the Right of Use of Radiofrequencies and the Regulation on the Imposition of Administrative Sanctions; Resolution No 683/2017, which disciplines the obligation to share support infrastructure for the provision of telecommunications

service, including towers poles, towers, masts, cabinets, ducts, conduits, surface structures and suspended structures.

Throughout 2018, Anatel enacted several impotant regulations, such as: (i) Resolution No 693/2018 which approved the new General Interconnection Regulation (RGI) which revoked the General Interconnection Regulatory Framework enforced by ANATEL in 2005; (ii) Resolution No 694/2018 which approved the new General Plan for Competition Targets (PGMC), updating the tools for market analysis and identification of operators with market power and imposition of ex-ante obligations; (iii) Resolution No 695/2018 which approved the new Public Price for the Right to Use of Radio Frequencie (PPDUR) establishes two calculation basis, one for renovation of RF and other for license acquisition; (iv) Resolution No 702/2018 which approved the new Public Price for the Right to Explore Satelites and Telecommunication Services reducing the authorization fee to R$ 400,00 for all telecommunication service; and (v) Resolution No 703/2018 which approved the Spectrum Use Management, which set up a new cap for Spectrum usage limits.

Table of Contents

v ***Authorizations***

ANATEL carried out the privatization of the former public monopoly operator and gradually opened the sector to competition, in addition to fostering universal access to basic telecom fixed services (STFC). According to the General Telecommunications Law and to the regulations issued by ANATEL, licenses to provide telecommunications services are granted either under the public regime, by means of a Concession or a Permission, or under the private regime, by means of an Authorization. Only certain fixed-line service providers are currently operating under the public regime (Telefónica, Embratel, CTBC, Sercomtel and Oi, commonly referred to as Concessionaires). All the other telecommunications services providers in Brazil are currently operating under the private regime, including all the mobile and data service providers.

Since the launch of GSM mobile services in 2002, four main players operate in the mobile market (Claro, Vivo, Oi and TIM) and compete nationwide. Third generation mobile services were introduced in 2008 while fourth generation mobile services started in 2012.

The authorizations for fixed and mobile services give the TIM Group (which operates under the brand name TIM Brasil) coverage of the entire country of Brazil allowing it to provide fixed, mobile, long distance and data services.

The rules require that all telecommunications services operators allow network access to any interested party to provide value-added services, without discrimination, unless technically impossible. The voice service providers can also provide value-added service through their own networks.

v ***Interconnection rules***

Telecommunication operators must publish a public interconnection offer highlighting both economic and technical conditions and are subject to the General Interconnection Regulatory Framework enforced by ANATEL in 2005. In May 2012, ANATEL approved a new regulation which, from January 2014, requires the application of the Bill and Keep system for local fixed termination rates, *i.e.*, operators will take rights of tariffs generated on their networks, and no interconnection remuneration will be owed for local calls between two different networks.

Until 2016, the interconnection charges for fixed network (**TU-RL** : Tarifa de Uso da Rede Local) amount to a percentage of retail prices for the incumbent operators. Alternative operators (including TIM) can apply asymmetrical interconnection rates exceeding up to 20% the one applied by the incumbents. As from 2016, the fixed interconnection rates have been following a cost oriented approach.

In July 2018, ANATEL approved the new General Interconnection Regulation which revoked the General Interconnection Regulatory Framework enforced by ANATEL in 2005.

The values of mobile termination rate (called Value to Use the Mobile network VU-M) are freely negotiated by operators. The National Regulatory Authority has, however, arbitration power in case of disagreement and it can determine a reference value according to criterion set up by regulation. From January 2013, the reference values set by ANATEL comply with a glide path , which led to cost orientated values starting from 2016 until 2019 only to SMP operators. On February 24, 2017, considering the glide path provided in Act No. 6,211/2014, mobile termination call values (VU-M) were again reduced, depending on the Plano Geral de Autorizações do Serviço Móvel Pessoal (PGA-SMP) Region, to approximately 0.03 (three cents) reais and, on February 24, 2018, it was reduced to 0.01 (one

cents) reais.

On December 18, 2018, Anatel published the corresponding Acts No. 9,019/2018, 9,020/2018 and 9,021/2018, which determined the specific reference rates effective as of February 2019.

v ***General Competition Plan***

In November 2012, ANATEL published the General Plan for Competition Targets (the PGMC), introducing tools for market analysis and identification of operators with market power and imposition of ex-ante obligations.

The decision opens the networks of the operators with SMP to unbundling and wholesale broadband access. It also improves transparency measures through the creation of a Supervisory Board to ensure the respect of the wholesale service quality levels.

Table of Contents

Item 4. Information On The TIM Group **Regulation**

In each market, ANATEL imposed a set of asymmetrical obligations to operators having SMP.

In the fixed access market an access obligation on copper networks (e.g., Leased Lines, bitstream and full unbundling) for the vertically integrated, fixed operators having SMP (Oi, Telefónica and Telmex) was introduced.

In July 2018, ANATEL published the new PGMC reviewing some of its points and set up two new markets: (i) interconnection for telephone traffic in fixed networks; and (ii) high capacity data transport. TIM Brasil has been identified as having SMP in the wholesale markets of mobile termination, national roaming, and high capacity data transport (in five municipalities). The measures applied to a SMP operator in those markets include:

- a glide path on mobile termination rates based on a price cap system and maintenance of partial Bill & Keep until the next revision of PGMC;

- an obligation to offer the service of national roaming to operators not having SMP based on a price cap system.

- an obligation to offer high capacity data transport based on a price cap system.

As from new PGMC, alternative operators can t apply asymmetrical interconnection rates exceeding up to 20% the one applied by the incumbents. As from 2016, the fixed interconnection rates have been following a cost oriented approach.

Due to such classification, we are subject to increased regulation under the PGMC, which could have an adverse effect on our business financial condition, results of operations and compliance with regulations.

Ø **Cost models implementation**

In 2005, ANATEL issued a ruling for Accounting Separation and Cost Accounting . This ruling introduced the obligation to present the Accounting Separation and Allocation Document (Documento de Separação e Alocação de Contas **DSAC**) for license holders and groups holding SMP in the fixed and/or mobile network interconnection and wholesale leased lines markets (Exploração Industrial De Linha Dedicada **EILD**). Operators, including TIM, are providing ANATEL with the requested information since 2006 for fixed services and since 2008 for mobile services.
In July 2014, ANATEL published the final decision regarding the costing models to set the wholesale reference values for the fixed and mobile access and interconnection services, as well as the reference values for the Leased Lines (Industrial Exploitation of the Dedicated Line **EILD**).

As from 2016, Fixed Termination Rates (**FTRs** or **TU-RL**) and Mobile Termination Rates (**MTRs**) are cost oriented to achieve the efficient cost level based on BU-LRIC model in 2019. For EILD, the efficient cost level will be reached in 2020.

ANATEL signaled that all products (not only call termination rates and Leased Lines) will be cost oriented from the revision of the PGMC. In October 2016, all operators were required to answer a Data Request from ANATEL, which

intended to raise the necessary data to update the cost model for all the products in the PGMC, such as national roaming and passive infrastructure.

Ø **Mobile interconnection rate glide path**

In November 2012, TIM Brasil, along with other national mobile operators Vivo, Claro and Oi, were identified by ANATEL as having Significant Market Power (SMP) in the wholesale mobile termination market.

The remedies applied to SMP mobile operators included a glide path on mobile termination rate (VU-M), based on a price cap system.

In July 2014, ANATEL published a final decision regarding the cost model and the reference values of the mobile termination rates that will apply over the period from 2016 to 2019 for SMP operators. For 2016, MTRS were set with a Top Down methodology, and 2017-2018 MTRs will be based on linear progressive reductions until convergence to the BU-LRIC model is reached in 2019. The 2019 MTR (based on a full LRIC cost model) of 0.017 reais/min. (0.47 eurocents), will be lower than the current European MTR average of approximately 1.1 eurocents, although the latter is based on pure LRIC cost model.

Table of Contents

Under the glide path of reductions defined by ANATEL, from February 2016, SMP operator MTRs (TIM Brasil, Vivo, Claro and Oi) are about 0.10 reais/min. (2.7 eurocents) on average. These termination rates represent a decrease of 37% relative to 2015 rates.

Between operators with SMP a full billing scheme is applied (i.e. each operator charges the total amount of the traffic terminated on its network). Conversely, between SMP and non SMP operators, an asymmetric scheme applies (so called partial bill&keep): each operator only pays the portion of the terminated traffic on the other network that exceeds a threshold percentage determined by the regulator with respect of the total traffic exchanged at the interconnection. Until February 2015, this threshold was set at 80% (i.e. a non SMP operator pays only if the terminated traffic on the SMP operator network is more than 80% of the total traffic exchanged at the interconnection).

According to the previous rules, by February 2015, the partial bill & keep threshold between SMP and non SMP operators would have decreased to 60% and from February 2016 the full billing scheme would have been adopted. To harmonize the evolution of the values of mobile interconnection with the introduction of cost-oriented values, in February 2015 the regulatory authority (ANATEL) postponed to 2019 the introduction of the full billing scheme in the interconnection between operators with market power and without market power, with a progressive decrease of the mentioned threshold over the next years.

However, as mentioned before, the last revision of PGMC in 2018, determined that partial Bill and Keel will be apply until the next revision of PGMC.

Ø **Lower fixed to mobile call prices for incumbent operators**

Under the Brazilian regulation, MTR reductions must translate into reductions in retail fixed to mobile call prices. Accordingly, ANATEL established new fixed to mobile retail call rates for fixed telephony concessionaries reflecting the lower mobile termination rates applicable starting on February 25, 2016.

Ø **Allocation of the 700 MHz band**

The auction for the allocation of the 700MHz band (698-806 MHz), the provision of the fourth generation mobile services and high speed internet was held in September 2014.

TIM Brasil, Claro and Vivo were granted three of the four auctioned national blocks of 10 + 10 MHz. TIM Brasil offered 1,947 million reais. The Auction also ordered the winning bidders to constitute an entity responsible for the spectrum clean-up process. A total amount of 3.6 billion reais is designated for the completion of the process and TIM shall pay 1,199 million reais.

The frequencies will be available in all Brazilian cities that could face interference in simultaneous TV and Long Term Evolution (**LTE**) operations within 9 months of the complete switch-off of analogue television channels.

The initial forecast contemplated 5,570 cities with a switch-off in 2018, however, Ministry Ordinance nº 3493/2016, established that:

· approximately 1,500 cities can have an immediate LTE activation since the frequencies are already free;

· approximately 2,700 cities only need analog channel relocation (switch-off not necessary now); and

· approximately 1,400 cities would have a switch-off by 2018.

Bid winners were required to cover the costs for the implementation of the measures to overcome any spectrum interference and the expenses resulting from the reallocation of Digital TV channels.

In December 2014, TIM acquired the 718-728 MHz and 773-783 MHz sub-bands with national coverage; these authorisations are valid until 2029. These sub-bands are only partially available for mobile operation because they remain in use by broadcasters and ANATEL s approval required for their usage is still pending. The mobile operations on those sub-bands may only begin after the reallocation of broadcasting channels and the following approval by ANATEL and interference mitigation.

Table of Contents

Since 2016, the spectrum of 5,089 municipalities have already made available for mobile operation, including all Brazilian capitals. These municipalities represent 91.84% of the Brazilian population (187.8 million). Currently about 2,859 cities are in operation.

Spectrum auction in the 1800 MHz, 1900 MHz, and 2500 MHz bands

On April 19, 2016, ANATEL s auction Committee assigned the multi-band local spectrum (135 MHz in the 1800 MHz, 1900 MHz, and 2500 MHz bands, including 60 MHz of unpaired Time Division Duplex spectrum) auctioned in December 2015 for mobile and fixed-wireless broadband services.

TIM was awarded Frequency Division Duplex (FDD) spectrum in the 2500 MHz band enabling the provision of 4G/LTE services in the metropolitan areas of Recife and Curitiba. Authorization Terms were signed in July 2016 for 15 years, and can be renewed for an additional 15-year term.

TIM and other mobile operators (Vivo, Claro and Oi) were eligible to bid for spectrum in 1800 MHz band since the publication of Resolution No 703/2018, which set up a new cap for Spectrum usage limits.

Ø **Marco Civil de Internet**

The Marco Civil Internet , which went into effect in June 2014, constitutes a kind of Constitution on the use of the Internet in Brazil.

Key topics covered in the new regulations include net neutrality, collection, use and storage of personal data, confidentiality of communications, freedom of expression and the treatment of illegal, immoral or offensive contents.

The Marco Civil has been elaborated upon by the issuance of a government decree of implementation and enforcement. The ministry s decree (issued on May 11, 2016) addresses three main aspects:

· clarification of the scope and implementation of the net neutrality rules;

· implementation of the rights and obligations for the protection of personal data; and

· governance of the Marco Civil, including authorities in charge of its enforcement.

The decree went into effect on June 10, 2016.

In August, 2018, the Brazilian president passed Law No. 13,709/2018, which altered the Internet Framework and established a comprehensive data protection system that applies across multiple economic sectors and contractual relationships (*Lei Geral de Proteção de Dados*), or the LGPD. LGPD has detailed rules and obligations regarding the collection, processing, storage and use of personal data and will affect all economic sectors, including the relationship between customers and suppliers of goods and services, employees and employers and other relationships in which

personal data is collected, whether in a digital or physical environment. In December, 2018, Provisional Measure 869/2018 passed by the former Brazilian president amended Law 13,709 to create the National Data Protection Authority, within the structure of the Presidency of the Republic, which implies in a larger control by the State and to, among other topics, extend to 24 months the entry into force of the Law, by which date (August 2020) all legal entities will be required to adapt their data processing activities to these new rules. Any additional privacy laws or regulations enacted or approved in Brazil or in other jurisdictions in which we operate could seriously harm our business, financial condition or results of operations

Ø **Review of the current regulatory model for the provision of telecom services**

The Brazilian government aims to review the 1997 General Telecommunication Law and to transform the old fixed telephony Concessions into Authorizations, modifying the relevant and related obligations.

On April, 11, 2016, following a public consultation that closed on January 15, 2016, the Ministry of Communications issued guidelines for ANATEL on how to carry out this transformation and move to a more market-oriented licensing approach.

Table of Contents

The Ministry recommended that public authorities should promote access to broadband service at affordable costs and levels, putting broadband at the center of public policies.

ANATEL is directed to:

- propose concrete rules and criteria to enable the phasing-out of concessions;
- highlight the consistency of the new licensing rules with the existing infrastructure coverage obligations;
- ensure service provision (including broadband) in less attractive economic areas;
- give incentives to concessionaires to migrate to the new licensing framework;
- lessen the universal service obligations for fixed telephony;
- schedule the phasing-out of the retail price control over retail fixed telephony services;
- withdraw recurring licensing fees;
- schedule the phasing out of the asset reversion scheme (foreseeing that the network assets used to provide services under a concession must be returned to the state upon the expiry of the concession); and
- establish suitable mechanisms to ensure regulation compliance control.

As a result of the on-going debate regarding the licensing regime, ANATEL was tasked with reviewing concession contracts by December 2016. However, after the publication of Resolution 673, approved on December 30, 2016, the deadline for reviewing these contracts was postponed to June 30, 2017, notwithstanding revised concession contracts have been not signed yet.

Additionally, a Bill of Law (PLC Projeto de Lei da Câmara 79/2016) is under review, which amends Law 9.472/1997 (LGT), allowing ANATEL to change the licensing model of telecommunications service. The concession agreement shall be replaced by an authorization form following ANATEL s approval. ANATEL is responsible for attesting the criteria of effective competition and proof of fulfillment of universal service targets in the provision of Serviço Telefônico Fixo Comutado or Fixed Switched Telephony Service (**STFC**).

This Bill also changes radiofrequency rules, establishing subsequent and unlimited renewals of up to 20 years and creates Spectrum Secondary Market, allowing Radiofrequency trading among players.

The Bill has been approved by the Lower House and the Senate but has not been approved at the presidential level. On December 22, 2016, a number of senators from opposition parties filed a petition for writ of injunction (Mandado de Segurança). Legislative discussion returned in February 2017 and the Bill of Law now awaits Senate approval.

The bill awaits a vote in the Senate. Even if the Senate approves the bill without changes in connection with the proposal approved by the House of Representatives, Presidential approval will be required.

Additionally, in 2018, entered into force the Conectivity Plan Decree (Decree No 9612/2018) which updates and consolidates, in a single instrument, the public policies for the telecommunications in Brazil. The Decree establishes a series of guidelines for execution of terms of conduct adjustment, onerous granting of spectrum authorization and regulatory acts in general which includes: (i) expansion of high capacity telecommunications transport networks; (ii) increased coverage of mobile broadband access networks; and (iii) broadening the coverage of fixed broadband access network in areas with no internet access offer through this type of infrasctructure. It also establishes that the network implemented from the commitments will be subject to sharing from its entry into operation, except when there is appropriate competition in the respective relevant market.

This decree repealed Decree No. 4,733 / 2003, which provided for public telecommunications policies; Decree No. 7,175 / 2010, which established the National Broadband Plan (PNBL); and Decree No. 8.776 / 2016, which created the Brazil Intelligent Program, a new stage of expansion of the PNBL with actions to universalize access to the Internet and increase the average speed of fixed broadband in the country.

Table of Contents

4.4 TRANSACTIONS WITH U.S. SANCTIONED COUNTRIES

In accordance with our Code of Ethics and Conduct, we seek to comply with all applicable international trade laws including applicable sanctions and embargoes. Below we discuss our activities related to certain countries that are targets of U.S. economic sanctions: Iran, North Korea, Sudan and Syria (the **Designated Countries**).

Activities relating to the Designated Countries

To our knowledge, activities relating to Designated Countries are as follows:

(i) **Roaming Agreements** with local mobile phone operators:

- **North Korea**: none;
- **Iran:** KFZO-TKC (former Payam Kish), Gostaresh Ertebatat Taliya PJS (former Taliya), Rightel Communication, Irancell (**MTN**), Mobile Company of Iran (MCI) and Telecommunication Company of Iran;
- **Sudan**: ZAIN Sudan and Areeba (former MTN Sudan);
- **Syria**: MTN Syria (former Spacetel Syria 94 and former Areeba) and Syriatel Mobile Telecom SA (**Syriatel**).

(ii) **International Carrier Agreements** for the delivery of voice and data traffic from such countries to our networks and from our networks to such countries including in connection with our roaming agreements. To this end, our subsidiary Telecom Italia Sparkle S.p.A. (**TI Sparkle**), directly and through its subsidiaries, has agreements with the Telecommunication Company of Iran (**TCI**) in Iran; Sudan TLC (former PT&TG PUBLIC SUDAN), Sudatel Telecom Group, ZAIN Sudan and Canartel in Sudan; and Syrian Telecom Establishment (STE) (Directorate General of Syria) in Syria.

TI Sparkle has an agency agreement with Cypress Corporation DFZCO (a company incorporated in the free zone of the Dubai airport) that promotes the use of voice services towards Syrian Telecom Establishment (**STE**), a company reportedly affiliated with the government of Syria. The agreement provides that we pay this agent based on a fee that is a percentage of revenues we earn.

In addition, TIM S.p.A. has entered into certain agreements for the provision of TLC services (marine radio traffic) with Telecommunication Infrastructure Company of Iran (**TIC**) for services to the Islamic Republic of Iran Shipping Lines.

(iii) **Commercial Sale and Other Agreements**.

In quantitative terms, the impact of all such agreements (roaming, international carrier, commercial sale and other) on the TIM Group consolidated financial statement line items are as follows:

	Year ended December 31, 2018 (thousands of euros)
Revenues	7,794
Expenses	6,796
Receivables	28,024
Payables	28,181

Roaming Agreements

We operate one of the largest mobile networks in Italy. Through our foreign subsidiaries, we also have large mobile operations in Brazil (Tim Participações S.A. through its subsidiary TIM S.A.). The following is the definition of roaming:

Roaming: *A function that enables wireless subscribers to use the service on networks of operators other than the one with which they signed their initial contract. The roaming service is active when wireless is used in a foreign country (included in GSM network).*

[3] Effective October 12, 2017, the U.S. Government lifted comprehensive sanctions with respect to Sudan and the Government of Sudan, although the State Department has not yet remove Sudan from its list of state sponsors of terrorism. Accordingly, we have included disclosure with respect to Sudan and have included Sudan within the definition of Designated Countries.

Table of Contents

Item 4. Information On The TIM Group Transactions With U.S. Sanctioned Countries

Like all major mobile networks, in response to competition and customer demands, TIM and Tim Participações group have entered into roaming agreements with many foreign mobile networks, in order to allow customers to make and receive calls when travelling abroad.

Roaming agreements, including those relating to the Designated Countries, are on standard terms and conditions. In fact, entering into roaming agreements is an activity carried out in the ordinary course of business by a mobile network operator.

Roaming agreements are, generally, reciprocal. Pursuant to a roaming agreement our mobile customers may, when they are in a foreign country covered by the network (the **Foreign Network**) of an operator with which we have a roaming agreement, make and receive calls on their mobile using such operator s network. Likewise, when a customer of such Foreign Network is in Italy (or Brazil), such customer may make and receive calls using our networks or the networks of other mobile operators in Italy (or Brazil) if this foreign Network has an International Roaming Agreement with other Italian (or Brazilian) Operators.

Calls made and received by our customers through the services of the Foreign Network are billed by the Foreign Network to us at the roaming rate agreed upon in the applicable roaming agreement. We then bill our end customers according to the specific tariff plan of the subscription they have signed with us. Similarly, we bill the Foreign Network at the roaming rate agreed upon in the applicable roaming agreement. The Foreign Network will bill its clients for the calls made and received using our networks according to their specific offer to their customer base. Roaming contracts do not, generally, contemplate other fees or disbursements.

The purpose of all of these roaming agreements is to provide our customers with coverage in areas where we do not own networks. In order to remain competitive and maintain such coverage, we intend to continue maintaining these agreements.

In 2018, our total revenues from roaming agreements with networks of the Designated Countries are detailed as follows:

	Year ended December 31, 2018 (thousands of euros)
North Korea	
Iran	5
Sudan	10
Syria	5
Total revenues from roaming agreements	**20**

In 2018, our total charges from roaming agreements with networks of the Designated Countries are detailed as follows:

	Year ended December 31, 2018 (thousands of euros)
North Korea	
Iran	82
Sudan	90
Syria	14
Total charges from roaming agreements	**186**

Table of Contents

Item 4. Information On The TIM Group **Transactions With U.S. Sanctioned Countries**

As of December 31, 2018, our total receivables from roaming agreements with networks of the Designated Countries are detailed as follows:

	As of December 31, 2018 (thousands of euros)
North Korea	
Iran	694
Sudan	52
Syria	45
Total receivables from roaming agreements	**791**

As of December 31, 2018, our total payables from roaming agreements with networks of the Designated Countries are detailed as follows:

	As of December 31, 2018 (thousands of euros)
North Korea	
Iran	2,692
Sudan	53
Syria	90
Total payables from roaming agreements	**2,835**

The amounts of revenues, charges, receivables and payables are *de minimis* when compared to our consolidated revenues, operating expenses, trade receivables and trade payables, respectively.

International Carrier Agreements with the Designated Countries

In the modern telecommunication business, when traffic from a specific network is placed with, or transported through, our networks, we receive a fee from the incoming network. Likewise, when traffic coming from one of our networks is placed with, or transported through, another network, we owe a fee to such network.

The purpose of these agreements is to allow the uninterrupted exchange of international traffic. Consequently, we intend to continue maintaining these agreements.

In 2018, our total revenues from traffic from networks located in the Designated Countries to our networks are detailed as follows:

	Year ended December 31, 2018 (thousands of euros)
North Korea	
Iran	438
Sudan	1,580
Syria	4,649
Total revenues from traffic	**6,667**

Table of Contents

Item 4. Information On The TIM Group **Transactions With U.S. Sanctioned Countries**

In 2018, our total charges from traffic to networks in the Designated Countries from our networks are detailed as follows:

	Year ended December 31, 2018 (thousands of euros)
North Korea	
Iran	5
Sudan	1,936
Syria	4,669
Total charges from traffic	**6,610**

As of December 31, 2018, our total receivables from traffic from networks located in the Designated Countries to our networks are detailed as follows:

	As of December 31, 2018 (thousands of euros)
North Korea	
Iran	5,493
Sudan	11,511
Syria	8,042
Total receivables from traffic	**25,046**

As of December 31, 2018, our total payables from traffic to networks in the Designated Countries from our networks are detailed as follows:

	As of December 31, 2018 (thousands of euros)
North Korea	
Iran	5,151
Sudan	11,832
Syria	8,363
Total payables from traffic	**25,346**

Such amounts of revenues, charges, receivables and payables are *de minimis* with respect to our consolidated revenues, operating expenses, trade receivables and trade payables, respectively.

Commercial Sale and Other Agreements

TI Sparkle provides institutional access to Internet to Syria and Sudan by means of Seabone IP ports and data transmission capacity through international cable systems.

On December 20, 2016, Olivetti and Faravaran Hamgam, a local Iranian company, executed an agreement for the local production and sale of Olivetti s electronic cash registers and the provision of assistance in connection with these machines in Iran. Faravaran Hamgam will locally assemble Olivetti products through one of its own controlled companies. Production has not yet started.

In September 2016, TI Sparkle reached an agreement with TCI for the development of a Point of Presence (**POP**) of Sparkle Internet backbone in Iran and the provision of IP Transit services from Sparkle to TIC. Currently the POP is not open.

Table of Contents

Item 4. Information On The TIM Group **Transactions With U.S. Sanctioned Countries**

In 2018, our total revenues from Commercial Sale and Other Agreements with the Designated Countries are detailed as follows:

	Year ended December 31, 2018 (thousands of euros)
North Korea	
Iran	
Sudan	202
Syria	905
Total revenues from commercial sale and other agreements	**1,107**

As of December 31, 2018, our total receivables from Commercial Sale and Other Agreements with the Designated Countries are detailed as follows:

	As of December 31, 2018 (thousands of euros)
North Korea	
Iran	502
Sudan	333
Syria	1,352
Total receivables from commercial sale and other agreements	**2,187**

* * *

Disclosure pursuant to Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012 (ITRSHRA)

Other than the disclosure above on activities related to the Designated Countries, to our knowledge, none of our sales of products and services are required to be disclosed pursuant to ITRSHRA Section 219.

Table of Contents

4.5 GLOSSARY OF SELECTED TELECOMMUNICATIONS TERMS

The following explanations are not intended as strict definitions, but to assist readers to understand certain terms as used in this Annual Report.

2G (second-generation Mobile System). Second-generation mobile systems using digital encoding and including GSM, D-AMPS (TDMA) and CDMA. 2G networks are in current use all over Europe and other parts of the world. These systems support voice and limited data communications as well as auxiliary services such as fax and SMS.

3G (third-generation Mobile System). Third-generation wireless system, designed to provide high data speeds, always-on data access, and greater voice capacity. 3G networks allow the transfer of both traditional communication services (telephony, messaging) and data (such as downloading Internet information, exchanging email, and instant messaging). The high data speeds, measured in Mbps, are significantly higher than 2G, 3G networks technology enable mobile video, high-speed internet access. The standards of the 3G technology include UMTS, based on WCDMA technology (quite often the two terms are often used interchangeably) and CDMA2000.

4G (fourth-generation Mobile System). Fourth-generation systems are designed to provide, in addition to legacy services, mobile broadband Internet access to several kinds of devices such as laptops with wireless modems, smartphones, tablets, and other mobile devices. Current and future applications include mobile web access, IP telephony, gaming services, high-definition mobile video, video conferencing, Internet of Things and cloud computing applications. 4G standards include LTE e LTE-A (LTE-Advanced). LTE offers a higher spectral efficiency in bits per Hertz and download bandwidth up to 150 Mbit/s per cell reducing the latency time. LTE enables services that require high interactivity (e.g., gaming, video conferencing). A further development of LTE, called LTE Advanced, is being implemented and will allow reaching even higher bitrates in download.

5G (fifth-generation Mobile System). 5G indicates the fifth generation wireless systems that will be introduced on market starting from 2020. International standard for a like 3GPP (3rd Generation Partnership Project) and ITU Commission (International Telecommunication Union) are defining characteristics and standards of 5G future connectivity and the first field trials will be launched in 2018.

The main elements of the 5G network will be:

- bit-rate significantly higher than 4G in larger spectrum bandwidth (up to tens of Gbit/s over hundreds of MHz) to ensure greater quality of service, for innovative services such as video download and live streaming;

- ultra-low latency in the order of milliseconds;

- possibility of connecting simultaneously hundreds of thousands of objects (Internet of Things): wearable technologies, automatic systems for traffic control, assisted driving for vehicles, home automation;

· ability to connect moving vehicles at higher speeds.

Access charge. Amount charged by national operators for the use of their network by customers of other operators. It is also known as an interconnection charge .

ADS (American Depositary Shares)/ ADR (American Depositary Receipt). Equity shares used for the listing of TIM ordinary and savings shares on the NYSE (The New York Stock Exchange). Each ordinary ADS represents to 10 TIM ordinary shares.

ADSL (Asymmetric Digital Subscriber Line). Technology that transforms, through a modem, the traditional copper fixed line into a high-speed digital connection for the transfer of multimedia data. ADSL is an asymmetrical technology used to achieve broadband transmission.

Agile. In software engineering, the expression Agile (or agile software development) refers to a set of software development methods that are opposed to traditional models such as cascade models (e.g., waterfall model); Agile methods propose a less structured approach focused on the objective of delivering to the customer quickly and frequently software that is functional and with best quality. Among the practices promoted by agile methods, today in general referred to the Project Management of products (not exclusively software), there are: the setup of small, poly-functional and self-organized development teams, iterative and incremental development, adaptive planning, and the direct and continuous involvement of the customer in the product development process.

Table of Contents

AI (Artificial Intelligence). Ability of a technological system to solve problems and carry out tasks and activities typical of the mind and human behavior. In the computer science field, it is the discipline that deals with creating machines (hardware and software) able to act autonomously (solve problems, perform actions, etc.).

API (Application Programming Interface). It is a set of procedures used to interact with other programs and expand their functionalities. APIs are software libraries available for a given programming language that extend some functionality of the platforms making them interoperable and open to different implementations.

AltNets (Alternative Network Operators). Companies, other than the incumbent operators, that operate telecommunications systems in a national market.

Analog transmission. Legacy non-digital transmission technology where the representation of voice, video or other information is done by a continuous signal for which the time varying feature (variable) of the signal is a representation of source time varying quantity.

ATM (Asynchronous Transfer Mode). A network protocol through which the transfer of data is achieved using the encapsulation of fixed length (53 bytes) data units, called cells, instead of variable-length packets as is the case in packet-switched networks.

Backbone. Portion of the telecommunication network that supports long-distance connections which aggregates large amount of traffic and from which the connections for serving specific local areas depart.

Big Data. Big data is a term used to describe the set of technologies and methods for massive data analysis. The term indicates the ability to extrapolate, analyze and relate a huge amount of heterogeneous, structured and unstructured data, to discover the links between different phenomena and predict the future ones.

Bit-stream access. Wholesale interconnection services which consist in the supply by a dominant telecommunications operator (incumbent) of access transmission capacity between an end customer and an interconnection point of another operator (OLO).

Blockchain. Blockchain represents an innovative technology for structuring data and information with sharing on the network; a blockchain system is similar to a distributed database or virtual register, structured as a chain of blocks (hence the term blockchain) containing the transactions, and whose validation is entrusted to a consensus mechanism distributed on all the nodes of the network participating to the chain. The main distinguishing characteristics of blockchain are the immutability of the registry, the traceability of transactions and the security based on advanced cryptographic techniques. Blockchain technologies are currently used to support global supply chains, financial transactions (e.g., BitCoin), accounting assets and distributed social networks.

BRAS (Broadband Access Server). Also named BNG, BRAS is equipment that handles the access sessions of fixed broadband users. It authenticates the users, terminates the logical links originated at users premises, produces user accounting data, may apply policies and QoS (Quality of Service) techniques (for the description or measurement of the overall performance of a service).

Bottom-up. The bottom-up approach develops a cost accounting model beginning with the expected demand in terms of subscribers and/or traffic. It then assesses the network design and related costs based on the network

engineering model.

Broadband services. Broadband includes network technologies which achieve a transmission speed of 2 Mbit/s. These speeds are made available on both the copper fixed-line, through ADSL technology, and mobile network, starting from third generation systems. Broadband services include voice and data. Data services comprise high speed internet access, interactive video and audio files, point to point and multi point video services (video calling and video conferencing), video on demand (download and streaming) and television programs.

Broadcast. Simultaneous transmission of the same information to all nodes and terminal equipment of a network.

Table of Contents

BSC (Base Station Controller). Control node of the 2G radio access network and interface with the MSC switching node. It has the task of supervising and controlling radio resources, for both call or data set up and maintenance.

BSS (Business Support System). The system used by network operators to manage business operations such as billing, sales management, customer-service management and customer databases.

BTS (Base Transceiver Station). Radio base station transmitting and receiving the GSM radio signal to cover an area, split in one or more cells) by using one or more radio transceivers (TRX). BTS performs also GSM communications ciphering/deciphering.

Bundle. Commercial offer including multiple telecommunications services (voice, broadband internet, IPTV, other) by an operator under the same commercial brand. *Dual Play* bundle includes fixed telecommunication services and broadband internet; *Triple Play bundle* is the dual play bundle integrated with IPTV; *Quadruple Play bundle* is the bundle triple play integrated with mobile telecommunication services.

Caching. Web-content caching (videos, HTML pages, images, etc.) is a technology that allows for the reduction of bandwidth usage and content access time. A cache stores copies of documents requested by users, so that subsequent requests can be satisfied by the cache itself, under appropriate conditions.

Carrier. Telecommunication services operator, providing a transport of communication services by means of its physical telecommunication network.

Carrier Aggregation. Technology used to aggregating more radio carriers to increase the transmission speed over a wireless network.

CCA. In a current cost accounting (CCA) approach, the operator s asset base is annualized based on the gross replacement cost of the assets. CCA belongs to the family of constant annualization methodologies where the depreciation share is stable and the cost of capital share decreases over time, resulting in decreasing annuities. Unlike historical cost accounting, in current cost annualization methods the amortization is adjusted according to variations in the price of the assets being considered due to technical progress and general variations in price (inflation).

CDMA (Code Division Multiple Access). A channel multiple access method used in radio communication. First radio systems based on CDMA were developed by Qualcomm, and commercially introduced in 1995. It enables the simultaneous transmission on the same channel of multiple signals, each of which is uniquely coded to distinguish it from the other messages.

CDN (Content Delivery Networks). Are content distribution systems (especially large multimedia contents, such as IPTV) managed by a Service Provider for the provision of audio streaming services and video, with better quality towards customers.

Cell. Geographical portion of the territory illuminated by a radio base station.

Central Office. A building where the copper wires or optical fibers that make up the access network, reaching the customers, originate from. It hosts equipment for telephony services (Stadio di Linea in TIM terms), broadband services (DSLAM) and possibly ultrabroadband services (OLT). Some COs also host equipment of higher hierarchical

rank (SGU for telephony, router for data services), and those COs also collect traffic from the other COs which are not so equipped.

Cellular. A technique used in mobile radio technology to use efficiently the same spectrum of frequencies in a network. Controlled power radio transmitters are used to cover a cell (i.e., a limited area) so that the spectrum used for it can be reused without interference in other parts of the network.

Channel. The portion of a communications system that connects a source to one or more destinations by means of transmission media and optical, electric, electromagnetic signals.

Table of Contents

Item 4. Information On The TIM Group Glossary of Selected Telecommunications Terms

Closed User Group. Groups of customers who can make and receive calls or messages within the group at special conditions (e.g., restricted access, dedicated pricing)

Cloud. The term Cloud is used as an abbreviation of the concept of Cloud Computing , a model of consumption of processing resources (e.g., networks, servers, memory, applications and services) through the network. With the Cloud, the end customer, otherwise defined as cloud consumer, is allowed widespread, easy and on-demand access to a shared and configurable set of resources that can be quickly acquired and released with minimal management or interactions with the service provider. The Cloud model is made up of five essential features: 1) Self Service on customer request, 2) broad-network access, 3) resource sharing, 4) elasticity/automation in resource demand, and 5) certified SLAs, three service models (see also SaaS, PaaS and IaaS) and four distribution/deployment models (private, public, hybrid and communities).

Cogeneration. Cogeneration is the combined production of electrical (or mechanical) energy and useful heat from the same primary source. By using the same fuel for two different purposes, cogeneration aims for a more efficient use of primary energy, with associated cost savings especially in production processes where there is a strong overlap between the use of electricity and heating.

Cognitive Computing. Advanced artificial intelligence system in which the machines have part of the typical functions of a human brain. Cognitive computing technologies are able to process enormous amounts of information, learn autonomously, interact in human language and reproduce human thought models.

Community. A group of people who have some interests in common and communicate via Internet (i.e., via social network).

Connected Cars. Connected Cars are vehicles with internet access and sensors for sending and receiving signals, perceiving its surrounding environment and communicating with other vehicles and services.

Co-siting. Agreements to share technological sites (for Telecommunications, specifically, sites of access to the network and passive infrastructure) by several operators in order to achieve a more efficient use of network infrastructure in urban and rural areas.

CPE (Customer Premise Equipment). An electronic device (terminal, telephone, modem) for telecommunications used on the user s side that is able to connect directly to the geographic transmission network through appropriate interfaces. The connection between the CPE and the network can be realized on physical carrier (optical fiber, telephone twisted pair) or on radio (wireless) carrier.

CPS (Carrier Pre-selection). Within the framework of the Equal Access policy guaranteed to all operators, the CPS is a feature of the telephone network that allows to permanently specify the call routing to the chosen operator. This function must be implemented by the access operators in their own plants.

Cybersecurity. Cybersecurity deals with the analysis of threats, vulnerabilities and risks associated with internet-connected systems, including hardware, software and data, to protect such systems from attempts to expose, alter, disable, destroy, steal or gain unauthorized access or make unauthorized use of an asset.

D-AMPS (Digital-Advanced Mobile Phone Service). A digital version of AMPS (Advanced Mobile Phone Service), the original analog standard for cellular telephone service in the United States.

DAS (Distributed Antenna System). DAS is a network of distributed antennas connected to a signal source in order to provide wireless services in a geographical area or indoor. The radiofrequency signal is combined and distributed through an antenna system.

Data Center. Data Center is the department of a company that hosts and manages back-end IT systems and data repositories (i.e., its mainframes, servers, databases, etc.). In the past, this type of management and control was in a single physical place, hence the name data center . The development of new distributed computing technologies has inaugurated new management criteria that see more data centers located/distributed at both a physical and virtual level.

Table of Contents

DCC (Digital Contact Center). DCC is a set of platforms used to connect customers to most appropriate human and virtual customer care agents, via different channels (e.g., voice, web, apps, mail, chat, sms) and to support agents in their interaction with customers (e.g., verbal ordering, back office).

DCS 1800 (Digital Communication System). A derivative of the GSM cellular mobile telephone standard. 1800 refers to the frequency used of 1800 MHz. DCS 1800 is the European PCN standard.

DDoS (Distributed Denial of Service). A distributed denial-of-service (DDoS) is an attack to a target, such as a server, website or other network resource, and cause a denial of service for users of the targeted resource. A flood of incoming messages, connection requests or malformed packets to the target system forces it to slow down or even crash and shut down, thereby denying service to users or systems.

Decommissioning. The disposal of the oldest technological solutions (legacy or obsolete) in order to rationalize and simplify the current Telecommunication networks with the aim of optimizing investments and improving the quality and time-to-market of services.

DevOps. DevOps is an agile method of software development that aims at communication, collaboration and integration between developers and operations operators. DevOps is an approach to the development and implementation of applications in a company, such as the release of the product, the testing of the software, and the evolution and maintenance (correction of bugs and minor releases) of the product to increase reliability and security and speed up development and release cycles.

Digital. A mode of representing a physical variable such as speech using digits 0 and 1 only. The digits are transmitted in binary form as a series of pulses. These networks, through the use of a technology converting analog signals into digital ones, allow for higher capacity and higher flexibility. Digital systems offer lower noise interference and can incorporate encryption as a protection from external interference.

DLA (Data Layered Architecture). An architecture for real-time management of user data in telecoms networks (such as user profiles, etc.). It introduces a separation between a logically centralized data storage layer, taking into account data consistency and availability, and a front-end layer which handles requests coming from network elements.

DPI (Deep Packet Inspection). A technology for analysis of live traffic packets which looks deeply into packets payload (i.e., up to application level, rather than just at IP/TCP/UDP headers level). It enables advanced traffic management.

DSL Network (Digital Subscriber Line Network). A network technology family that provides wide bandwidth digital transmission at short distances, through the traditional twisted copper pairs from the first switching office to the end user.

DSLAM (Digital Subscriber Line Access Multiplexer). DSLAM denotes equipment multiplier of digital access lines able to process digital signals of various clients with xDSL lines and multiply them in a high rate data link to the nodes of the Internet.

DTT (Digital Terrestrial TV). Digital Terrestrial Television Broadcasting is a type of broadcasting technology that provides a more effective way of transmitting television services (in terms of number of channels and images quality) using a digital system.

DVB H (Digital Video Broadcasting Handheld). DVB H was a standard for the transmission of digital video optimized for mobile networks and handheld devices such as smartphones and cellular phones.

DWDM (Dense Wavelength Division Multiplexing). This is a technology for multiplying and transmitting at the same time optical signals with different wavelengths in a single optical fiber in order to increase the available amount of bandwidth.

EDGE (Enhanced Data for GSM Evolution). Technology that increases the speed of data transmission of the GPRS, the standard from 30-40 kbit/s to 400 kbit/s in the best radio transmission radio condition.

Table of Contents

Edge (Network Edge). A segment of the network lying between access and core, wherein service functions are located (e.g., those performed by BRAS). Depending on the context, it may be quite distributed (e.g., to the level of mobile Base Station), or less distributed (e.g., at the edge of the backbone).

EEB (Energy Efficiency in Buildings). International initiative promoted by the World Business Council for Sustainable Development (WBCSD) for research in energy efficiency in buildings in order to reduce the environmental impact and the energy costs.

EFFC (Extraction Full Free Cooling). A cooling system for the reduction of consumption without the use of greenhouse gases. The EFFC is based on the principle of free cooling (forced ventilation without the use of air-conditioning), combined with a system to extract the hot air produced by the apparatus and further cooling (adiabatic) of incoming air obtained by exploiting a zone with a high concentration of nebulized water.

EMF limits (ElectroMagnetic Field limits). Electromagnetic fields are present everywhere and are generated both by natural sources (e.g., thunderstorms, earth magnetism) and human-made sources (e.g., such as power lines, TV antennas, mobile base stations, microwave ovens). They are known to affect human body in ways that depend on their frequency. For radiofrequency fields, such as those produced by mobile base stations and mobile handsets, the major biological effect is heating of the body tissues. The current view of scientific community, as outlined by World Health Organization, is that while exposure to high levels of EMF are harmful to health, there is no evidence that prolonged exposure to low levels of EMF might be harmful. The definition of what is meant to be a level low enough to be harmless is left to individual countries, however guidelines have been defined by the International Commission on Non-Ionizing Radiation Protection (ICNIRP).

For Italy, the exposure limit is 20 V/m. In homes, schools, playgrounds and places where people may stay for longer than 4 hours per day, an attention value of 6 V/m is applied and averaged over any 24 hour period.

EMS (Environmental Management Systems). Environmental management systems contribute to the sustainable management of production and support processes and are a stimulus to the continual improvement of environmental performance as they are tools to ensure effective management, prevention and the continuous reduction of the environmental impact in work processes

eNB (Evolved Node B). The Radio Base Station in 4G technology, which implements LTE radio interface and manages its radio resources.

EPC (Evolved Packet Core). The core segment of a 4G network. It performs management of user mobility, routing of traffic (which in 4G is only packet traffic), policy enforcement, production of accounting data, interconnection with IP networks.

EPS (External Power Supplies). External power supplies of equipment.

eSIM (embedded SIM). The evolution of the SIM. An Embedded SIM is an integrated circuit embedded directly inside a device and consequently not extractable and not replaceable, but remotely managed through the functionality of the device itself.

Ethernet: Family of computer networking technologies for local area networks (LANs) and metropolitan area networks (MANs).

Exchange. See Switch.

Fixed UBB. Access technologies involving the use of optical fibers, known as FTTx, to provide ultrabroadband connectivity.

FTTx (*Fiber to the *). The term used to indicate any network architecture that uses fiber optic cabling in telecommunications access networks to replace, partially or totally, traditional copper cables. The various technological solutions differ in the point of the distribution network where the fiber connection is made, with respect to the end-user s location. In the case of **FTTC** (Fiber to the Cabinet) the fiber connection reaches the

Table of Contents

Item 4. Information On The TIM Group Glossary of Selected Telecommunications Terms

equipment (distribution cabinet) located on the sidewalk, from where copper connections are run to the customer; in the case of FTTB (Fiber to the Building) the fiber arrives at the base of the building to a distribution box from where the vertical copper connection starts; in the case of **FTTH** (Fiber to the Home) the fiber connection terminates inside the customer premises.

FWA (Fixed Wireless Access). FWA refers to a set of transmission systems developed to exploit specific frequencies of the radio spectrum in order to provide fixed broadband connectivity services (with nominal connection speeds equal to 1 Gbps).

Gateway. An interconnection node between networks. A Gateway node may be used to separate networks belonging to different Domains or make functionally different networks interwork through protocol interworking.

G-FAST (Fast Access to Subscriber Terminal, group G of the ITU-T recommendations) is a DSL standard, fourth generation on copper, adopted by ITU-T starting from 2014 that allows to reach aggregate Downstream speeds + Up Stream of about 500 Mbit /s up to 100m. and about 800-900 Mbit /s up to 50m. It is therefore a technology with a speed higher than VDSL2 and eVDSL but, being optimized for very short distances, the network devices must be positioned even closer to the customer than the cabinets line, or rather in distribution boxes at or at the base of buildings.

GRI (Global Reporting Initiative). The Global Reporting Initiative (GRI) is a leading organization in the field of sustainability. GRI promotes sustainability reporting as a way for organizations to become more sustainable and contribute to sustainable development.

GGSN (Gateway GPRS Support Node). Node that acts as a gateway for data traffic between mobile networks (2G and 3G) and the Internet network or private networks.

GPON (Gigabit capable Passive Optical Network). A passive optical network (PON) is a network architecture that brings fiber cabling and signals to the home using a point-to-multipoint scheme that, by unpowered fiber optic splitters, enables a single optical fiber to serve multiple premises.

GPRS (General Packet Radio System). Packet switched system to efficiently transmit data over 2G cellular networks.

GRX (GPRS Roaming eXchange for Mobile Operators). The GRX service allows Mobile Operators to globally interconnect GPRS networks around the world enabling global GPRS roaming coverage.

GSM (Global System for Mobile Communication). A worldwide standard for digital cellular telephony working on the 900MHz and 1800MHz bands. It belongs to the Second Generation (2G) of mobile systems.

HDSL (High-bit-rate Digital Subscriber Line). Technology of xDSL family, standardized in 1994. It provides up to 8 Mb/s symmetrical over copper.

HLR (**Home Location Register**). Database where customer data are recorded. It is part of 2G and 3G systems.

Home Access Gateway Access Gateway Home gateway Residential Gateway. Home networking device that is used to concentrate voice/data/video traffic of customers for private TLC networks and to connect devices in the home to the Internet or other WAN.

Housing. Leasing of physical space to customers, which is managed within a data center for the installation of their own equipment or servers.

HSDPA (High-Speed Downlink Packet Access/UMTS Hi Speed Universal Mobile Telecommunications System). Evolution of UMTS, which enables broadband mobile data both in Downstream (HSDPA) and Uplink (HSUPA), up to 42 Mb/s and 5.76 Mb/s, respectively.

IaaS (Infrastructure as a Service). Through a Cloud IaaS offer (Infrastructure as a Service, see also Cloud models), a consumer acquires from a Cloud Provider in a flexible and dynamic way computing, memory, network

Table of Contents

resources and other fundamental calculation resources, through which the customer can develop and run arbitrary software, including operating systems and applications. The consumer does not manage or control the underlying Cloud infrastructure, but controls operating systems, memory, applications and possibly, in a limited way, some network components (e.g., firewalls).

ICT (Information and communication(s) technology). Broad area concerned with information technology, telecommunications networks and services and other aspects of managing and processing information, especially in large organizations.

IEEE (Institute of Electrical and Electronics Engineers). An organization of professional scientists aiming at promoting technology science and research in the field of electrical and electronics engineering and related fields. IEEE also works as a publishing house and standardization body.

IMS (IP Multimedia Subystem). The architecture for providing IP Multimedia services (i.e., voice, video and text) communications over IP networks. It comprises all the network elements related to signaling and media flow handling.

IMSI (International Mobile Subscriber Identity). The International Mobile Subscriber Identity is a unique identifier associated with a SIM card in cellular networks.

Interconnection. The physical and logical connection among public telecommunication networks belonging to different operators, in order to enable users of an operator to communicate with users of the same or a different operator, or to access services provided by another operator.

Internet. Global network for networks interconnection based on a common protocol suite, i.e., TCP/IP, which is the language by which connected equipment (hots) are able to communicate.

Internet of Things. The extension of Internet to the world of objects (devices, equipment, systems,..etc.), which become recognizable and acquire intelligence due to the fact that they can communicate data about themselves and access aggregate information from other object. There are many fields of applicability including: industrial applications (production processes), logistics and infomobility, to energy efficiency, remote assistance and environmental protection.

IP (Internet Protocol). A connectionless data routing protocol, used for data transmission on both public and private networks, in particular over the Internet.

IPCC (IP Contact Center). See DCC.

IP/MPLS (Internet Protocol/Multi Protocol Labeling Switching). A packet switching protocol to optimize network behaviors of mapping Layer3 (IP) end-to-end data flow to Layer2 traffic between adjacent network nodes.

IPTV (Internet Protocol Television). A system that utilizes the Internet Protocol infrastructure to transmit digital television content over a network and deliver it via a broadband Internet connection.

ISDN (Integrated Services Digital Network). A narrowband system in which several services (e.g., voice and data) may be simultaneously transmitted end to end in digital form.

ISPs (Internet Service Provider). A vendor who provides access to the Internet and World Wide Web.

ITU (International Telecommunication Union). An international organization that aims to set telecommunications standards and in the use of radio waves. Founded in 1865 in Paris, it is one of the specialized agencies of the United Nations and its head office is in Geneva.

Jitter. In electronics and telecommunications, jitter indicates the variation of one or more characteristics of a signal, such as amplitude, frequency, phase, transmission delay. The causes leading to jitter must be kept at the center of the design of electronic systems and components in which signal integrity is a strict constraint.

Table of Contents

LAN (Local Area Network). A private network that covers a local geographic area and provides public telecommunications services as well as interconnection between personal computers.

Latency. The latency of a system can be defined as the time interval between the time the input arrives to the system and the time when its output is available. In other words, latency is nothing more than a measure of the speed of response of a system.

LCA (Life Cycle Analysis). Analysis methodology for the evaluation and quantification of environmental impacts associated with a product, process or activity along the entire life cycle from the extraction and acquisition of raw materials to the end of its life.

Local Loop. Twisted pair of copper wires through which the telephone connection reaches users; it is the foundation of traditional telephone lines and it is often called the last mile .

LLU (Local Loop Unbundling). Service by which alternative operators other than TIM can lease the local loop, i.e., the wire connection between the TIM local exchange and the customer s premises.

LRIC (Long run incremental cost). Long run incremental cost is the cost of producing a specific additional increment of a given service in the long run (the period over which all costs are variable) assuming at least one other increment is produced. It includes all the directly assignable variable economic costs of a specific increment of service, which is usually less than the whole service.

LTE (Long Term Evolution). Represents the fourth generation (4G) of mobile phone systems. LTE belongs to the 3GPP (Third Generation Partnership Project) standard and is the latest evolution of the GSM / UMTS / HSPA standards. LTE offers a higher spectral efficiency in bits per Hertz and download bandwidth up to 150 Mbit/s per cell reducing the latency time. LTE enables services that require high interactivity (e.g., gaming, video conferencing). A further development of LTE, called LTE Advanced , is being implemented and will allow reaching even higher bitrates in download.

Machine Learning. The ability of computers to learn without having been explicitly and preventively programmed.

MEMS (Micro-Electro-Mechanical Systems). MEMS are miniaturized devices ranging in size from a few micrometers to a few millimeters, which execute one or more monitoring, processing or actuation functions by deploying a combination of electronic, mechanical, optical, chemical or biological components integrated on a usually silicon hybrid circuit.

MGCP (Media Gateway Control Protocol). An Internet Engineering Task Force (IETF) signaling protocol allowing a bridge between classic telephone networks and Internet (i.e., IP-based) infrastructures.

MGW (Media GateWay). Equipment that processes voice and video traffic adapting codings between different technologies (e.g., from circuit to packet).

Microservices. A specific architectural model for the development of a single application as a suite of small services. Each micro-service is identified as a specialized processing process (e.g., a web server or a storage application) and is able to communicate with fast and lean mechanisms, often based on API interfaces for the

description of HTTP resources. These services provide capabilities for the development of a company s business and are particularly suitable for the creation of software products according to agile methodologies. Each micro-service can be implemented and managed independently using fully automated implementation algorithms, thus ensuring maximum flexibility in the development and maintenance of applications.

MIMO (Multiple Input Multiple Output). A set of techniques aimed to increase the overall bitrate of radio access through simultaneous transmission of two (or more) different data signals on two (or more) colocated antennas, using the same frequency resources. The receiving side, also equipped with two or more antennas, is able to discriminate the different data signals by exploiting the differences in time and direction of arrival of the simultaneous signals that are caused by multipath propagation. Multipath propagation (i.e., the fact that a signal

Table of Contents

from A reaches a point B via multiple paths due to reflection and scattering from objects (such as buildings, trees)) is a natural phenomenon affecting radio communications, which used to be seen as an impairment. Conversely, MIMO techniques exploit (using suitable signal coding) this multiplicity of paths to increase capacity.

Mobile UBB. Mobile ultrabroadband refers to the use of HSPA mobile network (evolution of the 3G network), LTE and its evolution to provide ultrabroadband connectivity.

MPLS (Multi Protocol Label Switching). See IP/MPLS.

MSC (Mobile Switching Center). Executes functions such as controlling calls, switching traffic, billing, controlling and authentication and acts as an interface with other networks.

Multicast ABR (Multicast Adaptive Bit Rate). Technology that encodes the video multicast traffic in different streams at different bitrates, used according to the channel conditions, allowing to optimize the use experience the use of network resources.

Multimedia. A service involving two or more communications media (e.g., voice, video, text, etc.) and hybrid products created through their interaction.

MVNO. (Mobile Virtual Network Operator). MVNO is a mobile communications service provider that does not own the radio spectrum or wireless network infrastructure over which the MVNO provides services to its customers.

NaaS (Network as a Service). The term NaaS (Network as a Service) refers to the provision of virtual network services by a Network Provider to a third party, such as a Service Provider not equipped with geographically networked resources, or a medium/large customer that requires basic or advanced connectivity resources on a public or shared network infrastructure. Some examples of services that refer to the NaaS model are Virtual Private Networks (VPNs), Dynamic Bandwidth Services (Bandwidth on Demand) and Mobile Network Virtualization. Today, the spread of NaaS offers is increasingly supported by flexible network virtualization models and the use of network programming and automation technologies, such as Software Defined Networking (SDN).

Naked. A digital subscriber line without an analog or ISDN telephony service. It is a line dedicated to data services.

NB IoT (NarrowBand Internet of Things). A 3GPP specification enabling the Internet of Things, based on the optimization of narrowband radio access aimed at the application of LTE technology to sensor networks. Its characteristics include few and small messages per day, high coverage range (e.g., to reach the counters in the basements), very high battery life (target 10 years), high number of connections per cell (tens of thousands) and very low cost of the modules.

Net Neutrality. The principle that Internet service providers should treat all data equally and not discriminate or charge differently based on user, content, website, platform, application, type of equipment or method of communication.

Network. An interconnected system of elements. In a telephone network, these consist of switches connected to each other and to customer equipment. The transmission equipment may be based on fiber optic or metallic cables or radio connections.

Network cap. See Price cap.

NFV (Network Function Virtualization). The NFV paradigm allows both fixed and mobile network functions to become software applications, called VNF (Virtual Network Function), which the operator can instantiate on commercial servers, exploiting virtualization technologies, separating the link between hardware and software present in the current network devices.

NGAN (New Generation Access Network). It can be realized with different technological solutions, typically fiber optic and VDSL pairs.

Table of Contents

NGCN (Next Generation Core Network). TIM s own name for the IP backbone.

NGDC (Next Generation Data Center). A major rethink of the IT and Data Center architecture through the physical concentration and virtualization of servers to reduce the costs of maintenance/management and energy consumption, and to improve efficiency.

NGN (Next Generation Network). New generation network created by TIM to meet the demands of corporations, public administrations and citizens. The new network architecture guarantees an infrastructure designed to cover multiple offers by increasing customization levels and bandwidth availability, removing bandwidth limits and providing a huge capacity along with a wide selection of access systems.

NGNs (Non-Geographic Numbers). Non-geographic numbers are unique as they are by definition not associated with any particular geographic location (*e.g.,* premium rate services, toll free, directory assistance services).

Node. Topological network junction, commonly a switching center or station.

Node B (similar to BTS in GSM). This is the Radio Base Station in UMTS technology which, via an antenna, sends the UMTS radio signal that creates cell coverage (typically 3 cells for Node B). It also performs functions that are strictly linked to managing the radio connection.

N-play offering. Offerings to customers which bundle two or more of the following mobile and fixed services: voice, broadband and ultrabroadband data, video and TV, mobile.

NYSE. The New York Stock Exchange.

OAO (Other Authorised Operator). Operators other than the incumbent one that provide services to their customers by using the fixed access network of the incumbent.

OHSAS (Occupational Health and Safety Assessment Series). An international standard that sets the requirements that a management body for the protection of workers health and safety must meet.

OLOs (Other Licensed Operators). Companies other than the incumbent operator that operate telecommunications systems in a national market.

OLT (Optical Line Termination). Optical element of the PON network (Passive Optical Network) that acts as an interface between the PON itself and the Backbone network. OLT is located in the central office.

ONU (Optical Network Unit). Optical element of the PON network (Passive Optical Network) which acts as an interface with the user access device or the distribution network to users. ONU is located in the distribution cabinet.

Open Source. A computer software in which source code is released under a license in which the copyright holder grants users the rights to study, change and distribute the software to anyone and for any purpose. Open-source software may be developed in a collaborative public manner.

Optical fiber. Thin glass, silica or plastic wires, building the base infrastructure for data transmission. An optical fiber cable contains several individual fibers, and each of them is capable of delivering a signal (light impulse) at almost unlimited bandwidth. Optical fibers are usually employed for long-distance communication: they can transfer heavy data loads protected from possible disturbances along the way. The driving capacity of optical fibers is higher than the traditional cable and copper twisted-pair lines.

OSS (Operations Support System). Methods and procedures (whether automatized or not) that directly support the daily operation of the telecommunications infrastructure.

OTN (Optical Transport Network). A technology designed to enable multiplexing of digital signals for transport over WDM links, and to achieve OAM capabilities for these signals similar to those available in SDH.

Table of Contents

This allows a better utilization of WDM links, since it allows to fill lambdas with high rate signals (e.g., 100 Gb/s), which may contain several lower rate signals (e.g., 10 Gb/s), rather than devoting a lambda for each lower rate signal.

OTT (Over the Top) players. Operators offering contents and services on the Internet without owning the proprietary TLC network infrastructure.

Outsourcing. Entrusting an external party carrying out services and business operations. For example, it can be outsourced the planning, construction and hosting services of a telecommunications management system and, ultimately, the management of the entire telecommunications system.

PaaS (Platform as a Service). One of the three Cloud offer service models. Through a PaaS offer of a Cloud Provider, the consumer is given the opportunity to distribute applications created on their own, or acquired by third parties, on the Cloud infrastructure, using programming languages, libraries, services and tools supported by the supplier. The consumer does not manage or control the underlying Cloud infrastructure, including network, servers, operating systems, memory, but has control over the applications and possibly the configurations of the environment that hosts them.

Packet-Switched Services. Telecommunications services provided by telcos and long distance carriers that route packets of data between local area networks (LANs) in different geographical locations to form a wide area network (WAN). Packet-switching services are used to connect multiple LANs into a point-to-multipoint configuration, usually called a multipoint WAN.

Pay-Per-View or PPV. A system by which the viewer pays to see a single program (such as a sporting event, film or concert) at the moment at which it is transmitted or broadcast.

Pay TV. Subscription TV channels. To receive Pay TV or Pay-Per-View programs, a decoder must be connected to the television set, and a conditional access system is needed.

PCS (Personal Communications Services). Set of wireless communications functionalities, voice and/or data, which provide similar services such as mobile ones.

Peering. The voluntary interconnection of Internet networks, that refer to different Internet Service Providers which allows users to exchange traffic between different networks.

Penetration (market penetration). It represents the number of people (or subscriber) who acquires goods/ services of a particular brand or a particular category, divided by the population where the service is available.

Platform. It s an execution environment that includes hardware, software, application servers and other supporting tools, for the execution of programs.

POP (Point Of Presence). It is a point of access to the network (router), provided by an Internet Service Provider (ISP), able to route traffic to end users connected to POP.

POTS (Plain Old Telephone Service). Refers to the basic telephony service (single-line telephones, fixed-line services and access to public voice telephony network).

Price-cap. Then it identifies the maximum price limit, set by a regulator, at which a product/service can be sold.

PSTN (Public Switched Telephone Network). It is the first-generation telephone network and provides basic telephone service.

PTN (Packet Transport Network). A class of equipment that implements natively both SDH and Ethernet technologies, (i.e., it is able to transport and switch separately both kinds of traffic). It is used to connect smaller, peripheral central offices to larger ones, that is a use case where aside packet traffic (e.g., backhauling of broadband access and mobile sites) also legacy circuit traffic (e.g., voice, 2G backhauling) may be found.

Table of Contents

RAN (Radio Access Network). The part of mobile network that implements radio technologies, comprised of data transport functions over air interface and control functions.

Refarming. Reassignment of frequency band of an operator of mobile networks from one technology to another for optimization reasons (e.g., UMTS900 instead of GSM900 or LTE1800 instead of GSM1800).

RNC (Radio Network Controller counterpart of BSC in GSM). It is the equipment (or node) for the control and aggregation of 3G network.

Roaming. Agreement among two or more Mobile Operators from different Countries, under which Users can use the mobile network of other Operators participating in the agreement. The roaming service is activated for example when the terminal is used overseas and enables a mobile user to access a different network from the one to which he subscribes.

RoHS (Restriction of Hazardous Substances). European Directive No. 95/2002 that regulates the use of hazardous substances in electrical and electronic equipment, in order to contribute to the protection of human health and environment.

RTG. Also known as the Public Switched Telephone Network, is the first-generation telephone network and provides basic telephone service.

SaaS (Software as a Service). As part of the Cloud offer service models (see also Cloud entry), the SaaS model allows the consumer to use a supplier s applications and services, operating on a cloud infrastructure. The applications are accessible from different devices through a light interface (e.g., a thin client), such as an email application on a browser, or from programs with a specific interface. The consumer does not manage or control the underlying cloud infrastructure, including network, servers, operating systems, memory, and even the capabilities of individual applications, except for limited configurations intended for him.

SAR (Specific Absorption Rate). SAR is a measure of the percentage of electromagnetic energy absorbed by the human body when it is exposed to the action of an electromagnetic field at radio frequency (RF). See also EMF limits.

SDH Standard (Synchronous Digital Hierarchy). The European standard for high-speed digital transmission. It s a protocol of the physical layer used for multiplexing in time division and the subsequent digital transmission of telephony and data, in geographic networks on optical fiber, electric cable or radio link.

SDN (Software Defined Networking). A paradigm based on network virtualization that aim is to transform traditional networks into flexible and intelligent platforms to satisfy in real time the bandwidth requirements and the dynamic nature of digital applications.

SD WAN (Software Defined WAN). The SD-WAN solutions are an innovation of the traditional Wide Area Network solutions and of the Edges IP Networking, developed to offer advanced connectivity services addressed to business customers. SD-WAN solutions work agnostically with respect to the access technology, and the WAN transport network, they use dynamic routing of data on an application basis and in strong integration with multi-cloud solutions to link connectivity to certain added-value services such as WAN optimization, application monitoring and advanced security.

Service Exposure. The Service Exposure is an infrastructure that offers certain functionality, called Application Programming Interface (API), both to Third Parties (eg Business Partner), both for internal use.

Service Orchestration. Service Orchestration means a single centralized business process that can be performed by an orchestrator (e.g., a SW platform) that coordinates the interaction between various services and is responsible for their invocation and composition, as well as the management of transactions between the individual services. Service Orchestration is often compared to service choreography, which instead makes a decentralized approach to the composition of services, where each of the services participating in the choreography implements a self-consistent process / workflow.

Table of Contents

Service Provider. The Service Provider offers to the Users (Residential or Business) that subscribe his offer, a range of contents and services.

SGT (Transit exchange interconnection level for telephone traffic). Transit Exchange for telephone traffic carriage, routing and transmission.

SGU (Local exchange interconnection level for telephone traffic). Local Exchange for telephone traffic carriage, routing and transmission. See also Central Office.

SL (Distribution Frame level for telephone traffic). See Central Office.

Shared Access. Shared access to the user s twisted pair with another TLC service provider by using separately voice and non-voice band frequency spectrum. This mode allows keeping voice telephony with an Operator (TIM or others) and ADSL service on the proprietary network of the shared access operator, i.e., not passing over the TIM network but directly through the DSLAM of the operator.

SLA. Service Level Agreements (SLA) are contractual instruments through which service metrics are defined (eg quality of service) that must be respected by a service provider (provider) towards their customers / users.

SLU (Sub Loop Unbundling). It consists in providing access to the local sub-section of the Operator copper network, in particular the section of the network between the user site and the distribution cabinet or an intermediate concentration point.

Small Cells. Small cells are low energy consumption access nodes to the radio spectrum. Smaller than the antennas, Small Cells are usually used in mobile telephony, both for the coverage of outdoor areas (squares, pedestrian streets, etc.) and for the coverage of indoor hot spots (airports, stadiums, shopping centers, stations, hospitals, university campuses, etc.).

SMART CITY. The term Smart City refers to an urban area that uses integrated ICT technologies to optimize resources in key areas: mobility, communication, economy, work, environment, administration and construction. From an infrastructural point of view, the use of available resources on the web improves economic and political efficiency and can allow social, cultural and urban development.

Smartphone. Electronic device that combines the functions of a mobile phone and a handheld computer equipped with a complete operating system.

SMART TV. The term Smart TV identifies the new generation of televisions which allows us to enjoy multimedia audio-video content (e.g., movies, TV series, music videos, gaming) through an internet connection.

SME. The small- and medium-size enterprise market (from 3 to 50 employees).

SMS (Short Message Service). Short text messages that can be received and sent through GSM-network connected cellular phones. The maximum text length is 160 alpha-numerical characters.

SOHO. The small office/home office market which consists of businesses that use telephone lines to connect to the Internet, as opposed to dedicated lines, and is made up of small businesses, generally with one or two employees, and businesses conducted out of the home.

SON (Self-Organizing Network). It is a set of technologies and architectures that allows operators to introduce, in the context of radio-mobile networks, the technological enablers for the automation of network configuration, optimization and assurance processes.

STB (Set-Top Box). A customer device able to receive TV signals from a communication network (such as broadband/ultrabroadband access network, terrestrial broadcast, satellite broadcast, etc.) and output them to TVs and other display devices (monitors, projectors, etc). It may include Conditional Access functions to handle paid content.

Table of Contents

Tablet. A portable computer with compact dimensions whose screen can be used to write or give commands with the touch of a finger or using a specially designed stylus.

Switch Telephone Switch. Synonymous of Telephone Exchange, i.e., network equipment used to set up and route telephone calls to the number called possibly through other switches. They may also record information for billing and control purposes.

Switch Network Switch. Data networking equipment able to receive and forward packets using information at layer 2 of OSI (Open Systems Interconnection) model (i.e., hardware addresses of other equipment).

Synchronous. Type of data transmission in which there is permanent synchronization between the transmitter and receiver.

Tablet. Portable computer with compact dimensions whose screen can be used to write or give commands with the touch of your fingers or using a specially designed stylus.

TCO (Total Cost of Ownership). The TCO represents the global cost of an asset (e.g., an IT equipment) during its life cycle. The TCO takes into account both direct costs (hardware costs, network infrastructure, licenses) and indirect costs (management, maintenance, energy consumption).

TDMA (Time Division Multiple Access). A technology for digital transmission of radio signals between, for example, a mobile phone and a radio base station. TDMA breaks signals into sequential pieces of defined length, places each piece into an information channel at specific intervals and then reconstructs the pieces at the end of the channel.

ToIP (Telephony over IP). The term is often used as synonymous of VoIP, however it has a wider meaning since it includes advanced telephony services (such as video, messaging, possibly some call handling, etc.) beyond the basic voice communication.

TRX. Radio transceivers located in BTS.
ULL (Unbundling of the Local Loop). See LLU.

Ultrabroadband. Includes all network technologies that offer connectivity from 30Mbit/s to over 1Gbit/s, referring in particular to the peak rate and not to the average available. The definition is related to the characteristics of the fixed and mobile access network. By increasing the capacity and the speed, Ultrabroadband technologies allow quicker access from multiple users to the content available on the net, also on the move, and to take advantage of high quality video up to Ultra HD and interactive gaming.

UMTS (Universal Mobile Telecommunications System). Third-generation mobile communication standard. It consists of a broadband system in which data travels at a bandwidth of 2Mb/s, communication is faster, quality is better and multimedia contents can travel over the Net.

UMTS Cell. Geographical portion of territory illuminated by a Node B.

UMTS Channels. These enable all the customers of the cell to access both the CS (Circuit Switched) services and PS (Packet Switched) services of UMTS technology.

Unbundling. The service offered by the incumbent to the alternative operator which consists of the rental of the local loop i.e., the wire connection between the local exchange and the customer s premises, so that the alternative operator is able to connect the twisted pair from the customer to its own equipment

Universal Service. The obligation to supply basic service at an affordable price, or at special rates solely for subsidized users.

UPS (Uninterruptible Power Supply). Electrical equipment that provides continuous powering to users in case of power outage.

Table of Contents

VAS (Value Added Services). Value Added Services provide a higher level of functionality than the basic transmission services offered by a telecommunications network. In PSTN and first generation mobile networks the basic service was telephony (switched voice calls, initially analog and later digital ones) while VAS could include data and fax transmission services, as well as call handling features such as call waiting, call forwarding, etc.. As time passed VAS based on call handling grew with further features such as toll free calling, voice virtual private networks, etc. A new class of VAS also developed in mobile networks, including message handling services such as SMS and MMS. In parallel, development of data networks turned data transmission services (initially X25, then Frame Relay, ATM, Ethernet, IP) into basic services of those networks, on top of which there may be VAS such as address translation, data virtual lines and virtual networks, traffic priority, encryption, etc.. A further category of VAS is those based on contents of Service Providers linked to the network, beginning with contents provided on telephony network, going on with contents delivered via SMS (news, weather, etc) and contents provided via browsing from mobile and fixed terminals, and arriving to video streaming contents.

VDSL (Very-high-data-rate Digital Subscriber Line). Access technology that allows providers to give clients, by means of an apparatus installed in their homes, access to voice and TV services on the traditional telephone line with speeds of up to 50 Mbps in downstream.

VDSL2 (Very-high-data-rate Digital Subscriber Line 2). 2nd generation VDSL, able to achieve downstream speed in the range of hundreds of Mbps. Actual data rate however is largely dependent upon the distance between customer equipment and network equipment, e.g., for distances of some hundred meters the achievable rate is about 100 Mbps. For this reason network equipment is typically located in street cabinets, so to be closer to customers. A VDSL2 evolution named eVDSL (enhanced VDSL) yields achievable rates around 200 Mbps; it has been recently deployed in TIM network.

Vectoring. Transmission technology that removes mutual interference (crosstalk) between copper lines bundled in the same cable. Of particular interest is the use on VDSL / VDSL2 / eVDSL lines in view of the growing penetration of ultrabroadband services, which would make interference more perceptible. In this perspective, the use of vectoring allows to maintain the typical performances of the aforementioned technologies. The technology is placed in the ONU apparatus where to be effective it is applied on all the lines of a cable; this means that in case of SLU (Sub Loop Unbundling), that is the presence of ONUs of several operators serving the lines of the same cable, a more complex implementation is required, the MOV (Multi-Operator Vectoring) that coordinates the vectoring of the different ONUs.

Virtualization. An approach to implementation of functionality resorting only to software running on general purpose hardware generally not dedicated, as opposed to approaches resorting also to special purpose and/or dedicated hardware

VOD (Video On Demand). TV-program offering on user s request, with payment of a fee for each purchased program (a movie, a soccer match, etc.). Broadcast specifically for cable and satellite TV.

VoIP (Voice Over IP). A technology that allows transmission of voice communication over an Internet connection or another dedicated network using the Internet Protocol (IP) data networks (such as IP-based LANs, intranets or the Internet) instead of a conventional phone line.

VoLTE/ViLTE (Voice over LTE / Video over LTE). A service providing voice and video calls over IP via LTE radio access, controlled by standard ToIP architecture named IMS (IP Multimedia Subsystem). The mated naming VoLTE/ViLTE is used since the service is essentially the same for voice and video, differing only in the type of media streams that are set up. Since it is standard based, it achieves interoperability among user terminals and between terminals and networks.

VPN (Virtual Private Network). A network designed for a business customer or government agency, using the infrastructures of a carrier and providing customized services, and which operates in such a manner as to appear dedicated to the user thereof.

VRAN (Virtual Radio Access Network). An architecture applied in 4G/5G networks which implies a split of the Base Station between a Centralized Unit and a remote or distributed unit. The CU is typically placed in a more

Table of Contents

centralized site than antennas and deals with baseband signal processing, so also the terminology BBU (BaseBand Unit) is used, while the Remote Unit is left at antenna sites to provide radio coverage and is also termed RRU (Remote Radio Unit). Given this split the CUs may be implemented as Virtual Network Functions on a suitable hardware infrastructure, from which the virtual title.

For the viability of the architecture a key issue is the choice of the partition of Base Station functions between CUs and DUs, which affects the requirements on communication links CU-DU (referred to as fronthaul). In the 5G development efforts this issue has been addressed by identifying split options that are candidate for standardization.

VULA (Virtual Unbundling Local Access). A wholesale service provided by incumbent providers to alternative operators, where the incumbent provides over its broadband access network the transport of data traffic (a bitstream) between the end customer and an interconnection point where the alternative operator receives said traffic. In TIM s case, the interconnection point is located at local exchange level, aside the OLT (Optical Line Termination) i.e., the head end of optical access network.

WAN (Wide Area Network). A private network that covers a wide geographic area using public telecommunications services.

WEEE (Waste Electrical and Electronic Equipment). Waste from electrical and electronic equipment which the holder intends to dispose of as it is faulty, unused or obsolete.

White, gray and black areas. The distinction between white, gray and black areas is relevant for the assessment of state aid to support the development of ultrabroadband networks, in terms of the compatibility of the aid with respect to Community legislation. This classification is contained in the European Union Guidelines:

- white areas are areas without ultrabroadband (UBB) networks (connectivity), where private investors do not intend to invest in the next three years;

- gray areas are areas in which an ultrabroadband (UBB) network (connectivity) is present or will be developed in the next three years by a single private operator.

- black areas are areas in which at least two ultrabroadband (UBB) networks (connectivity) of different operators are present or will be developed over the next three years.

WI-FI. Wireless technology enabling data links in a limited area, generally in some hundred meters range, with speed up to tens of Mbps. Typical applications are in homes and offices as alternative to wired LAN, as well as in public services for Internet access, and also to create link between devices (e.g., between a laptop and a smartphone linked to Internet).

Wi Max (Worldwide Interoperability for Microwave Access). A technology that allows wireless access to broadband telecommunications networks, initially defined in order to work on ranges up to tens of kilometers and

speed in the tens of Mbps. It was defined by the Wi MAX Forum, a global consortium formed in 2001 that brings together major companies in the field of fixed and mobile telecommunications and whose purpose is to develop, test and promote the interoperability of systems based on IEEE standards.

WLL (Wireless Local Loop). The means of providing a local loop equivalent (e.g., connection from customer premises to local exchange) without the use of wiring, resorting instead to wireless technologies.

WLR (Wholesale Line Rental). It is a telephony only wholesale service provided by the Incumbent to alternative operators, whereby the alternative operator gets an ULL-like service without the need to physically deploy equipment at local exchange sites. It is technically similar to Carrier PreSelection (CPS), and differs from CPS on the commercial side since the end customer is not subscribed to the incumbent s access service, nor billed for it; in this way alternative operators are able to provide to customers both access and traffic services and to produce a single bill covering both services.

xDSL (Digital Subscriber Line). It is a technology that makes use of standard telephone lines and it includes different categories including: Asymmetric DSL (ADSL), High-data-rate DSL (HDSL), Very high bit rate DSL (VDSL) and enhanced Very high bit rate DSL (eVDSL). This technology uses a digital signal at very high frequencies in order to achieve high data transfer rates.

Table of Contents

4.6 DESCRIPTION OF PROPERTY, PLANT AND EQUIPMENT

General

As of December 31, 2018 and 2017, property, plant and equipment owned and leased are detailed as follows:

	As of December 31, 2018				As of December 31, 2017			
	Owned	Leased	Total property, plant and equipment	% of total property, plant and equipment	Owned	Leased	Total property, plant and equipment	% of total property, plant and equipment
	(millions of euros, except percentage)							
Land	250	16	266	1.6	213	16	229	1.4
Civil and industrial buildings	588	1,365	1,953	12.1	488	1,768	2,256	13.6
Plant and equipment	12,096	302	12,398	76.9	12,049	353	12,402	75.0
Manufacturing and distribution equipment	31		31	0.2	36		36	0.2
Other	358	148	506	3.1	376	138	514	3.1
Construction in progress and advance payments	928	64	992	6.1	1,054	56	1,110	6.7
Total	**14,251**	**1,895**	**16,146**	**100.0**	**14,216**	**2,331**	**16,547**	**100.0**

Land comprises both built-up land and available land.

Buildings (civil and industrial) almost exclusively include buildings for industrial use hosting telephone exchanges or for office use, and light constructions.

Plant and equipment includes the aggregate of all the structures used for the functioning of voice and data telephone services.

Manufacturing and distribution equipment consists of instruments and equipment used for the operations and maintenance of plants and equipment.

Other mainly consists of hardware for the functioning of the Data Center and for work stations, furniture and fixtures and, to a minimal extent, transport vehicles and office machines.

There are no encumbrances that may affect our utilization of our property or equipment.

REAL ESTATE (LAND, CIVIL AND INDUSTRIAL BUILDINGS)

As of December 31, 2018, the Company owned a number of buildings throughout Italy. Specialized buildings for telecommunications services account for the majority of properties both in number and in terms of book value. Such buildings house mainly exchange equipment and transmission equipment, and are used as part of our continuing telecommunications operations. General purpose properties consist chiefly of offices, depots and computer centers.

At the end of 2014, TIM launched a major real estate project, aimed at restructuring the use of space for industrial usage in a manner consistent with the evolution of next-generation networks and optimizing the number of properties used as offices through the creation of functional centers that adopt a modern and more efficient space utilization.

This real estate project provides for a path of restructuring, termination and renegotiation of contracts, to achieve efficiency and savings, mainly through the extension of terms and lower rents.

Properties of strategic importance have been identified, in relation to their current use and to significant investments in technology and real estate planned to support the technological evolution of the network and new ICT services.

In particular, in 2015, the Company purchased five strategic buildings and two strategic buildings were acquired in 2016. Over the 2015-2016 period the Company renegotiated and/or renewed approximately 1,100 leases. Over

Table of Contents

half of the renegotiated property rental contracts were previously accounted for using the operating lease method, however, as a result of the changes to the relevant contracts, they have been recognized in the statement of financial position at December 31, 2016 using the financial method (Tangible assets held under finance leases). In 2017, the renegotiation process continued and approximately 150 further contracts were successfully renegotiated.

In 2018, the Company purchased an additional 12 strategic buildings and returned 18 large properties mostly per office to the property, resulting in significant economic savings.

In 2019, we plan to proceed as the previous years in the real estate project, with the aim of further reducing real estate costs.

NETWORK INFRASTRUCTURE (PLANT AND EQUIPMENT)

The TIM Group network infrastructure includes the domestic (Italian) and international fixed network, the domestic mobile network and the Brazilian mobile network. See -4.5 Glossary of Selected Telecommunications Terms , for definitions of the technical terms used in this section.

Domestic (Italian) Fixed Network

At December 31, 2018, the domestic fixed network had the following figures:

Central Offices	approximately 10,360
Switching areas	527
Gateway areas (TDM)	33
Aggregation areas	12
Copper network	114.4 million kilometers-pair[4]
Fiber optic access/carrier network	16.4 million kilometers-fiber
Long Distance VC4	4,256
Long Distance Lambda (l)	991 l at 1 Gbps, 50 l at 2.5 Gbps, 1,291 l at 10 Gbps and 135 l at 100 Gbps
Broadband/ADSL network	Approximately 9,700 Central Offices
Main PoP data networks	32

Fixed Voice network. The Fixed Voice Network dedicated to serving traditional voice (**TDM**) consists of 567 main local switches (**SGU**). Concerning the OLO interconnection, local switches are divided in 33 gateway areas.

Each local switch is physically interconnected to 2 out of 24 (12 pairs) Backbone Nodes (**BBN**).

Voice over IP (VoIP) service is guaranteed by a specific control platform dedicated to consumer and business customers. The IP/TDM interworking is carried out in the transit layer.

In terms of cable infrastructures, the fixed network includes 114.4 million km of copper pairs, mainly in the distribution network, and also 16.4 million km of fiber, both in access and trunk network.

Optical fiber cables significantly increase network capacity and make it possible to offer hi-tech services based on the simultaneous transmission of various types of signal, such as voice, data and video.

Domestic Transport Network. The transport network uses the **SDH** (Synchronous Digital Hierarchy) or **PTN** technology and the optical **DWDM** technology (Dense Wavelength Division Multiplexing) and is based on optical fibers with systems from 155 Mbps to 100 Gbps. WDM systems realize point-to-point connections multiplying by a factor from 12 to 96 the bandwidth capacity of each optical fiber, thereby increasing the total capacity of the transport network.

The fixed long-distance transport network routes 4,256 VC-4 on the SDH Arianna, Phoenix, Phoebe, Kosmos networks. It supports also 991 l at 1 Gbps, 50 l at 2.5 Gbps, 1,291 l at 10 Gbps and 135 l at 100 Gbps on the DWDM systems and on the **Kaleidon** network.

[4] in 2016 TIM adopted a new copper twisted pair counting system which influenced the measures in some CO Areas.

Table of Contents

Kaleidon is the national optical transport platform that allow to set up a completely photonic optical mesh network. Kaleidon along with its expansion (Kaleidon Evolution) supports optical channels at 40 Gbps and 100 Gbps with protection and restoration mechanisms at photonic level.

OPB (Optical Packet Backbone). The OPB is the IP backbone of TIM based on 32 POPs equipped with Terarouters.

The OPB network supports:

- Internet traffic of residential, business and Wholesale customers;
- VPN traffic (Virtual Private Network) of business customers;
- Voice traffic;
- Video traffic;
- Mobile data traffic.

At the end of 2018 in the 8 major POPs a new IP backbone (Next Generation Core Network) has been deployed, featuring a larger capacity than OPB.

OPM (Optical Packet Metro). The OPM network is the Metro-Ethernet network at regional level for traffic aggregation and transport up to the 32 IP POPs. The OPM network consists of 30 metro regional networks and support traffic from mobile and fixed access nodes. The OPM provides also Gigabit Ethernet Services for business customers (Ethernity, Hyperway, Gigabusiness and GEA on GBE optical access).

Broadband/xDSL network. The broadband access network of TIM offers hi-tech telecommunications and multimedia applications and is based on ADSL2 DSLAM technology.

In 2018, the xDSL services for residential and business customers (retail and wholesale) covers more than 99.4% of the population and have been extended to 7,673 towns**,** including S. Marino (town covered minimum at 70%).

At the end of 2018, approximately 9,700 local switching areas were covered by ADSL technology.

NGAN (Next Generation Access Network). NGAN (Next Generation Access Network). In 2018 TIM continued to deploy a **NGAN** , based on optical fiber cables. NGAN deployment started in 2009 in Milan based on Fiber-To-The-Home (**FTTH**) architecture. Since 2012, deployment has been extended to the main cities in Italy with Fiber-To-The-Cabinet (**FTTCab**) architecture using fiber to street cabinets equipped with VDSL2 cards. In 2016, TIM also introduced eVDSL cards to increase the UBB speed to 200 Mbps.

The NGAN coverage in FTTCab is approximately 80% of reached households at the end of 2018 (approximately 19,400,000 households, through approximately 5,100 distribution central offices).

Approximately 113,500 cabinets NGAN are reached with fiber optic cables and for approximately 103,100 of these cabinets the UBB services are available for customers; approximately 1.400 ONU-cab are installed in Central Office (FTTE architecture) to provide UBB services to customers with copper accesses without cabinet.

With the aim of improving ultrabroadband service to 1 Gbps in 2015, TIM began to bring FTTH to the 30 main cities, their neighboring cities, and a further 59 BUL[5] cities in south of Italy. The total of cities reached by 1Gbps services at the end of 2018 is 118.

The households in FTTH are nearly 3,500,000, with a coverage of about 14,2% at the end of 2018

Domestic (Italian) Mobile Network

The domestic mobile network consists of:

· GSM network (2G: second generation network);

[5] BUL is an Italian acronym (Banda UltraLarga) referring to a public funding project aimed to deploy ultrabroadband infrastructures in 7 regions in South of Italy.

Table of Contents

Item 4. Information On The TIM Group **Description Of Property, Plant And Equipment**