

SECTORAL Report

Performance of small-scale service providers (SPSPs): an analysis of the main economic and financial indicators of the telecommunications sector

Economic Monitoring Management of the Service
Superintendence of Competition



Introduction

The telecommunications sector plays a fundamental role in the Brazilian economy, being one of the essential pillars for the country's social, economic and technological development.

Due to the increasing digitalization of the economy, the integration of different sectors through information and communication technologies (ICTs) has become increasingly necessary to ensure competitiveness, innovation and efficiency in the most diverse segments.

It is important to highlight that the telecommunications sector is a critical infrastructure for the functioning of several other productive sectors, such as industry, commerce and services. The connectivity provided by its networks enables the operation of efficient communication systems, which are essential for e-commerce, banking operations, telemedicine, distance education, among others, facilitating Brazil's integration into the global market, as well as contributing to improving the productivity and innovation of national companies.

The telecommunications sector in general plays a significant role in the Gross Domestic Product (GDP) of countries, reflecting its relevance as a driver of economic development and as a basis for digitalization and connectivity. In Brazil, the telecommunications sector is particularly

important, representing approximately 2.6%¹ of the GDP, according to recent data from IBGE. This participation highlights not only the size and complexity of the Brazilian market, but also the strategic role of telecommunications in supporting several other sectors. In addition, with the growing demand for digital infrastructure and connectivity, the sector's contribution to the GDP is likely to increase, consolidating its relevance.

In this regard, it is noteworthy to mention the importance that companies considered as Small-scale Service Providers (SPSPs) have been playing in the Brazilian telecommunications sector, especially in the fixed broadband market (Multimedia Communication Service – SCM).

The concept of SPSP was defined in Resolution No. 694, of July 17, 2018, which approved the General Plan of Competition Goals (PGMC). It established that Small-scale Service Providers in the telecommunications market would be those companies with a national market share of less than 5% (five percent) in each retail market in which they operate.

It is worth noting that this same PGMC played a significant role in promoting the competitiveness of SPSPs in fixed broadband services, largely thanks to the asymmetric regulatory measures implemented by Anatel, which were

fundamental for the expansion of SCM coverage in Brazil. As a result of these actions, there was an explosion of companies offering fixed broadband services, so that today Brazil is one of the countries with the largest number of internet providers in the world.

These companies, generally focused on regional niches or specific market segments,

have proven to be essential for fostering competitiveness and reducing inequalities in internet access in various locations, directly contributing to the expansion of broadband service coverage, serving remote areas or areas that are less attractive to large operators, such as rural areas, urban peripheries or small municipalities.

Data Collection System

Considering the relevance that SPSPs have in the Brazilian telecommunications sector, it is also essential to seek to understand how these companies behave in relation to the main economic indicators.

In light of this, Anatel instituted Process No. 53500.040674/2019-91 with the aim of proposing the establishment of a periodic collection of technical and financial information that Small-scale Service Providers should provide to the Agency.

In conclusion to this process, Decisional Order No. 30/2020/SUE was published, which instituted the periodic collection of economic-financial and technical-operational data on SPSPs.

Since this Order was issued, providers have been sending Anatel, systematically and quarterly, through the “Data Collection” system, information regarding Net Operating Revenue (NOR), Investments, and Data Traffic transmitted through the SCM network, which has allowed the Agency to outline a profile of these companies, as well as to build indicators needed to monitor the sector.

It is necessary to point out that currently, approximately 7,300 companies have been systematically inserting data into the “Data Collection” system, which requires extensive work to verify and check the data so that information considered to be inconsistent can be properly criticized and adjusted.

Thus, in the next sections we will try to show an overview of the main economic indicators of SPSPs, as well as a comparative analysis with the segment of companies considered as non-SPSPs.

Data curation

Before going into the specific analysis of the indicators, it is to be noted that the SPSPs database in the Collection system is relatively recent, and has been undergoing cycles of curation with the aim of correcting flaws in the presentation of the information sent by the providers.

In this regard, there were very significant advances in curation in the database for the years 2023 and 2024, with systematic interactions with companies aimed at improving the information sent. In addition, this study also carried out a second analysis, which took into account the exclusion of company records that showed revenue, investment or traffic indicators inconsistent with the standard of non-SPSPs companies, eliminating possible outliers that could distort the analysis.

The curation of data from SPSPs companies begins when the information is sent, using rules defined in the “Data Collection” system itself. In order to prevent basic filling errors from interfering with the quality of the data presented, the system itself notifies the service provider, rejecting the file at the time of submission. The basic rules of the system include the following:

- CNPJ field must have 14 positions with only numerical data;
- NOR, CAPEX and Traffic fields must record only numeric values;
- All services offered by the provider must be disclosed;

- Mandatory reporting of values for NOR, CAPEX and Traffic.

Subsequently, after these initial criteria, the scripts created in the CPAE perform some more automatic analyses in relation to the data informed by the providers, as in the cases of:

- Criticism regarding the values of NOR, Traffic and Investment in case of significant variations (above 30%) in relation to the previous period, or in relation to the average of the last 4 periods;
- Negative values for NOR.

Upon encountering criticisms of this nature, the curation scripts periodically and automatically send emails to the attorneys and/or legal guardians of these providers so that records with possible inconsistencies can be duly corrected and resubmitted, if the provider confirms the occurrence of a filling error.

At the same time, when using the data presented by SPSPs to prepare indicator reports, other types of analyses are carried out to identify, notify and remove inconsistent and/or improbable values from the calculations, always preserving the data for the companies to correct or confirm the values submitted. These analyses are specific to each value presented, which we will detail below.

It is also necessary to emphasise the issue of possible underreporting of access by

SPSPs, with some of these companies not correctly reporting data from their customer bases, which may make it difficult to measure economic and financial indicators in this segment. From this perspective, this Study only considered those companies that have been continuously submitting

data on the number of accesses to the Agency's portal, in addition to other metrics that take into account the number of users, such as ARPU and Data Consumption, whose values are consistent with those of other companies in the sector.

1.1 Curation Process in Net Operating Revenue

Data curation has made efforts to identify errors in filling in Net Operating Revenue values with the aim of adjusting this information in accordance with sector parameters.

In the case of revenues with possible overestimated values, we first identify the companies whose NOR has a relevant weight in the SPSP segment and which have an ARPU calculated above the sector average.

These companies are then notified to correct or justify the NOR values. Those companies that did not respond, either by correcting the values or justifying them, for this first survey, ended up having their data excluded from the calculation base of the indicators.

As an example, in several analyses carried out with the SPSPs database, it is possible to find situations in which companies with just over 1,000 accesses registered in the “Data Collection” system a NOR in the region of billions of Reais, practically a figure similar to the entire Brazilian fixed broadband market, showing a strong indication of inconsistency in these numbers.

It is also at this stage of the curation that companies operating in the “Business to Business” (B2B) market niche are identified, which have specific characteristics and ARPU well above the sector average.

Another significant analysis for identifying possible overvalued revenues occurs when this indicator presents variations in the order of 1,000% in the period, and when checked in more detail, it is possible to notice the absence of cents in the information submitted, which leads to the deduction that, due to a typing error, the data was entered incorrectly. Although it is a trivial error, it is very common and several companies have this filling error.

Therefore, in order for the data to be properly adjusted, these companies are identified and notified so that they can carry out the correction process or justify the data submitted. In this case, for reporting purposes, such values are corrected in the calculations, so that the data is preserved until the companies correct or justify the figures presented.

Regarding the issue of possible understated revenues, companies with published accounting information (Publicly Traded

Companies) are checked, so that their NOR is compared with that reported in the Collection system. If NOR is identified as being lower than the value published to the market, companies are notified to justify or correct the figures presented. However, as these companies are important in the sector, the values are not removed from the calculations.

Another point to consider refers to NOR with a negative sign, since some companies present this indicator already including deductions from operating expenses, contrary to current accounting standards

regarding this number. The Collection system still accepts the introduction of NOR with a negative sign as a result of management adjustments made by some companies, as well as as a result of the effects of apportionments made by service providers, so that part of the information could, in fact, present negative values, but in the total calculation, the company's consolidated NOR could not be recorded with a negative sign. In this case, the companies are notified to correct their values and the data is removed from the calculations.

1.2 Curation Process for Data Traffic Information

As with the NOR indicator, a series of companies presented their data traffic information in the SCM with values that were out of sync with the reality of the sector, such as providers with an average of 5,000 accesses per month, but with data traffic, in gigabytes, in the order of 94 million times higher than that recorded by all companies considered as non-SPSPs.

Until these companies make the necessary adjustments to this indicator, their records are excluded from the indicator calculation base. However, in order to prevent many companies from being excluded and, therefore, compromising the calculation of this data, there was a decision to use a different methodology to quantify data traffic.

Therefore, in order to estimate a more accurate data traffic in the SPSP segment,

as well as to exclude some outliers that could distort this volume, we considered as a parameter all those companies that have a data consumption of between 50 and 600 Gb per month per user, which is considered to be the standard consumption of companies classified as non-SPSPs. Based on this data, the weighted average consumption per user was calculated for all the small providers and then, taking into account the number of accesses of these respective companies, the total traffic for the SPSPs was estimated.

The results of this curation of the companies considered to be SPSPs turned out to be very coherent and very close to the average for the sector as a whole, as will be demonstrated in a specific section of this Study.

1.3 Curation Process in Investment Information

Regarding investments, there was also a need to make adjustments in relation to the information sent by providers, although to a lesser extent compared to data traffic. In this case, the vast majority of SPSPs investment information was consistent with the market average, so exclusion occurred in only a few specific cases.

The analysis for this indicator took into account the absolute value of investments in each of the SPSPs and their comparison in relation to the volume recorded by incumbent companies.

Therefore, if a given company considered as a SPSP registered investments higher than the sum of all incumbent companies of the SCM, or if companies with an average of less than a thousand accesses presented investments higher than companies that have more than 4 million subscribers, these records were excluded from the analysis. In this case, such actions aimed to provide a certain standardization to this indicator.

Even with the exclusion of some records, the results presented in this Study show very significant investment values, higher than those demonstrated by incumbent companies, as will be addressed in a specific section of this Study.

Company size

It was pointed out before that the SPSP concept was established through Resolution No. 694, of July 17, 2018, which approved the General Plan of Competition Goals (PGMC). It defined that Small-scale Service Providers in the telecommunications market would be those companies with a national market share of less than 5% (five percent) in each retail market in which they operate.

However, although a telecommunications company may be considered a SPSP, depending on its annual revenue, this same company may be considered a large company.

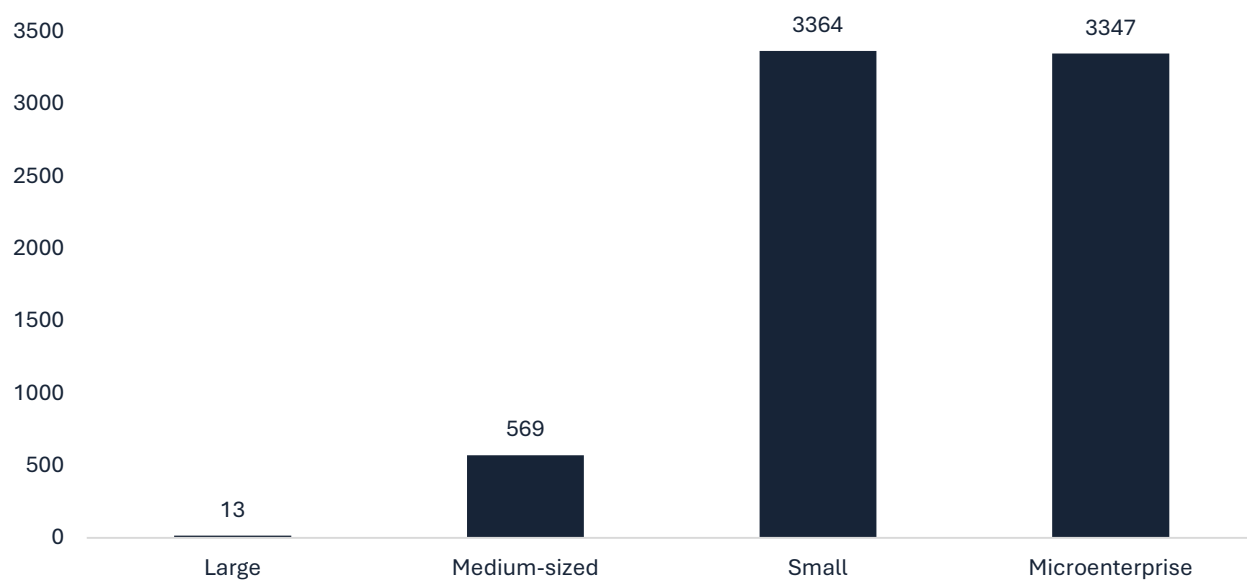
According to data from BNDES², these are the criteria used to classify the size of a company based on its annual revenue:

- Microenterprise: Revenue less than or equal to R\$ 360 thousand;
- Small business: Revenue greater than R\$360 thousand and less than or equal to R\$4.8 million;
- Medium-sized company: Revenue greater than R\$4.8 million and less than or equal to R\$300 million;
- Large company: Revenue greater than R\$300 million.

Therefore, we may have companies considered SPSPs based on the rules described in the PGMC, but considered large depending on their annual revenue.

Figure 01 shows the classification in the SPSP segment considering the criteria established by BNDES. Of the almost 7,300 companies that forwarded economic-financial data or information on the number of accesses, around 90% of them, about 6,600 companies, are classified as “Small” and “Microenterprises”. And of this universe, only 13 end up being classified as “Large” companies in terms of revenue, with emphasis on the providers Brisanet Telecom Services S.A., Algar Telecom S.A., Giga Mais Fibra Telecom S.A., Vero S.A., Unifique Telecom S.A., Desktop S.A., Sercomtel S.A. Telecommunications/Ligga, Tecpar Telecom Services S.A., Alares S.A..

Figure 01: Company size (BNDES)



SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Collection Indicators

Economic-financial and sectoral indicators

After carrying out the curation work on the economic and financial indicators of the companies classified as SPSPs, we begun the tabulation and consolidation of this information, with the aim of generating reports on the profile of these companies in

the fixed broadband market (Multimedia Communication Service - SCM), as well as outlining a comparative analysis with the segment of companies considered as non-SPSPs.

1.1 Net Operating Revenue (NOR)

Revenues represent one of the main economic and financial indicators of an organization, directly reflecting its ability to generate value from the sale of goods or provision of services. The importance of revenues as an indicator lies in the fact that they are the starting point for the analysis of profitability and financial sustainability.

Monitoring revenues is essential not only to measure an organization's operational performance, but also to gain insights into how they affect companies' strategic decisions, such as investments, market expansion and cost management, in order to ensure long-term sustainability and competitiveness.

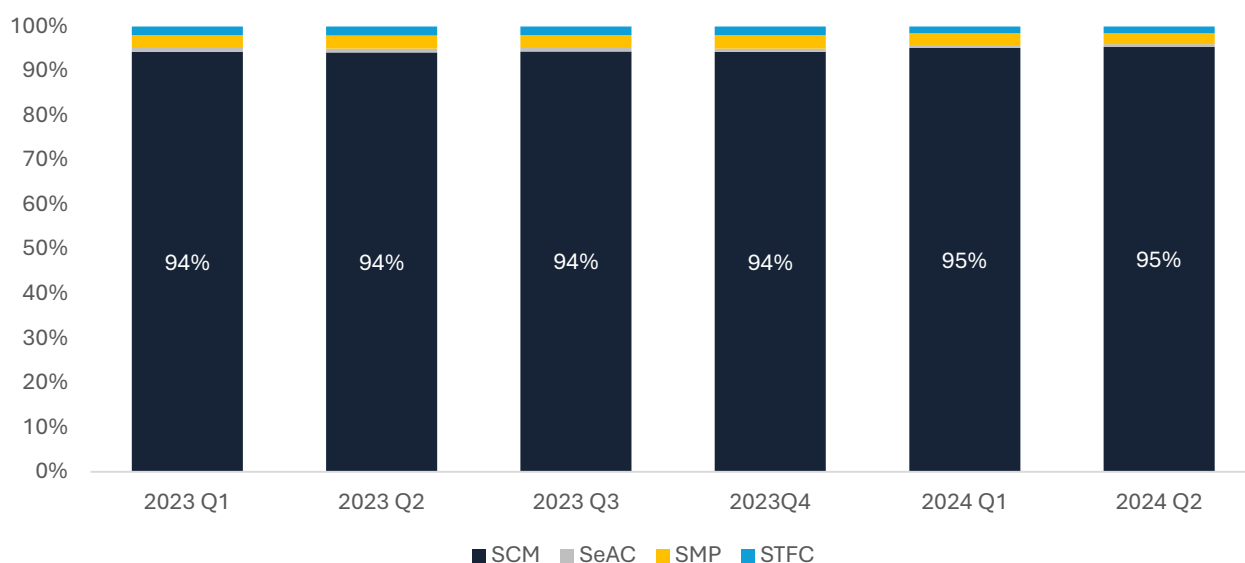
Revenues from the telecommunications sector play a significant role in countries' Gross Domestic Product (GDP), reflecting its relevance as a driver of economic development and as a basis for digitalization and connectivity. As already explained in

this document, in Brazil, the telecommunications sector represents approximately 2.6% of the GDP, according to recent data from IBGE. This participation highlights not only the size and complexity of the Brazilian market, but also the strategic role of telecommunications in supporting several other sectors, such as commerce, services and industry.

Looking at the SPSP segment in detail, it is clear that it is in the Multimedia Communication Service (SCM) where revenues are most concentrated. From a historical series established between the 1st quarter of 2023 and the 2nd quarter of 2024, it can be seen that more than 94% of the Net Operating Revenue (NOR) of these companies is related to the fixed broadband internet service, with the remainder being spread among other services, as shown in Figure 02.

Figure 02: Participation of services in the NOR

SPSPs Performance | Economic-financial and sectoral indicators



SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Collection Indicator

As shown in Figure 02, the focus of these small providers is basically on exploring SCM. It is now necessary to evaluate the performance of the NOR of SPSPs in comparison to those companies considered as non-SPSPs.

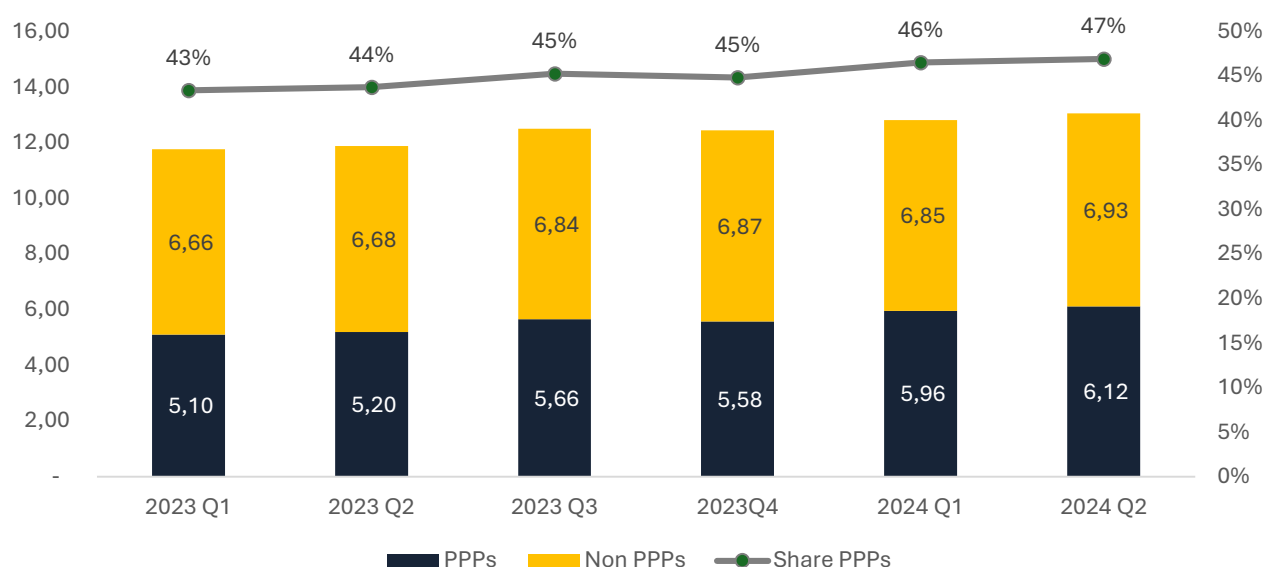
Observing the analysis period for this study (1st quarter of 2023 to 2nd quarter of 2024), it can be seen that the SCM revenues of those companies considered as incumbents (Vivo, Claro, Oi and Tim) are estimated between R\$6.6 billion and R\$6.9 billion each quarter, showing a certain stability throughout the series.

When observing the NOR of companies considered as SPSPs, the scenario presented is also one of growth, but with greater relevance. In absolute numbers the NOR of this segment presents values slightly lower than non-SPSPs, varying between R\$5.1 billion and R\$6.1 billion, but in

percentage terms the growth of this indicator is much higher. In this case, the NOR of the SPSPs showed growth of around 20% in the period, compared to just 4% for the incumbent companies.

This significant growth in the levels of revenue earned by SPSP companies is largely justified by the emergence of new companies in this segment, as well as by the growing number of accesses that these companies have been registering over time, reflecting an increasingly greater demand for connectivity by society.

This situation is also reflected in the participation of SPSPs in the composition of the NOR of the entire fixed broadband internet service, with an increase in their relevance over the period. On average, SPSPs account for approximately 46% of total SCM revenues. Figure 03 shows the details of these revenues.

Figure 03: SCM NOR

non-SPSPs: Vivo, Hi, Tim, Claro

SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Collection Indicators

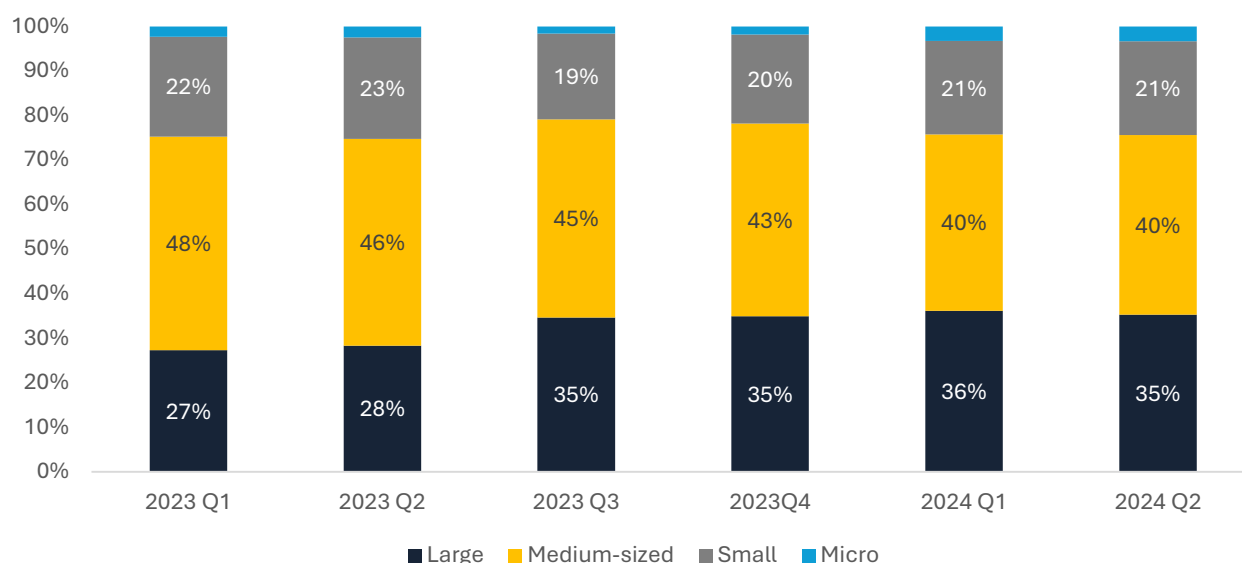
Now analyzing the distribution of revenues between large, medium, small and micro companies for SPSPs, according to parameters defined in a specific section of this study, some points should be highlighted. Firstly, although there are only 13 companies considered large, they represent around 33% of all NOR earned in

this segment. On the other hand, companies considered medium-sized hold the largest share of revenues over the period analyzed, earning on average 44% of the total.

Figure 04 shows the details of these revenues.

Figure 04: SCM NOR according to company size

SPSPs Performance | Economic-financial and sectoral indicators



SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Collection Indicator

In addition to the analyses of NOR from the point of view of the size of the companies and their performance in comparison to companies considered as non-SPSPs, it is pertinent to observe the distribution of SPSP revenues based on the segmentation by states of the federation. It is in this regard that we can assess the importance that these small providers have when it comes to universalization and democratization of access to fixed broadband services.

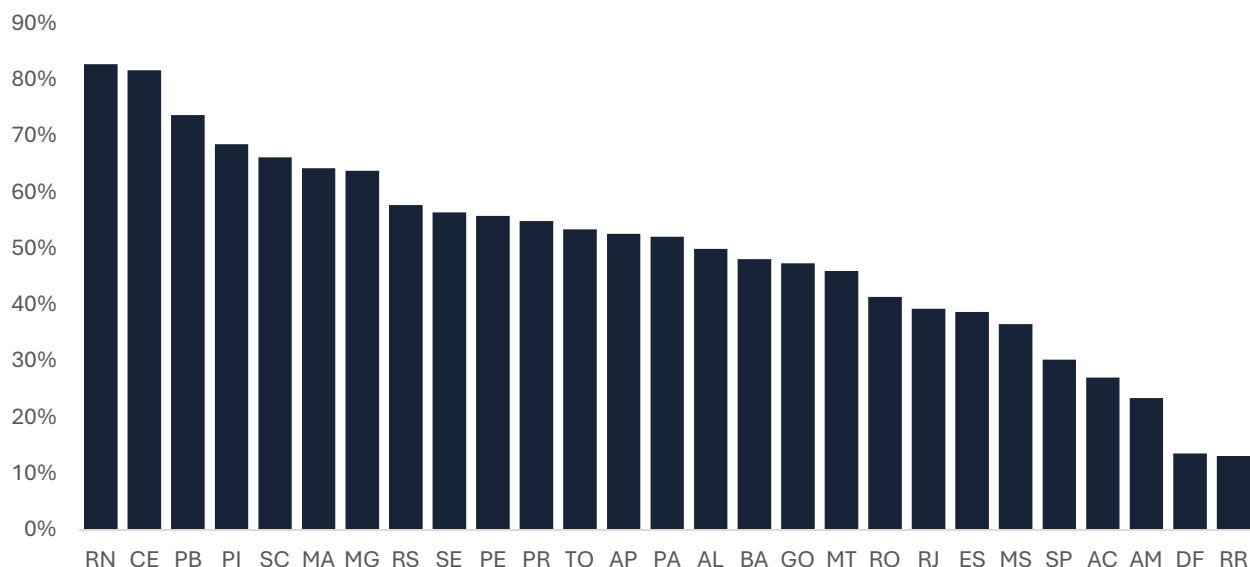
In states in the Northeast region of Brazil, such as Rio Grande do Norte, Ceará, Paraíba and Piauí, companies considered as SPSPs are responsible for around 70% to

80% of the total NOR registered by the SCM in these areas, reflecting the action of these companies in serving regional niches or specific market segments, such as remote areas or areas that are less attractive to large operators (rural areas, urban peripheries or small municipalities). The highlights in these regions are the companies Brisanet, Alares, Giga Mais, G3 Telecom and Proxima Telecomunicações.

Figure 05 shows the share of the NOR of SPSPs segmented by the states of the federation, considering the sum of the entire period analyzed (1st quarter of 2023 to 2nd quarter of 2024).

Figure 05: Participation of NOR of SPSPs by State

SPSPs Performance | Economic-financial and sectoral indicators



SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Indicator Collection

When analyzing the share that small providers have on revenues in the SCM, it is also pertinent to observe the performance of another extremely relevant indicator in the telecommunications market, namely the Average Revenue Per User (ARPU).

ARPU is a financial indicator that reflects the ability of operators to generate revenue from their customer base. This index is widely used to measure the efficiency of service providers, as well as being a reference in analyzing the economic performance of telecommunications companies. ARPU is calculated by dividing the total revenue generated by an operator by the number of users or subscribers during a specific period, usually monthly, quarterly or annually.

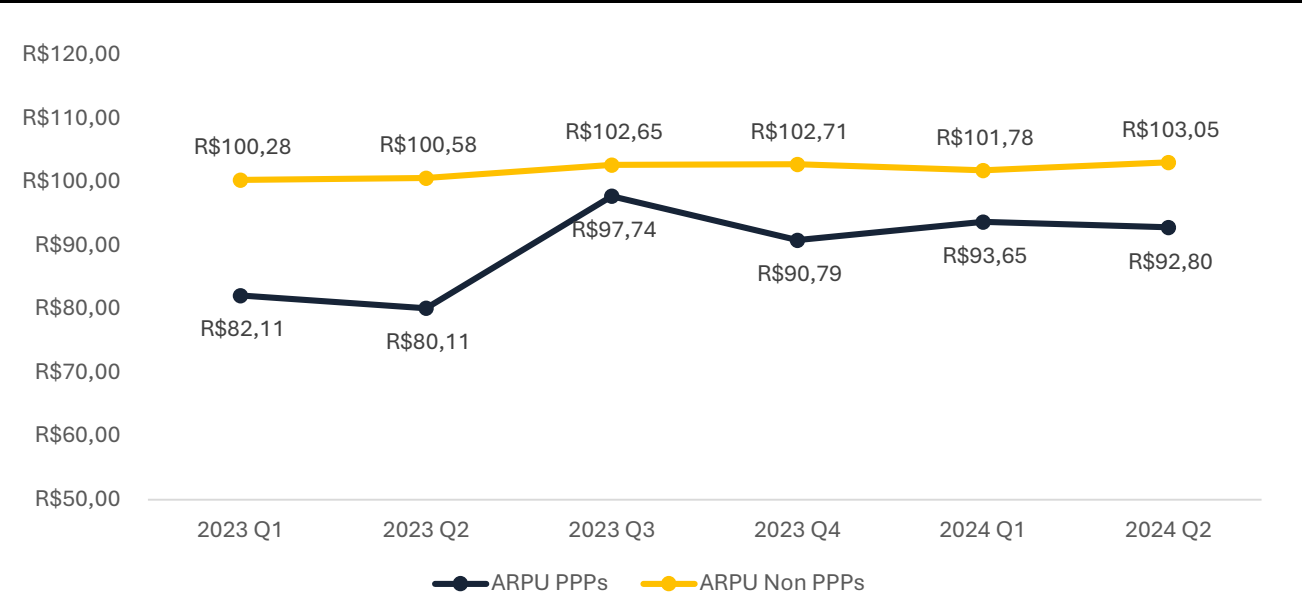
Taking the period between the 1st quarter of 2023 and the 2nd quarter of 2024 as a parameter, the SCM ARPU calculated for those companies considered as non-SPSPs was established in the range between R\$100

and R\$103, showing stability in the relationship between revenue earned and the number of registered users.

When looking at the SCM ARPU of SPSP companies, the values are at slightly lower levels compared to large providers. The fluctuation in values during the period analyzed is the result of issues involving possible underreporting in the number of accesses and the work involving the curation of technical-operational and economic-financial information in the treatment of inconsistent data by SPSPs.

However, the lower values can also be explained by the fact that these companies operate in regions with lower purchasing power, when compared to the preferred regions of non-SPSPs, as well as by some more advantageous offers that these companies make available to consumers compared to the incumbents. Figure 06 shows the comparison of ARPUs in both segments.

Figure 06: SCM ARPU



non-SPSPs: Vivo, Oi, Tim, Claro
SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.
Source: Indicators Collection

1.2 Investments (CAPEX)

The telecommunications sector plays a central role in the economic and social development of any country, being responsible for providing essential services for communication, education, health, commerce and industry. Among the various services offered, fixed broadband stands out as a strategic infrastructure, extremely important for digital inclusion, technological innovation and sustainable growth. Continuous and strategic investments in this sector are therefore essential to ensure not only the expansion of coverage, but also the improvement of the quality of services, the reduction of regional

inequalities and the creation of an environment conducive to economic development.

In a global context of increasing digitalization, high-quality internet has become a basic requirement for full participation in contemporary society. Thus, the expansion of fixed broadband infrastructure is an essential pillar for digital inclusion, allowing more individuals and companies to have access to economic and educational opportunities, regardless of their geographic location.

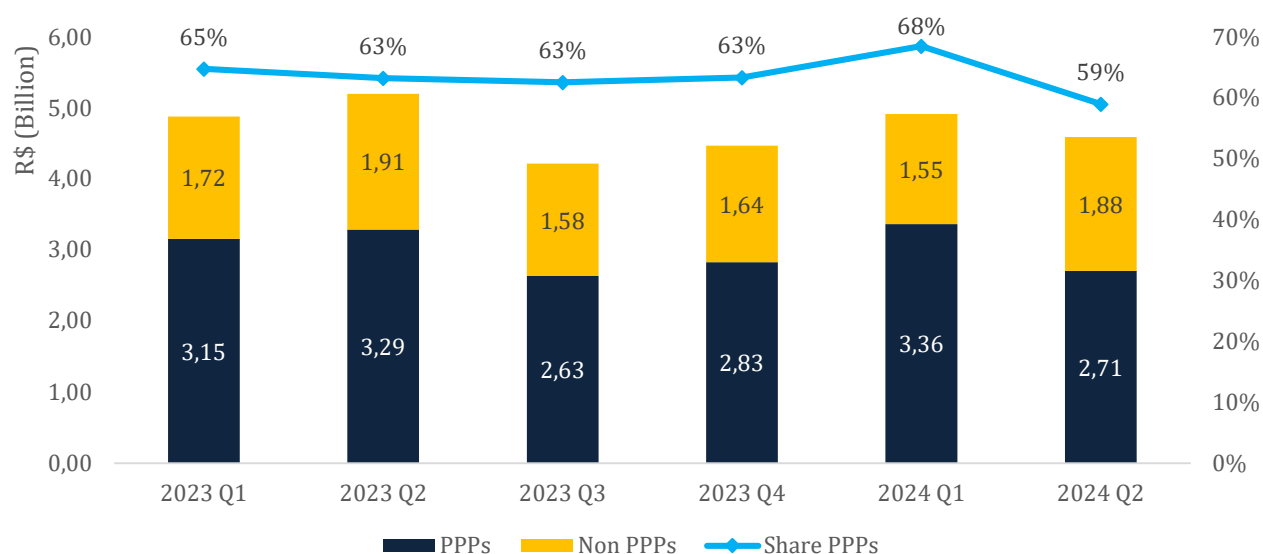
Investments in this area have a significant multiplier effect on the economy, as improved internet connectivity boosts productivity, competitiveness and innovation in a range of sectors, from e-commerce to the digital transformation of traditional industries. However, in many cases, the lack of adequate infrastructure limits the potential for innovation and reduces the ability of companies and governments to adopt advanced technological solutions.

The quality of telecommunications service, especially with regard to fixed broadband, is also directly linked to the reduction of social inequalities. Peripheral or rural regions often face difficulties in accessing quality telecommunications services, which exacerbates disparities in relation to more developed urban areas. Investments in telecommunications infrastructure can mitigate this gap, promoting a more equitable distribution of the benefits of digitalization and contributing to regional economic development.

At this point, it is important to evaluate the performance of investments made in fixed broadband service based on the segmentation between incumbent operators and those considered Small-scale Service Providers (SPSPs).

What has been seen since the implementation of the General Plan of Competition Goals (PGMC) is a considerable growth in fixed broadband access linked to SPSPs, so that such growth is also reflected in investments in the sector.

In Figure 07, we see the weight of investments by these small providers in relation to the total SCM market. Depending on the quarter analyzed in the historical series (1st Quarter 2023 to 2nd Quarter 2024), the consolidated value of investments in the sector varies between R\$4.2 billion and R\$5.2 billion, and SPSP companies are responsible, on average, for 64% of total investments in the SCM.

Figure 07: Investments in SCM

non-SPSPs: Vivo, Oi, Tim, Claro

SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Indicators Collection

It is important to point out that, despite the volume of SCM accesses being very similar when comparing the 4 operators considered as non-SPSPs and all of the almost 7,000 companies considered as small, what can be seen is that over the period analyzed, SPSP companies invested approximately R\$18 billion in network infrastructure, while large companies invested smaller amounts, in the order of R\$10.2 billion.

This difference in relation to the magnitude of investments between incumbent companies and small providers can be justified by the business strategy of each segment.

The large companies that provide fixed broadband services were formed after the privatization of the Telebrás System, where the STFC (Public Switched Telephone

Network) concessionaires acquired monopolies, which, as indicated in the Explanatory Memorandum No. 231/1996/MC³, “have a large installed infrastructure, have thousands or even millions of customers, have a cash flow that allows them to finance a substantial part of their investment needs, and have a well-known brand in the market”.

As these telephone networks from the Telebrás System were concentrated in the most economically attractive areas of Brazilian territory, the concessionaire invested, through its own strategy, in expanding the existing metallic pair network, conquering the market even in a monopoly environment (the market opening was happening gradually).

If telecommunications technology were not convergent, it could be said that the concessionaire made investments that were exclusively intended for the STFC concession. However, the xDSL technology for providing fixed broadband from SCM was developed to be used over the same metallic pair network that was already being used to provide STFC. This turned out to be an excellent deal for the concessionaire: instead of offering only STFC and having its revenues limited to this service and its investments restricted to developing a single business, without making any new investment in its copper cable plant, it also started to offer SCM through the same access that was already installed on the user's premises to offer STFC.

Due to this convergence characteristic, the concessionaire obtained two very relevant advantages: it had the advantage of the pioneer, of the monopolist, which allowed it to enter the SCM market before its competitors, with a previous network structure and with a well-known brand, in addition to having made investments only once to explore two (or more) telecommunications services. The concessionaire did not have to install one cable for the STFC and another for the SCM; it used the same infrastructure simultaneously for both services.

Thus, these networks allowed incumbents to own infrastructure to generate cash flows, allowing them to finance their investment needs in new generation networks (fiber optics) gradually. This type of situation allowed companies to focus investments in fiber optics in the most

competitive regions with greater purchasing power, while maintaining a customer base stable enough for this process of changing the access plan to be done in an organized and financially more spaced-out manner.

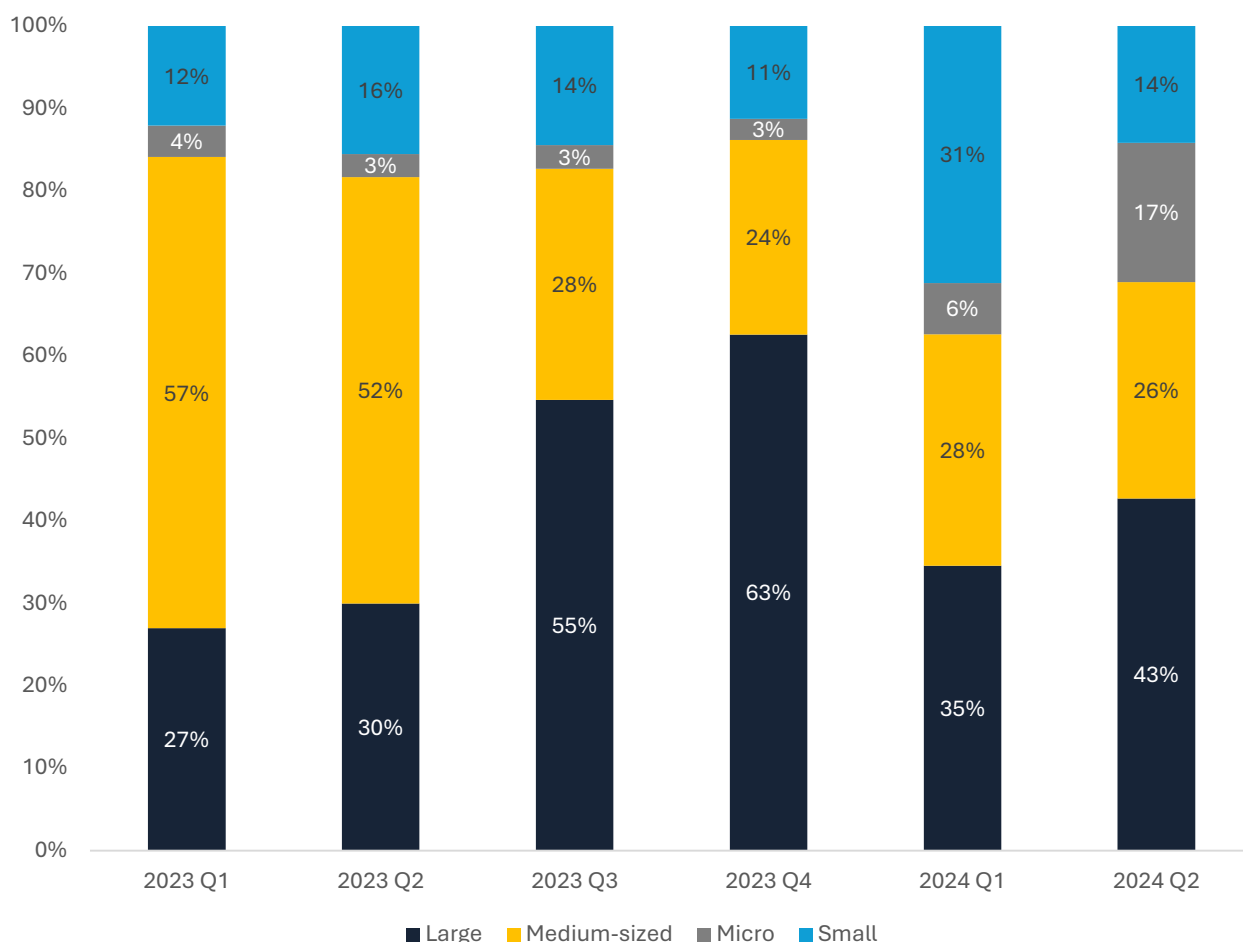
However, for SPSPs, the scenario is somewhat different. These companies are essential to expanding digital inclusion in Brazil, especially in regions where large operators do not reach. Thus, the volume of investments that these small providers make, when considered together, tends to be significantly higher than that of incumbent companies, since many of these companies start building their infrastructure from scratch, implementing fiber optic networks with an estimated useful life of between 10 and 20 years.

In this way, small companies end up injecting, in aggregate, significant amounts of resources to build their own network infrastructures, unlike large providers, which make incremental investments in their networks because they already have a more consolidated infrastructure.

One point that stands out is the allocation of these investments considering the size of these SPSPs. Analyzing the distribution of investments among large, medium, small and micro companies in the SPSP segment, it is possible to observe significant variations throughout the series. This can be explained by the fact that companies sometimes make heavy investments in specific periods of the year aiming at the construction of their network infrastructures, leaving the implementation of incremental actions for the other periods.

This behavior is shown in Figure 08.

Figure 08: SPSPs investments according to company size



Source: Indicators Collection

Figure 08 shows that the behavior of investments, based on the size of these SPSPs, does not follow a rigid pattern. In the first and second quarters of 2023, medium-sized companies accounted for more than half of SCM investments, while in the following quarters large companies dominated these shares. In 2024, the distribution of investments appears to be

more balanced, with a slight predominance of companies considered large.

Given the points presented, it was possible to show the performance of Small-scale Service Providers in the fixed broadband market, especially regarding investments made in network infrastructure. As they represent approximately 64% of the total resources allocated to the SCM, investments made by SPSPs end up

generating positive impacts on economic growth due to their transversal nature and their interdependence with several other industries, with effects on the growth of production and consumption, in addition to

the creation of new production chains. These spillover effects drive innovation and expand the country's productivity frontiers, thus demonstrating their relevance for the growth of Brazil's GDP.

1.3 Data Traffic

The internet has become one of the fundamental pillars of contemporary society, playing a central role in various dimensions of social, economic and cultural life. Among the countless innovations enabled by global connectivity, the advent and popularization of streaming services and social networks stands out, which have revolutionized the way in which audiovisual, musical and other types of media content are consumed.

The relevance of these services is closely linked to the evolution of digital infrastructures, accessibility and the impact they have on consumption habits and business models in sectors such as entertainment, communication and education. In a scenario of digital convergence, the internet, streaming services and social networks are determining factors for cultural, social and economic development.

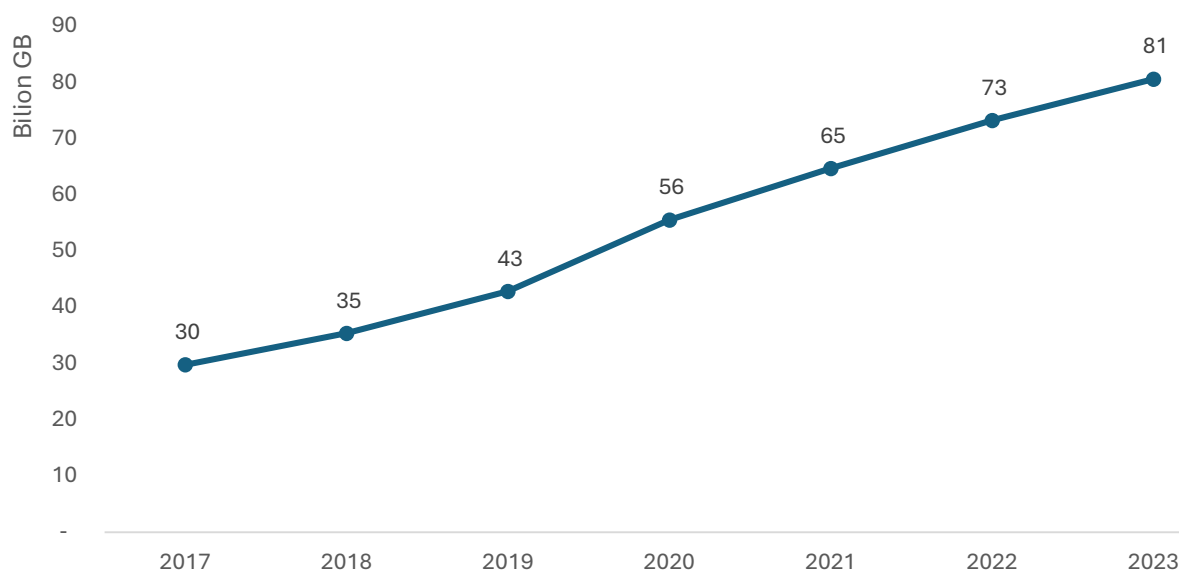
By enabling instant communication and data exchange on a global scale, the internet has established a new paradigm of connectivity and access to information. These services allow multimedia content, such as films, series, music and podcasts, to be accessed on-demand, that is, at any

time and in any place, through devices connected to the internet, such as computers, smartphones, smart TVs and other devices.

The massive use of these applications together with internet services has led to changes in data traffic among providers. In fact, the rise of Over the Top (OTT) services, that is, the provision of content, service or application to the end user via the Internet, such as social networks (WhatsApp, Facebook and Instagram), video streaming services and e-commerce, offered SCM consumers a more economical and versatile form of communication and entertainment, generating increases in the consumption of gigabytes in the fixed broadband market.

Putting the above into context, when analyzing data traffic in the SCM, considering only those companies classified as non-SPSPs, we see a significant increase in the consumption of gigabytes between 2017 and 2024, with an increase of approximately 171% over the series.

The result is shown in Figure 09.

Figure 09: SCM traffic for non-SPSPs

Source: Indicators Collection

Non-SPSPs: Vivo, Oi, Tim, Claro

However, from 2023 onwards, it is possible to compare data consumption in fixed broadband services based on the segmentation between incumbent operators and those considered Small-scale Service Providers (SPSPs).

As already mentioned, since the implementation of the General Plan of Competition Goals (PGMC) there has been an explosion of companies offering fixed broadband services. In fact, the sum of the number of accesses from operators considered as non-SPSPs (Vivo, Oi, Tim, Claro) is practically identical to the total number of companies considered as small.

In this way, all this quantity of new accesses originating from SPSPs ended up generating significant volumes of data traffic, which we will demonstrate below.

From the analysis of SPSPs data extracted directly from the “Data Collection” system,

it is possible to verify that the volume of data transferred on their networks is very similar to that of large providers, with a balance in the relationship between these 2 groups. On average, traffic on the network of small companies represents around 46% of the total gigabytes transferred on the SCM network.

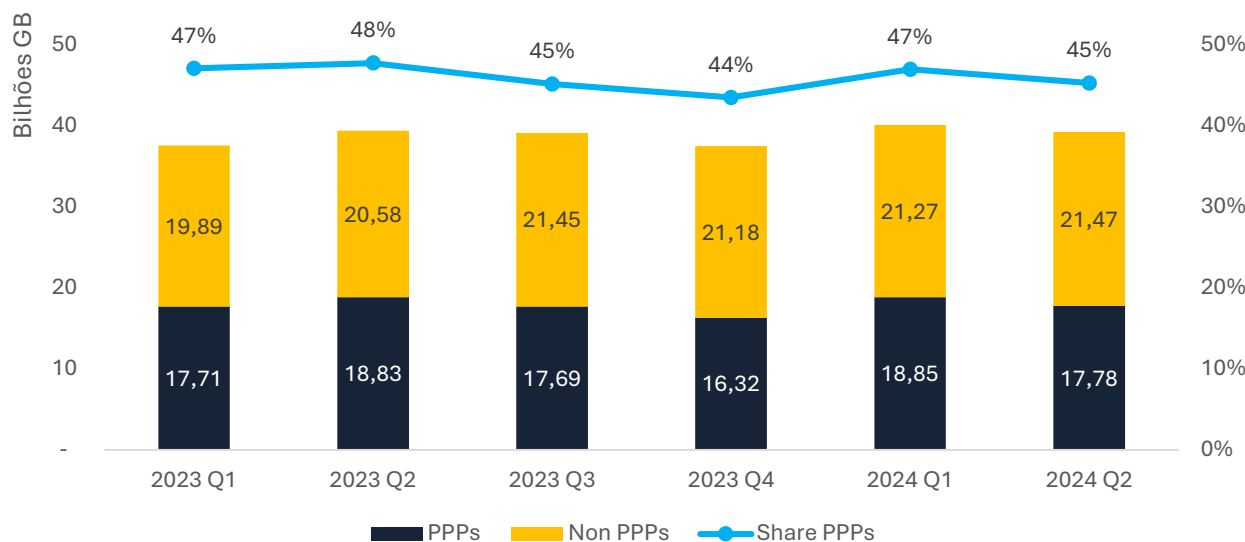
However, it is important to notice that, due to issues involving the possible underreporting of accesses by some SPSPs, as well as the work involving the curation of information in the treatment of inconsistent data by SPSPs, this indicator is subject to change.

As already explained in a specific section of this Study, to estimate more precise data traffic in the SPSP segment, as well as to exclude some outliers that could distort this volume, all companies that have data consumption between 50 and 600 Gb per month per user were considered as a

parameter. From this data, a weighted average of consumption per user was constructed for all small providers and, subsequently, having in hand the number of

accesses of these respective companies, the total traffic for the SPSPs was estimated. Thus, Figure 10 reflects what this traffic profile would be in the SCM, by segment.

Figure 10: SCM Traffic



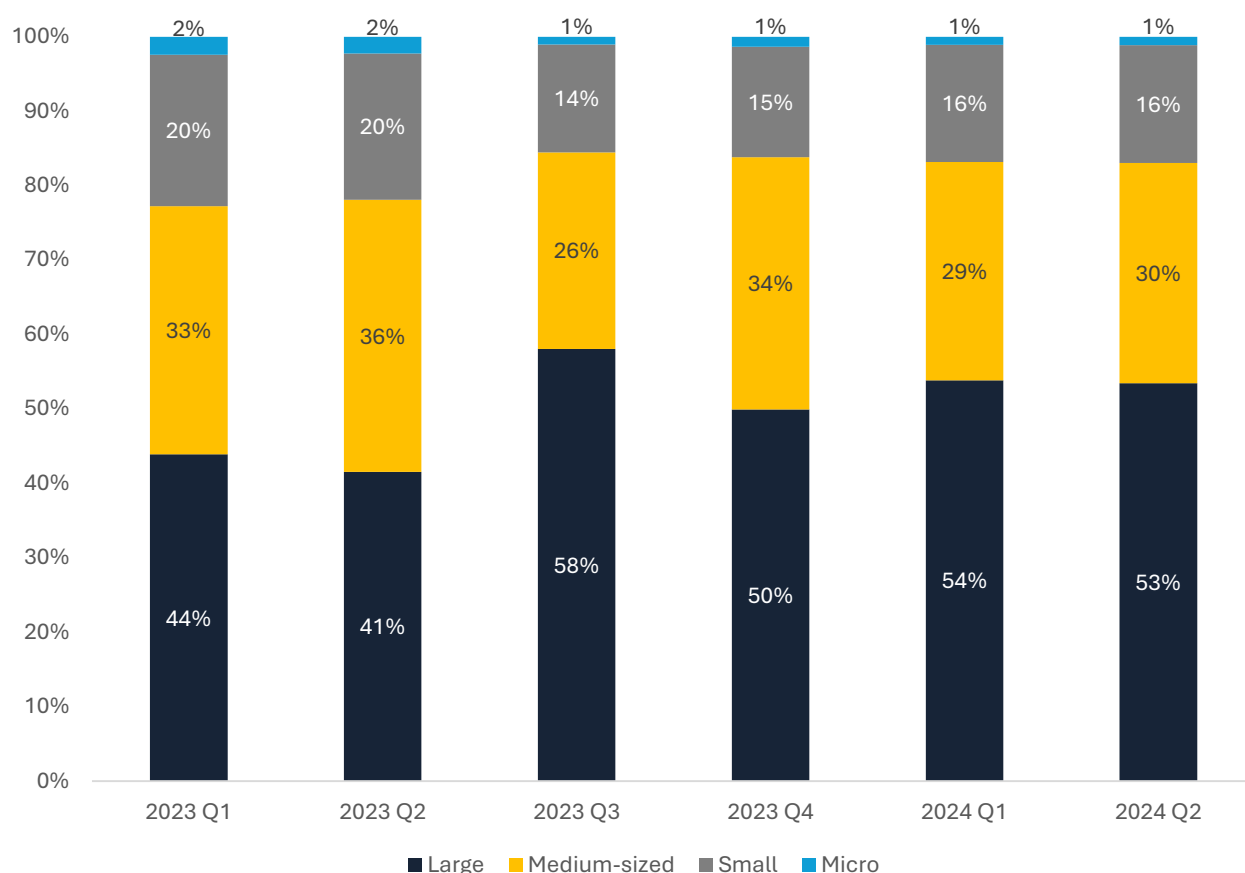
non-SPSPs: Vivo, Oi, Tim, Claro

SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Indicators Collection

Another point that draws attention is the allocation of data traffic considering the size of the companies. Analyzing the distribution of data traffic among large, medium, small

and micro companies in the SPSP segment, it is possible to verify very specific behaviors throughout the series, as shown in Figure 11.

Figure 11: SCM traffic – SPSPs according to company size

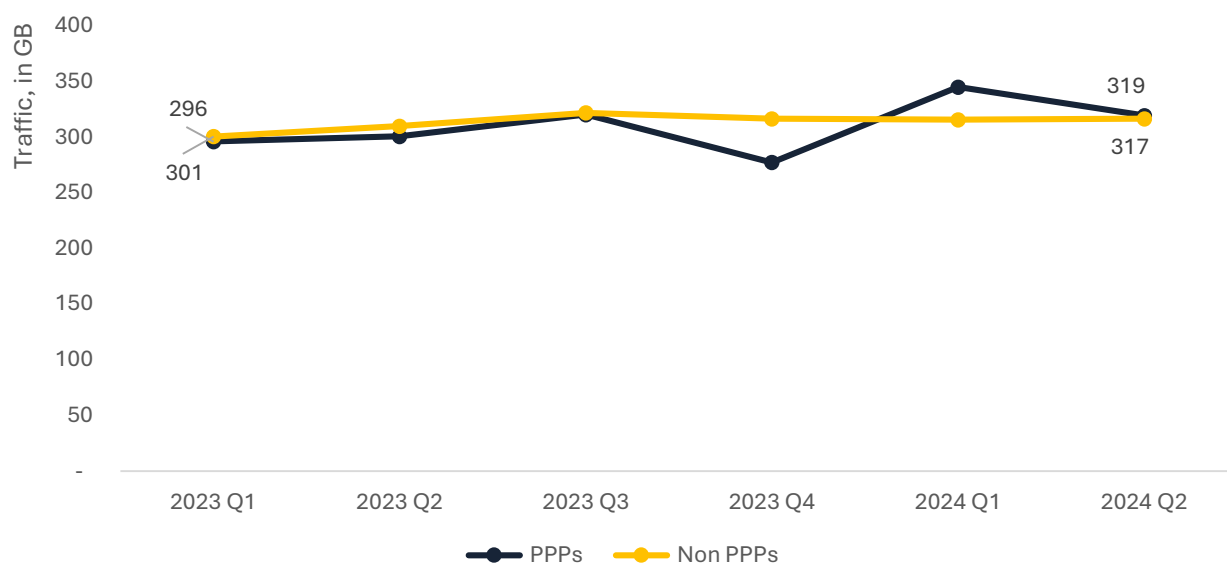
Fonte: Coleta Indicadores

It is clear that in the SPSP sector, there is a predominance of SCM data traffic in the large companies segment, which have a greater volume of gigabytes trafficked. It is worth noting that only 13 companies considered to be large represent approximately half of the data traffic generated in the SPSP segment.

Based on this analysis, we can consider that the advancement of Small-scale Service Providers in the SCM market ended up making access to fixed broadband service more democratic, generating increases in

data traffic due to the expansion in the number of accesses.

The results of these perceptions can be observed from the SCM data consumption indicator, in gigabytes, per user. Even considering the issue of possible underreporting in the number of accesses and the work involved in curating information in the treatment of inconsistent data by SPSPs, what is observed in this indicator is that it follows a pattern very close to that of companies considered as non-SPSPs, as shown in Figure 12.

Figure 12: SCM traffic by user

non-SPSPs: Vivo, Oi, Tim, Claro

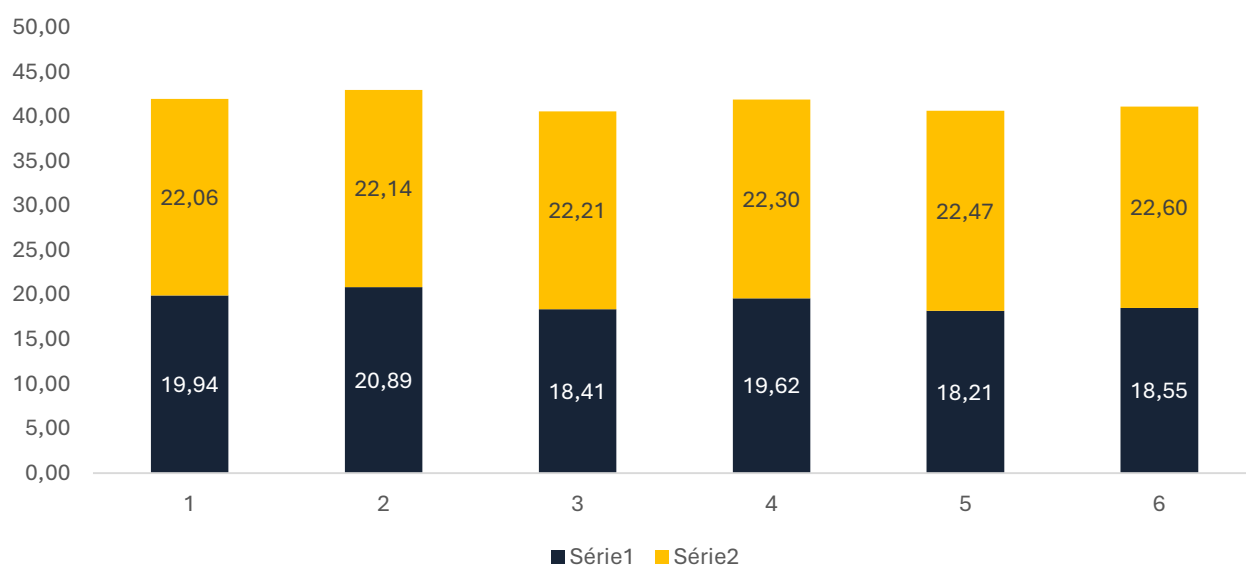
SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Indicators Collection

The equation that defines this indicator is established based on the relationship between the volume of data traffic carried on the SCM network, in gigabytes, and the number of users registered with each provider.

In this case, although there is a relatively equal number of consumers registered with operators considered to be SPSPs and incumbents, as can be seen in the “Anatel

Access Panel”, the data curation process for these companies took into account the exclusion of records from companies that presented revenue, investment or traffic indicators that were not consistent with other companies in the sector. Thereupon, with the implementation of these curations to properly exclude outliers, the number of accesses by small providers was lower compared to other companies, as shown in Figure 13.

Figure 13: Accesses by type of provider

Given this information, added to that relating to SPSPs data traffic defined by the consumption range metric between 50 and 600 Gb per month per user (already presented in this study), it is possible to see

that the volume of traffic generated by small providers, although smaller in terms of absolute volume, became very similar when analyzed from the point of view of individual consumption.

1.4 Service Price (Price Proxy)

Small broadband internet providers have become increasingly important in recent years. The level of investment they have made in network infrastructure projects has become significant over the years and is currently much higher than that made by incumbent companies, as demonstrated in this study.

Furthermore, the revenue levels earned by SPSP companies have also been showing significant growth rates, due not only to the emergence of new companies in this segment, but also to the increasing number of accesses that these companies have

been registering. And as a reflection of this situation, the volume of data traffic carried on the networks of small providers currently shows values as significant as those recorded by non-SPSP companies.

In this scenario, it is important to evaluate, based on the information already made available in this study, the price level for each gigabyte consumed within the SPSP segment.

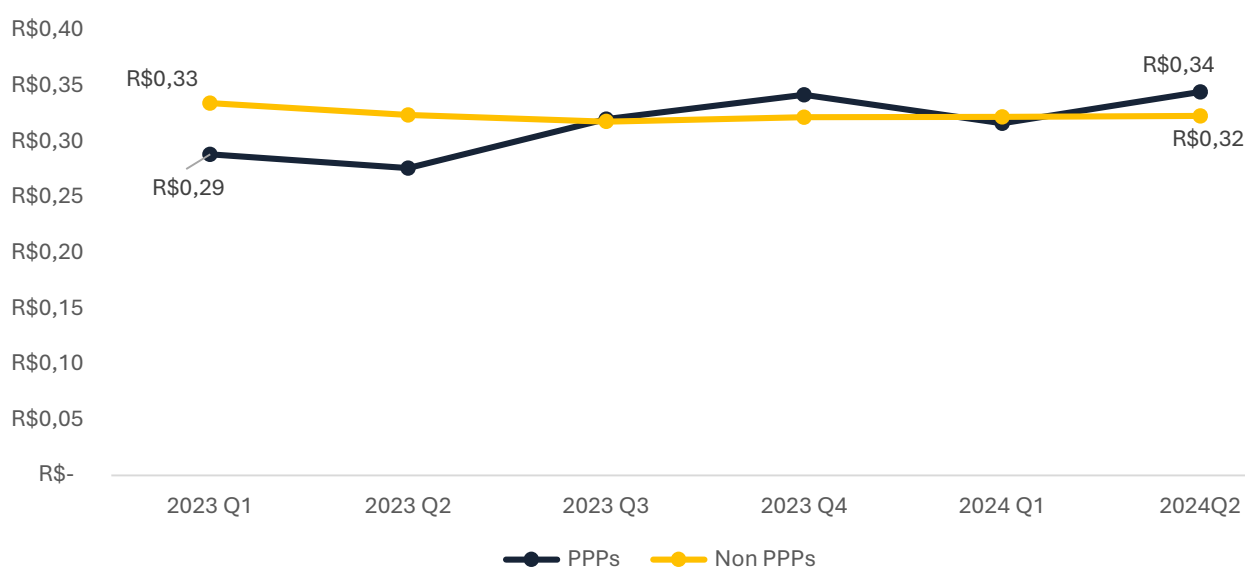
This price proxy is established by the relationship between the revenues earned by providers in the broadband service and

the data traffic carried on the network of these same providers, with the generating fact of this relationship being the data consumption per user when connecting to the internet. The result of this equation gives us the monetary value of each gigabyte consumed by users in the SCM.

Figure 14 shows that in the incumbent companies segment, the price of each gigabyte consumed per user remains stable in the range of R\$0.32, showing a continuous pattern between revenues and

data traffic for these companies. As for SPSPs, the variation of this indicator is noteworthy, with smaller and larger fluctuations compared to those companies considered incumbent. This fluctuation is justified by the higher growth rate of the NOR in the SPSP segment vis-à-vis the stability of its data traffic. However, this difference tends to disappear over time, as the information provided by these companies is forwarded to Anatel in a more precise manner.

Figure 14: SCM Proxy-Price



non-SPSPs: Vivo, Oi, Tim, Claro

SPSPs: Algar, Sercomtel/Ligga, Sky, Brisanet and more than 7,000 companies.

Source: Indicators Collection

Final considerations

This paper aimed to present the performance of Small-scale Service Providers in the Brazilian telecommunications market, highlighting the main economic and financial indicators of the sector.

These companies play a fundamental role in the fixed broadband market, especially in the context of an increasingly dynamic and competitive scenario. And, because they operate in specific niches or in geographically more restricted areas, they offer significant contributions to market diversity and access to connectivity, particularly in regions less served by large operators.

In economic terms, SPSPs have contributed to increasing competitiveness in the telecommunications sector, corroborating the results presented in this study.

In fact, the data presented here, in which approximately 64% of the investments made by operators in the SCM come from Small-scale Service Providers, combined with the representativeness of their Net Operating Revenue, in the order of 46% and growing rapidly, show the great relevance that SPSPs represent in the Brazilian telecommunications sector, especially in the states of the Northeast Region of Brazil.

Acting as an important agent for expanding broadband coverage, often in rural or peripheral areas, SPSPs end up offering greater digital inclusion, promoting the democratization of internet access, a fact reflected in the indicators of Data Traffic, Data Consumption per User and Price Proxy, whose records show values very similar to those of incumbent companies.

Finally, an extremely important point to highlight in relation to the technical-operational and economic-financial data forwarded by SPSPs concerns the curation of this information. During the preparation of this study, we came across issues involving possible underreporting in the number of accesses, as well as inconsistent information regarding investments, revenues and data traffic of some providers, which led to successive rounds of meetings with the operators to make the necessary adjustments, as well as the exclusion of records in cases where rectification was not possible.

At this point, so that analyses of this nature can be carried out more frequently and accurately, it is essential that SPSPs pay attention to the quality of the data presented in relation to the main economic-financial indicators to be entered into the Data Collection System, as well as the need to carry out curation cycles with the aim of correcting flaws in the presentation of information sent by providers.

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