

Analyzing markets for electronic communications services in emerging economies - the case of Romania

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Abstract

Despite the rapid and complex development of the Romanian electronic communications markets after the full sector liberalization in 2003, local literature often evaluates the development of the Romanian markets in a simplistic manner, by solely comparing the penetration of electronic communication services in Romania with the penetration rates in other European Union countries. The widespread appeal of this assessment method is explained by the availability and accuracy of penetration data in the official statistics as well as by the traditional use of this method before liberalization.

This paper argues that assessing the development of electronic communications markets solely by comparing penetration rates entails a number of deficiencies, especially when this method is used to compare emerging economies (such as Romania) against developed economies (such as mature EU 15 countries). In such cases the use of the penetration rates comparison method could lead the regulator into designing ineffective competitive remedies and service providers into making ineffective strategic investments.

Starting from this critical analysis, the paper proposes an alternative method for the evaluation of the development of electronic communications markets in emerging economies, using Romania as a case-study. The proposed method complements the penetration rates comparison by two additional qualitative criteria: intensity of competition, measured by the number of competitors and structure of market shares, and the consumer welfare generated by markets, measured by the indicators of service quality and price levels.

In the case of Romania, the analysis of both quantitative and qualitative market indicators recommended by our method yields a different conclusion than the one obtained using the penetration comparison method. While the penetration comparison method labels the electronic communications markets in Romania as underdeveloped in comparison with mature European Union markets, the alternative method proposed by this paper proves that in the last 7 years of competition, Romanian markets have largely recovered their extensive development handicap, while they are more advanced than most European Union mature markets in terms of competition quality and market dynamics.

Key words

Electronic communications, penetration rates, service bundles, competitive markets, extensive market development, qualitative market development

JEL codes: C81, L11, L96, O12

Objectives and Methodology

Europe is one of the world regions with a well-developed competitive environment in the electronic communications sector. The efforts of the European Commission to establish, by the Lisbon Strategy, information technology and communications (ICT's) as a strategic priority for Europe materialized in the liberalization of the communications markets in 1998¹, followed by the introduction in 2003 of a new regulatory framework, based on the principles of competition law and technological neutrality², which proved particularly effective in eliminating market entry barriers. This strategic approach facilitated the fast development of competition, the growth of service penetration and the reduction of prices, to the advantage of the European consumers³.

Romania was one of the latest European states to liberalize the telecom sector, at the beginning of 2003. This was one of the reasons why, at the moment of liberalization, Romania had one of the lowest levels of electronic communications services penetration in Europe, as well as one of the lowest levels of competition in the electronic communications markets. In order to recover this handicap, during the pre-accession negotiations in year 2002, Romania undertook to immediately transpose the provisions of the new telecoms regulatory framework⁴ in the national legislation, without a transition period. That permitted the adoption, immediately after the liberalization, of an aggressive regulatory policy focused upon elimination of market entry barriers to facilitate the rapid development of competition, which was expected to offer the fastest route to recovering the gap between Romania the other European states.

Despite rapid and complex development of the electronic communications markets in Romania after the liberalization, the local literature, offers, for the most part, a simplistic evaluation of the development level of the electronic communications markets in Romania based on benchmarks that compare the service penetration rates in Romania to those recorded in other European countries.

The preference for comparison of penetration rates to those in other countries as the unique indicator of the market's development level is explained by the availability and accuracy of data on the penetration rates of electronic communications services in Europe, as well as by the tradition of utilizing this method before liberalization⁵. However, the use of benchmarking with regard to service penetration among emerging economies, such as Romania, and developed economies, such as the first 15 member states of the European Union, has several fundamental deficiencies:

¹ Under the 1998 Telecoms Directives Package

² Under the 2003 Electronic Communications Directives Package

³ 8th-14th European Commission Reports on the European Electronic Communications Regulation and Markets, 2003-2009

⁴ Romania was the first country in Europe to implement the 2003 Electronic Communications Directives Package

⁵ Service penetration rates in regulated monopoly markets, such as fixed telephony markets before liberalization, were particularly relevant as they indicated the extent to which the monopolistic provider was determined to give up the typically monopolistic behaviour of *limiting the output* and *pricing at the level of marginal revenue* in order to maximize profits

- analysis based exclusively upon penetration rates has less relevance on competitive markets where there is no monopoly provider with an inclination to limit the volume of its offer
- analysis of the markets' level of development based exclusively on a quantitative criterion (number of services provided) became insufficient as services are more diversified in terms of quality, features, and coverage as a consequence of accelerated adoption of technological innovation in the sector over the past 10 years;
- comparing penetration rates in emerging markets to those in mature markets loses relevance since emerging competitive markets prioritize the allocation of investment resources efficiently, towards maximizing social welfare, which does not necessarily require immediate extensive development of markets, whereas mature markets had developed extensively during the monopoly period up to the present levels (that have become benchmarks), often by massive subventions aimed at accomplishing social objectives such as universal service.

Exclusively using the comparison of penetration rates as a basis for designing and measuring the success of the economic policies can lead to accepting flawed premises which can, in turn, lead to establishing unreasonable priorities and to adopting inefficient competitive remedies. Using the respective method by potential investors as fundament for strategic decisions such as market entry can lead to hazardous decisions, as it can allow for underestimation of the saturation and competitiveness of the market.

This paper proposes an alternative method for the assessment of the development of electronic communications services in emerging markets, using Romania as a case-study. This method complements the “penetration rate criterion” (as a means of evaluating the extensive development of the market), with two additional qualitative criteria: intensity of competition and consumer benefits generated by the respective markets:

Table 1. Evaluation criteria for the development of electronic communications markets

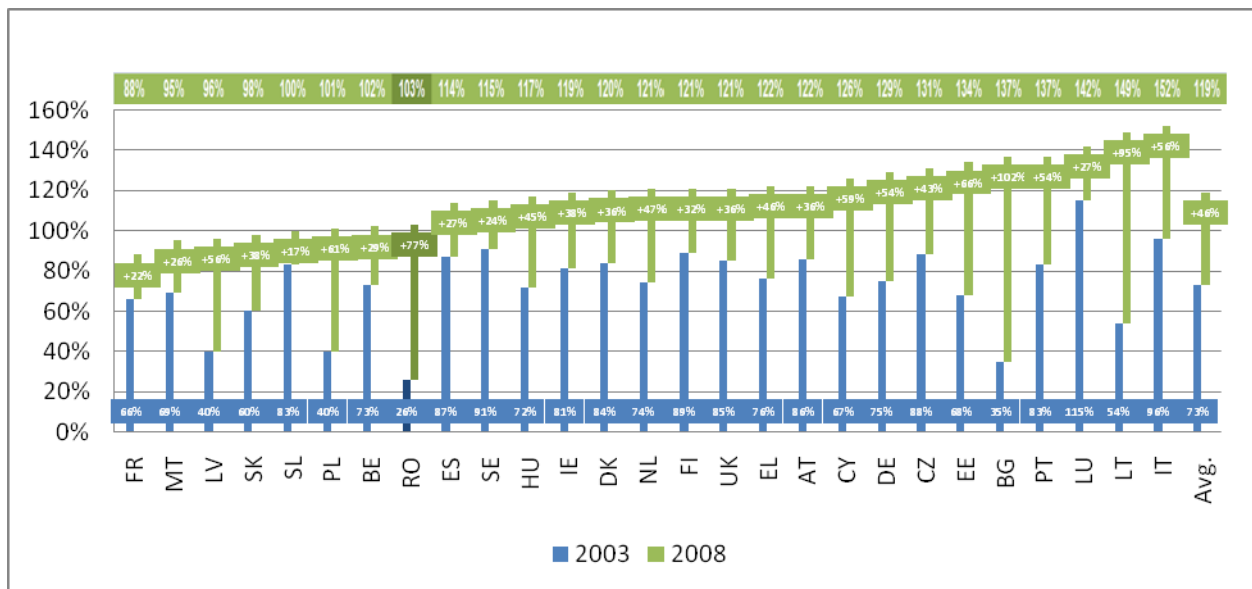
Extensive development criterion	Qualitative development criteria
1. Availability of service, quantified by the penetration rate (population that uses the services)	2. Intensity of competition, quantified by the number of competitors and the size of their market shares 3. Consumer benefits, quantified by measuring the average quality of service and price levels

Contrary to the conclusions that might be drawn from an analysis based exclusively on the penetration rate comparison method, we shall use a set of correlated indicators able to measure both the extensive and the qualitative development of the market to demonstrate that in the 7 years that passed since the liberalization of the market in Romania, electronic communications markets in this country have recovered most of the development gap compared to other EU markets.

Competition in the Mobile Telephony Market

On the 1st of January 2003, the liberalization date, Romania's mobile telephony penetration rate was the lowest in Europe, at 26%, compared to an European average of 73%. In 2008, the mobile telephony penetration rate in Romania reached 103%, close to the European average, which was of 119% at the time.

Figure 1: Penetration of mobile telephony services in Romania and the other European countries in 2003 and 2008



Source: European Commission 9th Report, 14th report; IBM 4th report

As indicated in Figure 1, despite the initial handicap, the penetration of mobile telephony services in Romania increased in 5 years at a fast pace, exceeding the penetration rate in 7 other member states of the European Union, among which France, Belgium and Poland. The mobile penetration rate in Romania has increased by 77 percent between 2003 and 2008, a significantly greater increase than the average penetration increase in the European Union, of only 46 percent. As Figure 1 indicates, Romania's mobile telephony penetration growth rate surpassed the penetration growth of 24 out of 26 member states.

The rapid increase of the mobile telephony penetration rate in the last 6 years and the recovery of the gap between Romania and the other European states indicate the existence of a favourable environment for investments in Romania, as well as that of healthy competitive incentives. This hypothesis is sustained by the evolution of the market concentration index from 2003 to 2009 (Figure 2).

One of the particularities of the mobile telephony market is that the maximum possible number of mobile network operators, hence the maximum possible number of mobile telephony service providers⁶, is limited by the number of licenses for the usage of the radio electric spectrum.

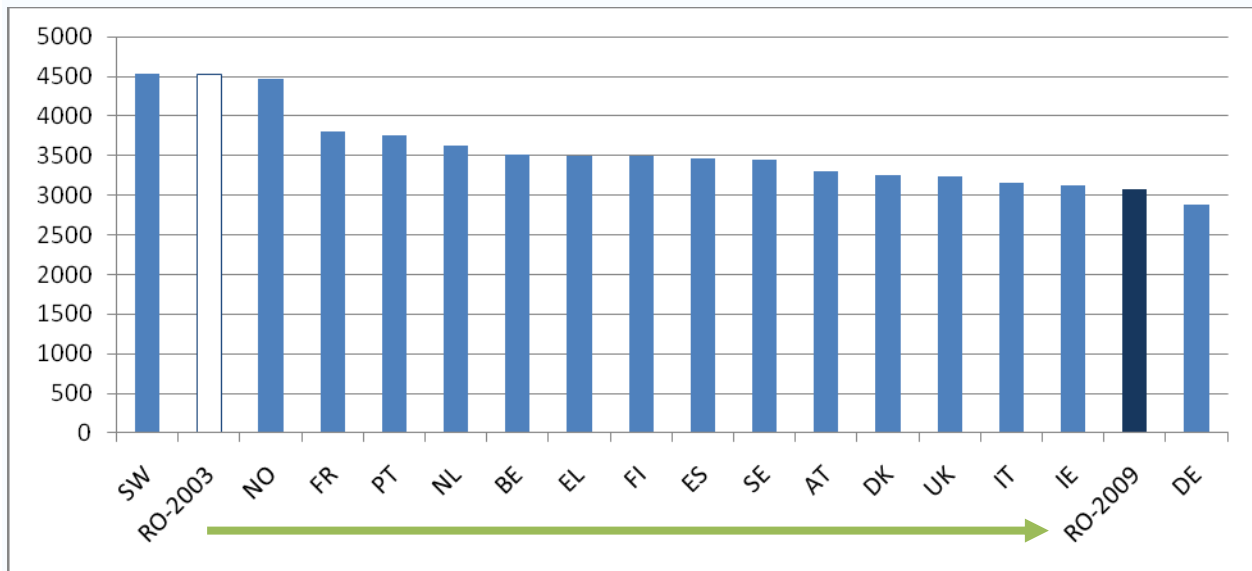
⁶ Not taking into consideration the operators of mobile virtual networks (MVNO - Mobile Virtual Network Operators), active in some European states;

Given this barrier to market entry, the number of service providers represents a very important indicator of the competition level in the mobile telephony market. Romania is one of 4 countries in the European Union where there are 5 operational service providers, the highest number in a European Union country.

A complementary indicator to the number of service providers is the balance of their respective market power, which is a guarantee of a real competitive confrontation, able to generate benefits for the consumers. This balance can be estimated by comparing the market shares controlled by the service providers.

The number of service providers in the market and the relative market shares they control are further evaluated in an aggregate way, through the Herfindahl-Hirschman market concentration index (HHI)⁷. The smaller the value of the HHI index, the more intense the competition in the market is. The decrease of the HHI index indicates an increase in the competition in the market, while its increase indicates the opposite, that is, a decrease in competition.

Figure 2. The Herfindahl-Hirschman market concentration index⁸ in the mobile telephony market, in 2003 (Romania) and 2009 (EU Countries including Romania)



⁷ The Herfindahl-Hirschman index (HHI) is calculated as the sum of the square market shares of the 50 largest companies active in a certain market. The result is proportional to the average market share of each company, weighted with itself. The HHI can range from 0 (in the case of a very large number of small companies with roughly similar market shares) up to 10.000 (in the case of a market with a unique monopolistic provider). The main advantage of using the HHI index, as opposed to the „concentration ratio”, is that the former gives more weight to large companies, being capable of identifying a situation where a company has a market share that does not alter significantly the average market share on a market with numerous companies, while it significantly affects the efficient functioning of competition due to the net advantage of size and market power compared to any of its competitors

⁸ The calculation does not take into account the Mobile Virtual Network Operators (MVNO)

Source: Analysys Mason Telecoms Market Matrix, 2009. The data for Romania is calculated based on national aggregated data published by ANCOM and on public statements of the telephony service providers in Romania regarding the number of users, as of the 1st of January, 2009.

As Figure 2 indicates, the concentration of the mobile telephony market in Romania decreased in the last 6 years from 0,454 to 0,308. At present, it has reached, one of the lowest levels in Europe⁹, second only to Germany.

The decrease of the market concentration index, corroborated with the reduction of the gap in mobile services penetration in the period 2003-2008, proves that the *dynamics of the mobile telephony services market* in Romania is, both quantitatively and qualitatively, superior to the European Union average. This accelerated dynamics has led to the recovery of the development gap between Romania and the other European countries.

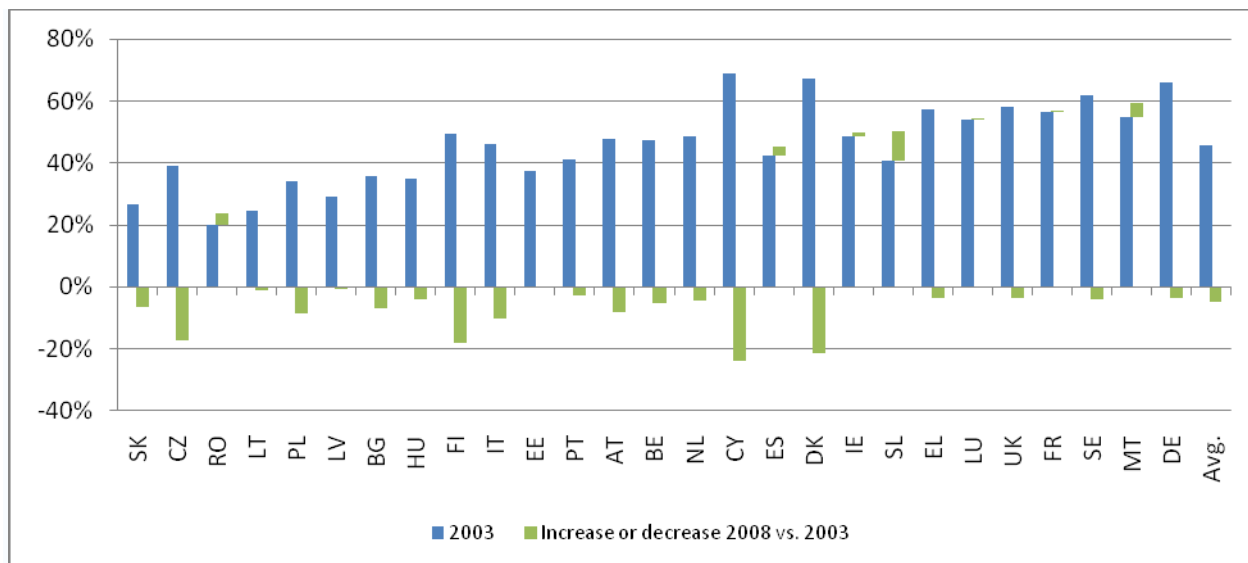
Competition in the Fixed Telephony Market

At the date of liberalization (2003), Romania's fixed telephony penetration rate, computed as number of lines divided by population, was among the lowest in Europe, reaching only 20%, while the European average was 46%. Between 2003 and 2008, the fixed telephony penetration in the member states has decreased, by an average of 5%, as a consequence of the accelerated fixed-mobile substitution¹⁰, while in Romania it has increased by 4%. Romania is one of the 7 countries in Europe that recorded a growth in the fixed telephony penetration in the period 2003-2008, Romania's growth rate being second only to that of Slovenia.

Figure 3: Penetration of the fixed telephony services in Romania compared to the other European countries and its evolution in the interval 2003 -2008

⁹ The concentration index for the Romanian market did not change significantly (from 3080 to 3120) after Zapp was taken over by Cosmote in November 2009

¹⁰ Fixed-mobile substitutability refers to the decreased usage of fixed telephony services related to the increased usage of mobile telephony services. Traffic substitution happens when the users retain their fixed line, but mostly use the mobile phone in order to make calls. Service substitutability happens when consumers completely give up their fixed line and use the mobile phone exclusively



Source: European Commission 14th report, 4th IBM report, ICT Statistics Database¹¹

This performance took place despite the fact that the fixed-mobile substitution in Romania was more intensely manifest than in the other European countries, due to the following:

- a large segment of the Romanian population never had access to a fixed line, therefore lacked the inertial behaviour of using the fixed telephony services;
- the average budget available to be spent on electronic communications services was significantly lower than in other European countries due to the lower average income;
- the penetration of the mobile telephony services grew faster in Romania than in the other European Countries (Figure 1) which is an indication of higher fixed-mobile substitution, especially considering the constraint on the available budgets of the population.

The fact that the penetration of the fixed telephony services did not decline in such circumstances is a first indication of the efficient functioning of competition in the fixed telephony market. The decrease in the number of users of the incumbent fixed telephony operator in Romania, due to competition and fixed-mobile substitution, was integrally compensated by the growth of the number of users of the alternative fixed telephony providers and by the increase of the penetration of fixed telephony services in the previously uncovered the rural areas.

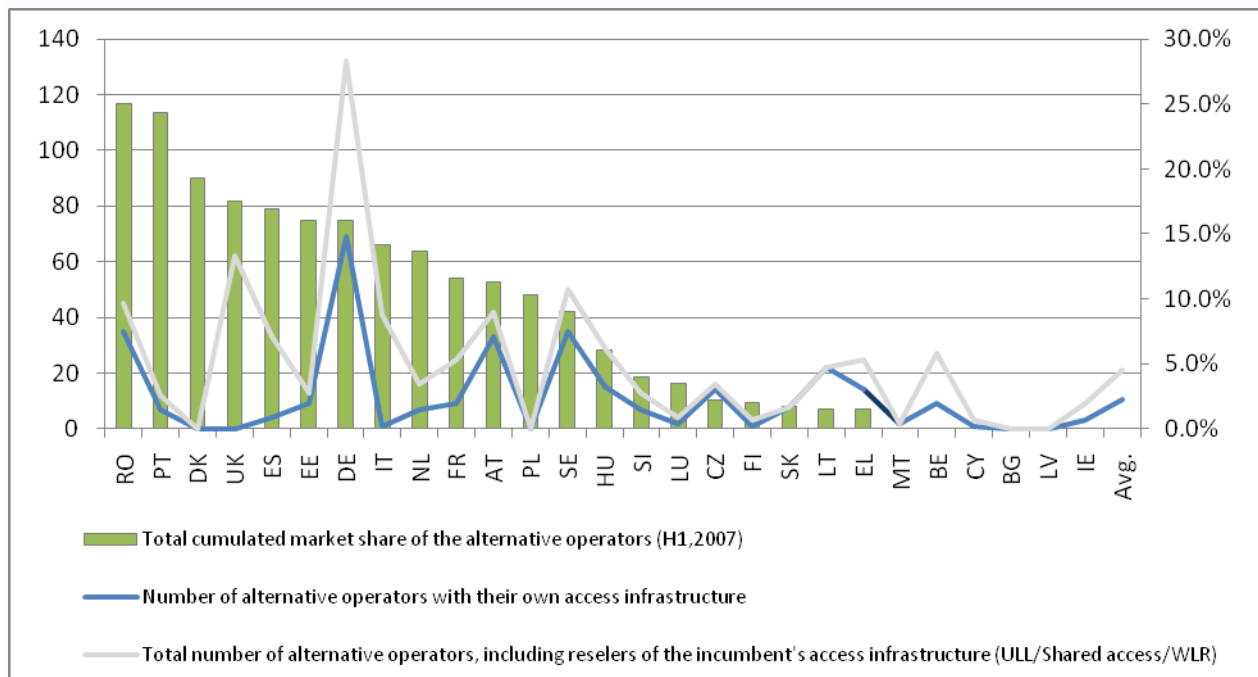
The evaluation of the retail competition among fixed telephony service providers is best done by evaluating the competition in the *market of access to the public fixed telephony network*. The *network access service* (commercially marketed by service providers as “line rental”) is essential for the provision all fixed telephony services because it is strictly required in order for the users to be able to make any kind of calls, to any destination. Service providers need to make very sizeable long term investments in order to deploy the access networks required to connect the users to the fixed telephony network. This is why, having more than one credible service

¹¹ <http://www.itu.int/ITU-D/ICTEYE/Indicators/Indicators.aspx#>

provider making such investments in order to compete in the market for access to the end user is a very strong indication of a durable, infrastructure-based competition.

Evaluating the intensity of competition *in the market of access to the public fixed telephony network* using the HHI index would have limited relevance, since the incumbent still controls a high market share in this market, which makes the fragmentation of the market controlled by the alternative operators irrelevant as an indication of the intensity of competition. For example, a sole competitor with a 20% market-share could exert a higher competitive pressure on the dominant provider than 20 alternative providers, each having a market-share of 1%, due to the increased economies of scale and increased positive “network effects”¹², such a competitor would enjoy due to its bigger size. This is why, in the fixed telephony market, the HHI index offers a good indication as to the intensity of competition only to the extent its reduction is driven by the reduction of the market share of the dominant operator and not by the fragmentation of the market shares of the alternative operators. Considering this, we shall evaluate the intensity of competition *in the market for access to the public fixed telephony network* based on the market share “lost” by the incumbent, which is equal to the cumulated market share gained by the alternative operators.

Figure 4: Cumulated market share of alternative fixed telephony service providers in Romania compared to the other European states, at 1st of July 2007



¹² The network effect (positive network externality) represents the increase in the value of the service for all the users of the network, existing or potential, generated by the subscription to the same network of a new user. In network industries, such as fixed telephony, the *value* of the service offered by a service provider grows proportionally with the number of users of the respective network, increasing the competitive strength of the provider.

Source: Based on the data in the „European Commission 14th report”¹³

Only 6 years after the liberalization and the elimination of the legal monopoly of Romtelecom, Romania records the highest market share of the alternative operators *in the market for access to the public fixed telephony network*, among all European Union countries. Moreover, unlike most other European countries¹⁴, all service providers in Romania provide access through their own networks, and not by “reselling” the access network of the incumbent operator; this proves the high levels of investment advanced by the alternative service providers which indicate a durable, infrastructure-based competition.

Additionally, we look at the *number of active alternative providers* who operate their own infrastructure in order to offer access services, in Romania compared to the other European Union countries. This indicator gives us an estimate of the size of the administrative barriers to market entry, as well of the optimism of the investors with regard to the market potential which in turn is a good indication of the likely development of the competition in the more distant future. Romania ranks second in Europe, after Germany, in terms of number of alternative providers that operate their own infrastructure, and fourth, after Germany, the United Kingdom and Sweden in terms of the total number of alternative operators.

The growth of the fixed telephony penetration, correlated with the rapid growth of the alternative operators’ market share up to a level exceeding that in countries where liberalization occurred 20 years before (for instance, the United Kingdom), indicates that, in the 6 years since liberalization, Romania attained a high level of competition in the fixed telephony services market, which lead to a remarkable increase in the intensive development of the market¹⁵ compared to other member states. However, both due to the large historical difference in the penetration of fixed telephony services and to the present technological context, characterized by the gradual replacement of fixed technology with mobile technology, Romania could only recover a small part of the gap in the extensive development¹⁶ of the fixed telephony market compared to other member states.

Competition in the Broadband Market

In 2003, broadband Internet access was virtually unavailable for residential customers in Romania and the country occupied the last position among European Union and Candidate Countries from the point of view of broadband Internet access penetration. 6 years later, the penetration gap to the European Union countries is significantly reduced; however Romania continues to rank among the last from the point of view of broadband penetration, surpassing only Bulgaria and Slovakia.

However, the relatively low penetration of broadband Internet access in Romania in 2009 does not necessarily indicate a low level of market development, as it is determined more by the

¹³ The analysis is limited to the values recorded at the end of the second trimester of year 2007, the most recent data made public by the European Commission. In the case of Romania, the alternative operators market share in July 2009 will continue to increase up to 32%, a 28% increase compared to July 2007 (Source: ANRC, Statistical Data Report, 1st Semester 2009), which supports the conclusions of our analysis.

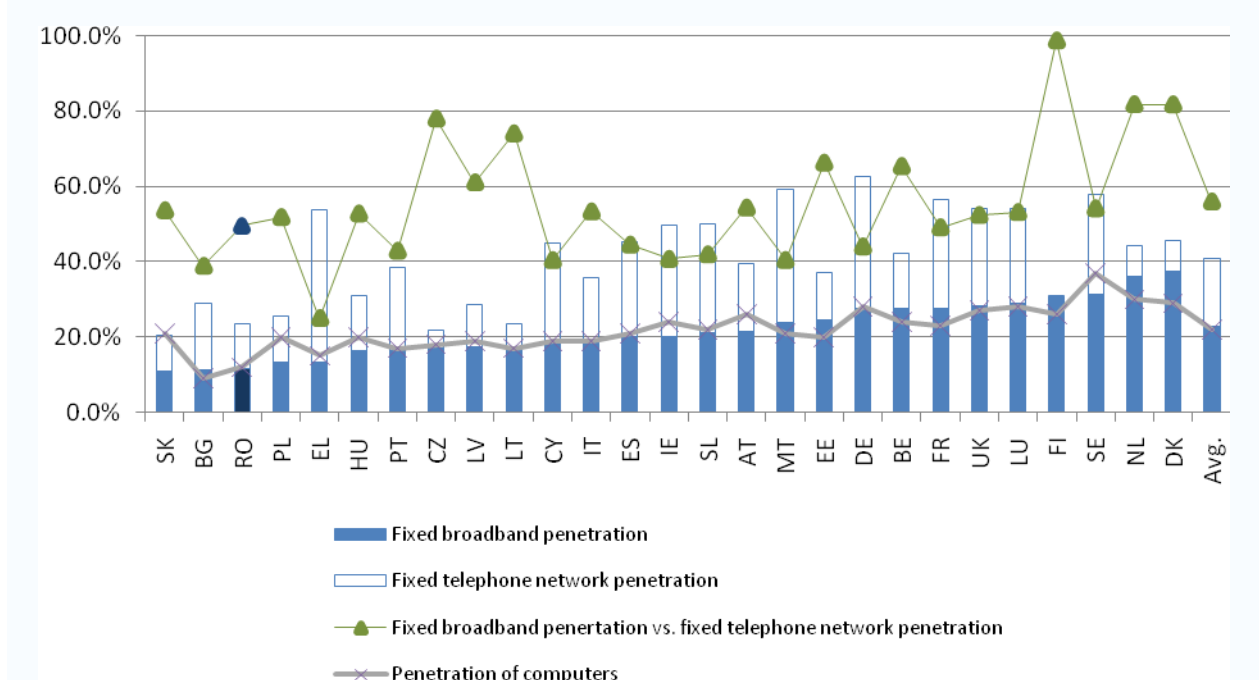
¹⁴ European Commission 14th report”

¹⁵ By intensive development we refer to the penetration of the addressable client base;

¹⁶ By extensive development we refer to the penetration of the total population

existence of a large segment of population who does not own a personal computer or an access connexion to the fixed telephony network and not by an insufficient intensive penetration of the market.

Figure 5: Penetration of broadband Internet versus penetration of personal computers and penetration of access to the fixed telephony network



Source: „European Commission 14th report”; Europe’s Digital Competitiveness Report - Main achievements of the i2010 strategy 2005-2009

As Figure 5 indicates, the penetration of broadband Internet access in the member states of the European Union, including Romania, is correlated to the penetration of computers, in a ratio close to 1:1. Together with Bulgaria, Romania has the lowest penetration of personal computers in the European Union (12% in comparison to the European average of 22%). This is one explanation why Romania still lags behind the other member states from the point of view of broadband Internet penetration.

At the same time, it is well known that the rapid growth in the number of Internet access connexions in the European Union countries relied mainly on the exploitation of the existent cable infrastructure, used for the provision of fixed telephony or cable TV services. If we do not take into consideration the Romanian population that does not have access to a fixed telephone line¹⁷ and we recalculate the penetration rates of broadband Internet access connexions (Figure 5), we find that the penetration of broadband Internet access in Romania goes up to 50%, a value which is very close to the average of the European Union countries (56%); this is despite Romania’s handicap determined by the low penetration of personal computers. The analysis clearly shows that the extensive development of the market of broadband Internet access

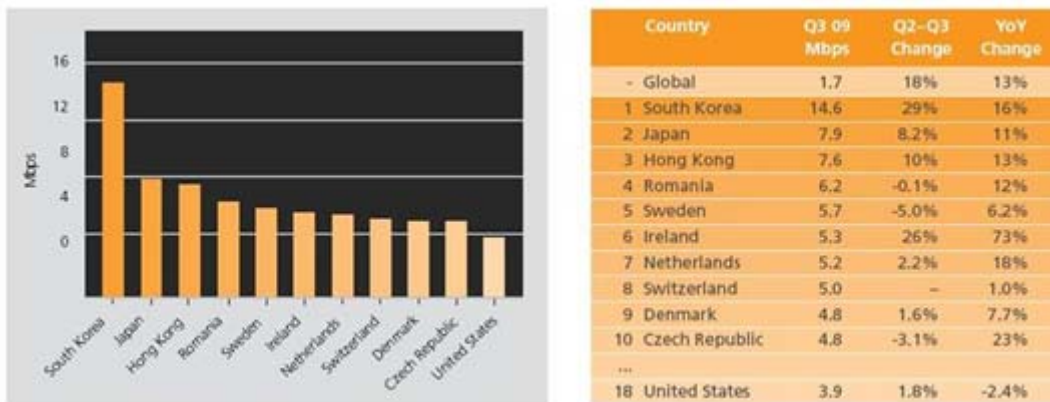
¹⁷ The unavailability of infrastructure for access to the fixed telephony network is geographically correlated to the unavailability of infrastructure for access to a cable TV network which is technically capable of offering access to broadband Internet access (cable TV networks have urban coverage that is comparable to that of the PSTN network and inferior rural coverage).

connexions in Romania is hindered by strong constraints that pertain to underdevelopment of some closely connected adjacent markets (computers and access to the public fixed telephony network).

In order to assess the level of intensive development of the market as well as the quality of the competitive environment compared to other European Union countries, we shall proceed to analysing the *quality of the services* available in the market, which is a strong indication of the level of the investments engaged in the adoption of new technologies and *of the quality of the competition* among alternative infrastructures, which, in itself, ensures the premises for continued the growth in the penetration and quality of service.

In 2009 Romania ranks first in Europe and fourth in the world (after South Korea, Japan and Hong Kong) in terms of the average quality (speed) of broadband Internet connections provided at national level.

Figure 6: Average access speed of broadband Internet access connexions



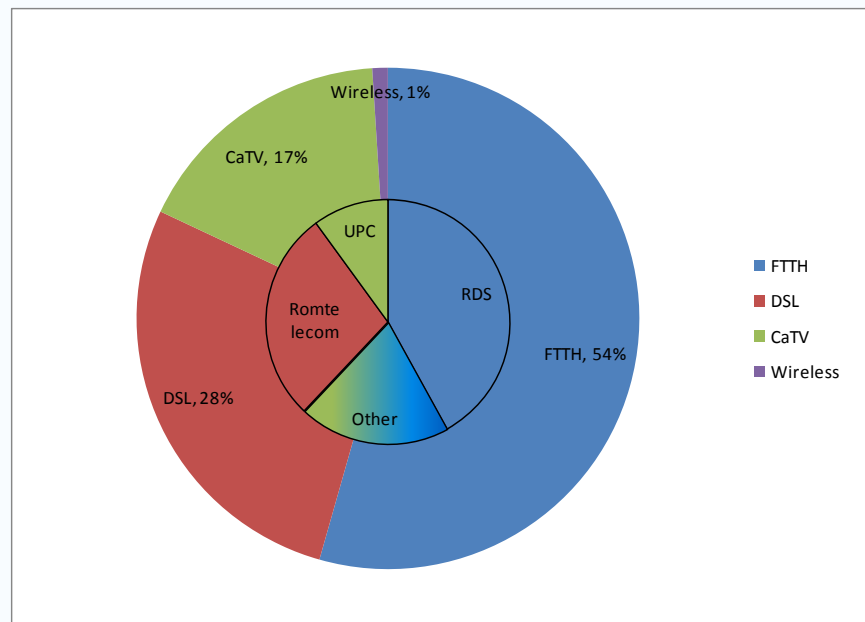
Source: Akamai, 2nd Quarter, 2009, Volume 2, Number 2 REPORT, „The State of the Internet”

Romania’s performance in terms of broadband quality is arguably even more striking than the 4th place in the world shows as, unlike Romania, where the investments were exclusively stimulated by market mechanisms (competition between service providers), Korea and Japan subsidized the installation of high-bandwidth Internet access networks¹⁸ with public money. At the same time, the difference in demographic density between Romania and Hong Kong asks for a more appropriate comparison, such as the one between the average speed of *urban* broadband connection in Romania and the average speed of broadband connections in Hong Kong, a contest that Romania would surely win.

Finally, looking at the market shares of the service providers and at the market shares of different access technologies, Romania features a balanced market structure (Figure 7) which ones more indicate that the high level of the quality of service is the direct consequence of a high level of competition between infrastructures.

¹⁸ KPMG - The State of Telecoms Industry in Asia Pacific, Aprilie 2009

Figure 7: Market shares of operators and technologies



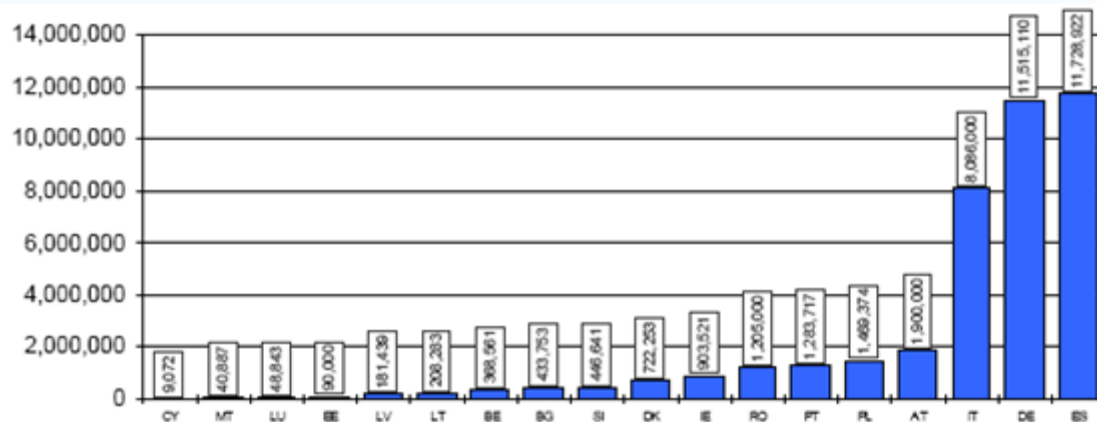
Source: Aggregated data published by ANCOM and public statements of the broadband Internet access providers in Romania regarding the number of users, as of the 1st of January, 2009

The dominant access technology, FTTH (dedicated fibre optic access to each building) is one of the most advanced technologies available at the moment in the world, offering access speeds of 100Mbps. The prevalence of the Fibre Optics technology in the Romanian market explains the outstanding average speed of the broadband connections compared to the other countries in the world.

The relatively balanced distribution of the market-shares between the three dominant end-user access technologies, FTTH (Fibre optic), DSL and CaTV, as well as the balanced distribution of market shares between the broadband Internet service providers, set the premises for a durable competition among infrastructures, which offers the most appropriate environment for further investments to increase the penetration and quality of the broadband services in Romania.

As far as the market for mobile broadband Internet access is concerned, in Romania there are 5 providers with urban coverage at national level. Although the number of competitors and the level of investment indicate the premises for high service penetration, due to the very high quality of the fixed broadband connections in Romania, the use of a mobile connexion as an alternative to a fixed one is never attractive, mobile connexions being used rather as complementary solutions for Internet access. This explains the merely average penetration of mobile broadband Internet access connexions in Romania in comparison to the other European Union member states.

Figure 8: Number of active mobile broadband Internet access connexions in the member states of the European Union (January 2009)



Source: „European Commission 14th report”

The market for broadband Internet access in Romania is therefore at a high level of intensive development, with a very high quality of services and of the competitive environment, while lacking in extensive penetration due to the constraints imposed by the underdevelopment of some closely connected markets (computers and fixed access to the public telephone network).

These circumstances entail a high potential for growth of the service penetration in the near future. The large number of providers active at national level (1033, as of July 2009¹⁹) offers supplementary indications as to the attractiveness of this market to investors, confirming the perspectives for maintaining the rhythm of investments and of the growth in service penetration.

Based on the actual structure of the market indicators, we consider that Romania has recovered in the past 6 years the gap in competition levels and investments in the market of broadband Internet access provision that separated it from the other European states. These are the fundamental premises for the accelerated recovery of the penetration delay in the future.

Competition in the TV Market

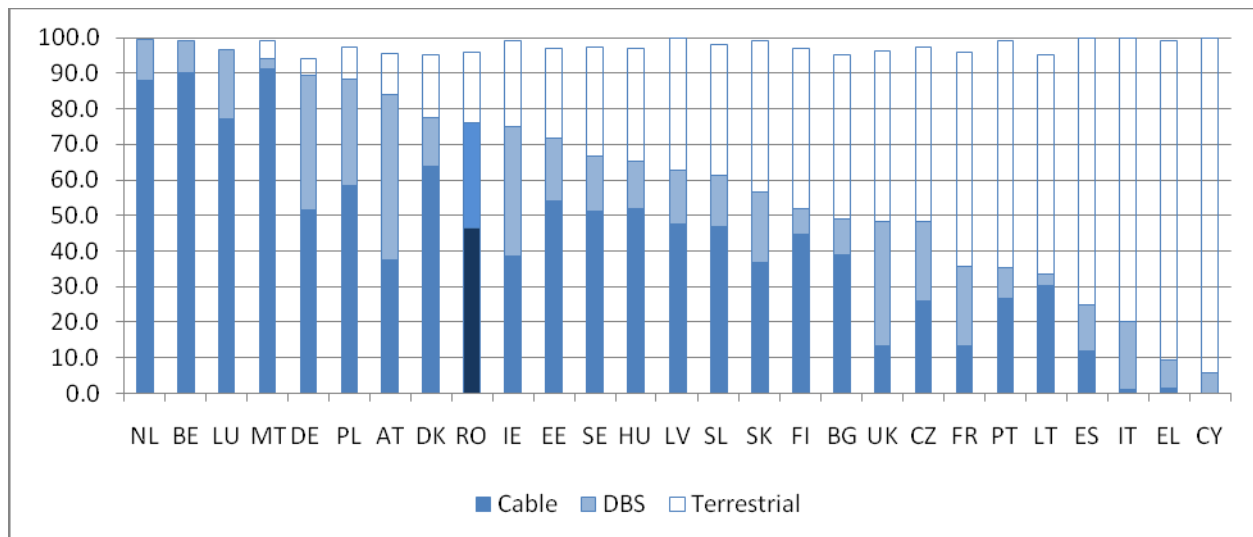
At the time of liberalization, Romania enjoyed a high penetration of cable TV networks, complemented, especially in the rural areas, by full national coverage of the public television programmes via analogue terrestrial broadcasting. The most important post-liberalization evolutions were:

- Television services penetration remained at a level close to 100% of households;
- Satellite television services penetration increased, from 0% to 30% of the market, at the expense of a decrease in the penetration of terrestrial broadcasting;
- Cable TV penetration slightly increased up to almost 50% of the market, while at the same time there was a concentration of the offer by mergers and acquisitions;

¹⁹ ANCOM

- Cable networks were upgraded extensively so as to enable the provision of broadband Internet access services and telephony services, cable networks becoming thus the first integrated platform for the provision of bundled communications services²⁰. The service bundling strategy, along with transferring the economies of scope to the consumer through discounts on service bundles, lead to the cable operators reaching a market share of over 60% of the broadband Internet access market (Figure 7) and over 30% on the fixed telephony market (Figure 4) in the 2003 – 2009 interval.

Figure 9: Penetration of television services and breakdown of the access technologies²¹



Source: MAVISE Advanced search - TV in Europe²²; OECD Communications Outlook 2009²³; ITU Yearbook of Statistics 2009²⁴

Among the other member states of the European Union, Romania ranges 9th from the point of view of “Paid TV” penetration with a good balance between the two dominant technologies, cable TV and satellite. From the point of view of the market dynamics, satellite access (DBS) is growing at the expense of terrestrial broadcasting, especially in rural areas.

Where the transition from analogue terrestrial broadcasting to digital terrestrial broadcasting (DBT) is concerned, Romania scheduled the dead-line for the 1st of January 2012, with a slight delay compared to some member states of the European Union, who have already completed the transition. Given the large combined penetration of CaTV and satellite access services in Romania, as well as the incompatibility of the existent receivers with the DBT technology, it is unlikely that the new, digital terrestrial broadcasting technology will determine a significant reconfiguration of the market.

²⁰ Additionally, digital cable TV services (DBC) have become largely available in 2009

²¹ Data from 2006, 2007, 2008

²² TV penetration

²³ Market shares of the TV technologies

²⁴ Market shares of the TV technologies for: LT, LV, EE, BG, SL, MT, CY

Based on the penetration of television services in Romania, we can conclude that the extensive development of the TV market is higher than the average levels in the European Union, while, based on the competition level in the pay-TV market and on the evolution of the TV networks into integrated platforms competing successfully with the operators of PSTN and wireless networks in adjacent electronic communications markets, we can conclude that the intensive development of the Romanian TV market is among the highest in Europe.

Impact of Competition on the Prices of Electronic Communications Services in Romania

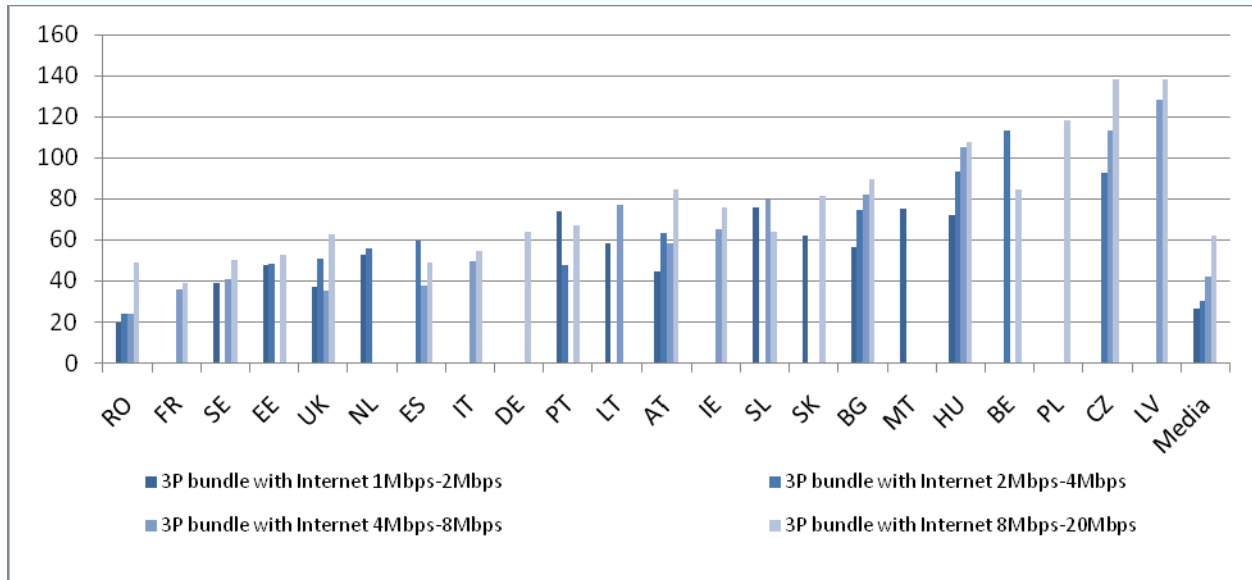
The analyses at each individual market level show that Romania is at the moment one of the European countries with a high level of competition in the electronic communications sector. Among the strong points of the Romanian markets, we can summarize:

- High penetration of mobile telephony services and low concentration of the market;
- Growth of the fixed telephony penetration, large market share of the alternative providers who operate their own access infrastructure and few barriers at market entry, which leads to a large number of operators;
- Broadband Internet penetration of the addressable population (i.e. owners of personal computers) close to the European Union average but with an average quality of the services among the very highest in world, as a result of healthy competition between infrastructures, which stimulated the investment in the widespread adoption of the latest technologies;
- Penetration of Pay-TV services higher than the average levels in the European Union, with an evolution of the TV networks into integrated platforms competing successfully with the operators of PSTN and wireless networks in adjacent other electronic communications markets.

Considering the fact that the most important service providers in Romania operate integrated platforms are offering all types of electronic communications services, some of them exclusively as bundles, we shall look at the *prices of service bundles* in the Romania, compared to the other countries in the European Union, as to a synthetic indicator of the general level of consumer welfare generated by the electronic communications markets.

Figure 10: Prices in euro, adjusted with the purchasing power parity (PPP), VAT included, for the best 3P offers available in April

2008²⁵.



Source: European Commission 14th Report, BIAC - First half of 2008, Van Dijk Management Consultants

As figure 10 shows, the prices for 3P services (fixed telephony, broadband Internet access and TV) in Romania are the lowest in Europe, not only nominal, but also after adjustment with the purchasing power parity, which, in Romania's case, doubles the nominal price.

The intense platform-based competition across all markets, corroborated with the low available incomes in Romania, explains the high quality of services at very low prices, which translates into a very high level of consumer welfare generated by the Romanian electronic communications markets.

Conclusions

The comparison of the penetration rates of the electronic communications services in Romania with the levels recorded in the other member states of the European Union puts Romania on one of the last places. Based on such an analysis, one could conclude that the development of the electronic communications markets in Romania is very low, significantly inferior to that of most member states of the European Union.

However, a qualitative analysis of the functioning of the markets places Romania on one of the first positions in the European Union from the point of view of competition, quality of service and price levels. Moreover, Romania records one of the highest growth rates of the electronic communications penetration in Europe. Analyzing the dynamics of investment over the past 7 years, we observe that the intensity of competition and the low level of price did not affect the

²⁵ Unavailable data for: Greece, Cyprus, Luxemburg, Finland and Denmark.

investment level (the dynamic efficiency), but rather determined a rapid improvement in the productive efficiency of the service providers²⁶.

Corroborating the findings of our analysis, we can conclude that Romania has, on one hand, surpassed the European Union's average performance in terms of the qualitative development of the electronic communications markets, while, on the other hand, closed most of the gap recorded at the date of liberalization, in 2003, in terms of service penetration rates (extensive market development). Given the healthy qualitative premises present in the Romanian markets, a continuation of the accelerated extensive development of the electronic communications service markets is to be expected in the near future.

The analysis we performed on the Romanian case-study is conceptually applicable to other emerging economies with a competitive electronic communications sector. The dynamics of the penetration rates indicate that states such as Poland, the Baltic countries or Bulgaria share a similar context to that of Romania. It remains to be confirmed by subsequent studies that the proposed analysis method is also applicable to other countries that share some or most of the particularities of the Romanian electronic communications markets.

²⁶ For example, Romtelecom, the fixed line incumbent, has cut the number of employees from 45,000 in 2001 to 10,000 in 2009, while extensively increasing the service portfolio and sales volumes

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