POLISH MOBILE COMMUNICATIONS MARKET – PRIMARY TRENDS OF CHANGES

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Abstract

The article characterizes the Mobile Communications Market in Poland and its current trends of changes. Some of the newest available data were used to show the main, nowadays, features of this market. The primary feature is its dynamic growth measured by number of active SIM cards per 100 inhabitants. This market is characterized by a dominance of three operators. Each of them has approximately the same market share of around 30%. Despite the existing oligopolistic structure, since the year 2006 on the Polish mobile market appear new entrants building their own network as well as virtual operators.

Subsequently the article focused on the growing market power of the new operator (company PLAY) building its own network and on the company's business strategy. Also the reasons for the relatively weak position of virtual operators were presented.

At the end, some of the main features of the Polish Mobile Communications Market were identified. Generally, those features suggest that the direction of mobile telephony development pursued in Poland favors strengthening the competitiveness of the Polish telecommunications market.

Key words: Telecommunication, Polish Mobile Communications Market

POLONYA MOBIL İLETİŞİM MARKETİ – DEĞİŞİMİN TEMEL EĞİLİMLERİ

Özet

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Makale, Polonya'daki mobil iletişim pazarını ve bu pazarın güncel değişim trendlerini tanımlamaktadır. Bu pazarın temel ve güncel özelliklerini göstermek için mevcut en yeni verilerin bir kısmı kullanılmıştır. En önemli özellik, her bir 100 mukim başına kullanılan aktif sim kartlarının sayısı ile ölçülen dinamik büyümedir. Bu pazar üç operatörün eğemenliğiyle karakterize edilmektedir. Her biri ortalama %30 ile yaklaşık olarak aynı pazar payına sahiptir. Mevcut oligopolistik yapıya

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rağmen 2006 yılından bu yana Polonya mobil iletişim pazarına kendi ağlarını kuran yeni firma ve sanal operatörlerin girişi görülmektedir.

Bunun ardından, makale, kendi ağını kuran yeni bir operatörün (Play firması) artan pazar payına ve şirketin iş stratejisine odaklanmaktadır. Ayrıca, sanal operatörlerin görece zayıf pozisyonları da ortaya konulmaktadır.

Sonuç olarak, Polonya mobil iletişim pazarının bazı temel özellikleri tanımlanmaktadır. Bu özellikler, genel olarak, Polonya'daki mobil telefonculuğun gelişim yönünün Polonya telekomünikasyon pazarının rekabetçi yapısının güçlendirilmesine katkı sağladığına işaret etmektedir.

Anahtar Kelimeler: Telekomünikasyon, Poloya Mobil İletişim Pazarı

1. Introduction

Characteristic processes of recent years are the progressive liberalization (Jurczyk, 1991; Wilczyński 1991) and globalization (Kaplan, Norton, 2001) of economic activity. These processes run particularly intensively in sectors that previously functioned on a monopoly basis. Telecommunication is an example of such sector.

Changes in telecommunications are also a consequence of the dynamic development of new communication technologies, resulting, amongst other, in the creation and development of mobile telecommunication. The advantages of this technology led to the emergence and rapid development of many mobile operators, including on one hand those having their own network and on the other hand those using leased lines and the rapid development of service offerings of these operators.

The observed continuous development in mobile communication technologies forces the operators functioning in this segment to continuous improve their resources and applied business solutions. Business advantage in this market achieve those operators who efficiently exploit the potential of modern technologies allowing them to better satisfy the demand for telecommunication services. These facts have become the inspiration to present the Polish Mobile Communications Market (MCM) and the changes within this area.

In this context the paper also formulated the following hypothesis:

The direction of mobile telephony development pursued in Poland favors strengthening the competitiveness of the Polish telecommunications market, improving and expanding services in the telecommunications market and consumer empowerment.

According to this, the objectives of the article are: to present the status and the development trends of the Polish MCM, to visualize new trends emerging in the Polish MCM and subsequently to evaluate the changes in the Polish MCM.

The realization of the three above mentioned objectives requires the use of the following methods: analysis of studies concerning the economics of services, including telecommunication services, economic policy and marketing of services, induction and deduction as well as the observation of the Polish MCM.

During article preparation, the author used information contained in reports of domestic and foreign markets created by institutions investigating telecommunication markets, materials of national Polish mobile operators and resources of the polish national telecommunication regulatory authority – the Office of Electronic Communications (Urząd Komunikacji Elektronicznej - UKE).

The article structure was subordinated to the article objectives. The second section presents the Polish MCM, characterizing the major operators, their market shares and the changes in this area. The third part focuses on new trends observed in the Polish MCM. In this part especially the emergence of sectional areas of cooperation between competing operators, as well as the first occurrence of acquisitions processes were highlighted. The fourth part of the article contains a preliminary attempt to evaluate new trends observed in the Polish MCM. In this section at first, the positive effects of MCM on the whole Polish telecommunications market were pointed out. Referring to the initiated cooperation processes and acquisitions, it was considered that their current range should not limit the level of competition on the Polish MCM, but rather strengthen it. At the end of the article some final remarks regarding the Polish MCM were presented.

2. Mobile Communications Market in Poland

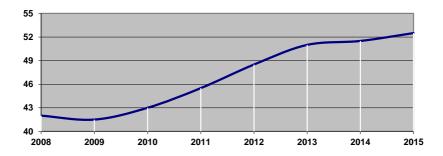
Telecommunications service market is subject to dynamic changes. An significant impact on this state of matter has the liberalization of the telecommunications service market and the technical and technological progress.

One of the effects of technical-technological progress was the emergence of mobile telephony (MT). The emergence and development of MT strongly affects the entire telecommunication market. On one hand it contributes to the increase regarding the value of this market, which is also reflected in the forecasts of the telecommunication market development.

¹ In the article, the author uses the name – mobile operators to describe both - mobile network operators (MNOs) as well as mobile virtual network operators (MVNOs).

The increase in the value of telecommunication market in Poland and forecasts of this growth to the year 2015 shows figure 1.

Figure 1. Estimated value growth of the telecommunication market in Poland until 2015 (in bln PLN)



Source: Audytel, "Polski Rynek Telekomunikacyjny 2010", dane spółek. After: Dziennik Gazeta Prawna of 23.02.10.

On the other hand the development of MT as a substitute for fixed services will reduce the role of fixed telephony. On the fixed telephony market, despite the drop of call prices and also the possibility to easily chose an operator, which in consequence leads to a more attractive offer choice, the number of calls made by customers of this market segment is decreasing. This fact coupled with falling tariffs leads to decreasing revenues from this market segment.

This process is also accelerated by the growing number of MT users and number of calls in mobile networks as well as by technical and organizational improvements taken by the MT operators.

In Poland, MCM despite a small decrease of its value in 2009, is characterized by continuous growth in terms of users, the number of calls and the aggregate time of their duration. Already in 2007 the so-called nominal penetration of this market has exceeded 100%. One of the key indicators for the mobile phone development is the number of active SIM cards and the number of cards per 100 inhabitants. Data on these two figures for the polish MCM show figures 2 and 3.

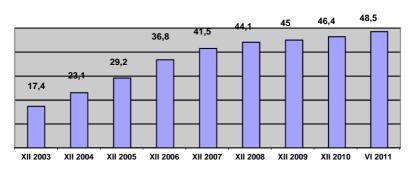


Figure 2. Number of active SIM cards in Poland (in mln)

Source: Główny Urząd Statystyczny – GUS (Central Statistical Office). After: GoMobi.pl [date of access 03.10.11] (http://gomobi.pl/news/GUS-podal-aktualna-liczbe-aktywnych-kart-SIM).

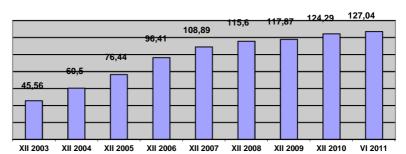


Fig. 3. Number of active SIM cards per 100 inhabitants in Poland (in %)

 $\label{lem:source:GUS.After:GoMobi.pl [date of access 03.10.11] (http://gomobi.pl/news/GUS-podal-aktualna-liczbe-aktywnych-kart-SIM).} \\$

The above shown data allow to speak of a saturated market, where the acquisition of new customers is relatively difficult. In addition to the saturated market, another important feature of the polish MCM is the domination of three operators:

- PTK Centertel (Orange),
- Polkomtel (Plus),
- Polska Telefonia Cyfrowa (Era).²

 $^{^{2}}$ More detailed capital structure of the 3 dominant Polish mobile operators is presented in appendix.

These operators are functioning on the polish MCM since the beginning of its inception, with strong strategic investors and a significant market share. As of April 2009 the shares of these operators of the polish MCM were as follows:

- Orange 30.99%
- Plus 32.56%
- Era 30.18%.³

The presented status indicates that the MCM in Poland has an oligopolistic structure. Taking advantage of this situation, these three, named earlier operators, didn't compete for a long time with service prices, but mainly with the types and prices of the offered mobile phones models. The existence of such a situation was not favorable to customers, and its clear change required the emergence of new entrants on the market. However, the entry in this market is a considerable challenge and involves amongst other the need to offer services for users already having a phone, the use of price as well as non-price competition (upgrade offer of additional services - mobile Internet, telephone payments, mobile TV), the improvement of customer service and an increasing competition between major players (the aspiration to become a leader, the desire to discourage new and potential players to enter the market).

Despite a significant challenges related with entering the MCM in Poland, new players began to appear on it. A more noticeable change in the polish MCM began to take place since the year 2006 in connection with the entry of subsequent mobile operators (MNO), who had their own infrastructure as well as with the emergence of virtual operators (MVNO).

This process led to changes within the structure of operators functioning on the MCM in Poland and their market shares. Those shares at the end of September 2009 measured by the number of active SIM cards shows figure 4.

³ http://gsmonline.pl/portal/news/news.jsp?s0n_id=23171

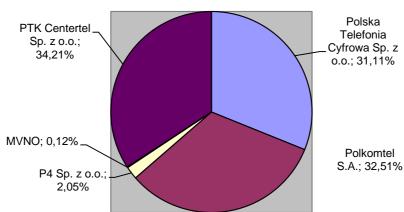


Figure 4. Shares of main operators on the MCM in Poland by number of active SIM cards (as at 30 September 2009)

Source: Vodafone, France Telekom, Deutsche Telekom, GUS. After: Dziennik Gazeta Prawna of 12.11.09.

Among the new MNO, who have their own network and are developing that network, an exceptional dynamism is showing the company Play (P4)⁴.

In March 2008 Play had nearly one million of customers, and at the end of 2009 - 1.4 million. 33% of its clients used the subscription service and the remaining 67% - the prepaid offer. This proportion is nowadays a standard on the market and the ratio of subscribers to the customers using pre-paid services is similar (30:70) also in the remaining operators. Play assumes to break even in 2010 by obtaining more than 5 million users.

The success of the Play is undoubtedly linked to the facts that P4 is competing with low prices (recently offered a new pre-paid offer called "fresh"⁵) and it promotes a comparative campaign, informing that the connection from Play network to other networks is cheaper than those within other operators networks)⁶.

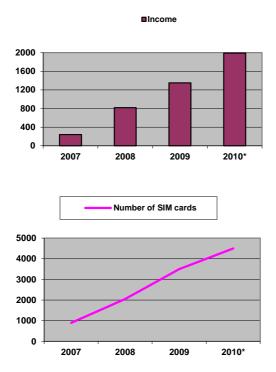
⁵ A 1 minute call to all networks costs 29gr, SMS 9gr, MMS 19gr and transmission of 100kb of data 12gr.

⁴ As at the end of 2009 the ownership structure of PLAY is as follows: Hilson 49.7%, 50.2% Tollerton (see http://p4.playmobile.pl/pl/o-firmie/udzialowcy/index.html).

⁶ Play believes that polish companies - Orange, PTE, PLUS are raising prices in order to improve the profitability of their owners, and the company tries to exploit this fact in order to strengthen its own market position. An example confirming this point of view are the fees charged by Orange for the use of broadband Internet in the UK and in Poland. In the UK the Orange "Internet Everywhere" package is

This strategy gives results in rapid increase of the number of SIM cards and in increasing incomes. This state of matter is illustrated on figure 5.

Fig. 5. P4 Annual Results - income (in millions) and the number of SIM cards (in thousands).



Source: P4. After: Dziennik Gazeta Prawna of 21.01.10.

It should be noted that Play benefits from some regulatory preferences. Due to the use of UKE regulations it benefits from higher, than competitors, MTR rates.⁷

equivalent to about 67 PLN. In Poland, a comparable package of Orange "Free Premium" is a monthly expenditure of approximately 120 PLN (see interview with Chris Bannister, President of P4 company – GW, 17.11.2008).

 $^{^7}$ The asymmetry of rates, which favors Play is 141%, while in other EU countries this asymmetry varies between 0% and 59%. (DGP, 7.12.2009).

The number of operators in the Polish MCM is gradually growing. On one hand, new entrants with their own telecommunications networks are entering this market. One should especially mention the following companies:

- Centernet, intending to make money in this business after three years of operation,
- Mobyland planning to gain profits after 5-6 years of activity (WSJ, 2.01.2008),
- Dialog, announcing the start-up in the first half of 2010 (GW, 29.01.2010).

On the other hand, conversion of the MCM in Poland are the result of the emergence of virtual operators, who do not have their own network and are renting a network from the infrastructure operators. Major MVNOs in Poland on the MCM and the operators, who provide them a network (infrastructural operators) are shown in table 1

Virtual operators (MVNOs)	Infrastructural operators (MNOs)
	. , ,
MEC, Polsat	PTC
Avon, MNI, Wirtualna Polska	PTK Centertel
Gadu-Gadu, Carrefour, Dialog, P4, mBank	Polkomtel

Table 1. Major MNOs and MVNOs in Poland

Source: Powolny marsz wirtualnych operatorów, Rzeczpospolita of 27.03.2008.

First MVNO on the Polish market was mBank. The company has launched its services in the late 2006 after a rapid conclusion of a cooperation agreement with Polkomtel. MBank consistently pursues a strategy of offering great mobile services, which are a marketing support for its core activity, namely banking.

Otherwise proceeds Mobile Entertainment Company (MEC). The company does not offer special low prices but is steadily building the "Mobilking" brand image, which is addressed mainly to young men.

Furthermore, MNI (a company listed on the Warsaw Stock Exchange) offers mobile services for its own fixed telephony customers and also a niche brand for fans of fortune-telling.

The results of MVNOs operating on the Polish market are hardly satisfactory. Four players who begun their businesses in 2007 managed to gather less than 100 thousand customers until the end of March 2008. Main reasons of weak MVNOs position are primarily related with several features. The most important seem to be connected with the lack of an well-recognized brand, an inadequately developed sales network and the inappropriate equipment. Beside this facts, some other development barriers are associated with high fees for technical infrastructure, which are up to 60-70% of all expenditures, late MVNOs market entry (when infrastructure operators already had a 100% market penetration), the relatively high traditionalism of polish customers who are quite reluctant to change an telephone company and the actions of competition (especially the impressive advertising campaign of Play, which overshadowed the actions of other players) (WSJ, 27.02.2008).

In the current situation, chance of success in the polish market have those MVNOs who will be able to reduce the price of services, attract a particular customer's niche or have rich shareholders (WSJ, 27.02.2008).

Many companies were interested in the status of MVNO⁸. From a formal point of view, in Poland it can be anyone - actually the companies only need to have an agreement with infrastructure operator, choose a group of customers and have a general business idea.

But in reality to become a MVNO is rather a more complicated issue. First of all, the company needs an agreement with an infrastructure operator. Obtaining a mutually satisfactory agreement is not easy because infrastructure operators demand information about such factors as a reliable estimate of the customer base, the method of distribution, services and the financial credibility (Dziennik, 11.09.2006).

The first three, mentioned above elements, MVNOs would like to retain for themselves as a trade secret, and keep it at least until the start of the business. Moreover, one often stress the importance of having relevant experience in telecommunication business.⁹

Observation of RTK in Poland leads two different, but overlapping conclusions. On one hand it is hard to gain a place on this market by new network operators. And on the other hand, it seems, that there is place for only a few virtual operators.

 8 In the year 2006 more than 100 companies applied for the status of MVNO (Dziennik, 11.09.2006).

⁹ For cost-effectiveness of the project one have a monthly sale of minimum of 30 thousand. minutes of phone calls, which may require not only the provision of telecommunications services but also the Internet telephony (WSJ, 11.09.2006).

The first conclusion results from the strong position of three dominant network operators and a high saturation of RTK in Poland. One should also note that in Europe there are no success stories about a fifth player on RTK (DGP, 7.12.2009).

The second conclusion connected with virtual operators results from the basic fact, that this is a difficult market segment. One should remember that there are around 350 to 400 MVNOs operating on the world. According to the Pyramid Research studies in 2006, the MVNOs served 86 million customers. At the same time there were 2.7 billion mobile customers worldwide. So MVNOs had only around 3-4% market share (Rzeczpospolita, 27.03.2008).

Despite the difficult forecasts in the MVNO segment in Poland, new pretenders are showing up steadily. Among them a special attention deserve in particular the following:

- cable television operator Multimedia Poland. This operator does not require the SIM card change. It offers an application, through which the phone automatically logs in to the Wi-Fi networks. Being within the range of Wi-Fi networks anywhere in the world, it connects for free to the Multimedia Poland number. Local call price is 10gr per minute, and to the mobile networks 29gr per minute (GW, 29.01.2010).
- TV operator Cyfrowy Polsat, which combines mobile telephony services in a package with television and the Internet (GW, 30-31.01.2010). Moreover the company has their own billing system and their own customer service center (GW, 19.03.2008).

Taking into account the experiences of MVNOs globally, one can assume that on the market will remain only those companies, which will be able to promote intensively, direct their services to selected customer segments and parallel will be able to assure competitive prices (which may be difficult taking into account the high fees paid by national MVNOs for leased technical infrastructure).

3. New trends in the Polish Mobile Communications Market

Information on the growing role of MT in the Polish telecommunications market are presented by a summary of the revenue structure in this market in 2009 and 2010 (figure 6).

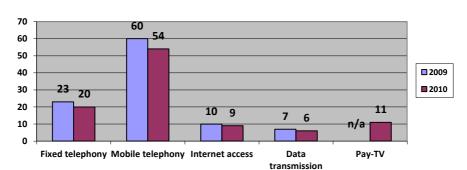


Figure 6. Revenue structure of the telecommunications market in Poland in 2009 and 2010 (in%)

Source: Audytel, "Polski Rynek Telekomunikacyjny 2010", dane spółek. After: Dziennik Gazeta Prawna of 23.02.10; Audytel, spółki, Telepolis.pl. Za: M. Fura, Rozmowy i SMS-y operatorom nie wystarczą, więc przyspieszają Internet. Dziennik Gazeta Prawna of 13.01.2011.

The presented data indicate, most of all, two main issues. The first one is the dominant role of MT segment, which value accounts for over a half of the Polish telecommunications market. The second one is the, quite long, observed stagnant or even shrinking share of fixed telephony.

Characteristic for this is that the main MOs in Poland, see diminishing opportunities to increase revenues from traditional services such as voice calls and SMS. Focusing on the provision of such services would not allow MOs to distinguish on the market, and it would most probably lead to their recognition as an little innovative company.

Taking into account these factors of MOs in Poland are seeking additional sources of revenue, with an emphasis on the development of Internet access and online services.

PLUS operator plans in 2011 - initially on a pilot basis - to offer LTE network (Poznański, 2011). Two other major Polish MCM operators – ORANGE and T-Mobile – plan together (as a consortium) to stand up for a tender on LTE, which will be written out in 2011. The fourth largest operator of Polish MCM - PLAY, plans to offer throughout the country an Internet connection at 2-3 Mb/sec speeds (Fura (b), 2011).

Strong focus of the MOs on the Internet is a consequence of their own assessments of market developments ¹⁰ and forecasts made by market analysts ¹¹.

In addition to making investments in the development of Internet and data transmission, one can also observe the development of cooperation between MOs in Poland. Examples of such activities is the intensifying cooperation of PLUS and PLAY regarding the use of the network or T-Mobile and ORANGE agreement on the construction of a common network infrastructure (Gwiazdowski, 2011).

On the Polish MCM consolidation processes also occur. There has been an acquisition of the MO PLUS by the Group of Mr. Z. Solorz-Żak, the owner of the Polsat digital television platform and the AERO-2company, which is building an LTE network.. There are also signals of the sale of PLAY company - the fourth MO in Poland (Fura (b), 2011).

Occurring in the Polish MCM new trends are focused on acquiring new competences by operators in order to provide a wide range of services as well as on rationalizing the costs of network infrastructures by making joint investments.

4. Evaluation of changes within the Polish Mobile Communications Market

The observed in Poland rapid TM development fosters:

- expansion of individual communication capabilities by members of society, as well as the possibility of contacts with institutions and communities that focus on specific individual interests,
- offering different options of managing free time for members of society, ensuring the transfer and acquisition of information in the field of culture and entertainment,
- improving the spread and promotion of information, shaping or influencing the system of social values and norms as well as the social behavior.

However, the improving and accelerating impact of mobile telecommunications on the economy can be mainly associated with:

- improving the transparency of the market situation by broadening the possibility of efficient transmission and acquisition of information in order to:
- a / compare companies, products and their characteristics,

b / evaluate the price-quality relationships that characterize the individual goods,

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¹⁰ In 2008, Poland had 1.7 million mobile Internet users, and in 2010 about 3.0 million.

¹¹ According to the research company Audytel, in the year 2015 there will be 8.0 million of mobile Internet users in Poland. Another company that studies the market - NOKIA SIEMENS NETWORK POLAND - believes that in 2015 there will be 27.0 million mobile Internet users in Poland (Fura (b), 2011).

- creation of new technical possibilities, that can be used by economic entities - of business (e-business) and work (e-work).

Experiences of the world's developed economies have shown that efficient and effective fulfillment of its tasks by telecommunication regarding the transmission, acquisition, processing and storing of information needed for the economy and the society, are particularly dependent on measures aimed at two main objectives (Pohler, Beckert, Schefczyk, 2006). The first one is associated with ensuring universal spatial access to telecommunication services (Ubiquity). The other one is related with service offer ensuring customers a relative ease of use (Convenience).

In pursuing of these objectives a special role plays MT. The resulting positive effect of MT is reflected by the development of the telecommunication sector and the wider use of telecommunication services by the society and the economy, the positive influence on the development of various branches of the national economy and the rationalization of their activities, and by the influence on the development of household as well as the development of whole countries and improvement of performance.

The dynamic development of MT gives rise to the growth of innovation by telecommunication itself and the entire national economy by offering a wide range of telecommunications services available virtually anywhere and anytime (Goliński, 2010).

It can therefore be assumed that the MT network and services, continually improved and widely supported by software, allow to change and improve the way of management and life (Kleer, 2006).

When assessing the changes in the Polish MCM one should consider the launched consolidation processes. A special impact on the Polish MCM has the purchase of significant operator – Polkomtel - by the capital group of Mr. Z. Solorz-Żak, the owner of Cyfrowy Polsat, which offers, among others television and mobile telephony services.

This acquisition, in case of connection of the activities of these entities may lead to a reduction of mobile operators functioning on the Polish market (from five to four). Theoretically, this could lead to competition weakening in the Polish MCM, which would be a disadvantageous occurrence.

However, it must be recognized that by the merger of Polkomtel and Cyfrowy Polsat a new operator appears, which will be from one side a strong competitor to the former monopolist, namely Telekomunikacja Polska and its associated mobile operator - ORANGE, and on the other side the first service provider offering mobile telephony and television services, including content that this company creates on their own.

In consequence the merger of Polkomtel and Cyfrowy Polsat should therefore create on the Polish MCM new balance of power, leading to increased competition in this market.

An additional advantage of the previous mentioned acquisition is the strengthening of the private property on the Polish MCM. Transition of Polkomtel, whose major owners were Polish state-owned companies, in the hands of a private owner should lead to improved efficiency of the company and its rapid development.

5. Final Remarks

The observed and subsequently presented transformation of the Polish MCM is connected with functioning of four strong infrastructure operators and a number of smaller operators, mainly using leased lines. Moreover those operators offer an increasingly wider range of services, including advanced services based on broadband networks. In consequence, this facts as well as a deeper analysis of this market reveals the existence of competition and its maintenance despite of a partial cooperation processes initiated by competing operators (in form of a coopetition) and the first acquisitions.

Thanks to these features, the Polish MCM contributes to an overall enhancement of the capacity of communication, both in the area of social and economic life, increased interest in new communications services and products from the side of society as well as the whole economy, creation of new opportunities for growth and socio-economic development.

All the above mentioned information help to assume that the initially placed hypothesis has been confirmed. The direction of mobile telephony development pursued in Poland favors strengthening the competitiveness of the Polish telecommunications market. It also help to improve and expand services in the telecommunications market and leads to consumer empowerment.

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http://www.era.pl/pl/strona_korporacyjna/o_ptc/udzialowcy

http://gsmonline.pl/portal/news/news.jsp?s0n_id=23171

http://p4.playmobile.pl/pl/o-firmie/udzialowcy/index.html

Appendix 1

Capital structure of 3 dominant Polish mobile operators

- PTK Centertel (Orange), which is since 2005 solely owned by the incumbent polish operator Telekomunikacja Polska, which, on the other hand, main owner (49,79% shares) is France Telecom¹²:
- Polkomtel (Plus), which is owned by:
- Polski Koncern Naftowy ORLEN SA (24,39%);
- KGHM Polska Miedź SA (24,39%);
- Polska Grupa Energetyczna S.A. (21,85%);
- Vodafone Americas, Inc. (19,61%);
- Węglokoks SA (4,98%);
- -Vodafone International Holdings B.V. (4,78%);¹³
- Polska Telefonia Cyfrowa (Era), which is owned by:
- T-Mobile Deutschland GmbH (70,5%);
- T-Mobile Poland Holding No. 1 B.V. (22,5%);
- Polpager Sp. z o. o. (4,0%);
- CARCOM Warszawa Sp. z o.o. (1,9%);
- Elektrim Autoinvest S.A. (1,1%). 14

¹² http://www.tp.pl/prt/pl/o_nas/o_firmie/udzialowcy?_a=502148

http://www.polkomtel.com.pl/polkomtel_sa/wladze/akcjonariusze/Default.aspx

¹⁴ http://www.era.pl/pl/strona_korporacyjna/o_ptc/udzialowcy