Market Creation, Development and Barriers: The Case of Polish Mobile Telephony Market

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1. Introduction

Markets of contemporary economies are characterized to a considerable degree by market concentration connected with gaining and maintaining dominant position by a company. The position of the entitles depend on various factors. These determinants influence the creation of new markets and its latest development. The dynamic of changes is depend on them, too. The paper objective is to present Polish mobile telephony market development in the light of entry barriers. The changes in the researched market are highly depend on obstacles created by not only market conditions but also by state regulations.

The paper is consisted of three parts: the first describe mobile telephony market and its development, the second presents barriers to entry in theoretical point of view and the last one is presented real barriers in the market.

2. Mobile telephony market

The researched market in Poland is a liberalized under of law circumstances. Nevertheless, it is characterized by relatively high barriers of entry. The most important obstacle is, in the context, law barrier referred to necessity of having a free frequencies. But they are rare goods in the market, ration by law rules (Report on the telecommunications market in 2007 , 2008). During the year 2007 three main operators were active in the market and several virtual. The most important market roles have played:

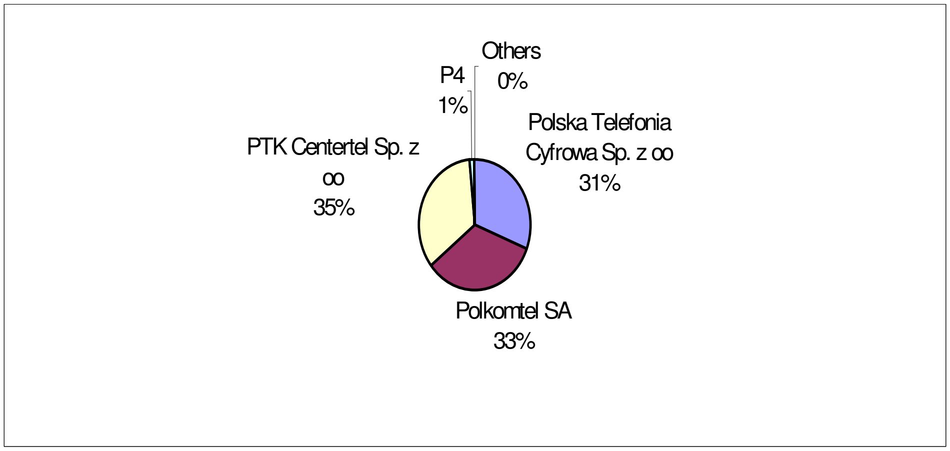
• PTK Centertel Sp. z o.o. (Orange),

• PTC Sp. z o.o. (Era, Tak Tak, Heyah),

• Polkomtel S.A. (Plus, Simplus, Sami Swoi),

In 2007 another four operators started their activities on the domestic mobile telephony market. P4 Sp. z o.o. (Play brand) was the most significant entrance because the company is the 4th real operator. Totally there were 8 operators managing 13 brands of mobile telephony on the Polish market as at 31 December 2007. The structure of the market is present at the chart 1.

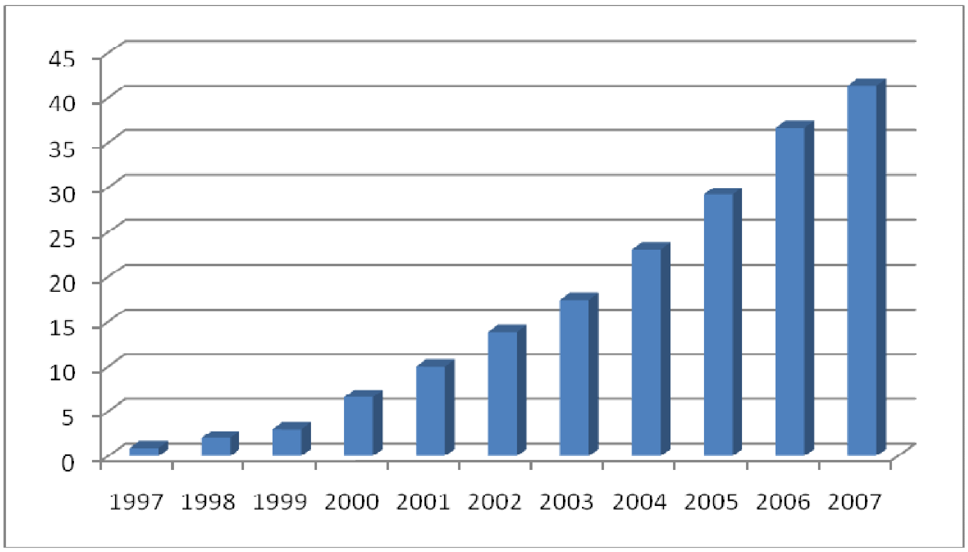
Chart 1. Structure of mobile telephony market in 2007 in revenue, in per cent



Source: Report on the telecommunications market in 2007, Office Of Electronic Communications, Warsaw, 2008

The chart 1 presents that the biggest company on the market is PTK Centertel sp. z o.o. What is interested that the new operator P4 was acquired in the first year of activity more then 1% of market share. The market has been developed in a fast rate since 1997. The number of users presents chart 2.

Chart 2. Number of users in the mobile telephony market in Poland in years 1997-2007, in mln persons



Source: Report on the telecommunications market in 2007, op. cit.

The chart 2 shows increasing number of mobile users telephony in Poland. In year 2007 total number of people used mobiles cross over 40 millions. The dynamics of this value has decreasing slowly, presenting penetration in the market.

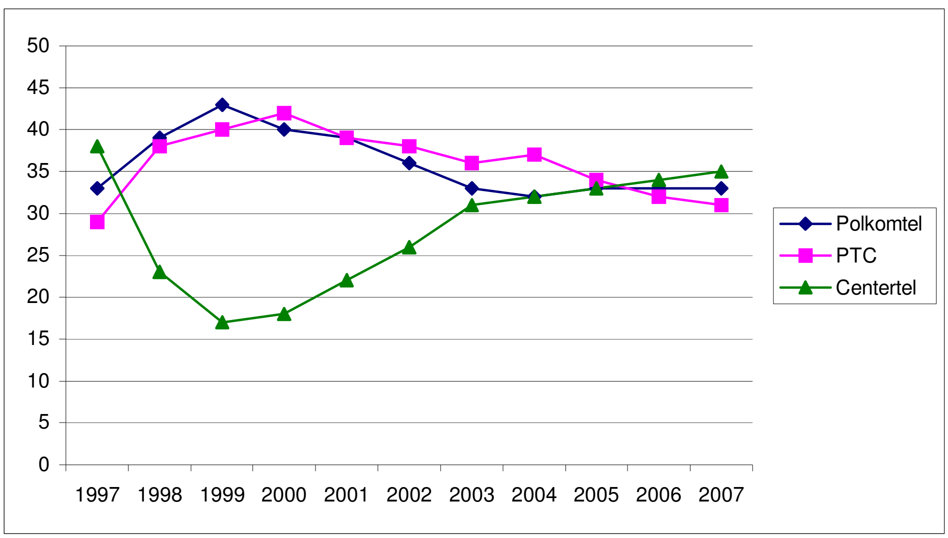
The market was divided into three main operators as it was mentioned above. The basic data is presented to describe the companies and market. The first are market shares in years 1997-2007. The table 1 and chart 3 are shown referred data.

Table 1. Market shares in the mobile telephony market in Poland in years 1997-2007, based on revenues, in per cent

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Polkomtel	33	39	43	40	39	36	33	32	33	33	33
PTC	29	38	40	42	39	38	36	37	34	32	31
Centertel	38	23	17	18	22	26	31	32	33	34	35

Source: financial statements of the companies

Chart 3. Market shares in the mobile telephony market in Poland in years 1997-2007, based on revenues, in per cent



Source: own compilation.

Market shares of mobile telecommunication market has been changed over the researched period as the table 1 and chart 3 present. Up to

1999 dominant role has played Polkomtel and in the next years it has been taken by PTC. Nevertheless, market shares of those two companies have had decrease tendency since 1999-2000 year. During the same period the third rival get increasing market share. Centertel (over that times it was created Idea brand) has been changed because of strategic alliance with France Orange. This events create fast development of the company that is draw as a quick market share rise. The market share equalize in the years 2005-2006 and the new allocation has become to start in the last of research period. To pass over market development one conclusion is going up – the market is concentrated.

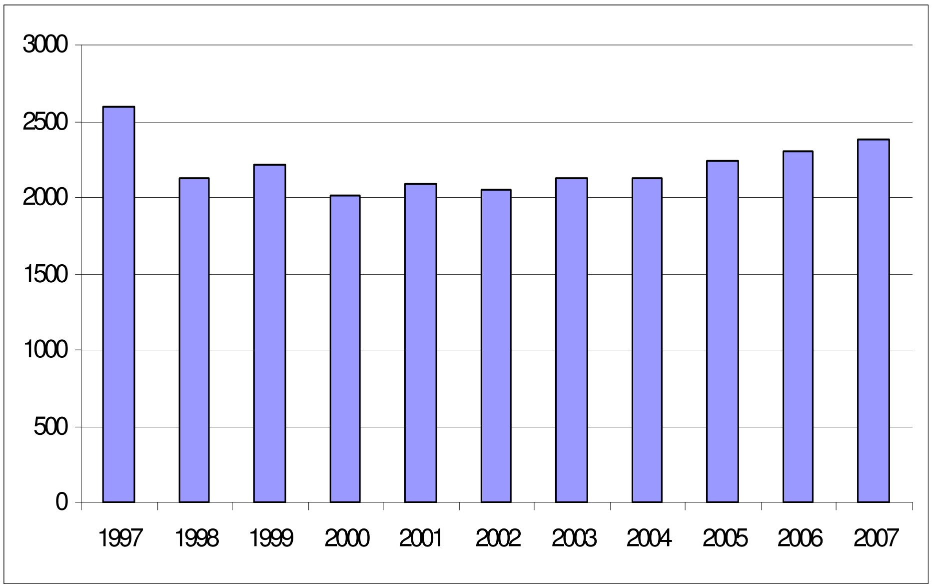
The second indicator, confirming the conclusion and describing market concentration is HHI – Herfindahl-Hirschmann Index. Its value is indicated in table 2 and graph 4.

Table 2. Market concentration measured by HHI, years 1997-2007, based on revenues

Rok	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
HHI	2591	2126	2218	2008	2083	2048	2122	2122	2246	2309	2376

Source: own compilation based on financial statements of the companies

Chart 4. Market concentration measured by HHI, years 1997-2007, based on revenues



Source: own compilation

Table 2 and chart 4 confirm that market is highly concentrated. During all the indicated period its value never decrease under 3300. That means high concentration level. What interesting is, level of concentration is growing up slowly since year 2000. This conclusion is confirming by Office Of Electronic Communications in the report, which present that the mobile telecommunication market competition has no effective competition (Postanowienie Prezesa, 2005).

What are reasons of such a high level of market concentration? One of the most important could be entry barriers.

3. Barriers to entry to the market

The market concentration, as a phenomenon taking place in economies all over the world, has defined reasons for inception, maintenance and decreasing. The determinants for marketconcentration can be divided into two groups:

- building and strengthening the degree of market concentration
- weakening the degree of competition

The barriers to enter to the market that cause the concentration belong to the first group. Their type and strength determine the possibilities of market contestation by new rivals as well as a chance of defence that are undertaken by business entities. The antimonopoly activities performed by a state belong to the second group, they aim at limiting market monopolization through decreasing concentration as well as various pro-competitive action of competing enterprises to limit existing market barriers. The main problem of this paper comes down to description and analysis of barriers to entry to the market.

Entry barriers play a significant role both in the theory of economics and legal aspects of antimonopoly action. Their types, significance were researched and described many times. However, defining them is a very important issue and will enable a wider analysis.

J. Bain in his works developed a concept of barriers to entry. First of all, *they exist when an enterprise is able to set a sale price above the competitive level after a long time, in situation when enterprises produce the optimum* (Bain, 1954). *Next, the competitive price level was replaced by a concept of hypothetical price of a longterm balance in perfect competition* (Bain, 1956) *and finally he changed it into the concept of minimum average costs* (Bain 1968), without exposing enterprise to potential entrants. Finally, the condition of barrier existence is possibility of identifying if the sale price is above the average costs of production. J. Ferguson *defines barriers to entry as factors making potential entrants unprofitable,* while existing enterprises can set their prices above the marginal costs and gain monopolistic profit (Ferguson, 1974). The author adds to J. Bain's definition another condition-price surplus over marginal costs. Both J.Bain and N. Coterelli share the same opinion that barrier *of entry takes place when sale price exceeds average costs of production in the long run* (Cotorelli, 2002). The ratio of price to marginal costs isn't, however, significant. According to G.J. Stigler, *barriers to entry cover production costs (for specific or any level of sale) that have to be incurred by enterprises who are entering the business and aren't incurred by entities that have already been on the market* (Stigler, 1968). According to H. Demsetz *barriers to entry constitute various opportunities that occur among enterprises in business and outside of it. Their action is connected with the necessity of incurring additional costs which can't be reimbursed after entering the market* (Demsetz, 1982). In this case, the problem of risk occurs. Entrepreneurs, who overcome the barriers, act in conditions of increased risk connected with possibility of not gaining reimbursement of expenditures on overcoming the barriers to entry. Barriers to entry to the market are variously defined by economists. Relation that surely should be taken into account while defining is connected with a difference between price and average or marginal costs of enterprise that is run in the long term. Much easier to analyse is an evaluation based on average costs which are spotted easily in financial reports. **Barriers to entry take place when occurs a situation causing inception and maintenance of market concentration. An enterprise is able to keep a price level above the average production costs in the long run.**

3. Barriers to entry- types

On the base of the following division, there can be distinguished many different types of barriers to entry. They are visible in all markets and their functioning affects the inception of market concentration and its maintenance. The type of barriers to entry depends on the character of described market. It'll be different for production, commercial or services branches. Mentioned division can be deepened depending on detailed examination of an economy sector. The barriers that are mentioned in the literature the most frequently, are briefly described below.

Product differentiation is a barrier that covers a sale of similar (substituted) products by competing enterprises in such a way that customers are able to recognize easily. This barrier is based mainly on consumers' preferences (Heflebower, 1957) and fulfilling them. This barrier is, at the same time, highly correlated with the size (scale) of the enterprise (Bain, 1956). It can be , however, a difficult barrier to overcome to new products simultaneously on different product markets. One of the examples can be market of trade-mark trainers (Adidas) and the same type of trainers but made in China and so called hypermarkets brands such as ARO in MACRO or TIP in Real. Reinforcing product differentiation can be achieved through different law aspects such as pursuing registered product designs or patent and license law (Solop, 1979). They cause that competitive products must have another form that those already existing on the market, that's why they can have bigger problems with inception in consumers' awareness. The example of such situation can be franchise agreements of the McDonalds connected with fast-food type services and other not so well known brands that copy the magnate. One of the elements of product differentiation can be also a strategy of low sale prices applied by enterprise (Rothschild and Styglitz, 1976). If it's applied deliberately as a tool for competing with rivals, it may be a 'successful weapon' that will discourage new enterprises to enter the market. This strategy should be to a great extend based on suitable signalling company's readiness to sell products for lower prices.

Economies of production scale are one of the best known barriers to entry to the market. It is connected with experiences that enterprise gains producing certain products. It results in lowering unit costs in a big scale production. It enables the enterprise to sell products for lower prices than competition without any loss. The effects of production scale are, however, limited by MES (minimum effective scale of production that depends on techniques of production) or by demand barrier. This barrier takes place mainly on markets with production that requires incurring high initial costs (fixed charges) and later low marginal (unit) costs of production, e.g. telecommunication services or heavy engineering branch. Also additional mentioned in literature barriers are connected with economy of production scale such as: the amount of companies within one enterprise (Saving, 1961), average size of enterprise in a branch of industry (Ornstein, at al, 1973) or level of technology used in enterprise and cost of its modernization (Kocherlakota, 2001). Two barriers firstly mentioned are undoubtedly connected with availability and possibility of using the scale effects. Along with size of scale effects, the amount of factories in a single enterprise can decrease and also an average size of factory in a branch should increase. Both implemented technology and potential opportunity of introducing new solutions also affect the scale of production. Generally, implementing new technologies should improve production efficiency, then they should cause increase in using available production scale, the increase in scale itself or access to already existing.

Capital barrier is connected with the necessity of incurring high initial costs for starting-up business activity. The costs depend on two main reasons: purchase of appropriate labour means (land, buildings, machines, etc.) as well as law requirements that can mean both: necessity of purchasing a concession issued by a state and license for production and sale. The barrier is often equated with costs sunk in a new production start-up. They are expenses that can't be expected to pay off, e.g. cost of concession, getting permits, purchases of specific machines or devices made to order. Its amount depends on many different factors, however, this barrier will certainly occur in such branches as: car (new factory), telecommunications (new network), steel (new mill), bank (new bank), insurance (new company). The capital barrier can also be connected with an attempt at inception of new brand in consumers' awareness. With a tough competition, it is necessary to earmark a significant amount of financial means for advertisement. Costs of advertising campaigns on national media are significant and require much effort. Their amount, counted in accordance to the level of sale, can be a good indicator of barrier to entry to the market (Greed, 1961). This type of restriction in entering the market concerns mainly big business subjects that sell mass-produced products, in this way they want to reach a vast amount of potential consumers. The access to resources used in production is also connected with a capital barrier. (Solop, 1979). Limiting access to resources, particularly natural ones, by dominating enterprises, can result in forcing rivals to import them or locate them in a farther distance. It results in increase in costs and affects the price of product.

Entering into long-term contracts between buyers and sellers can also be kind of barrier to entry to the market. (Shepherd, 1973). Such contract makes dependent to some extend a buyer (as well as a seller) on the other party of contract. Competition that enters such market has to overcome legal contractual security as well as convince the buyers to change a previous contract e.g. contracts between mobile communications and their customers (standing charges). Such contracts are usually concluded in Poland for 1-2 years and they are restricted by many fines for breaking them off.

State protection can be also a kind of barrier. Administrative protection enables functioning with a decreased (or even without any) risk of facing competition (Dixit and Kyle, 1985). Everything depends on the scale of protection. In case of strategic branches, such help can lead to fighting off competition, so that only one enterprise stays on the market. Enterprises with state-owned roots (especially in case of post-socialist ones) and those owned by state, can count on lenient attitude of administrative authorities. State protection can also concern protection from state competition (inception of new entities) as well as international- establishing new foreign entities is forbidden (rather rarely used), or by imposing customs duties and tax barriers, e.g. such barriers were on the insurance market until 1999- establishing foreign representatives was forbidden so it was necessary to establish entities based only on the state law that were registered in Poland. Protection from foreign (mainly Asiatic) flow of products is widely used in all developed countries as well as all groups (the European Union). Also law can be made in such way that it will limit or even prevent foreign companies from entering the market. It can be achieved by appointing trade or professional organizations (unions). Membership is, in such case, obligatory so this way the amount of members is controlled, e.g. the amount of public notaries, barristers and judges was regulated by professional organizations to restrict competition from new lawyers. It is abolished at present. Similar situation takes currently place on the sworn translators market.

One of barriers to entry can be also **establishing oligopolistic groups** (Parente and Precscot, 1999). Such coalitions are formed to divide the market into its so far participants and prevent it from entering the new ones. According to anti-trust law, such actions are illegal, that's why they are often in form of secret agreement concerning sale prices or market sharing. The oligopolization itself is a reason for increasing concentration and strengthening a market force of entities, e.g. in a global scale such example can be OPEC's Cartel, which restricts access to oil resources, prevents from competition and this way increases its power by common competition activities. One of the examples on domestic market can be an attempt of illegal agreement between drug producers that set high prices for drugs on a shared market.

4. Barriers to entry – the case of Polish telecommunication mobile service market

There are several entry barriers that can be described among the market. The are presented below.

The most imortant one is **state regulation**. It is become form rare frequency available. This frequencies are divided among companies by state. Until 2005 year only three licenses were sold to market. In the year 2006 the fourth license was available and the new company set up in 2007. P4 sp z o.o. – brand PLAY, has started providing commercial services within domestic roaming in Polkomtel S.A. network. At the same time virtual operators are able to set up. The process has started and finally 4 new companies has been created.

The second barrier is **scale effect** – especially economy of the scale. The scale is directly connected on the market with number of technical equipment. Especially it is referred to radio masts that have to be build to let to create own independent network. This barrier is well visible in P4 case. The new company, even if has own licensed frequency, has to use network of Polkomtel, to acquire range over the Poland.

Next barrier is directly connected to previous one. It means **cost of setting up new business**. In the case of virtual operator these costs are generally generated by fees for network using and marketing. According to real operator with own network, starting costs are highly bigger. Current operators has invest in previous years lot of capitals. And so the total amount spend for investments in years 1999-2003 cross 17 billions of PLN (about 4 billions of EURO). Centertel spent 7,3 billion PLN, PTC and Polkomtel almost 5 billions PLN. The amount are high and the returns are not possible to be created in short run. It is become from cost of single mast. A new company has to invest over billion PLN to create basic network of masts in Poland.

The important barrier is **long run agreements** between operators and users. The agreements are especially connected to telephone subscription's contracts. The duration in such cases in Poland is range from 12 months (rather rare) via 24 months (the most popular) to 36 months. Breaking of the agreement carry lot of consequences, including financial ones. The users is lost his number and have to pay contractual penalty. It means undoubtedly, problems for the users which results in rare resignations.

Less important barrier is **differentiation of the product**. Although mobile telecommunication product in the basic meaning is simple (talking, SMS, MMS), there are several additional services and price tariffs that make product more complicated for common user. Setting up new operator on Polish market has been complicated the product and its market more. Its means that a user has to give more effort to find proper solution according to his/her needs.

Mobile telephony market in Poland is generally free from **tacit agreements**, although there are some example of companies' decisions that can be read in other ways. For example similar price level. Another case is lack of goodwill of three main rivals in wholesale of network service for virtual operators. New competitors can never appear in such a circumstances. Moreover, tacit oligopolistic agreements could be under direct control of State agencies.

5. Summary

Polish mobile telephony has been developed since its beginning. From the first year of activity it was created as a concentrated market. The important reason were barriers of entry not only from the theoretical point of view. The paper describe both: theoretical and practical treatment. Base on the first one, practical picture of the market and barriers created there was presented. The most important barrier was in the case state regulations and become of this limitation of frequencies. Currently in Poland this situation limited number of active independent companies to 4. Perhaps, the solution for the market can be taken for virtual operators.

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