

THE RELEVANT TEMPORAL MARKET DEFINITION IN ANTITRUST ANALYSIS

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Abstract. The *purpose* of the paper is to compare various theoretical approaches to the relevant temporal market definition, collecting the arguments for their implementation under the different kinds of antitrust cases. It is vital for the markets with peak demand (transport, electricity, markets of intergenerational products) or discreet supply (agriculture). *Methodology.* The survey is based on the theoretical and graphical modelling of product space perception by consumers. It investigates changes of the latter under different marketing strategies of a seller. Statistical methods are used to analyse trends of demand and prices for iPhones' changes, as well as dynamics of electricity consumption. *Results.* The paper reveals two facing approaches to the definition of relevant temporal market: 1) the discrete one that provides a short-run analysis of products' substitutability and combines only those time periods that are characterized by a stable balance of demand and supply, as well as stable market equilibrium; 2) the coherent one that provides a long-run analysis of cyclical variation of the market. This cycling is based on the awareness of consumers and producers of intertemporal substitutability of products. The authors use the model of intertemporal competition to explain principles of these approaches and apply it to the iPhone market analysis. They conclude that the coherent approach must be applied to the temporal market definition for the products with elastic demand. Inelastic demand brings the necessity to apply the discrete approach to the temporal market definition. These conclusions cannot be applied to regulated markets. The system of government regulation is the main determinant of the temporal boundaries of such markets. *Practical implications.* The results of this research can be used by competition agencies in antitrust cases to define the relevant temporal market, where the violations of antitrust legislation can occur. The correct definition of the market is the first step of structural analysis under antitrust cases that determinates the correctness of its next steps and finally – accurate labelling of an antitrust violation. *Value/originality.* The paper grounds capability of both (discrete and coherent) approaches to the relevant temporal market definition, determines the factors that define what the approach must be chosen, as well as the exceptions from the rule.

Key words: relevant market, temporal market, intertemporal competition, peak and off peak services, intergenerational products.

JEL Classification: D47, D91, D92, L49, L94, O31

1. Introduction

The relevant market is a key term of antitrust economics. The term was first-ever used in 1948 in the court case *United States v. Columbia Steel Co.* in response to the need to determine the geographical boundaries of post-merger competitive effects expansion. In that case, the geographical market boundaries were defined as the territory smaller than the nationwide market boundaries, although that decision of competition authorities was rejected by Supreme Court (US Supreme Court, 1948). The better-known case of the relevant market definition took place in 1953 in the court case

of *United States v. EI Du Pont De Nemours & Co.* and was concerned the definition of product boundaries of the market. In the course of this case, the courts found that cellophane was in a market with other flexible wrapping materials. More specifically the Supreme Court found that there was a substantial cross-elasticity between cellophane and other flexible wrappings, and that cellophane and these other wrappings had reasonable interchangeability. What the courts failed to recognize was that, if Du Pont had market power over the relevant market that included cellophane and raised its price to the monopoly level, then was already exercising market

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power in the market for cellophane, so much so that any further increases in price would cause customers to migrate in sufficient numbers so as to render an attempt at a further price increase unprofitable. However, these other flexible wrappings might not have been viewed as close substitutes if cellophane were priced at competitive levels (Stocking and Mueller 1955; Jamison, 2014). This court case became well-known in the theory of industrial organizations as “cellophane fallacy” and appeared in the relevant textbooks. However, it is interesting for us not only because of the meaning of the “cellophane fallacy” but as an illustration of the basic principles of relevant market definition. First of all, it is about the principle of substitutability. The US Federal Trade Commission and the US Supreme Court decisions were based on the criteria that the substitutes belonged to the same relevant market.

The substitutability of goods as a criteria of relevant market definition was described by J. Robinson (Robinson, 1934), F. Scherer and D. Ross (Scherer & Ross, 1990), M. Coate and J. Fischer (Coate & Fischer, 2006), Y. Li (Li, 2009), T. Teodorovicz, T. Leandro and L.A. Esteves (Teodorovicz, Leandro & Esteves, 2015), and others. The substitutability principle is the main basis of the relevant market definition by the competition authorities of Australia, Bulgaria, the European Union, Israel, South Korea, Mexico, Poland, Romania, etc. (OECD, 2012). For example, according to the definition in the Polish Competition Act, the relevant market is a market of goods, which by reason of their intended use, price, and characteristics, including quality, are regarded by buyers as substitutes, and are offered in the area in which, by reason of their nature and characteristics, the existence of market access barriers, consumer preferences, significant differences in prices and transport costs, conditions of competition are sufficiently homogeneous (OECD, 2012). Modern competitive authorities explore not only demand-side substitution but also supply-side one (EC, 1997) for defining the relevant market boundaries. It demonstrates one more important characteristic of the relevant market – the balance of demand and supply.

When the goods are substitutable (in terms of demand or supply) and the market is balanced enough to support its members to keep certain equilibrium parameters of interplay that means the existence of the relationships of competition or monopoly between market participants. These relationships are the main evidence of the relevance of the studied market according to M. Coate and J. Fisher (Coate & Fischer, 2006), J. Baker (Baker, 2007), M. Galalov (Galalov, 2002), V. Lahutin and others (Lahutin et al., 2009). These relationships cannot exist between sellers of independent products. That means that the first step of any antitrust investigation is a definition of the relevant market.

The legislation of the majority countries distinguishes two types of boundaries of the relevant market:

product and geographical. For example, the European Commission in the Commission notice on the definition of relevant market for the purposes of Community competition law announce that the relevant market combines the product market and the geographic market, defined as follows:

- a relevant product market comprises all those products and/or services, which are regarded as interchangeable or substitutable by the consumer by reason of the products' characteristics, their prices, and their intended use;
- a relevant geographic market comprises the area, in which the firms concerned are involved in the supply of products or services, and in which the conditions of competition are sufficiently homogeneous (EC, 1997).

Recently the idea of expanding the list of relevant market boundaries has become popular. C. Beaton-Wells (Beaton-Wells, 2003), C. Filho (Filho, 2011), V. Lahutin (Lahutin et al., 2009), B. Marshall (Marshall, 2007), M. Motta (Motta, 2004), F. Russo and M.L. Stasi (Russo & Stasi, 2016), B. Zhang (Zhang, 2009) suggest to define temporal boundaries of the relevant market in antitrust cases. This suggestion is supported by law in China, Germany, Poland, Singapore, Ukraine, United Kingdom of Great Britain, and Northern Ireland (OECD, 2012). For example, the British Guidance on Market Definition gives three examples that require detailed analysis of temporal market boundaries. There are:

- peak and off-peak services. This can be a factor in transport services or utilities such as electricity supply,
- seasonal variations, such as summer versus winter months, and
- innovation/intergenerational products. Customers may defer expenditure on present products because they believe innovation will soon produce better products or because they own an earlier version of the product, which they consider to be a close substitute for the current generation (OFT, 2004).

The similar list was announced by China's Anti-Monopoly Commission. Chinese Guideline on Definition of Relevant Market provides that timeliness shall also be considered in defining the relevant market, when a product's production cycle, lifetime, seasonality, fashion, or a valid term for intellectual property protection has become an essential characteristic of the product (Zhang, 2009).

The common denominator of all the reasons for detailed analysis of temporal market boundaries is the imbalance between demand and supply of goods that appears on the different stages of market functioning. For example, the demand on the passenger transport services significantly increases in the peak hours or before holidays, while the supply of it is limited by transport infrastructure capacity that stays constant or increases insignificantly. This fact stimulates changes of parameters of market equilibrium compared to the off-

peak period. The same situation is in tourism, where the demand is under the great impact of the seasonality, especially in the coastal regions; in fuel market and market of fertilizers, where the demand depends on the agricultural season duration; etc. The imbalance between demand and supply in markets of vegetables and fruits is induced by reduction of their supply in wintertime. In the markets of inter-generational products, it caused by the introduction of the next-generation product. All of these periods are characterized by different parameters of the market equilibrium comparing to off-peak ones – mostly higher price and lower output. In this context, the question is how to determine the temporal market boundaries: as separate discrete periods of peak and off-peak consumption or as the coherent periods between individual peaks of consumption? The article is dedicated to the investigation of this question.

Starting with the example of imbalance between demand and supply of intergenerational products caused by their introduction on the market, the second section provides the model of intertemporal competition. Its analysis brings the arguments for applying the different approaches to defining the temporal market. The third section introduces the way of the intertemporal competition model's use in the practice of temporal market definition via the example of imbalance between demand and supply of iPhones as an intergenerational product. The findings of this analysis are expanded onto other kinds of temporal imbalances between demand and supply. The fourth section researches the role of state regulation in the temporal market definition. It brings the example of state regulation of the business activity of power plants in Ukraine. The last section concludes.

2. The model of intertemporal competition

The phenomenon of intertemporal competition was the subject of economic research in the mid-twentieth century. It appears on the market of durable goods, and, first of all, intergenerational ones. The buying of an intergenerational good at the moment of its launch excludes the consumer from the market for a long period. To support sales, the seller has to cut the intertemporal price. This fact has an effect on a specific form of the demand curve for these products. Its elasticity increases gradually with the process of the life cycle of goods. At the moment of a new product launch, its demand is relatively inelastic. Sometimes it even characterized by the positive value of price elasticity of demand, caused by the Veblen's effect. It pushes up the price of the good. While the product loses positions in the premium segment and moves into the mass-market (where the cross-elasticity between goods is usually significantly higher) the price elasticity of its residual demand increases. Following the elasticity changes, the rational (in terms of neoclassical analysis) seller steadily reduces the price of the product as long as it gets to the value of marginal costs. Knowing this fact, consumers consider the intertemporal substitution of products as a separate element g_o^t of the chain of substitutes. It is situated between the good g_o and its closest substitute g_c (Fig. 1). You can buy the good now in the seller's market power zone (segment OA in the Fig. 1) or you can wait and lose some time of consumption but buy the same product at the reduced price in the zone of intertemporal competition (segment AB). There is a big difference between market power zone and competition zone in terms of prices and, as a result, of the value of

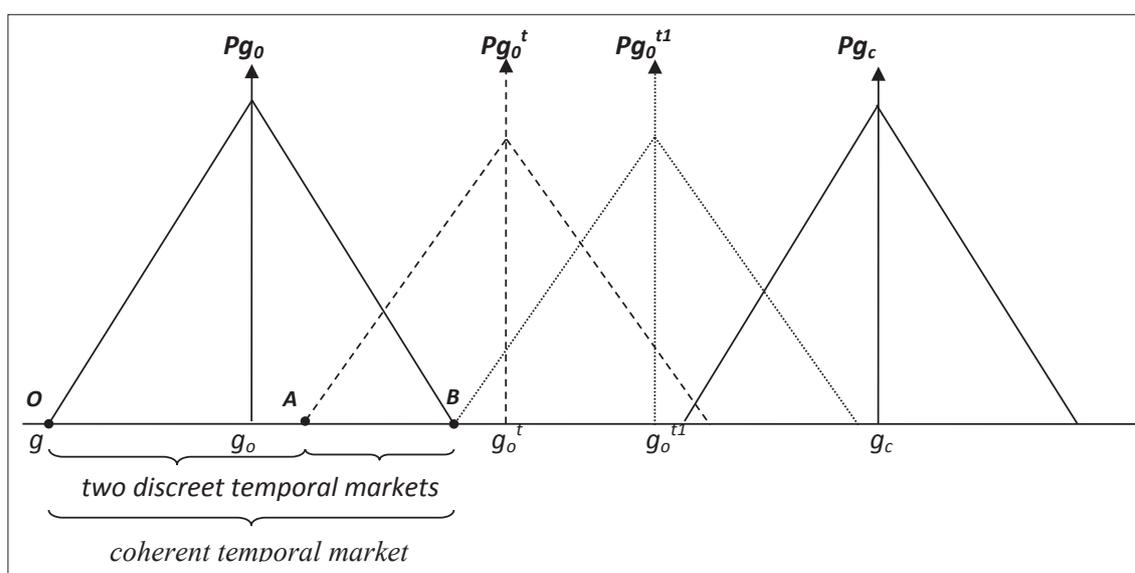


Fig. 1. Intertemporal competition in the Salop's circular city model

Source: constructed by the authors according to the research results

the economic rent. For example, in the US video game market, this difference is about 170% (Nair, 2007). There are two discrete time periods (OA and AB) with different supply and demand for goods, on the one hand, and the free move of consumers' demand between the periods, on the other hand. Ultimately the latter may cause the unification of these periods and reduction of the economic rent of the OA period up to zero. This is the point of the Coase paradox.

The understanding of the possibility to move the demand between the periods gives the consumer the perception of temporal substitutability of such goods' consumption. As the demand-side substitution is a key indicator of the relevant market, we can broaden the latter from the one stage of the life cycle of an inter-generational product to the whole one according to the coherent approach to the temporal market definition. The exception is only several products and services of prime necessity, which elasticity demand is sufficiently low to abuse the dominant position inside the small temporal market. In these cases, it is better to apply the discreet approach to study the temporal market boundaries.

The analysis in terms of supply-side substitution allows making the same conclusions. Knowing the principles

of the mechanism of intertemporal competitions, the seller tries to extend the zone of inelastic demand. The most general tool of this extension is to convince consumers that intertemporal price reduction will not happen at all or that the price reduction will not happen soon (Avdasheva & Rozanova, 1998). How the seller can do this? The spread of invalid information about keeping the prices is not good for the company in terms of optimizing the elasticity of demand for the next-generation products. The realization of the long-term strategy of high prices maintaining is also wrong in terms of the natural changes of residual demand elasticity. The best way is to postpone the prices reduction. This strategy is the most realistic and one that corresponds to the Coase paradox. The seller can take the responsibility to keep the price at the primary level within a clearly defined period. Its duration is a function of the initial level of the price, the expected price level in the future period, the dynamic of price elasticity changes, etc. Graphically it looks like the movement of the axis of the intertemporal substitute from g_o^t to g_o^{t1} . It causes the extension of the market power zone from the segment OA to the segment OB, including those consumers for whom the alternative value of postponed consumption (expectation for the period $t1$) is higher than monopoly

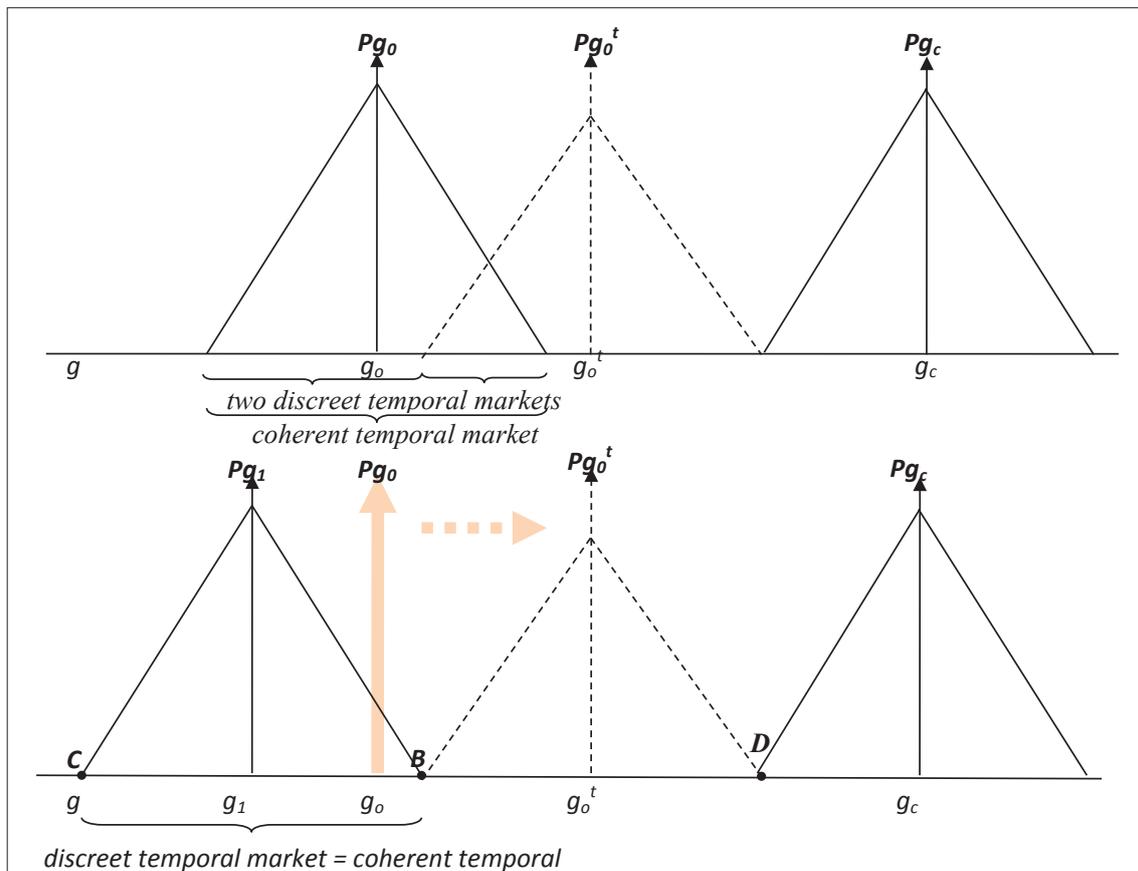


Fig. 2. The strategy of planned obsolescence of a product in the Salop's circular city model

Source: constructed by the authors according to the research results

increase in price in the zone of temporary market power. That leads to the stabilization of demand and supply and other parameters of market equilibrium within the relevant period that corresponds to the temporal market boundaries, which are wider than the discrete period of keeping the high level of price elasticity of demand for the new product but less than the period of full life cycle of the product.

Another tool of equilibrium parameters' unification in the extended temporal boundaries is fulfilling the strategy of planned obsolescence of product. It means the systematic upgrading of the product based on science and technological progress (STP), producing the next-generation product when the demand for the product of the previous generation is too flexible for maintaining the price on the profitable level (Tirole, 1996). Firstly, this policy returns consumers (who bought the product in the previous period) to the market. Secondly, it makes consumer expectation of lower price unreasonable. The utility of the consumption of intertemporal substitute at the reduced price is lower than it was for the same product in the in the moment of its introduction in the market by the amount that is higher than the cost of delay. Fig. 2 shows the next-generation product with the axis g_1 , located to the left of the former position of the previous-generation product g_0 , while the consumption of the latter has shifted to the position of its intertemporal substitution g_0^t , creating different temporal relevant markets CB and BD. This means that the sales conditions are the same during all the period between the introductions of adjacent inter-generational products, answering the question of how to define the temporal market.

3. Intertemporal competition model's use in the practice of temporal market definition

Looking for the empirical evidence of the effectiveness of the intertemporal competition model, as well as the results, made on the base of its theoretical analysis, let's explore the dynamics of worldwide demand for iPhones (Fig. 3). As it was described in the theoretical model, the demand, which was driven by the persuasive advertising, increases rapidly at the time of introduction of a new model of iPhone. Then the demand falls down and becomes constant up to the time of introduction of the next generation model (every second peak on the diagram is conjunctural and relates to the Christmas holidays). The cycle repeats for every new iPhone model. This means that the price elasticity of iPhones' demand, as well as demand and supply balance, are different in the first month of its sales comparing to the other part of the year, making the argument for the use of the discreet approach to the temporal market definition. However, the demand and supply of iPhones in these two periods are closely connected by intertemporal substitutability. For example, the annual Christmas peaks in Fig. 3 indicate that many consumers consider the iPhone purchased in December (three months after the start of the sales), as the substitute for iPhone purchased at the time of its release on the market. They plan this purchase in the area of the lower price elasticity of demand, consciously postponing consumption. There can be two conclusions of it. The first one points at the existing of the single temporal market of iPhones within the period between the introductions of adjacent iPhone models. Another one points at the validity of Coase paradox in this market, which must be considered by The Apple Corp, while pricing.

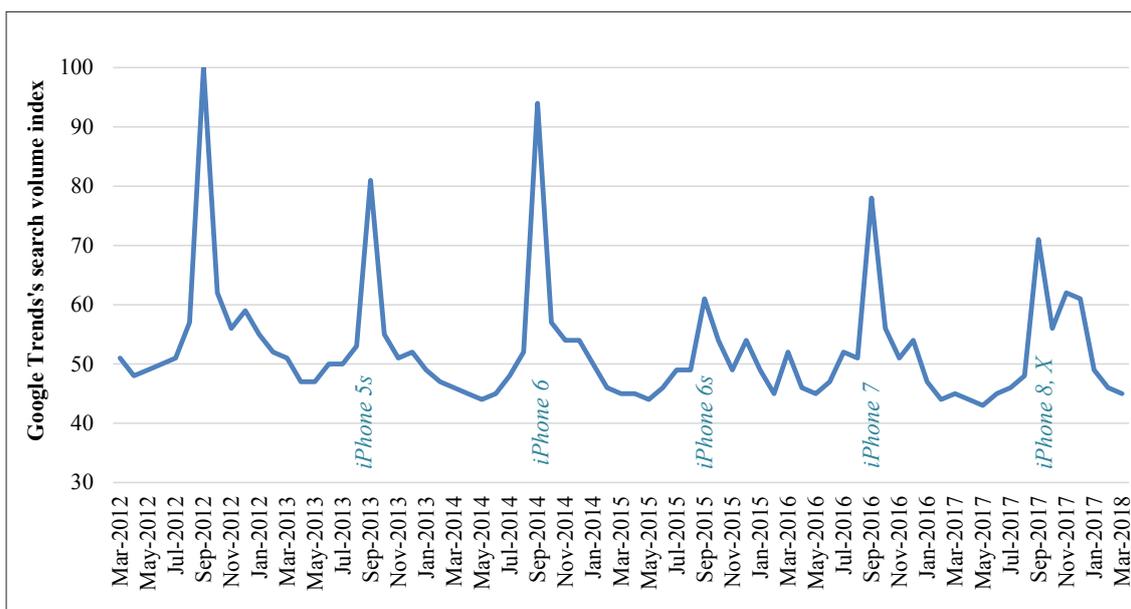


Fig. 3. The dynamics of the worldwide demand for iPhones, March 2012 – March 2018

Source: Google, 2018

Notwithstanding the difference in the price elasticity of demand, the Apple Corp cannot set different prices on the same model of iPhone in the first month of its sale, comparing to the subsequent ones, being under the risk of the first-period sales decrease according to the Coase paradox. It decreases the price of the previous-generation model of iPhone once a year – in the moment of the next-generation model introduction (Fig. 4), walking the line of the strategy of planned obsolescence of product. It allows the company unify the market equilibrium parameters within the whole cycle of demand change, being the argument for the use of the coherent approach to the temporal market definition, instead of the discreet one.

These conclusions could be applied to the other cases of temporal market definition. Let's start with the example of seasonal imbalance between demand and supply. The quality and quantity of the agricultural products' harvest (for example, apples), collected in summer and autumn season, determines annual supply and sales conditions. The consumers can easily move within the boundaries of the temporal market. They can buy apples in the summer time at the lower price and keep them within the year at their own expense or buy them at the higher price in the winter time. This difference in prices cannot be an indicator that approves the existence of two separate temporal markets of apples, while the intertemporal substitutability is an indicator of the single temporal market existence.

The other example deals with peak and off-peak services in the transport. The transport company knows in advance about the irregularity of the traffic flow

within the day, week or year. It considers it by planning the volumes and the schedule of service supply. The practice of such markets functioning witnesses that the transport companies mostly use the instruments of the cross-subsidization between periods instead price discrimination. Therefore, the temporal market does not cover a separate period of the cycle (daily, seasonal, life cycle of a product), but the whole cycle.

These both cases, as well as the intergenerational product case, bring enough arguments to applying the coherent approach to the temporal market definition. The exceptions must be made only for the markets with inelastic demand, where the possibility of intertemporal substitution is poor. Many of such markets are under strict government regulation that raises the issue of the government regulation impact on the temporal market boundaries.

4. The government regulation impact on the temporal market boundaries

Government regulation can significantly change the institutional environment of the market that is one of the important determinants of market boundaries. Let's show it at the example of the Ukrainian electricity market. This market is marked by at least three major cycles of its operation: daily, weekly, and annual (Fig. 5). They illustrate the fluctuation of electricity sales up to 50% of the market capacity. According to the neoclassical logic, the interaction of demand and supply in each cycle peak and off-peak periods has to result in different equilibrium prices and outputs. That means the existing of at least six different temporal markets

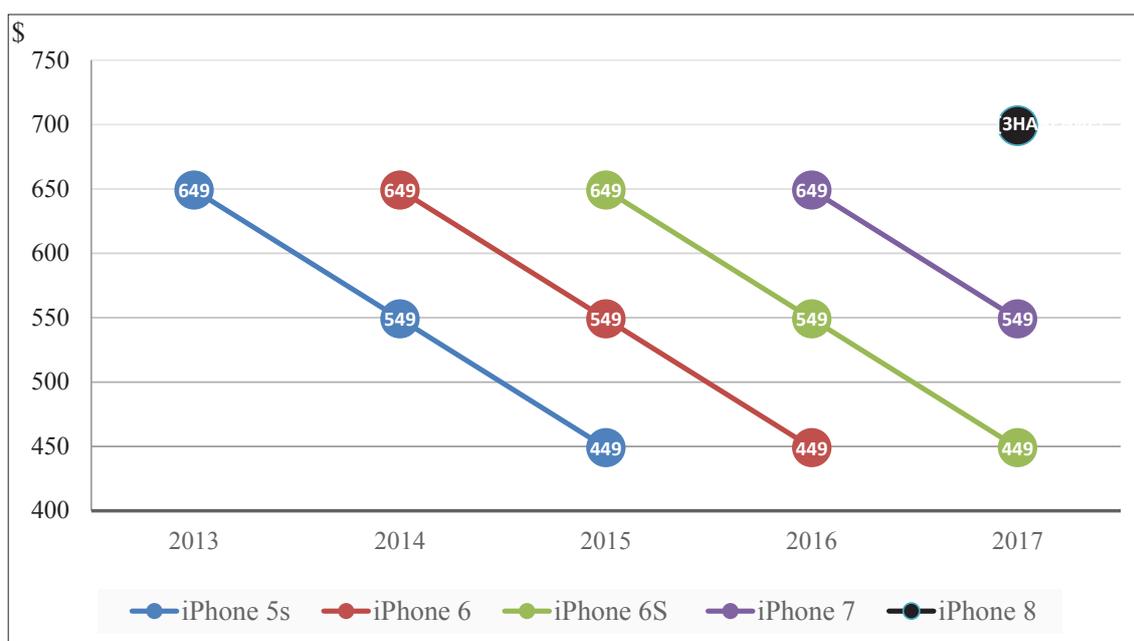


Fig. 4. The dynamics of the iPhones' basic model prices, September 2013 – September 2017

Source: constructed by the authors on the data of The Apple Corp., 2013–2018

under the discreet approach to the temporal market definition. Using the coherent approach reduces the number of relevant temporal electricity markets two times. Considering the current Ukrainian government regulation of power companies' activity challenges the existence of the only one temporal relevant electricity market in Ukraine – the daily one.

The Regulations of Ukrainian wholesale electricity market (hereinafter – WEM Regulations) spells out that all the electricity producers have to submit operating capacity bids for each designed period of the next day to the system administrator of the power grid. The external inflow operators have to submit import and export schedules. The power suppliers have to submit the forecasts of electricity consumption. Basing on this data, the system administrator of the power grid has to design load schedule for each power unit during each designed period of the next day (WEM Regulations, 2015). This means that the competition between electricity producers arises at the moment when they submit daily bids and repeats on a daily basis. It takes place due to the fact that such bids (taking into account restrictions and privileges, the system of priorities provided by applicable law, and the prices bid by the producers) determine whether or not a power unit will be put into operations, how long it will operate during the day, and at which capacity. The adjustment of the bid by the producers during the daily period is allowed in cases of emergency only. The set of grounds for the adjustment is set by applicable regulations. The validity of a bid that was not accepted is not extended to the next day, requiring a new act of competitive bidding.

This means that there is no smaller market than the daily electricity market in Ukraine because the fact of power plant's inclusion into the load schedule depends on the terms of their daily bids, specified by hours. This also means that there is no wider relevant temporal market. Next day the companies will submit new operating capacity bids, as well as price bids. These bids will create a new balance of power in the market

and new parameters of market equilibrium. Thus, the temporal boundaries of this market are just 24 hours.

Further statutory evidence that the Ukrainian electricity market functions within the daily boundaries can be found in the State Standard GOST 13109-97 “Electric energy. Electromagnetic compatibility of technical equipment. Power quality limits in public electrical systems” (GOST, 1997), in the Rules of relations between the SE ‘National Energy Company “Ukrenergo” and electricity industry facilities (entities) under conditions of parallel operation within the Ukrainian United Power Grid (MFE, 2008), in the Guidelines on inspection of thermal power plants, hydropower plants, and nuclear power plants readiness to participate in the regulation of frequency and voltage in the Ukrainian United Power Grid (MFE, 2009), and in the Ukrainian Law “On Electricity Market”. Although the latter has not become fully operational yet, it can be used as a landmark in the context of institutionalization of the existing business practices. Article 1 of this Law introduces a new category of the “day-ahead” electricity market (the day-ahead market), which constitutes a system of relations between participants of the day-ahead market and the system operator of power grid in connection with the sale and purchase of electricity that is necessary to meet the demand of the day following the trading day (Ukrainian Law, 2017). Among the trading platforms for the sale and purchase of electricity, offered by this Law, this particular market in conjunction with the interday market and balancing market corresponds to the acting model of the electricity market. This is one more argument to support the singular day dimension of the temporal boundaries of this market.

So, in such a case, the government regulation becomes the key determinant of the temporal market boundaries, while the economic and technological determinants are put on the back burner. The last two determinants would like to define the electricity market as a spot market with different equilibrium parameters for every second. However, these boundaries are denied with

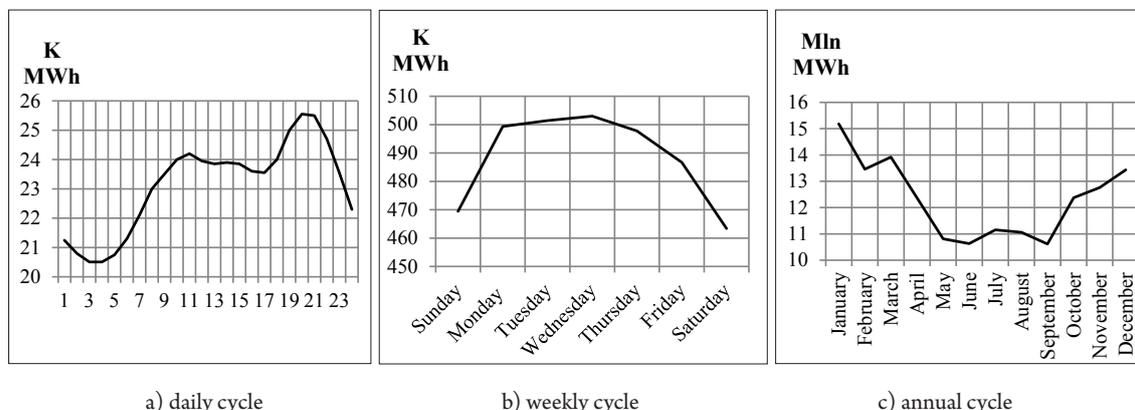


Fig. 5. The cycling of the electricity market in Ukraine

Source: constructed by the authors on the data of Gerasymenko et al., 2016, p. 15, 41

the impossibility of producers to change their bids in response to changes in market conjuncture within the 24 hours.

There are the same restrictions for the use of above-mentioned approaches to the temporal market definition in other regulated markets. The temporal boundaries of the market of services of transporting the oil (or the gas) by pipelines depend on the time value of the auction lots for network access. The temporal boundaries of the market of heat supply services are determined by the most common terms of the delivery contracts; etc.

5. Conclusion

Summarizing this investigation results, it should be stated that the question of the correct definition of temporal boundaries of the relevant market in the antitrust analysis is becoming more important now. As we can see from the above examples, these boundaries could be different and are dependent on the internal and external market parameters. Among the latter are: government regulation of the economy, traditions and habits of the social groups and other institutional determinants. The structure of various temporal markets could be dramatically different that leads to the differences in the behaviour of companies and regulatory bodies according to the “structure – conduct – performance” paradigm.

The world's practice of temporal market boundaries' researching suggests two alternative approaches: discrete and coherent. The first one means the short-run analysis of goods' and services' substitutability. It implies the combining of only those periods, that marked by a stable balance of demand and supply and

stable parameters of market equilibrium. The second one means the long-run analysis of goods' and services' substitutability, which consider the cyclic variation inside the market. This cycling is aware of consumers and producers, being the base for intertemporal substitution. It allows transforming the question of temporal market boundaries into the question of the cost of postponed consumption. If the increase of the peak price is lower than the cost of postponed consumption, the consumer will purchase a product at the time, when the need arises. If it is not, the consumer will wait for the price cut. The even spatial allocation of consumers by the criteria of the cost of postponed consumption is the factor of peak and off-peak periods' integration into the single temporal market, asking for applying the coherent approach to the temporal market definition. If such an allocation is not an even one and the prices change discretely (for example, because of a rapid drop of price elasticity of demand), the discreet approach to the temporal market definition should be applied.

These conclusions are confirmed by business practice but they fail when there is a strong external interference with the market mechanism operation, inter alia in the way of government regulation of the market. For example, the strict regulation in Ukrainian electricity sector determines the temporal boundaries of the relevant electricity market in the administrative way, fixing the interval of arising competition and the forms of competitive behaviour. Neither coherent, no discreet approach to the temporal market definition is effective in such a market conditions. The same barriers to applying economic methods of market boundaries definition exist in other regulated markets.

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