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Investment and Regulation in Telecommunications

by

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CONTENTS

Abstract

This article presents the difficulties associated with the implementation of the regulatory goal of promoting investment and innovation within the area of sector specific regulation in telecoms. The encouragement of efficient investment is one of the major goals reflected in the EC and domestic legal rules on telecoms access as well as price- and rate of return regulation. The law and the interplay of the interests of incumbents and alternative operators create a fertile soil for the emergence of various regulatory concepts of stimulating investment and facility-based competition. Considered here are the concepts most frequently referred to in this context including: the notion of new and emerging markets, the ladder of investment theory, sunset clauses and dynamic pricing policies. However, most of these concepts had little influence on regulatory practice so far, seeing

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as telecoms regulation is mostly directed at service competition and effective utilisation of existing infrastructures. This fact is the result of national regulators balancing their various regulatory goals in the existing technical and economic environment of the sector. The approach of the Polish regulatory authority towards these concepts constitutes an example of this reality. The urgent need to establish a new policy for next generation networks and access, bringing new technologies and business models to the sector, will have to induce more recognition for some concepts presented in this article.

Classifications and key words: telecommunication, regulation, investment, regulatory holidays, ladder of investment, sunset clause, price regulation, telecommunications access.

I. Introduction

Investments are inseparably linked to economic risk. The high level of risk associated with the telecoms sector is associated with a capital-intensive profile of investment and the considerable size of necessary sunk costs. Large financial commitments are normally required to start an infrastructure-based telecoms business, and a significant part of that investment is impossible to recover in case of market exit.

Market activities of major infrastructure operators are regulated. Regulation of wholesale and retail services provided by operators having significant market power (SMP) directly influences the ability to recover the costs of their investments. If regulatory control reduces the rate of return below the level achieved in un-regulated businesses then it weakens an operator's readiness to invest. Regulation may induce or restrain investment incentives even though regulators normally assume that an operator's drive to reduce costs, or to gain another competitive advantage, is a constant stimulus to invest. The expected level of return and the risk and uncertainty associated with these returns are generally recognised as the primary drivers of investment[1].

Regulatory effects are important to SMP operators using their own network to provide retail services as well as to alternative operators entering retail markets. SMP operators of fixed networks face the need of huge investments related to the construction of new generation networks (NGN) based on optical fibre. The main dilemma of alternative operators in the fixed sector, and virtual network operators in the mobile sector, is whether to engage in the construction of their

[1] *An Assessment of the Regulatory Framework for Electronic Communications – Growth and Investment in the EU e-Communications Sector* – report to the European Commission by London Economics in association with PricewaterhouseCoopers, July 2006, p. 72.

own infrastructure or, alternatively, whether to use the incumbent's network, access to which is made available to competitors by regulatory decisions.

The telecoms sector in Poland requires significant investments, in particular, fixed networks providing broadband access necessary for the creation of the information society. Reports and studies published recently show the weakness of fixed broadband infrastructure in Poland and the low level of investments *per capita* in the telecoms sector[2].

The literature indicates various factors influencing the level of investment in telecoms. Many studies consider the regulatory environment to be a significant factor in this context[3]. The core regulatory effects result from sector specific regulation that co-exists with general legal rules applicable to businesses, particularly competition law. This article analyses the regulatory effects of *ex ante* regulation based on the EC electronic communications directives of 2002, implemented into the Polish legal system by the Telecommunications Law of 2004. Provisions of these legal acts authorise extensive regulation of wholesale access to networks and services as well as the regulation of price and other conditions of retail services of SMP operators. Regulatory decisions issued by national regulatory bodies (NRA), represented in Poland by the decisions of the President of the Electronic Communications Office (UKE), directly affect investment decisions taken by the incumbent operator in the fixed sector and by major operators of mobile services. Regulation creates strong impulses influencing policies of alternative operators of fixed networks and new entrants into the mobile sector.

II. The EC electronic communications directives on investment

The 2002 EC directives on electronic communications contain a series of provisions directly related to investment and innovation in the telecommunications sector. They are to be found mostly in the Framework Directive and in the Access Directive. Article 8 of the Framework Directive declares "encouraging efficient investment in infrastructure, and promoting innovation" to be one of major regulatory objectives of the Directive. The ultimate effect of Article 8

[2] R. Cadman, *Regulation and Investment in European Telecoms Markets* – report for the European Competitive Telecoms Association, November 2007, p. 6.

[3] D. Flacher, H. Jennequin, J.-H. Lorenzi, "Innovation, Investment and Regulation: What are the Options for Regulation in the Near Future?" (2006) 64(4) *Communications & Strategies* 105–123; P. Baakea, U. Kamecke, Ch. Wey, "Regulatory Framework for New and Emerging Markets" (2005) 60(4) Communications & Strategies 123–146; J. Gans, S. King, *Access Holidays and the Timing of Infrastructure Investment*, available at: www.mbs.edu/home/jgans/research.htm.

should be significant since NRAs are obliged to take all reasonable measures aimed at achieving the objectives specified in the directives. The goal of encouraging efficient investment in infrastructure is linked in Article 8(2) to the promotion of competition; that fact supports the differentiation of infrastructure competition, seen as a distinct regulatory outcome, from service competition. Article 8 is referred to in many other provisions of the directives which intensify the impact of the somehow broad language of this obligation. Limited influence on regulatory practice is attributed to a recital of the Framework Directive referring to "emerging markets, where de facto the market leader is likely to have a substantial market share but should not be subjected to inappropriate obligations"[4]. Market leadership resulting from investment and innovation should not be subject to premature regulation.

The Access Directive seems to be more specific on the expected influence of regulatory decisions on investment in telecoms. Recital 19 if this Directive states that "the imposition by national regulatory authorities of mandated access that increases competition in the short-term should not reduce incentives for competitors to invest in alternative facilities that will secure more competition in the long-term". This provision advises regulatory bodies not to reduce the motivation of alternative operators to invest in new infrastructure which should be beneficial for competition long term. The provisions of Article 12 of the Access Directive show strictly normative features determining the conditions of access to networks and services of SMP operators. The provisions of Article 12(1) are of crucial importance for the determination of access conditions to services and network elements having significant influence on the development of competition. Access services, like among others, the access to the unbundled local loop (LLU), wholesale line rental (WLR), wholesale bitstream broadband services (BSA), co-location services and other forms of co-usage of ducts, building and masts showed to be critical for the development of competition. While determining the access obligations and assessing the proportionality of regulatory obligations, the Access Directive requires NRAs to take account of "the initial investment by the facility owner, bearing in mind the risks involved in making the investment". Article 12 of this Directive grants alternative operators access to existing infrastructure, the non-replicable part of which is needed for the provision of their own services or for the construction of their own infrastructure. At the same time, the Access Directive promises SMP operators to take into account the initial risk associated with their investment. The price setting policy of the regulatory body should take into consideration the risk's influence on the expected return on the capital employed. The EC rules on the creation of the conditions for long-term competition should induce regulatory

[4] Recital 27, Framework Directive.

bodies to keep the right proportion of regulatory obligations stimulating service competition (based on the exploitation of existing infrastructure belonging to SMP operators) and obligations reinforcing infrastructure competition (based on the creation of alternative technical assets).

The impact that regulatory decisions have on the investment inclination of SMP operators is associated not only with the obligations to grant access to specific services and network elements, but most of all with price setting policies pursued by regulators. The Access Directive permits various models of cost calculation and price control. However, according to Article 13(1) of this Directive "national regulatory authorities shall take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved". This provision is directly applicable to regulatory decisions setting wholesale prices of SMP operators within the process of dispute resolution and approval or determination of reference offers (eg. Reference Interconnection Offer – RIO, Reference Unbundling Offer – RUO).

The above short review of the EC provisions on investment makes it possible to conclude that community law requires Member States and regulatory bodies to take account of the influence that regulation (in particular, the imposition on SMP operators of regulatory obligations) exerts on investment in telecoms. This should generally lead to the balancing of short term interests of alternative operators and end users, connected with an increase of service competition, and the long term objective of promoting infrastructure competition based on new facilities.

III. Polish Telecommunications Law on investment

Regulatory decisions base on national legislation. The Polish Telecommunications Law of 2004 (hereinafter: PT) transposes into the national legal system all of the regulatory instruments contained in the EC directives on electronic communications. The provisions of the TL reflect also fairly accurately EC rules on investment. Article 1(2)(2) PT determines that the purpose of the Act is to create the conditions "for the development and usage of a modern telecommunications infrastructure". This is one of its main goals aside of "the support of equal and effective competition within the scope of telecommunications services provision". Article 189(2) obliges the President of UKE to carry out regulatory policy aimed at "efficient investment in infrastructure and promoting innovative technologies". The PT does not prioritise statutory goals and aims of regulatory policy leaving the task of their practical achievement

to the regulatory body. Where regulatory goals are concerned, investment is treated in accordance with the EC regulatory model.

No fault can be found concerning the level of specific statutory premises determining the content of regulatory decisions on obligations imposed on SMP operators. Article 35(2) PT requires that, while determining the scope of the telecoms access obligation, "the President of UKE will take into consideration the preliminary investments made by the owner of the equipment or associate facilities, having taken into account the investment risk" and "the necessity to ensure long term competitiveness". It reflects all guidelines that can be derived from the EC directives on electronic communications as regards long term interests connected with the development of new infrastructure.

However, the wording of the respective provisions in the EC and national law does not impose any specific obligations of the national regulator to promote investment. The provisions of the TL merely specify the various factors influencing regulatory decisions; it is the responsibility of the regulatory body to strike the right balance between service- and infrastructure competition while determining access obligations and setting prices[5].

The vague impact of the rules concerning investment on regulatory practice, both in EC and national law, raises an issue of regulatory policies pursued at the Community and national level. Various policy concepts concerning the promotion of investments in telecoms are being developed. On the basis of the provisions of the directives, an attempt is made to transpose its broad and vague provisions on investment, new markets and investment risk into policy concepts stimulating regulatory decisions. They are reflected in documents and reports of the European Commission, the European Regulators Group (ERG), organisations and associations of telecoms operators, in national regulatory strategies as well as in literature.

IV. The concepts of regulatory promotion of investments in telecoms

1. The concept of new and emerging markets (regulatory holidays)

The concept of new and emerging markets is promoted mainly by incumbent operators and their associations. It is based on recital 27 of the Framework Directive forewarning against a premature imposition of regulation upon emerging markets. A similar approach appears in the European Commission's

[5] See: F. Kamiński, "Oddziaływanie regulacji konkurencji na nowe inwestycje oraz strukturę rynku komunikacji elektronicznej" (2006) 2–4 *Telekomunikacja i Techniki Informacyjne* 24.

guidelines on market analysis[6] where, with reference to recital 27 of this Directive, it is stated that emerging markets where the market leader is *de facto* likely to have a substantial market share should not be subject to inappropriate *ex ante* regulation. Premature *ex ante* regulation may unduly influence the competitive conditions taking shape on such markets. Incumbents explored this concept trying to exclude some new investment projects from access regulation, in particular, in relation to the construction of broadband access networks using optical fibre technologies. The practical attempts to use this legal basis as a foundation of regulatory policy are called "regulatory holidays" or "access holidays"[7].

From the start the idea of regulatory holidays stumbled over the vagueness of the notion of "new and emerging markets". In the light of the European Commission's Recommendation on relevant markets[8], new and emerging markets seem to be perceived as "innovation-driven markets characterized by ongoing technological progress". However, in the initial phase of the application of the Framework Directive, the Commission did not clarify this notion. This fact was criticised by some incumbents within the review of the EC legislation on electronic communications that took place in 2006. According to major European incumbents, the vagueness of this notion limits its suitability for shaping regulatory policy. At the same time, alternative operators claimed that attributing too much attention to the notion of new and emerging markets creates more confusion than useful guidance for the regulatory process. They asserted that applying this concept is to likely to result in re-monopolisation of access markets relying on modernised or newly constructed access infrastructure.

The ERG cast some light on this concept by stating that "there is no generally accepted definition of an "emerging market". But in the view of ERG, the distinguishing feature of such a market is that it is immature which implies that there is high degree of demand uncertainty and entrants to the market bear higher risk. Where these characteristics are present, it will not be possible to make definitive findings on whether or not the three criteria are met in relation to the emerging market"[9]. According to the ERG, close

[6] Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services, OJ [2002] C 165/03.

[7] J. S. Gans, S.P. King, "Access Holidays and the Timing of Infrastructure Investment" (2002) 14 *Melbourne Business School Working Paper*.

[8] Commission Recommendation of 11 February 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, OJ [2002] L 114/45.

[9] Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, Final Version May 2006, p. 20.

monitoring of the situation is necessary where emerging markets are in some way linked to established, traditional markets on which a SMP operator controls non-replicable inputs required to enter an emerging market. Even a large investment does not necessarily create an emerging market. ERG insisted that SMP operators take into consideration the previously established access obligations while considering new infrastructure investments. The ERG is rather inclined towards a critical assessment of the emerging markets concept, as far as regulatory practice is concerned, and formulates mostly warnings as far as its practical implementation is concerned. This critical approach cumulated in the assessment of the "regulatory holidays" concept, which reflects a practical attempt to apply the notion of new and emerging markets on the national level of telecoms regulation.

The difficulty of defining emerging markets and identifying such markets in practice is generally recognised in the literature[10]. The task of making this notion more operational was pursued by the European Commission in its Recommendation on Relevant Markets of 2007[11]. It reflects the standpoint of the Commission which was established following the proposal of the German regulator to protect some investments made by Deutsche Telecom. According to the Commission, incremental upgrades to existing network infrastructure rarely lead to the creation of a new or emerging market. The emergence of new retail services may lead to the creation of a new, derived wholesale market to the extent that such retail services cannot be provided using existing wholesale products. This Recommendation states clearly that new infrastructure and, in particular, the most expensive passive infrastructure (ducts, optical fibres) does not determine by itself the creation of a new market. It is a service product, and not a technology, that creates a new market. Only the evident lack of substitutability of a new product, proven from the demand, as well as the supply-side perspective, gives grounds to conclude that this product is not part of an existing market. The demarcation of new and existing markets in most disputed broadband services requires thorough examination of user behaviours concerning the extent to which they confirm the substitutability of successive broadband services.

A practical attempt to apply the new market concept was made by the German regulator (BNetzA) in its draft decision concerning the wholesale broad-

[10] P. Baake, U. Kamecke, Ch. Wey, "A Regulatory Framework for New and Emerging Markets" (2005) 60(4) *Communications & Strategies* 131.

[11] Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to *ex ante* regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, 2007/879/EC, OJ [2007] L 344/65.

band access market. The decision declared that the VDSL bitstream service is not part of the bitstream market services. BNetzA considered that the existing bitstream service based on hybrid networks (mixed copper/fibre networks) was a separate area compared to new bitstream services using fully optical fibre network. BNetzA regarded connections on VDSL networks as a previously non-existing new product that was priced significantly higher for end-users. The proposal to exempt this wholesale market from regulation for a 2 year period was contested by the European Commission seeing as these products should not differ significantly from other broadband products. The next attempt of the German authorities to exempt from regulation broadband markets based on optical fibre technologies relied on legislative instrument. The rule concerning 'new markets' contained in the German Telecommunications Law excluded from regulation markets for products and services that, taking into consideration their functionality, scope, availability for broader users' groups (mass accessibility), price and quality for a rational user, differ significantly from, rather than merely replace, previously existing products and services. The Commission decided to refer the German solution called the "regulatory holiday law" to the European Court of Justice claiming that it grants an exemption to the German telecoms incumbent from the EC directives on electronic communications[12]. In a similar case, the Romanian regulator, in a market analysis carried out before Romania's accession to the EU, declared that the wholesale broadband access market is an emerging market and did not designate SMP operators; as a result, no bitstream access offer is available.

The concept of new and emerging markets didn't influence the regulatory practice to a significant extent. The attempts to use this concept for the purpose of exempting large scale investment projects in upgrading access networks were questioned at the EC level. In light of the clear position expressed by the European Commission in the German case, proposals of national incumbents that made large scale investments in fibre networks dependant on the granting of "regulatory holidays" for services delivered via such networks were blocked at the national level.

The Polish telecoms incumbent, Telekomunikacja Polska (TP), offered to make large scale investment in optical fibre access networks on the condition that the regulator grants it, in advance, an exemption of access obligations regarding the newly developed optical network. The proposal was rejected by the President of UKE on the grounds of incompatibility with the EC regulatory framework as well as the Polish PT.

The concept of new and emerging markets remains part of the regulatory framework for the sake of argument that market is protected from overregulation

[12] IP/07/595, IP/07/888, MEMO/07/255.

and impediment of innovations. Past discussion helped to solidify the position that markets can be considered to be new and emerging if, because of their lack of maturity, they do not pass the three-criteria test. No list of such markets was established; only VoIP and IPTV service markets are occasionally mentioned in this context. The sole implementation of new technology (eg. optical fibre networks) does not create a new or emerging market. Until it is confirmed from both, the supply and the demand perspective that services provided over new infrastructure are not substitutable to the existing offer, an exemption from regulation of new infrastructure is not permitted. This however makes it difficult to gain a guarantee of exemption before the investment is made.

2. Sunset clauses

The regulatory framework applied to the telecommunications sector encompasses the goal of effective competition which allows desisting from ex ante regulation and relying on general competition law instead. Thus, one of the concepts supporting investment in telecoms is related to the fact that regulatory obligations are imposed only for a period of time specified in a regulatory decision. The clauses providing for the expiration of such obligations are known as the "sunset clauses". Sunset clauses could provide some predictability and legal certainty concerning the regulatory environment in which investment decisions are being made. They could prove to an incumbent that *ex ante* regulation is, as a rule, a transitory phenomenon; they could also stimulate alternative operators to investment by showing that long-term business models based on regulatory obligations placed on the incumbents may turn out to be risky. It could help avoiding rent-seeking activities by the beneficiaries of regulation addressing pure service competition[13].

Sunset clauses have only intermediate legal grounds. According to Article 16(3) of the Framework Directive, where a national regulatory authority concludes that a market is effectively competitive, it shall not impose or maintain any regulatory obligations. In cases where such obligations already exist, it shall withdraw such obligations giving an appropriate period of notice to the affected parties. Accordingly, Article 7(3) of the Access Directive imposes an obligation on regulators to periodically undertake a market analysis to determine whether it is necessary to maintain, amend or withdraw existing regulatory obligations.

[13] Y. Chou, K-Ch. Liu, "Paradoxical impact of asymmetric regulation in Taiwan's telecommunications industry: Restriction and rent seeking" (2006) 30 *Telecommunications Policy* 180.

Different kinds of sunset clauses are considered. Their basic type is related to the attainment of the main regulatory goal of effective competition. Such clauses result directly from the law which obliges NRAs to periodically review regulated markets. Associating the withdrawal of regulatory obligations with the attainment of the general objective of regulation reduces somewhat investment uncertainty, retaining at the same time the high level of administrative discretion. Sunset clauses based on the success of general regulatory policy, rather than on measurable criterions, risk to delay the switch-off of *ex ante* regulation. The fact is recognised that credible commitment to sunset regulation is difficult[14].

Sunset clauses could also be related to more explicit and measurable indicators such as: the quantity of wholesale sales, the penetration of retail services, the number of competitors on specific markets or the passage of time.

This concept underpins a decision taken by Ofcom following the review of the wholesale broadband access market announced in May 2008. The regulatory decision states the conditions on which regulatory obligations are being withdrawn or reduced. Exempted from regulation are markets of asymmetric broadband access where consumers have access to at least four wholesale broadband providers and where the exchange serves 10,000 or more premises. Ofcom requires a 12 month notice period for customers who had contracts with BT, so that they can continue to operate while making necessary alternative arrangements. Besides exempting specific areas of service delivery from *ex ante* regulatory obligations, Ofcom formulates clear cut conditions of withdrawal of such obligations as a result of future reviews.

The concept of sunset clauses attracted the attention of the ERG considering that regulatory authority may actively support investment of alternative operators by signalling, through the use of sunset clauses, that regulation will be removed[15]. More detailed examination brought the ERG to the conclusion that, at least in the case of broadband markets, it is too early to anticipate when sunset clauses can be introduced in practice by national regulators without risking to disrupt competition[16].

During the initial phase of drafting of the telecoms regulatory framework (the 1999 Review), sunset clauses were broadly advertised by the European Commission as the main instrument guaranteeing a transitory character of *ex*

[14] J. A. Hausmanp, J. G. Sidak, "Did mandatory unbundling achieve its purpose? Empirical evidence from five countries" (2005) 1(1) *Journal of Competition Law and Economics* 244.

[15] *Broadband market competition report*, ERG (05) 23. European Regulatory Group, available at: www.erg.eu.int, p. 24.

[16] Revised ERG Common Position on the approach to Appropriate remedies in the ECNS regulatory framework, Final Version May 2006, p. 84.

ante regulation[17]. This concept was never developed in subsequent documents. Recent attempts of some national regulators to incorporate sunset clauses in regulatory decisions on dynamic and territorially differentiated markets gives hope that this concept is not forgotten.

Polish regulatory practice did not use any kind of sunset clauses seeing as it was already difficult to finalise, by the end of 2008, the first round of the required market analyses. Even the finding of effective competition on some markets (transit in fixed networks, wholesale trunk segments of leased lines) did not result in an immediate withdrawal of regulatory obligations but rather, required separate administrative actions. In order to exempt service areas saturated with competitive infrastructure offerings from regulation, the incumbent PT proposed the segmentation of markets depending on the existing level of competition. This proposal was however rejected by the Polish regulatory authority[18].

3. The ladder of investment

The concept of "the ladder of investment" is the best known theory linking regulatory goals with the creation of investment incentives. The concept encompasses regulatory stimulation of investments in network assets that are less and less easily replicable. It mostly relates to investments made by alternative operators effecting indirectly also the modernisation of the networks belonging to the incumbent. This concept has no explicit legal grounds in EC directives on electronic communications resembling instead policy guidance concerning the usage of the set of regulatory instruments provided in the directives for national regulators. The ladder of investment finds recognition in the documents of the European Commission on electronic communications, in opinions expressed and statements made by the ERG; it is also widely analysed in literature.

This concept was mentioned in the ERG's statement on remedies in 2003. According to the ERG, the promotion of infrastructure-based competition makes it necessary for national regulators to set investment incentives in order for the dominant undertaking's infrastructure to be replicated wherever this is technically feasible and economically efficient, within a reasonable period of time. The "approach, where two or more access products at different levels of the network hierarchy are simultaneously available to alternative operators has

[17] A. de Streel, *A New Regulatory Paradigm for European Electronic Communications: On the Fallacy of the 'Less Regulation' Rhetoric*, ITS-Europe Regional Conference, Berlin, September 2004, p. 23.

[18] *Strategia wsparcia rozwoju inwestycji telekomunikacyjnych w Polsce w latach 2008–2011* – report by Telekomunikacja Polska, August 2008, p. 18.

been called the "ladder of investment"[19]. The European Commission referred to this concept in some of its comments to the notifications made by national regulatory bodies concerning market analyses[20]. The broader theory of the ladder of investment was discussed by M. Cave[21].

This concept relies on the assumption that regulation should motivate alternative operators to invest in infrastructure in order to take advantage of less complex, and therefore cheaper, access products of the incumbent. In the initial period of competition-creation, regulatory obligations enabling new providers to access wholesale services and to resale them are justified by the goal of attracting new service providers to the market, reducing retail prices, increasing immediate consumer benefit and the utilisation of existing infrastructure. Therefore, the initial phase of service competition requires obligations enabling the purchase of wholesale line rental and bitstream services in addition to carrier selection and pre-selection. On the basis of these products, alternative operators may extend their client base, market position and revenue. In the next step they should use the unbundled elements of the incumbent's network, in particular, the local loop or sub-loop. On the final rung of the ladder of investment an alternative operator gets its own access network where, and when it turns out to be the efficient way to reach the subscriber. It is assumed that regulation should motivate alternative operators to move up the ladder and deeper into the value chain, adding more and more of their own infrastructure elements, which normally requires new investments. It is assumed that this should result in the development of infrastructure competition as well as in the reduction of regulation.

In order to achieve a functioning ladder of investment, the regulator should send the right signals to alternative operators. Pricing of service elements located on the initial rungs of the ladder should stimulate alternative operators to move up. Thus, the pricing policy of the regulator should create the right signals as to whether to build, or whether to buy successive elements of the value chain. The timing of price regulation is therefore of key here. In the initial phase of market de-monopolisation, regulatory policy should encourage alternative operators to buy service-products of the incumbent. Later, as alternative providers establish themselves on the market, the incentives to

[19] ERG Common Position on the approach to Appropriate remedies in the new regulatory framework, ERG (03) 30 rev1, p.13.

[20] SG-Greffe (2006) D/204559, SG-Greffe (2006) D/202659, SG-Greffe (2006) D/204818.

[21] M. Cave, I. Vogelsang, "How Access Pricing and Entry Interact" (2003) 27 *Telecommunications Policy* 717–727; M. Cave, "Encouraging infrastructure competition via the ladder of investment" (2006) 30 *Telecommunications Policy 30* 223–237; M. Cave, *Regulation and Competition Law in European Telecommunications*, June 2006, 24, report prepared for Post-och Telestyrelsen.

buy complex service products should decline and finally vanish. Facility-based competition should be progressively promoted. This type of policy may result in a duplication of alternative infrastructure. It may as well encourage the incumbent to invest in infrastructure exempted from *ex ante* regulation.

Defining the replicable and non-replicable parts of the infrastructure constitutes a precondition for a practical application of the ladder of investment. Regulatory policy may address only the replicable parts. The methods for assessing the level of replicability of different assets were presented in the literature that shows that replicability is not a simple binary variable and may depend upon a range of variables[22]. The assessment of network replicability differs in the context of narrowband and broadband networks, services provided for institutional and individual customers as well as in light of other technical and economic factors. For the concept to be applied, basic rungs in the investment ladder need to be clearly identified as well as the economic and operational conditions of moving the business up the ladder and the regulatory instruments needed to stimulate such move.

M. Cave speaks of 6 steps of implementing the ladder of investment: deciding which of the products in the value chain are clearly non-replicable; ranking the replicable components of the value chain for relevant products by their level of replicability; identifying the location of the incumbents and the entrants on the ladder; assessing the potential progression over the period of the regulatory intervention (app. 2-3 years); choosing the regulatory instruments (mode of intervention) and calibrating the strength of the intervention; and finally, making credible commitment to this policy[23]. The success of such policy depends on the credibility of regulator's communications warning market players of the changing conditions of access to the incumbent's infrastructure.

In regulatory practice the concept of the ladder of investment performs mostly an explanatory, rather than a normative, function. In official documents of the European Commission the ladder of investment is used to explain the development options of alternative operators. The concept is useful to describe the relationship between various access services that require differentiated investment engagement of the operators seeking access. This kind of approach appears in the 12th and 13th Implementation Reports and in documents accompanying the proposals for amendment of the directives on electronic communication published in November 2007. The ladder of investment is used mostly to show the future road facing the incumbents as well as alternative operators. To what extent and how regulation should and could motivate alternative operators to follow this road remains a separate

[22] M. Cave, "Encouraging…", p. 226.

[23] M. Cave, *Making the ladder of investment operational*, available at: http://www.ictregulationtoolkit.org/en/Publication.2916.html, pp. 22–28.

question. This aspect of the ladder of investment theory is less developed and rarely utilised.

ERG documents concerning various aspects of the regulatory approach to new infrastructures show more practical orientation. In the ERG's opinion on regulatory principles of New Generation Access, an attempt is made to determine what new rungs of the ladder would have to be considered by alternative operators if the incumbent decides to construct an optical fibre access network[24]. The guidance of the ERG is concentrates on the identification and the reciprocal relationships between new rungs in the investment ladder, that is, rungs required by new networks technology. The migration process may be disrupted by the lack of necessary rungs and if the distance between successive rungs is too great. It is therefore vital for the ladder of investment to be a complete structure from the economical, technical and operational point of view. The ERG is determined to identify the competitive options related to all necessary rungs and the functional migration to higher rungs without disrupting services. The ERG stresses that access products should be implemented in a logical manner, starting with the lowest rungs. New products must be announced in advance to give alternative operators a chance to adapt their investment strategy to the new opportunities. In the light of this proposal, it is however less important to create impulses inducing alternative operators to climb up the ladder.

The ERG indicates that the prices of products of the incumbent located on consecutive rungs should reflect the scope of investment needed to take the advantage of a specific product[25]. This is difficult to achieve if various pricing methodologies are applied at different rungs (eg. cost orientation and retail minus).

The approach of the ERG towards the ladder of investment resembles the position of alternative operators who insist on the neutrality of this concept. The freedom to enter the market on different levels of value chain and the possibility of using various products at the same time are important demands of alternative operators. The choice of the appropriate access product should therefore rest with alternative operators and not with the regulator or the incumbent. On the other hand, the incumbents consider that regulatory policy implementing this concept should motivate alternative operators to move up the ladder. Incumbents criticise the neutral approach saying that, instead of a ladder, NRA create a chessboard which allows moves in various directions and pricing arbitrage for alternative operators.

The ladder of investment has a very limited impact on the regulatory practice in Poland considering that access products are only in the initial phase

[24] ERG Opinion on Regulatory Principles of NGA, ERG (07) 16rev2, p. XIII.

[25] ERG Common Position Bitstream Access, 2 April 2004, ERG (03) 33rev1, s. 10.

of their development. During the first round of market analyses, regulatory obligations focused on basic access products such as: wholesale line rental, bitstream access, flat rate interconnection etc. The next regulatory goal is to create further products and secure safe migration from basic resale services to unbundled access line or products based on optical fibre infrastructure. The major obstacle to be identified here is the lack of a stable pricing policy based on cost calculations verified by a competent auditor. In practice the ladder of investment is considered by the President of UKE to be a theoretical model able to create developmental opportunities rather than an instrument for forced infrastructure investments.

4. The rate of return and price regulation

Rate of return regulation is based on explicit provisions of the Access Directive. Its Article 12(2)(c) calls on the regulator to take account, while imposing regulatory obligations, of the initial investment by the facility owner, bearing in mind the risks involved in making the investment. Article 13(1) requires that while regulating prices "national regulatory authorities shall take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account the risks involved".

The Access Directive does not impose a specific method of price control. In general, it is required that prices are based on costs. However, different types of costs are allowed to be considered while various methods of cost determination are applied by an operator and the regulatory body. In practice three methods of regulatory price control are being applied: based on cost orientation, based on the "retail minus" approach and based on benchmarking against prices of similar services in other countries[26]. Each of these methods produces different regulatory effects – each has different effects in terms of regulatory certainty for the incumbent and for alternative operators.

Cost oriented price setting methods prevent the incumbent from fixing the price above the cost level in situations where the creation of an alternative infrastructure is not possible or is rather unlikely. Since the main version of cost orientation (LRIC) reflects the avoidable costs of providing the service, it is by itself not the best instrument to stimulate investments. The regulatory body may, to some extent, stimulate the calculation of the cost base by setting accounting principles and rules of cost calculation. The main instrument of influence in this context is connected to the setting of WACC (Weighted Average Cost of Capital). By determining WACC, the regulatory body decides

[26] Revised ERG Common Position, p. 75

what constitutes a reasonable rate of return on the capital employed in the provision of services by the regulated company. Normally WACC is set by the regulatory body at one particular level by calculating a single rate of return for the whole company. Investments in new generation broadband networks are associated with a higher level of risk as compared to the traditional business of voice and data transmission. In order to stimulate investments, it is attempted to adopt a differentiated WACC that takes into account different levels of risk associated with each project. The Independent Regulatory Group (IRG) made an assessment of the potential to adopt a differentiated WACC that shows that this is in theory reasonable from a regulatory point of view. However, lack of information makes it difficult to determine the level of risk associated with various assets (projects) relative to the market risk[27]. IRG presented Oftel's experiences in applying a differentiated WACC in order to reflect various levels of systematic risk faced by different parts of BT's business[28]. Ofcom adopted a separate WACC for BT's copper access network business and for the rest of BT's business.

Price determination based on "the retail minus" approach prevents incumbents from performing a price squeeze; this method is however not suitable to stimulate investment. This is particularly true in Poland where the wholesale price is calculated on basis of the alternative operator's retail costs and disregards the incumbent's level of production costs. Although the retail minus approach is a recognised in EC law, it is being questioned by Polish courts seeing as it was not properly legalised in the PT. Four years of exercise in regulatory accounting and efficient cost calculation, supported by examinations of independent auditors, did not produce cost data for the determination of wholesale prices that could be used by the President of UKE and the incumbent.

The benchmarking method suits only the initial phase of market de-monopolisation when no reliable data on costs is available to the regulatory body.

Long term stimulation of investment on the part of alternative operators would require a dynamic pricing policy starting with relatively "low" prices, enabling new entrants to start operation, that would be systematically raised in order to abandon the incumbent's complex service products and to move towards unbundled elements of its infrastructure. However, difficult must preconditions must be met to apply a dynamic pricing policy. First, the regulatory body must have precise knowledge of the replicable parts of the infrastructure and of the necessary time frame for replication. Second, the regulator should predict the market relationships and meet high requirements

[27] IRG – *Regulatory Accounting Principles of Implementation and Best Practice for WACC calculation*, February 2007, pp. 25–29.

[28] Ibidem, p. 30.

concerning its own regulatory strategy. Third, the level of wholesale prices would have to be determined significantly in advance and with a high degree of certainty in terms of its tendency to change. This kind of a dynamic pricing policy could most of all influence the investment decisions of alternative operators. The incumbent's investments could benefit mostly from a higher level of regulatory certainty and predictability.

There are only few examples of the application of a dynamic pricing policy (Canada, Holland). Referring to the Italian experience, the ERG stated that cost oriented prices serve better the investment engagement of alternative operators than the retail minus approach. However, there is no broader consent in this regard.

The case of price control is one of the most discussed issues in Polish regulatory practice. The proposal to use a differentiated WACC was put forward by the incumbent TP[29] but considered to be impossible to implement in a report published by the regulatory authority[30]. Price regulation during the transitory period, moving away from the regulatory framework of 1998 to the regulatory mechanism based on the 2002 directives on electronic communications, was based mostly on benchmarks and on the retail minus approach in case of wholesale services related directly to retail services of the incumbent. Benchmarking effectively ended with the completion of the first cycle of 18 markets analyses and the retail minus approach was successfully challenged in courts. The only way forward seems to be the recognition by the regulatory body of cost calculations positively verified by an independent auditor. So far the positive opinions expressed by the auditor concerning cost levels calculated by the incumbent TP were called into question by the President of UKE who claimed that the cost levels submitted by TP may lead to burdening alternative operators with its inefficiencies.

5. Regulatory approach to Next Generation Networks

The roll-out of NGN and, in particular, of the access part of such networks (Next Generation Access) requires substantial investment and therefore needs an appropriate regulatory response. The recent recommendations and positions of the European Commission[31], the ERG[32] and the President

[29] *Strategia wsparcia rozwoju inwestycji*…, p. 16.

[30] A. Piotrowski, *Opinia o dokumencie pt. „Strategia wsparcia rozwoju inwestycji telekomunikacyjnych w Polsce w latach 2008–2011"*, p. 25, available at: www.uke.gov.pl.

[31] Draft Commission Recommendation on regulated access to Next Generation Access Networks (NGA), 2008.

[32] ERG Common Position on Regulatory Principles of NGA, ERG (07) 16 Rev 2.

of UKE[33] introduce some new elements to the current set of regulatory instruments. The main features of the new approach include: clear focus on facility based competition, reorientation towards passive elements of the infrastructure, dependence of regulation on network architecture, and a more symmetrical approach concerning access to newly built passive elements of the infrastructure.

The prospect of NGN/NGA deployment changes the regulatory perspective. New access networks have not been directly linked to the concept of new markets. It is expected however that they will be capable of delivering broadband services with bandwidths much above the present level. It is recognised that clear indications of a break in the chain of substitution, as compared to current products, prove the existence of a newly emerging market.

The fact is acknowledged that the facilitation of infrastructure competition should constitute the preferred regulatory option bearing in mind the necessity to protect the existing level of service competition. New prioritisation of remedies should reflect this approach. Regulatory obligations supporting investment should be applied to the lowest level of network architecture. Most relevant are regulatory obligations concerning access to passive infrastructure elements, in particular, to telecommunication ducts. The new approach entails access to existing as well as to new ducts. The same goes for access to civil engineering works and other passive infrastructure elements (dark optical fibre, street cabinets).

The regulation of SMP operators' and alternative operators' investment activity gains slightly in symmetry. The present regulatory framework is, in principle, restricted to regulatory authorities encouraging the sharing of passive infrastructure. Currently, the imposition on non-SMP operators of an obligation to share ducts, and other infrastructure elements, is only permissible when other operators are deprived of viable alternatives because of the need to protect the environment, public health or security, or to meet town and country planning objectives. Now the sharing of infrastructure necessary for NGN/NGA should constitute the main regulatory goal. The encouragement of infrastructure sharing between SMP and alternative operators should be complemented by build-and-share projects. The sharing of infrastructure within a building (in-building wiring) may be mandated. The regulatory body could even allow SMP operators to refuse access to new investments for alternative operators who, without due reason, refuse to grant reciprocal sharing of their own passive assets. If there are no existing ducts, access to civil engineering works (trenching and ducting) or other passive elements (dark fibre) should be mandated which would enable entry for operators willing to

[33] Opinia regulatora dotycząca procesu budowania i eksploatacji infrastruktury NGA w Polsce, 17 December 2008.

invest. It is recommended here that sufficient space for other operators should be guaranteed in newly built ducts not only by SMP operators.

The various speeds of NGN/NGA roll-out in urbanised and rural areas justifies the definition of geographic markets at sub-national level – taking into account that specific competitive conditions may lead to the withdrawal of regulatory control in some areas with developed infrastructure competition. Substantial cost differences in the creation of infrastructure in various areas should at least justify the abandonment of the geographic averaging of wholesale prices.

The selection of regulatory instruments must recognise the architecture of the NGA. Regulation must take into account how close is the optical fibre brought to the termination point of the network – to the home of the end-user (FTTH), to the building (FTTB), to the street cabinet (FTTC) or to the network node (FTTN). Decisions in this regard are made by the investing operator depending on his investment and business scenario. It is recognised here that the competitive result may vary depending on the form of future network architecture. Therefore, a different set of regulatory instruments is recommended for each of its forms in addition to general principles of the imposition of remedies in case of NGN/NGA investments.

The pricing methods applied to new ducts (Greenfield projects) need to incorporate a project-specific risk premium to reflect the investment risk incurred by the operator. The methods of calculating the rate of return and WACC should strike the right balance between investment stimulation and the promotion of efficiency and sustainable competition.

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