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## Conference Paper

# Challenges in the regulation of broadband in Hungary

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## **'Challenges in the regulation of broadband in Hungary**

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The Hungarian broadband market considering its technology mix and the level of success of inter-platform facility-based competitors is very atypical in the EU. It poses challenges to regulation which has to fit to the new EU regulatory framework, but does not get too much guidance from it. In the paper we describe the current Hungarian market situation in details, showing the similarities to and the differences from the EU average and the mainstream. We discuss that whether special conditions characterizing the current broadband market may lead to competition in this setting when two or more platforms compete on the market. We consider the potential short term competitive effects of asymmetric regulation, under and over regulation, and the effects of these options on dynamic competition and investment.

In the last years the European regulators gave high priority to the regulation of broadband markets. The European Regulators Group issued several common position papers concerning this topic. As a common approach of the Group, they elaborated the investment ladder concept. This concept assumes that investments are made in a step by step way by new entrants. In order to allow them to gradually invest in their own infrastructure they need a chain of access products to acquire a customer base by offering their own services to end users based on mandated wholesale access. Once, these companies generated enough revenues they will implement their own infrastructure migrating from one access point to another. As a result, they will move closer to the customer, which makes them less dependent of the incumbent's infrastructure. According to ERG the concept of the ladder of investment is followed explicitly or implicitly by all NRAs. It corresponds to the EU regulatory framework as it encourages efficient investment while promoting competition at the same time.

To view the Hungarian picture as a case study it is good to start with the descriptive characteristics of the market. It shows that:

- vigorous inter-platform facility-based competition exists in a large part of the country
- the fragmentation of the market makes the geographic market analysis rather difficult
- cable is a more advantageous position in the competition
- DSL technology is an underdog position
- fibre deployment is in very early phase and moreover it is a very expensive investment and very vulnerable to the changing market and regulatory conditions

The regulator who is in charge with policing the market and analyzing it regularly and intervene if the market is not functioning well according to its forward looking evaluation, encounters the dilemma of what to do in such a complex situation.

Hungary was the first among the new EU member countries implementing the new EU Regulatory Framework. The National Regulatory Authority have completed the first round of market analysis procedures for the broadband markets in 2005, introduced several new remedies like the Retail Minus (RM) pricing for national bitstream services, and worked hard

to correct the problems with the details of LLU Reference Offers. Unfortunately the market impacts of these measures were less positive than the expectations. It seems that because of facility based competition the investment ladder concept does not work in Hungary. There is no hope, that the alternative DSL operators will increase their investments into network infrastructure.

The Hungarian market experience demonstrates that competition has intensified in the last years, however as we show it not really as a consequence of the applied regulations. Moreover this competition is in vain seems workable, because it is competition between infrastructures and technological platforms. This can be a guarantee of the workability of dynamic competitive forces in the in the foreseeable future. For the regulator a question remains to be answered: what kind of competition considered sustainable and effective? The competition we have now is enough?

In the last years some economists shown that typical conditions of the telecom market, where there are at least two competitors with their own independent infrastructures, are against of any kind of individual market power and collusion, therefore favor competition. The only requirement is to have excess capacity in the networks and a considerable overlap between them. We can add to it that the importance of innovation and continuously high level of investment in these markets and the heterogeneity of technologies makes the argument even more convincing.

Concerning to the future regulation the regulator is facing a strategic dilemma. Strictly following the EU regulatory framework there is opportunity to define geographic markets, separating the densely populated urban areas from the remote rural areas. In the urban areas where competition exists there is the option to terminate the obligation of the former SMP operator to provide national bitstream service to alternative operators, but this move can lead to the collapse of these companies, and eliminate the choice in rural locations where there is no infrastructure competition. Taking into account the inter-platform competition, which is supported by the economics of the networks any partial deregulation on wholesale broadband access market is impossible, and the choice is binary: either deregulate fully or keep regulation alive for the whole territory in order to make the service-based competition sustainable.

What lessons can be learnt from Hungary's case?

First: facility-based broadband competition may develop without or in spite of regulation if there are strong cable networks.

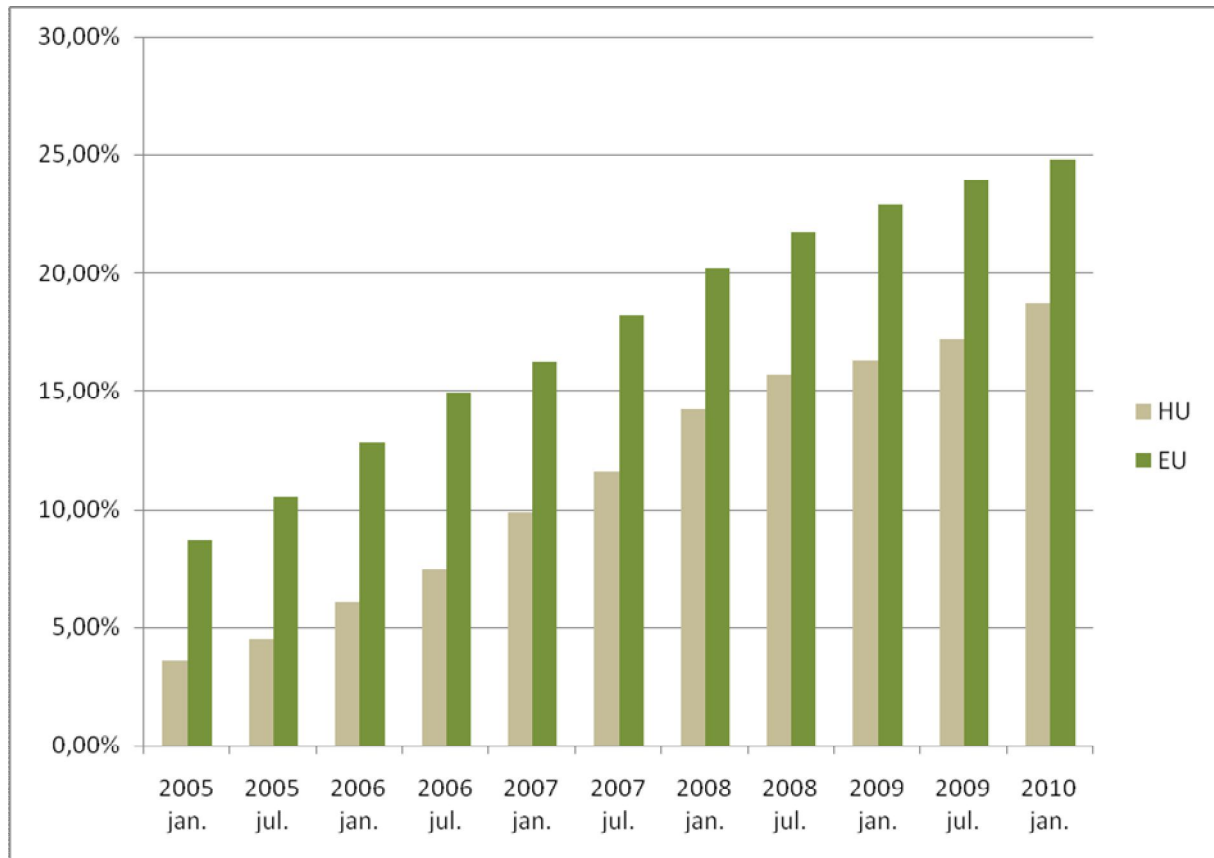
Second: The ladder of investment concept does not help if there is strong inter-platform competition.

Third: One size does not fit all. There are countries different from mainstream, maybe their own way. And clearly it is the case for several of the new EU member states.

Fourth: Regulation needs to be targeted to the problems, and experimenting is better than give uniform but inadequate answers.

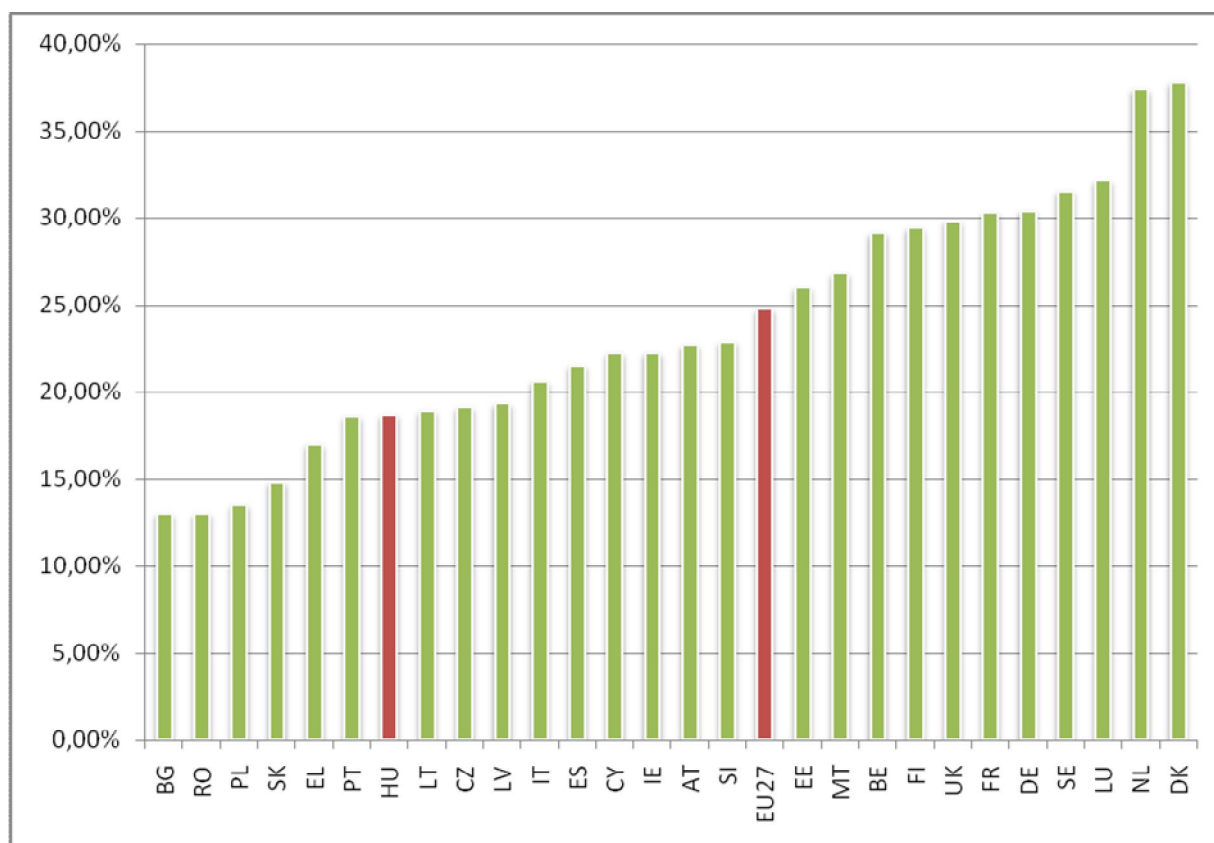
## Hungary compared to the EU – bird's view

Broadband internet subscriptions in percentage of the population is dynamically growing in each EU Member State, with the EU average increasing from 8,7 % to 24,8% in the last five years. The growth in Hungary has been even faster, the broadband penetration in Hungary was 41,4% of the EU average in 2005 increasing to 75,4% in 2010.



Source: European Commission Implementation Reports

Despite this impressive growth the broadband penetration in Hungary is lagging behind the developed Western-European countries. In comparison to the member states of the region it shows relatively good performance. It managed to keep its advantage over Poland and Slovakia, and its lagging behind Slovenia is not increasing significantly. It was only the Czech Republic with a lower index in 2004 that overtook Hungary, although barely.



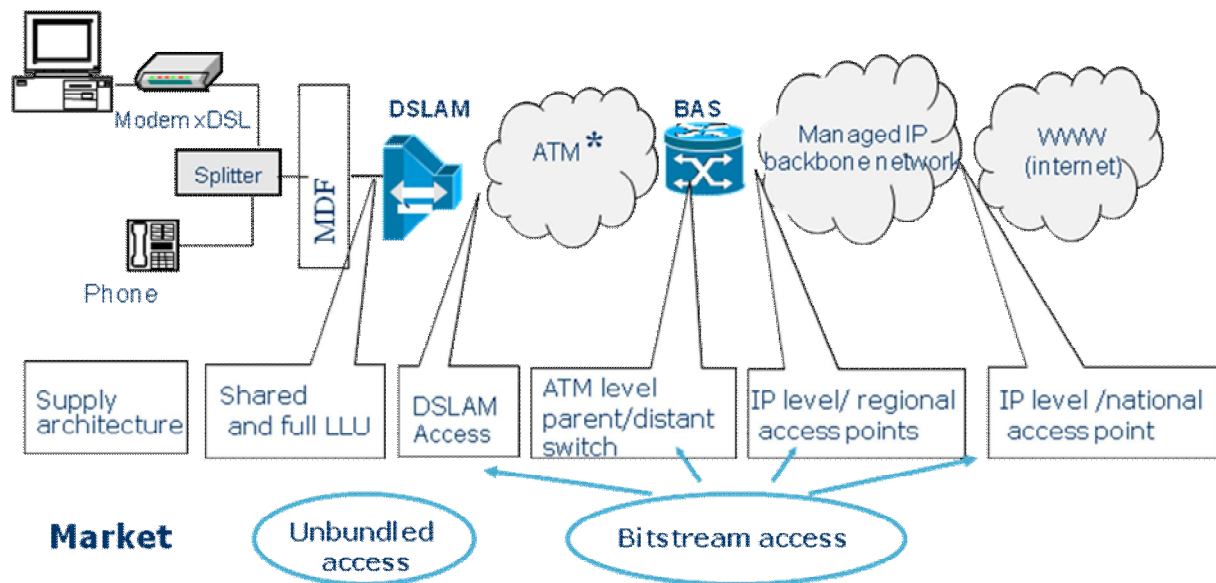
Source: European Commission 15th Implementation Report (Broadband access in the EU: Situation in January 2010)

### **Broadband market regulation in EU member countries – and the ladder of investment concept**

The regulatory approach introduced in EU countries in 2002 did not pay special attention to broadband markets. Based on the principle of technology neutrality, a standard procedure consisting of market definition, identification of SMP and selection of appropriate remedies was foreseen as for the other markets. Because the Commission has not got veto power concerning the remedies this topic was neglected in the Guidelines on market analysis<sup>1</sup> as well.

Compared to this laissez-faire approach the EU member countries gave high priority to the details of broadband market regulation. The European Regulators Group issued two common position papers concerning this topic. In the document on bitstream access they defined a comprehensive system of access products, which they recommended for the regulatory authorities to implement as part of remedies on the broadband market. In the following chart they clearly defined the difference between the shared/full unbundling and different kinds of bitstream access.

<sup>1</sup> (2002/C 165/03)



Source: **ERG (03) 33rev1** Common Position on bitstream access

A breakthrough was made in the Remedies Paper<sup>2</sup> which mentioned as a major principle, that “replication of the incumbent’s infrastructure is viewed as feasible, the available remedies should assist in the transition process to a sustainable competitive market”<sup>3</sup>. In a separate chapter on investment incentives they defined them as tools for ensuring, that “the alternative operators should replicate the incumbent’s infrastructure.”

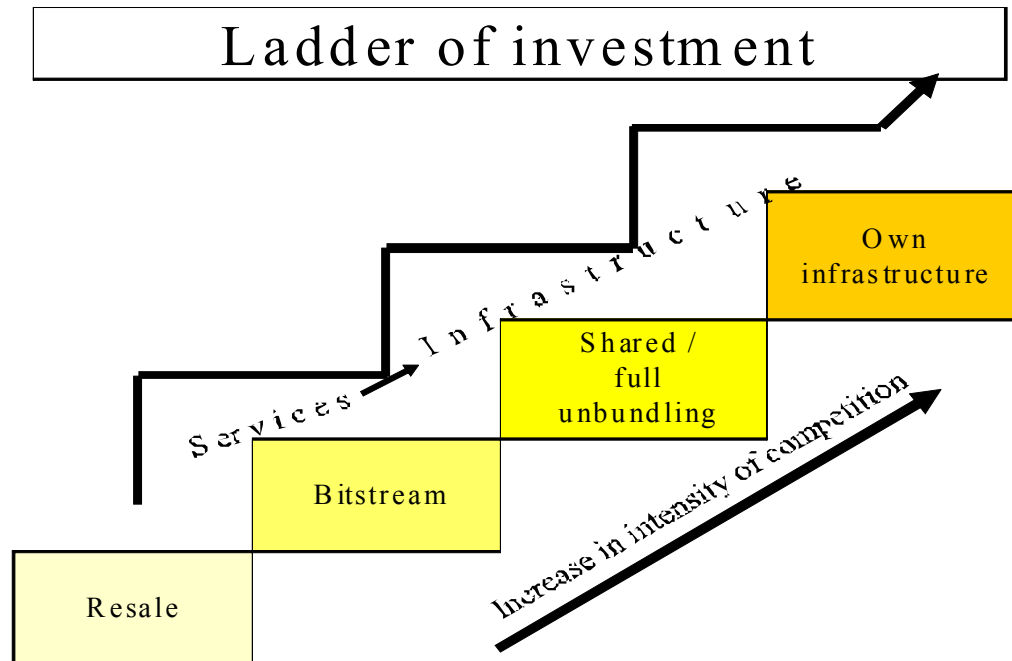
In 2005 ERG has issued a Broadband Market Competition Report<sup>4</sup> which elaborated in detail the investment ladder concept as a comprehensive approach of the group related to the broadband market regulation. This concept assumes that investments are made in a step by step way by new entrants. In order to allow them to gradually invest in their own infrastructure they need a chain of access products to acquire a customer base by offering their own services to end users based on mandated wholesale access. Once, these companies generated enough revenues they will implement their own infrastructure migrating from one access point to another. As a result, they will move closer to the customer, which makes them less dependent of the incumbent’s infrastructure.

Three wholesale products were included in the chain (resale, bitstream, shared/fully unbundled access). It was stated that starting from the initial phase of service competition the market will evolve to a state of infrastructure competition ensuring sustainable competition in the long run.

<sup>2</sup> ERG(03)30 - Common Position on regulatory remedies - 1st Version (published April 2004)

<sup>3</sup> ERG(03)30 p.59

<sup>4</sup> ERG (05) 23



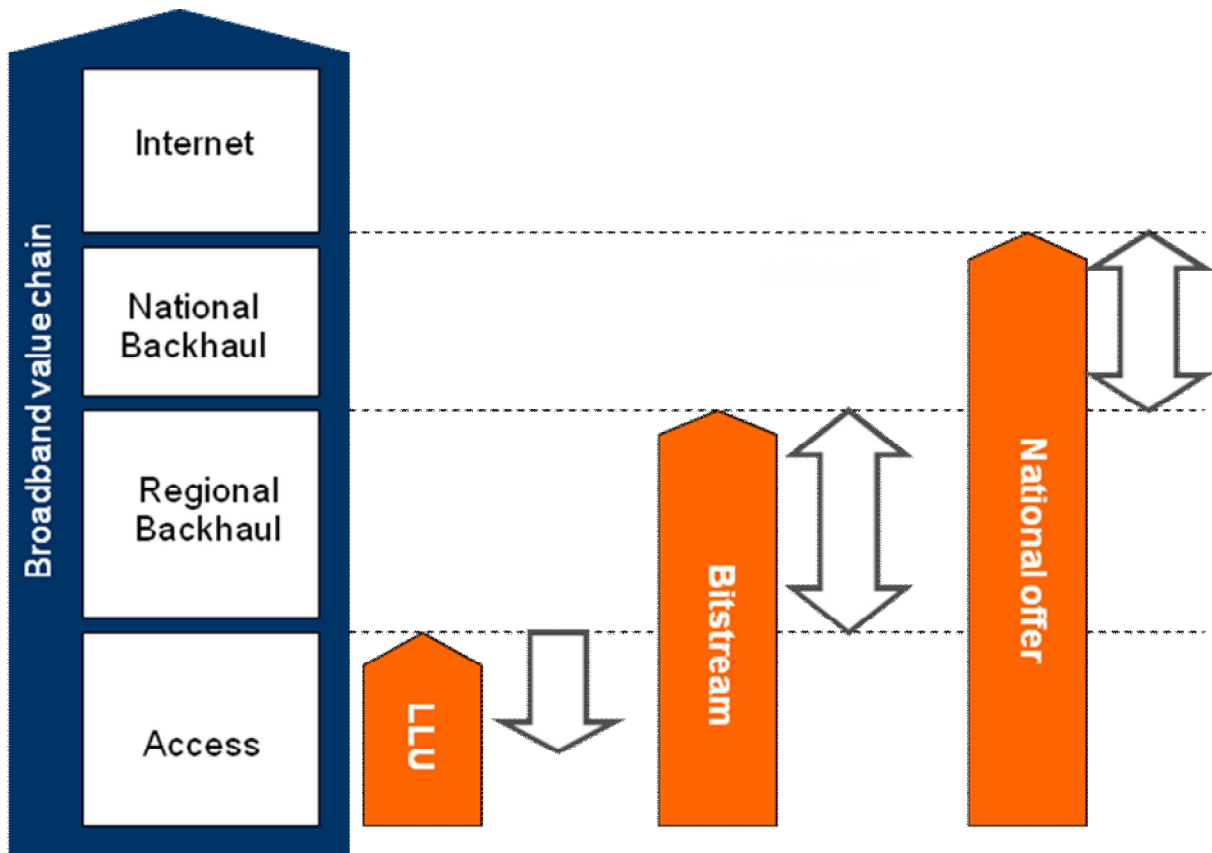
Source: ERG (05) 23 Broadband market competition report p.18

The ERG paper has provided some additional conditions which are needed to make the system effective.

- The regulator has to mandate complementary access products at one time. It seems that rural areas with lower customer concentration can be served by new entrants by nation-wide bitstream only. If the national bitstream is abolished after some time it may be uneconomic for them to offer service only in a patchwork of locations.
- The crucial factor is the availability of proper migration processes. It means, that it is possible for the alternative operator to switch to another access product without having to disconnect his customers.
- The regulators should ensure access products are consistently priced with minimal scope for regulatory arbitrage.

Details of optimal pricing policy were the topic for debate inside ERG. Some experts proposed, that pricing policy should incentive alternative operators to climb the ladder at maximum speed. Based on this argument, they favored dynamic access prices, others criticized this approach as a micro management.

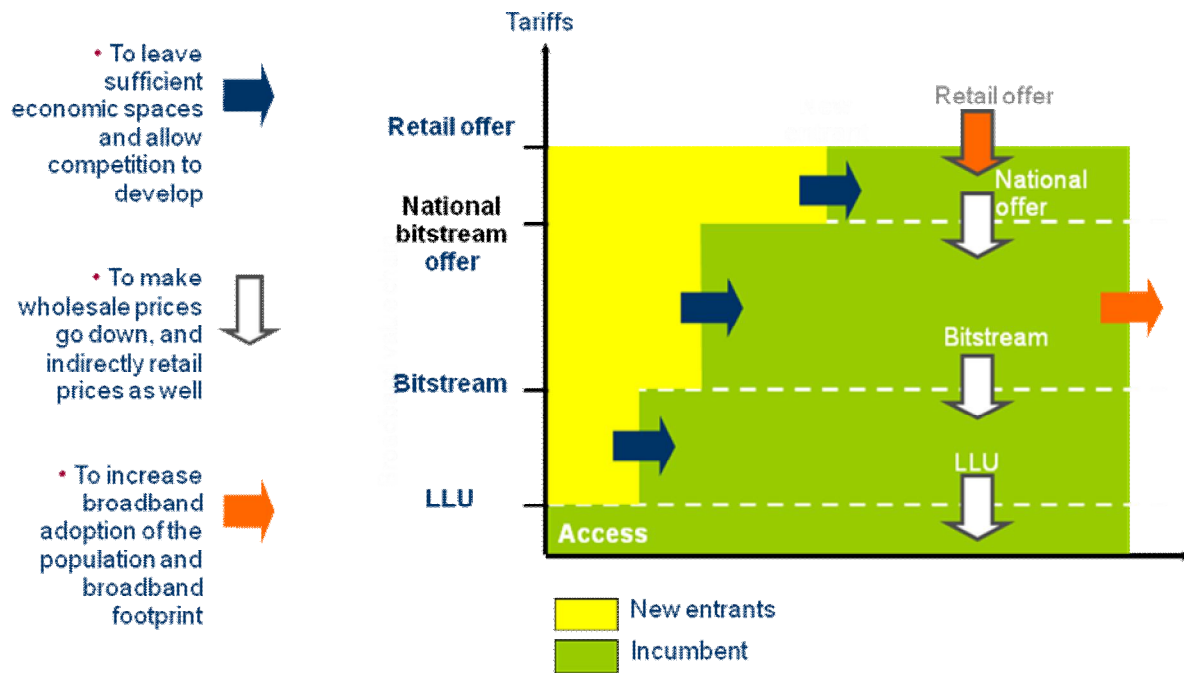
The requirements of access pricing can be summarized in the following chart:



As usual the prices of local loops are based on cost orientation. If it is the case, the differences between them and the bitstream prices (including the national offer) has to leave sufficient economic space for the investments of the alternative operators.

The investment ladder concept seems quite straightforward, but its implementation can be rather complicated in practice. The following chart provides the interpretation of the regulatory objectives base on a presentation by ARCEP the French regulator.





Source: ARCEP presentation

According to Broadband Market Competition Report of ERG “the concept of the ladder of investment is followed explicitly or implicitly by all NRAs” analyzed in the document. “It corresponds to the EU regulatory framework as it encourages efficient investment while promoting competition at the same time.”<sup>5</sup> This overoptimistic assessment was partly overruled by the 2006 version of ERG Remedies Paper, which raised the attention of national regulators to avoid micro-managing competition, picking the winners, choosing the winning technologies, not misunderstand the ladder of investment as a form of industry policy.

Quite interestingly in 2010 two major regulatory documents have once again picked the ladder of investment principle as a basic approach to regulate the broadband markets. The draft Commission Recommendation on regulated access to Next Generation Access Networks says: “The appropriate array of remedies imposed by an NRA should reflect a proportionate application of the ladder of investment principle.” BEREC the successor of ERG has stated in its opinion on the draft recommendation, “BEREC welcome the explicit mention of the continued validity of ladder of investment principle.”

## The current competitive picture of the Hungarian market

### Peculiarities of Hungary compared to EU mainstream

To view the Hungarian picture as a case study it is good to start with the descriptive characteristics of the market. At the first sight it can be realized that it is not a European mainstream. Though the former EU 15 member states are different from many respects, the European average is determined by the market characteristics of the large countries like Germany, France, Italy, and UK. The common characteristics of these market the predominance of DSL and much less significance of cable as a means of providing

<sup>5</sup> ERG (05) 23 p.1.

broadband. There is another characteristically different group of EU15 countries where the cable broadband is very significant, however it is still the second after the DSL. These are middle or smaller size cabled countries like Belgium, The Netherlands, Portugal, Denmark and Austria. In these countries the technology division pattern of broadband is not heavily dominated by DSL, and as a consequence the market development was influenced considerably by inter-platform competitive forces, besides the followed mainstream regulatory policy of DSL access regulation. Hungary is rather similar to the second “strong cable” group but even more extreme in the significance of cable. We can draw the picture from this point.

The table below shows the comparative characteristics of Hungary.

	DSL coverage	DSL rural coverage	DSL penetration	DSL rural penetration	Cable modem coverage	Cable modem rural coverage	Cable modem penetration	Cable modem rural penetration
HU	94,0%	87,0%	8,0%	7,1%	74,0%	60,0%	6,7%	3,7%
EU	92,7%	76,6%	18,0%	12,3%	43,6%	13,8%	3,4%	0,8%
HU rank in EU27	14	11	21	19	6	1	6	4

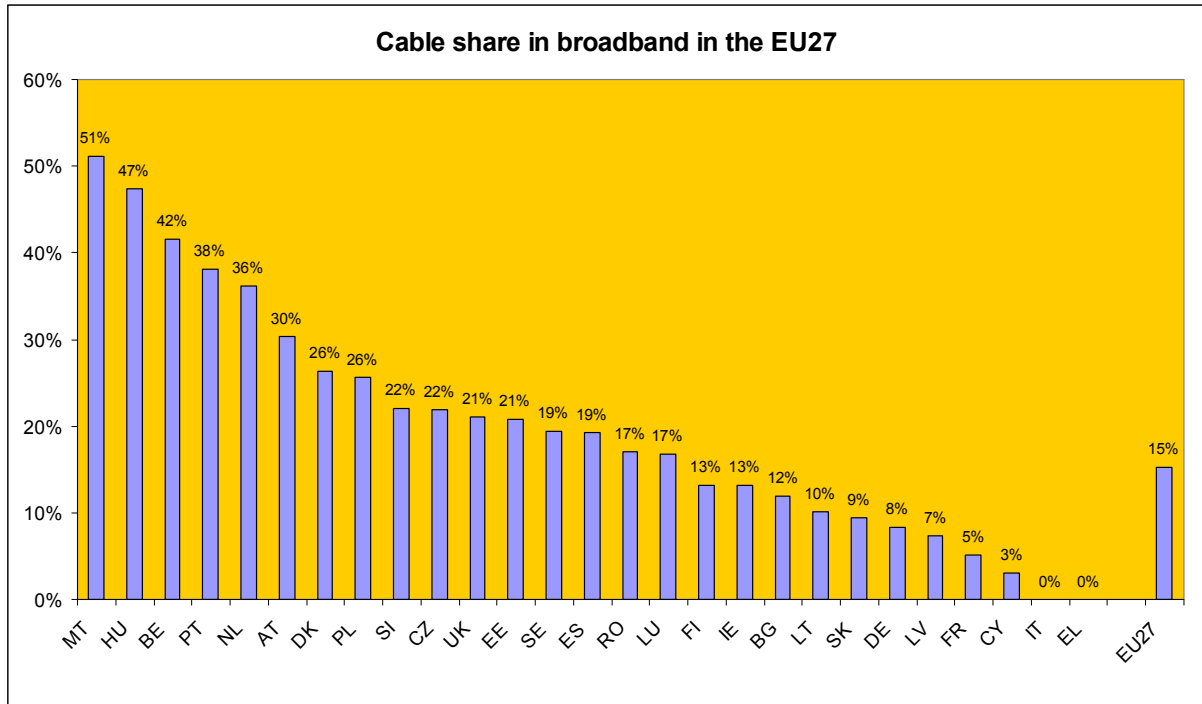
Source: IDATE (2009)

It is striking that counting the availability of the fixed infrastructures, Hungary is better than the average, and what is more it is among the best considering the coverage of cable modem, and not only the first, but clearly an EU outlier if the rural cable modem coverage is considered<sup>6</sup>. As far as the penetration concerned the rank in DSL penetration is not striking, but Hungary is the 6<sup>th</sup> in cable modem penetration and 4<sup>th</sup> after Belgium (11,3%), the Netherlands (6,5%) and Denmark (3,8%).

The high relevance of cable in providing broadband can more significantly be felt if we see the market share of this technology.

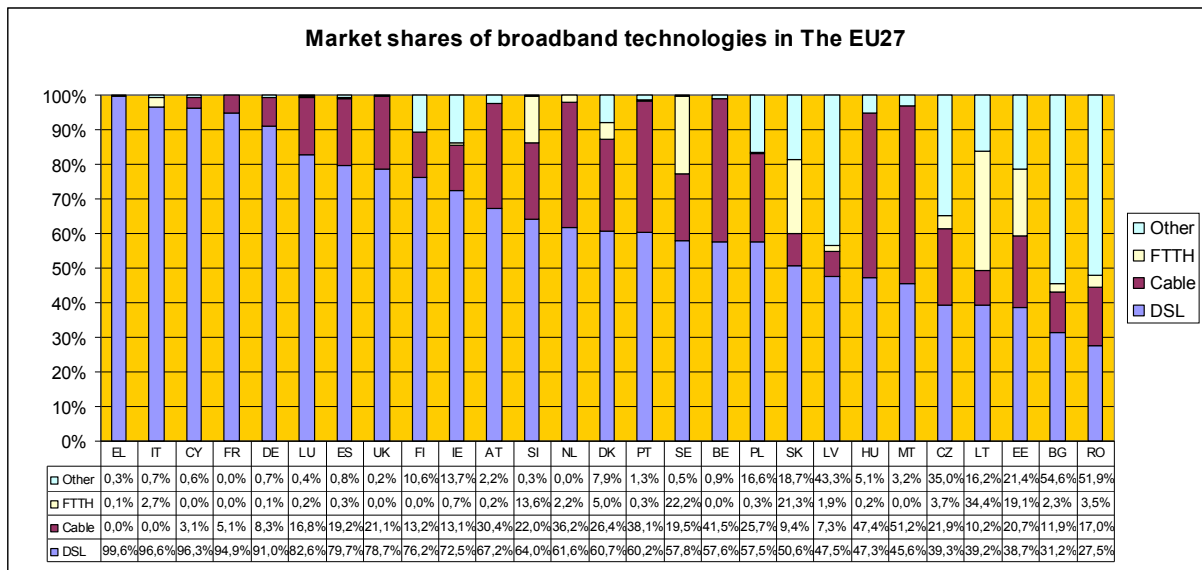
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<sup>6</sup> IDATE (2009).



Source: Cocom 2009 July

In Hungary cable is now the dominant broadband technology. With the 47% market share Hungary is 2nd in the EU (after Malta) and 3rd in the OECD after US and Canada.



Source: Cocom 2009 July

Though the figure above shows that the new member states are rather different from the EU mainstream dominated by DSL, and even from the EU15, this is clear that they differ from EU15 rather on their own ways. It follows that their broadband infrastructure technology mix does not fit to the picture of the market what the Commission considers to regulate.

## **Hungary – devil in the details**

Though the key characteristics of broadband infrastructures are straight the details are more complex. Hungary – though it is a less than middle size country - has 3 DSL incumbents as a heritage of the result of the special interplay between politics, privatisation and the demolition of the telco monopoly in the early nineties. The DSL incumbents were local monopolies before the liberalization in 2002, but differ from each other considerably in size. The 3 DSL incumbent provide broadband for slightly more than 40% of customers. The cable industry is even more fragmented, the largest 4 companies serve 30% of the total broadband customers.

Beside the facility based providers of DSL, cable (or wireless in rural places), there are facility based and service based players using any of the regulated access services in their provision of broadband. While the market share of DSL alternatives re around 10% of the total market, the number of full or shared LLU DSL lines is very limited (around 1,5% of the total), the remaining part is based on bitstream access. This makes Hungary similar to Belgium and Ireland where the LLU has not proven to be a success.

In Hungary 78% of the population lives in a location where there are at least two wireline broadband infrastructures, one is the DSL network of the former local PSTN incumbent, the other is a cable network<sup>7</sup>. Having two parallel broadband networks is common not only in towns but even in many villages. Moreover a significant part of the population which is living in dense urban areas even has a third wireline choice which is provided on another cable type FTTB+LAN broadband network. In these areas it is undeniable that the facility based competition is very intense and it is felt by the consumers.

## **Development of the facility-based broadband competition without the ladder**

In order to understand how this intense facility based competition become normal we should tell shortly the story of the last two decades of the telecom industry history.

The PSTN network was rather underdeveloped (penetration was around 12%) in the beginning of the nineties. After the privatization of the fixed telephony in 1993 and the establishment of one large and some smaller local telephone monopolies in 1994, an intensive network investment and deployment had started. However the start of the development of mobile telephony made a very significant effect on the development of the PSTN. The fixed telephony penetration had never reached the 40%, while the mobile development had kept the pace with the Western European development, with a not more than 2 years lag. As a result the PSTN penetration had never been so high than in the western countries<sup>8</sup>. When the broadband had started in the end of 1999, PSTN network were available for DSL but its voice business development had been seriously cramped by the vigorous and popular mobile telephony. While the fixed telephony was a cash cow, broadband seemed to be the outreach, but the telco incumbents had to develop their DSL business in a competitive environment from the very beginning, because cable TV companies also entered into the broadband field for the additional revenues they hoped from it.

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<sup>7</sup> This does not mean that the two networks exactly overlap, but it is surely a potential and rather a business decision of the companies.

<sup>8</sup> The later a post communist country had started the PSTN development, the more it is the case with the availability of the PSTN infrastructure and the penetration of the fixed telephony.

The build out of the cable TV infrastructure had started in the beginning of the nineties after the collapse of the communist rule. Cable TV had passed all dwellings in the urban areas, and had penetrated even many villages. Cable TV was a popular medium which paid soon back to the network owners for their initial investment. These networks were originally the typical tree structure video distribution networks. With the advent of broadband from the end of nineties the owners started to rebuild their networks in order to get the capability of providing two-way services, predominantly broadband for their cable TV customers. For licensing this rebuilding there were supports available from the Media fund, and later from EU backed infrastructure development projects. Another source of the investment payback was the increased package prices (together with enhancing the service and incorporate more TV channels to the packages). Cable TV had been a very stable and very lucrative local monopoly business from the beginning until the competition reached the video distribution business in 2006. Until then they enjoyed the quiet life of selling TV packages and from 1999 their developing broadband business.

Broadband development was fast and because of late start of the development Hungary almost leapfrogged the narrowband age. Moreover broadband developed in a competitive setting from the very beginning. The regulator obliged the incumbents to offer bitstream access for service based competitors since 2000. So till the second half of the first decade of the XXI century the broadband was competitive, mostly facility-based and available in almost everywhere except the sparsely populated rural areas. The big broadband players were Magyar Telekom (The subsidiary of the Deutsche Telekom), UPC, Invitel (a private equity owned local telephony incumbent), and many middle or small cable companies and some DSL alternatives, mostly service-based. There were investments in networks, facility-based competition had emerged but not in the way imagined by any of the regulators, be it as the Commission, ERG, or even the National Communication Authority. There was little help from the ladder.

### **The market can become even hotter – too much infrastructure competition?**

If the achieved level of facility-based competition would have been judged less than enough, surprisingly the rivalry become even stronger. A new development phase of broadband competition started in Hungary in 2008 when a cable and satellite TV operator had launched an extensive campaign to build new broadband capable video distribution networks in dense urban areas in many large cities, and part of the country capital Budapest. The company came to the market with a new business model and new technology. But the story has started a little bit earlier and on another market...

In 2006 Digi, a Romanian based cable and satellite company entered the attractive video distribution market and bombarded the countryside with a new satellite TV offer, which was rather cheap and not the highest quality but very attractive for this price<sup>9</sup>. Digi's offer proved to be an incredible success. Prices were plummeted Satellite TV penetration had more than doubled in 2 years, and multichannel TV became available even for the poor and those who live afar. As a consequence this change in the video distribution market had not left the cable market untouched. The success of the satellite TV endangered the comfortable position of the cable companies which were well established then and enjoyed the quiet life on their subscription revenue stream. Having been attacked, they had to answer to this challenge with decreasing subscription fees for their core product and looking for new revenue sources.

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<sup>9</sup> Until then UPC Direct was the only satellite offer available for Hungarian speaking audience. UPC were then the largest cable TV provider, so the satellite prices were positioned well above of its cable TV offer.

Broadband as a source of new revenues was promising, and voice as well. They had been on this road anyway; however it seemed to be reasonable to gear up to gain an even better position in the competition for customers. Technology development helped them very much. Implementing Eurodocsis 2.0 promised to be a good investment granting at least to keep the pace with the incumbent telcos and the DSL alternatives hanging around them. Inter-platform infrastructure competition had been on since the start of broadband however in its early extensive development phase it was not extremely fierce.

But Digi spoilt again the soup with a new move. It came and hit again. It had invaded the dense urban areas with its new wireline video distribution and broadband infrastructure development projects, even if there was already a DSL and cable “incumbent” there. Moreover it had arrived again with a very attractive offer, similar to what it used in the satellite TV earlier. It was focusing rather on price than on quality. It offered a good TV subscription package on low price which seemed to be well enough attractive to price-sensitive customers. Broadband was also an option along with cable TV or as a single service. Of course voice also was the optional element of the package deal. Digi has been deploying an FTTB network which ends in the basement of the multi-apartment buildings and uses coaxial cable for cable TV and UTP-LAN for internet connections<sup>10</sup>.

This aggressive entry posed a challenge to the incumbent telco and cable companies, and they had no other option than fight. As a consequence the competition in these markets has intensified considerably. Throughout the country in many dense urban areas having 3 wireline competitors is rather a common phenomenon by now. The choice for customers has widened considerably and prices have been decreasing. Though the incumbents have tried to answer this competitive challenge locally, these indirect consequences of the intensified competition had appeared on other geographical markets as a spill over effect. Behind this phenomenon we find part of the explanation in the fragmentation of the players. Telco incumbents have large coherent territories so their network is not scattered or fragmented. Cable networks were built locally, and even after some consolidation, cable companies have no coherent networks but at best networks in different towns and nearby villages. Moreover the Magyar Telekom also has cable networks, mostly in other telco incumbents’ territories. As a consequence a very colourful picture shows who competes against whom in each territory. Though the fragmentation may be a loss from the point of exploiting the scale, density and the coherence of the network, but seems producing very favourable result to consumers, because it helps to spread out the benefits of competition. Because of the size of Hungary for a company it is not reasonable to make audio-visual media advertisements locally, general marketing campaigns require a national scale. So the image, the features of the packages, and prices are advertised nationally. So the competitive benefits spill over to other territories, even if there are localized answers to the local competitive challenges. Companies try to compete locally with targeted discounts.

### **Strategy options for the players – challenges and opportunities**

The most important result of the strengthened competition by new facility based entry that the cable companies have been pushed forward to keep the pace by upgrading their networks to Eurodocsis 3.0. This is not only a must have but a clear middle term competitive advantage of cable over the telecom incumbents. Eurodocsis 3.0, though it uses a shared medium, can offer faster individual internet connection than DSL. Moreover it goes well with a cable TV

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<sup>10</sup> This was new in Hungary but Digi and other companies used this technology in Romania, and FTTB+LAN networks are very common in Asia.

package, so for the TV and internet traffic there is no need to share the same overall bandwidth. The Eurodocsis upgrade is a not very investment intensive move, and combining this with further segmentation makes the cable capacity increase manageable gradually.

Living on DSL does not seem promising and future proof for incumbent DSL companies in such context. It is also the case for the few alternative ISPs who uses the incumbent telco's regulated access products. The problem with DSL is its limited capacity and sensitivity to distance, and line quality. In Hungary both set severe limits. But the most critical is that with DSL they are simply not able to provide what the customers need.

Many customers want multiplay packages. In the end of 2009 25% of the households subscribed to three services (namely broadband, internet and pay TV) and two-thirds of them subscribed to double- or triple-play packages. Multichannel television is very important for selling packages with broadband, more important than telephony (which has slept back to an add-on position).

VDSL is good for IPTV but it requires rather short loops and good line quality. In Hungary neither is the case, so VDSL is not an option. If the telco cannot become a cable as a result of a magic enchantment, fibre is the only chance to win back the dominant position and overcome the upgraded HFC networks with speed and quality. The largest incumbent telecom company Magyar Telekom had to change its strategy toward starting to deploy FTTH and opting for GPON especially in the case of green field development projects. But the fibre deployment is very expensive and only gives a chance of pay back in reasonable time in places where the subscriber density is eligible. As we know from studies, fibre deployment is very sensitive to the population density, available penetration and revenue opportunities<sup>11</sup>. Deployments are very sensitive to risks. Telcos are cautious and would rather wait with the investment. But what to do in a competitive situation where the demand side developments pose the Hamletian question for the incumbent telcos: To be or not to be? Invest or Extinct?

To make the situation more complex and the judgements more complicating, that since 2007 mobile broadband has started to penetrate the market and produced significant growth. Though the speed, stability and the reliability of the mobile broadband makes it a less than perfect substitute, for those who want to have a normal broadband session but not an IPTV it can be a good choice. However according to empirical studies mobile broadband is not an economic substitute now on the Hungarian market<sup>12</sup>, though it can be in the future.

The description of the market situation shows that:

- vigorous inter-platform facility-based competition exists in a large part of the country
- the fragmentation of the market makes the geographic market analysis rather difficult
- cable is a more advantageous position in the competition
- DSL technology is an underdog position
- Fibre deployment is in very early phase and moreover it is a very expensive investment and very vulnerable to the changing market and regulatory conditions

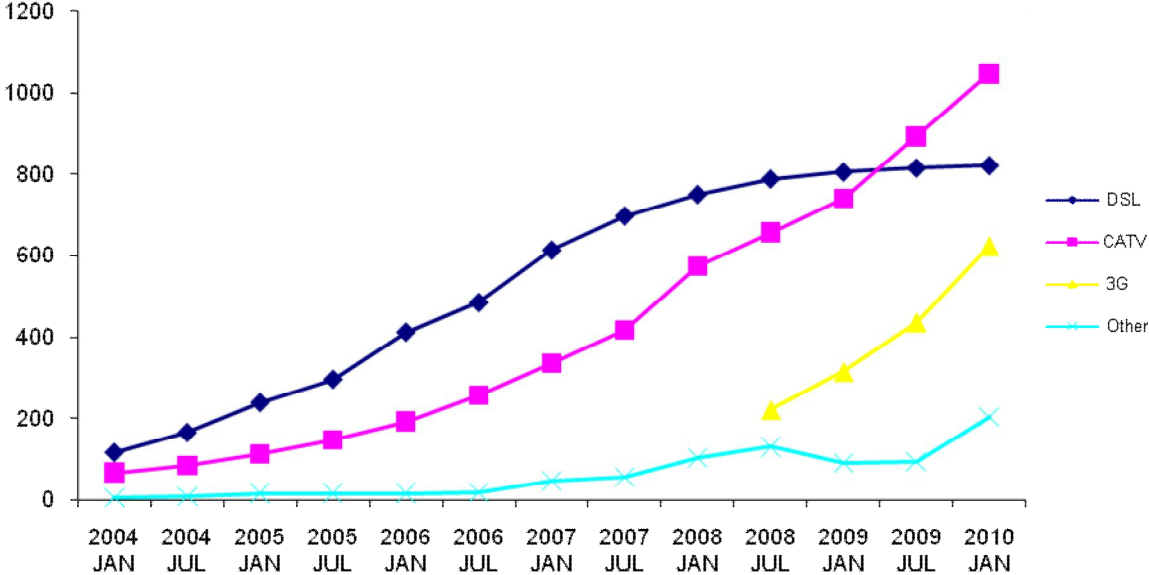
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<sup>11</sup> Analysys, WIK

<sup>12</sup> A study made by Infrapont Ltd. in the end of 2008, and another study prepared by the Hungarian competition office for investigating a merger on the broadband market in 2009 came to the conclusion that the demand substitution effect is less than the critical level.

The above tendencies are summarized in the form of time-series can be seen the following chart:

**Broadband Subscriptions 2004-2010**



The regulator who is in charge with policing the market and analyzing it regularly and intervene if the market is not functioning well according to its forward looking evaluation, encounters the dilemma of what to do in such a complex situation.

**What regulator can/should do?**

**Evaluation of the previous regulatory measures**

Hungary was the first among the new EU member countries implementing the new EU Regulatory Framework. The National Regulatory Authority have completed the first round of market analysis procedures for the broadband markets in 2005, introduced several new remedies like the Retail Minus (RM) pricing for national bitstream services, and worked hard to correct the problems with the details of LLU Reference Offers. Unfortunately the market impacts of these measures were less positive than the expectations. See the following table as a summary of the regulator’s analysis:



YEAR	MEASURE	MARKET IMPACT
2000	Mandatory wholesale ADSL offer	Significant
2002	Mandatory reference LLU offer	None
2004	Mandatory local bit stream access	None
2004	Decrease of full & shared ULL access prices based on updated costing methodology	Negligible
2005	Introduction of retail minus prices for wholesale broadband access	Significant
2008	Further decrease of full & shared ULL access prices including collocation services	Negligible

As you can see, the introduction of national bitstream services in 2000 and the imposition of a pricing mechanism on it were both quite successful. To allow an easy market entry for the alternative operators fully corresponds to the principle of investment ladder. The application of RM pricing methodology also followed the ERG best practice.

On the contrary to any efforts to improve the conditions of LLU offers and of the local and regional bitstream access has not produced substantial results. In 2008 the Authority conducted an impact assessment project; using questionnaires and interview and tried to explore the reasons behind this failure. It turned out, that the alternative DSL operators were simply not competitive compared to the CATV operators. As a result of the fierce facility-based competition the retail prices of broadband services were among the cheapest in the EU. The alternative DSL operators could survive using the guaranteed margin provided by the RM pricing of national bitstream offers, but they have not got enough revenues to climb up the ladder. The reduction of the LLU prices did not offer any relief, because using cost-based pricing the regulatory options were strictly limited.

The Broadband Market Competition Report of ERG from 2005 says: “In some countries with high shares of alternative infrastructures – mainly cable – the broadband market as a whole is driven by the DSL part based on access regulation, which causes an increase in DSL which then pulls the cable part of the broadband market. Thus inter-modal competition is a result of the dynamic of the intra-modal competition in the DSL part based on regulated access rather than the cause of a competitive broadband market. Good examples of this positive interaction are Belgium and the Netherlands.”<sup>13</sup> The Hungarian experience clearly contradicts this assessment. Maybe some special factors took part in the development of the present market structure. As we have mentioned earlier, the CATV have got substantial government subsidies to upgrade their networks and also they could cross-subsidize their broadband services from the unregulated pay TV business. These and the favourable technology features and the development of the cable modem technology gave them an advantage compared to the ADSL operators

<sup>13</sup> ERG (05) 23 p.19.

The reasons are not quite clear, but there are some consequences for the future regulation of broadband markets. It seems, that because of facility based competition the investment ladder concept does not work in Hungary. There is no hope, that the alternative DSL operators will increase their investments into network infrastructure. We see much more chance in promoting co-investments projects, where DSL and CATV can share access to physical infrastructure.

### **How much competition is enough?**

The Hungarian market experience demonstrates that competition has intensified in the last years, however as we show it not really as a consequence of the applied regulations. Moreover this competition is in vain seems workable, because it is competition between infrastructures and technological platforms. This can be a guarantee of the workability of dynamic competitive forces in the in the foreseeable future. However the picture is more complex because the competition is present and alive in urban locations and less intense or missing in rural ones. In a few villages even there is no broadband at all.

For the regulator a question remains to be answered: what kind of competition considered sustainable and effective? The competition we have now is enough?

In order to answer the question, we need to define the relevant market in the commodity and geographic space either, then in the ideal case we can study the adequate structural, performance and behavioural indicators which can be measured and evaluated toward some benchmarks.

It is the obvious structural characteristics of the local broadband markets that they are oligopolistic ones. Competition in oligopoly markets usually considered less effective by some welfare standard based on economic theories and characterized by the presence of market power. However the situation is not as straightforward as it seems. Though in many theoretical and practical cases the oligopoly markets really a detriment to the competition, it is not always be the case. If the real characteristics of the market force the players to compete fiercely, and the result of this competition is not foreseeable, unlike the pure worlds of classic oligopoly models, there is no way to no the best response in advance.

In the last years some economists shown that typical conditions of the telecom market, where there are at least two competitors with their own independent infrastructures, are against of any kind of individual market power and collusion, therefore favor competition<sup>14</sup>. The only requirement is to have excess capacity in the networks and a considerable overlap between them. We can add to it that the importance of innovation, and continuously high level of investment in these markets and the heterogeneity of technologies makes the argument even more convincing. Let us see the details of the reasoning more closely. The key point is about the nonexistence or considerably lower level of market power as a consequence of the prevalent economies of scale and scope.

The economies of scale and scope and vertical integration are well-known characteristics of network industries and therefore the telecom industry. The economy of scale is the consequence of large investment into the network which makes the high fixed cost and the low marginal cost of services. Therefore especially in competitive situations large relative

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<sup>14</sup> See for example Crandall, Kahn, Tardiff, Weisman

margins are not infallible indicators of market power, or at least indicate not as high market power as it seems for the first sight. High price-cost margin is the consequence of high fixed cost. For investors it is a requirement that this investment should pay back in a reasonable period. The viability of the business requires a margin level high enough to make return on this investment, which pushes the price well above the marginal cost, without market power. If there is at least one competitor, the revenue loss exercised by losing a customer is higher than the avoidable cost, so the result is not neutral. The company loses the available revenue from the leaving customer and also spares the marginal cost, but really loses the price-cost margin which financed the allocated part of the fixed cost. As a result the price, in spite of the large price-cost margin, is constrained by the market, and no economic profit emerges.

If there are multiple services provided to the same customer, in case if it is leaving the company the loss must be higher since the revenue from other services is being lost either. That is why the Lerner index, the usual market power measure is distorted upward in case of complements. The high price-cost margin in the presence of large fixed costs therefore not a sound indicator of real market power. If there is no market power then the competition is effective<sup>15</sup>.

The other issue which should also be considered is the very dynamic nature of these markets and the importance and high level of innovation. Technology platform competition and innovation in Schumpeterian sense are the normal characteristics of the current situation. This situation combined with the ability to steal the market, does not favor the laziness, or any form of collusion behavior. Though the cost of R&D is expected to return through the prices, the dynamic nature of competition makes higher than competitive return very temporary and makes it difficult to gain back all costs of innovation with great certainty. As a consequence again, higher margin cannot be interpreted surely as an indicator of market power. Market dynamism leaves less space to take advantage on customers. The current cable telco network competition is highly characterized by this dynamic rivalry of innovations, technology and business as well.

A further supportive argument about that the inter-platform competition can provide satisfactory result in broadband development, the empirical studies prepared in the last years. Though these results show the unambiguous positive effect of the inter-platform competition on broadband penetration, the inter-platform competition proved minor, insignificant or even negative<sup>16</sup>.

### **Dilemmas related to the future regulation**

As we see it, the Hungarian broadband market is at present in a transitional phase. A new challenge is the mobile broadband, although these services are in an early phase of development. In 2-3 years time the mobile broadband networks will cover 90-95% of Hungary's territory. The network operators have plans to upgrade the average bandwidth to 2-3 times of the present capacity. At that time the consumer will have choice to select between 4-5 alternative facility-based broadband service providers (there are three mobile networks in the country).

This will be the future, though at the moment the mobile broadband is still not a substitute for the fixed broadband services. Based on three consumer surveys implemented in late 2008 and

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<sup>15</sup> See guideline on market analysis...

<sup>16</sup> See Distaso et al., Denni and Gruber, Frideriszick et al., Höffler, Bouckaert et al., Hausman and Sidak, Aron and Crandall.

2009, the majority of the Hungarian consumers find mobile broadband as a complementary service compared to fixed. The largest incumbent telco dominating, both fix and mobile markets is also interested to position the above services as complementary. They offer bundles including both fix and mobile broadband services; while their major competitors the pure mobile network operators are not in the position to replicate them without access to wholesale broadband services.

The regulator is facing a strategic dilemma. In spite of the favourable competitive conditions, in the coming 2-3 years it is too risky to deregulate the market. The reasons are quite clear. Although strictly following the EU regulatory framework there is opportunity to define geographic markets, separating the densely populated urban areas from the remote rural areas. In the urban areas where competition exists there is the option to terminate the obligation of the former SMP operator to provide national bitstream service to alternative operators<sup>17</sup>, but this move can lead to the collapse of these companies, and eliminate the choice in rural locations where there is no infrastructure competition. As we have mentioned introducing the investment ladder concept the patchwork of locations cannot support sustainable businesses. Though the alternative DSL operators serve only 10% of broadband customers, but their exit might have a negative impact on the market. A conjecture comes to the fore: in the presence of inter-platform competition where it is supported by the economics of the networks any partial deregulation on wholesale broadband access market is impossible, and the choice is binary: either deregulate fully or keep regulation alive for the whole territory in order to make the service-based competition sustainable.

What lessons can be learnt from Hungary's case?

First: facility-based broadband competition may develop without or in spite of regulation if there are strong cable networks.

Second: The ladder of investment concept does not help if there is strong inter-platform competition.

Third: One size does not fit all. There are countries different from mainstream, maybe their own way. And clearly it is the case for several of the new EU member states.

Fourth: Regulation needs to be targeted to the problems, and experimenting is better than give uniform but inadequate answers.

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<sup>17</sup> On the wholesale broadband access market

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