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1. Introduction

The report is called degree of competition and major barriers for market entry. As the degree of competition will be handled in report A where an overview of the market is presented, we will concentrate in this report on major barriers to market entry.

Based on our findings in the different market segments we present in this report an overview of barriers to entry. We have determined the elements that may constitute a barrier to entry. Much has been written about what constitutes barriers to entry and there are diverging opinions how these should be assessed. The purpose of this report is not a to give a theoretical overview of competition measurement and elements of that as barriers to market entry. It is important to note that according to Recommendation 2007/879/EC ex ante regulation can only be imposed on markets outside the 7 markets mentioned in this recommendation if these markets pass the 3 criteria test. The first of these three criteria is the existence of barriers for market entry.

In this report we will not focus of any of the markets as defined in the EU recommendations but concentrate on the provisioning of broadband services as the project was asked to do. Therefore our definition of market is broad it is taken in the sense of technology independent broadband provisioning, where necessary we will of course make distinctions as not all technologies can offer the same services.

In this report we propose a pragmatic approach where we follow the way forward as presented by the UK Office for Fair Trading in 1994 and amended by Kim and Lee for the telecommunications market in 2005. The approach is that 8 questions have to be investigated. In this report these questions are discussed, the situation in the Croatian telecommunications market is presented and conclusions are drawn for each of these questions.

The questions that have to be answered are:

1. The establishment of market boundary and production substitutability;
2. Market conditions and the record of entry and exit;
3. Absolute (cost) advantage of the incumbents;
4. Sunk cost, economies of scale and capital requirements;
5. Product differentiation, advertising, switching cost, and network externalities;
6. Vertical foreclosure and exclusion;
7. Predatory behaviour;
8. Entry impediments such as certification requirements and
9. Required time to build up brand name.

This report cannot be exhaustive. Many of the issues mentioned deserve further in depth analysis. With this overview we provide an introduction to the subject that can be further developed where necessary.

2. The existence of barriers to market entry

As indicated, the market should be understood as the provisioning of broadband services. In the following we will follow the questions from Park¹. We will formulate the main questions to be answered and try to do this for the Croatian market. This must be done briefly and could

¹ Park, E. "Explicating Barriers to Entry in the Telecommunications Industry" Paper presented at the annual meeting of the International Communication Association, TBA, San Francisco, CA Online http://www.allacademic.com/meta/p171776_index.html

be expanded further if wished. Nevertheless this approach a systematic introduction to the subject.

2.1. The establishment of market boundary and production substitutability

2.1.1. The questions

The main question is:

1. Is there competition from existing rivals and/or from potential new entrants?

This question can be further subdivided into the following:

2. Are there potential suppliers that could easily switch to provision broadband services?
3. Is a similar technology used in other markets already?
4. Are there other distribution networks that could be used to provide the service?
5. Are the services produced in other areas
6. How has the market developed in response to price increases?
7. Is there idle capacity?
8. Are there large buyers that could easily supply themselves?
9. Are there vertically integrated firms that could increase their production in order to serve the open market?

2.1.2. The situation in Croatia

We will first look at the subdivided questions before answering the main question.

Question 2

Are there potential suppliers that could easily switch to provision broadband services?

In Croatia there are a few of these potential suppliers, the first are the mobile telephony service providers, they are already switching to 3G services which means that a basis form of broadband can be obtained through them.

There are several other firms that could use their present infrastructure to offer broadband wholesale services like the national railways, the highway authority and the petrol pipeline company. They cannot offer retail services, at least not easily and not without much investment, but they can offer interesting long distance connections, also to neighbouring countries.

Lastly there are satellite operators that could and indeed can offer broadband services as well. It must be noted however that these switch to broadband is not feasible all over the country, especially in rural areas. Only satellite services and to a lesser extend 3G have no limitation in this respect

Answer to question 2

Yes, there are potential suppliers that could easily switch to broadband but not to broadband everywhere.

Question 3

Is a similar production technology used in other markets already?

There is no straightforward answer to this question. But there are examples where the answer is yes. For providing mobile broadband much of the technology and infrastructure used for mobile telephony can be used to provide mobile broadband. The WiFi technology that is used to set up wireless offices in the home environment can also be used in hotspots

open to the public. The fixed line ADSL broadband service uses the same telephony line that is used for voice.

Answer to question 3

Yes, there are alternative production technologies that could be used for broadband. Many are already doing that, but the service cannot be ubiquitous.

Question 4

Are there other distribution networks that could be used to provide the service?

Apart from the small band distribution networks that exist there are no readily available distribution networks, with the notable exemption of satellite, but this is and will probably remain of marginal importance.

Answer to question 4

No there are not readily available other distribution networks.

Question 5

Are the services produced in other areas

This question is not relevant as the services must by nature be produced in the country with infrastructures built for this. Import is not an option.

Answer to question 5

Yes, but the question is irrelevant for service provision in Croatia.

Question 6

How has the market developed in response to price increases?

This question cannot be answered as there have been no price increases of broadband services in the past. On the contrary prices have come down more or less gradually.

Answer to question 6

No answer can be given

Question 7

Is there idle capacity?

This question cannot be answered in a general way. In principle, when an infrastructure is built there is always idle capacity.

At the same time however, there are limitations in the crucial fixed network connections. This is true in rural areas where the length of the lines may be too long and in the cities as well when there is no duct space available and when the number of copper pairs in a multi line cable that can be used for ADSL is limited.

Answer to question 7

No clear answer can be given

Question 8

Are there large buyers that could easily supply themselves?

There could be some, for instance the big banks and the government. Both have no policy of doing that. The exception is Carnet, the Internet, especially broadband provider for the educational sector. For competition to develop healthy it is important that Carnet restricts itself to the educational sector.

Answer to question 8

Yes, there is one. There are no others foreseen to enter this market.

Question 9

Are there vertically integrated firms that could increase their production in order to serve the open market?

Yes there is. Carnet would easily be capable of extending its services outside the educational area, but is prohibited from doing so. The implementation of this prohibition needs continuous attention from the regulator as the borderline between open commercial service and service to a closed user group is not always clear.

Answer to question 9

In principle the answer is yes, but in practice it is no under the condition that HAKOM actively surveys the market.

After having treated the sub questions we go back to the main question:

Question 1

Is there competition from existing rivals and/or from potential new entrants.

There is competition in all areas, in the fixed network there are alternative providers of ADSL broadband services, in the mobile network there are three competitors that are delivering or plan to deliver 3G services. Wimax services are being introduced and compete with fixed ADSL.

Nevertheless the actual situation is not as clear as this description would suggest. The competition in the fixed network is limited to urban areas and the mobile offers much lower speeds. Satellite is not perceived as a viable alternative in many instances.

2.1.3. Conclusion

This first test gives no clear indication of the presence or absence of barriers to entry. In some case there are no barriers to entry as mobile (3G) services will be able to deliver broadband almost everywhere in the country, but this service provision is expensive and offers relatively low bandwidth.

On the long term however when the evolution to higher speed mobile data (4G, or LTE) is further developed and costs will come down, mobile technologies might well be able to overcome any other barriers to entry. At the same timescale however it must be expected that optical fibre to the home becomes widespread, if that is the case it may surpass mobile in bandwidth capabilities and mobile might not be a viable alternative in all cases. Thereby again a barrier for entry for very high bandwidth could become evident.

Satellite is the only technology that at this time can deliver services all over the country, but as its significance in the market is limited because of costs and performance, its presence alone does not take away any barrier to market entry.

Wimax technologies are being introduced in the Croatian market, they could develop into a ubiquitous service in many relevant areas. If this is the case this development could take away barriers for entry in many cases but for the time being it can only play a supplementary role.

2.2. Market conditions and the record of entry and exit

2.2.1. The questions

1. What has been the recent history of market entry and exit, large scale entry or small scale entry
2. What has been the recent trend in profitability
3. Has the market entry had effect in limiting the effect of market power?
4. Have market conditions changed recently?

2.2.2. The situation in Croatia

Question 1

What has been the recent history of market entry and exit, large scale entry or small scale entry?

Here we must make a distinction between fixed markets, mobile markets and fixed wireless access.

In the fixed market our analysis has shown the following market shares for HT, ISKON, Optima and others base on ADSL subscribers: 89%, 3%,6% and 1%. As ISKON is a fully owned subsidiary of HT its market share should be added to that of HT, leaving 7% market share for ADSL subscriber based. When looking at revenues from these subscribers the market share of the non-HT group is only 3%. Optima started operation 4 years ago and although by itself it cannot be called a small company, it is quoted at the Zagreb stock exchange, its scale is small compared to that of HT. This is even more so for the other new entrants in the market. The conclusion is that for the fixed market there are small scale entrants only.

For the mobile market segment the situation is different, all the three operators offer UMTS services. By itself the number of UMTS customers does not have much significance as these customers may use their UMTS connection for simple calling. The market shares of the two main mobile operators have not changed dramatically during the last years since the third one, Tele2, entered the market. The market share of Tele2, now about 8% was gained mostly at the cost of VIP. Entrance in this market is only possible at large scale, this is apart from the regulatory regime due to large economies of scale that exist in mobile networks. The effect of mobile broadband offerings to other broadband offerings cannot be established. At the time there does not seem to be any influence of significance.

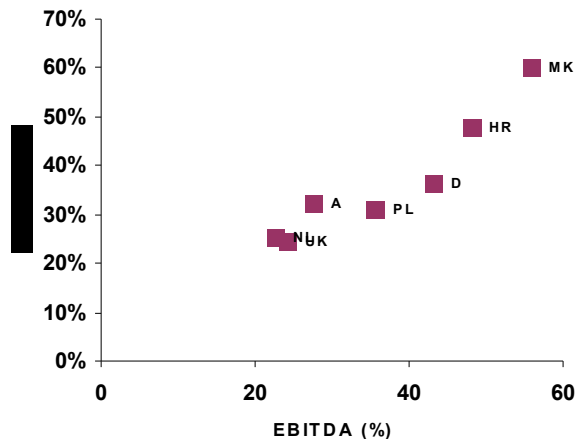
The fixed mobile access, mostly using Wimax is just starting up. The effect of this technology on existing offerings cannot be established. For the time being it is plays the role of ADSL where this is not available or it replaces it in other areas and then it must compete on price as it offers no better service grade except when it is built into mobile computers where it competes with UMTS.

Question 2

What has been the recent trend in profitability

Looking at fixed broadband, from the data we have it is not possible to say if HT makes any profit on broadband Internet provision. This is because the cost data we have cannot be allocated to a specific service. We only note that the alternative operators from which we have data are all loss making. This may be due to the fact that they are all relatively new and that they need time to become profitable. It may also be that their scale of operation makes it difficult to become profitable in reasonable time as quite some investment is needed over many years in order to build the network.

When looking at mobile, it is impossible at this early stage of development of mobile



broadband what part of the income is related to broadband offerings. The two big mobile operators are profitable while the newcomer Tele2 is loss making. Apart from the obvious barrier in the form of licenses to use frequencies there is a clear indication that scale in a market is directly related to profitability. To illustrate this we have made the following graph, depicting the market share of subsidiaries of T-Mobile in several countries together with the EBITDA realised in that country. There is a remarkable high correlation between market share and EBITDA. This shows

that, at least for mobile operators that are run like T-Mobile subsidiaries a minimum market share of about 12% is necessary to have a positive EBITDA. In order to have a EBITDA of 20% which is minimally needed to become profitable a market share of about 20% is required. It is interesting to note that this is relatively independent of the size of the market itself, but only on the market share. This illustrates that size is a major barrier for entry in the mobile market.

As far as fixed wireless access is concerned there are no data available as these services are just starting up. Technically it is possible to start up at low scale and gradually increase the size as the market develops. At the same time this also means that these small scale start ups are, at least for the time being, not a real threat to the established operators.

Question 3

Has the market entry had effect in limiting the effect of market power?

When looking at the fixed market there have been market entries, be it that they are not profitable (yet). The market prices for ADSL subscriptions have come down and the offering has been extended into many triple play packages. The number of broadband access lines has increased 20 times in less then 3 years. The acquiring of ISKON by HT, the most active alternative provider, has not notably influenced the offering.

The conclusion is that on the fixed market the conditions have improved, it cannot be determined whether this is caused by market entry or not.

On the mobile market Tele2 has entered the market, it is not profitable yet. Whatever the impact was, UMTS service offering is now the standard.

Question 4

Have market conditions changed recently?

There are no recent changes that influence market conditions. The starting of Wimax fixed wireless broadband operators has the potential to do so but it is too early to judge.

2.2.3. Conclusion

Entrants in the fixed market are relatively small scale, entrants in the mobile market are big entrants that need to capture quickly a substantial market share. On the fixed wireless access market even smaller companies can enter as the investments that are needed to start a business are lower and the scale is smaller. Only fixed operators can offer triple play services (TV, telephony and internet access) and as these are marketed heavily this could

develop into a barrier to entry in the telecommunications market. Until the very latest technologies are introduced non fixed suppliers will have to team up with fixed suppliers in order to provide triple play service.

The entrance of Fixed Wireless Access (Wimax) has the potential to introduce more competitive behaviour in the market.

2.3. Absolute (cost) advantages of the incumbent

The incumbent owns most of the copper access lines and has the most extended long distance network. In principle regulated local loop unbundling (LLU) should take away any advantages the incumbent has in this respect. This requires that the costs should be set at a level that exactly reflects the costs of the dominant operator while taking away any inefficiencies and allowing a reasonable profit margin. A first step has been set in Croatia by basing the LLU tariffs on benchmarking. A further development into full Long Range Incremental Costing (LRIC) should be started in order to ensure that the tariffs are not a barrier to entry. In most cases it is not an option for alternative operators to build their own last mile infrastructure.

In principle other operators are able to use the infrastructure of HT at reasonable cost based prices. There may however be problems in urban areas where there are no fibre pairs available that are suitable for ADSL. In principle this a barrier for entry for all market operators as it hinders both the incumbent and the new operators. The same is true for areas that have no infrastructure suitable for ADSL. The essence is that if the regulator is able to effectively enforce equal treatment of alternative operators than there is no barrier to entry. But when the regulator is less effective a real barrier for entry may exist.

There is another barrier to entry in Croatia. This is the slow working of the appeal procedure through the administrative court. As decisions of HAKOM can be appealed only at the administrative court there remains uncertainty in the market on certain outcomes until a court decision has been taken. A procedure at the administrative court may take several years. During this time the market has no certainty whether a decision from HAKOM will or will not stand. The effect of this uncertainty for operators is difficult to assess but it puts possible new entrants on non-equal footing as it increases the level of uncertainty under which they have to take their investments decisions.

2.4. Sunk costs, economies of scale and capital requirements

If it is necessary to invest a substantial amount before any serious market entry is possible the operator that has already invested and has written off (part of) the investment has a cost advantage on a new operator that has still to invest. This is all the more true if the incumbent operator can use the existing infrastructure for several purposes (voice and internet of example) and the new operator can only enter a specific market. In many cases the alternative operators are faced with a barrier to entry. The only regulatory response to this is to ensure that alternative operators have access to existing infrastructure of SMP operator(s) at real costs.

The figures as presented for mobile operators do not suggest that there is an absolute economy of scale for these operators but that there is a relative economy of scale. This means in practise that any newcomer will always be faced with a period of unprofitability.

As indicated for fixed wireless access a small scale operation is feasible, Novinet is an example of this. As there no real barriers are from this point of view this explains part of the popularity of this way of offering broadband access.

For fixed wireless access on own infrastructure there is a large barrier as own infrastructure can only be profitable if it can be shared by many customers. Small entrants in this market will have difficulty if they have no perspective on reaching a high customer base. This barrier to entry into the telecommunications market can only be remedied by regulators that force cost based tariffs for using the infrastructure of SMP operators.

2.5. Product differentiation, switching costs

2.5.1. The questions:

1. How are products differentiated
2. Are there switching costs for users when switching to broadband operators.

2.5.2. The situation in Croatia

Question 1

How are products differentiated?

It is clear that in the Croatian market operators are doing their utmost to differentiate themselves. Not so much by different offerings but by trying to create a brand name. Max ADSL is of course the main example which is being imitated by Bnet with its 'Xbranding' of services and to a lesser extent by Optima. If the brands are well established this may be a barrier to entry for new market parties. As a big investment is needed to enter the broadband market, except perhaps fixed wireless broadband, this increases the risk for smaller market players when they are trying to enter this market. Small start-ups using the Wimax technology have to face the marketing power of the big players. They will have difficulties in matching that. Even if their investments in the technology can be limited, they will have to spend considerable energy in marketing. This constitutes a real barrier to entry, it is however difficult to see what the role, if any, of HAKOM could be in this respect.

Question 2

Are there switching costs for users when switching to broadband operators?

There are switching costs when moving from one technology to another. The Customer Premises Equipment for Wimax is different from fixed and different from mobile. Other costs that may come up are change of email addresses. The latter concerns mostly individuals as in most case they do not have an own domain.

Another aspects is that service providers try to bind customers to longer term contracts by offering all sorts of advantages. Some of these costs are difficult to avoid as they are part of normal competitive business behaviour, but HAKOM should limit this to exclude unreasonable effects.

2.5.3. Conclusions

There are certainly barriers to entry that fall under this heading. Part of them are simply the consequence of competitive business behaviour and cannot and should not be addressed by HAKOM. Others should be addressed especially those that bind consumers to longer term contracts. The consumer protection section of HAKOM has an important role to play here.

2.6. Vertical foreclosure and exclusion

In the telecommunications market vertical integration is the rule. It is one of the reasons why regulators have to play their role. Barrier to market entry occur whenever vertically integrated companies, mostly the incumbent, try to abuse their control of (parts of) the network by offering less advantageous conditions to competitors than to their own subsidiaries. The European telecommunications regulatory framework tries to establish equal

conditions for market entry for all players. As these are now implemented in Croatia there is not much more that HAKOM can do to remedy this. This does not mean that there are no barriers to market entry, on the contrary, but these fall under other categories.

2.7. Predatory behaviour

2.7.1. The question

1. Is the market structure such that predatory pricing can be expected?

2.7.2. The situation in Croatia

The situation in Croatia is such that in the fixed area the market share for ADSL (including its subsidiary ISKON) of the incumbent is very high but decreasing. It went from 100% in 2006 to 92% in 2008. This does not indicate predatory pricing behaviour. On the contrary the consumer prices of HT are higher than those of its main competitors. At the wholesale level HAKOM controls the price settings of the incumbent. There is no reason to believe that predatory pricing at any scale is done in the market.

On the mobile market the market structure is different two operators each having between 40 and 50% market share and one smaller with a bit over 10%. In this market predatory pricing is not to be expected. The cost for any operator to do so would be very high.

The fixed wireless access market is only served by small companies that have neither the interest nor the possibility to practise predatory pricing at any scale.

2.7.3. Conclusion

On the telecommunications market in Croatia and especially the broadband market predatory pricing is not present and therefore not creating any barrier to market entry.

2.8. Market entry impediments

2.8.1. Question

Under this heading any factors that delay market entry and thereby allow the incumbent to exercise its market power for a longer period than necessary.

The question therefore is:

1. Are there any market impediments present?

2.8.2. The situation in Croatia

The most evident factor here is the fact mentioned earlier that long term contracts may hinder transfer to another operator, this was already mentioned under chapter 2.5.

In the fixed market it is also evident that by nature it takes time to roll out a network. In the meantime the new operator is dependent on the co-operation of HT in order to get access to and serve its customers. Experience in other countries has shown that it is very necessary for the regulator to watch this closely and to investigate any complaints seriously.

In the mobile market the main impediment to market entry is the licensing regime. Without a licence market entry is not possible. Here HAKOM has a crucial role that is limited by availability of frequencies. The important role is to give as much freedom as possible to frequency usage, for new licenses but also for existing licenses.

Another important impediment is the situation with ducts in Croatia. Some of them are almost filled up and it will be impossible to lay new cables in it. In practise old unused cables cannot always be taken out and situation of ownership has not been solved.

2.8.3. Conclusions

There are barriers to market entry that fall in this category. They are being addressed by HAKOM but attention must not be weakened.

3. Overall conclusions

There are barriers for entry. They can be categorised according to the technology that is being used in a specific segment or to the control that can be exercised on it. We choose for the latter approach where we make a distinction between barriers that cannot be controlled by the government, barriers that can be controlled by government but not by HAKOM and barriers that can be controlled by HAKOM.

Description	No control	Control by government	Control by HAKOM
Carnet should limit itself strictly to the educational sector, there is no indication that it goes outside this but continuous attention is needed			No specific action other than continuous watching of the market
Triple play offerings can only be made by fixed operators.	No control as any control would hinder market innovation		
Use of HT infrastructure is necessary for competitors. The price must at the one hand reflect an encouragement for Ht to continue investing and at the other hand allow for viable competition			Introduction and enforcement of strict regulations concerning RIO and LLU, based on sound regulatory accounting principles
Long Administrative court procedures introduce unnecessary uncertainties into the market		Improvement of administrative court procedures	
For any mobile operator a minimum scale of operation is necessary, this creates a relatively long loss making period after starting service	This is inherent to the market		
The difference in scale of operators translates into different powers for marketing, they can create real brands. This is difficult to match for any newcomer	This is inherent to the market		

Description	No control	Control by government	Control by HAKOM
Switching costs for moving from one technology to another exist.	This is inherent to the market		
Long term contracts may limit switching			HAKOM should formulate what is acceptable and what not
Situation with ducts is unclear		A solution must be found with HAKOM as a pushing party	
Incumbent may use all sorts of practical problems to hinder access to its facilities			HAKOM should watch carefully and intervene quickly with disputes