UNIFORM TERMINATION FEES AS AN IMPEDIMENT TO COMPETITION?

The Fixing of mobile termination fees revisited

Hannes Leo

Executive Summary

Intensive competition cannot necessarily be taken for granted given the market structures and product features within mobile communication. Mobile communication markets are usually strongly concentrated within Europe. The market for the termination of calls within a mobile network is a special case of this constellation. Mobile termination means the delivery of a call from another network into a mobile network. The termination can only be effected by the operator whose network is used by the called user. Therefore each operator has a monopoly status within that special market - the termination of calls within a mobile network.

Within a monopoly monopolistic pricing strategies - and therefore excessive profits - are probable. These excessive profits lead to allocative distortions and therefore to deadweight losses (see RTR, 2004A, p. 84). That causes problems especially where these excessive incomes are not "needed" within the competition process, but register as excessive profits

In contemplating the optimal regulatory regime for mobile termination fees the RTR (Austrian telecommunications and broadcasting regulator) concludes that a uniform termination fee is the correct answer to the given competition deficits in this segment of the mobile communication market. In order to achieve a uniform termination fee, individual gliding paths are being proposed. The Telecom Control Commission has followed this opinion and fixed it in a decision. Mobile communication operators have – for different reasons each – filed appeals against this decision.

RTR underpins this decisions by stating that the regulator should "imitate" a market result. The market to be imitated is a market with perfect competition where as a result of competition one price (one price rule) set at the level of the most efficient firm evolves. At the same time it is assumed that a fast convergence process of market shares will take place and that consequently existing cost differences will be diminished. According to the RTR a uniform termination fee improves allocative efficiency.

These opinions of the RTR are challenged here by stating that a uniform termination fee would increase allocative inefficiencies and lead to less dynamic competition on mobile communication

market. Uniform termination fees will only be appropriate when cost differences will have disappeared.

This opinion is based on the following assumptions:

1. The market model used by RTR is not appropriate for determining mobile termination fees. RTR assumes perfectly competitive markets and therefore a single price at the level of the most efficient operator. Actually this "solution" can not arise with respect to mobile termination, because the operators are monopolists and therefore do not interact with each other, but only follow their own – possibly monopolistic - pricing strategies. As a consequence regulation should take measures from the already developed repertoire for monopoly markets in order to restrict the abuse of market power. Usually this is done by price regulation which bring prices closer to cost and by measures which improve productive efficiency – possibly by way of a RPI-X regulation. These measures can though only be taken if individual termination fees are set – such as has been regulatory practice until now.
2. Even if one would accept that a kind of "market interaction" would be the appropriate analogy for setting mobile termination fee research on the "one price rule" (which is better known as the "law of one price" (LOP) or in more general terms as price dispersion) shows that this rule can hardly be observed in reality, not even on markets for homogeneous goods, because many factors influence the formation of prices. Even if these factors - which are responsible for the heterogeneity of suppliers but also customers – are taken into consideration, inexplicable price dispersion remains. A specific result of the research on price dispersion is the fact that the "law of one price" does not apply if the enterprises have different cost structures. Thus theoretical research suggest individual termination fees as long as cost structures have not converged.
3. The argumentation of the RTR assumes as well that the introduction of uniform termination fees is possible because convergence of operators' costs takes place. As the cost structure of an enterprise in mobile communicatiosn is to a large extent determined by its its size, a convergence of market shares has to take place beforehand or a strong growth of output to make all operators produce on the flat part of the costs curve. Examinations of market share developments on European GSM markets show that first mover advantages and late comer disadvantages are persistent and will only die away in a medium to long term perspective. Although there is a faint tendency of market share to convergence this is no law of nature. What is important is the fact that first mover advantages result from regulatory decisions: the licencing strategies for mobile operators are responsible for the existence of first mover advantages. It would therefore be even

more astonishing if latecomers were again put at a disadvantage by regulatory decisions throught the introduction of uniform termination fees.

4. The introduction of uniform termination fees discriminates against small operators as these have higher unit costs because of lower economies of scale and would therefore sustain losses through the termination of calls. These losses would have to be subsidized by an increase of prices of other types of calls. From this mechanism results a reduction of allocative efficiency, because termination fees would be below costs, thus the signalling effect of this price is distorted and hence too many call will be terminated on this network. Effects are inverse for those services whose prices have to be increased to balance the losses incurred by termination fees below cost. Uniform termination fees are allocatively efficient for the most efficient operator only, because this operator is in a neutral position as the termination fees for all operators are determined at the level of his own costs.
5. The losses which smaller operators have to accept through the termination of calls in their network, causes the level of competition to be considerably reduced. This is even more regrettable as the small operators have been the most dynamic competition factor until now on the Austrian mobile communication market.

The simplest solution by far – and especially the one where no conflict with reality emerges – is that one accepts that the operators are monopolists each and that regulatory measures – all following the same principles - will have to be taken for each monopoly separately. In order to secure allocative efficiency, prices have to be equal to marginal costs. Usually an extra charge for overheads is accepted here in order to facilitate the arrival at the profit zone. Therefore the level of costs of each monopolist has to be determined, examined whether the service is produced efficiently – enough information on the cost function exists to do this determination – and based on that the prices have to be fixed at a level where costs are recovered. The consequence are individual termination fees guaranteeing equal treatment of the enterprises: each operator gets the possibility to recover the costs arising from the termination of calls. A medium- to long-term convergence of cost structures will lead to a uniform termination fee in this regulatory setting. Uniform termination fees should therefore be the result of a market process and should not be imposed on the operators.

This strategy leads to an equal treatment of all operators, because no profits nor losses emerge from terminating call in a any of the networks. Even though that is a clear improvement in comparison to uniform termination fees at the level of the most efficient operator, higher termination fees for newcomers or small operators would be indicated in order to stimulate a high level of strong competition.

1. Starting point: mobile termination as a competition problem

When the European Commission published its Green Paper in 1994 mobile communication operators had only just started their steep path of growth. The predictions of growth - risky at the time - do appear explicitly modest looking back: (For?) In the year 2000 about 40 million users were estimated in Europe - in the year 2010 this number was expected to (double) be doubled to about 80 million users (European Commission, 1994). In fact there were more than 280 million GSM users in Europe in December 2000 according to the GSM Association. At the time being there are 393 million users within Western Europe only.

The success of mobile communication is based on the new possibilities of this technology on the one hand and - equally important - on the creation of competition by liberalizing the market. Liberalisation caused a rapid decrease of prices and therefore a (the?) use of mobile communication services outside the field of business clients only.

In the beginning established enterprises as well as newcomers had the same chances to conquer the market. The price decreases created rapidly increacsing demand for mobile communication services which encouraged mobile operators to offer even better service contratcts to attract potential customers intor their networks.

The introduction of UMTS - and thereby the expansion of the mobile offering spectrum further than just voice and simple data services - had been planned as the following big development within mobile communication. The momentum of the successful GSM history should be extended to UMTS. Although the strategy has been implemented the expected success has been achieved only in part: the development of revenues in the past years indicates a market stabilization more than a continuing of the steep growth path. The exponential growth rates thus remain limited to the 1990s of the last century.

As nowadays almost every - even only little interested - customer owns a mobile phone, the competition situation has changed from the simple recruiting of first time users to an ousting competition. Because of the market entering of new UMTS operators as well as the different market share distribution between the mobile communication operators the level of competition still remains high.

Intensive competition cannot necessarily be taken for granted given the market structures and product features within mobile communication. Mobile communication markets are usually strongly concentrated within Europe. As a rule there exist four or five GSM- and/or UMTS infrastructure operators within the still strongly "insular" national markets. Within such strongly concentrated

markets there exists a high risk of collusion.1 "The most important potential restriction of competition within an oligopoly is the practising of agreed behaviour (collusion) having the target to achieve higher profits than would be achieved in a competitive market. According to the present jurisdiction such a situation constitutes collective market control (RTR, 2004A, p.26)."

Collusion shall be prevented by the regulation of the telecommunication sector. On a more general term it can be maintained that the regulation of the telecommunication sector in itself is targeted on the prevention of excessive profits and on the establishment of efficient competition.2 2Only if efficient competition can be established, it will be possible to reduce regulative interventions and to delegate price formation to the market.

The market for the termination of calls within a mobile network is a special case of the stated basic constellation. Mobile termination means the delivery of a call from another network into a mobile network. The termination can only be effected by the operator whose network is used by the called user. Therefore each operator has a monopoly status within that special market - the termination of calls within a mobile network. This situation of monopoly status is not believed to change within the foreseeable future.

Within a monopoly monopolistic pricing strategies - and therefore excessive profits - are probable. These excessive profits lead to allocative distortions and therefore to deadweight losses (see RTR, 2004A, p. 84). That causes problems especially where these excessive incomes are not "needed" within the competition process, but register as excessive profits: "If the mobile end user market were not competitive, excessive mobile termination fees would result in respective excessive profits of mobile operators. Within a competitive mobile end user market - as it is the case in Austria - those margins obtained by excessive termination fees are "consumed" in the competition for end users (subsidy of equipment, on-net calls, etc.), (RTR, 2004A, p. 85). Achieved excessive profits are therefore used for the subsidizing of other services in the case that sufficient competition exists.

It is also possible that mobile termination fees are used to implement foreclosure strategies. "A foreclosure problem can also occur in the case of connecting "big" and (small) new operators (MVNOs). Amongst the refusal of connection, respectively the (precautionary) charging of high termination fees, especially the discrimination between on-net and off-net calls plays an important part. Cheaper on-net than off-net tariffs create so-called tariff-mediated network externalities (Laffont

---

[1] In the study of economics, collusion takes place within an industry when rival companies cooperate for their mutual benefit. Collusion most often takes place within the market form of oligopoly, where the decision of a few firms to collude can significantly impact the market as a whole. Cartels are a special case of overt collusion. en.wikipedia.org/wiki/Collusion"

[2]The Telecommunication Act 2003 stipulates the challenge of the law and therefore the one of regulation even to a larger extent: sec. 1. (1) The purpose of the present law shall be the granting of the population's and economy's supply with reliable, good value, high quality and innovative communication services by promoting competition in the business of electronic communication.

& Tirole, 2000, P. 202) making the network of another (smaller) operator unattractive. At this point please imagine the situation of H3G whose clients are forced to make nearly 100% of their calls as expensive off-net calls. In front of this background it is to be expected that the practised price discrepancies between on-net and off-net calls would severely intensify - if no regulation is made. Such a distinction is not justified even in front of efficient price structures (Ramsey Pricing), at least not to the observable (respectively expectable) extent. Within those business fields where fixed and mobile network operators are competitors to each other, such as is the case with converging services or Virtual Private Networks, foreclosure strategies may also be aimed against fixed network operators. This competition problem is relevant to a certain extent as in Austria nearly all mobile operators dispose of a fixed network branch (let alone Mobilkom - Telekom Austria). Its importance increases with increasing substitution relations between fixed and mobile networks, because mobile operators may reinforce the mobile sector in general by such strategies with regard to the fixed network" (RTR, 2004A, P. 86f).

The RTR (broadcasting and telecommunication regulatory authority) though states that termination fees may be used for collusive behaviour to a certain extent only, because the requirements (linear tariff without distinction between basic and call-dependant fees and without handset-support, uniform tariffs for off-net and on-net calls) are not met in Austria (see RTR, 2004A, p. 85f).

In judging the mobile market the following (potential) competition problems can be summarized (RTR, 2004A):

- *"allocative distortions of the market because of excessive termination fees for calls from fixed to mobile networks.*
- *allocative distortions of the market because of excessive termination fees for calls between mobile networks as well as price discrimination of on-net and off-net calls.*
- *foreclosure strategies against smaller mobile operators (Greenfielder, MVNOs) by refusal of connection, excessive termination fees, price discrimination of on-net and off-net calls or other non-price tactics (raise rivals cost); connected thereto is the transmission of market power onto an end user level.*
- *under certain circumstances foreclosure strategies against fixed network operators in the case of overlapping of business fields (e.g. fixed-mobile convergence or within the scope of Virtual Private Networks), respectively by raising substitution between fixed and mobile networks. That is increased not least by the strong discrimination between implicit termination fees for on-net calls and those charged for off-net calls."*

To sum up the RTR (2004A, P.85f, 2004B, P. 14f) states that the ..."allocative competition distortions because of excessive termination fees for calls from fixed to mobile networks ... do create the most essential competition problem".

These allocative distortions - as the most essential competition problem - shall be the centre of the following remarks. The problem shall though be treated only in part - even if in its main part: the introduction of identical termination fees. To date operators used individual termination fees which also considered their own level of costs as well as their own position within the developing process. The introduction of uniform termination fees raises the question whether these can in fact make any contribution to increase allocative efficiency.

In order to be able to find any answers hereto, in the following the argumentation of the RTR regarding the introduction of uniform termination fees shall be analysed. That shall set the basis to discuss whether the decisions made may in fact contribute to sort out the stated problems. In the final chapter, conclusions shall be made.

2. Proposed Solutions by the RTR

According to the analysis of the RTR (2004A&B) the allocative distortions33 caused by termination fees - for calls from fixed to mobile networks in particular – constitute the main problem, possible foreclosure strategies do exist only potentially and are unlikely in Austria because of the given situation here.

However when prices are not sufficiently determined by competition a regulation of prices is the obvious strategy. Termination fees have been regulated in the past - and will be in the future - given the identified competition problems and the actual monopoly position of the operators.

The question in detail is which price will have to be determined in order to primarily prevent allocative distortions as well as foreclosure strategies. The RTR presumes that a price meeting all requirements can be found and describes the requirement profile as such: an efficient termination price "… is therefore principally suitable to remove allocative inefficiencies (excessive prices) in connection with competition problems ….. as well as discrimination/subsidizing problems …; an efficient termination price secures that no excessive profits are gained by this service which might then be used for subsidizing other services (on-net tariffs in particular), respectively that the termination service needs no subsidy itself. Such an obligation is in accordance with …. the nature of the most essential

[3] Allocative efficiency is the market condition whereby resources are allocated in a way that maximises the net benefit attained through their use. Allocative efficiency is also defined as the production of the quantity that is most beneficial to society. A firm is allocatively efficient when its price is equal to its marginal costs (that is, P = MC). en.wikipedia.org/wiki/Allocative_efficiency, see also: http://www.woodgreen.oxon.sch.uk/economics/allocative_efficiency.htm

competition problems identified in competition analysis, i.e. the problem of "excessive prices" (RTR, 2004B, p. 29).

An efficient termination price should also be "cost orientated" and used in form of a "cost plus regulation". The efficient price from an economic point of view is at the level of long term marginal costs plus extra charges for fixed costs and external effects. "The best approach to such a "correct price" from the cost accounting point of view are long term average incremental costs (LRAIC). By way of a price determined as such it is secured that no excessive profits are gained (respectively that the price is lower than the Stand Alone Cost) and that the service does not have to be subsidized by other services (price is higher than incremental costs)". A price determined as such can also help to sort out discrimination-/subsidizing problems (of on-net tariffs), (RTR, 2004B, p. 35f).

The RTR does also propose that termination fees should be equally high for all operators. This proposal for the termination of mobile calls – a uniform cost based termination fee – constitutes a principal change in the practised regulation regime. Although termination fees were cost based to date too, they were set indiviudally for each operator. Individual termination fees are obvious because every operator has different cost structures – even on the assumption that the production of services is efficient. The main reason are the different sizes (of the firms) and the economies of scale connected therewith. As all operators – given that they operate an all-area covering network – more or less have the same fixed costs, a rising use of network capacity results in considerable economies of scale, i.e. bigger operators can split their fixed costs on a bigger amount of output. That leads to the fact that the bigger a operator is the lower unit prices are.

The RTR is well aware of that problem. It is the reason why the authority stated in detail why individual termination fees cannot be justified. In a separate chapter the question of the "correct price" is raised and explicitly picked out as a central theme the question of "reciprocity versus operator individual fees".

Accordingly there are three options for the determination of termination fees:

(1) direct determination of uniform (reciprocal) termination fees
(2) individual operator termination fees
(3) temporarily individual operator fees/long term reciprocal fees

Because of the economies of scale considerable scale economies exist in mobile communication: operators with a low amount of output are confronted with higher average costs than bigger competitors. This clear relationship results from the cost calculations made by the RTR in its IC-decisions (RTR, 2004B, p.35f).

Through the following argumentation points the RTR though comes to the conclusion that uniform termination fees are necessary and that size advantages/or disadvantages are less important: "In a

competitive market a single market price develops – given the products are sufficiently homogeneous ("one price rule"). In a (perfect) competition situation operators are price recipients and are forced to be sufficiently efficient in order to obtain positive contribution margins or otherwise leave the market. Under certain circumstances another more efficient operator may enter the market. This "healthy" market mechanism secures that enterprises are sufficiently efficient and that social welfare (and therefore each consumer's benefit) is maximised. In front of this background a "uniform termination fee" is to be preferred anyway. The primary goal of regulative intervention would be - … - the "imitation" of a competition result. Beside this point there is another one that emphasizes uniform termination fees. On a long term view market shares will align with each other and therefore LDK (long term average costs) will align too. Cost calculations which have been made in connection with IC proceedings prove that cost functions of the operators seem to be quite symmetric, which is not surprising given the strongly standardized technology, meaning that in the absence of other asymmetries similar market shares can be expected (on a long term basis). Moreover, newcomers are confronted with negative margins on many markets - on the mobile communication market too – without necessarily leading to a leave of the market, because such a decision requires a long term profitability expectation.

On the other hand there are statements to deviate from the "one price rule". Such a deviation can be justified if:

- *Deadweight losses in connection with reciprocity exceed welfare profits*
- *Cost asymmetries between the operators are the result of regulative interventions*

Deadweight losses in connection with (low) reciprocal termination fees may be intensified by the fact that smaller market players could leave the market as a result of consequent "imitation" of a "perfect competition result" and that would have a negative effect on the long term competition situation on other mobile communication markets (especially the mobile end user market). If for example termination fees for all operators were fixed at the level of (average) costs of the one operator with the highest amount of output (market result with perfect competition), a operator with a very low amount of output would be confronted with a considerably negative cost coverage, which in connection with negative contribution margins on other markets – size advantages do in fact have effects on all mobile markets – might lead to a leave of the market of the enterprise in question. That again might – not least because of high, almost insuperable market entrance obstacles within mobile communication - have such a negative long term effect on competition (higher risk of collusion) on other mobile markets that deadweight losses caused thereby might be higher than those caused by (temporarily) higher termination fees of smaller operators. In front of this background a (temporary) deviation of the "one price rule" would be justifiable from a welfare-economic point of view, even though three important qualifications have to be made in this context:

- The differences in average costs reduce with a rising amount of output; *i.e. the danger of the abovementioned inverse effects because of reciprocally ordered fees reduces with a rising amount of output (of all operators).*
- The extent of size advantages strongly depends on initial investments of the operators which are not dependent on capacity. The cost function of a operator who only covers part of a territory with its own infrastructure and furthermore operates via national roaming, is marked by lower economies of scale. This means that *"the economies of scale – disadvantages of a 3G newcomer, who does not considerably exceed the stipulated level of coverage (25% at the end of 2003 and 50% at the end of 2005) have to be estimated less than those of a 2G operator who entered late and covers far more than 90 % of the population with his own network. MVNO's show ignorable size advantages in comparison (according to a lack of investments for network equipment).*
- *Such a distinction in prices includes the danger that wrong attracting structures for the enterprises and competition distortions might result from the fact that operators with less market success, respectively less productive efficiency might be protected and that therewith a higher danger of inefficient subsidizing arises. (RTR 2004B, p. 37ff).*

The second reason for a deviation from the „one price rule" are cost asymmetries which are not based on enterprise decisions, but on regulative/state interventions. The most important asymmetry in this context is the licensing-, respectively the market entrance time which could not independently be chosen by the operator. The different licensing times are also responsible for differences in market shares and therefore in average costs because of the existence of first mover advantages/late comer disadvantages. Even in front of this background a difference in termination fees of each operator is justifiable, although only temporarily as the following statements will show. The main reason for first mover advantages are change costs, which in part only temporarily exist (purchase of new equipment and binding terms of contracts) or which are removed by regulation (introduction of the transition of phone numbers). On a long term view an erosion of first mover advantages and – not least because of relatively symmetric cost functions – an alignment of market shares (and therefore costs) can be expected. Furthermore it may not be forgotten to state that in Austria frequency licences are auctioned and differences in long term profitability caused by different market entrance times are (at least in part) internalised in licence fees.

Finally – in order to clearly state the position of the RTR without any own interpretation – on balance from the statements of the RTR it can be cited as follows: "the discussion shows that a difference of termination fees is basically justifiable. Because of late comer disadvantages caused by the later licensing time and scale disadvantages operators who enter the market later do have higher average costs. A regulation concept of consequent "imitation of a perfect competition result" (reciprocal

termination fee at the level of costs of the one operator with the lowest costs) might have adverse effects on competition (end user market), even though the analysis also shows that such a difference should be only temporary and that higher termination fees for newcomers – depending on the extent of supply – should be determined during the time of market entrance only. On a long term basis a uniform termination fee will therefore …. have to be implemented in the form of a sliding path (RTR, 2004B, p. 39f).

In fact the Telecom Control Commission (TKC) mostly accepted the proposals of the RTR and has determined individual sliding paths for operators regarding the convergence to a uniform termination fee. Objections to that decision have been raised by all operators – for different reasons each – and the problem has yet to be finally solved.

3. Does the RTR strategy contribute to achieve the goal?

In the chapter above the evaluations and solution proposals of the RTR for the determination of termination fees in mobile networks have been described. In the following it shall be tried to check on the sound validity and appropriateness of the argumentation.

3.1 Assessment of the RTR arguments

The argumentation of the RTR may definitely be judged as conclusive: arguments are stated, "evaluated", disproved, confirmed and as a consequence a complex statement line pro uniform termination fees is reached. One thereby has the impression that things were not made too easy, that all options have been considered and despite a difficult problem a reasonable decision has been made.

Of course with contradicting arguments priorities had to be chosen in order to reach a clear solution, i.e. some principles do have more importance in the argumentation. Only if these compromises and priorities stand up to close examination the chosen solution/decision will keep its validity for the future regulation practice.

In order to view this way of argumentation more closely table 1 shall try to show the framework of the argumentation of the RTR. On the one hand it is described which competition problems in the field of mobile termination have to be sorted out and on the other which arguments have been raised for or against the proposal of the RTR to introduce uniform termination fees.

Table 1:Main arguments of the RTR

Nr.	Argument	+ = for, - = against uniform termination fee
1	allocative efficiency	?
2	Foreclosure	?
3	market result is simulated by regulation	+
3a	• healthy" market mechanism: perfect competition market, operators are price recipients, have to be efficient, otherwise leaving market	+
3b	• one price rule: regulation reaches its primary goal of "imitation" of market result=there is only one price	+
4	on a long term view the alignment of market shares and therefore of long term average cost can be expected; differences in average costs reduce with rising amount of output	+
5	regulation causes differences between operators:	-
5a	• cost asymmetries are caused by regulative decisions	-
5b	• different market entrance times lead to first mover advantages/late comer disadvantages	-
6	frequency licences have been auctioned whereby differences in profitability caused by different market entrance times are internalised in licence fees	+
7	newcomers are confronted with negative margins in the beginning but do nonetheless not leave the market	+
8	smaller operators leave the market, competition is reduced	-
9	3G newcomer uses national roaming	+
10	operators with little market success, respectively little productive efficiency are protected	+

Regarding the argumentation about individual or reciprocal termination fees the original questions about competition problems with the forwarding of mobile calls are removed to the background. By the detailed argumentation of the RTR for and against individual operator termination fees the question whether these do in fact contribute to the prevention of competition problems in this market may be neglected, respectively remains open. The question marks at the points "allocative efficiency" and "foreclosure problem" do indicate that the argumentation on reciprocal or individual operator termination fees has become independent in the papers of the RTR and is no longer discussed in

relation to these problems. In other words: only pro and contra arguments on uniform termination fees are taken into account and it is implicitly assumed that both solutions will have the same effects on the identified competition problems. The fact that possibly these are totally different and should therefore be judged respectively, is neglected.

In order to put these questions – the effect of uniform termination fees on allocative efficiency and the foreclosure problem – into the centre of attention again, it is necessary to inspect in detail all stated arguments, to extract and then closely examine the core elements which in the end have motivated the RTR proposals. To meet this challenge any arguments which are minor or totally irrelevant to the subject will be excluded. This shall simplify the question as much as possible and the view on the "core elements" shall be cleared.

Before this step can be made a clear definition about the effect of a uniform termination fee has to be made which is crucial to the following statements: a uniform termination fee strikes operators – depending on their position on the costs curve – very differently and has a considerable influence on their competition position. According to size advantages and the respective different costs a uniform termination fee will lead to winners and losers. Those operators whose costs are lower than the termination fee will make a profit with the termination; those operators whose costs are higher, lose money here. Last but not least there may be a operator whose costs correspond exactly with the uniform termination fee and who will therefore neither have profits nor losses by the uniform termination fee. What is primarily difficult with a uniform termination fee is the fact that small operators are systematically discriminated as their unit costs are higher. Small operators will definitely have losses with mobile termination and those losses will – in relation to the size – be the higher the smaller the operator is. A uniform termination fee therefore clearly discriminates smaller operators.

On the grounds that the above conclusion is accepted, the following arguments may be estimated only little relevant for the solution of the competition problems on the market of mobile termination:

- the RTR states (**argument 6**) that by the auctioning the differences in profitability, caused by different market entrance times, have been internalised in the licence fees. Although this argument is correct, that is no "royal charter" for regulative decisions of any kind. Regulative decisions which – just as a uniform termination fee – burden mobile operators differently, depending on their size, are not justifiable by lower auction prices of operators who have entered the market later. Those operators who have entered the market later have a right of equal treatment regarding all regulative decisions which have been taken after the purchase of the frequency. Basically any deteriorations/improvements have to be valid equally and to the same extent for all operators if regulative neutrality shall be maintained. Additionally it has to be stated that at the time of auctioning individual termination fees were "in use". Bidders

for the frequencies could therefore easily assume that this regulation regime would be continued in the future.

- **Arguments** number **7** and **8** are of little help either in the chain of argumentation for uniform termination fees. The hint that newcomers have to accept losses in the start-up period and still do not leave the market , does not imply that regulation may contribute to a further unbalanced deterioration of already negative contribution margins without good reason. A market exit is not necessarily the point, but longer amortization periods and less room to manoevre in the competitive process for new and small operators are.
- **Argument 9**, that the 3G newcomer uses national roaming, appears little objective either. For the judgment of the newcomer's position – who despite national roaming will have to invest in his own infrastructure – , his actual cost position has to be analysed. This cannot be refused by pointing out national roaming. The effects on the 3G newcomer are not to the fore either, it is more the effects of uniform termination fees on the identified competition problems that need to be analysed.
- **Argument 10** of the RTR points out that individual operator termination fees protect operators with little market success, respectively little productive efficiency. That is correct if the regulatory authority is not successful in calculating the efficient level in relation to the size of the enterprise. The argument though loses importance if one takes seriously the statements of the RTR that the given high level of competition in Austria grants productive efficiency of all operators (see RTR, 2004B, p. 35). That reveals that – as already mentioned in chapter 2 – termination profits do not lead to excessive profits –they are used much more for the backup of other tariffs.

If one simplifies the chain of argumentation by the abovementioned lines and excludes the actual targets of regulative measures (foreclosure, allocative efficiency), the following three points (arguments 3-5) remain subject to further discussion:

Table 2: Remaining argumentation points of the RTR

3	market result is simulated by regulation
3a	• " healthy" market mechanism: perfect competition market, operators are price recipients, have to be efficient, otherwise leaving market
3b	• one price rule: regulation achieves its primary goal of "imitation" of market result=only one price exists
4	on a long term basis the alignment of market shares and therefore of long term average costs can be expected; differences in average costs reduce with a rising amount of output
5	regulation causes differences between operators
5a	• cost asymmetries are caused by regulative decisions
5b	• different market entrance times lead to first mover advantages/late comer disadvantages

These arguments shall be discussed in two subchapters. The first one will analyse the role of regulation (argument 3). Thereby it is not the question whether the regulatory authority shall substitute interplay of market forces, but how the regulatory authority pictures the game of market forces. That concerns the statements to competition regarding mobile termination (total competition, one price rule etc.). Arguments 4 and 5 shall be analysed in the second subchapter. Market shares should converge on a long term whereby the operators should show comparable cost structures. The present differences in costs which have been caused by regulative decisions (licensing times) and which manifest themselves in first mover advantages and late comer disadvantages, should therefore lose importance. Here the question is raised how big first mover advantages are and how long it takes until market shares and therefore cost structures will converge.

3.1.1 The regulator as a substitute for the perfect market

3.1.1.1 Atomistic, oligopolistic or monopolistic market structures?

The RTR practices a very direct relation to the idealised play of market forces which to imitate it believes as its own challenge. (National) economy distinguishes between various market types whose characteristics are also being analysed and empirically checked in stylised mathematical models of reality. In the present case the model of perfectly competitive markets is being assumed by the RTR as working hypothesis for the targeted working of the market for mobile termination services.44 This hypothesis is based on the following assumptions:

- "Atomistic market structure" (many small operators with a small market share each)
- Homogeneity of goods (no actual, spatial, personal or preferences in time)
- Total transparency of the market (operators and demanders dispose of all market relevant information)
- Unlimited mobility of all production factors and goods, free entrance and leave of the market
- Unlimited divisibility of all production factors and goods
- Infinite speed of reaction (adaptation process effected immediately)
- Voluntary exchange relations only (no external effects)
- Given resource allocation
- Constant production processes and constant product range
- Constant "preferences" (http://de.wikipedia.org/wiki/Vollst%C3%A4ndige_Konkurrenz)

[4] It may first be stated that the conclusions which can be drawn for such idealised models, principally do describe balance phenomenons, i.e. they are results produced by a market when a balance has been found. These concluded structures/rules/patterns therefore only apply for markets which are balanced. In order to understand the processes between balance conditions these models do contribute very little. Market dynamics in mobile communication, where a new market shall be established, are described insufficiently by these balance orientated and statistic arguments – mobile communication is far from a balanced condition.

Astounding is the fact that for an oligopolistically structured market (in this case the mobile communication market) the RTR has explicitly chosen a perfectly competitive market as reference model, which implies explicitly atomistically structured supply and demand structures. What is even more astounding than that is the application on the area of mobile termination of calls as these are monopolies according to the understanding of the RTR. The operators therefore are no competitors, but may apply monopolistic pricing structures which are only limited by the demand on mobile termination services.

If monopolies are regulated, the target always is the prevention of negative economic effects. That means excessive prices – compared to costs – in monopolistically organised markets. Part of the demand is not satisfied in such a market – compared to a competitive market (deadweight loss). This effect is usually prevented by price regulation. In this case prices are – this has already been mentioned above – reduced to the level of long term average costs. This is the strategy that has been chosen with the determination of operator individual termination fees. Monopolies may not only determine excessive prices, but may also produce inefficiently and therefore incurr production costs which are much too high. This fact according to the RTR does not exist, because productive efficiency is maintained via intensive competition on other market segments. From an economic point of view instruments for regulation (i.e. individual termination fees) used to date are perfectly sufficient.

The RTR though insists on the fact that for the determination of termination fees pricing mechanisms in perfectly competitive markets are the suitable analogy. That contradicts the decision of the TKC which confirms to operators that they are monopolists on the market for mobile termination. Assuming that the TKC was not mistaken in this decision the situation appears quite difficult. If they are monopolists, then they are no competitors to each other and the assumption of pricing mechanisms which apply in perfect markets is not indicated. A price formation on the level of the most efficient operator – as in analogy assumed by the RTR for mobile termination – cannot be imagined when interaction between the enterprises is missing. The alternative statement – pricing happens on the level of the most efficient monopolist – is little spread within economic theory and practice.

The argumentation of the RTR and the decisions of the TKC until now have led to the somehow absurd situation that we talk about a market where - the accumulated and stipulated by the decisions - market shares of all operators amount to 500%. This unreasonable statement emerges if one accepts that the operators are competitors to each other (assumption RTR) and that each operator disposes of a market share of 100% (decision TKC – all operators are monopolists in the market of mobile termination). This definitely is a very interesting starting point for the next market analysis.

Summing up it can be stated that

- the assumption of a market solution for the determination of termination fees is intellectually risky, because the monopoly for the termination of calls in mobile networks is not based on regulative decisions (which could be abolished for the benefit of competition), but has technical reasons. Considering the given technologies a market cannot develop here; as a consequence the operators will never compete with each other, because no market exists for mobile termination, but only monopolies. Therefore the application of a market solution on this situation is logically inconsistent.
- As each operator has a monopoly with mobile termination, those regulatory instruments should be applied which have proved effective for monopolies. This means in detail that the prices have to be reduced to the level of long term average costs and – if necessary – measures to improve productive efficiency shall be taken. As according to the statements of the RTR productive efficiency is given with Austrian operators, the application of cost orientated individual termination fees is an adequate strategy. A uniform termination fee is not justifiable under these conditions.
- A price building on the level of the most efficient operator – as intended for mobile termination by RTR and TKC – cannot be imagined when a competition situation is missing. The alternative statement – pricing happens on the level of the most efficient monopolist – is little spread within economic theory and practice.

3.1.1.2 The "one price rule"

The RTR argumentation is not only based on an idealised and to mobile termination not applicable representation of market forces, but even substantiates it by the "one price rule". The "one price rule" claims that on a competitive market – given there are sufficiently homogeneous products – a single market price will emerge. Now, at least every day life experience indicates that the "one price rule" is not met very often: price dispersion is – even with homogeneous goods – the rule and not the exception.5

Every day life experiences nonetheless are not sufficient to substantiate or analyse regulatory decisions. It has therefore been tried here to find economic evidence for the applicability of the "one price rule" – better known as the "law of one price" (LOP).

The "law of one price" constitutes a central law of the neoclassic economic theory. There exist several definitions which in their content are identical to a large extent. The New Palgrave Dictionary of Money and Finance (Newman – Milgate – Eatwell 1992, p. 563) defines the "law of one price" as follows: "The law of one price states that, abstracting from transport costs, obstacles to trade, and

[5] the visiting of www.geizhals.at proves very helpful if one wants to check the working of the "one price rule" himself. Even though all price information on identical goods is given, prices differ to a considerable extent.

information costs, the price of a given good (i), quoted in the same currency, will be the same in different locations: pi =epi*, where p denotes the domestic price of the good, p* the foreign price and e the exchange rate (domestic currency per unit of foreign currency). What is important is the fact that the "law of one price" (LOP) only works when arbitrage is possible and the markets are completely competitive. Officer (1986, cited by Pippenger – Phillips, 2005, S. 3) has stated as follows: "For the law of one price of tradables to be valid, a sufficient condition is that the markets involved be purely and perfectly competitive (in the Chamberlainian sense). This would assure the existence of perfect arbitrage." It has to be added here that the definitions of the LOP explicitly refer to tradable goods.

Literature on LOP is extensive and can be divided into a theoretical and an empirical strand. In the theoretical part mathematical models are used to study the conditions under which price dispersion can develop and therefore the LOP does not apply or only to a restricted extent. Empirical research tries to understand the extent of price dispersion on real markets and to find the determinants of price dispersion. First of all it can be stated that the reasons for price dispersion is not only produced by heterogeneity of firmss and/or customers – although this of course contributes to price dispersion – but also by the fact that the search for information as well as the distribution of information is expensive and costly.

The theoretical models which have been developed for the explanation of price dispersion help to understand why price dispersion can develop. These models are trying to imitate the behaviour of firmss and customers although stylised and in an abstract way, but still in accordance with important behavioural patterns. In this context the theoretical approaches in "search-theoretical"-models and "clearinghouse"-models are described. It has to be pointed out that this is very sketchy treatment of a large body of research.

"Search-theoretical"-models examine the search behaviour of consumers.6 It is stressed that the search for the cheapest offer for a homogeneous product causes costs. One either has to visit different stores, make phone calls or gain information via other channels. The customers therefore have an optimising problem and must find the correct relation between search costs and the expected benefit of the product. Basically customers cannot examine all offers because the costs resulting thereof would exceed the benefit from the purchase of the product considerably. Customers therefore collect information until the expected benefit from additional information is lower than its costs. Within these models different search strategies re modeled: customers may for example look for a certain number of offers or they search until a certain price (reservation price) is reached, whereas – if this price is not reached, only a certain number of searches is made.

---

[6] The earliest contributions in this field of research are by Stigler (1961), Diamond (1971), Rothschild (1973). Baye – Morgan – Scholten, 2005 provide a very good survey – which also is the basis for the statements above.

The suppliers of products are of course aware of the information problem and the search strategies of customers. Supplierss are trying to achieve the highest price and are looking for solutions to achieve this in a competitive environment.

A market solution is achieved when both groups have chosen strategies which maximise their target variables. The then found market equilibriums show that price dispersion - and therefore mark-ups – are the rule. Diamond (1971) even showed in his critical remarks on the first "search-theoretical"-models that the fixing of a monopolistic price can be the only existing solution for firms, even if a continuum of identical enterprises is fighting for market shares and therefore the requirements for strong competition are met.

Within the second model type – the "clearinghouse"-models – the amount of search costs plays a less important part because it is assumed that there is an information broker (e.g. newspapers, internet) who allows the comparison of prices between the different supplierss. Basically it is assumed that two different groups of customers exist: one which is ignorant to prices, walks into the next store and buys the wanted product; the other group is looking for the cheapest offer.77

Within the "clearinghouse"-models dynamism is developed by those customers who do not search for information, but just buy. Those customers who use the services of a clearinghouse, certainly buy in the store of the cheapest supplier. Therefore there is a tendency that prices approach costs. There is though a threshold value where it may be cheaper for the supplier not to reduce the price any further and to sell the product to uninformed customers only. It is best for suppliers in this context to apply "mixed strategies" and to fix the price arbitrarily, i.e. for a certain period of time they set very low prices in order to attract those customers who are sensitive to prices and at other times they fix high prices on the other hand (Rosenthal, 1980).

Varian's (1980) model shows that a balance with price dispersion may develop if consumers have a different ex ante status of information.In his model price dispersion is no monotonous function of customers' information costs. If information costs are very high, the information of the clearinghouse is not requested and all supplierss charge monopoly prices. If on the other hand search costs are very low and all customers use the clearinghouse, prices decrease to the level of marginal costs. In between there exist equilibrium solutions with price dispersion.

Baye and Morgan (2001) show in their model that even with homogeneous firmss and customers price dispersion can exist, if the operator of the clearinghouse fixes profit maximising entrance prices: in this case entrance prices for consumers are fixed at a level low enough that everybody uses the

[7] Despite the different approaches "clearinghouse"-models are very similar to "search-theoretical"-models with a fixed number of searches. The main difference is that "clearinghouse"-models mostly are oligopolistic models and therefore have a fixed and small number of enterprises and no continuum of enterprises competing for customers.

clearinghouse, is fully informed and buys with the cheapest supplier. Price dispersion develops in this case because firms have to pay a fee if they want their offers listed with the clearinghouse, but not all firms make use of that possibility. It is astonishing that – even though customers buy at the lowest listed price – firms gain (positive) profits which are proportional to the costs of the use of the clearinghouse.

Particularly relevant in our case are the models in which enterprises do have different costs. Spulber (1995) and MacMinn (1980) show that different costs in enterprises are sufficient to cause price dispersion (and to annul the LOP) even if all customers dispose of all information. That applies for an oligopolistic market (Spulber) as well as for a market with a continuum of operators, where customers search for a certain number of offers (MacMinn).

The empiric branch of price dispersion research equally shows a considerable number of publications. These works also show that price dispersion for homogeneous goods is a common feature of our economic system. Most empirical tests of the LOP thus had negative results – i.e. the LOP was not confirmed (The new Palgrave Dictionary of Money & Finance, 1992, p. 563). Baye – Morgan – Scholten (2005) describe the research results on the LOP as follows: "Simple textbook models of competitive markets for homogeneous products suggest that all-out competition among firms will lead to the so-called law of one price. Yet, empirical studies spanning more than four decades ... reveal that price dispersion is the rule rather than the exception in many homogeneous product markets. The observation that the prices different firms charge for the same product often differ by 30 percent or more led Hal Varian to suggest that "the `law of one price´ is no law at all" (Varian, 1980, p. 651). Astonishingly not even the internet has had the effect that price dispersion were reduced. Apparently the lower information costs do not help the LOP to its breakthrough.

The different studies on the LOP and on price dispersion between regions, cities, countries or on over time are by themselves explicitly interesting. For example Froot – Kim – Rogo (2001) examine the development of prices regarding agricultural products in the Netherlands and Great Britain over a period of 700 years. Wolf (2004) analyses – again based on the measurement of price dispersion – whether between 1500 and 1800 there existed an integrated European labour market. Many studies show that even when the different shaping of variables which influence price dispersion (e.g. different estate prices in different cities) are being considered and calculated, there still is unexplained price dispersion. That means that convergent prices – as indicated by the LOP – cannot be confirmed (see Baye – Morgan – Scholten, 2005).

The discussions on the LOP nevertheless will continue, because it constitutes a central assumption of the neoclassic economic theory. Lacking empirical support for the LOP entails that consumers as well as operators do ignore possibilities to increase welfare. Such a behaviour would question some fundamental assumptions of economic theory on welfare- and utility maximising behaviour,

respectively would mean that the real world is somehow more complicated than simple mathematical models are trying to suggest. (see Pippenger – Phillips, 2005, p. 2).

Often it is sufficient to make model assumptions more closer to reality in order to achieve a better correspondence between theory (regarding the LOP) and practice. Only the dismissal of the assumption of "full rationality" of economic subjects (i.e. no one makes mistakes, is mistaken, interprets information wrongly, is confused by complex tariffs…), and the introduction of "bounded rationality" may reduce the gap between theoretical models and lived reality. Here some works show that limited anticipations in theoretical models produce similar patterns of price dispersion as have been observed in laboratory experiments and with internet price comparisons (for a survey see Ellison (2005)).

Summarizing it can be stated that

- The "law of one price" (LOP) can be found only in simple mathematical models. Theoretical as well as empirical research on the law of one price, i.e. price dispersion, come to the conclusion that LOP in this simple form does not exist. Particularly different costs structures with enterprises are a sufficient condition for the development of price dispersion. In this case even mathematical models do not show a uniform market price. The reason for price dispersion lies in the fact that the search for information as well as the distribution of information is expensive and costly.

3.1.2 Asymmetries in costs, average costs and output amount, first mover advantages and late comer disadvantages, converging market shares caused by regulation?

The second important branch of arguments for individual termination fees is based on asymmetries in costs which are caused by regulation. The differences in costs are based on – this has been said more than often – the different size of operators. That itself is a clear consequence to the time of market entry which again was due to regulative decisions.

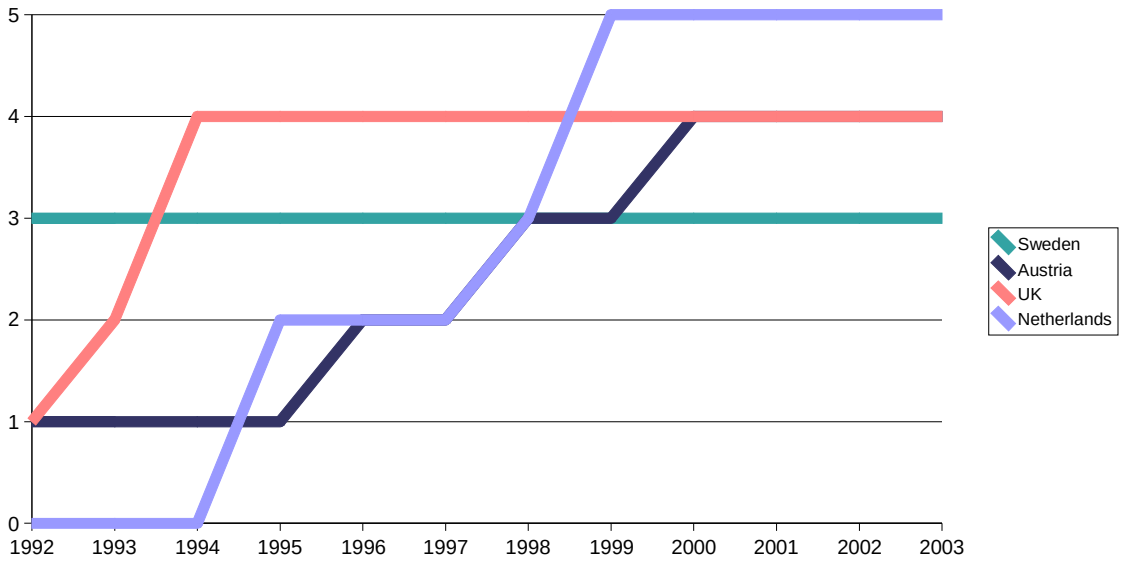
Regulative decisions have been very different in Europe. In order to illustrate the different ways of action, graph 1 describes the sequencing of market entry based on regulatory decisions in the Netherlands, Sweden, the UK and Austria (see Leo 2004):

- In Sweden three GSM-operators entered the market in the year 1992. The operators therefore had a comparable starting position apart from their different history regarding analogue mobile services.
- In Great Britain as well the GSM900 and GSM1800-operators entered the market with only short differences in time. The first operator started to operate in 1992, a second followed in

1993 and in 1994 two more operators entered the market. Only two years passed therefore between the market entrances of the first and the last operator.

- In the Netherlands the history of mobile communication services started only in 1995 - quite late in comparison to other European countries. But it started with two operators immediately, followed by two more two years later and a fifth operator one year after that.
- In Austria in contrast the operator who had started in 1992 held a monopoly until 1996, until 1998 the market was organised as a Duopoly, the fourth operator following in the year 2000. Austria therefore – if the average of all countries is taken as a benchmark - granted the licences with hesitation in the beginning, but afterwards granted more licences than average in Europe.

Graph 1: Market entrance sequences in the Netherlands, Sweden, the UK and Austria



Source: ERO

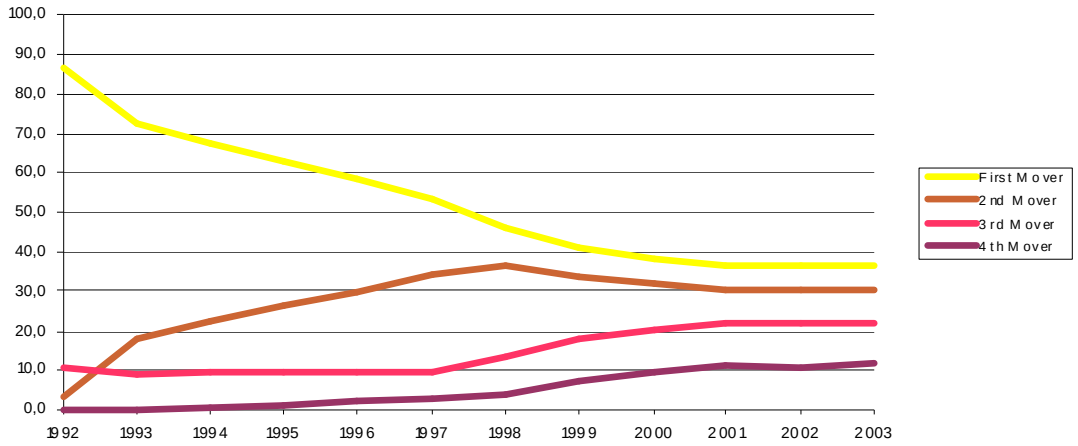
The countries which had already reached the final number of operators on the market – which had therefore followed a fast course of liberalisation – include Luxembourg (with only 2 operators though), France, Portugal, Sweden, Denmark and Great Britain. In the other countries it lasted until the year 2001 until all (GSM)licences had been granted.

From these liberalisation strategies result considerable first mover advantages. These are even bigger the longer a operator had the chance to hold a monopoly on the market.

It is interesting that the (accumulated and averaged) market shares of the operators who entered the market as first, second, third, fourth or fifth may be put in exactly that order. The placing of operators

according to their market shares – as an average through the whole of Europe - exactly reflects the order of market entrance. In detail first operators on the markets with three operators dispose of market shares of about 51%, the second of about 33% and the third of 16%. In markets with four operators average market shares of first movers are clearly below, i.e. 36%, the second operator holding 30%, the third 22% and the fourth 12% (see Graph 2).

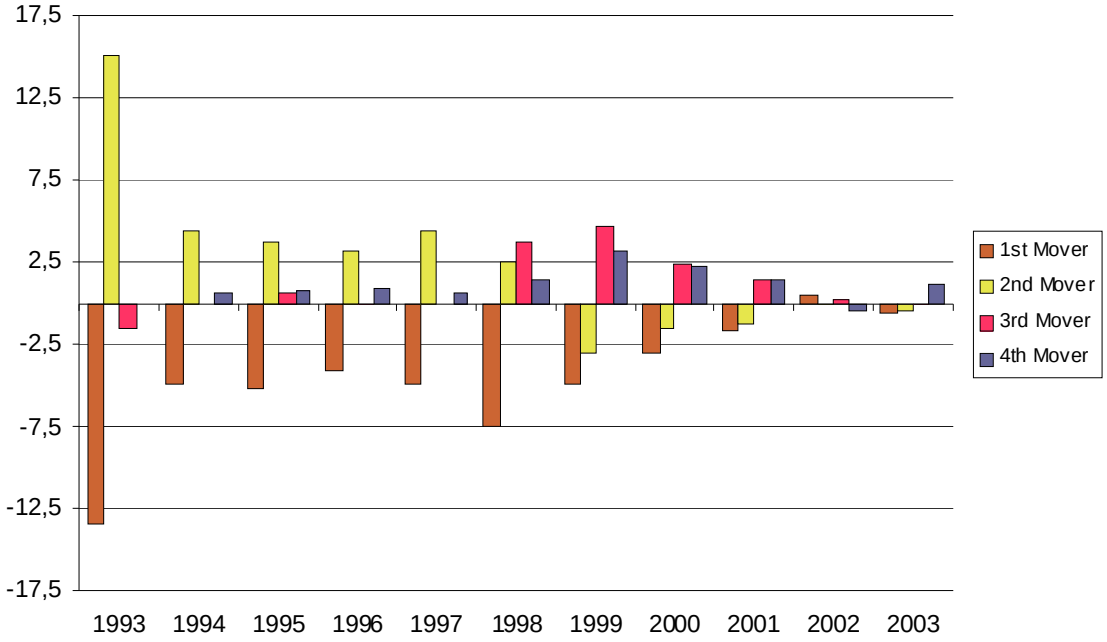
Graph 2: Development of market shares in European markets with 4 GSM operators



Source: Leo, 2004

Economic estimations confirm these statements. The main driving forces for the development of market shares are long experience in the mobile communication business – measured by the fact that analogue services had already been offered -, the time gap to the first operator and the number of competitors. If an operator had offered analogue services, that still has a clear consequence even in the year 2003: the market share of such an operator is on average about 10 to 12 % higher than the ones of operators who have started the business with GSM-services only. The backlog resulting from a later market entrance may be quantified: the backlog per year with regard to the first mover reduces the market share about 4%. That stresses the fact that first mover advantages still do exist in the year 2003 even if their importance reduces on a long term view. The convergence process has though slowed down considerably since the year 2000. Changes in market shares only take place to a small extent due to a reduced stream of new customers and a low willingness of established users to change their operator. As market share gains amount to 1-2 % per year on average (see graph 3), a newcomer theoretically needs 10 to 20 years to reach a market share of 20%. That implies the conclusion that medium-term a convergence of market shares will not take place.

Graph 3: Changes in market shares in European countries with four GSM-operators



Source: Leo, 2004

It has to be pointed out that convergence of market shares – even if there is a faint tendency into that direction – is no law of nature and it therefore is in no way secured that balanced market shares will develop on this market.

Noteworthy is also that the asymmetries resulting from regulatory decisions cannot be removed short-term, but will be observable medium- to long-term. Market share developments across Europe in the past years are in glaring opposite to the optimistic convergence assumptions of RTR. RTR assumes that first mover advantages are created by switching costs and that those "…..do only temporarily exist (purchase of new equipment and binding terms of contracts) or can be removed by regulation (introduction of the transition of phone numbers). A longer-term erosion of first mover advantages may therefore be expected and – not least because of the relatively symmetric cost functions – an alignment of market shares (and therefore costs)." Here remains the question what is meant by "longer-term".

Summing up a regulation strategy which relies on fast convergence of market shares (and therefore cost structures), stands on weak ground. The analysis of the European market clearly shows that

- distinct first mover advantages can be observed. Per year of backlog with regard to the first mover a late comer has a lower market share of about 4%.
- first mover advantages are long-term - the convergence process regarding market shares is moving very slowly
- the differences between market shares have mainly been caused by regulatory decisions (licensing strategy) and
- that there is no guarantee that market shares will come to a balance at all

4. Uniform termination fees and allocative efficiency

Allocative efficiency is given when resources are allocated in a way that the utility from their use is maximised. In this case the (optimal) number of goods is produced bringing about the biggest benefit for society. A system which is allocatively efficient reaches a Pareto-optimal use of resources: here it is no more possible to place individual in a better position without having to place another in a worse position.

A product is described as allocatively efficient when prices are equal to marginal costs. If prices are not equal to marginal costs, wrong price signals are being sent to consumers. Prices below marginal costs lead to a higher demand for the product than is preferable. Prices above marginal costs have the inverse effect.

As a consequence a uniform termination fee at the level of the most efficient operator would not improve allocative efficiency but worsen it instead, because a uniform termination fee will lead to losses regarding the termination of mobile calls with all operators but the most efficient one. In this case – this has been recognized by the RTR as well – enterprises which up to now have assured intensive competition are put at a disadvantage: "If for example termination fees for all operators were determined at the level of (average) costs of the one operator with the highest amount of output (market result with perfect competition), a operator with a small amount of output (newcomer) would be confronted with a considerably negative cost coverage and that might – size advantages are effective on all mobile communication markets – in connection with negative contribution margins lead to a leaving the market by that operator (RTR, 2004B, p.38). Although it must not necessarily be assumed that the operator immediately leaves the market, the argumentation clearly shows that all enterprises – not only newcomers – which are smaller than the most efficient one, are put at a disadvantage by that determination strategy. Allocative efficiency is endangered in this case, because prices for the termination of calls are set below costs for all operators but the most efficient one and therefore too many termination services are requested.

Enterprises with losses regarding termination services have two possibilities to react. They can rise prices for other types of calls and compensate the losses incurred through the termination of calls

from other networks. This causes further allocative distortions as the prices for services which cross-subsidise termination have to deviate further from underlying costs.If the market allows this, then the "receiving party pays-principle" is implicitly implemented by operators running a deficit by the termination of calls on its network. If prices cannot be increased because of strong competiton the profitability of this investment is lowered which may result in a market exit.

These shown allocative inefficiencies caused by a uniform termination fee constitute only the static part of the problem. The scope of action of smaller operators is restricted by the losses incurred by the termination of calls from other networks. That implies negative dynamic effects on intensity of competition on mobile communication markets which usually is fuelled by the following "mechanism": Entrants have to undercut the prices of established operators in order to gain clients. Prices of newcomers have to be clearly lower than those of the incumbents, because they have to reimburse clients for their switching costs and at the same time also for other (actual or only believed) disadvantages (smaller market coverage, unknown branding etc.). Additionally newcomers or smaller operators are more easily prepared to lower their prices, because the customer base is comparably small and therefore losses from price reductions with these customers are in good relation compared to potential increases of customers. Operators with a big number of customers have to face considerable losses with existing customers by price reductions and may only expect – in relation to the existing clientele – a modest increase in new customers. The probability that established operators will introduce price reductions is therefore much lower than that of entrants or small operators.

A uniform termination fee would also lead to a weaker competition dynamism in the course of time, because the room to manouvre for smaller operators would be restricted over-proportionally. These negative effects occur independently from the level of a uniform termination fee and lead to allocative distortions as long as the operators have different cost structures. As a consequence the problem of allocative inefficiency is not improved but worsened by uniform termination fees.

The RTR has recognized this problem too and stated as follows: …an efficient termination price "… is therefore principally suitable to remove allocative inefficiencies (excessive prices) in connection with competition problems ….. as well as discrimination/subsidizing problems …; an efficient termination price secures that no additional profits are gained by this service which might be used for subsidizing other services (on-net tariffs in particular), respectively that the termination service itself needs no subsidy. Such an obligation is in accordance with …. the nature of the most important competition problems identified in competition analysis, i.e. the problem of "excessive prices" (RTR, 2004B, p. 29).

These statements emphasise that a uniform termination fee according to the criteria of the RTR constitutes no efficient termination price as long as cost structures have not aligned. Until that is the case mobile termination fees may – if allocative inefficiency shall not be increased – not be decreased below the level of individual costs for the termination (when productive efficiency is given). The

arguments which have guided the RTR when "overruling" this understanding, appear valid only in part: the "one price rule" does not exist in this simple form just as little as the assumed market structures are adequate for the problem. A direct alignment of mobile termination fees with actual costs therefore seems sound and obvious. The further development – i.e. the coming regulative decisions – has to result from the actual development of costs which itself is determined by the amount of output. A uniform termination fee may only be introduced when cost structures have aligned to a large extent and convergence has in fact taken place. If it is forced beforehand the allocative inefficiencies are intensified and competition dynamics weakened. Along with that a weakening of the dynamic factor which have made the mobile communication market an example for a positive development process would take place: fast growth, strong technological progress, substantially reduced prices, increasing jobs, increasing exports ….

5. Conclusions

In contemplating the optimal regulatory regime for mobile termination fees the RTR concludes that a uniform termination fee is the correct answer to the given competition deficits in this segment of the mobile communication market. In order to achieve a uniform termination fee, individual gliding paths are being proposed. The Telecom Control Commission has followed this opinion and fixed it in a decision. Mobile communication operators have – for different reasons each – filed appeals against this decision.

The main target of the present work was to examine the arguments which RTR had given as the explanation for its preference of a uniform termination fee. Above all stands the opinion that the decisions of the regulator should "imitate" a market result. The market result to be imitated can be seen in a market with perfect competition where as a result of market forces one price (one price rule) set by the most efficient operator develops. At the same time it is assumed that a fast convergence process of market shares will take place and that therefore – admittedly considerable - existing cost differences will balance. According to the RTR a uniform termination fee improves allocative efficiency and has no stimulating effects on foreclosure strategies of operators – which in Austria are of little relevance anyhow.

These opinions of the RTR are challenged here by stating that a uniform termination fee would increase allocative inefficiencies and lead to less dynamic competition on mobile communication market. Uniform termination fees will only be appropriate when cost differences will have disappeared.

This opinion is based on the following assumptions:

1. The market model used by RTR is not appropriate for determining mobile termination fees. The RTR assumes perfectly competitive markets and therefore a single price at the level of the most efficient operator. Actually this "solution" can not arise with respect to mobile termination, because the operators are monopolists and therefore do not interact with each other, but only follow their own – possibly monopolistic - pricing strategies. As a consequence regulation should take measures from the already developed repertoire for monopoly markets in order to restrict the abuse of market power. Usually this is done by price regulation which bring prices closer to cost and by measures which improve productive efficiency – possibly by way of a RPI-X regulation. These measures can though only be taken if individual termination fees are set – such as has been regulatory practice until now.
2. Even if – as has been assumed by the RTR – a market solution is taken as analogy for the development of regulatory interventions regarding the mobile communication market, the repertoire of possible market solutions is clearly bigger than the solution chosen by the RTR. The RTR favours perfect competition and therefore a price formation at the level of the most efficient operator which will then according to the "one price rule" apply for all operators. Research on this "one price rule" (which is better known as the "law of one price" (LOP) or in more general terms as price dispersion) shows that this rule can hardly be observed in reality, not even on markets for homogeneous goods, because many – specific to the enterprises too – factors influence the formation of prices. Even if these factors - which are responsible for the heterogeneity of suppliers but also customers – are taken into consideration, inexplicable price dispersion remains. A specific result of the research on price dispersion is the fact that the "law of one price" does not apply if the enterprises have different cost structures. Thus theoretical research suggest individual termination fees as long as cost structures have not converged.
3. The argumentation of the RTR assumes as well that the introduction of uniform termination fees is possible because convergence of operators' costs takes place. As the cost structure of an enterprise in mobile communicatiosn is to a large extent determined by its size, a convergence of market shares has to take place beforehand or a strong growth of output to make all operators produce on the flat part of the costs curve. Examinations of market share developments on European GSM- markets show that first mover advantages and late comer disadvantages are persistent and will only die away in a medium to long term perspective. Although there is a faint tendency of market share to convergence this is no law of nature. What is important is the fact that first mover advantages result from regulatory decisions: the licencing strategies for mobile operators are responsible for the existence of first mover advantages. It would therefore be even

more astonishing if latecomers were again put at a disadvantage by regulatory decisions throught the introduction of uniform termination fees.

4. The introduction of uniform termination fees discriminates against small operators as these have higher unit costs because of lower economies of scale and would therefore sustain losses through the termination of calls. These losses would have to be subsidized by an increase of prices of other types of calls. From this mechanism results a reduction of allocative efficiency, because termination fees would be below costs, thus the signalling effect of this price is distorted and hence too many call will be terminated on this network. Effects are inverse for those services whose prices have to be increased to balance the losses incurred by termination fees below cost. Uniform termination fees are allocatively efficient for the most efficient operator only, because this operator is in a neutral position as the termination fees for all operators are determined at the level of his own costs.
5. The losses which smaller operators have to accept through the termination of calls in their network, causes the level of competition to be considerably reduced. This is even more regrettable as the small operators have been the most dynamic competition factor until now on the Austrian mobile communication market.

The simplest solution by far – and especially the one where no conflict with reality emerges – is that one accepts that the operators are monopolists each and that regulatory measures – all following the same principles - will have to be taken for each monopoly separately. In order to secure allocative efficiency, prices have to be equal to marginal costs. Usually an extra charge for overheads is accepted here in order to facilitate the arrival at the profit zone. Therefore the level of costs of each monopolist has to be determined, examined whether the service is produced efficiently – enough information on the cost function exists to do this determination – and based on that the prices have to be fixed at a level where costs are recovered. The consequence are individual termination fees guaranteeing equal treatment of the enterprises: each operator gets the possibility to recover the costs arising from the termination of calls. A medium- to long-term convergence of cost structures will lead to a uniform termination fee in this regulatory setting. Uniform termination fees should therefore be the result of a market process and should not be imposed on the operators.

This strategy leads to an equal treatment of all operators, because no profits nor losses emerge from terminating call in a any of the networks. Even though that is a clear improvement in comparison to uniform termination fees at the level of the most efficient operator, higher termination fees for newcomers or small operators would be indicated in order to stimulate a high level of strong competition.

References:

Baye, M.R., Morgan, J., Information Gatekeepers on the Internet and the Competitiveness of Homogeneous Product Markets, American Economic Review, 91 (3), 454-474, 2001

Baye, M. und J. Morgan . Price Dispersion in the Lab and on the Internet. Rand Journal of Economics 35.449-466, 2004.

Baye, M. R., Morgan, J., Scholten, P., Information, Search, and Price Dispersion, in: Hendershott, T. (Ed.) Handbook on Economics and Information Systems, Elsevier, 2005.

Diamond, P., A Model of Price Adjustment, Journal of Economic Theory, 3, 156-168, 1971.

Ellison, G., Bounded Rationality in Industrial Organization, mimeo, 2005.

RTR, (2004A), Wirtschaftliches Gutachten für die Telekom–Control-Kommission in den Verfahren M 14/03, M 15/03, Gutachter: Felder, S., Liu, P.-W., Neubauer, R., Pisjak, P., Zlabinger, D., Wien, Mai 2004.

RTR, (2004B), Wirtschaftliches Gutachten für die Telekom–Control-Kommission in den Verfahren M 15/03, (Terminierung im Mobiltelefonnetz der Hutchison 3G) betreffend Regulierungsinstrumente, Gutachter: Felder, S., Liu, P.-W., Neubauer, R., Pisjak, P., Zlabinger, D., Wien, Juli 2004.

Froot, K. A., Kim, M., Rogo, K., The Law of One Price over 700 Years, 2001, http://www.economics.harvard.edu/~krogoff/lop.pdf.

Europaische Kommission, Towards the Personal Communications Environment: Green Paper on a common approach in the field of mobile and personal Communications in the European Union; COM(94)145 , 1994.

Laffont, J. J., Tirole, J. Competition in Telecommunications, CES, 2000

Leo, H., First Mover Advantages in der Mobilkommunikation: Der Einfluss des Markeintrittszeitpunkts auf die Marktanteilsentwicklung, Wien, 2004.

MacMinn, Richard D, Search and Market Equilibrium, Journal of Political Economy, University of Chicago Press, vol. 88(2), pages 308-27, April, 1980.

Officer, Lawrence H., 1986, The Law of One Price Cannot Be Rejected: Two Tests Based on the Tradable/Nontradable Price Ratio, Journal of Macroeconomics, Vol. 8, No. 2, 159-182.

Pippenger, J., Phillips, L.,Some Pitfalls in Testing the Law of One Price in Commodity Markets, Department of Economics,University of California, Santa Barbara, 2005.

Rosenthal, R.W., .A Model in Which an Increase in the Number of Sellers Leads to a Higher Price, Econometrica, 48(6), 1575-1580,1980

Rothschild, M., Models of Market Organization with Imperfect Information: A Survey, Journal of Political Economy, 81(6) 1283-1308, 1973.

Spulber, Daniel F, Bertrand Competition When Rivals' Costs Are Unknown, Journal of Industrial Economics, Blackwell Publishing, vol. 43(1), pages 1-11, March, 1995.

Stigler, G., The Economics of Information, Journal of Political Economy, 69 (3), 213-225, 1961

Newman, P., Milgate, M., Eatwell J., (eds.),The New Palgrave Dictionary of Money & Finance, London, Macmillan Press, 1992.

Varian, H.R., A Model of Sales, American Economic Review, 70, 651-659, 1980.

Wolf, N., A European Labour Market for Craftsmen? Evidence from 17 European Cities 1500 – 1800, LSE, 2004.