

**An Analysis of the Efficient Scale Determination Approach  
Proposed in the Draft Commission Recommendation  
on the Regulatory Treatment of Mobile Termination Rates in the EU**

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## 1. Background

The Commission of the European Communities is currently preparing a Recommendation on the regulatory treatment of mobile termination rates in the European Union (EU). On 26<sup>th</sup> June 2008, the Commission initiated a public consultation on a draft version of its recommendation and an accompanying note to the main document. The present paper responds to the Commission's request for assessments of whether this regulatory intervention can be expected to achieve its objectives.

The recommendation includes the suggestion that “National Regulatory Authorities [NRAs] should set symmetric termination rates based on the *costs* incurred by an *efficient* operator” (Commission Recommendation 2008 [CR], p. 7, no. 1; italics added). In order to calculate these costs the Commission imposes the obligation on NRAs to “construct (cost) models which set wholesale termination charges as close to marginal cost as possible” (Commission Staff Explanatory Note [CSEN] 2008, p. 15). More specifically, the Commission urges NRAs to “use a bottom-up modelling approach using long-run incremental costs [LRIC]” (CR 2008, p. 7, no. 2).

The use of such cost models requires assumptions regarding the scale of mobile network operators [MNOs] because in the mobile communication industry the notion of *efficiency* is closely linked to an MNO's size.<sup>1</sup> The Commission indicates that NRAs should set the scale of an efficient MNO at “1/Number of Mobile Infrastructure Operators” (CR 2008, p. 10; CSEN 2008, p. 22). This means NRAs have to fix an MNO's market share at 33%, 25% or 20% in markets with 3, 4 or 5 MNOs, respectively in their cost model computations to derive a benchmark against which to decide the allowable wholesale mobile termination rates (MTR) in a country. The Commission's “efficient scale” concept further implies a competitive mobile communication market, which is characterized by *equal* market shares of *all* infrastructure providers.

The Commission believes that its MTR recommendation “can be expected to lead to enhanced competition and lower retail tariffs across the range of consumers while still facilitating efficient cost recovery and appropriate investment incentives” (CSEN 2008, p. 15). The purpose of the present paper is not to question the overall thrust of the Commission's recommendation. Rather, it aims at drawing attention to a seemingly “technical” aspect of the recommendation which has important implications for the development of competition in the national mobile communication service markets of the EU countries. This aspect is the Commission's approach to determine “the appropriate efficient scale” (CR 2008, p. 7, no. 7) of an

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<sup>1</sup> MNO size is generally measured by the absolute number of subscribers/active SIM cards or the absolute traffic volume of a supplier or by its subscriber/SIM card or traffic volume share in its licence area (which is equal to a country in the EU).

MNO in modelling MTR costs and the likely effects of this approach on the competitive positions of different types of MNOs in a national market. It is addressed in section 2 of this paper. The focal topic of my analysis also has implications for the duration of a transition period which the Commission envisages as meaningful to move from the current MTR regulation to the new regime favored in the recommendation. Consequently, section 3 of this paper contains brief reflections on the appropriate length of this transition period. Section 4 presents the main conclusions following from the arguments in the preceding sections of my analysis.

## 2. Determination of an MNO's Efficient Scale

It is commonly acknowledged that costs per call minute of an MNO strongly depend on the number of its subscribers and the traffic volume, which the firm generates (e.g., see European Regulators Group [ERG] 2008, p. 90; Brinkmann et al. 2006, pp. 51-53; Kruse 1993, pp. 111-124). Put in more technical terms, an MNO's unit costs are strongly scale driven. Therefore, even if MNOs optimally exploit their resources the minimum per unit costs, which is achievable diverges between operators with different sizes.<sup>2</sup>

According to the Commission recommendation NRAs should base their MTR decisions on a "single efficient cost level" (CR 2008, p. 5, no. 15) assuming equal market shares of all MNOs in a country. Unfortunately, to date there are large market share/scale differences between MNOs in the various EU countries. For instance, in the France the largest MNO reported a SIM card share of 44.1% at the end of 2007 whereas the market share of the third largest MNO amounted to 16.9%, i.e. was 27.2 percentage points lower than that of the leader (Credit Suisse 2008, p. 64). Similarly, at the end of 2007 the SIM card market share of the largest MNO in Germany was 37.0%, which gave this firm a lead of 24.2 percentage points relative to the 12.8% share of the smallest player among four MNOs in this country.<sup>3</sup>

Therefore, in many EU countries MNOs exist with market shares much *lower* than the share, which would have to be assumed by an NRA in its MTR model calculations. These firms are likely to be forced to offer wholesale mobile termination services *far below* their unit costs even though they operate in an efficient/optimal manner relative to their size. Similarly, there is a considerable number of MNOs with market shares *much higher* than the share an NRA will be obliged to use in computing MTR benchmarks. These corporations could have the opportunity to sell wholesale mobile termination services *above* their unit costs even if their op-

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<sup>2</sup> This fact is also stressed in a recent ruling of 4<sup>th</sup> April 2008 of the Brussels Court of Appeal which suspended a decision of the Belgian NRA of 18<sup>th</sup> December 2007 on MTR allowed in Belgium; see La Cour D'Appel de Bruxelles 2008, p. 19 (no. 21). URL: <http://www.bipt.be/ShowDoc.aspx?objectID=2841&lang=en> (access: 07/17/2008).

<sup>3</sup> Raw data to calculate SIM card market shares for Germany were taken from the German NRA's website. URL: [http://www.bundesnetzagentur.de/enid/157a1c7f1eb433cecb43a975de09299b,0/Marktbeobachtung/Mobilfunkdienste\\_vw.html](http://www.bundesnetzagentur.de/enid/157a1c7f1eb433cecb43a975de09299b,0/Marktbeobachtung/Mobilfunkdienste_vw.html) (Access: 07/19/2008).

erations expenses are inefficient relative to their size (but are still lower than the MTR set by the NRA). In any case, smaller MNOs with market shares below a country's average will experience a stronger absolute and relative margin decrease on a single MTR imposed on any MNO in a country than their relatively larger competitors because the latter group benefits more strongly from scale-related cost reduction possibilities.

The stronger negative economic impact of the Commission's efficient scale concept on smaller MNOs compared to the consequences for larger MNOs will be further amplified for those small MNOs with large shares of *prepaid customers* which are typically characterized by low average revenues per user [ARPU]. For prepaid customers (incoming) termination traffic revenues regularly make up a higher proportion of the total revenues generated by a user than for postpaid accounts.<sup>4</sup> This implies that the drastic MTR reductions, which will result from the Commission's efficient scale and avoidable costs concepts, will lead to relatively stronger margin squeezes for an MNO's prepaid than for its postpaid customers. Consequently, the financial vitality of MNOs which have focused on attracting prepaid customers with low ARPU will be more severely hampered by symmetric MTR set close to marginal costs than that of their counterparts whose business models are more geared toward postpaid segments with high ARPU. The Commission's recommendation in its current form imposes the challenge on MNOs which have targeted prepaid accounts to change their competitive strategies in the direction of capturing higher shares of the postpaid market in order to compensate for the relatively larger fixed cost contribution losses triggered by the Commission's desired significant MTR cuts.

In many EU countries MNOs with smaller market shares are just those ones which have a relatively high proportion of prepaid customers because the postpaid segment was already rather mature and saturated when they were permitted to enter into a country's mobile market. Hence, a swift transition from the current MTR regime to the Commission's new approach based on a single per country MTR close to marginal costs, which refuses to take notice of potential time- and frequency-related structural asymmetries between mobile infrastructure firms operating in a country, would have particularly devastating effects on smaller late entrants with high proportions of prepaid customers characterized by relatively low outgoing call volumes.

To sum, in numerous EU countries the Commission's "appropriate efficient scale" concept will give one or two dominant MNOs on a national market, which have already benefited for many years from an earlier market entry date and a favorable radio frequency allocation (see below), a relative margin advantage from wholesale MTR over their smaller competitors,

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<sup>4</sup> The reason for this revenue structure difference is that the average prepaid customer has a relatively stronger preference to be called by others rather than actively calling somebody else.

which typically occupy a “follower” position in terms of their market entry timing, spectrum endowments and addressable customer segments. The wholesale margin advantage/mark-up of the “early movers” provides them with additional opportunities (e.g., reduction of on-net prices to keep high value postpaid customers from switching to smaller competitors) to reinforce their already strong positions on the retail market. On the other hand, follower MNOs, which have already suffered from an uneven playing field in the past, are subjected to MTR much lower than their costs although their cost level may be efficient relative to their scale. It is obvious that a regulatory regime forcing efficient late entrants (and particularly those whose focus is to make mobile services accessible to less affluent consumers) to sell mobile termination services at a significant loss deters followers from making further network investments. Rather, it pushes smaller MNOs into a downward spiral. This vicious circle renders it probable that their owners sell their shares to an already powerful player with an above average retail market position or take the MNO off the market if antitrust rules prevent a takeover of their business by another large MNO.

The Commission contends that asymmetric MTR, which are derived especially for those MNOs, whose market share is below the value observed in a situation of equal market shares across all competitors, “may give rise to inefficient entry” (CSEN 2008, p. 18). This conjecture is not tenable for mobile communication markets because their entry barriers are much too high to lure new “inefficient” mobile infrastructure providers into this business. The absurdity of the Commission’s inefficient entry fear can be easily inferred from the supply side development of the mobile communication markets in the various EU countries: There is not a single example of a *new* MNO which dared to enter a national market after the completion of UMTS licence allocations in the various EU countries.

Occasionally it is argued that the Commission’s interpretation of the efficient scale construct does *not unfairly* discriminate against smaller MNOs because the smaller subscriber base of these firms is simply a consequence of their managements’ incompetence to conquer a market share close to that of their competitors. However, several scholarly investigations (Bijwaard et al. 2008; Gerpott 2008a and 2005; Sung 2005; Nunn/Sarvary 2004; Rieck 2004; Knyphausen-Aufseß et al. 2002) provide strong empirical evidence that today’s market share discrepancies between MNOs in various EU country markets can largely be attributed to three factors which were outside the control of an MNO’s management.<sup>5</sup>

*First*, an MNO’s current SIM card market share and profitability level are significantly positively correlated with the time span passed since its licence assignment. Market entry date differences reflect the staggered licence award procedures used in most EU countries during the

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<sup>5</sup> Such factors are also named “exogenous cost drivers” (ERG 2008, p. 82) or “exogenous cost factors” (CSEN 2008, p. 17).

1990s. *Second*, the present average SIM card market share and profitability level of firms operating a GSM900-network are significantly higher than the mean share/level of their counterparts running a DCS1800-network even after controlling for date of entry differences between the two MNO groups. This differential is caused by propagation and transmitter power differences between 900 MHz and 1800 MHz radio access infrastructures which in turn lead to smaller radio network cell/higher numbers of base stations and higher per unit network investments and operations costs of competitors with DCS1800-networks, particularly in less densely populated rural areas (see ERG 2008, pp. 83-85; Gerpott 2008a, pp. 55-58; Brinkmann et al. 2006, pp. 62-85). The favorable production cost position allowed GSM900-MNOs additional customer acquisition, marketing and network quality improvement spending without sacrificing their high levels of profitability. *Third*, for many years NRAs in numerous EU countries allowed MNO to set MTR significantly above their costs. Since mobile termination traffic volumes of early entrants were much larger than those of late entrants, early movers could already draw huge profits from wholesale mobile termination services during the many years of their market presence. This profit accumulation opportunity was not available for late entrants with much smaller subscriber stocks and worse customer acquisition possibilities. Therefore, a regulatory regime with just one single MTR across all MNO in a country will have stronger devastating effects on the competitive prospects of followers (with less “deep money pockets”) than on early movers (with enormous “financial muscles”).

### 3. Transition Period Duration

The Commission appears to basically acknowledge the existence of the various “exogenous factors” on the one hand (see CR 2008, p. 5, no. 15; CSEN 2008, p. 9 and p. 15). On the other hand, the Commission’s proposed short period of transition to its new MRT regime appears to rest on the idea that brand image, quality perception, customer mix/ARPU, site cost, network investment, customer acquisition and retention cost advantages of early entrants with GSM900-networks stemming from the various exogenous factors explained above vaporize rather quickly.

Unfortunately, this tenet is not in line with empirical research findings which reveal that early mover advantages *endure* in various national mobile communication markets of EU countries *over many years* (see Gerpott 2008a, pp. 46-47 and 2008b, pp. 565-566 for reviews of the evidence). These scholarly findings can be supplemented by taking a look at the MNOs’ SIM card market share development in Germany.

At the end of 2007 the early movers *T-Mobile Germany* and *Vodafone D2*<sup>6</sup> had a joint SIM card market share of 71.9%. Three years earlier (i.e., at the end of 2004) their combined share

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<sup>6</sup> *Vodafone D2* started to market digital mobile communication services in late June 1992, *T-Mobile Germany* followed only a few days later in early July 1992. See Gerpott 2008b, p. 576.

amounted to 76.3%.<sup>7</sup> This means that the average annual market share decrease of the two German early entrants was 1.47 percentage points during the years 2005 to 2007. Assuming that each of the follower MNOs in Germany, *E-Plus* and *O2 Germany*,<sup>8</sup> benefits equally from the dominant players' losses and that the latter keep on losing 1.47 percentage points SIM card market share per year it would take *E-Plus* (*O2 Germany*) more than 13 (16) years to increase its 15.2% (12.8%) share obtained at the end of 2007 to a 25% value. However, just this value would have to be assumed by the German NRA for an efficiently scaled MNO in its mobile termination cost model calculations according to the efficiency concept suggested in the Commissions recommendation.

The Commission states, that “a period of transition until 31.12.2011 should be considered long enough to allow NRAs to put the [MTR] cost model in place and for operators to adapt their business plans accordingly” (CR 2008, p. 6, no. 19; see also CSEN 2008, pp. 27-28). The illustrative computations for the German market in the preceding paragraph suggest that the Commission's designated transition period is much too short. The duration of the proposed period is neither derived from any conceptual reasoning nor from empirical data. Thus, it appears as rather arbitrary. It is clearly not in line with the market share changes of late entrants in various national markets of EU countries actually observable in the course of the recent past. Finally, the recourse to an undifferentiated short transition period across all EU countries would leave very little room for NRAs to derive a country-specific optimal duration of this period which accounts for peculiarities of their national markets (e.g., prepaid-postpaid customer mix, churn rates).

#### **4. Conclusions**

To summarize, the Commission's notion of “the appropriate efficient scale” of an MNO to be used in cost model calculations in order to derive MTRs is very likely to promote reductions in the competitive intensity of mobile communication markets in most EU countries due to its discrimination against smaller late entrants. Scholars in economics and management practitioners alike agree that a lowered competitive intensity in a national mobile communication service market leads to less steep mobile service price reductions, worse mobile service quality and less aggressive mobile service innovation efforts over time (for a research review see Gerpott 2008a, pp. 87-88; Jakopin 2006, pp. 69-71 and p. 234). These developments will harm European mobile communication service customers. Consequently, the conclusion is inevitable that the efficiency concept underlying the Commission's MTR regulation approach is at odds with what the Commission aims at with its intervention, namely “a level playing field

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<sup>7</sup> The source of the market share figures can be taken from footnote 3 above.

<sup>8</sup> *E-Plus* sales start was in May 1994. *O2 Germany* launched its offers in October 1998. See Gerpott 2008b, p. 576.

between operators, and .. further reductions in termination rates to the benefit of European consumers.”<sup>9</sup>

In essence, the Commission’s appropriate efficient scale concept rests on the proposition that the microeconomic textbook notion of an industry with a single equilibrium market price and with suppliers of equal size with identical production functions and resulting identical unit costs and with sales prices being the only competitive lever is a proper starting point for regulating MTR. Unfortunately, this approach completely ignores the path-dependence of the current market positions and cost/production functions of MNOs. Its application would diminish the competitive intensity of mobile communication markets in most EU countries. Therefore, the Commission would be well advised to keep the overall direction of its MTR recommendation, but improve its efficiency assessment guidelines. They should be revised in a direction which acknowledges that even within a single EU country efficient costs of mobile termination services typically differ depending on an MNO’s market entry timing relative to other competitors and its allocated radio spectrum frequencies.

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<sup>9</sup> The quote is taken from a web page of the European Communities. URL: [http://ec.europa.eu/information\\_society/policy/ecom/library/public\\_consult/termination\\_rates/index\\_en.htm](http://ec.europa.eu/information_society/policy/ecom/library/public_consult/termination_rates/index_en.htm) (access: 07/18/2008).

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