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Better regulation of mobile telecommunications

New research shows that competition in mobile telecommunications is unlikely to be effective without regulation. The competition problems can be expected to prevail also in the long run, even if consumers have the opportunity to choose between many different networks and switching is easy. Some form of regulation is thus necessary to secure continued low call prices. Based on this research, we propose a structural form of regulation which is powerful enough to remove the obstacles to competition, but which at the same time is simple to implement. Structural regulation is also more transparent, which should reduce regulatory uncertainty and promote investments in a sector which is of great importance for economic growth.

Our proposal in brief

We propose a possible alternative to the burdens of the current European regulation and the likely failure of a free mobile telecommunications market. The alternative is a structural regulation with rules that are simple and undemanding as regards information yet powerful enough to eliminate the threat of monopolization.

The box summarizes the elements of structural regulation. The details are presented on page 6 below.

One of the key ideas of structural regulation is that the authorities would not need to investigate the market

before metering out the obligations. The obligations can also be implemented without any need for detailed information. Structural regulation is thus both simple to implement and transparent to the industry.

New research suggests that such structural regulation would remove the obstacles to competition if combined with efforts to make it easier for consumers to switch between different networks. It would be possible to diminish the conflict between the simplicity of the regulation and its efficiency.

THE ELEMENTS OF STRUCTURAL REGULATION

- 1 Ex ante regulation rather than competition policy.
- 2 The obligations are always imposed, possibly on all operators.
- 3 The obligations are structural:
 - a. Mandatory interconnection
 - b. Reciprocal access prices
 - c. Ban on call price discrimination
 - d. Cap on access prices independent of cost.

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Thus we see structural regulation as a possible way out of a difficult dilemma. Recent economic research shows that competition in mobile telecommunications would probably not be effective without the support of public regulation. Consumer prices in an unregulated market might well be as high as in a monopoly market. The problem of an unregulated market remains even if there is a large number of competing networks, and even if it is easy for consumers to switch between networks.

At the same time, recent public reports argue that the current European regulations create their own problems. The outcome is often unpredictable and regulatory uncertainty may reduce investment incentives. Since the telecommunications sector is an important engine for growth – one third of economic growth in the OECD area over a 20-year period can be directly or indirectly attributed to improved telecommunications³ – there is a need for a third alternative.

Before examining the conclusions in detail, we must scrutinize the arguments in favour of and against regulation, and also compare the current and structural regulations.

The case against regulation

The number of networks offering mobile telephony has increased dramatically. In the past, only Telia offered mobile telephony in Sweden. Today there are four competitors, TeliaSonera, Comviq, Telenor and Tre. Table 1

confirms this development for the entire OECD area.

All the monopolies were gone within ten years of telecom liberalization, and today there are at least three mobile carriers in most OECD countries.

Most OECD countries have also taken steps to foster competition between the existing networks. In Sweden, for example, the consumers can compare call prices on the website of the regulator, PTS (The Swedish National Post and Telecom Agency). Subscribers may keep their phone number when they switch operator. Mandatory interconnection implies that all consumers are able to call each other independently of the caller and receiver's network. Universal coverage obligations serve to reduce network differentiation and intensify price competition.

Many OECD countries have also introduced more detailed regulations to facilitate the transition from monopoly to competition. The European regulatory framework allows the price of traffic between mobile networks – the access price – to be regulated.⁴ Carriers with significant market power may be enjoined to set cost-based access prices.

The changes in market conditions and the technological development in mobile telecommunications have generated large price reductions. The Swedish price development since 2003 is depicted in the figure, page 3. The average caller today pays 40 percent less than four years ago.

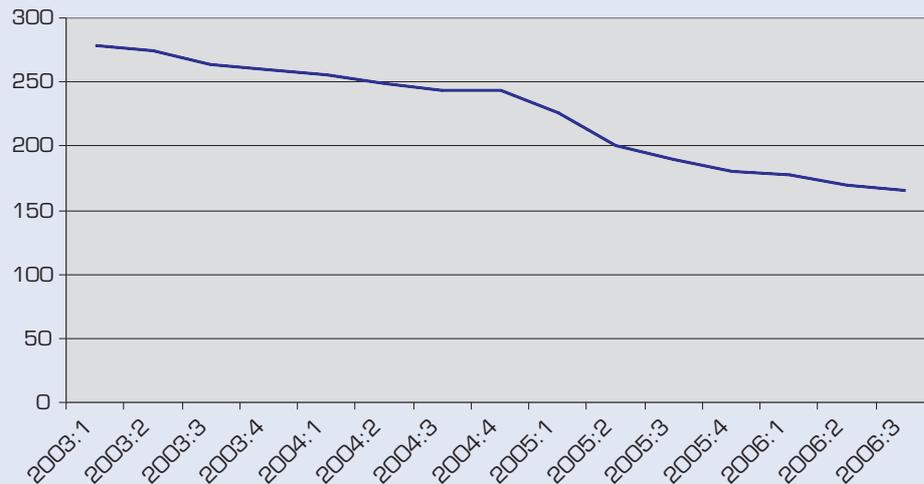
According to a study by the European Commission,

TABLE 1: COMPETITION IN MOBILE PHONE INFRASTRUCTURE IN 30 OECD COUNTRIES				
	Monopoly	Duopoly	Triopoly	Four or more
1989	24	6	0	0
1990	23	7	0	0
1991	23	7	0	0
1992	18	11	1	0
1993	15	12	3	0
1994	11	14	4	1
1995	11	13	4	2
1996	6	16	5	3
1997	3	18	4	5
1998	0	14	8	8
1999	0	9	13	8
2000	0	5	15	10
2001	0	4	14	12
2002	0	4	10	16
2003	0	4	12	14
2004	0	4	13	13

Source: **OECD Communications Outlook 2005**

³ Lars-Hendrik Röller and Leonard Waverman. Telecommunications Infrastructure and Economic Development: A Simultaneous Approach. *American Economic Review*, 2001, 91(4), pp. 909–923.

⁴ The Framework Directive sets out the main principles, objectives and procedures and the Access and Interconnection Directive stipulates procedures for imposing pro-competitive obligations regarding interconnection. In addition, the Commission has issued recommendations on relevant markets definitions and guidelines on market analysis and assessment of significant market power.

TABLE 2: MONTHLY PRICE (IN SEK) FOR AN AVERAGE CONSUMER AND AN AVERAGE SUBSCRIPTION

Source: PTS Prisundersökning 2006:3

mobile telephony has now overtaken fixed telephony.⁵ Nearly one in five households no longer bothers with a fixed phone line, instead chooses to own only a mobile phone. The proportion increases to almost 60 percent for people below the age of 30.

Even if price regulation has played a part in this development, the classic regulatory failures can also be seen in telecommunications.

Problems with the current regulation

The philosophy behind the current regulation is that it should be market based, i.e. the obligations should be imposed only to the extent they are deemed necessary. The implementation thus involves a great deal of information and analysis for the NRAs – the National Regulatory Authorities in the Member States.

The NRAs must assess how well competition works in the relevant markets; an exercise full of conceptual and practical problems. It is for instance not clear how you should measure market power in the wholesale market where there are only a few companies acting as both sellers and buyers at the same time. At the next stage, if competition is deemed insufficient, appropriate remedies must be found. If the operators are required to charge cost-based access prices, a cost model must be constructed. Should the networks be valued according to the historical cost or the replacement value? How should joint costs be distributed between call origination and call termination? Next, the authorities have to collect the relevant cost data; the networks are also burdened with compiling this information.

A recent official Swedish report describes excessive bureaucratic complications.⁶ Companies and the Swedish regulatory authority tend to have divergent opinions on these issues and the decisions are usually appealed. Legal processes are known to drag on for years. In addition, companies have great difficulties in predicting the decisions. The official report speculated that this unpredictability reduces investments and thereby the supply of services valuable to consumers.

This conclusion is supported in a London Economics report comparing investment in electronic communications throughout the EU.⁷ It concludes that regulatory uncertainty is the factor that is most detrimental to higher levels of investment. Regulatory uncertainty may thus be an important obstacle to growth.

A cost-based regulation may also reduce the incentive for cost efficient production. If cost coverage is always guaranteed, companies will see no reason to cut their costs. This is a waste of resources and may also lead to increased call prices.

Time to deregulate?

With seemingly intensified competition and falling prices, deregulation might therefore be tempting. Moreover, deregulation does not imply that mobile telecommunications will be left without any supervision. The Competition Authorities may intervene if market powers are abused.

Indeed, the long-term goal of the European Commission is to scrap the regulation when the conditions for competition have been established.

⁵ European Commission: Eurobarometer: E-Communications Household Survey, Brussels, 2006.

⁶ Effektivare LEK, SOU 2006:88.

⁷ London Economics: An Assessment of the Regulatory Framework for Electronic Communications – Growth and Investment in the EU e-Communications Sector, London, 2006.

»Regulation is seen as essentially a temporary phenomenon, required to make the transition from the formerly monopolistic telecommunications industry to a fully functioning market system. ... [A]s the sector evolves, operators will increasingly build their own infrastructures and compete more effectively. ... [R]egulation can be rolled back and competition law ... will replace sector-specific intervention.«

European Commission

However, our main point is that some form of regulation is probably necessary for mobile call prices to remain low, and that it is possible to greatly simplify the regulation.

The case for regulation

Mobile telecommunications differ from most other markets. Mobile operators compete to sell subscriptions to the end-users. However, they cooperate at the same time by interconnecting their networks to enable customers to call each other across different networks. Interconnection increases the consumers' value of owning a phone. Interconnection is also good for competition. Without it all consumers would want to belong to the largest network, triggering a process leading to extreme dominance. There is good reason for mandatory interconnection.

On the downside, interconnection is coupled with so-called access pricing which leads to weakened competition compared to other markets. TeliaSonera, for instance, must pay an access price for every call they send to Telenor. The presence of such access prices means that the operators share the revenues from all subscribers. Consequently, they are less interested in stealing each other's customers through price cuts.

The problem of limited competition has been acknowledged in research. In their seminal contributions

from 1998, Mark Armstrong respective Jean-Jacques Laffont, Patrick Rey and Jean Tirole showed that operators are sometimes able to eliminate competition in an unregulated market for mobile telephony.⁸ By agreeing on high access prices the networks can artificially inflate the costs of calls to other networks. The higher costs manifest themselves as higher call prices. According to this theory, it is conceivable that the call price is the same as if it were set by a monopolist.

Unlike cartel agreements, a contract between two operators stipulating an access price between them is not illegal *per se*. Such an agreement is part of the operators' fulfilment of their interconnection obligation.

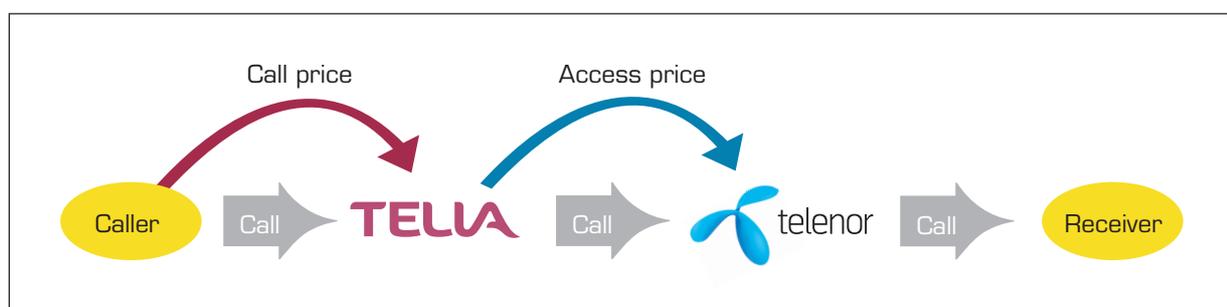
Early research suffers from two major limitations. First, it only deals with markets with two networks. This is a commonly used strategy to simplify the analysis, and duopolies often share most aspects with less concentrated markets. The fact that most OECD markets were either monopolies or duopolies at the time lent empirical relevance to the analysis. Following the recent wave of entry, the existing results may now be outdated, especially since there is reason to believe that duopolistic competition differs significantly from more fragmented competition in the market for mobile telecommunications. The second limitation is that early research only deals with markets where it is very difficult for consumers to switch between networks.

The effect of entry

In a recent theoretical study⁹ we show that competition is fundamentally changed by entry beyond duopoly. However, call prices are unaffected, since there is also an anti-competitive effect of entry.

1. Access price competition

Access prices are determined in pair-wise negotiations. The networks wield market power as both buyers and sellers of access. A key insight is that in a market with



⁸ Mark Armstrong: Network Interconnection in Telecommunications. *Economic Journal*, 1998, vol.108, no. 448, sid. 545–64. Jean-Jacques Laffont, Patrick Rey and Jean Tirole: Network Competition: Overview and Nondiscriminatory Pricing. *RAND Journal of Economics*, 1998, vol. 29, no. 1, pp. 1–37. Jean-Jacques Laffont, Patrick Rey and Jean Tirole: Network Competition: Price Discrimination. *RAND Journal of Economics*, 1998, vol. 29, no. 1, pp. 38–56.

⁹ Johan Stennek and Thomas Tangerås: "Competition vs. Regulation in Mobile Telecommunications" Research Institute of Industrial Economics, 2006, WP 685.

more than two operators, there will be competition also in the wholesale market for access – we call this phenomenon access price competition.

Two operators agreeing to reduce the access price vis-à-vis one another gain a competitive advantage against their competitors (“third parties”) as a result of lower costs. Due to the cost reductions, they will cut call prices to poach customers from the third party competitors. Since access price negotiations are bilateral, the operators will not internalize the competitive externalities on third parties. All pairs of networks reason the same way and there is a clear tendency to reduce access prices and, as a consequence, call prices.

2. Increased “effective cost”

The study also indicates that an anti-competitive force arises when the number of companies increases. It can be so strong as to *completely* offset the competitive pressure in a deregulated market.

With entry, an increasing share of each network’s call volumes will consist of calls to other networks. The perceived call costs increase with entry. If the networks are of a similar size, roughly 50 percent of all calls will be to the competitor if there are two networks. With three networks, the corresponding figure is 67 percent. And with four networks 75 percent of the calls will be subject to an access charge. Naturally, incoming calls generate access revenues, but the key point is the increased cost of outgoing calls.

We show that the price hike ensuing from the increased call costs exactly matches the price reduction resulting from intensified competition. The reason is that both effects are proportional to the market share.

The effect of reduced network differentiation

Reducing network differentiation does not lead to lower call prices in an unregulated market either. The reason is that the networks may simply increase their access prices to eliminate the increased temptation to reduce prices.¹⁰

In conclusion, neither entry nor reduced differentiation has any effect whatsoever on call prices in an unregulated market. Despite the subscribers’ improved opportunities of choosing between more networks, call prices remain exactly the same as if the market were monopoly-controlled.

So, why are prices falling?

Our interpretation is that the regulation may have contributed to the falling call prices. As we will discuss be-

low, entry and easier consumer switching does have an effect if combined with regulation.

There is also some evidence to suggest that regulation has had positive effects. In 2001 the legal framework displayed a lot of variation across countries. Great Britain and the USA had comprehensive telecommunications regulations, whereas New Zealand relied exclusively on a general competition policy. At the same time, Australia and Chile applied a solution somewhere in between the two extremes. The New Zealand price level was twice as high as that in Great Britain and the USA. In Australia and Chile, the price level was somewhere in between.¹¹

This evidence must be considered with caution, however, as it is impossible to control for e.g. wage differences between countries using a very limited number of observations.

An alternative to the current regulation: Structural regulation

The combination of the regulatory burdens and the likely failure of an unregulated mobile telecommunications market raises the question of whether a third alternative can be found. Is it possible to devise rules that are simple and undemanding as regards information yet powerful enough to eliminate the threat of monopolization?

We have studied the effect of a more structural form of regulation. Structural regulation requires mandatory interconnection. But it also involves two new obligations on the operators: each operator must set the same price for calls to other networks as for calls within the own network, and access prices must be reciprocal. Importantly, these rules focus on the price structure and not the level. The price *level* is affected indirectly through competition. These rules would place only a light burden on the NRA in terms of collecting information.

Structural regulation would include an access price ceiling even in the future. The innovation would be that the ceiling would be set independently of the operators’ costs. Consequently, there would be little need for the NRAs to collect cost information.

Our research shows that structural regulation could even reduce call prices towards zero if the subscribers’ switching costs are reduced towards zero. It is tempting to steal the competitors’ customers if poaching is cheap. The networks would have to agree on very high access prices in order to offset the competitive pressure. Even a very generous ceiling eliminates this possibility. Our point is not that the ceilings necessarily should be increased,

¹⁰ On this point see also Toker Doganoglu and Yair Tauman: Network Competition and Access Charge Rules. *Manchester School*, 2002 vol. 70, no. 1, pp.16–35.

¹¹ Michel Kerf, Isabel Neto and Damien Gérardin: How Antitrust and Sector Regulation Affect Telecom Competition. Public Policy for the Private Sector, 2005, Note Number 296, The World Bank, Washington.

but that the ceiling can be set independently of the operators' costs. When switching costs are low, the exact level of the ceiling has only a small effect on call prices. Consequently, the NRA would not need to collect precise information about the operators' costs.

What should the future regulation look like?

Clearly, the effects of structural regulation are uncertain, since this policy has never been tried out before. But the same goes for the long-run objective of the European Commission to deregulate telecommunications. This ambition is founded on the presumption that competition will be effective, but not on any historical evidence that deregulation actually works.

Despite this uncertainty, it is important to spell out what the policy implications of the currently available theoretical research are, since the European regulatory framework is currently under review.

1. Ex ante regulation rather than competition policy
Access price agreements cannot be placed in the same category as cartel agreements and be considered *per se* illegal under Article 81 of the European Treaty. An access price agreement is a normal commercial contract with a subcontractor.

An agreement on a *high* access price might be considered anti-competitive, but then we would in effect be back to regulating the price. A competition authority adjusting the access price by ex post interventions would force the operators to guess the tolerable price. Since the competition problems are ubiquitous in the mobile phone market, guessing would be ubiquitous too. An *ex ante* price regulation would be more transparent.

2. Always impose obligations, possibly on all networks
Our research suggests that the competition problems prevail on a fully deregulated mobile telecommunications market, regardless of the number of networks and of the degree of network differentiation. Two of the typical catalysts of competition, entry and reduced switching costs, are ineffective in mobile telecommunications. Market failure seems inescapable. This result suggests that the regulation be based on the *presumption* that competition will not arise spontaneously. It should not be necessary for the NRAs to investigate the issue before obligations are metered out.

One should also consider whether the same rules should apply to all networks, in contrast to the current

regulation. Within our analytical framework, the regulation should encompass all companies. To be able to elaborate more on the latter point, additional research is required to explicitly address the impact of differences between companies.

3. Structural obligations

“Structural” obligations would relieve the operators and the NRA of a heavy regulatory burden. Mandatory interconnection, reciprocal access prices and a ban on price discrimination are transparent rules and can be implemented with little information. Their effect is to remove the network externalities.

The cap on access prices may be disconnected from any precise measures of costs when combined with the other obligations. Announcing a rough cost estimate today and that the future evolution of the cap be tied to a rough measure of technological development, such as the evolution of factor prices would increase regulatory transparency.

Forcing the networks to charge the same call price regardless of whether the call is to another network or within the network constitutes a direct regulation of call prices. As far as we know, this is a new regulatory instrument, although this type of contract already exists on the market. Today, call prices are only indirectly regulated through the access price. Our suggestion therefore marks an important change to the current view on call price regulation.

4. Reduce switching costs to increase competition

If competition is deemed ineffective under a structural regulation, reducing switching costs (and reduced network differentiation) may be better than promoting the entry of new networks. The cost of rolling out new networks is substantial, and entry not only increases competition but also the share of calls subject to the access price mark-up.

Our analysis suggests that a combination of structural rules and reduced switching costs may push the price down to short-term marginal cost. Too intense a price competition may render the return to capital insufficient, thereby distorting investment incentives and innovation. To secure long-term profitability, it is important that switching costs are not reduced too far. A reasonable strategy would be to tighten the rules gradually.

Facilitating consumer switching can be achieved by increasing the price transparency, e.g., by compelling the carriers to offer simpler menus of contracts. Another is to reduce the contract length of subscriptions. ●

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