

Market Definitions for Regulatory Obligations in Communications Markets

A Study for the European Commission

Executive Report

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Executive Report

PART I. INTRODUCTION

To date, the sector-specific ONP rules for the communications sector have neither required nor reflected a market analysis; they have been confined to the regulation of individual services or access relationships. Regulatory measures have been driven by the perceived need to provide a surrogate for effective competition, by ensuring the availability of key competitive inputs, and by subjecting historical monopolists to pricing regulation, intended to force them to seek efficiencies, based on cost orientation measures directed at both the wholesale and the retail levels.

However, one of the focal points of the new EU electronic communications networks and services regulatory package adopted in February 2002 and due to take effect by 25 July 2003, is to address *relevant markets* that are characterised by a lack of “effective competition” (defined in terms of the existence of a dominant market actor or actors with Significant Market Power (SMP)). The identification of such relevant markets requires an economic assessment, consistent with Community competition rules, of the range of services which act as competitive substitutes to certain other services, so as to act as a competitive restraint on any single or collective market actor(s) wishing to raise price and/or limit production for those services. This Study has adopted such an approach, considering possible relevant markets *ab initio*, rather than derivatives from Annex I to the *Framework Directive*.

To this end, an institutional mechanism requires that National Regulatory Authorities (NRAs) conduct their market analyses consistent with the Commission's forthcoming ‘Recommendation’ identifying those product and service markets within the electronic communications sector which may be the subject of *ex ante* regulation, and a Decision on transnational markets. The Commission will further inform this process also by publishing SMP ‘Guidelines’ on market analysis and the assessment of the concept of SMP. NRAs must take the “utmost account” of the Commission’s Recommendation and SMP Guidelines when analysing, the relevant markets appropriate to their national circumstances and identifying SMP operators therein. Member States can only define markets that differ from those defined in the Recommendation where they satisfy the criteria set forth in Articles 6 and 7 of the *Framework Directive*.

The purpose of this Study, entitled “*Market Definitions for Regulatory Obligations in Communications Markets*”, is to inform the Commission’s various additional regulatory instruments on market analysis, subject to the limitations posed by the lack of probative data in certain cases.

In order to conduct its market analyses consistent with the prevailing legal standard under Community law and accepted antitrust economic principles, the Study Team has needed to establish a body of empirical data, which it has gleaned from desk research and interviews with a broad cross-section of industry players.

PART II. ECONOMIC AND LEGAL CRITERIA FOR MARKET DEFINITION

II.1 KEY ELEMENTS OF SUBSTITUTABILITY ANALYSIS

The process of market definition is primarily an economic exercise, which is nevertheless echoed in case-law precedent and administrative practice developed in the application of competition rules. Relevant markets have two dimensions under EC competition rules, namely: the *product dimension*; and the *geographic dimension*. Both product and geographic markets are delineated through an analysis of the interchangeability of products from both demand and supply side perspectives in terms of the characteristics of the service(s) concerned, their price and intended use. Limited interchangeability with other services results in the exclusion of those services from the market definition exercise, but should be taken into account at the later stage of calculating SMP. This does not mean that an analysis of the competitive impact of marginal customers is to be disregarded; indeed, it is the reaction of marginal customers to a shift in prices which should be the pivotal element of a market definition exercise.

The performance of the *relevant product market* definition exercise requires that the following methodological matters be taken into account:

- According to the European Court of Justice (ECJ), the *functional level of trade* is “*the level at which the objective conditions of competition are alike for all traders*”. Such a “level of trade” analysis enables wholesale (inputs to competition) and retail (services to end users) markets to be identified in the communications sector, which is characterised by complex, layered, value-chains. The distinction between wholesale and retail levels does not imply that these levels do not interact with one another, nor that they are not constrained by each other.
- *Demand substitutability* focuses on the obstacles which might prevent a customer from *switching* easily to another product or a supplier located elsewhere. Examples of such obstacles might include high investment costs, long-term contracts and costly terminal equipment. An analysis of *supply substitutability* also needs to account for the obstacles which might prevent a supplier from switching production or other resources to the relevant products. The effectiveness and immediacy of suppliers’

responses distinguishes between supply-side substitutability and potential competition, with the latter concept only being taken into account in the assessment of SMP (*i.e.*, through future entry).

- The usual short-term period of assessing market parameters under competition rules (*e.g.*, one year projection into the future), should be tempered by the acknowledgement in the *draft SMP Guidelines* that the timeframe will inevitably depend on the characteristics of each market. **The temporal element** for *ex ante* purposes should, however, reflect the dynamism of technology-driven markets and the forward-looking nature of the market analysis process. A time period more than 18 months to two years might therefore be appropriate, particularly in light of the availability of ongoing periodic review of the market.
- It may be possible, in certain circumstances, to identify specific *customer segmentations* or sub-markets to which such products or services are targeted, particularly when such a group is subject to price discrimination (the practice of selling the same product or service to different customer groups at different prices, and being able to sustain such price differentials).
- **Chain substitution.** This occurs where it can be demonstrated that, although products A and C are not directly substitutable, product B is substitutable for both product A and C and therefore products A and C may be in the same product market since their pricing might be constrained by the substitutability of product B (*i.e.*, where there is clear price interdependence at the ends of the chain and where the degree of substitutability along the chain is sufficiently strong).

A **relevant geographic market** comprises the area in which the undertakings concerned are involved in the supply and demand of the relevant products or services, in which area the conditions of competition are similar or sufficiently homogeneous and which can be distinguished from neighbouring areas in which the prevailing conditions of competition are appreciably different. The geographic scope of the relevant market in the fixed sector has traditionally been determined by reference to: (i) the geographic scope of the network concerned; and (ii) the presence of legal and regulatory obstacles.

Although the regulatory framework distinguishes between the definition of relevant markets and the analysis of **market power** in such markets, each of these analytical stages cannot be viewed in isolation. Indeed, the impetus of a market definition exercise is to enable a market power assessment to be undertaken. The closer a market definition exercise gets to identifying an enduring bottleneck or non-contestable structural characteristic of a marketplace, the greater the difficulties encountered in differentiating market definition and market power analyses.

II.2 THE HYPOTHETICAL MONOPOLIST TEST

The classic market definition exercise is usually conducted through the empirical “Hypothetical Monopolist Test”, otherwise commonly referred to as the “SSNIP” test (which refers to a small but significant non-transitory increase in price). This test considers whether, starting from the competitive price, it would be profitable over a period of about one year for an entity or entities to implement a hypothetical small (in the range of 5 to 10%) increase in price. This will depend upon the degree of consumer switching to other products (demand substitution) and additional supply (supply substitution). If such a price increase is not profitable, the products to which consumers would switch, or additional output, are included within the relevant product or geographic market.

However, there are limits to the efficacy of the Hypothetical Monopolist Test, whether in terms of: (1) the quantitative data needed to estimate the effects noted above are often not available (see next section); (2) certain characteristics of the communications sector will not always permit the application of the test, (*e.g.*, where peering arrangements are used as a substitute for paid connectivity relationships, or where quality of service, and not price, exerts the greater influence on customer choice); (3) the test assumes that the price from which the percentage price increase made is at the competitive level but, where this is not the case, the test gives rise to the “*Cellophane Fallacy*” (*i.e.*, substitution inevitably results where the price test is applied to a market price that is already set at a monopoly level; in regulated industries, it is often difficult, if not impossible, to determine the level of the competitive price).

II.3 QUANTITATIVE TOOLS TO MEASURE MARKETS

The traditional legal and economic standards used to define relevant markets are best implemented by quantitative market measurement techniques, on which regulators can rely for a more accurate understanding of the parameters of the relevant markets that are the subject of their review. For example, a market definition exercise may be supplemented with an analysis of price elasticities and residual demand estimates. Two types of price elasticities which are arguably most useful for our present purposes are “own price elasticity of demand” and “cross-price elasticity of demand” techniques. However, it should be borne in mind that the results of these price elasticity tests may themselves also be susceptible to the *Cellophane Fallacy*. Additional empirical techniques include price correlation and speed of adjustment techniques. The former concept refers to the examination of a relative price change of products over time, rather than to an examination of their absolute prices, while the latter concept relates to the speed of adjustment of a product price or geographic area to a price change of another product or geographic area. Both of these concepts have their own limitations, such as auto-correlation. Event studies, client studies and consumer studies also provide further means of defining relevant product markets. Such studies will comprise historical data,

however, which means that a regulator should interpret such information cautiously. In many cases, even these types of information will not be available.

PART III. GUIDING PRINCIPLES FOR IDENTIFYING CANDIDATE MARKETS

III.1 RELEVANT MARKETS ANALYSIS FOR *EX ANTE* PURPOSES

Even in the absence of very accurate empirical data, the aim of the Study Team’s analysis has been to identify those relevant product markets (and their geographic dimensions) which might warrant *ex ante* regulation because the *ex post* application of competition rules is less capable of addressing the competition concerns arising in those markets in a systematic and timely manner. In conducting such an *a priori* market analysis for *ex ante* purposes, one should be guided by the following principles:

Principle 1	<i>It is important to explore the relationship between the different functional levels of competition at the wholesale and retail levels.</i>
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The working presumption of the Study Team has been that, unless there is a disconnect between the wholesale and retail levels of competition, the policy goal of achieving a “light touch” and “proportionate” *ex ante* regulatory framework is most effectively achieved by limiting regulation to the wholesale level. This might not be appropriate, however, where there appears to be a market failure such that there is no functioning wholesale market and competitors and end users are forced to acquire the same services on the same terms (*e.g.*, the single wholesale and retail market for leased lines found in many Member States). Highly competitive retail markets can, in principle, often lead to competitive corresponding markets at the wholesale level, subject to the caveat that the nexus between the two functional levels of competition may be weaker where retail customers are relatively price insensitive to certain types of charges, where the wholesale inputs in question are characterised by certain bottleneck qualities, or where the very general nature of the wholesale inputs (*e.g.*, “interconnection”) is such as to render any link to more specific retail services tenuous.

The interrelationship between the wholesale and retail levels of competition is one particular example of a relevant market analysis which takes into account broader competitive constraints going beyond an assessment of short term substitutability considerations. This is particularly important in light of the nature of the communications sector (*e.g.*, the provision of multiple services over a simple platform, the disequilibrium between sunk and incremental costs, and the relationships between the various technologies within networks). It is also important to consider the different types of wholesale fixed services, ranging from facilities owned, operated or entirely controlled by the operator, to capacity (rather than facilities) so owned or controlled and, ultimately, to services acquired for onward capacity as some form of retail service.

Principle 2	<i>There is a need for the greater aggregation of markets for ex ante regulatory purposes.</i>
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By and large, narrow product market definition is more appropriate for *ex post* intervention, especially because competition regulators have the benefit of identifying the parameters of the relevant market in the context of particular identified abuses or a particular anti-competitive arrangement, and because competition rules can be relied on to address instances of leveraging of market power into related or neighbouring markets. In particular, competition rules are best used to address “virtual” or nascent markets (usually at the wholesale level) which might arise from an existing local access monopoly. By contrast, an aggregated market approach provides a more realistic appraisal of market power in a forward-looking context; it also provides a broader basis upon which one can take into consideration all potentially substitutable services and platforms, including those that may act as chain substitutes.

Principle 3	<i>The identification of relevant markets for ex ante purposes should apply traditional principles of competition law, subject to a number of changes in emphasis, consistent with the dynamics of the communications sector.</i>
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The key elements of market analysis for *ex ante* purposes which should depart from an *ex post* analysis are: (1) although the *Hypothetical Monopolist Test* is used as a reference point for analytical purposes, its limitations must be taken into account; (2) *supply-side analysis* should be incorporated into an appraisal of relevant product markets, rather than at the later analytical stage of measuring market power; (3) it must be acknowledge that *existing regulatory obligations* may have had or may continue to have a profound effect on the shape of “markets” which, in the absence of those regulatory measures, might have developed very different patterns of supply and demand; (4) it is not appropriate to impose *ex ante* regulatory obligations on **embryonic** services, as this would run the significant – and disproportionate - risk of distorting market signals and development.

Principle 4	<i>The principle of technology neutrality requires that services be regulated in a comparable manner, irrespective of their means of delivery.</i>
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The “technology neutrality” principle implicitly requires that appropriate account be taken of, and weight given to, the differences between platforms which may derive from technological, economic (*e.g.*, linked to scale and scope), standardisation (or interoperability), commercial (*e.g.*, time from entry to market) or historic regulatory factors. It thus requires that the same regulatory questions be asked in relation to potentially substitutable platforms to determine whether and to what extent they

are fully substitutable, so that one can determine “how” and “why” they should differ in terms of an appropriate regulatory response.

Principle 5	<i>As a result of the inherent link between the separate processes of market definition and market power assessment, the approach adopted in relation to key issues must be consistent in both contexts.</i>
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Because of the close link between issues of market power and market definition, it is a common error to rely on certain types of commercial indicators as being determinative of either market definition or market power issues, while failing to maintain those distinctions consistently. Whereas such an approach can be more easily accommodated under the analytical frameworks of Article 82 EC and the *Merger Regulation*, it is less appropriate in the context of *ex ante* regulation. Examples of issues with respect to which a consistent analytical approach needs to be taken are: (1) **one-way substitution** - the traditional substitutability test, which is based on the “functional interchangeability” of products or services, presumes that substitution will be occurring both ways in the market definition analysis, whereas its one-way effect can be highly material to a market power assessment (*e.g.*, some customers might substitute mobile for fixed for their voice calls, but not *vice versa*); (2) **partial substitution** - this occurs where some consumers of a service find that it serves part or all of their needs in a particular market, which means that a partial substitute should be taken into account for the purposes of the assessment of market power (rather than for market definition); (3) **vertical integration** - is a commercial phenomenon which, although affecting the competitive dynamics of a market, is more relevant to market power than market definition; however, NRAs will need to identify historical shifts in value chains, which might render a certain market synonymous with service provision only by vertically integrated firms at a given historical point in time.

Insofar as the process of market definition and the assessment of market power constitute distinct analytical steps in the *ex ante* process, it is essential to differentiate between whether issues such as those listed above contain elements of only one analytical step, or whether they contain elements of both. In the *ex ante* regulatory context, the appropriate policy balance can arguably be struck through the adoption of a policy of proportionate remedies which progressively reflect competition rules rather than sector-specific standards.

Principle 6	<i>The market definition exercise should facilitate the prediction of any enduring market failure capable of occurring in a potential relevant market.</i>
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The identification of relevant markets is only meaningful if it provides the means to identify market power, which in turn is the cause of particular types of market failure. This underlying “end result”

approach is key to understanding that the process of market definition should never be an abstract exercise (*i.e.*, the process is both too time-consuming and difficult to perform without a clear understanding of why any given set of market dynamics warrant such analysis).

The Study Team does not believe that a sector characterised by explosive technological/commercial change and innovation such as the communications sector is susceptible to analysis against a static model of perfect competition. Accordingly, actual or potential market failures have been identified in terms of the criteria advanced by theories of imperfect competition, namely: (1) **market structure** (in terms of concentration, vertical integration and barriers to entry); (2) **market conduct** (in terms of restrictive, predatory and exclusionary practices); and (3) **market performance** (in terms of technical efficiency, satisfaction of consumer needs and monopoly profits). Consistent with this model, the potential for enduring market failure can be seen as a likely by-product of **rational economic behaviour** (*e.g.*, profit maximizing, exclusionary supply) which takes advantage of peculiarities in network-based markets which render customers fairly price-insensitive (*e.g.*, termination prices in light of the effects of certain network externalities), or the leveraging of **historical incumbency** derived from a local access monopoly (*e.g.*, local loops, short-haul leased lines).

Principle 7	<i>A state of effective competition is increasingly likely to occur the further one radiates away from the local access monopoly of the fixed network.</i>
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Historical experience and marketplace evidence suggests that, in the fixed line sector, competitive bottlenecks are least likely to arise in those markets or market segments which are furthest from the key monopoly asset of a fixed incumbent – its **local access network**. There is no equivalent competitive bottleneck issue for local access on mobile networks, because individual mobile networks face competition from other mobile operators with comparable coverage. With the exception of those Member States characterised by significant alternative infrastructure competition (usually in the form of digitised bi-directional cable TV networks), residual market power resides in the ownership of the fixed local access network. That market power can be leveraged into adjacent or neighbouring markets. However, the further one radiates from this local access monopoly, the greater the likelihood that market conditions are more conducive to competitive entry (which have also coincided historically with the more attractive long distance and trunk capacity services offered by international operators).

Principle 8	<i>Although the process of market definition is identical for all relevant product markets across all Member States, there may exist significant Member State variations in the existence and scope of relevant markets.</i>
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The use of a common methodology to identify relevant markets does not negate the fact that differences in the existence and scope of relevant product markets may occur across Member States, particularly because of factors such as: (1) the rollout of alternative infrastructure (especially digitised bi-directional cable TV networks, which have relatively high penetration rates in some Member States, but are virtually non-existent in others); (2) the imposition of certain types of regulatory obligations (e.g., the effect on origination services of indirect access and number portability policies); (3) the particular network architectures employed by PSTN operators; and (4) factors such as the total size of the Member State economy, revenue projections per customer and demographic characteristics, which will play a key role in the fashioning of the apparent competitiveness of certain product markets.

Principle 9	<i>The geographic reach of communications services need not be synonymous with the relevant geographic market where those services are provided.</i>
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Because the relevant geographic market is “*the area in which the objective conditions of competitive applying to service providers are similar*”, and not merely the geographic area in which competitors are able to offer their services, care must always be taken to ensure that the geographic market is properly identified. As a general rule, most markets at the wholesale level will be national in scope, regardless of whether retail services are consumed locally. Similarly, even though mobile roaming services are “consumed” outside the geographic territory of the operator of the mobile user, the relevant geographic market might remain the territory in which the mobile operator is licensed (primarily because of the existing price differentials and the loss of functionality across borders). Both in the fixed and mobile sectors, the principle drivers in the expansion of markets beyond national territories are the commercial priorities of business customers (e.g., one-stop-shopping, global reach, discounts over total international purchases).

Principle 10	<i>Consideration must be given to the nature, proportionality and prescriptiveness of ex ante regulatory measures to be imposed.</i>
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The assessment of relevant markets and market power requires a delicate balancing process to ensure that the effects of very narrow market definitions are not exacerbated in an *ex ante* context by a market power assessment which misconstrues some of the characteristics of the communications sector as providing evidence of a lack of effective competition. For example, markets with very

high sunk costs and low marginal costs are likely to be highly concentrated, to involve a significant degree of price discrimination and to exhibit high profit margins. Care will need to be exercised in the *ex ante* context to ensure that what might otherwise be the natural consequences of the cost structure of communications industries are not taken to indicate bases for genuine competition concerns.

Arguably the most sensitive policy balance in this context can be struck through the development of remedies that are proportionate to, and tailored and appropriate for, the perceived likely market failure identified by the application of the two-pronged relevant markets/market power analytical model. Those remedies should themselves not skew future market developments or likely competitive market outcomes, and should produce a balanced approach to the *ex ante* regulation of any given relevant market. Whether the nature of that balance is to continue to favour productive efficiencies over allocative efficiencies is a matter which will depend, in part, on whether the latter type of “efficiencies” will also, over time, be considered to play an important role in merger analysis.

III.2 ENTRY BARRIER ANALYSIS AS THE BASIS FOR *EX ANTE* REGULATION

Given that the principal policy goal of *ex ante* regulation is the removal or amelioration of market failure, there will always be those who will contend that many if not all forms of market failure (regardless of whether a given product market is found to be not “effectively competitive” at a given point in time) can be addressed over time by market forces themselves. This approach, however, presumes that all markets are effectively “contestable”. Markets will be contestable, and market failure should be left to be addressed by the market itself, if the relevant markets in question are not characterised by insurmountable entry barriers. Accordingly, the nomination of relevant markets for *ex ante* regulation (“Candidate Markets”) should be based on a comprehensive understanding of whether entry barriers are of such significance as to render the particular market in question unlikely to be characterised by effective competition, in the absence of *ex ante* regulation.

III.2.A. The Key Element of *Ex Ante* Analysis: Barriers to Entry and Contestability

The existence of non-transient barriers to entry represents the main obstacle to the development of effective competition. A barrier to entry can be defined as a restriction on entry into the market which has the effect of allowing firms already in the market to charge prices above their otherwise competitive levels while not attracting new competitors. In the absence of barriers to entry, even a dominant firm can in theory be effectively constrained by the threat of competition; the universally acknowledged lesson drawn from contestability theory is that, under certain conditions, the threat of entry will force even a dominant firm to price at levels which ensure both efficiency in production and competitive pricing.

For our purposes, we are concerned with barriers to entry which justify *ex ante* regulation. This implies that: (1) they should be sufficiently high to merit this particular form of regulation, bearing in mind that almost all industries exhibit some form of barrier to entry, without the corresponding need for *ex ante* regulation; and (2) they are of the kind which warrants being addressed through *ex ante* regulation and which cannot effectively be addressed through alternative means, such as direct action to reduce or to remove them, or through the application of competition rules in specific cases.

Unfortunately, there is neither a universal metric for the comparative measurement of the height of all kinds of barriers to entry, nor a complete understanding of all the factors that can operate as entry barriers. In some cases, where the barrier to entry is absolute, its height is infinite. In other cases, judgements have to be made which can be informed by calculations. For example, if the barrier to entry arises through the existence of a scale economy, the extent of this scale economy can be measured (*e.g.*, in the form of a cost volume elasticity). As far as the choice of the appropriate regulatory response is concerned, *ex ante* regulation is most appropriate where it performs better than other responses. This is likely to be the case where a barrier to entry cannot be reduced or removed by other means, where the source of the barrier to entry is durable and persistent and where the probability of detriment to consumers, in the absence of intervention, is high.

On the basis of these criteria, certain entry barriers have been proposed with the characteristics identified above, with another form of entry barrier being seen as an element which strongly reinforces the effects of either of the first two forms of entry barrier. Other forms of entry barrier are not regarded as material for our purposes. In all cases, a high level of entry barrier is usually required to warrant *ex ante* regulation. Moreover, while high entry barriers are a necessary precondition to regulation, they should not be sufficient of themselves to warrant *ex ante* regulation **unless and until** an effective competition analysis has already reached negative conclusions. A conclusion as to the effective competitiveness of any given relevant market depends, among other things, on the number of firms operating behind the entry restrictions. However, even two mobile operators may compete relatively vigorously, especially during the phase when the second operator is trying to take market share from the first mover. Moreover, the likelihood of effective competition increases with the number of operators, particularly where there are low barriers to expansion. There is ample evidence of new firms entering markets that have high entry barriers.

Customer inertia, of itself, is not an adequate basis for *ex ante* regulatory intervention. These types of concerns are best addressed through various informational and educational measures which NRAs can undertake. It may be otherwise, however, if it is significant switching costs which prompt the customer inertia. There are two different types of switching costs – exogenous switching costs arise from external factors, while endogenous costs result from the firm's behaviour - *i.e.*, they

are 'artificial'. As such, the latter is a cost resulting from the (potentially abusive) conduct of the operator imposing the costs.

III.2.B. Barriers to Entry Justifying Inclusion as a Candidate Market

These arise when there is an absolute barrier to entry in the industry. Such barriers can take one of two forms: (a) legal or technological; or (b) regulatory. Moreover, absolute entry barriers can in theory also arise from scale-related operating requirements in particular circumstances. Where, however, these scale-related barriers co-exist alongside legal, technological or regulatory barriers, their net effect can act as an absolute barrier to market entry.

a. Legal and Technological Barriers

A **legal barrier** might take the form of a requirement that firms have a licence in circumstances where additional licences are not available. Alternatively, there may be a legal limitation on the availability of a particular input which is necessary to produce a relevant electronic communications service. These two considerations come together in the case of wireless markets, for which operators require both a licence and access to spectrum. As a consequence, entry by network providers into wireless (fixed and mobile) markets is effectively blocked, unless the secondary trading of spectrum becomes possible.

Consideration has to be given to whether legal barriers to entry can be removed. For example, in recent years, competition has been facilitated by changes to operators' rights to undertake the civil works necessary to construct networks and gain access to numbers. The legal barrier to entry in relation to wireless operators could, in principle, be alleviated by changes in spectrum allocation methodologies (and the ability to trade spectrum), thereby allowing greater economic efficiency and lowering entry barriers. In summary, legal barriers to entry justify inclusion as a criterion by which to identify Candidate Markets, when they are expected to continue to operate, unless a significantly large number of operators are already operating behind the barrier to entry (so as to ensure effective competition).

As regards **technological barriers**, these occur where the provision of the service requires the use of a network component which can only be duplicated at a cost which can make it uneconomic for second or third entrants, given the capability already in place. The obvious illustration of such a barrier is call termination. Using existing technologies, a call to CPE owned by a subscriber can only be terminated through the path which connects that CPE to the network. If a subscriber has only one line, there is no immediate scope for substitution (in the absence of a technical means through which terminating access can be provided by third parties). There would thus be a barrier to

entry to provision of the service in question. Competition could, however, be introduced if a customer could be contacted on an alternative line, if a third party could provide termination over the single connection or if the customer's choice of operator were significantly influenced by termination rates, as incorporated into the rates paid by those calling the customer. There is a substantial probability that technological exclusion of this kind will create a barrier to entry which justifies *ex ante* regulation.

b. Regulatory Barriers

These arise when, as a result of regulatory policy or previous practice, entry into a particular market is too risky or perhaps even financially non-viable, and this situation is expected to persist. This state of affairs arises, for example, when the NRA, in pursuit of other objectives - typically relating to ensuring the affordability of retail services - imposes a retail pricing structure which means that some services are individually provided at below cost or without rates of return that support a business case to enter the market segment. This does not imply that the operator providing such services is doing so on a non-commercial basis, since its customers may buy other services from it as well, which in aggregate make the service package profitable (although this practice perpetuates cross-subsidisation). It does, however, make entry into the 'loss-making' segment of the market risky and unattractive. The most obvious example of this phenomenon is the retail pricing of access. In some Member States, this service fails to cover the forward-looking long-run incremental costs of its provision. This tends to have the effect of attracting entry to those services which the incumbent has traditionally used to cross-subsidise access, while deterring entry into the local loop.

It is widely recognised that tariff rebalancing can address this problem. However, experience suggests that rebalancing is likely to occur slowly, so that this regulatory barrier may persist longer than anticipated. In addition, NRAs should also consider the non-competition-related policy drivers behind other regulatory acts when considering their impact as barriers to entry (*e.g.*, affordability requirements for fixed access and local call charges).

Perhaps most importantly, however, where investors perceive that significant regulatory uncertainty persists, they tend to be reluctant to invest or enter new markets, especially where investment entails large sunk costs and assets are long-lived. Where such investments are made (*e.g.*, where entry occurs), changes in regulation can fundamentally alter the commercial environment, possibly undermining the profitability of investments that new entrants (or, for that matter, an incumbent) would make. If potential new entrants consider there to be a significant risk of this occurring, entry and investments are likely to be reduced or might not occur at all. This situation can result in an incumbent appearing to have enduring market power, not because of excessive conventional entry barriers, nor because of its use of apparent market power strategically in order to make entry less

attractive, but because firms are not prepared to enter the market due to perceived regulatory risks. Such problems are described in the industrial organisation literature in terms of regulatory commitment, or the lack thereof. No jurisdiction is completely free of this problem, and in some cases it might be an important cause of enduring market power. Consequently, where such cases arise, *ex ante* regulation will at very least need to condition its response through the use of proportionate remedies.

c. *Scale-related Barriers*

Economies of scale usually do not of themselves create a barrier to entry that cannot in practice be overcome by entrants. For economies of scale to be such as to prevent entry, the economy of scale must operate over a range which is large in relation to the market as a whole. If, for example, an industry exhibited economies of scale, but the minimum efficient scale (the level of output where a firm's costs are insignificantly different from the minimum) represented only ten percent of the market as a whole, then a scale economy of that kind would not represent a barrier to the development of effective competition. Thus, for a barrier to entry to exist, the economy of scale must operate up to a level which represents a high proportion of the total market to be addressed. These considerations suggest that, for scale to represent a substantial barrier to entry, the minimum efficient scale should be large relative to the total market, and that exit from the market be costly because the firm must incur substantial sunk expenditures which are not recoverable on exit.

It is possible to establish whether an entrant would incur substantial sunk costs by examining the kind of investments which have to be made. Generally, investments in resalable capital equipment, such as switches, are not sunk. Investments in civil works and underground plant can only be sold *in situ* and, as they have few if any other uses, they tend to have limited resale value such that substantial proportions of the value placed in these investments might not be salvaged on exit. The wireline local loop, where the proportion of expenditure on trenches, ducts and underground plant is particularly high and contains an especially high proportion of sunk costs, appears to satisfy this criterion.

Identifying the extent of scale economies represents a greater problem. A number of studies using engineering cost models address aspects of this problem in the fixed and mobile sectors. For example, they demonstrate that a local fixed distribution network exhibits large economies of scale. When economies of scale are accompanied by economies of scope, the barriers to entry can extend to related markets. This effect can, however, be nullified if there are alternative technological means of delivering the service. For example, the fact that local access exhibits economies of scale, and that there is an economy of scope between the provision of telecommunications services and

entertainment services on a local cable system, does not qualify the latter service for inclusion in the list, given that there are many alternative means of delivering entertainment services.

III.2.C. Barriers to Entry Not Warranting Inclusion in a Candidate Markets List

It is clear that the types of barrier to entry listed above are not exhaustive, and indeed there is no complete list of what constitutes an entry barrier. Many other kinds exist. In particular, the three listed above are all non-strategic barriers to entry – that is, barriers to entry that are not artificially ‘manufactured’ by the firm which enjoys them. It is therefore necessary to explain in general terms the absence from the list of both other non-strategic, and also strategic, barriers to entry. These additional barriers to entry may, however, raise barriers already created by those factors listed above. It may therefore be appropriate to take them into account when they augment material legal, regulatory and scale barriers (in other words, as a means of raising the relative height of the identified barrier(s) to entry), and thereby have an impact on any SMP assessment.

Absolute Cost Advantages: Some firms have lower input costs or better technology than others. These might derive in part from the fact that they were first in the market or more efficiently managed. Such advantages are not, of themselves, grounds for regulatory intervention. A firm enjoying these advantages (and no others), would be constrained in its pricing by the costs of the second most efficient producer. In the circumstances, that would be a competitive price.

Product Differentiation Advantages: The high reputation enjoyed by a particular supplier might also represent a barrier to entry. This occurs in all markets, and is not a basis for *ex ante* regulatory intervention.

Demand-side Network Effects: In some cases, consumers of a service may derive benefit from it in a way which increases with their number. This might result in two types of "network effects" which may have some undesirable consequences. First, the existence of a particular network effect might mean that demand for the product becomes less elastic in terms of price or income (which could be exacerbated by technological barriers). Second, network effects might, in certain circumstances, be found to arise where the existence of a first mover advantage, coupled with other factors militating against customer churn, creates an enduring competitive advantage for the largest firm over its smaller rivals, creating the risk of the market “tipping” in its favour. However, this would not be a sufficient condition for *ex ante* regulation. Such markets may still be subject to competitive pressures over the longer term as fringe competitors seek to replace the dominant operator through, for example, technological advancement. It should also be noted that other regulatory measures, such as requirements for interoperability and end-to-end connectivity, may at least in part alleviate

the risk of tipping (see, *e.g.*, Recital 6 and Article 4 of the *Access & Interconnection Directive*). Where standards are proprietary and give rise to network effects (*e.g.*, Microsoft's operating system), however, owners' property rights are often protected unless it can be successfully argued that the standard is an "essential facility".

Consumers can also benefit from certain types of network effects. The appropriate response in these circumstances is to ensure that the firm benefiting most from the direct network effects is prevented from engaging in anti-competitive conduct, such as would occur if there was a cessation of interconnection.

Strategic Barriers to Entry: These include many types of possible conduct. They may take the form of excessive investment in product capacity, R & D or advertising, which creates in the minds of entrants the expectation that entry will be subject to a strongly competitive response by an incumbent. It may also raise rivals' costs, for example by seeking to pre-empt inputs, raising the price of inputs, or artificially inflating consumers' switching costs by contractual or other means.

Each observation tends to be idiosyncratic, relating to a particular set of factors. In these circumstances, it may be preferable to rely on a focussed application of competition rules to address the circumstances of any particular complaint. However, dominant firms are likely to be able to engage in strategic actions in the markets that they dominate (which may allow them to leverage power into other markets), and which: (i) may not be illegal under competition rules, but have the effect of enhancing market power; or (ii) are too difficult to prosecute because the information / proof needed cannot be obtained. In such cases, *ex ante* regulation preventing certain types of behaviour can lead to an increased level of entry and investment, and can improve the performance of the industry. Strategic actions that may be prevented by regulation in communications markets occur where, for example, new entrants need to purchase and lease certain inputs from incumbents, such as interconnection, leased lines, co-location and so forth. Where a dominant operator can, for example, make the delivery times or other terms and conditions uncertain, it can delay or prevent entry.

PART IV. INDIVIDUAL MARKET ANALYSES

On the basis of the legal and economic standards outlined in Part II and the guiding principles for market definition for *ex ante* regulation outlined in Part III, the Study Team's market analyses across the fixed, mobile and broadcasting sectors are summarised below. In each case, a discussion of potential retail Candidate Markets will precede a discussion of potential wholesale Candidate Markets.

IV.1 FIXED SERVICES

Retail Narrowband and Broadband Services

Retail low bandwidth access services are usually provided by a dial-up connection over a PSTN circuit. High bandwidth access services may be provided over dedicated capacity, xDSL-upgraded copper lines, upgraded cable networks or other platforms capable of supporting two-way data transmission at high speeds. Distinct retail high and low bandwidth access service markets have been slow to develop because of a combination of factors, including the significant delays in xDSL deployment, the slow emergence of alternative platforms capable of providing high bandwidth access and the relative absence of “broadband” content requiring high bandwidth access (with speed of access to services accessible over low bandwidth access being the major content-based distinguishing characteristic of such services).

It appears that most end users currently make a price/quality trade-off when selecting which form of access to acquire. End user perception of “value for money” is central to their choice of services. The wide variation in xDSL take-up rates across Member States, examined in light of the pricing differentials for the various competing services and the apparently “strategic” nature of some pricing decisions, is instructive in this respect.

In assessing the appropriateness of *ex ante* regulation, the Study Team considered the relative immaturity of a number of services available to end users, the rapid growth of the overall market, market share fluctuations, and the high percentage of new high bandwidth subscribers churning between low and high bandwidth services (where they are not entering the market as new subscribers). In addition, while it is clear that changes in pricing structure have a significant impact on demand, the availability of new content (particularly content with a “minimum access speed”) will become increasingly important and new platforms (including mobile) and technologies might have a significant impact on the development of the market. It appears to the Study Team that, in a number of Member States, embryonic and more mature low and high bandwidth services may be chain substitutes.

On balance, the Study Team does not consider that *ex ante* regulation of this retail market is currently warranted, as “broadband” services continue to be embryonic in their development, as evidenced by the current apparent high levels of chain substitution.

Wholesale Fixed Network Access to End - users

This product market appears to include all forms of access to a fixed network that provide operators with access to end users over facilities under their control. There are clearly a number of ways that

operators can gain access to end users: make the “make/buy” decision in favour of “make” and build competing infrastructure; buy access over existing alternative delivery platforms; or access end users over facilities controlled by another party. For technical, economic and functionality reasons, the Study Team has concluded that none of these alternatives currently provide a substitute for access over PSTN facilities under the control of a competitive carrier (*i.e.*, a non-incumbent fixed line operator).

With local access facilities continuing to be, for the foreseeable future, a bottleneck dominated by PSTN operators, access to local loops is regarded as critical to the expansion of competition in local markets. Despite existing *ex ante* measures relating to unbundled local loops, PSTN operators still continue to dominate the provision of facilities-based local access. It is clear that the construction of new access networks and the resolution of technical issues surrounding certain existing networks have the potential, over time, to increase the number of networks over which end users can be accessed through facilities controlled by the access provider. It remains to be seen how far new or existing networks will provide the appropriate level of functional substitutability.

In the view of the Study Team, there is (and will remain, in the short term) a need for *ex ante* regulation of the supply of services in this market.

Fixed Interconnection Services

There are a number of fixed interconnection services falling within the broader basket encompassed by the term “interconnection”, including call termination, origination and transit services. It is important to recall that in all Member States there has been limited duplication of the local access element of the PSTN by new entrants. As such, most new entrants must acquire both origination and termination services from other operators. Currently, local, single transit and double transit fixed interconnection services are acquired and provided. Demand for fixed interconnection at different levels has altered over time as investment in alternative infrastructures has developed. More particularly, demand for double transit interconnection has dropped sharply as increasing numbers of new entrants develop their networks down to single transit switches (and, less commonly, local switches). Substantial differences in the conditions of supply (*e.g.*, costs, preconditions for supply) at local, single transit and double transit levels continue to exist across all Member States. To some extent, a decreased reliance on local interconnection services is itself dependent on other elements of *ex ante* regulation being maintained. For example, pre-selection and number portability have begun to reduce the local access providers’ control over originating service provision to end users. The issue is the extent to which these measures might generate the sorts of revenues necessary to fund investment in alternative local network infrastructure.

The other factor driving the changes in fixed interconnection services is the changing nature of the retail services provided by interconnecting operators. For example, Internet origination interconnection services (e.g., FRIACO) have developed as a result of the introduction and rapid take-off of flat rate retail Internet access services.

As with a number of other fixed services, recent rebalancing has seen substantial decreases in double transit prices, but little change in single transit and local (both origination and termination) charges. However, it should be noted that current fixed interconnection pricing is largely the creation of the existing *ex ante* regulatory framework, rather than being the result of the operation of competitive forces. As such, it is extremely difficult to anticipate what an interconnection “market” might look like in the face of existing regulatory requirements being lifted.

In the view of the Study Team, *ex ante* regulation of local (both origination and termination) and single transit interconnection the services should be retained, and regulators should monitor the interaction between these services and double transit services to ensure that the competitive conditions for double transit interconnection do not deteriorate.

Wholesale Internet Connectivity

Internet connectivity is a form of interconnection which allows ISPs providing retail access services to interconnect with other ISPs, thereby satisfying end users’ expectations that they will have access to all open addresses on, and content available over, the public Internet. Given the recent focus on “top-level” Internet connectivity services (i.e., U.S. Tier 1 ISP services), the Study Team considered whether there is a relevant market which warrants *ex ante* regulation. In determining whether there is a separate and distinct market for U.S. Tier 1 ISP services, the Study Team believes that there exists a range of substitutes that renders the relevant product market significantly broader for *ex ante* purposes than connectivity provided by U.S. Tier 1 ISPs, having taken into account the forms of available connectivity (e.g., transit and other forms of peering, secondary peering, alternative content delivery networks and so forth), service quality and price.

Moreover, empirical evidence and industry trends suggest that such a relevant market for transport services is highly competitive, regardless of its precise dimensions, and that any potentially anti-competitive bottleneck issues in terms of local access are adequately otherwise addressed by *ex ante* regulation, while effective competition at the retail level (i.e., the interface with the end users in terms of control of ‘eyeballs’) is best addressed *ex post* by competition rules.

The Study Team concludes that, both in terms of the inherent competitiveness of the transport function and the availability of actual and potential substitutes, Internet connectivity does not require *ex ante* regulation.

Wholesale and Retail Access to Dedicated Capacity

Access to dedicated capacity is a key input for alternative carriers and for large corporate customers. As such, it is clear that there is demand at both the wholesale and retail levels for such services. However, there are currently only distinct wholesale offers in very few Member States. In the view of the Study Team, the absence of a functioning wholesale market in a number of Member States does not provide persuasive evidence that there is no demand which needs to be satisfied. Our reasons for such a conclusion are based on the following empirical observations:

- (1) The basic services which provide the ability to use a defined amount of unswitched capacity to carry traffic between two defined points range from IRUs, to leased lines (which have some degree of management) to, possibly, VPNs. Requirements for dedicated capacity are essentially characterised by bandwidth and distance elements (coupled with location). It appears to the Study Team that there is limited substitutability between different bandwidths. In particular, there appears to be an important break point at 2 Mbps. In addition, it also appears that higher bandwidth demand will polarise around 34 Mbps (E3).
- (2) The nature and form of demand for national and international dedicated capacity continues to grow and evolve. A number of competitive providers of national and international dedicated capacity (both alternative infrastructure providers and bandwidth exchanges) have entered the market over the past five years. Prices for international services have, as a result, been falling significantly for many bandwidths and distances. At a national level, the provision of capacity between major cities has witnessed the strongest degree of competition. Some of the key factors driving the market are the rise of alternative providers, rebalancing between local and international charges and the availability of intelligent least-cost routing options.
- (3) Local tails are increasingly used as permanent access connections for non-residential users. In some circumstances, xDSL lines may be substitutable for tails of less than 2 Mbps. However, such lines are still provided predominantly by PSTN operators, as are local tails. In contrast to market trends witnessed in the provision of national and international dedicated capacity, there appears to have been little new entry and prices appear to have been rebalanced upwards in recent years.
- (4) The market for dedicated capacity has been, and continues to remain, opaque. National and international markets appear to be substantially more mature than the provision of local tails. Continued development of xDSL services may, increasingly, increase the pressure of PSTN operators' local tails strategies – new entrants might offer new services that are functional

and commercial substitutes for local tails; PSTN operators might in turn need to reassess their service placement to reduce “cannibalisation” between revenue streams.

In the view of the Study Team, the sub-market for local tails should continue to be the subject of *ex ante* regulation. By contrast, the sub-markets for national and international dedicated capacity are becoming increasingly competitive. However, NRAs should keep the provision of such services under review to ensure that competitive conditions do not deteriorate.

Wholesale Access to Fixed Networks and Low Speed Switched Voice Services

There are a number of wholesale services currently used to provide a range of retail services linked to access for voice services and various types of voice call services. In the view of the Study Team, fixed access for voice service provision over the PSTN or new entrants’ networks is substitutable with access provided over up-graded cable networks, wireless local loops and unbundled local loops. The Study Team does not consider that mobile and fixed access are as yet substitutable for operators seeking to provide retail services. They are still considered to be complements, rather than substitutes, by all but an insufficiently large margin of consumers. At this stage, it does not appear that the wholesale provision of voice-grade access is competitive.

In the view of the Study Team, those Member States in which carrier (pre)selection has been implemented for a number of years have separate voice-grade access and voice (and related services) service markets. In addition, most voice-grade service markets are competitive. As such, it appears that the provision of national and international voice (and related) services in a number of Member States is competitive. However, there are very few Member States where the provision of local voice (and related) services is competitive. The competitive conditions for the provision of such services are particularly poor where local pre(selection) has not been implemented.

The Study Team believes that voice-grade access and local voice (and related) services continue to warrant *ex ante* regulation in all Member States, and that there is no need to regulate *ex ante* national and international voice (and related) services in the majority of Member States (with the need for regulatory vigilance in the others).

IV.2 MOBILE SERVICES

Individual or Cluster Retail Mobile Markets

The patterns of supply and demand for mobile retail services have developed rather differently to their fixed line counterparts, reflecting the fact that they: (i) have, from the outset, been provided under non-monopolistic conditions (*i.e.*, no legacy incumbency); (ii) have been subject to less regulation (*i.e.*, they less reflect markets which exist solely by virtue of regulatory intervention); (iii)

have been provided in more aggregated packages, reflecting in part the relative structural immaturity of the market; and (iv) reflect different patterns of network/technical configuration (*i.e.*, they ensure connectivity regardless of location) and technological development. As a result, the Study Team's market definition analysis at the retail level has appraised: (1) complementarity for substitutability of fixed and mobile services; (2) the effects of technological migration; and (3) the extent to which individual mobile retail services form a broader “cluster” market. Its findings were:

- The Study Team examined whether a broad *voice communications market* exists at the retail level, *i.e.*, whether voice services, including short messaging services (SMS), provided over mobile and fixed networks are substitutable. The analysis went beyond the simplistic differentiation between fixed and mobile services on the grounds of convenience or mobility, because of the growing body of evidence of the migration of voice traffic from fixed to mobile networks.

Empirical research suggests that, at this point in time, it is most likely that fixed and mobile voice services are complementary, rather than interchangeable. A preliminary examination reveals that fixed and mobile data communications services remain separate relevant product markets, at least for high bandwidth data applications, due to the current technical limitations on the provision of mobile data services.

- Research suggests that *analogue and digital mobile services* fall within the same relevant product market, as do mobile communications services provided over GSM 900 and GSM 1800 systems. Both conclusions are based on an assessment of the conditions of competition, demand and supply substitutability, and anecdotal evidence from operators. The Study Team considers that the rollout of GPRS and WCDMA systems to be too immature to determine whether mobile services provided by 2G, 2.5G or 3G systems form part of the same relevant product market. It considers that several factors beyond price should be assessed in this context, including network integration, quality of service, speed of service delivery, licensing requirements, inter/intra-operability of voice and data services, and the range of available applications.
- The Study Team's analysis indicated the existence of a broader mobile communications market at the retail level (a *product “cluster”*, as that expression is understood by recent economic theory and in the recent administrative practice of the Commission). Consumers in a cluster market are said to be very sensitive to the substantial (and inconvenient) transaction costs that would be associated with the unbundling of the services. This sensitivity leads them to evaluate the price and quality of the whole package of services, not its component parts. If customers would find it inconvenient to have individual services supplied by different firms rather than as a bundle and the majority purchases such services as a bundle, the services would form a “cluster” market. The Commission

acknowledges that a narrow analysis of demand and supply-side substitutability might not facilitate a proper analysis of the conditions of competition for a “cluster”.

A mobile communications cluster market appears to exist for the retail provision of mobile access, basic voice services, supplementary voice services, emergency services, and basic and value-added SMS. Other services, such as premium SMS or international roaming services, may be provided individually by service providers. As such, some services might fall outside the scope of the cluster market. However, the provision of some individual mobile services should not affect the integrity of a cluster market approach, particularly where these services involve the provision of both electronic communications services and content (and hence fall outside the scope of the regulatory framework for electronic communications).

The Study Team does not consider that the *ex ante* regulation of retail mobile communications services, including international roaming services, is currently warranted. It is of the view that regulatory concerns regarding the mobile sector are best addressed at the wholesale level. Any regulation at the wholesale level should in principle take into account the fact that mobile services are characterised by common costs and are not priced by operators in isolation from other services (which may mean that a small number of items of wholesale regulation might have a direct impact across a broader range of retail services).

Retail Mobile Access Charge

The Study Team considers that the charging of a mobile access fee does not appear at present to be sufficiently capable of being unbundled from the charges for other mobile elements of service, particularly from the origination and termination elements, so as to be capable of constituting a separate relevant product market. This conclusion might be subject to change where mobile carrier selection obligations are introduced to the marketplace and they prompt actual – rather than merely theoretical – market entry.

Unlike the fixed line sector, which is characterised by a local access element, mobile retail services have developed in such a way that an access charge cannot be clearly differentiated and treated as a relevant product market separate to the other retail services to which it is directly linked. In the event, however, that a distinct market develops in the future for origination services at the retail level, this conclusion may need to be reviewed.

Retail Mobile Sub-markets

Pricing in the mobile sector is complex, with tariffs being differentiated on the basis of a number of factors such as usage, time of day, types of call and types of customer. Although tariffs differ for customers with different levels of usage, this characteristic need not of itself imply the existence of a separate product market. The ability of mobile users to switch between tariff offerings suggests that

distinct mobile customer groupings for 2G services do not affect the market definition exercise. This conclusion should, however, be reassessed in light of the possibly greater ability to differentiate between mobile services in a GPRS and a wCDMA environment.

By way of exception, it might be currently possible to segment multinational mobile users in light of their specific mobile requirements. Such an approach is comparable to the identification of a relevant product market for the provision of customised packages of corporate services in the fixed sector.

There are insufficient competitive concerns to justify the regulation of mobile communications services for corporate customers, irrespective of whether this distinct customer grouping might be considered to represent a separate relevant market for *ex post* purposes.

Wholesale Mobile Access

The fixed line sector is characterised by a series of clearly differentiated means of access. By contrast, at this stage in the development of the mobile sector, it is exceedingly difficult to identify the full range of access requests that might arise in the near future, given the complexity of the existing and emerging mobile value chain and the technology of mobile networks themselves. With the exception of arrangements for the termination of voice and data traffic (see below), each access request is therefore best appraised *ex post* on a case-by-case basis under competition rules. However, historical evidence makes it possible to identify categories of generic access requests for *ex ante* regulatory purposes beyond interconnection.

The relative immaturity of access requests – other than those for interconnection – in the mobile industry, coupled with the broad range of access-related requests which might in theory apply to the mobile sector in a future 3G environment, means that access to mobile networks does not lend itself to a generic analysis of all relevant markets for mobile access. An analysis of previous requests allows several categories of access to be identified, including voice termination and international roaming.

Wholesale Voice Origination Services

As a matter of general principle, the wholesale provision of voice origination services on the basis of carrier pre-selection should constitute a separate relevant product market, although such a relevant market might not be identifiable in each Member State as a result of providers having failed to emerge in the marketplace. In addition, mobile operators might provide wholesale offerings of bundled origination minutes, which would form the basis of the commercial offerings of the so-called MVNOs. Many operators view such wholesale origination arrangements as an additional means of generating revenues. Existing examples of regulatory intervention in Member States such as *The Netherlands* and the *United Kingdom* have demonstrated a lack of commercial interest in

carrier selection services. In addition, it would appear that the conclusion of a number of wholesale origination arrangements between mobile market actors suggests that the segment might be effectively competitive. On balance, however, the Study Team has left open whether such wholesale offerings of bundled origination minutes constitute a separate relevant market, particularly in light of the limited publicly available details of such arrangements.

The existence of competition for origination at the retail level among a number of mobile network operators arguably means that wholesale origination services need not be subject to *ex ante* regulatory intervention at this point in time.

Wholesale National Roaming

The Study Team considers that national roaming is a distinct relevant product market which has been primarily created through regulatory intervention. Given its existence as an obligation written into the licence conditions of many 3G operators and, in light of the fact that there is evidence of its being successfully negotiated on a commercial basis (at least for 2G-on-3G roaming), there appears to be little likelihood of additional action being required at this time.

Although identifiable as a relevant product market, the commercial and regulatory conditions which prevail with respect to national roaming are such that *ex ante* regulation is unnecessary.

Wholesale International Roaming

An analysis of service interchangeability and broader competitive conditions suggests that the wholesale provision of international roaming services constitutes a separate relevant product market for *ex ante* regulatory purposes. While the Study Team is well aware of current concerns regarding the pricing of international roaming tariffs, there is a general understanding that current commercial initiatives by mobile operators and enforcement actions by competition regulators may mean that the concerns about excessive or parallel pricing are transient issues which might not reflect a durable market failure.

The enforcement initiatives under competition rules include the Sectoral Inquiry into mobile roaming charges, the notification of Vodafone's Eurocall flat-rate service, the notification of several standard roaming agreements by the GSM Association, the Commission's competition investigation of the behaviour of mobile operators in the *United Kingdom* and *Germany* in the context of international roaming charges, and several regulatory initiatives at the national level to increase consumers' awareness. Examples of recent market developments which are in principle capable of acting as a stimulus to greater competition in the provision of international roaming services include the increasing ability and incentives on GSM 1800 operators to attract inbound roaming traffic, the increase in bargaining power of home network operators, particularly due to assisted roaming

technologies, the introduction of flat-rate tariffs by several pan-European mobile operators, and the Code of Conduct for information on international roaming retail tariffs adopted by the GSM Europe Association.

In the absence of the on-going competition investigations being resolved, there is reluctance on the part of the Study Team to propose that wholesale international roaming be designated as a Candidate Market for *ex ante* regulation. Given that problematic pricing practices are both the subject of *ex post* competition law assessment and commercial pressures, they might be capable of being resolved in a manner similar to that experienced in the fixed line sector with the disappearance of the old Accounts Settlement regime.

Wholesale Voice Termination

The Study Team examined the ability of characterising mobile voice termination services under a number of alternative relevant product market scenarios, including hypothetical product markets for voice termination on: (i) fixed and mobile communications networks; (ii) mobile communications networks; (iii) individual mobile communications networks; and (iv) individual mobile numbers. The analysis was confined to the short to medium term and, consequently, was restricted to a 2G environment. An analysis of the demand and supply characteristics of wholesale mobile voice termination services suggested that the current regulatory standard of the “national market for interconnection” (*i.e.*, embracing termination on all networks) is too broad for the purposes of a market definition exercise conducted on the basis of EC competition rules. At the other extreme, a market definition made on the basis of individual subscriber numbers would ignore the broader dynamics of competition in the provision of mobile termination services and the fact that a mobile operator cannot discriminate on price between individual numbers for the purposes of wholesale termination rates.

A short term analysis of demand and supply suggests that voice termination on individual mobile networks does not have a direct substitute, principally because it is not possible from a technological perspective to obtain alternative mobile access to a given subscriber other than where they use multiple SIM cards. However, it is arguable that this type of analysis might not reflect fully the competitive dynamics of the mobile sector in more general terms, and whether the specific termination service being sought is subject to competitive pressure from other sources which have an impact on the overall competitiveness of individual networks or alliances (as has occurred, for example, in the Commission’s administrative practice in the airline sector). In the alternative, such an additional analysis may occur at the later stage of determining SMP, where an assessment of the bargaining power of interconnecting parties will be relevant.

The Study Team pursued two lines of enquiry as regards the realistic scope of competitive constraints, with a view to determining whether the relevant product market is broader than

termination on individual networks and whether the relevant product market at the wholesale level should be “associated” in some way with the level of competitiveness retail markets. These lines of enquiry were:

- (i) whether subscribers of the called mobile network can themselves constrain mobile termination charges at the wholesale level; and
- (ii) whether alternative means of communicating between a caller and a mobile subscriber are sufficient to constrain mobile call termination charges at the wholesale level.

It has become increasingly accepted that the “calling party pays” principle contributes to end users being relatively insensitive to the pricing of termination on mobile networks. An essential element of a market analysis of mobile voice termination is a consideration of the relative price-sensitivity of mobile users to incoming call charges. In particular, attention can be focused on the price-sensitivity of mobile users at two distinct points in time, namely, at the time of the selection of the mobile network for the first time and during the period following this selection. The essential empirical elements of this analysis would need to consider several factors, including: (i) the existence of differentiated retail tariffs for fixed to mobile calls; (ii) the price sensitivity of mobile users to inbound call charges, including the impact of emerging mobile “communities of interest”; (iii) switching costs; and (iv) the likelihood of mobile users churning due to high inbound call charges.

The calling party pays principle, to the extent that it has an impact on the price sensitivity of mobile users, could also be seen as hindering the calling party’s ability to restrain mobile termination charges. Accordingly, the Study Team examined whether callers can realistically take their business elsewhere if dissatisfied with fixed to mobile tariffs and, to the extent that this happens, the impact that this behaviour might have on mobile termination charges at the wholesale level. As part of this analysis, the Study Team considered whether callers are aware that they are calling a mobile network and whether they are also sufficiently price-sensitive to fixed-to-mobile call charges to consider their by-pass options.

It emerged from the Study Team's analysis that the arguments for defining mobile voice termination markets, whether on an individual network basis or on the basis of mobile networks taken in the aggregate, are finely balanced. It is possible that the relevant product market for mobile call termination can be assessed in relation to individual mobile operators, although it is also legitimate that the market be assessed in the light of a broader range of competitive dynamics.

Regardless of the approach taken, the Study Team is of the view that mobile call termination has more of the characteristics of a 'bottleneck' than a classical 'market', which means that the separation of the stages of market definition and the identification of dominance is particularly difficult. As such, 'termination' on mobile networks is arguably no different from 'termination' or any other network, as all networks share this element of end user price insensitivity. This would not be the case, of course, where there is evidence of customers being able, through technical means, to obtain multiple means of access to another service provider (*e.g.*, multihoming in the Internet context, multi-SIM cards in the mobile context).

Ultimately, regulators may feel that the appropriate balance between market definition principles and calculations of relative market power might be most efficiently struck through the application of proportionate *ex ante* remedies. Taking into account the bottleneck aspect of the termination function, a flexible approach to the adoption of proportionate remedies might also be the best means of readdressing imbalances in relative bargaining power between interconnecting parties, which lie at the heart of perceived market failures for most forms of interconnection.

Wholesale Data Termination

The provision of mobile data services is currently in its infancy. There is therefore little empirical research and additional information available concerning the wholesale provision of data termination services by mobile operators. Nevertheless, the recent revisions across the mobile industry of pricing policies for SMS traffic and the introduction of SMS interconnection agreements might suggest that a wholesale SMS termination segment is emerging. It is understood that SMS agreements are generally being concluded on a commercial basis, with complaints having arisen in isolated instances thus far.

There is an absence of direct interconnection arrangements between mobile operators for GPRS-based services at this point in time, while interconnection arrangements are developing between individual mobile operators and providers of GPRS Roaming Exchange ("GRX") services. The charging and other arrangements for the exchange of traffic between operators has yet to be developed for a 3G environment, which will not necessarily exhibit the same characteristics as a 2G environment (*e.g.*, the lack of reliance calling party pays principle, the ability to easily differentiate applications, the "pulling" of content-based services, and the charging of interconnection on a per minute basis).

The *ex ante* regulation of mobile data termination services currently appears not to be warranted. Regulators should nevertheless monitor SMS interconnection arrangements to ensure that competitive conditions are maintained.

IV.3 BROADCASTING SERVICES

In the view of the Study Team, there are no retail markets falling within the ambit of “electronic communications services” which justify review as potential Candidate Markets.

Wholesale Broadcasting Transmission Services

Broadcasting transmission services, both analogue and digital, are a key element in the broadcasting value chain, and can be provided using an increasing number of transmission media. Content providers require access to transmission services that enable them to generate subscription and/or advertising revenues to support their business plans. However, care should be taken to avoid defining the relevant market by reference to individual business plans and structures. There are wide variations between Member States in relation to the number, coverage and technical characteristics of the platforms available. The key demand drivers are viewer coverage, price and other non-price terms imposed by platform operators. Other factors, including differences in the costs borne by consumers for content received on different platforms (given that historic behaviour in a market affects viewer perception of new services) also impact on demand.

The Study Team is conscious of the effects of “must carry” and other public policy-related regulation. However, it is of the view that, given the existence of at least two competing close-to-ubiquitous “any-to-many” platforms in every Member State, there is no justification for treating individual platforms as the sole means of access to individual viewers or for defining the relevant market so as to provide content providers with, effectively, mandated access. In addition, retail price-sensitivity and elasticity (in contrast to real-time bi-directional termination services) supports an approach whereby the relevant product market encompasses all broadcast transmission networks.

In the view of the Study Team, the relevant market for wholesale broadcasting transmission services is that of the aggregate of such services provided on all broadcast transmission networks.

Wholesale Broadcasting Ancillary Services

The broadcasting ancillary services concept (including technical services) is broad, including all elements in “set-top boxes”, namely: hardware and software for CAS; subscriber management services, EPGs and APIs (including derivative authoring tools). Set-top box manufacturers develop boxes in close co-operation with the providers of software for key elements (bearing in mind that APIs incorporate an operating system), transmission platform providers and, where they are separate, transmission network operators. It is usually the transmission platform providers that supply set-top boxes to end users.

Given the current regulatory obligations imposed on all entities producing and marketing CAS to provide all broadcasters with fair, reasonable and non-discriminatory access, that all descrambling consumer equipment allow descrambling in accordance with the common European scrambling algorithm, and that CAS must permit cost-effective transcontrol, it is difficult to anticipate how the relevant market(s) might have developed with less or no *ex ante* regulation. Interoperability of set-top boxes is a key issue for content providers. It requires either entry into simulcrypt agreements or the adoption of “open” multicrypt systems using a common interface, allowing for multiple CAS in each set-top box. Such boxes tend to be more expensive to produce, and their “open” nature reduces the incentives of the set-top box provider to subsidise retail acquisition.

APIs do not fall within the current mandated access regime. With the exception of the MHP standard, all of the APIs currently in use in Europe are proprietary. Incompatible proprietary APIs effectively prevent the unbundling of other ancillary services, thereby preventing the development of an application for use in the same form on competing platforms. There is mixed evidence concerning the possibilities of market failure in relation to the provision of access to APIs. However, the Study Team takes the view that the strong commercial incentives for platform operators to provide access to their APIs (*e.g.*, to ensure the availability of content that will be attractive on their platforms) should not be underestimated, and are likely to further increase as capacity increases. However, the development of the provision of access to APIs, particularly given their role as the operating system of the set-top box, should be carefully monitored by regulators.

It is technically possible to provide EPGs separately from both CAS and the API. However, the lack of API interoperability (inhibiting the development of generic EPGs) and the current use of EPGs as a marketing vehicle by platform operators, means that most platforms currently carry the platform operator’s EPG. As the number and range of programmes and other forms of content increase, generic EPGs may become more commercially viable. In the view of the Study Team, regulators should monitor this, together with access to APIs, to ensure that control by platform operators does not stifle the development of a competitive market.

In the view of the Study Team, broadcasting ancillary services form part of a single relevant market. While they warrant close monitoring, the Study Team does not believe that APIs and EPGs currently warrant *ex ante* regulation.

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