

# The Implications of Convergence in Telecommunications

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Convergence of fixed line and mobile phone services is one of the latest global trends in telecommunications. The fastest-growing products in telecoms employ new technologies and many countries are reporting double digit growth in mobile phone subscriptions, with national penetration rates as high as 100% or more. Conversely, the value of traditional fixed-line business is deteriorating, as consumers are terminating their fixed-line services for mobile phone services and other newer technologies such as voice over internet protocol (VoIP). What are the economic motivators behind convergence and what are the implications of convergence on the telecom market's dynamics, regulation and fair competition standards?

## COMPETITIVE CHALLENGES

New technologies and innovative service providers are challenging the provision of telephone service over fixed lines. For example, in Finland, 46% of all voice calls were carried over mobile networks in 2003, according to Northstream data. Similarly, in Italy, 40% of all voice calls were carried over mobile phone networks. Not all countries exhibit the same high substitution effect. However, even a low level of 15% for Sweden and 13% for Germany indicates the growing impact of mobile phone calls over traditional fixed line voice calls. In fact, Analysys Research estimates that by 2009 half of all phone calls will be made on mobile phones.

Emerging technologies such as VoIP and internet broadband technologies that can carry VoIP – such as wireless fidelity (WiFi), worldwide interoperability for microwave access (WiMAX), asymmetric digital subscriber line (ADSL), and Bluetooth – further challenge the market position of fixed-line service providers. Moreover, regulatory changes and technological advances may create new demand for telecom services.

Technological advances are also exerting serious downward pressures on telecom prices, directly affecting carriers' profit margins. In order to counterbalance the effects of inter-modal competition and price competition, fixed line operators must review their strategies and make difficult decisions on how to effectively compete in this new environment. Fixed mobile convergence offers fixed line operators an opportunity to not

only offset the impact of mobile substitution but also to generate incremental revenues.

### A thriving mobile phone sector

Wireless telecom services have recorded substantial growth in terms of subscribers, revenues and usage. For example, despite an average annual growth rate of over 40% since 1985, the number of mobile phone subscribers in the United States continues to grow at a double digit rate. The Federal Communications Commission (FCC) found that in 2004 mobile phone service providers achieved 23.4 million new subscribers – an increase of over 30% from the 18 million added in 2003.

In many other countries, the mobile phone market is growing at rates comparable to or even higher than in the US and may even reach or exceed the 100% penetration level, as consumers will likely have more than one mobile phone per household. For instance, in 2002, the International Telecommunications Union (ITU) reported that Luxembourg and Taiwan both surpassed the 100% mobile phone penetration level. Hong Kong exceeded the 100% level in 2003, and the Czech Republic, Israel, Italy, Sweden and the United Kingdom hit this milestone in 2004.

The rapid growth of the mobile phone sector was partly made possible by steep declines in prices paid by subscribers for various wireless service plans. The decline in these prices has been facilitated by:

- (i) dramatic reductions in the costs that mobile carriers incur to provide mobile phone services;
- (ii) competition among wireless telecom providers;
- (iii) intermodal competition with alternatives like fixed-line and internet based communications providers;
- (iv) regulatory changes, and
- (v) rapidly increasing consumer acceptance of the mobility, coverage and flexibility offered by wireless telephony.

### A deteriorating fixed-line sector

By contrast, because of the inroads made by wireless and other emerging technologies, revenues from and demand for fixed line services have been declining and likely will continue to decline. A study released by market research company In-Stat/MDR predicts that by 2008, 29% of the estimated 192 million mobile phone users in the US will no longer have

fixed-line telephones.

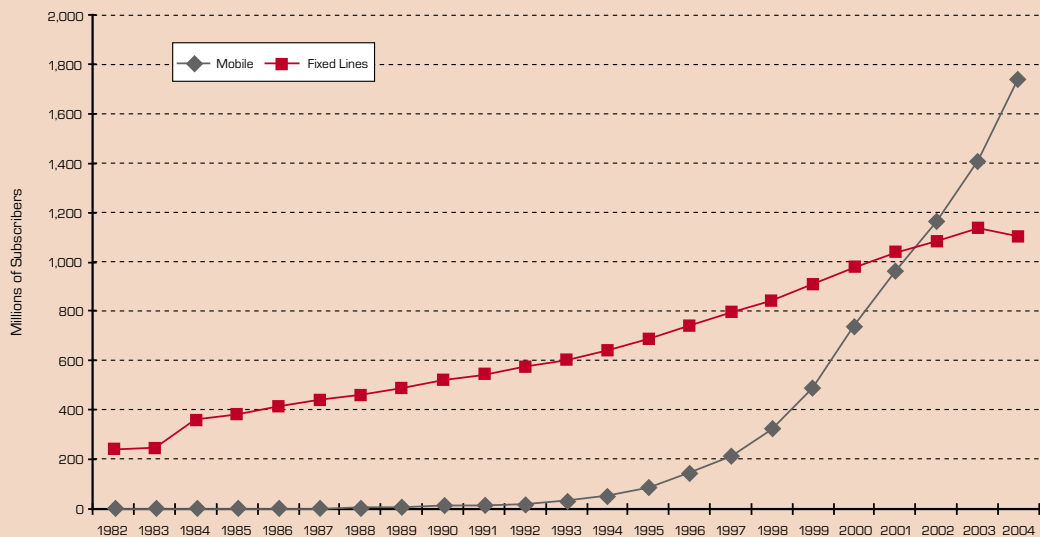
Globally, fixed line operators have already lost significant market share to mobile phone carriers. In the US, the FCC concluded that much of the decline in the fixed-line sector is due to increased competition from wireless providers.

In 2002, the number of global mobile phone subscribers surpassed the number of fixed line subscribers. If this trend continues, the number of mobile phone subscribers will soon exceed 2 billion. By contrast, the number of fixed-line subscribers has slightly dipped towards 1 billion [see *Figure 1*].

### ECONOMIC MOTIVATIONS FOR CONVERGENCE

Customers are the driving force behind fixed mobile convergence, with increasingly mobile lifestyles and demands for advanced telecoms services requiring flexible communication concepts. Converged networks offer customers a 'one stop shop' for all communication needs, offering discounted prices and consolidated bills, adding further convenience, functionality and budget control for customers.

Figure 1: Fixed to Mobile Substitution – Number of Subscribers



Source: ITU World Telecommunications Indicators 2005

Competition in the telecommunication markets ensures that the cost savings and network synergies achieved by operators will likely be passed on to consumers, who in turn will benefit from lower prices. This trend can already be seen in the marketplace, where the relative price difference between fixed-line and mobile phone services has been decreasing.

### Convergence benefits for fixed-line operators

Confronted with increasing competitive pressures, changing regulatory conditions and eroding market shares, fixed-line operators are searching to find new ways to counterbalance dwindling revenues. Convergence has become a key strategy to diversify their risks and achieve long term economic success.

In the short term, fixed-line operators can try to slash costs and improve efficiency levels, which might temporarily improve their profit margins. However, over the longer term, convergence offers the potential to preserve and enhance profits, as decreasing prices of mobile services, irreversible societal changes and changing consumer lifestyles are increasingly demanding flexible communications.

In particular, emerging technologies have the potential to improve profitability by both increasing demand for what traditional fixed-line operations can generate and by reducing costs. The increasingly prominent role of service bundling in telecoms illustrates how formerly standalone firms are enhancing their appeal to customers. On the cost side, potential benefits arise from:

- (i) greater utilization of economies-of-scale as fixed network costs are spread over greater volumes;
- (ii) increased opportunities to balance costs by sharing expenses such as marketing and customer care over a wider portfolio of services, and
- (iii) cost savings in the form of reduced churn rates.

## ECONOMIC IMPLICATIONS OF CONVERGENCE

### Implications for regulatory economics

Until recently, the telecom policy of the US and other countries has been to regard incumbent telecom carriers as dominant in both the wholesale and retail markets. Consequently, retail services have been traditionally subject to price regulation and, in order to facilitate competition from other carriers, certain components of the incumbents'

networks have been subject to mandatory unbundling requirements, i.e., some components have been leased to competitive carriers at rates prescribed by the telecoms regulator.

As competition emerges from firms employing newer technologies, such as wireless and VoIP, questions arise over whether the mandatory availability of unbundled elements should continue and whether the incumbent telecom providers are still dominant in retail markets.

#### a) Network unbundling

To facilitate competition, many telecom regulators have compelled incumbent local exchange telephone companies to make available to their competitors certain components of their networks, most prominently the local loop connecting end-use customers.

In the US, the FCC is in the process of phasing out the requirement that incumbents provide an unbundled platform (UNE-P), which is essentially a wholesale version of the incumbents' retail services typically available at very attractive discounted prices. While legal challenges ultimately resulted in a substantial reduction in the mandatory unbundling in the US, the question of whether the continuing growth of intermodal competition will eventually undermine the rationale for unbundling remains.

Even this more limited amount of mandatory unbundling, will need to be revisited at a minimum, as it is increasingly less likely to fit the market structure of a converged industry. Specifically, while there were generally much fewer competitive alternatives to fixed-line telephones when unbundling requirements were established (wireless telecoms was not comparable in either price or quality of service and VoIP was not a viable service due to network quality limitations), with convergence these and other threats to the traditional fixed-line network will need to be assessed and regulators will have to address the impact of these competing technologies.

What does it mean to have limited competition in a converged industry? Do the incumbent's competitors still need mandatory wholesale elements in order to economically enter and operate in the market? One might argue that the answers to these questions are contained in the tremendous success of wireless and VoIP services. These services clearly demonstrate that unbundled network access is not necessary for all competitors, as otherwise these carriers would not enjoy the success they do today. Regardless, a revisiting of regulatory unbundling rules is a necessity in light of current telecoms convergence.

In the US, Cox has been very successful in offering telephone services over its cable television network in direct competition with the incumbent, Qwest, in Omaha, Nebraska. As a result, the FCC has recently forborne from the requirement that Qwest be required to unbundled local loops in certain parts of the Omaha metropolitan statistical area.<sup>1</sup>

#### **b) Retail reclassification and/or forbearance**

Incumbents and new entrants have been subject to differing degrees of regulation. Incumbent carriers have typically been deemed to be dominant, i.e., to have substantial market power. Therefore, they are regulated more strictly than non-dominant carriers and are subject to, for example, pricing or rate of return regulation, must-file tariffs with cost justification and even long waiting periods before receiving approval for new tariff rates. By contrast, non-dominant carriers' prices are not regulated and, where new tariffs are required, changes can be made effective the day after a new rate or condition is filed. Similarly, dominant carriers are subject to stricter reporting requirements.

Given the degree of competition brought about by convergence and intermodal competition, regulation of the incumbent 'dominant' local exchange carriers becomes increasingly problematic. As wireless and other services such as VoIP continue to grow, the market will be competitive enough to relax the stringency of price regulation.

In the US, despite the dire warnings by some parties that the FCC's elimination of UNE-P would severely cripple retail competition, an increasing number of state regulators and legislative bodies have eliminated price regulation for a growing number of services, many times confining the remaining price restriction to basic telecom services for residential and possibly some business categories. NERA research indicates that at least 23 US states have implemented relaxed regulation (or deregulation) of this form, with many of these determination occurring very recently.

### **Implications for antitrust economics**

#### **a) Market definition**

Because the strength of competition is typically determined within well-defined markets, one of the first steps in many antitrust proceedings is to define the economic market. The economic definition of a market combines product, service and geographic characteristics. Only if markets are clearly defined can demand and supply relationships be analyzed.

Traditionally, the relevant product market for telephone services contained only

fixed-line services, as there were very few alternative providers of such services. Today, however, fixed-line, wireless, VoIP and other telecom providers have the capability to meet the demand for telephone service in many areas.

As markets and technologies converge, formerly major distinct markets are disappearing, such as that for standalone long-distance telecom providers, while others are taking their place. Competition is increasing for bundles of services such as for voice, high-speed data and video services, or for quadruple-play services which include wireless.

Regulators and competition authorities appear to be recognizing these trends. For example, in approving the recent SBC/AT&T and Verizon/MCI mergers, the US' FCC started with traditional local exchange and long-distance markets when analyzing the competitive effects on mass market (residential and small business) customers. The FCC also analyzed the impact on offerings of bundled services, for which competition is intensifying, in contrast to the shrinking usage of standalone long-distance services.<sup>2</sup>

#### b) Market power

Similar to the rethinking required for the definition of an economic market, the question arises over whether an incumbent local exchange carrier has market power. In determining whether market power exists, measures of concentration that might suggest the presence of market power in other industries may have very different interpretations in telecommunications. For example, the US Department of Justice/Federal Trade Commission's *Horizontal Merger Guidelines* define a highly concentrated industry as one with a Herfindahl-Hirschman Index (HHI) level greater than 1,800, which roughly corresponds to an industry with five equal-sized firms. The HHI is computed by squaring the percentage market shares of individual firms and adding them up.

Economic theory defines market power as the ability to raise profitably and sustain the price of goods or services above the level that would prevail in a competitive market. Usually, this power over price is made possible by a firm's ability to significantly affect the market supply of a product or service by restricting its own output of that product or service.

An effectively competitive market is one where no firm, regardless of size, has market power. In such a market, countervailing forces are likely to defeat any attempt by one firm to permanently raise the market price above the competitive level. One way that may occur is if other firms are induced to increase their supply of the product or service so that any

attempt by one firm to raise its profitably from a product or service by curtailing its output would fail, i.e., barriers to entry and expansion are low. As the US FCC has recognized numerous times, most recently in its Omaha forbearance decision, accommodative entry policies such as mandatory resale and unbundling have greatly reduced such barriers.

Perhaps more importantly, once intermodal entry by wireless and facilities-based VoIP providers has occurred, the cost structure of network-based carriers may render attempts to charge prices above a competitive level unprofitable, even when the incumbent's market share may be high by conventional standards. Prices in industries in which the cost structures include large proportions of fixed and/or sunk costs are necessarily well above marginal costs. The reason is simple: prices at marginal cost would fail to compensate the firm for its total costs. When industry output is sufficient to support only one such firm (resulting in a natural monopoly), regulation can serve to limit the necessary mark-ups so that profits are not excessive. However, when entry can occur, the potential for excessive prices may be of minimal concern. In fact, when total capacity of competing firms exceeds demand, competition can drive prices toward marginal costs to the point that the financial health of firms in the industry can be jeopardized.

Jerry A Hausman provides an insightful exposition of how the incipient loss of volume to competitors strongly limits the ability of firms with high fixed/sunk costs to sustain supra-competitive price increases.<sup>3</sup> A firm with high fixed and/or sunk costs must charge prices that are well in excess of its marginal costs in order to earn normal profits. Therefore, when such a firm loses customers to competition, its revenues erode much more than the costs that it can avoid. If the firm attempts to increase prices, the lost profits (revenue minus avoided cost) from even a small decrease in customers can easily exceed the extra revenue obtained from the price increases on customers that remain.

In particular, Hausman poses the following question: What fraction of volume must the firm lose to make such a price increase unprofitable? He suggests that for fixed-line companies, the marginal cost is about 20% of the price (with the remainder accounting for the mark-up required to recover fixed/sunk costs). With this cost structure, even a very modest 5% price increase would be unprofitable if the incumbent lost 6% or more of its volume to facilities-based alternatives such as wireless and VoIP over cable modem services.

The implication of recognizing that fixed-line telecoms depart widely from the textbook model of perfect competition are profound. When fixed and sunk costs are

low, a competing product or service has to be a very close substitute to discipline the incumbent's prices. A small price increase has to produce a disproportionately large loss in volume to be unprofitable, because when such a firm loses volume, the revenue loss is almost completely offset by cost savings.

By contrast, firms such as facilities-based fixed-line carriers cannot sustain large volume losses because the lost revenue greatly exceeds the costs savings. Competing telecommunications products do not necessarily need to be very close substitutes to fixed-line services in order for attempts at supra-competitive pricing to be thwarted.

Fortunately, competition authorities have recognized that cost structure and technological dynamism require a different interpretation of whether conventional levels of market concentration are indicative of market power. For example, in both the SBC/AT&T and Cingular/AT&T wireless merger approvals in the US,<sup>4</sup> while the FCC did calculate HHIs that would clearly imply high concentration in other industries, it appeared to give very little weight to such measures in concluding that the mergers would generally not harm competition.

## REASSESSING THE TELECOMS MARKET

The mobile telecoms sector is experiencing rapid growth in terms of the amount of subscribers, revenues and usage, despite recent difficult economic times, while the fixed-line sector is decreasing. The rapid growth of the mobile sector was partly made possible by steep declines in prices paid by subscribers for various wireless service plans. However, the success of the mobile sector has been at the expense of the fixed-line sector:

A recent survey of consumers demonstrates the significant inroads which wireless services have made into the market share of fixed-line services. The survey reflects mobile penetration rates as high as 95%, and 7-10% of the consumers surveyed have already abandoned their fixed-line services in favor of mobile service. Significantly, up to 54% of consumers indicated that they rely mostly on mobile services for voice calls. Moreover, recent industry reports and models predict that mobile wireless, cable telephony and VoIP stand to capture market share from traditional fixed line operators.

Convergence, whether restricted to fixed mobile services or more generally, has a fundamental impact on current regulatory economics. Some of the more important areas that need to be addressed include network unbundling and how to regulate the retail services of formerly dominant carriers. How a market is defined for antitrust proceedings

also will be affected by convergence. Once the market has been properly defined in this new environment, a determination of which service providers have market power must also be made. Previously, the incumbent local exchange carrier was assumed to have market power. Now, a reassessment will be necessary with the convergence of technologies. ■

### Endnotes

- 1 See *In the Matter of Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area*, WC Docket No. 04-223, Memorandum Opinion and Order, Federal Communications Commission, December 2 2005
- 2 See *In the Matter of SBC Communications Inc. and AT&T Corp. Application for Approval of Transfer of Control*, Memorandum Opinion and Order, Federal Communications Commission, November 17 2005.
- 3 See 'Regulated Costs and Prices in Telecommunications' by Jerry A Hausman in *International Handbook of Telecommunications Economics, Volume 2: Emerging Telecommunications Networks*, 2003. Also see 'From 2-G to 3-G: Wireless Competition for Internet-Related Services' by Jerry A Hausman in *Broadband: Should We Regulate High-Speed Internet Access*, AEI-Brookings Joint Center for Regulatory Studies, 2002
- 4 See *In the Matter of Applications of AT&T Wireless, Inc. and Cingular Wireless Corporation for Consent to Transfer Control of Licenses and Authorizations, etc*, WT Docket Nos. 04-70, 04-254, and 04-323, Memorandum Opinion and Order, Federal Communications Commission , October 26 2004.