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From the Editors

MVNOs are a relatively recent development in mobile telecommunications. As they succeed and fail, the debate persists as to whether regulatory intervention—specifically, imposing an access obligation on mobile network operators—helps or hinders the industry and its consumers.

In this issue of *Perspectives in Telecommunications*, NERA's Vice President Christian Dippon analyses the economic conditions that would justify regulatory intervention, and takes into account relevant international experience. This article is based on a book that he recently authored with Dr. Aniruddha Banerjee, former NERA Vice President, titled *Mobile Virtual Network Operators: Blessing or Curse?*

—José María Rodríguez and Agustín Ros, editors

The Economics Of Mobile Virtual Network Operators

Christian Dippon

Recent reports of the success and failure of mobile virtual network operators (MVNOs) have generated a great deal of media and industry interest in these wireless resellers. Virgin Mobile USA LLP is the typical success story, as it signed up over three million customers in its first 30 months of service and is currently the fastest growing mobile service provider in the US. On the downside is Walt Disney Company's recent announcement that it is closing its mobile ESPN wireless telephone service.

These drastically different outcomes spotlight the complexities of the market for branded cell phone services offered by MVNOs and have raised a series of questions—the most prominent being whether the MVNO business model is sustainable without regulatory interference. The objective of this article is to shed some light on whether MVNOs need regulatory protection or if they have sufficient appeal to thrive on their own.

What are MVNOs?

MVNOs are a relatively recent development in mobile telecommunications. Unlike facilities-based mobile network operators (MNOs), most MVNOs do not own network facilities.¹ Rather, they operate as resellers by purchasing airtime at wholesale rates from MNOs and reselling it to customers at retail prices.² However, unlike simple resellers of fixed or mobile telecommunications services, MVNOs typically rely on their brand appeal and reputation acquired in nontelecommunications lines of business to sell mobile services (i.e., they often bundle telecommunications services with their other products). MVNOs also add distribution channels and other bonus items when reselling mobile services.



The first MVNO in Europe was Virgin Mobile UK, which launched its mobile services in 1999. The European Commission (EC) reported the existence of 214 MVNOs by the end of 2005 in the EU-25, almost 30 percent more than in 2004.³ These MVNOs serve a diverse set of customers and offer a range of voice and data services. In the US, TracFone Wireless was the first to commence operations as an MVNO in May 1996. By early 2005, 22 MVNOs were operating in the US. That number is likely to grow significantly, with Amp'd, Helio, Qwest, Talk and Go, Movida, and Mobile ESPN having recently launched service and major retailers, such as Wal-Mart, Nike, and Apple, expected to launch MVNO offerings of their own to tie their established brands to mobile service.⁴

In contrast to MNOs, MVNOs in the US serve mostly the *prepaid* market segment; that is, they offer conveniently priced services that do not subject customers to long-term contracts, credit checks, or early termination fees. Moreover, prepaid services are not subject to regulatory surcharges or additional fees for activation, E911, or mobile number portability. Unlike their counterparts in Europe, MVNOs in the US have largely redefined the prepaid market segment and enjoyed considerable initial success in the process. That has forced all major MNOs to follow suit, and, as a result, the percentage of mobile service users that subscribe to prepaid plans has increased—from 6 percent in 2003 to 11 percent in 2005.⁵

In Europe (in particular, the member states of the EU), the early success of prepaid services and the relatively quick adoption of mobile services have caused mobile penetration rates to rise dramatically over the last decade (approaching 100 percent in some countries). As a result, European MVNOs (unlike their US counterparts) generally prefer to offer value-added data features, such as text messaging, ring tones, games, and music downloads, rather than voice-based prepaid services or other innovative features.

Should MVNOs enjoy regulatory protection?

Regulators around the world generally agree that the market itself (through commercial negotiations and legal enforcement) is best positioned to “regulate” the provision and growth of MVNO services. In most countries, regulators have refrained from mandating that MNOs grant MVNOs open access to their networks. However, regulators in some countries and regions, such as Spain, Hong Kong, Japan, and Slovenia, do not believe the marketplace will allow MVNOs to succeed without their help and have opted to introduce regulation

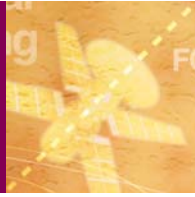
Any justification for mandating the opening of MNO networks to MVNOs depends on first establishing that MNOs exercise market power.

that forces MNOs to open their networks to MVNOs and that regulates at least some aspects of the wholesale agreement between MVNOs and MNOs. In support of their decisions, regulators have frequently cited welfare-enhancing objectives, such as increased competition, consumer choice, lower retail prices, innovation, service diversity, and the more efficient use of scarce spectrum resources.

Other regulators are still deciding whether their specific market conditions call for regulatory interference in this segment. Discussions are ongoing in Chile, Korea, Pakistan, and Israel, among others. Furthermore, in light of the recent Disney Mobile ESPN failure, some industry observers argue that the MVNO business model is not sustainable without regulatory protection for MVNOs.

The *economic* necessity for regulatory intervention on behalf of MVNOs requires critical examination. The main prerequisite for regulatory intervention in an industry is market failure, one contributing factor to which is the possession of market power by one or more firms. Economic theory defines market power as the ability to profitably raise and sustain the price of a product above the level that would prevail in a competitive market (e.g., Carlton and Perloff 1999). Usually, this power over price is made possible by a firm's ability to significantly affect the market supply of the product by restricting its own output. The corollary of this definition is that in a market that is effectively competitive or contestable no single firm, regardless of its relative size, can expect to charge a supracompetitive price and earn greater than normal profits.⁶ In such a market, countervailing forces are likely to defeat any attempt by a firm to permanently raise the market price above the competitive level. One way that this may happen is by inducing other firms to increase their supply of the product so that any attempt to raise the price profitably by curtailing output would fail.⁷

Thus, any justification for regulating the MNOs and, in particular, mandating the opening of MNO networks to MVNOs through wholesale access must depend on governments or regulators first being able to establish that MNOs exercise market power and prevent the normal operation of competitive markets from which consumers, and society at large, can benefit. Specifically, it must be demonstrated that MNOs possess natural monopoly characteristics or that they retain sole vertical control over wholesale mobile services (thus rendering those services essential facilities).



The rationales for imposing mandatory open access do not apply in the US or many other countries.

In the US, the FCC has repeatedly found the mobile market to be effectively competitive. Thus, the principal economic justification for regulatory intervention (to mandate that MNOs provide open access to MVNOs) does not exist in the US. The same is largely true in many EU member states in which MVNOs have been established and may explain the general tendency toward forbearance from any mandatory open access requirement in those countries. In the fixed sector, network facilities deemed to be “essential” historically have been subject to mandatory unbundling and cost-based pricing. However, MNOs’ mobile networks do not qualify as essential facilities, as competition for mobile services traditionally has been strong.

Consequently, neither the natural monopoly nor the essential facilities rationale for imposing mandatory open access on the mobile sector applies to MNOs in the US and many other countries. The general competitiveness of the mobile sector eliminates the market power justification for regulatory intervention, and the ready availability or duplicability of mobile network facilities eliminates the essential facilities justification.

This general conclusion likely applies to many modernized economies that enjoy robust competition in the wireless segment. A more detailed analysis is needed, however, in countries where such competition is not clearly established. In particular, in such economies it is important to examine the competitive landscape of the communications market. Such review must include a proper definition of the relevant economic markets and a thorough examination of intramodal competition (or the competition among existing wireless carriers) as well as intermodal competition (or the competition between wireless carriers and other carriers, such as wireline, VoIP, possibly cable, etc.). It is also important to review the relevant markets for any signs of market failure such as individual or collective market power by any of the wireless carriers or any evidence of concerted market behavior.

Under what circumstances can an MNO-MVNO relationship arise voluntarily?

Aside from the absence of these two standard justifications for regulatory intervention, there are sound economic and financial reasons for MNO-MVNO relationships to arise *voluntarily*. For instance, evidence shows that MNOs in the US have signed wholesale agreements with at least 42 MVNOs and are about to sign at least 13 more. Furthermore, an even larger number of such agreements are in place in the EU member states and elsewhere.



What drives these voluntarily agreements? The short answer to this question is “value.” That is, voluntary relationships will arise when MVNOs offer more economic advantages (benefits) than disadvantages (costs) to MNOs. The benefits arise principally in the form of (1) extending mobile services to market segments with which MNOs have not had much success previously, (2) market expansion by reaching entirely new or previously unserved market segments, (3) better network utilization and realization of economies of scale, (4) lower operational costs, (5) being more effective intermodal competitors, (6) effective product bundling and cross-selling⁸, (7) greater overall profits, and (8) wholesale revenues.

The costs arise principally in the form of (1) cannibalization of the MNOs’ market shares by MVNOs, (2) price erosion, (3) backlash from poor MVNO performance, (4) adverse selection of MVNOs for partnering purposes, (5) greater customer churn, (6) network congestion, (7) lower ARPUs, and (8) loss of information on usage patterns. It is important to note that not all of these benefits or costs need arise in any given MNO-MVNO relationship. However, because some of the costs may offset some of the potential benefits, a careful analysis of the prospects of a successful MNO-MVNO relationship must be conducted in advance.

MVNOs offer a way for MNOs to focus on the marketing mix and target market segments that are specific to prepaid services. This represents a form of “market deepening” that can be particularly helpful to MNOs, in light of the increased competitive pressure from intermodal, intramodal, and converged market participants. Moreover, MNOs can reach customers or market segments in the short run that they could not target previously through MVNOs. In this respect, a well-executed MVNO strategy can enable an MNO to expand its traditional market, which is a form of “market widening,” and further grow its revenues. Apart from gains in their marketing efforts, MNOs can also benefit from relationships with MVNOs that lead to improved network utilization and attendant benefits from economies of scale and lower operational costs. By being able to reap these demand-side and supply-side advantages of relationships with MVNOs, MNOs can present themselves as stronger intermodal competitors in an increasingly converged marketplace.

The many benefits of voluntary relationships with MVNOs can come at some cost to MNOs as well. One of the biggest disadvantages can arise when an MVNO ends up, for whatever reason, competing for essentially the same customers as its host MNO and, in the process, fails to either widen or deepen



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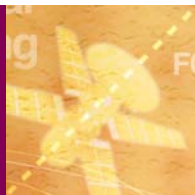
the market for that MNO. This can happen, for example, when the MVNO's services are not sufficiently differentiated, and its sole strategy is to compete on price. While competition among MNOs and MVNOs is not inherently bad for overall social welfare, the incentive for MNOs to engage voluntarily in relationships with MVNOs can only arise if overall profitability is improved for both. That is, the benefits of deepening or widening the market must more than offset the effects of cannibalization.

Another significant concern for MNOs can be that, by triggering price wars, MVNOs can actually undermine the profitability of all players. This is a valid concern, given the precedent established in the US long distance fixed sector in which vigorous competition from resellers resulted eventually in wafer-thin profit margins for incumbent service providers. To some extent, similar experiences have been observed with MVNOs in Europe. MNOs can also be hurt by associations with poorly performing MVNOs and by their failure to screen out such MVNOs in advance. Moreover, if MNOs agree to host MVNOs, but are slow to suitably upgrade their facilities, network congestion, delays, and other service quality problems can prove to be very costly—particularly in the form of churn (i.e., the readiness and ability of customers to move to alternative service providers).

When in doubt, opt for regulation?

The answer to this question is a resounding “no.” Generally, regulation should be viewed as a last resort solution. In particular, in the presence of voluntary relationships, unnecessary or unjustified regulation of MNOs can actually have detrimental effects. These could include serious losses of (1) allocative efficiency (by distorting price-cost relationships), (2) dynamic efficiency (by discouraging investments and innovation by both MNOs and MVNOs), and (3) overall social welfare. Unnecessary regulation may itself spur incentives for inefficient behavior. For example, MVNOs may pursue arbitrage opportunities that are created by such regulation or use lobbying and other means to attempt “regulatory capture.” In turn, in looking to counter or minimize the effects of pernicious regulation, MNOs may resort to expensive countermeasures, such as delaying tactics, litigation, and lobbying efforts of their own. In other words, unjustified regulation can, in effect, generate more inefficiency and welfare losses than the direct benefits it creates for MVNOs and their customers.

Based on these considerations, there can be no justification for mandating wholesale mobile access or regulating any other aspect of the MNO-MVNO relationship when concerns about wholesale and retail competition or essential



facilities are not borne out. Indeed, as many countries have discovered, in these circumstances, it is sufficient to have the instruments of antitrust or *ex post* regulation in place for remedying the consequences of bad conduct (whether on the part of MNOs or MVNOs), if and when that happens.

Where do regulators stand on the MVNO question?

In the US, there is no MVNO-related regulation. Specifically, in the 1990s, the FCC concluded that after broadband Personal Communication Services (PCS) licensees had built their networks and were competing with other existing mobile service providers, market forces would eliminate the need for explicit resale regulation. Accordingly, the FCC eliminated the resale rule for mobile services on 24 November 2002—five years after the last batch of initial licenses for the broadband PCS spectrum was awarded. In the US, that early resale rule was the only form of regulatory intervention that could possibly have aided entry by MVNOs into mobile service markets. As it turned out, such entry occurred at a much higher rate *after* the resale rule expired, possibly signifying that mandatory resale or open access was not a meaningful prerequisite for MVNO growth. While the FCC subsequently introduced other competition-facilitating programs, such as mobile number portability, none of those programs revisited the question of open access for MVNOs.

Telecommunications regulation in the EU remains the province of the national regulatory authority (NRA) in each member state. However, in April 2002, the EC implemented a uniform “new regulatory framework” based on the EU’s antitrust laws for regulating communications networks and services in the member states. The EC recognized that a stable and predictable regulatory environment was needed to (1) enable telecommunications companies in the member states to operate effectively in the EU’s single market, (2) safeguard consumer welfare, principally by promoting and preserving competition, and (3) create legal and economic cohesion among the member states. Notably, the new regulatory framework marked a significant transition in regulatory strategy itself—the replacement of *ex ante* regulation (designed typically to shape or influence the market structure) with *ex post* or antitrust regulation (designed typically to address concerns about market conduct).

The EU’s new regulatory framework directs regulatory scrutiny at 18 communications “markets” deemed most likely to be imperfectly competitive. Specifically, the EC requires individual NRAs to conduct a formal assessment of the level of competition in each such market. If a market is found to be not competitive, appropriate regulatory measures have to be drafted and



implemented, subject to EC approval. Specifically, the NRAs must determine whether incumbent operators within their respective jurisdictions possess significant market power (SMP) in any given market (among the 18 designated by the EC). SMP is said to be present if a party can “raise prices by restricting output without incurring a significant loss of sales or revenues.” According to EC guidelines, an operator with a high market share may be presumed to have SMP if that market share has remained stable over time. A gradual erosion of the market share may, however, indicate an increasingly competitive market, although that fact alone would not necessarily preclude an SMP finding. On the other hand, fluctuating market shares over time may indicate a lack of SMP in the relevant market.

In addition to market share analyses, the EC guidelines direct NRAs to further analyze markets for other economic characteristics, which include, among others, the overall size of the operator, control over essential network facilities, easy or privileged access to capital markets/financial resources, product differentiation and bundling, economies of scale and scope, vertical integration, barriers to expansion, and so on. Some combination of these criteria may suffice to support a finding that an incumbent operator has a dominant position, but no single criterion can be sufficient to support a finding of SMP.

The EC guidelines also note that a dominant position in the market can be held by more than one operator and that an operator can possess SMP either individually or jointly with others. Specifically, the guidelines require NRAs to examine whether the characteristics of the market make it conducive for multiple operators to acquire or exercise *collective* dominance through tacit coordination. Most NRAs appear to implement these guidelines by conducting the dominance test sequentially (first for individual and then for collective dominance), and by recommending regulation if an operator is found to have individual SMP or a group of operators is found to have collective SMP. If neither individual nor collective dominance can be established, then the NRA concludes that there is no SMP.

Any finding by an NRA that an incumbent operator possesses SMP in the study market is sufficient for that market to be declared “not open to competition.” Following such a declaration, the EC empowers the NRA to design and propose specific regulatory obligations to impose on the operator found to possess SMP. However, before imposing any such regulatory obligation, the NRA must submit its market SMP assessment to the EC for endorsement and approval. In this



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review process, the EC retains the authority to veto (and require withdrawal of) the NRA's market assessment.

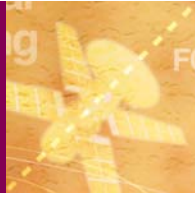
Wholesale network access and origination services provided by MNOs to MVNOs fall within the purview of "access and call origination on public mobile telephone networks," one of the 18 markets identified by the EC for SMP assessments. Thus, in determining the regulatory framework for MVNOs in the EU member states, NRAs must assess the level of competition in that particular market and determine whether any particular MNO possesses SMP.

As of April 2006, only 12 of the 25 NRAs in the EU had notified the EC of the findings from their SMP assessments of the market for mobile wholesale access and call origination. Seven of those NRAs (including Ofcom in the UK) found that the mobile wholesale access markets within their jurisdictions were competitive and did not recommend regulation to mandate MVNO access to MNO networks. The EC has endorsed the findings of all seven NRAs and their subsequent decisions not to impose the open access requirement on MNOs. Consequently, the mobile wholesale access and call origination markets in those seven member states remain unregulated.

The remaining five member states (Ireland, Slovenia, France, Finland, and Spain) found either individual or collective SMP in their respective mobile wholesale access and call origination markets and recommended regulation for MNOs to provide mandatory access to MVNOs. However, while it endorsed the findings of the NRAs of Slovenia, Spain, and Ireland, the EC disagreed with and rejected the findings of the NRAs of France and Finland. Furthermore, in December 2005, despite the EC's cautious endorsement, the Electronic Communications Appeals Panel overturned the draft regulation proposed by the Irish NRA (ComReg) for MNOs in Ireland.

Do MVNOs need regulatory protection?

Market failure is a compelling reason for using regulatory means to restore efficient competition in a market. However, based on a review of the theory and practice of economic regulation (specifically for facilitating market entry for MVNOs) and the empirical evidence drawn from our surveys of the US and the EU member states, the case for *ex ante* regulatory intervention on behalf of MVNOs is weak to nonexistent. The dramatic growth of MVNOs in a few short years (in both the US and the EU), even without the benefit of mandated open wholesale access to MNO networks, indicates that prevailing mobile market



The long-term prospects of MVNOs will depend on how effectively the industry can move beyond a cost-based market strategy.

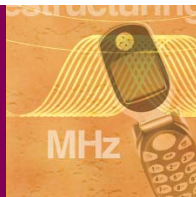
circumstances actually favor the spontaneous emergence of voluntary MNO-MVNO relationships. Thus, at least in countries with robust wireless competition, *ex ante* regulation to facilitate MVNO entry and participation in mobile markets is neither necessary nor inevitable.

Providing voluntary wholesale access to MVNOs can be a win-win situation for both MNOs and MVNOs, under the right circumstances (in terms of market structure, demand and cost conditions, and the value of brand names brought to the MNO-MVNO relationship). The key is to determine the conditions that lead to the voluntary, not mandatory, formation of a strategic relationship between the two types of service providers. As long as MVNOs can help to widen or deepen markets served by MNOs, voluntary relationships will continue to form in the impressive numbers already evident on a global basis.

Will ESPN be the first of many failures?

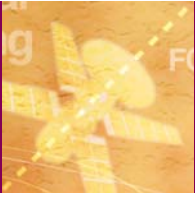
The long-term prospects of MVNOs will depend on how effectively the industry can move beyond a cost-based market strategy and exploit opportunities with mobile commerce, global positioning system applications, personal databases, and other offerings. With prices at or near marginal cost, future MVNO success stories will not be based on further discounting, but rather on value-added positioning. Some MVNOs will achieve this by relying on their brand value, innovative marketing, or expansive distribution channels. Other MVNOs or prepaid operators will succeed in this market by targeting the needs of substantial and well-defined groups, such as ethnic groups, travelers, and youths. The greatest survival challenge for MVNOs, as well as the greatest source of growth, is the ongoing process of convergence and the opportunity to offer a combination of voice, video, and data over any one of several alternative platforms. The challenge for MVNOs is to continually introduce new features and services in order to stay ahead of the game.

Disney's failure with ESPN underscores the importance of providing mobile phone service to consumers offering more than simply a different brand name. In order to succeed, MVNOs must target a niche market more efficiently than the established players—and provide some kind of added value. Much like any other line of business, if an MVNO cannot add value to consumers beyond the current offerings, it will join the ranks of ESPN Mobile. In this respect, an MVNO shakeout is quite possible, where MVNOs with a weak value proposition or an unsound business plan will be forced to exit the market. Such a shakeout, however, should not be misinterpreted as a failure of the MVNO business model, as demand and potential for sound MVNOs remain strong.



NOTES

- 1 Some leading MVNOs do possess network facilities such as mobile switching centers (MSCs) and service control points (SCPs). An MSC is a telephone switch, similar to a central office switch, which bridges a mobile telephone network with another telephone network—such as the public switched telephone network. An SCP is a database residing in a Signaling System 7 network that is queried to determine how a call should be handled (e.g., an SCP is consulted to provide the translation of an 800 number to an actual phone number and to bill the owner of the 800 number for the call).
- 2 See Federal Communications Commission (1996).
- 3 European Commission (2006) *11th Implementation Report*. Volume I Page 22.
- 4 For a comprehensive list of US MVNOs, see the Takashi Mobile MVNO/SP list (2006).
- 5 See Federal Communications Commission, Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Tenth Report*, 20 FCC Rcd 15908 (2005). See also Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Eleventh Report*, released 29 September 2006.
- 6 A contestable market is one in which the sunk costs of entry and exit are so low that attempts by a dominant incumbent firm (such as a firm with “high” market share) to exercise market power invariably fails.
- 7 Being dependent on the wholesale prices and service platforms of host MNOs, resellers and MVNOs are likely to be less effective than facilities-based competitors in disciplining the market and encouraging innovation.
- 8 For instance, with its high brand recognition and massive distribution channels, Walt Disney Corporation can reach market segments that might be out of reach to traditional network operators.



About the Author

Mr. Dippon is a Vice President in NERA's Communications and Intellectual Property Practices. He specializes in the economics, business, and regulation of the communications and high-tech industries, and the evaluation of economic damages in intellectual property and commercial litigation disputes. The above article is based on a book that he recently authored with Dr. Aniruddha Banerjee, a Vice President at Analysis Group, on economic and regulatory issues raised by the partnership between MVNOs and MNOs. To learn more about this book, *Mobile Virtual Network Operators: Blessing or Curse?* or to order a copy, please visit the NERA website at: www.nera.com/mvno.

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