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The regulation of national roaming

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The regulation of national roaming

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Contents

I.	Abstract	1
II.	Introduction	2
III.	National roaming as an instrument of policy	2
IV.	Emergency services	4
V.	European Union	5
VI.	Network sharing	7
VII.	United Kingdom	8
VIII.	Ireland	11
IX.	Finland	12
X.	Cyprus	14
XI.	Turkey	16
XII.	New Zealand	20
XIII.	Economic incentives	21
XIV.	Conclusion	23

I. *Abstract*

National roaming is a measure that can be agreed commercially between operators to extend coverage or can be imposed or facilitated by governments as a means to increase competition amongst networks. It has been used with varying degrees of success in a range of countries, notably in the European Union. It has generally faced resistance from established operators, reluctant to assist prospective competitors and reduce their shares of the market. In some countries implementation has been so poor as to fail in the objectives. The absence of agreed procedures and performance indicators may have contributed to some of those failures. The costs of deploying third generation networks are causing some operators to look at more extensive agreements, sharing radio access networks, rather than national roaming. A further factor has been the lack of prospective entrants in mature markets, making national roaming less important than had been expected.

II. *Introduction*

While attention has focused, arguably disproportionately, on policies to bring down the persistently high prices of International Mobile Roaming (IMR) there are also issues concerning National Roaming (NR). In addition to any benefits that come from identifying global best practice in NR, there may also be lessons to be transferred to IMR. The two look very much alike and might well pass the “duck test”, with the differences being that with the IMR customers can see that they are roaming on their handsets and should know that they have to pay a significant premium, especially within the European Union (EU).¹

A variety of technological, economic and political arguments in the 1980s and 1990s fatally undermined traditional positions in favour of a natural monopoly with governmental provision of mobile telecommunications. However, inertia has been seen in implementation of liberalisation, as a result of national decision-making structures and their interplay with private interest groups.² While regulators possess an informational advantage, they sometimes collude with industry incumbents, especially where they are financed by those operators, slowing liberalization. The ideologies of governments have a significant influence on outcomes, depending on the extent to which they have favoured liberalisation. Some countries experienced rapid progress, while others took several years. The question here is how these forces played out on the introduction and implementation of NR.

In a few geographically more extensive countries – notably China, India, Russia and the USA – licences for mobile services were issued on a local or regional basis. As a first step towards offering a national service, local or regional operators entered into mutual arrangements for roaming, sometimes aided by regulation, in their respective service areas. The operators responded by pursuing economies of scale up to the national level by acquisitions and by taking up additional geographic licences in subsequent auctions and beauty contests. Elsewhere, such economies of scale have generally been a matter of international expansion and consolidation.

This paper first addresses access to emergency call numbers by means of NR. It then examines the development of policies in the EU under successive regulatory frameworks. Then a series of country case studies are described and analysed: United Kingdom (UK), Ireland, Finland, Cyprus, Turkey and New Zealand (NZ). The economic incentives of the various players are then considered. Finally, conclusions are drawn and issues identified for further research.

III. *National roaming as an instrument of policy*

NR has been seen as an instrument of public policy, used primarily to facilitate market entry, in order to reduce concentration and to increase competition. It allows a new entrant a period of time during which it can offer a national service without having completed construction of its own national network. In the issuing of new licences it is considered a vital precondition to ensure non-discriminatory treatment of new entrants. If NR is allowed to endure then it gives rise to competition concerns.

¹ The “Duck Test” is formulated as: “It is a duck if it walks like a duck, swims like a duck and quacks like a duck.” There is a history of its origins at: http://en.wikipedia.org/wiki/Duck_test
However, this fails to make the obvious link to the 1843 story of *The ugly duckling* by Hans Christian Andersen.

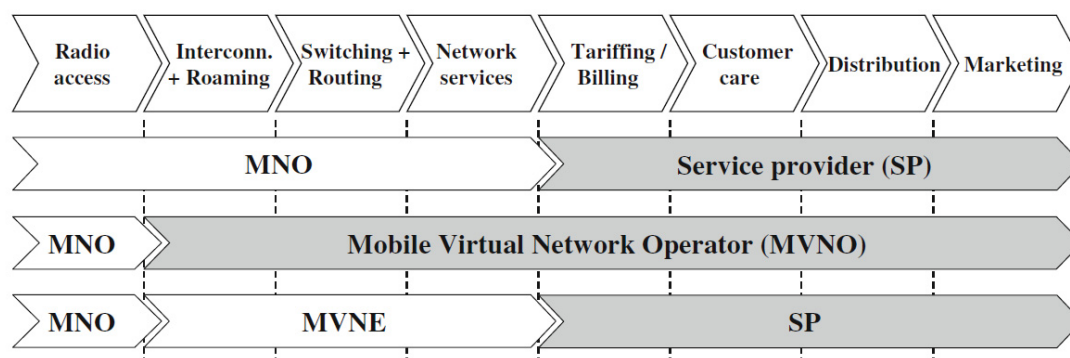
² Tomaso Duso & Jo Seldeslachts (2010) “The political economy of mobile telecommunications liberalization: Evidence from the OECD countries” *Journal of Comparative Economics* 38 (2) 199-216.

A closely related policy concerns the sharing of passive infrastructure, such as sites and towers, essential for the provision of mobile services. Analysis by competition authorities has shown these to present fewer dangers for competition than the sharing of Radio Access Networks (RANs), which generally gives rise to serious concerns about anti-competitive effects.

An analysis of the incentives in the construction of 3G networks has shown that, in equilibrium, full national coverage is achieved by means of competitors enter sharing and roaming agreements, but causing higher retail prices to consumers.³ Against a background objective of ensuring the greatest possible coverage, targets were set for percentages of the population able to use the 3G networks. It is possible to reduce the incentives for operators to use NR and RAN sharing by decreasing the scope for appropriation of extra-rents which they could otherwise have enjoyed. They can be eliminated by disallowing any sharing or, alternatively, NR fees can be regulated. NR for 3G networks can provide significant benefits for customers.⁴

Another related area is the introduction of Mobile Virtual Network Operators (MVNOs) that, in effect, engage in permanent national roaming (see Figure 1).⁵ The policy objective here is long-term service-based competition. This is in contrast to the infrastructure-based competition facilitated by NR, which would be expected to deliver more disruptive changes.

Figure 1 Mobile operator value chain possibilities⁶



Note: A Mobile Virtual Network Enabler (MVNE) provides services to MVNOs, such as billing, network element provisioning, administration, operations, support of base station subsystems and operations support systems, and provision of back end network elements.

Governments have a range of possible instruments available to increase competition in oligopolistic markets for mobile telecommunications including NR and MVNO obligations. However, they face strong pressures from the operators seeking to consolidate their activities through mergers or sharing RANs.

³ Simona Fabrizi & Bruno Wertlen (2008) "Roaming in the mobile Internet" *Telecommunications Policy* 32 (1) 50-61.

⁴ Johan Hultell & Klas Johansson (2007) *An estimation of the achievable user throughput with national roaming*. Stockholm: KTH. <http://tinyurl.com/5wmyogd>

⁵ Aniruddha Banerjee and Christian M. Dippon (2009) "Voluntary relationships among mobile network operators and mobile virtual network operators: An economic explanation" *Information Economics and Policy* 21 (1) pp 72-84.

⁶ Timo Smura, Annukka Kiiski & Heikki Hämmäinen (2007) "Virtual operators in the mobile industry: a techno-economic analysis" *Netnomics* 8 (1-2) 25-48.

IV. *Emergency services*

An important public policy objective is to ensure the greatest likelihood of connecting calls to the telephone numbers of the emergency services, even at locations where the network to which an individual subscribes does not provide a service. Such calls, always provided they are genuine, should be facilitated and given priority.

Access to emergency services, using the pan-European number 112, is available in almost all EU member states where a customer's network has no coverage (see Table 1). In twenty-one EU countries handsets that do not have a SIM-card can be used to make calls to the emergency services, with the exception of Belgium, France, Romania, Slovenia, the UK, Germany (ceased June 2009) and Bulgaria (ceased July 2009).

Table 1 *Non-availability of 112 on other domestic mobile networks*^{7, 8, 9}

Country	Status as at January 2009	Status as at January 2010	Status as at January 2011
Slovakia	-	-	Only O ₂ users on T-Mobile
Belgium	Two MNOs, but not the third	Two MNOs, but not the third	-
Estonia	SIM card has first to be removed	SIM card has first to be removed	-
UK	No – discussions underway	Available since October 2009	-
Cyprus	Activated during 2008	-	-
Romania	Activated during 2008	-	-

In March 2009 the UK regulator, the Office of Communications (OFCOM), launched a consultation on the mandatory provision of automatic national roaming between the five mobile operators for calls to the emergency services.¹⁰ This was intended to address the problem that some calls could not be connected because the customer's network was not available. It was a particular concern in remote areas, notably in parts of Scotland and Wales. The service had been available until the mid-1990s when it had been shut down, in response to concerns by the emergency authorities about the large number of hoax and nuisance calls. OFCOM argued that re-activating the service would improve public safety.

Following a successful trial, a service was again operational in October 2009.¹¹ Users could call the emergency services on either 112 or 999, the traditional UK emergency number, from another network if their own network was not available. A national roaming solution had been rejected as likely to be expensive for operators and to have taken longer to implement. Instead, a Limited Service State (LSS) solution was adopted as being both cheaper and faster. Unlike NR, LSS neither provided location

⁷ EC (2009) *Implementation of European emergency number 112 - results of the second data-gathering round* (January 2009). COCOM 09-11 and Annex. Brussels: European Commission.

⁸ EC (2010) *Implementation of European emergency number 112 - results of the third data-gathering round* (January 2010). COCOM 10-09 and Annex. Brussels: European Commission.

⁹ EC (2011) *Implementation of European emergency number 112 - results of the fourth data-gathering round* (January 2011). COCOM 10-38 and Annex. Brussels: European Commission.

¹⁰ OFCOM (2009) *Access and inclusion: digital communications for all: Consultation*. London: Office of Communications.

¹¹ OFCOM (2009) *Access and inclusion: digital communications for all: Statement*. London: Office of Communications.

information nor Calling Line Identification (CLI), meaning that emergency services are unable to return the call.¹²

Similar limits exist in the United States of America (USA). For example, Verizon Wireless warns its customers that in “extremely limited circumstances” a 911 call which is outside its own and its NR partners’ coverage will not allow emergency services to return a call to such a handset, since there is no access for incoming calls.¹³

The US Wireless Communications and Public Safety Act of 1999 required location information (Enhanced-911) to be provided to emergency services.¹⁴ The Federal Communications Commission (FCC) consulted on the means to extend 911 and E-911 to IP-enabled voice services, including those provided while roaming on Wi-Fi hot spots.¹⁵ In its Order it did not require Mobile VoIP providers to provide an E-911 service, though in a dissenting comment the FCC Chairman argued it should have been included.¹⁶

In December 2010, the FCC Federal Communications Commission opened an inquiry into a next generation of emergency services (NG911) to enable the public to obtain emergency assistance using advanced communications technologies, beyond traditional voice-centric devices.¹⁷

Clearly there is much more work to be done in ensuring access, traceability and the ability to return the calls of users of mobile phones and of, increasingly, ad hoc network devices such as games consoles, e-book readers, netbooks, tablets and the like. The elimination of hoax and nuisance calls remains a significant problem. NR plays a valuable role in ensuring access to networks to make calls to the emergency services, especially in remoter locations.

V. *European Union*

The Licensing Directive of 1997 set out the agreed principles with which Member States (MSs) had to comply when licensing 3G services.¹⁸ The UMTS Decision provided additional detail, in particular the requirement to ensure seamless compatible communications and coverage across the EU.¹⁹ 3G was uniformly taken to mean UMTS with neither cdma2000 nor TD-SCDMA being seriously considered, facilitating both NR and IMR. However, it required dual-mode handsets in order to

¹² Hutchison 3G UK Limited (2009) *Response to Mostly Mobile: Ofcom’s Mobile Sector Assessment: Second consultation*. London: Office of Communications.

¹³ http://support.vzw.com/faqs/Wireless%20Service/faq_domestic_roaming.html#item6

¹⁴ <http://thomas.loc.gov/cgi-bin/query/z?c106:H.R.438.IH:>

¹⁵ FCC (2008) In the matter of implementation of the NET 911 Improvement Act of 2008. Notice of Proposed Rulemaking. August 25, 2008. WC Docket No. 08-171.
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-195A1.pdf

¹⁶ FCC (2008) In the matter of implementation of the NET 911 Improvement Act of 2008. Report and Order. October 21, 2008. WC Docket No. 08-171.
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-08-195A1.pdf

¹⁷ FCC (2010) In the matter of framework for next generation 911 deployment. Notice of inquiry. December 21, 2010. PS Docket No. 10-255.
http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-10-200A1.pdf

¹⁸ Directive 97/13/EC of the European Parliament and of the Council of 10 April 1997 on a common framework for general authorizations and individual licences in the field of telecommunications services.

¹⁹ Decision No 128/1999/EC of the European Parliament and of the Council of 14 December 1998 on the co-ordinated introduction of a third-generation mobile and wireless communications system (UMTS) in the Community, OJ L 017, 22. 01.1999, p. 1.

access GSM networks. To ensure non-discriminatory treatment of operators without a pre-existing network, NR was to be ensured for any new entrants.

Article 4 (2) of the UMTS Decision permitted MSs to act to ensure coverage of less-populated areas. By 2001, many MSs had made arrangements for national roaming in order to improve or to accelerate coverage (see Table 2).²⁰ Very quickly national roaming between 2G and 3G was at least possible and often mandated, subject to specific conditions.²¹

Table 2 *Provisions for national roaming as at March 2001*

Availability	Countries
Yes	Austria, Belgium, Finland, Italy, Netherlands, Portugal, Spain & UK.
TBD	Denmark, Greece, Ireland & Luxembourg.
Other	Germany (commercial negotiation) & Sweden (access to GSM spectrum).

TBD = To be decided

Additionally, some MSs allowed the possibility of 3G to 3G national roaming agreements, including Denmark, France, Finland, Greece, Italy, Luxembourg and Spain. The sharing of geographic zones within a country, coupled with national roaming, was used to ensure coverage of different parts of the national territory and to accelerate full national coverage. Except for Finland and Spain, such arrangements did not count towards licence conditions that required coverage of some proportion of the territory or population.

Prior to 2003, most member states had designated at least one of their GSM operators as having Significant Market Power (SMP), with eleven of the then fifteen MSs having imposed NR obligations, of which five regulated the prices for NR.²² With the 2002 directives, regulators had to undertake analyses of Market 15 for Mobile Access and Call Origination (MACO), to determine which remedies were necessary, including NR, which was identified in Art. 12 (1)g of the Access Directive (2002/19/EC). Several MSs removed the NR obligations of operators:

- France;
- Netherlands;
- Norway;
- Spain; and
- Sweden.

A fallback position, where no operator had SMP, would have been to impose NR on operators using Article 5 of the Access Directive, on the basis that competition was not fully effective.²³

In 2007, MACO was removed from the list of markets.²⁴ The explanation offered was largely in terms of wholesale access for MVNOs and not NR, with a view that the

²⁰ EC (2001) *The introduction of third generation mobile communications in the European Union: State of play and the way forward*. COM (2001) 141. Brussels: European Commission.

²¹ EC (2002) *Towards the full roll-out of third generation mobile communications*. COM (2002) 301. Brussels: European Commission.

²² ERG (2006) *Mobile access and competition effects*. ERG (06) 45. Brussels: European Regulators Group.

²³ Tommaso Valletti (2003) *Obligations that can be imposed on operators with significant market power under the new regulatory framework for electronic communications: Access services to public mobile networks*. (Brussels: European Commission).

²⁴ Commission Recommendation on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the

market tended towards competition.²⁵ The entry of new operators was largely over, with the exception of a number of unissued licences, notably, in:

- Belgium;
- Luxembourg; and
- France.

With diminished expectations of market entry, with construction of quite extensive national networks with at least some spare capacity, the need for regulated NR has greatly diminished.

VI. *Network sharing*

In February 2002, the European Commission received applications from operators proposing to share their 3G networks:

- Germany: T-Mobile and O₂;²⁶ and
- United Kingdom: O₂ and T-Mobile.²⁷

This followed the auctions in Germany and the UK in which operators had spent enormous sums to acquire individual licences to build dedicated 3G networks. Financial markets and governments feared that the construction of the networks would be delayed by their high costs and the increasing realisation that the revenues might not, at least initially, be proportionate to the expenditure. Quam, a joint venture of Telefónica and Sonera, having won a licence to operate 3G services in Germany returned it, without the fee being refunded.²⁸

In 2003, the EC adopted two decisions determining the extent to which the operators could cooperate through network sharing and NR, these were in addition to the guidelines issued by the respective national regulators.^{29, 30} Site sharing was considered not to restrict competition. NR was held to restrict competition at the wholesale level, with potentially harmful effects in downstream retail markets, because of dependence on the price and quality provided by the other operator. The EC recognised that NR would allow the operators to provide better coverage and quality of service within a shorter time frame.

European Parliament and of the Council on a common regulatory framework for electronic communications networks and services. C(2007) 5406 rev 1. 2007/879/EC.

²⁵ EC (2007) Staff working document: Accompanying document to the Commission Recommendation on Relevant Product and Service Markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services. SEC(2007) 1483/2

²⁶ Case COMP/C-1/38.369

²⁷ Case COMP/C-1/38.370

²⁸ The Superior Administrative Court of the State of North Rhine-Westphalia (OVG) in Muenster gave its judgement on June 30, 2009 (Ref. 13 A 2969/07), deciding that the UMTS license acquired by Quam GmbH in the auction of 2000 had been legally revoked and that the regulator was not obliged to pay back the fee of €8.5 billion.

<http://www.bakernet.com/BakerNet/News/Archive/GermanFNAUMTSLicense.htm>

²⁹ 2003/570/EC: Commission decision of 30 April 2003 relating to a proceeding under Article 81 of the EC Treaty and Article 53 of the EEA Agreement Case COMP/ 38.370 — O2 UK Limited / T-Mobile UK Limited ('UK Network Sharing Agreement').

³⁰ 2004/207/EC: Commission decision of 16 July 2003 relating to a proceeding under Article 81 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/38.369: T-Mobile Deutschland/O2 Germany: Network Sharing *Rahmenvertrag*).

In negotiation with the EC the operators revised their agreement for Germany, creating a complex hierarchy of provisions for NR, undertaking gradually to roll back the service, first in major then minor urban areas and finally rural areas. The EC then exempted these, for limited periods, under Article 81 (3) EC.

O₂ Germany appealed against these provisions of the Decision, arguing there was no intention to restrict competition, nor would this be the effect of the agreement as claimed by the EC.³¹ In 2006, the Court of First Instance (CFI) annulled Articles 2 and 3(a) of the Decision.³² In addition to procedural failings by the EC, the CFI held that NR did not restrict competition within the meaning of the Article 81(1) of the EC Treaty (now Article 101(1) TFEU).³³ The Court accepted that NR assisted O₂, as the smallest GSM operator, in entering the UMTS market and this might well increase competition. This left in place only the Article 81(3) exemption which restricted resale of NR to MVNOs on the grounds that without such a prohibition the MNOs would not have entered into the agreement.

VII. *United Kingdom*

In 1999, OFTEL held a consultation on the provision of NR on existing GSM networks for future new entrant UMTS operators.³⁴ It proposed a licence condition for the GSM operators to act as a “backstop”, requiring them to provide NR, should commercial negotiations fail. This was necessary to ensure a “level playing field” for any new entrants. Incumbent operators were in an “excessively powerful competitive position” compared to prospective new entrants to the market. Both Her Majesty’s Government (HMG) and the Director General of Telecommunications regarded it as essential for the success of the auction of 3G licences that customers of new entrants be permitted NR.

One2one, supported by Orange, won a judicial review against OFTEL.³⁵ This struck down the requirement that they had to accept NR on their GSM licences as a condition of bidding for a 3G licence. OFTEL then had either to persuade the operators to accept changes to their GSM licences or it could have referred the matter to the Monopolies and Mergers Commission (MMC). However, both O₂ and Vodafone agreed to the NR condition.

The policy for future spectrum assignment had been set out in 1996, paving the way for auctions.³⁶ The 3G auction attracted nine bidders, as against four existing

³¹ Action brought on 25 September 2003 by O2 (Germany) GmbH & Co. OHG against Commission of the European Communities (Case T-328/03) (2003/C 275/88).

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2003:275:0052:0053:EN:PDF>

³² Judgment of the Court of First Instance of 2 May 2006 — O2 (Germany) v Commission (Case T-328/03)

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:154:0015:0015:EN:PDF>

³³ T-Mobile Deutschland/O₂ Germany [2004] OJ L75/32 (CEC)

Case T-328/03, O2 (Germany) GmbH & Co. OHG v Commission of the European Communities. [2006] ECR II-1231.

³⁴ OFTEL (1999) *Statement on national roaming*. London: Office of Telecommunications.

<http://www.ofcom.org.uk/static/archive/oftel/publications/1999/consumer/roam1099.htm>

³⁵ Mercury Personal Communications Ltd & Anor, R (on the application of) v Secretary Of State For Trade & Industry [1999] EWCA Civ 2072 (6 August 1999).

<http://www.bailii.org/ew/cases/EWCA/Civ/1999/2072.html>

³⁶ President of the Board of Trade (1996) *Spectrum management: into the 21st Century*. London: HMSO. Cm 3252.

operators, a significant factor in the large sum of money it raised.³⁷ Had only four licences had been offered, it was believed the four incumbents would have used their competitive advantages to outbid and thus exclude potential new entrants. Therefore, a key element was the provision of NR to facilitate new entrants. Nonetheless, the four incumbents won 3G licences. They were joined by Hutchison Whampoa, trading as “3” (3UK), which successfully negotiated an NR contract with O₂.

In May 2003, looking to the implementation of the new EU regulatory framework, OFTEL again consulted on NR.³⁸ Licences were to be replaced with general authorisations under the new directives, but could be supplemented by continuation notices.³⁹ OFTEL decided to continue the NR obligation, despite objections. The new entrant was already claiming to cover 60-65 per cent of the population and Vodafone argued that the GSM operators were likely to have spare capacity in rural areas making a competitive outcome for NR likely in the ‘last square miles’.⁴⁰

In July 2004 OFCOM began a further consultation on NR.⁴¹ It proposed to discontinue Condition 69A of the licences of Vodafone and O₂, which provided for NR on their 2G networks for 3. OFCOM now argued that it was no longer proportionate or objectively justified on the basis of access.

Nonetheless, OFCOM maintained a commitment to ensure that 3 had a “high degree of certainty” about the availability and the terms for NR, though it sought less intrusive means to achieve this goal. 3UK had a commercial agreement with O₂ and at least one other operator had committed to negotiating an alternative, on a commercial basis. OFCOM observed that it retained its statutory dispute resolution powers, though it did not set out how it might handle such a dispute.

At the request of 3, OFCOM postponed its decision until its own tendering exercise was completed. In 2006, 3 signed a contract with Orange for NR outside the 88 per cent coverage it had built.⁴²

Consequently, licence condition 69A requiring the provision of national roaming remained in force.

In March 2010, the EC approved the merger of two major mobile networks in the UK, those of Deutsche Telekom (T-Mobile) and France Telecom (Orange), which became Everything Everywhere Limited.^{43, 44} This was despite the joint venture becoming the market leader, with 29.5 million customers. The aim of the merger was to pool

³⁷ National Audit Office (2001) *The auction of radio spectrum for the third generation of mobile telephones*. London: The Stationery Office. HC 233 Session 2001-2002.

³⁸ OFTEL (2003) *National roaming condition: A consultation on proposals to set a national roaming condition after 25 July 2003*. London: Office of Telecommunications.
http://www.ofcom.org.uk/static/archive/oftel/publications/eu_directives/2003/eu_roam/roam0503.pdf

³⁹ Schedule 18 of the Communications Act 2003.

⁴⁰ Responses to consultation are available at:
<http://www.ofcom.org.uk/static/archive/oftel/publications/responses/2003/roam0503/index.htm>

⁴¹ OFCOM (2004) *National roaming: A further consultation*. London: Office of Communications.
http://www.ofcom.org.uk/consult/condocs/roaming/nr_update

⁴² 3G Operator 3 and Orange hook up for national roaming, 10th May 2006.
<http://www.3g.co.uk/PR/May2006/3040.htm>

⁴³ Merger of T-Mobile UK and Orange UK cleared by EU [sic] Commission. Everything Everywhere, press release, 1 March 2010.

<http://everythingeverywhere.com/2010/03/01/merger-of-t-mobile-uk-and-orange-uk-cleared-by-eu-commission/>
⁴⁴ Mergers: Commission approves proposed merger between UK subsidiaries of France Telecom and Deutsche Telekom, subject to conditions. European Commission. IP/10/208. 1 March 2010.
<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/208>
http://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=2_M_5650

resources to create a better high-speed mobile broadband network, with synergies from both firms, having combined 2009 revenues of £7.6 billion and EBITDA of £1.4 billion. The T-Mobile and Orange UK brands were to continue separate operations for at least 18 months after the completion of the transaction (i.e., until mid-2012).

The EC initially held serious doubts about the merger. Its analysis showed customers switching operators in ways that showed the parties were not particularly close competitors. The UK market for retail mobile services was considered competitive and likely to remain so following the merger.

The spectrum available was divided amongst the five operators, with O2 and Vodafone having 900 MHz spectrum and all five having both 1900 and 2100 MHz spectrum (see Table 3). There was concern that the combination of the spectrum holdings of Orange and T-Mobile would allow the merged entity to launch a unique national 2x20MHz LTE network in the near future at speeds of up to 100 Mbps.

Deutsche Telekom and France Telecom undertook to divest 2x15 MHz of their 1800 MHz GSM frequencies. Of the divested spectrum 2x10 MHz was to be cleared by 30 September 2013 and the remaining 2x5 MHz by 30 September 2015.

Table 3 *United Kingdom spectrum allocations to mobile network operators (MHz)*

<i>Operator</i>	<i>900</i>	<i>1800</i>	<i>2100</i>	<i>Total</i>
Orange	-	2x30	2x10	2x40
T-Mobile	-	2x30	2x10	2x40
Combined	-	2x60	2x20	2x80
Vodafone	2x17.4	2x5.8	2x15	2x38.2
O ₂	2x17.4	2x5.8	2x10	2x33.2
3UK	-	-	2x15	2x15
Total	2x35	2x72	2x60	2x167

3UK had agreements with both merging parties dating from 2007:

- A 3G RAN sharing agreement with T-Mobile; and
- A 2G NR agreement with Orange.

Under the RAN agreement 3UK and T-Mobile merged their 3G networks to create a unified network of 13,000 sites under a joint venture. This allowed 3UK significantly to increase its coverage in the UK and to diminish its use of the 2G agreement. The FT/DTAG joint venture would have created the incentive to terminate or to compromise the 3G RAN agreement. To eliminate this, the merging parties undertook to modify the agreement with 3UK to change the provisions for its termination, to safeguard 3UK when consolidating the Orange and T-Mobile networks and to submit written reports to the monitoring trustee on continuing negotiations with 3UK.

In February 2010, the UK Office of Fair Trading (OFT) requested the EC refer to it the consideration of the merger, under Article 9(2)(a) of the EU Merger Regulation, arguing that it threatened significantly to affect competition in UK mobile communications markets. In light of the commitments offered by the parties, the OFT withdrew its referral request on 1 March 2010.

The issue was further complicated by introduction of spectrum trading in June 2011.⁴⁵ This included all three bands – 900 MHz, 1800 MHz and 2100 MHz – aimed at giving operators added flexibility.

⁴⁵ Mobile spectrum trading given go-ahead, OFCOM, 20 June 2011.

For all the enthusiasm of the UK to ensure an opportunity for the entry of new players, this was eventually whittled down to one and that required several interventions to sustain its rights to NR. Ultimately, the UK has seen a reduction in the number of competing RANs, with considerable collaboration and consolidation between players, faced with the costs of covering a relatively densely populated country. The outcome of any spectrum trading, the sale of spectrum by Everything Everywhere and the 2012 auctions for LTE spectrum (800 MHz band) will show how much infrastructure competition there will be, certainly much less than envisaged in preparation for the 3G spectrum auction.

VIII. Ireland

The third GSM licence in Ireland was awarded in June 1999 to Meteor, but was not issued until mid-2000, due to litigation initiated by Orange, the loser in the beauty contest.⁴⁶ In 2005 Meteor was acquired from Western Wireless Corporation (USA) for €420 million, by Eircom, formerly Telecom Éireann. The state-owned operator had been privatised and then acquired by private equity “investors”. Eircell, its original GSM operation had been first spun-off and then acquired by Vodafone, leaving it a purely fixed network operator.

The government issued 3G licences were to “3 Ireland” (Hutchison Whampoa Ltd), Vodafone and O₂ (Telefónica de España). The fourth licence was issued in late 2005 to Smart, which beat both Eircom and Meteor in the contest.⁴⁷ In February 2006, the regulator cancelled the licence following the failure of Smart to make the payments specified in its bid and in the licence conditions. This decision was upheld on appeal by the Dublin High Court in March 2006.⁴⁸ The licence was then offered to and accepted by Eircom, completing the set of four GSM and UMTS players.⁴⁹

Meteor had belatedly launched its GSM service in early 2001, making slow progress against the two established operators. In February 2003, it announced it had sought assistance from the regulator in its pursuit of an NR agreement.⁵⁰ Meteor finally obtained an NR agreement with O₂, signed in August 2004.

In its market analysis in 2005 the regulator found O₂ and Vodafone to be jointly dominant, which they maintained by a “constructive refusal” to grant wholesale access for airtime service providers or MVNOs.⁵¹ The regulator accepted that the NR agreement with O₂ allowed Meteor to compete more effectively, but argued there was no evidence at that time that the NR agreement was sufficient to alter the

<http://media.ofcom.org.uk/2011/06/20/mobile-spectrum-trading-given-go-ahead/>

⁴⁶ Orange Telecommunications Ltd. v. Director of Telecommunications Regulation [2000] IESC 22 (18th May, 2000).

<http://www.bailii.org/ie/cases/IESC/2000/22.html>

Orange Telecommunications Ltd. v. Director of Telecommunications Regulation (No.2) IESC 22; [2000] IESC 79; [2000] 4 IR 159 (18th May, 2000).

<http://www.bailii.org/ie/cases/IESC/2000/79.html>

⁴⁷ “Irish regulator awards final 3G License” *Cellular News*, 16th November 2005.

<http://www.cellular-news.com/story/14860.php>

⁴⁸ Smart Mobile Ltd v Commission For Communications Regulation [2006] IEHC 82 (13 March 2006)

<http://www.bailii.org/ie/cases/IEHC/2006/H82.html>

⁴⁹ James Middleton “Eircom accepts 3G licence” *Telecoms.com*, 28 February 2007.

<http://www.telecoms.com/7500/eircom-accepts-3g-licence/>

⁵⁰ “Meteor seeks national roaming from ComReg” *Silcon Republic*, 6 February 2003.

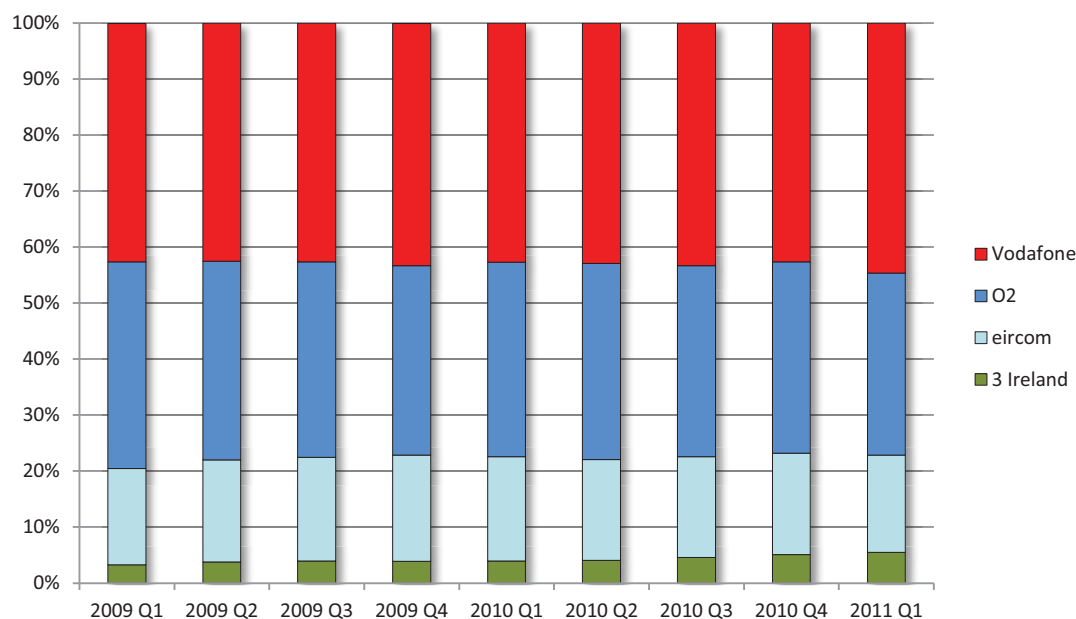
<http://www.silconrepublic.com/digital-life/item/609-meteor-seeks-national-roami>

⁵¹ Comreg (2005) *Market analysis – Wholesale access and call origination on public mobile telephony Networks*. Doc. No. 05/27. Dublin: Commission For Communications Regulation.

dynamics of the market. It limited NR agreements until the access seeker had its own network covering 20 per cent of the population. The joint dominance decision was subsequently withdrawn. The test for joint dominance is relatively high and very difficult for a regulatory authority to achieve.⁵²

In 2005, 3 launched its UMTS service as a new entrant, having signed a GSM NR deal with Vodafone.

Figure 2 *Mobile market shares by revenue in the Republic of Ireland*⁵³



The result today is a market still dominated by Vodafone and O₂, the older established operators (see Figure 2). It could take a further decade for 3 Ireland and Eircom to reach some level of parity.

IX. Finland

In 1999, in response to a complaint by Telia, then a new entrant on the Finnish market, *Kilpailuvirasto* (the Finnish Competition Authority) accused the two leading mobile operators, Sonera and Radiolinja (later rebranded as Elisa), of violations of the Competition Act.⁵⁴ There was alleged to be a price squeeze between the wholesale charges for NR and the retail charges for its own customers, which prevented Telia from providing a competitive national service.⁵⁵ This squeeze was intended, in the short term, to protect the market positions of Sonera and Radiolinja.

At that time, neither Sonera nor Radiolinja held, either separately or jointly, a dominant position on the market for NR, but both had the opportunity and the

⁵² Chris Doyle (2007) "Collective Dominance, Market Analysis and the 2002 EU Framework Directive: The Case of Mobile Access and Call Origination in Ireland" pp 141-69 in Author: Paul J J Welfens & Mathias Weske (editors) *Digital economic dynamics*. Berlin: Springer.

⁵³ Comreg (2011) *Quarterly key data report: Data as of Q1 2011*. Doc. No. 11/44. Dublin: Commission for Communications Regulation.

⁵⁴ Act on Competition Restrictions (480/1992), incl. amendment (318/2004).

<http://www.kilpailuvirasto.fi/cgi-bin/english.cgi?luku=legislation&sivu=act-on-competition-restrictions-amended>

⁵⁵ <http://www.kilpailuvirasto.fi/cgi-bin/english.cgi?luku=news-archive&sivu=news/n-1999-09-17>

incentive to use their market power to affect competitive conditions. *Kilpailuvirasto* closed the case after Telia concluded an NR agreement with Radiolinja in 2000, which enabled the former to offer nationwide coverage.⁵⁶ Nonetheless, Telia appealed to the Competition Council against the decision of the *Kilpailuvirasto*, since it continued to seek access to the more extensive network of Sonera.

The Competition Council confirmed the opinion of the *Kilpailuvirasto* that Sonera did not hold, either alone or jointly with Radiolinja, a dominant position on the market.⁵⁷ However, it rejected *Kilpailuvirasto's* opinion that the operator was engaged in an abuse of dominance, but accepted that its pricing practices had harmed competition. The case was sent back to the *Kilpailuvirasto* to clarify whether the prices for national roaming were slowing the entry of competitors.

In March 2002, the merger was announced of Sonera and Telia. Following the failure of the Telia-Telenor merger.⁵⁸ At that time Sonera was the largest and dominant provider of mobile telecommunications in Finland, with more than half the market and with very substantial coverage of the population. Telia was the third largest network with limited coverage, but extended by NR contracts with both Radiolinja and Suomen 2G (Finnet Group), respectively the second and fourth operators. In the view of the European Commission the proposed merger raised "serious doubts as to its compatibility with the common market in relation to the provision of mobile communications services".

In July 2002, the EC approved the merger.⁵⁹ TeliaSonera had undertaken to divest the Telia network in Finland and to be non-discriminatory in its provision of wholesale mobile network services in Sweden and Finland. The merger resulted in savings for TeliaSonera in NR charges.⁶⁰ The Telia Finland network was acquired by Song in 2001, then in 2004 Song was acquired by TDC of Denmark. In 2006 TDC became an MVNO on Finnet's DNA network (900, 1800 and 2100 MHz), in parallel with MVNO deals in Norway and Sweden.^{61, 62}

Elisa (previously Radiolinja) bought Saunalahti in mid-2005, with the *Kilpailuvirasto* requiring commitments only on the fixed market.⁶³ While this decreased competition in mobile services it was held not to lead to the creation of a dominant position.

Following the adoption of the new regulatory framework, Ficora, the Finnish NRA, undertook an analysis of the MACO market.⁶⁴ TeliaSonera had 45 per cent, Elisa just under 30 per cent and DNA under 15 per cent, the remaining 10 per cent being held by independent service providers. Ficora, supported by the other operators, considered TeliaSonera to be dominant, but the EC disagreed, arguing that the

⁵⁶ TeliaSonera Annual Report 2000, page 9.

⁵⁷ Finland (2001) *Annual report on competition policy developments in Finland*. Paris: Organisation for Economic Cooperation and Development.
<http://www.oecd.org/dataoecd/34/9/2489023.pdf>

⁵⁸ Stefan Schmid & Andrea Daniel (2009) "Telia - a Swedish-Finnish marriage after a failed Norwegian courtship" *Thunderbird International Business Review* 51 (3) pp 297-310.

⁵⁹ DG Competition Case No COMP/M.2803 – Telia/Sonera.

⁶⁰ TeliaSonera Annual Report 2003.

⁶¹ Liikenne- ja viestintäministeriö (2005) *MVNO pricing structures in Finland*. Helsinki: Ministry of Transport and Communications.
<http://www.mintc.fi/files/maailma/mvno%20pricing%20structures%20in%20finland.pdf>

⁶² Annukka Kiiski, Heikki Hämmäinen (2004) *Mobile virtual network operator strategies: Case Finland*. ITS 15th Biennial conference. Berlin, Germany.
http://www.netlab.tkk.fi/tutkimus/lead/leaddocs/KiiskiHammainen_MVNO.pdf

⁶³ <http://www.kilpailuvirasto.fi/cgi-bin/english.cgi?luku=publications&sivu=oecdreport2005>

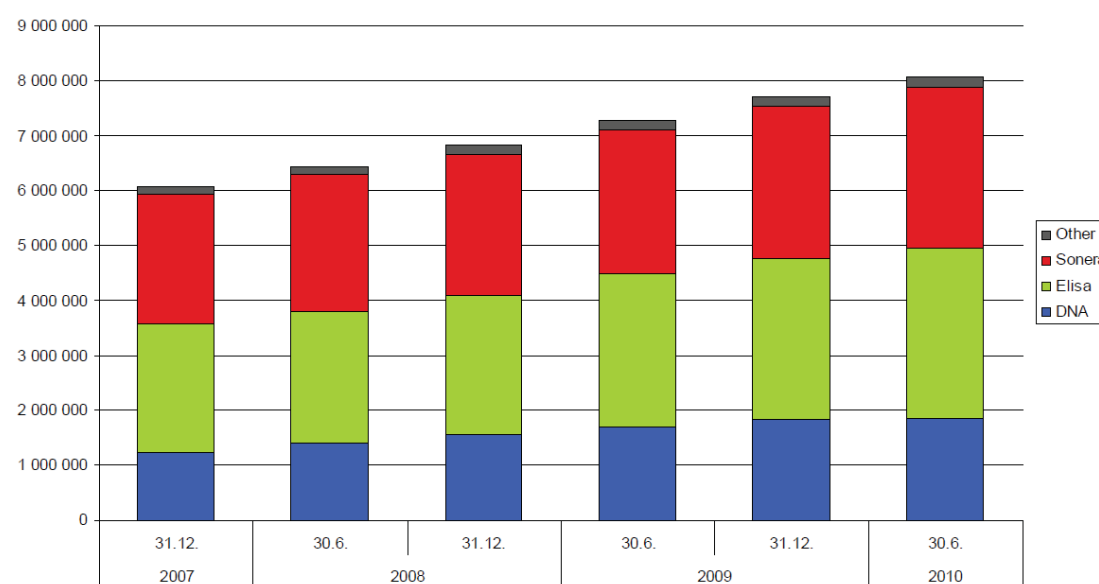
⁶⁴ <http://www.ficora.fi/>

market was competitive and that TeliaSonera should not be subject to remedies. On reconsideration Ficora accepted the position of the EC.

Kilpailuvirasto began, on its own initiative, an investigation into the wholesale mobile markets for access and termination in 2005.

Today, the Finnish market has two substantial operators, TeliaSonera and Elisa, with DNA the other significant player in addition to a sprinkling of small MVNOs and service providers (see Figure 3). The degree of concentration is relatively high, even allowing for the small size of the market. It seems likely that, with more aggressive regulation to support new entrants, especially in the provision of NR, the market might have been able to sustain four infrastructure-based competitors.

Figure 3 *Market shares in Finland*⁶⁵



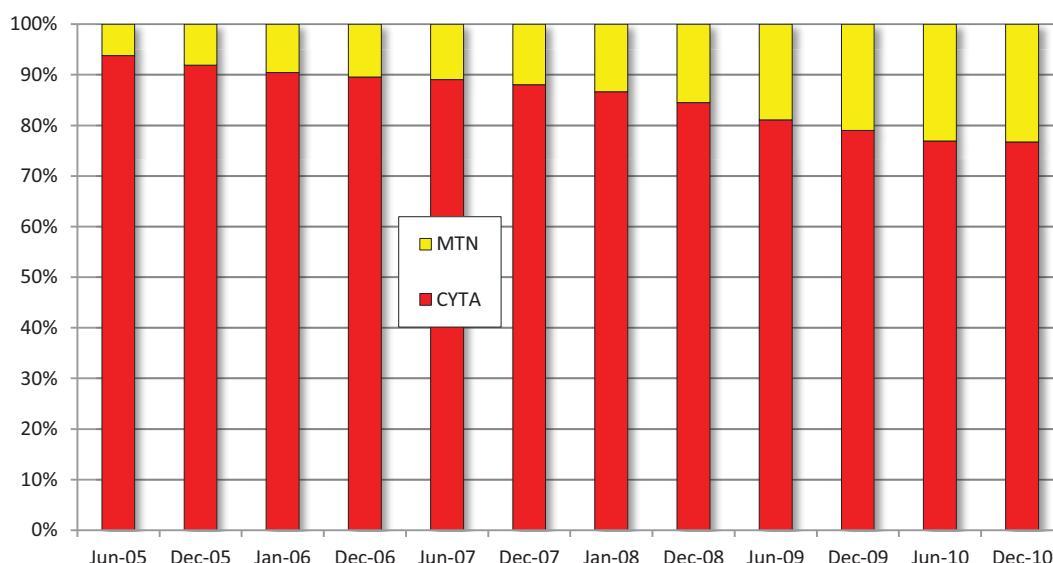
X. Cyprus

The Cyprus Telecommunications Authority (CYTA) was the monopoly direct state provider of telecommunications for decades, eventually losing its regulatory function to the Office of the Commissioner of Telecommunications and Postal Regulation (OCECPR), remaining the incumbent state-owned operator. In 2003, a second GSM licence was belatedly issued to Areeba (later MTN), though even today the market is dominated by CYTA, now Cytamobile Vodafone.⁶⁶ It was only in 2009 that the second operator, having made remarkably slow progress, could be seen to have become properly established (see Figure 4).

⁶⁵ Ficora (2010) *FICORA market review 3/2010: Bi-annual review 2010*. Helsinki: Ficora.

http://www.ficora.fi/attachments/englantia/5uqZ0T7OB/English_3_2010.pdf

⁶⁶ Cytamobile Vodafone is branding agreement with Vodafone Group. Since February 2004 it has been the exclusive Vodafone representative in Cyprus.

Figure 4 Market shares in the Cyprus mobile market⁶⁷

Areeba began its commercial operations in September 2004, signing a national roaming agreement with CYTA. On 18 April 2005 it filed a complaint against CYTA, alleging a margin squeeze between the wholesale prices it was charged and the new retail rates that CYTA had introduced for its own customers.

The Commission for the Protection of Competition (CPC) found a *prima facie* infringement of Section 6 of the Protection of Competition Law.⁶⁸ It issued a Statement of Objections against CYTA and required it to appear to respond, then issued a relatively lenient fine of CYP 50,000.⁶⁹ The CPC subsequently fined CYTA CYP 2,200,000 (€3.8 million) for abusive conduct in the mobile telephony market.⁷⁰ This was raised partly because CYTA had failed to comply with an interim order issued the previous July which had already resulted in criminal charges against CYTA.⁷¹ The Cyprus Supreme Court annulled, on procedural grounds, the decision of the CPC.⁷²

⁶⁷ OCECPR (2009) Telecom bulletin.

⁶⁸ Protection of Competition Law No. 207 of 1989.

[http://www.competition.gov.cy/competition/competition.nsf/All/98B5C3B0F0543CECC22571A80030F503/\\$file/L.%20207-89eng..pdf?OpenElement](http://www.competition.gov.cy/competition/competition.nsf/All/98B5C3B0F0543CECC22571A80030F503/$file/L.%20207-89eng..pdf?OpenElement)

⁶⁹ See CPC press release of 15 September 2005:

<http://www.competition.gov.cy/competition/competition.nsf/All/362CBC9C76D8676FC225707D0027A098?OpenDocument>

⁷⁰ Statement of objections for the infringements of competition legislation by the Cyprus Telecommunications Authority (CYTA) following the complaint submitted by Areeba Ltd. Case 2006/01/20.

⁷¹ See press releases of 31 August and 9 September 2005:

<http://www.competition.gov.cy/competition/competition.nsf/All/E7E86B047548BD06C225706E00296DAF?OpenDocument>

<http://www.competition.gov.cy/competition/competition.nsf/All/AE7C108863B4249EC22570770031B7E0?OpenDocument>

⁷² [in Greek] Commission for the Protection of Competition (Epitropi Prostatias Antagonismou), 20 January 2006, Areeba Ltd. vs. Cyprus Telecommunications Authority (CYTA). Available at:

<http://www.competition.gov.cy/competition/competition.nsf/All/5CA0720EF7FDDA7CC22570FF>

CYTA was separately found guilty of a price squeeze against a fixed ISP.⁷³

In parallel the OCECPR had been addressing the problem of NR, noting that:

According to the Order regarding National Roaming (564/2003), the Commissioner took all necessary measures to ensure the continuance of the implementation of the relevant provisions and the cooperation between CYTA and Areeba, the two mobile telephony providers in the Republic of Cyprus, by issuing the Decision 15/2006 in order to settle the dispute of National Roaming tariffs. The said dispute arose from a failure to reach an agreement between the parties for the amendment and the re-determination of National Roaming maximum tariffs, as these were imposed to the parties according to the Decision of the Commissioner 5/2004 and were included in the relevant National Roaming Agreement they have both signed. The need to amend the existing Agreement was a result of the alteration of retail tariffs in mobile telephone services by CYTA.

Cyprus was one of the few countries in the EU where the MACO market was found not to be competitive.⁷⁴ Consequently CYTA was designated as having SMP. The EC noted that OCECPR had to ensure competition between the two MNOs through “stringent” wholesale regulation, proposing that it impose price controls on national roaming. OCECPR determined the price should be €0.0214 per minute for voice calls, which MTN alleged was twice the level of cost orientation.

The “market” in Cyprus has been very poorly governed by the ministry, regulator and the competition authority, with little regard for the citizens. The state-owned entity has been allowed an entirely unnecessary and enduring dominance, presumably also benefitting from its dominance of the market for wholesale IMR services.⁷⁵ The second operator has grown only very slowly because of poorly designed and ill-executed policies. As yet no third or fourth licence has been issued, nor are there any MVNOs. Some defence is offered with the argument that the small size of the market constrains many of the options of larger countries and even excludes some.⁷⁶

XI. Turkey

Experience in Turkey is of an “interesting interplay” between privatization, liberalization and regulation.^{77, 78} It has been complicated by the troubled relationship

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See also the press release in English:

<http://www.competition.gov.cy/competition/competition.nsf/All/297CEFF6CC8941D3C22570FF00451B6C?OpenDocument>

⁷³ Decision of the Commission for the Protection of Competition relating to a proceeding under section 6 of the Law 207/89 (Case No.: 11.17.25/2004).

[http://www.competition.gov.cy/competition/competition.nsf/All/12F705B85B1E5FE2C22571DA0031ED43/\\$file/telepassoport-english1.pdf?OpenElement](http://www.competition.gov.cy/competition/competition.nsf/All/12F705B85B1E5FE2C22571DA0031ED43/$file/telepassoport-english1.pdf?OpenElement)

⁷⁴ EC (2007) *European Electronic communications regulation and markets 2006* (12th implementation report) SEC(2007) 403. Brussels: European Commission.

⁷⁵ Additionally, CYTA has seen its revenues bolstered by its dominance of the IMR market.

⁷⁶ Pavlos C. Symeou (2009) “Does smallness affect the liberalisation of telecommunications? The case of Cyprus” *Telecommunications Policy* 33 (3-4) 215-29.

⁷⁷ Izak Atiyas & Pinar Doğan (2010) “Glass half empty? Politics and institutions in the liberalization of the fixed line telecommunications industry in Turkey” pp. 261-284 in *Understanding the process of economic change in Turkey* Edited by T. Çetin & F. Yilmaz, Nova Science Publishers, Inc.
https://www.novapublishers.com/catalog/product_info.php?products_id=12315

⁷⁸ For general background see: Tamer Çetin and Fuat Oğuz (editors) (2011) *The political economy of regulation in Turkey*. New York: Springer.

between the Competition Board and the Telecommunications Authority, compounded by Council of State being unwilling or unable to resolve matters and by periodic political interference.^{79, 80, 81} Nominally, it has aspired to implement the EU *acquis communautaire*, though implementation has been somewhat selective.

The first GSM services in Turkey were launched in 1994 by Telsim and Turkcell using the 900 MHz band.⁸² Aria (a joint venture of Telecom Italia Mobile (TIM) and İş Bankası) entered the market in 2001 Q1 and Aycell (wholly owned by Turk Telekom, the fixed incumbent) in 2001 Q4, both using the 1800 MHz band, which requires many more base stations. In 2003, Aria agreed to merge with Aycell, later rebranding as Avea. Then, at the end of 2005, Vodafone acquired Telsim. In April 2009, after previous abortive attempts, 3G licences were issued to the three incumbents, with Turkcell taking the largest allocation of spectrum.

The retail mobile market has been consistently dominated by Turkcell and remains heavily concentrated.⁸³ Later entrants fought an uphill battle, failing to make much progress against Turkcell, which continued to report figures twice as high as its nearest rival for perceptions of network coverage in consumer surveys.⁸⁴ Using revenue data, the HHI is slightly higher than on the chart, because of the success of Turkcell in securing post-paid customers (see Figure 5). The failure of the Turkish authorities to implement mobile number portability and NR greatly dampened the effect of market opening. Based on this, there was only a modest expectation that 3G services, admittedly now supported by number portability, would see significant changes in the market structure.

⁷⁹ Şahin Ardiyok and Fuat Oğuz (2010) "Competition law and regulation in the Turkish telecommunications industry: Friends or foes?" *Telecommunications Policy* 34 (4) 233-43.

⁸⁰ Necmiddin Bagdadioglu & Murat Cetinkaya (2010) "Sequencing in telecommunications reform: A review of the Turkish case" *Telecommunications Policy* 34 (11) 726-35.

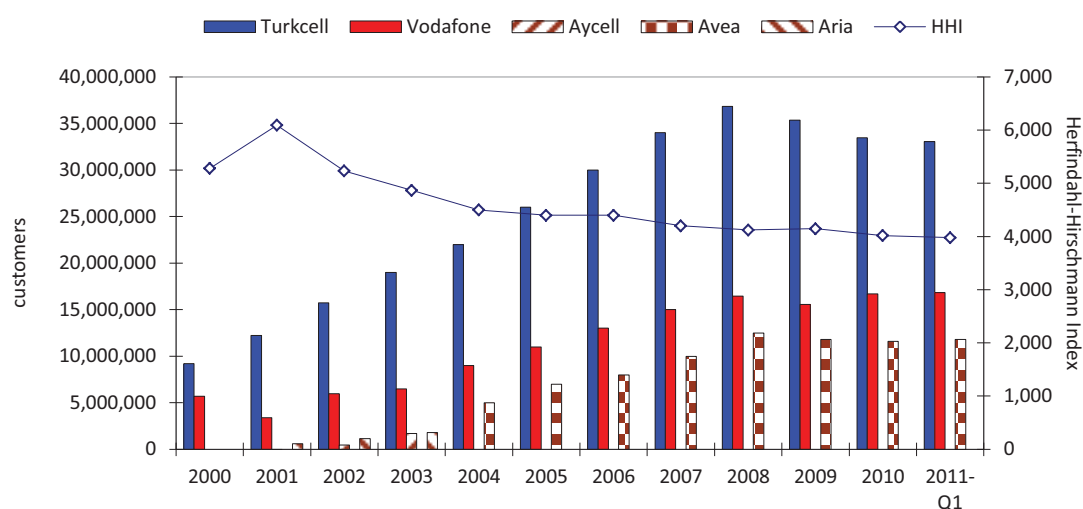
⁸¹ Şahin Ardiyoka & Fuat Oğuz (2010) "Competition law and regulation in the Turkish telecommunications industry: Friends or foes?" *Telecommunications Policy* 34 (4) 233-43.

⁸² TeliaSonera owned 37.3% of Turkcell, raised to 64.3%. *Wireless Federation*, 8 July 2009.

<http://wirelessfederation.com/news/17623-teliasonera-to-raise-stake-in-turkcell-sweden-turkey/>

⁸³ İzak Atiyas (2005) "Competition and Regulation in the Turkish Telecommunications Industry" Working Paper Series of Economic Policy Research Institute, Sabanci University.

⁸⁴ See, for example, slide 8 of its presentation at HSBC 9th CEEMEA Investor Forum, September 2009. Available at <http://www.turkcell.com.tr/en/investorRelations/presentations/Presentations>

Figure 5 *Growth of mobile telephony in Turkey*

One study has examined elasticities at firm level, for pre-paid and post-paid customers in Turkey, for the period 2002 to 2006.⁸⁵ Another takes a managerial/marketing view of Turkcell and its “early mover” advantage.⁸⁶ This found Turkcell, has used an array of differentiation marketing strategies and improved quality of services to defend itself against later entrants.

NR has been an unresolved dispute since 2001, despite legislative provisions and regulatory interventions.⁸⁷ Aria and Aycel were initially unable to conclude NR agreements with Turkcell and Telsim. The obstacle was the high level of charges proposed by the two 900 MHz operators, with the clear intention of hindering their entry on the market. In November 2001 the two entrants requested the regulator to intervene to determine the terms, conditions and prices. However, its decision on the concession was subject to arbitration before the International Chamber of Commerce.

In 2002, the Telecommunications Authority (TA) adopted an ordinance on NR, which specified that:⁸⁸

- The TA had 15 days to decide if a request was to be accepted;
- The parties were expected to reach agreement within four weeks;
- If they failed to agree, the TA could decide; and
- The TA could fine operators between 1% and 3% of turnover for failure to implement its orders.

In 2003 the Competition Board imposed record fines on Turkcell and Telsim, amounting to €17.8 million, for their abuse of dominant positions by their refusal to provide national roaming.⁸⁹

⁸⁵ Mehmet Karacuka, Justus Haucap & Ulrich Heimeshoff (2011) “Competition in Turkish mobile telecommunications markets: Price elasticities and network substitution” *Telecommunications Policy* 35 (2) 202-10.

⁸⁶ Solmaz Filiz Karabag & Christian Berggren (2011) “Mobile communications in Turkey: from first mover advantages to management capabilities” *info* 13 (2) 72-84.

⁸⁷ OECD (2002) *Reviews of regulatory reform: regulatory reform in Turkey: Regulatory reform in the telecommunications industry*. (Paris: Organisation for Economic Cooperation and Development). <http://www.oecd.org/dataoecd/40/13/1840797.pdf>

⁸⁸ Ordinance on Principles and Procedures for Making National Roaming Agreements on 8 March 2002. English translation available at: http://www.tk.gov.tr/pdf/Ulusal_Roaming_yonetmeligi_ingilizce.pdf

The two established operators had reached 90 per cent coverage of the population at that time, while Aria and Aycell lacked sufficient coverage to compete effectively. The entrants faced geographical and topographical difficulties, legal restrictions, bottlenecks and technological limitations. Consequently, they could not engage new customers and obtain returns on their investments.

The Competition Board designated the networks of Turkcell and Telsim as essential facilities, until sufficient coverage was achieved by the two market entrants. It also determined that prices for NR must be related to costs, otherwise it would have artificially raised the costs of the new entrants and created a barrier to entry.

The Competition Board imposed fines on Turkcell and Telsim of 1% of their net sales in 2001, for abuse of their dominant positions by refusing to comply with their obligation to make NR agreements with Aria. The fine of nearly YTL 30 trillions (€17.8 millions) was the highest imposed until then by the Board.

The Board did not impose a behavioural remedy, based on its expectations of further changes in the market conditions and the changes that had already occurred in the demand by the new entrants for NR during the investigation. It referred the matter to the Telecommunications Authority which it believed had better market information.

The Council of State, the supreme administrative court in Turkey, stopped the implementation of the decision of the Competition Board.⁹⁰ It was argued that the Board's decision would now have little effect and that NR had ceased to be an issue, given the merger of Aria and Aycell.⁹¹ However, the merger was substantially the result of the failure of government and its agencies to ensure suitable conditions for market entry.

In 2003, the EC noted that no NR agreements had been signed.⁹² By 2007, there were still no NR agreements, though Turkcell and Telsim had been required by the TA to satisfy reasonable, economically proportionate, and technically feasible requests made by other operators. In 2009, it was again observed that no NR agreements had been signed.⁹³ Nonetheless, another provision had been made that allowed national roaming to be imposed by the TA, as part of the access obligations in Article 15 of Electronic Communications Law.⁹⁴

Despite all the legislation, regulatory interventions, litigation and arbitration no operator has ever obtained NR services in Turkey. The dominant operator, Turkcell, with the most geographically extensive network and the largest customer base, continues to attract a disproportionate number of customers because of the extent of its coverage and density of its network. The authorities have been shown to be

⁸⁹ Turkey (2006) *Roundtable on remedies and sanctions in abuse of dominance cases: note by Turkey*. DAF/COMP/WD(2006)11. (Paris: Organisation for Economic Cooperation and Development).

⁹⁰ Supreme Administrative Court, Decision No. 910 of 2006 (March 8, 2006).

⁹¹ The result was a firm owned by Turk Telecom (40%), TIM (40%) and İşBank Group (20%). See Turkey (2004) *Post regulatory reform developments with regards to competition policy in Turkey*. Paris: Organisation for Economic Cooperation and Development. DAF/COMP/WD(2004)36

⁹² EC (2003) Regular Report on Turkey's progress towards accession.

http://ec.europa.eu/enlargement/archives/pdf/key_documents/2003/rr_tk_final_en.pdf

⁹³ Cullen International (2010) *Supply of services in monitoring regulatory and market developments for electronic communications and information society services in Enlargement Countries: Report III: Annex Cross-country tables*. Brussels: European Commission.

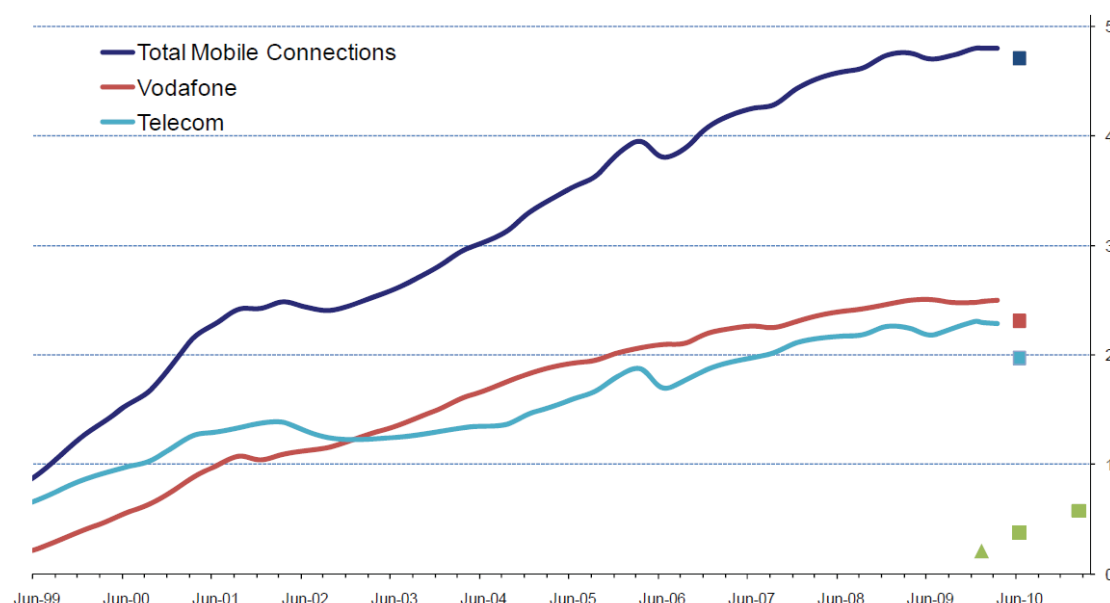
⁹⁴ Electronic Communications Law No. 5809. See also Mehtap Yıldırım Öztürk, Çağdaş Evrim Ergün and S. Mustafa Durakoğlu (2009) "Electronic communications law: analysis" *E-Commerce Law & Policy* 11 (5) 14-15. Available at: <http://www.cakmak.av.tr/pdf/ECLaw.pdf>

entirely incapable of ensuring reasonable conditions for market entry and even of recognising the scale of the problem.

XII. New Zealand

In 2007, the Commerce Commission noted that New Zealand had, after fifteen years of duopoly, two relatively evenly matched operators in Telecom NZ and Vodafone, a position that remains little changed today (see Figure 6). A belated new entrant, 2degrees, has argued that the position is significantly worse, with social and geographical monopolies held by each of the operators, propped up by price differentials between on-net and off-net calls. By mid-2010 the market shares were: Vodafone 50 per cent, Telecom NZ 42 per cent and 2degrees with 8 per cent.

Figure 6 Market shares of mobile operators in New Zealand ⁹⁵



The duopolists each used a different technology, Telecom NZ had chosen CDMA while Vodafone had GSM, though both are migrating to UMTS for 3G to take advantage of opportunities for IMR. Telecom NZ launched its XT Mobile Network service, using UMTS in the 850 MHz band in 2009, just as Vodafone was completing construction of its UMTS network in the 900 MHz band.⁹⁶ This meant that customers could switch operator by changing a SIM-card, provided they had a quad-band handset,⁹⁷ rather than having to change the handsets as in the past.

While a third licence had been issued in 2001 to NZ Communications, a consortium of Econet of Zimbabwe and indigenous Maori interests, it had repeatedly delayed the launch of a commercial service. The company was restructured and rebranded as 2degrees, finally launching a service in August 2009.⁹⁸

⁹⁵ Commerce Commission (2011) *Annual telecommunications market monitoring report 2010*. Wellington: Commerce Commission.

⁹⁶ Jock Given (2010) "Take your partners: Public private interplay in Australian and New Zealand plans for next generation broadband" *Telecommunications Policy* 34 (9) 540-49.

⁹⁷ 850, 900, 1900 and 2100 MHz bands.

⁹⁸ Owned by Trilogy International Partners (USA), Hautaki Trust, General Enterprise Management Services International (HK) and Communication Venture Partners.

In order to succeed in the market, which was already saturated, 2degrees argued strongly that it required NR at reasonable rates. NZ Communications having chosen GSM, negotiated an NR deal with Vodafone, completed at the end of 2007.⁹⁹ It had a fallback position, since its licence gave it the right to NR once it had completed coverage of ten per cent of the population with its own network.

The Commerce Commission conducted an inquiry into NR and published its report in March 2008.¹⁰⁰ In May, the Minister agreed to amend the terms for NR, but reserved a decision on whether it should be subject to price regulation.¹⁰¹ This was given effect by an Order in Council the following August.¹⁰²

In September 2008, having receiving a further request from 2degrees, the Minister asked the Commerce Commission to conduct an investigation to consider changing national roaming from a specified to a designated service, i.e., to impose price controls. The Commission delayed its inquiry while it completed its complex investigation into the cost of Mobile Termination Rates (MTRs).¹⁰³ On 15 December 2010, the Commission announced that it would not investigate whether NR regulation should be extended to prices, because there were adequate commercial arrangements in place.

The need for market entry to help reduce the high level of concentration is self-evident in New Zealand. The third entrant repeatedly put off its entry, perhaps for financial or commercial reasons, yet the authorities did not revoke the licence and re-auction. When what was effectively a new company did enter, there were repeated disputes over NR rates and terms, this made more difficult an already hard entry into a saturated and heavily concentrated market.

XIII. Economic incentives

A national network with the most extensive coverage is perceived by many customers as an important factor when selecting between competing offers, with attention being given to maps and to perceptions of quality and availability as reported by friends and colleagues or, more formally, by surveys.¹⁰⁴ The absence of coverage has led one regulator to use the term “not spot” for areas lacking a 3G or, sometimes, a 2G service.¹⁰⁵

⁹⁹ <http://www.vodafone.co.nz/about/media-centre/2007-media-releases/nz-communications.jsp>

¹⁰⁰ Commerce Commission (2008) *Schedule 3 investigation into amending the roaming service: final report*. Wellington: Commerce Commission.

¹⁰¹ David Cunliffe. National mobile roaming decisions announced. Press release. 8 May, 2008.

<http://www.beehive.govt.nz/release/national+mobile+roaming+decisions+announced>

¹⁰² Telecommunications (National Roaming) Order 2008 (SR 2008/251).

¹⁰³ Commerce Commission (2010) Final Report on whether the mobile termination access services (incorporating mobile-to-mobile voice termination, fixed-to-mobile voice termination and short-message-service termination) should become designated or specified services. Wellington: Commerce Commission.

<http://www.comcom.govt.nz/IndustryRegulation/Telecommunications/Investigations/MobiletoMobileTermination/ContentFiles/Documents/MTAS%20Final%20Report%20-%20PUBLIC%20Version%20-22%20Feb%202010.pdf>

¹⁰⁴ See, for example, OFCOM mobile coverage maps:

<http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/broadband/cellular/3g/maps/3gmaps/> Ordnance Survey:

<http://www.ordnancesurvey.co.uk/oswebsite/business/sectors/wireless/gsmcoverage.html>

¹⁰⁵ One early use of the term, in 2006, was by Mason for the Scottish Administration.

<http://www.scotland.gov.uk/Publications/2006/12/20130045/2>

A similar argument applies to the IMR service, with operators offering their post-paid customers coverage in small islands in the Pacific and on Caribbean cruise liners, even on some airlines. There is a clearly a value given to wider geographic coverage and also a level of concern amongst operators about complaints of a failure to provide the service, with the possible loss of high-spending customers. In IMR a foreign operator will have contracts with several and possibly all available networks. This is allegedly ensure calls are not lost, but it seems to reflect the significant margins available on IMR compared to making similar NR deals.

Building a truly national network entails a substantial initial investment and not insignificant operating costs that depend more on the structure of the network than on the volumes of the traffic being carried. For an operator that owns its own network, such investments and operating costs are not variable costs and therefore have no direct bearing on the price of the units it sells to its customers. The network operator has an incentive to achieve the largest economies of scale, within the available network capacity, as the costs incurred in building and operating the network are largely independent of the units used. Selling large numbers of units to an MVNO or to an MNO that is still constructing its own network can be effective ways of achieving those economies of scale. As Vodafone noted, networks are unlikely to be fully loaded in the “last square miles” and thus inclined to make deals.

Fewer operators run their own networks today than in the past. Instead they contract network management to vendors, which are now as much in the service business as in manufacturing. For example:

- HT Mobile Vietnam to Huawei;
- Orange UK to Nokia Siemens Networks;
- Vodafone Turkey to Motorola; and
- Zain in East Africa to Nokia Siemens Networks.

Site preparation for masts can be bought from other firms (e.g., Tunk Telecom in Turkey). In some cases chains of masts belong to a third party which lease them to the operators such as

- Crown Castle International;¹⁰⁶
- Indus Towers;¹⁰⁷ and
- National Grid Transco.¹⁰⁸

One consequence is that many of the costs that are usually considered to be fixed may well have become variable.

Where one operator relies on another operator for a substantial part of its national coverage, it can create incentives and constraints in the way in which it sets prices and the structure of those prices that are different from those of an infrastructure owner. The cost of purchasing wholesale capacity under an NR agreement is generally based on the volume of use (the number of minutes of speech, the number of text messages and the Megabytes of data). Consequently, use is a variable cost and thus contributes, together with other costs, to the minimum price per unit that the operator can charge its customers and its ability to offer bundles, “buckets” or “unlimited” calls or data.

¹⁰⁶ <http://www.crowncastle.com/>

¹⁰⁷ <http://www.industowers.com/>

¹⁰⁸ <http://www.nationalgrid.com/> acquired the UK business of Crown Castle in 2004.

In using national roaming, a mobile operator cannot achieve the same economies of scale as on a dedicated network. The more capacity it sells to its customers, the higher will be its spending under its NR contract.

Dependence on a national roaming agreement considerably narrows the room for manoeuvre by an operator. Compared with its rivals, a new entrant has quite different incentives, for example, in deciding whether or not to adopt an aggressive pricing strategy or to attract customers in areas where it does not yet have its own infrastructure.

Vodafone has proposed a model for pricing competitively neutral national roaming.¹⁰⁹ This takes account of the geographical cost structure of the networks, allowing any possible “cream-skimming” effect in which a new entrant concentrates the construction its network in lower cost or higher traffic density areas.

XIV. Conclusion

National roaming was seen an important instrument to support the entry of additional infrastructure-based mobile network operators that should, in the medium term, increase competition and reduce market concentration, delivering wider choice, lower prices and better services for consumers and businesses. Maximum success requirew it to be offered definitively at the time when licences were first announced to attract bidders. The pricing must be sufficiently below retail levels as to allow a reasonable degree of flexibility for new entrants when setting their tariffs and, at least, a modest profit margin.

The application of national roaming was predicated on the presence of a pool of well-funded potential entrants. However, this dried up first in the dot com crash, then as markets saturated and the high cost of network construction and customer acquisition became clearer. It was not helped by some countries seeking to protect smaller national operators from acquisition by multi-national operator groups. Instead, multi-national operators switched to growth market: Africa (Orange and Vodafone), Latin America (Telefónica) and Asia (Telefónica and Vodafone). Recent entrants in markets such as Belgium, France and Ireland have been fixed operators driven into mobile more to protect existing revenues with multi-play offers than in pursuit of growth.

National roaming obligations can become disproportionate to policy goals. In markets where there is sufficient competition between existing infrastructure owners then – at least in theory – existing market players may provide national roaming on purely commercial terms. However, those same players have considerable incentives not to make market entry easy and to try to thwart, delay or damage the new entrant. Thus, even in relatively competitive markets, it seems injudicious to assume negotiations will be quick and effective, without the fallback of effective dispute resolution by a regulator.

As the case studies show, inept and delayed implementation or poorly crafted decisions being overturned on appeal have damaged market entry, leaving entrenched operators in dominant, monopolistic or duopolistic positions, causing market entry to fail or to be so drawn-out as to contribute little towards policy goals. It is remarkable that, given the clarity of the policy objective, some countries managed to fail so abjectly in implementation of national roaming.

¹⁰⁹ Jonathan Sandbach (2009) “National roaming pricing in mobile networks” pp 249-64 in B. Preissl *et al.* (eds.), *Telecommunication markets*, Contributions to Economics. Heidelberg: Springer Verlag.

One of the reasons for the failures has been the absence of criteria for monitoring the implementation of NR, with neither the OECD nor the European Commission having developed tests or indicators. The measures that might be tracked to diagnose possible problems include:

- Market concentration (calculated both from volumes of use and revenue);
- Customer numbers (actual, new and churn rates);
- Average Revenue Per User (ARPU); and
- Network construction (coverage of area and population).

The repeated failures to enforce mandated national roaming in Cyprus and Turkey illustrate fundamental and systemic flaws. They highlight the risk of markets that remain unnecessarily concentrated, in which one operator is allowed to perpetuate its dominance and thus draw from the market excessive profits. The causes are inadequate systems of governance and the absence of proper reviews of institutional performance, including ineffective oversight by the European Commission. Even today it is doubtful that the Cypriot and Turkish systems of governance of telecommunication markets are fit for purpose, requiring significant institutional reforms.

National roaming does not stand on its own, but is used in conjunction with other measures, including mast and network sharing, mobile number portability and the supply of leased lines, metro-Ethernet and dark fibre to connect together base stations and exchanges. The open licensing of international gateways also helps new entrants, by allowing them to offer competitive international call rates, to terminate calls and to internalise IMR.

Much more detail is required to understand which combinations of policies and instruments have really been effective and the need for links to other measures. This would help regulators fine tune the terms and conditions of national roaming for future market entry strategies. Indeed, it may be legitimate to ask if it has ever truly worked.

There is considerable scope for further research. There are questions of the roles of outsourcing of network management and the leasing of masts, in order to understand how these affect competition in mobile markets. There are also questions about the choices between national roaming and the sharing of radio access networks, with its need for deeper integration, which may conceal more from regulators, but which may yield greater savings for the operators.