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POLICY DEPARTMENT A
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Economic and Monetary Affairs

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How to Build a Ubiquitous EU Digital Society

STUDY

EN

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Abstract

In this study, we analyse the achievements and failures of the *European Regulatory Framework for Electronic Communications*, with an eye to its impact on the broader EU economy; contrast it with regulatory models in other parts of the world; evaluate the costs and benefits of various interventions such as international mobile roaming; consider the interaction between fixed and mobile networks; assess the European Commission's proposed Connected Continent proposals of 11 September 2013; and make policy recommendations going forward.

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CONTENTS

LIST OF ABBREVIATIONS AND GLOSSARY

3rd Generation Partnership Project (3GPP) The 3rd Generation Partnership Project (3GPP) is a collaboration between groups of telecommunications associations, known as the Organizational Partners. The initial scope of 3GPP was to make a globally applicable third-generation (3G) mobile phone system specification based on evolved Global System for Mobile Communications (GSM) specifications within the scope of the International Mobile Telecommunications-2000 project of the International Telecommunication Union (ITU). Over time the scope has expanded to technologies beyond 3G.

(IEEE) 802.11ac Within the IEEE family of standards, the 802.11ac refers to a version of the Wi-Fi standard which also allows transmission in the 5 GHz frequency band. See also Wi-Fi.

Access Access enables one network operator to obtain the use of portions of the network of an operator that possesses SMP at cost-oriented prices, thus enabling it to offer services to its customers.

Access Directive Directive 2002/19/EC (the Access Directive) which fosters competition by enabling network operators to gain access to the facilities of network operators that have Significant Market Power (SMP), and provides for interconnection of networks.

Accounting separation Accounting separation refers to separated regulatory accounts (financial details) which are made available to the NRA or to the public concerning regulated.

ADSL ADSL stands for Asymmetric Digital Subscriber Line (DSL). DSL is a type of high speed Internet that communicates through a phone line, but produces a continuous connection that does not interfere with the line. ADSL creates an asymmetric connection, where the downstream data is much faster than the upstream. See also VDSL.

All-IP	All-IP refers to a full transition in telecommunication networks to packet switched communications based on the Internet Protocol.
Australian Communications and Media Authority (ACMA)	An Australian National Regulatory Authority (NRA) (for many purposes). See also ACCC.
Australian Competition & Consumer Commission (ACCC)	The Australian NCA and (for most purposes) NRA. See also ACMA.
Basic Broadband	Basic broadband represents fixed-line network technologies capable of delivering broadband at any speed in excess of 144 kbps.
Body of European Regulators for Electronic Communications (BEREC)	BEREC is an association of EU NRAs (and observer country NRAs) with formal standing under the Regulatory Framework. It replaces the European Regulators Group (ERG).
Bill and keep	Bill and Keep is a pricing scheme for the two-way interconnection of two networks under which the reciprocal call termination charge is zero - that is, each network agrees to terminate calls from the other network at no charge.
Bitstream (Access)	Bitstream Access refers to the situation where the incumbent installs a high-speed access link to the customer premises, and makes this access link available to third parties (new entrants), to enable them to provide high-speed services to customers. Bitstream depends in part on the Public Switched Telephone Network (PSTN), and may include other networks. Bitstream access is a wholesale product that consists of the provision of transmission capacity in such a way as to allow new entrants to offer their own, value-added services to their clients. The incumbent may also provide transmission services to its competitor, to carry traffic to a 'higher' level in the network hierarchy where new entrants may already have a broadband point of presence.
Cable Television Networks	Networks designed to provide cable television (broadcasting) services.
Canadian Radio-television and Telecommunications Commission (CRTC)	The Canadian NRA.

Capacity based charging (CBC)	Charges based on the capacity required, rather than the transmission capacity actually consumed. Some technologies supplied by telephone operators, such as certain implementations of ADSL broadband, require Internet Service Providers (ISPs) to pay a fee for the bandwidth their customers are likely to consume during any given period. Sometimes the cost of this bandwidth can also be different depending on the time of day (usage during peak periods will cost the ISP more, a cost usually passed on to end-users). This is known as Capacity Based Charging.
Capital Expenditure (CAPEX)	Expenditures that are used to deploy or upgrade facilities.
Carrier pre-selection (CPS)	Carrier pre-selection is a method of routing calls for least-cost routing (LCR) without the need for programming of PBX telephone system. A telephone subscriber whose telephone line is maintained by one company, usually a former monopoly provider, can choose to have some of their calls automatically routed across a different telephone company's network without needing to enter a special code or special equipment.
Carrier Selection (CS)	Carrier selection is the principle whereby on the fixed telephone network competing operators can provide telephone services.
Cell	In the context of mobile communication networks, a cell is the smallest service area of the network. The size and the capacity of the cell is determined by the specifications of the base station that serves the cell.
COFETEL	The former Mexican NRA. See also Ifetel.
Comitology procedures	Comitology procedures set out the rules by which rule-making may be delegated to the European Commission with the assistance of relevant committees (normally composed of Member State representatives).
Communications Act (of 1934)	The Communications Act as amended (primarily by the Telecommunications Act of 1996) is the basis for telecommunications regulation in the U.S.
Competition Commission of India	The NRA for India.

Compound Annual Growth Rate (CAGR)	The year-over-year growth rate of an investment over a specified period of time.
Connect America Fund (CAF)	A federal fund to promote broadband deployment in the U.S.
Consumer welfare / consumer surplus	Consumer welfare refers to the individual benefits derived from the consumption of goods and services. It reflects the degree to which the consumer derives benefits that exceed the price that is paid.
Cookie (or HTTP cookie)	Cookies are used by web browsers to record whatever a web site may wish to record.
Copper subloop	The copper subloop is a partial local loop providing access from the end-user to a concentration point such as a street cabinet. Copper subloops together with Very High Bit Rate Digital Subscriber Line (VDSL) technology and fibre-to-the-cabinet (FTTC/VDSL) are used to offer fast broadband.
Core network	A core network is the central part of a telecommunication network that provides various services to customers who are connected by the access network.
Dark fibre	Dark fibre refers to an optical fibre line that has not been activated through the use of optical equipment to send light signals (and hence communications) down the line.
Deadweight loss	The decrease in supply as a result of the exercise of market power creates an economic deadweight loss which is often viewed as socially undesirable. See also Harberger triangle.
Decisions	Decisions are binding measures, which must be related to SMP regulation and numbering. They may only be proposed by the Commission two years following the adoption of a Recommendation on the same subject.
Delegated instruments	Delegated instruments enable the European institutions delegate circumscribed authority to the European Commission. See also delegated acts.

Delegated acts	Delegated acts are instruments that can be adopted by the European Commission, usually subject to the approval of a body representing Member State Governments such as the Communications Committee (COCOM).
Digital Dividend	The digital dividend refers to the spectrum which is released in the process of digital television transition, i.e. going from analog to digital transmission and reception.
Digital Single Market	A market structure aimed for by the European Commission whereby online services and entertainment can flow freely (without regulatory barriers) across national borders within the European Union.
DSL	DSL stands for Digital Subscriber Line (DSL). DSL is a type of high speed Internet that communicates through a phone line, but produces a continuous connection that does not interfere with the line. DSL creates an asymmetric connection, where the downstream data is much faster than the upstream. ADSL and VDSL are both forms of DSL.
Duopoly	A duopoly is a market in which two operators between them constitute all or nearly all of the market for a given product or service.
Dynamic Efficiency	Dynamic efficiency is concerned with the development of better technology and working practices which improve the efficiency of production over time.
EDGE (2.5G)	Enhanced Datarates for Global System for Mobile Communication (GSM) Evolution (EDGE) is an extension of GPRS offering higher speeds. GPRS stands for General Packet Radio Service and allows packet data transmission over GSM networks.
Electronic Communications	Passing of information from one individual to another electronically, using computers, phones or other suitable devices.
Electronic Communications Provider	Provider of electronic communication services
Evolved Packet Core (EPC)	The Evolved Packet Core provides a converged voice and data networking framework to connect users on an LTE mobile network.

European Regulatory Framework for electronic communications

The Regulatory Framework is based on five EU Directives that seek to converge and harmonise communication regulation throughout the EU:

- Directive 2002/19/EC - on access to, and interconnection of, electronic communications networks and associated facilities (the Access Directive);
- Directive 2002/20/EC - on the authorisation of electronic communications networks and services (the Authorisation Directive);
- Directive 2002/21/EC - on a common regulatory framework for electronic communications networks and services (the Framework Directive);
- Directive 2002/22/EC - on universal service and users' rights relating to electronic communications networks and services (the Universal Service Directive) and;
- Directive 2002/58/EC - concerning the processing of personal data and the protection of privacy in the electronic communications sector (the Privacy Directive).

The Framework Directive provides the overall structure for the new regulatory regime and sets out the policy objectives and regulatory principles that NRAs must follow. It also requires that market analyses be carried out before regulation is imposed. The Authorisation Directive establishes a new system whereby persons do not require prior authorisation before providing electronic networks and services. It includes provisions relating to enforcement of conditions and the specific obligations which can be imposed. The Universal Service Directive deals with the obligation to provide a basic set of services to end-users. The Access Directive sets out the terms on which providers may access each others' networks and services with a view to providing publicly available electronic communications services. Finally, the Privacy Directive establishes users' rights with regard to the privacy of personal data.

European Regulators Group (ERG)	The ERG was an association of EU NRAs (and observer country NRAs) with formal standing under the Regulatory Framework. It has been replaced by BEREC.
Ex ante	The term ex-ante (sometimes written ex ante or exante) is a phrase meaning 'before the event'.
Ex post	The opposite of ex-ante, i.e. 'afterward', 'after the event', based on knowledge of the past, measure of past performance.
Fast Broadband	Represents fixed-line network technologies capable of delivering broadband at any downstream speed of at least 30 Mbps.
Federal Communications Commission (FCC)	The U.S. NRA.
Femtocell	In telecommunications, a femtocell is a small, low-power cellular base station, typically designed for use in a home or small business.
Fibre –to-the-Cabinet	The fibre optic path is terminated in a street cabinet. The final connection to the subscriber's premises is a physical medium other than optical fibre.
Fibre –to-the-Premises	An optical fibre reaches the premises of the user. FTTP comprises both Fibre-to-the-Building (FTTB) as Fibre-to-the-home (FTTH). In case of FTTB, the fibre optic connection terminates at (not beyond) the boundary of the building, such as the basement in a multiple dwelling unit, and the final connection to the subscriber's premises is a physical medium other than optical fibre. In case of Fibre-to-the-Home, the fibre optic communications path is terminated on or in the premise for the purpose of carrying communications to a single subscriber.
Fixed call origination	Call origination at a fixed location. This is the beginning of a call in an operator's network due to an end user making a call.
Fixed telephony	Telephony services involving fixed (stationary) user equipment.
GSM	Global System for Mobile communications. The industry standard for mobile networks providing circuit switched mobile telephony services. GSM is considered 2G technology.

Harberger Triangle Harberger's triangle refers to the deadweight loss occurring in the trade of a good or service due to government intervention, that takes the shape of a (curvilinear) triangle in the graph involving the demand curve and supply curve, where two sides of the triangle are usually segments of the demand curve and the supply curve respectively, and the third side is a straight line representing the government intervention. See also deadweight loss.

Hetnets Heterogeneous networks. A heterogeneous network is a network connecting computers and other devices with different operating systems and/or protocols.

Home Network In the context of mobile networks, this is the network where a mobile subscriber is registered as customer, and which keeps all the necessary subscription data.

HSPA(3.5G) High Speed Packet Access (comprising HSDPA for the downlink and HSUPA for the uplink) provides a packet switched data communication service in a Universal Mobile Telecommunications System (UMTS) based mobile network. HSPA provides an enhancement to the original UMTS standard with respect to data communication speeds.

Hybrid Fibre Coax (HFC) A broadband bidirectional network based on a combination of fibre and coax transmission, suitable for broadcast and broadband communications services. HFC networks have migrated from purely coax based Cable networks (for TV and Radio broadcasting).

Ifetel Ifetel is the Mexican NRA established in 2013. It replaces COFETEL.

Implementation Reports For many years, these annual statistical and narrative reports described the implementation of the Regulatory Framework in the Member States. They have been replaced by the Digital Agenda for Europe Scoreboard.

Incumbent Network Operator Network operators having enjoyed special and exclusive rights or de facto monopoly for the provision of voice telephony services before liberalisation, regardless of the role played in the provision of access by means of technologies alternative to the PSTN.

Industry Canada	The Canadian telecommunications ministry, and also the Spectrum Management Authority (SMA).
Infocomm Development Authority (IDA)	The Singapore NRA.
Information services	Services dealing with processing, storage and manipulation of information. These services are subject to few obligations. (U.S. law)
Input-Output Methodology	An economic technique for modelling economic flows through an economy (where the output of one sector becomes the input to the next). An economic change ripples through society in complex ways.
Inter-modal competition	Intermodal competition refers to provision of the same service by different technologies. See also Intra-modal competition.
Intra-modal competition	Intramodal competition refers to competition among identical technologies in the provision of the same service.
Infrastructure competition	See inter-modal competition.
Interconnection	Interconnection enables the customers of two network operators to exchange communications with one another.
Internet of Things (IoT)	The Internet of Things refers to objects, rather than people, communicating with one another.
Local loop unbundling	Unbundled lines supplied by the incumbent operator to other operators (new entrants), excluding experimental lines, i.e. a copper pair is rented to a third party for its exclusive use. As unbundled lines (LLU) supplied by the incumbent operator to the new entrants could in principle be used for services other than broadband, the total number of LLU for access to internet will be lower than the total number of LLU.
Long Run Incremental Cost (LRIC)	A practical means of estimating the cost of a network service for regulatory purposes. Rather than historical cost, the emphasis is on the cost that an efficient operator would incur if it were to deploy today.
LTE (4G)	Long Term Evolution. LTE (4G) is the successor to UMTS (3G), and is a fully packet switched concept (all IP) for mobile broadband electronic services, including voice.

LTE Advanced	LTE Advanced is a major advancement of LTE (4G mobile network technology). See also LTE.
Macro-cell	In the context of mobile communication networks, a macro cell is the largest in the cell hierarchy and its main purpose is to contribute to wide area coverage.
Margin squeeze tests	Margin squeeze tests are aimed at ensuring that there is an adequate margin between the retail and wholesale price, so as to enable an efficient operator to make a fair return.
Metro-cell	In the context of mobile communication networks, a metrocell is a compact and discrete mobile phone base station, unobtrusively located in an urban area. See also cell.
MIMO	Transmit-Receive concept applied in mobile networks, based on the use of multiple input and multiple output antennas.
Ministry of Internal Affairs and Communications (MIC)	The Japanese Ministry and NRA for telecommunications.
Mobile Network Operator (MNO)	An operator providing mobile telecommunications services to his subscribers.
Mobile Roaming	Roaming is a general term referring to the extension of connectivity service in a location that is different from the home location where the service was registered. Mobile roaming refers to roaming among mobile networks. Mobile roaming could be either domestic or international.
Mobile telephony	Telephony services offered to mobile (travelling) subscribers.
Mobile Termination Rates	Mobile Termination Rates are the charges which one mobile telecommunications operator charges to another for terminating calls on its network.
Monopoly	In a monopoly, a single seller confronts many buyers and effectively controls the market.
Monopsony	In a monopsony, a single buyer confronts many sellers and effectively controls the market.
National Broadband Network (NBN)	An ultrafast broadband network being built by the Australian government.
National Regulatory Authorities (NRA)	An independent governmental body that is responsible for the regulation of electronic communications.

National Telecommunications and Information Administration (NTIA)	The U.S. federal agency responsible for telecommunications (in effect, the U.S. Ministry of Communications).
Net neutrality	Net neutrality is the principle that Internet service providers and governments should treat all data on the Internet equally, not discriminating or charging differentially by user, content, site, platform, application, type of attached equipment, and modes of communication.
New Zealand Commerce Commission	The New Zealand NCA and NRA.
Next Generation Access (NGA)	NGA refers to both fast and ultra-fast broadband.
NFC	Near field communication (NFC) is a set of standards for smartphones and similar devices to establish radio communication with each other by touching them together or bringing them into close proximity, usually no more than a few inches.
Notification	The process whereby an undertaking that wishes to provide an electronic communications network or service informs the NRA of its intent, and obtains permission to do so.
OECD	Organisation for Economic Cooperation and Development
Open Network Provisioning (ONP)	Open Network Provisioning means that customers will be free to buy their services wherever they like, and a network service may be based on network resources from many different providers.
ONP Directives	Specific EC directives under the ONP Framework Directive, dealing with Leased Lines, Voice telephony services, Interconnection, and Voice Telephony and Universal Services.
Optical fibre	Optical fibre cable is used to carry signals for broadband, TV and voice. Made of very thin strands/threads of glass or plastic that can carry large amounts of digital information for long distances using light, optical fibre cables can carry a lot more data at one time than traditional copper wires.

Passive Optical Network (PON)	A Passive Optical Network (PON) is an architectural concept in fibre optic communications in which a fibre is split, through passive splitters, into multiple individual fibres to serve multiple premises. PON is the alternative for Point-to-point (P2P) in which homes are connected from a central node using individual active fibre connections from that node to these homes.
Platform Competition	See inter-modal competition.
Powerline	Powerline is the provision of broadband Internet access over the consumer's electrical connection.
Price elasticity of demand	Price elasticity of demand is a measure used in economics to show the responsiveness, or elasticity, of the quantity demanded of a good or service to a change in its price.
Producer welfare / producer surplus (PS)	Producer welfare or surplus (PS) is the difference between the price received by seller and the minimum amount necessary for the seller to be willing to produce the good.
Public Switched Telephone Network	The public switched telephone network (PSTN) is the aggregate of the world's circuit-switched telephone networks that are operated by national, regional, or local telephony operators, providing infrastructure and services for public telecommunication.
Quality of Experience (QoE)	QoE refers the quality of a telecommunication service delivered, as perceived by the end user. Compared to QoS, QoE comprises subjective quality elements. See also QoS.
Quality of Service (QoS)	QoS is a general term to objectively express the quality of the telecommunication service delivered by a provider to the end user. Typical QoS aspects are packet loss ratio, latency and jitter. See also QoE.
Radio Spectrum Policy Group (RSPG)	The Radio Spectrum Policy Group (RSPG) is a high-level advisory group that assists the European Commission in the development of radio spectrum policy.
Radio Spectrum Policy Programme (RSPP)	A Policy Programme established by the EU on the matter of managing radio spectrum in the EU internal market, established under the Spectrum Decision.

Recommendation on relevant markets	Recommendation on relevant markets (Recommendation 2007/879/EC), identifies a series of potential problem markets that NRAs must analyse for possible SMP.
Recommendation	A Recommendation is a Commission instrument that seeks to ensure consistent implementation of the Regulatory Framework. Member States must take ultimate account of it.
Regulation	In the EU, a Regulation has direct effect in the Member States. Unlike a Directive, it does not depend on transposition into national law.
RTR	The Austrian NRA.
Service competition	See Intra-modal competition.
Shared access (Lines)	With shared access, the incumbent continues to provide telephony service, while the new entrant delivers high-speed data services over the same local loop.
Significant Market Power	Market power is the ability of a firm to profitably raise the market price of a good or service over marginal cost. Significant market power (SMP) is an assessment equivalent to 'dominance' that is used in combination with other criteria to identify circumstances where ex ante regulation is considered appropriate in the telecommunications sector.
SMP Guidelines	SMP Guidelines (COM 2002/C 165/03), lays out in detail the procedure that NRAs are to use for market definition and SMP determination.
SPAM	SPAM is unsolicited Internet messages, typically unsolicited e-mail.
State Aid	State Aid refers to forms of assistance from a public body, or publicly-funded body, given to selected undertakings. In the context of this study, State Aid is primarily used for essential infrastructure and services (mainly broadband) that would not otherwise be provided on reasonable terms by the market.
Static efficiency	Static efficiency is concerned with the most efficient combination of resources at a given point in time.

Telecommunication services	Services involving distant communications, typically through electronic means. These services are subject to numerous regulatory obligations. (U.S. law)
Telecommunications Act	A 1996 US law that amended the Communications Act of 1934. The Communications Act as amended is the basis for telecommunications regulation in the U.S.
Telecommunications Regulatory Authority of India (TRAI)	The NRA of India.
Television	Television is a telecommunication medium for transmitting and receiving moving images that can be monochrome (black-and-white) or colored, with or without accompanying sound.
Termination Rates	Termination rates are the charges which one telecommunications operator charges to another for terminating calls on its network.
The Ministry of the Economy, Trade and Industry (METI)	A Japanese government agency with certain responsibilities relevant to the electronic communications sector.
Transposition	Transposition is the process whereby a Member State government takes a Directive and implements it in the context of national law.
Ultra-Fast Broadband	Represents fixed-line network technologies capable of delivering broadband at any downstream speed of at least 100 Mbps.
UMTS(3G)	Universal Mobile Telecommunication System. UMTS (3G) was the successor of GSM (2G), providing circuit switched mobile voice communications and packet switched mobile data communications. UMTS is based on Wideband CDMA technology (WCDMA).
Universal Service	Universal service is an economic, legal and business term used mostly in regulated industries, referring to the practice of providing a baseline level of services to every resident of a country.

Universal Service Directive Directive 2002/22/EC (the Universal Service Directive). The first half of the Universal Service Directive seeks to ensure that all reasonable requests for network access at a fixed location are satisfied at a reasonable price. The second half provides for a range of consumer rights.

VDSL Very high bit rate DSL. VDSL uses copper networks in the access. VDSL is deployed over existing wiring used for analog telephone service and lower-speed DSL connections. VDSL is an upgrade of ADSL, providing higher speeds, but over shorter loop lengths. See also ADSL.

Visited Network In the context of mobile networks, the visited network is the network a mobile user roams to while travelling and which is not his home network. See also home network.

VULA Virtual Unbundled Broadband Access means that the incumbent retains control over the physical copper line, but the competitor has management freedom over the connection.

Wholesale Broadband Access (WBA) Wholesale use or purchase of Broadband Access services, e.g. bitstream.

Wholesale Line Rental (WLR) Wholesale Line Rental (WLR) is a method to use an alternative provider for fixed telephony services. See also CPS and CS.

Wi-Fi Wi-Fi is the trade name of a technology standardised by the organisation IEEE and which allows an electronic device to exchange data or connect to the internet wirelessly using radiowaves.

WiGig The trade name for the IEEE 802.11ad standard (advanced Wi-Fi standard).

WiMAX WiMAX is a technology standardized by the organization IEEE and which provides wireless access of fixed and nomadic users to the Internet. WiMAX differs from Wi-Fi in the sense that it is meant for outdoor use only and is to be used in a licensed frequency band, allowing greater distances compared to Wi-Fi. Unlike Wi-Fi, WiMAX offers full QoS support on individual connections.

World Radio Conference (WRC) World Radiocommunication Conference (WRC) is organized by the International Telecommunication Union (ITU) to review, and, as necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and the geostationary-satellite and non-geostationary-satellite orbits.

Zigbee ZigBee is a specification for a suite of high level communication protocols used to create personal area networks built from small, low-power digital radios. ZigBee is based on an IEEE 802.15 standard.

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EXECUTIVE SUMMARY

In this study for the ITRE Committee of the European Parliament, we were asked to analyse the achievements and failures of the *European Regulatory Framework for Electronic Communications* (the Regulatory Framework),[1] with an eye to its impact on the broader EU economy; to contrast it with regulatory models in other parts of the world; to evaluate the costs and benefits of various interventions such as international mobile roaming (Roaming); to consider the interaction between fixed and mobile networks; and to make policy recommendations going forward.

The European Commission has just tabled its *Connected Continent* proposals.[2] We have provided a detailed assessment; however, we have not limited our policy recommendations to those contained in the Commission's new proposal.

This study is part of a constellation of three studies that review European information and electronic communications policy from different and complementary perspectives. The companion study *Ubiquitous Developments of the Digital Single Market*[3] addresses commercial and e-government applications that operate using Internet transmission capabilities. *Entertainment x.0 to boost broadband deployment*,[4] deals with the definition of broadband, the state of play in Europe today, and the drivers of broadband.

Central themes

Central issues for this study flow from core questions that lie at the heart of the European Union itself. The EU seeks to benefit from scale economies of a peaceful, united Europe; however, we are not a federal system, but rather a confederation of distinct Member States with rich and diverse cultures and languages. The Member States telecommunications markets are at different stages of development, and not all are on the same exact path. Striking the proper balance between centralisation and decentralisation (or subsidiarity[5]), which is a key theme in the discipline of political science, is crucial.

The *European Regulatory Framework for Electronic Communications* sought from the first not only to provide a common framework for a liberalised environment based on the promotion of competition and consumer welfare, but also explicitly to foster the internal market, including the development of pan-European networks and the interoperability of services across the EU. The revision adopted in 2009 placed increased focus on the promotion of investment as well. Many goals are explicitly enshrined within the Framework, but the Framework supports some of them only to a limited degree (see section 3.3.3).

Harmonisation is not the same as uniformity. Where might true uniformity be needed, where is loose harmonisation sufficient? Have we made the right choices? Are there areas where going beyond harmonisation might be warranted?

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1 For a discussion of the Regulatory Framework, see section 3.4.

2 European Commission (2013e), *Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012, 11 September 2013, COM(2013) 627 final*.

3 European Parliament (2013c), *Ubiquitous Developments of the Digital Single Market*.

4 European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

5 Subsidiarity is defined in Article 5(3) of the Treaty on the Functioning of the European Union (TFEU). 'Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, […] but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.'

As many have observed, ten years after enactment of the Regulatory Framework and twenty-three years into the liberalisation process,[6] we still have no pan-European networks. Do we still need them? Is regulatory harmonisation alone sufficient to produce them? What other measures might be needed?

Overall assessment

It is clear that Europe's telecoms sector is fragmented. In cases where services are truly national (as may be the case with fixed residential broadband access[7]) fragmentation is not necessarily fatal for the European project. In other cases such as business communications, audio-visual entertainment services,[8] and e-Health services,[9] providers face multiple obstacles in offering effective trans-European services. In mobile markets, trans-border networks exist, but they have not always resulted in cross-border services, as the continued debate over Roaming (see sections 7.5 and 8.1.3) illustrates.

This lack of integration represents a significant missed opportunity for Europe. One study estimates, for instance, that indirect benefits of up to € 90 billion per annum could be achieved from policies which foster a Single Market for business communications.[10]

Regulation is not wholly responsible, but must bear part of the blame. The EU Regulatory Framework has failed to distinguish where harmonisation is essential for the Single Market, and has not achieved consistency where it is genuinely needed (see section 8.1). The cause may lie in the Framework's approach of permitting wide discretion for National Regulatory Authorities (NRAs) and relying heavily on delegated instruments such as Recommendations,[11] and on case by case policing of Member State regulatory actions by the European Commission to achieve consistency. The result is procedurally and institutionally complex, and often neither transparent nor clear (see section 3.7).

The increasing trend towards Regulations[12] and Decisions[13] overlaying the existing Framework merely serves to confirm the problem, but **the solution should not be a patchwork of measures**, with the potential further addition of a Regulation which risks overlap and inconsistency with existing legislation (see section 7.1). **It is essential to carefully distinguish and prioritise discrete implementation issues that require urgent attention, and then to conduct a root and branch review of the Regulatory Framework and related instruments as a coherent whole.**

Where harmonisation really matters, we advocate specifying the rules in legislation. **For aspects where full uniformity is not essential, legislation could specify a default approach, but leave NRAs free to deviate if they provide adequate justification so as to provide room for regulatory innovation and experimentation (see section 3.7).**

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6 The liberalisation process could be said to have begun in earnest with European Council (1990), Council Directive 90/387/EEC of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision.

7 Fixed broadband is high speed (greater than 144 Kbps) access to the Internet over the fixed network.

8 See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

9 See European Parliament (2013c), *Ubiquitous Developments of the Digital Single Market*.

10 Godlovitch, I., Monti, A., Schäfer, R. G. and U. Stumpf (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at; http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf.

11 A Recommendation is a Commission instrument that seeks to ensure consistent implementation of the Regulatory Framework. Member States must take ultimate account of it.

12 A Regulation has direct effect in the Member States. Unlike a Directive, it does not depend on *transposition* into national law.

13 A Decision is a binding measure proposed by the Commission, relating to SMP regulation or numbering.

This could be seen as reversing the burden of proof in a way that favours consistency and legal certainty compared with the current system. For still other issues, full flexibility at national level may well be justified.

A benefit of this approach is that by simplifying and codifying regulatory rules, the institutional set-up could be streamlined. The Commission's role in evaluating regulatory actions taken by Member State NRAs would become one of judging exceptions rather than policing rules. Such a change could also serve to minimise the resourcing requirements of the Body of European Regulators for Electronic Communications (BEREC).[14] **A 'Euro-Regulator' would not be necessary, although a presence for BEREC in Brussels could be valuable in enabling it to better engage with the co-legislators (see section 8.1).**

What benefits does the European regulatory system provide?

The European regulatory framework provides tangible societal static economic benefits for through many instruments, including the regulation of Termination Rates[15] and Roaming.[16] These come about through the combined effects of price reductions and increased consumption of services. The regulation of Mobile Termination Rates (MTRs)[17] achieved a gain in societal welfare of from € 2.8 billion to € 11.8 billion per year over the period 2005 through 2010, and a much larger transfer of surplus from network operators to consumers (see section 5.1). The regulation of prices for Roaming achieved an average a gain in societal welfare of € 4.5 billion per year over the period from 2012 through 2014 (see section 5.2).

The Commission's Connected Continent proposals

We have concerns with the coherence of the Commission's Connected Continent proposals. Some of the proposals, however, warrant prompt attention because they have serious implications for cross-border networks, trans-European services, and access to global content and applications.

We advise fast-tracking through separate discrete legislative instruments: (1) provisions aimed at harmonising the time frames for assignment of 700 MHz and 800 MHz spectrum; (2) virtual wholesale products (see section 7.4); and (3) network neutrality (Net Neutrality)[18] and associated contractual obligations.

As regards the Commission's proposals for measures to encourage 'roam like home' and to cap intra-EU international calls, we agree with the overall objectives but have quite serious doubts about the likely effectiveness of the proposed means of getting there.

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[14] BEREC was established by European Union (2009a), Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Office, 18 December 2009

[15] Termination Rates are wholesale payments made between network operators, for example for completing a voice telephone call.

[16] For an assessment of the potential economic benefits of Digital Single Market instruments that facilitate e-commerce, see Table 2 of European Parliament (2012c), *Roadmap to Digital Single Market: Prioritising Necessary Legislative Responses to Opportunities and Barriers to e-Commerce*. For a review of the overall benefits of the Single Market, see European Parliament (2013d*), Performance-based Full Policy Cycle for the Digital Single Market*.

[17] Mobile Termination Rates are Termination Rates imposed by Mobile Network Operators (MNOs).

[18] For general background, see European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*

We would also stress that an important choice must be made between continuing current policies of favouring wholesale regulation to address competitive issues in these market segments, versus moving to retail regulation that must be fully consistent at European level (see section 7.5). A comprehensive review is needed, because the implications are complex and affect market structures. If retail regulation is pursued to create a single European calling space, this could only be properly addressed through a Regulation covering Roaming, intra-EU call charges, and termination rates as a coherent package. The European numbering space could also be considered within such a review.

Lastly, a comprehensive review of the EU regulatory framework could address a range of the crucial long term debates, including institutional issues, where and how best to achieve consistency, the objectives of regulation, the role of asymmetric Significant Market Power (SMP)[19] regulation versus alternatives which may be more suitable in some circumstances, and a possible phase-out of Universal Service[20] in favour of alternative regimes such as State Aid[21] and direct support for end-users (see section 3.8).[22]

Is it realistic to phase out SMP regulation altogether?

The current Framework envisages a continued reduction in ex ante asymmetric regulation in the telecommunications sector such that eventually the sector could be governed by competition law alone. Our assessment is that this goal may be unrealistic – an objective of limiting ex ante regulation to areas of enduring market failure may be more appropriate. The degree to which regulation can be rolled back depends significantly on the extent to which mobile services might be able to substitute for fixed over time (see section 6.3).

Mobile telephony is increasingly being used as a substitute for fixed telephone services, which could potentially allow the roll-back of regulations applying to fixed voice services. It seems unlikely; however, that mobile will represent a full and comprehensive substitute for fixed broadband in Europe in the medium term (see section 6.3). Even if it did, it is probable that some bottlenecks would remain, for example in access links for business services for which mobile is less of a substitute (for both data and voice), and in Termination.

Consolidation and merger control

Consolidation is inevitably a part of the discussion of achieving pan-European networks and trans-European services. Europe has a quite huge number of fixed and mobile network operators. By contrast, the network tends to be more concentrated in many of the regions with which Europe competes. In the US, for example, the vast majority of customers are served by three fixed operators and four national mobile operators (even though there are huge numbers of tiny fixed operators).

In the context of the European policy debate, policymakers are hoping for cross-border mergers, while market players seem to be more interested in in-country mobile mergers. Cross-border mergers of fixed incumbents or alternative operators do not appear to offer major advantages either to market players or to residential consumers (see section 8.2).

[19] Market power is the ability of a firm to profitably raise the market price of a good or service over marginal cost.
[20] Universal Service is the provision of a defined minimum set of services to all end-users at an affordable price.
[21] State Aid is assistance given by a publicly-funded body to selected undertakings.
[22] See also European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

Cross-border mergers could potentially facilitate multi-Member State services, which would provide even greater benefits to multi-Member State business customers than to residential consumers. Given that mobile network operators with multi-Member State presence have not offered aggressive packages to business customers to date, there is reason to doubt that consolidation alone would produce trans-European services for all (see section 8.2).

A frank discussion at European level of the tensions among European goals, and of the proper balance between static efficiency versus dynamic efficiency[23] (and their respective implications for competition and for retail prices) would now be timely (see section 8.2).

A way forward?

A summary of our overall assessment and key recommendations, including our view of the European Commission's Connected Continent proposals, appear in the table that follows.

[23] For an economy to balance *static efficiency* against *dynamic* means that it is balancing short run gain against longer term benefits (for example, by encouraging research, development, and modernisation of physical plant.

Ref	Priority	Topic	Commission proposal	Our suggestion
Next steps				
Rec 15 (page 196),[24]	High	Approach to regulatory reform	Adopt Connected Continent proposals as a complement to existing EU telecoms legislation	Fast-track priorities (1) spectrum (2) virtual wholesale products and (3) Net Neutrality, conduct review on Roaming/international calls measures. Address remaining issues through a root and branch review of the EU Regulatory Framework.
Overarching principles				
Rec 15 (page 196)	Medium	Objectives of regulation	Selection of markets susceptible to 'ex ante regulation' should have regard to the 'need for convergent regulation[…] and the global competitiveness of the Union economy'	Review objectives for the Framework as a coherent whole. Applying industrial policy objectives to competition-law based aspects of the Framework, risks inconsistency and confusion.
Rec 1, 2, 3 (page 189)	Medium	Institutional balance – flexibility vs. harmonisation	Veto for the Commission on remedies affecting European operators. Strengthened role for BEREC Chair, independent professional with 3 year term. Review need for European Regulator.	Specify key requirements for harmonisation in more detail in the legislation, with the option for NRAs to make a case for exceptions. This would put less burden on the Commission, NRAs, and BEREC.
Rec 7, 8, 11 (pages 193, 194, 195)	Medium	Review SMP, core bottlenecks	-	Clarify ex ante regulation expectations. Consider alternative approaches to SMP for certain services. Study implications of consolidation on SMP.
Specific measures				
Rec 4 (page 190)	Low	Authorisation	Single EU authorisation. 'Home' NRA involved in 'host' country.	Annex standard notification form to Authorisation Directive.
Rec 14 (page 196)	High	Spectrum	Co-ordinated allocation of harmonised broadband spectrum under supervision of EC	Enact Regulation that achieves the key purposes of the Commission's spectrum management proposals.
Rec 9, 10 (page 194)	High	Virtual wholesale inputs	Harmonised specifications for virtual access (required for VULA, optional for leased lines)	Go further than proposed. Detailed harmonisation of all products
Rec 13 (page 195)	Medium	Consumer contracts and switching	Contracts to include broadband service quality, 6 month termination. Consumer-led switching.	Broadly support Commission proposals, but investigate effects of 6 month termination.
Rec 12 (page 195)	High	Network neutrality	Ban blocking and throttling, but permit managed service innovation	Broadly support Commission proposals.
Rec 6 (page 193)	Medium	Roaming, intra-EU calls	Incentivise but do not require 'roam like home'. Ban surcharges on intra-EU international calls.	Assess a coherent approach covering Roaming, intra-EU calls, Termination, and EU numbering. Align prices with costs.
Rec 5 (page 191),[25]	High	Fostering fast broadband	Regulation to reduce deployment cost Flexible pricing for wholesale NGA where appropriate.	Rapid adoption of Commission cost reduction proposals. Mandated sharing of fibre terminating segment. Renewed attention on Phase-out of traditional Universal Service, replace with State Aid and demand-side measures.

[24] See European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*
[25] See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

1. INTRODUCTION

In this study for the ITRE Committee of the European Parliament, we were asked to analyse the achievements and failures of the *European Regulatory Framework for Electronic Communications*, with an eye to its impact on the broader EU economy; to contrast it with regulatory models in other parts of the world; to evaluate the costs and benefits of various interventions such as international mobile roaming; to consider the interaction between fixed and mobile networks; and to make policy recommendations going forward.

The European Commission has just tabled its *Connected Continent* proposals.[26] Our analysis and our policy recommendations include a detailed assessment; however, we have not limited our policy recommendations to those contained in the Commission's new proposal.

This study is part of a constellation of three studies that review European information and electronic communications policy from different and complementary perspectives. The companion study *Ubiquitous Developments of the Digital Single Market*[27] addresses commercial and e-government applications that operate using Internet transmission capabilities. *Entertainment x.0 to boost broadband deployment*, [28] deals with the definition of broadband, the state of play in Europe today, and the drivers of broadband.

1.1. European Policy Instruments, Electronic Communications, and the Digital Single Market

The task that has been set for us obliges us to consider a number of perplexing questions.

The issues flow from core questions that lie at the heart of the European Union itself. The EU seeks to benefit from scale economies of a peaceful, united Europe; however, we are not a federal system, but rather a confederation of distinct Member States with rich and diverse cultures and languages. In the context of electronic communications, the Member States are a mix of different markets in different stages of development, and not all are on the same exact path. Striking the proper balance between centralisation and decentralisation (or Subsidiarity),[29] which is a key theme in the discipline of political science, is thus a core issue in this entire discussion.

The *European Regulatory Framework for Electronic Communications* (Regulatory Framework) (see section 3.4) sought to achieve:

(1) regulatory harmonisation among the Member States,

(2) pan-European networks, and

(3) trans-European services.

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[26] European Commission, *Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012, 11 September 2013, COM(2013) 627 final.*

[27] European Parliament (2013c), *Ubiquitous Developments of the Digital Single Market.*

[28] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment.*

[29] Subsidiarity is defined in Article 5(3) of the Treaty on the Functioning of the European Union (TFEU). 'Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, […] but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.'

These goals are explicitly enshrined within the Framework itself, but some of them are supported only to a limited degree by operational measures within the Regulatory Framework.

Harmonisation is not the same as uniformity. Where might true uniformity be needed, where is loose harmonisation sufficient? Have we made the right choices? Are there areas where going beyond harmonisation might be warranted?

As many have observed, ten years after enactment of the Regulatory Framework and twenty-three years into the liberalisation process,[30] we still have no pan-European networks. Do we still need them, and if so, why? At the time the Regulatory Framework was put in place, it was hoped that pan-European networks would benefit European equipment manufacturers (such as Alcatel,[31] Siemens,[32] Ericsson,[33] and Nokia[34]); however, in today's globalised economy, this can no longer be taken for granted. Might pan-European networks provide scale economies to our network operators? Might they strengthen their bargaining position with equipment vendors and in international transactions?

What measures are needed to create pan-European networks? Is regulatory harmonisation alone sufficient to produce them? What other measures might be needed?

Trans-European services are especially important for European multi-site businesses. Enterprises have not been particularly well served by the Regulatory Framework to date. Pan-European networks could in principle serve as an important element in the provision of trans-European services;[35] however, many multi-Member State network operators have demonstrated little inclination to provide seamless multi-Member State services (see section 2.2). Potential socio-economic benefits of a well regulated and effective Single Market offering usable trans-European services have been estimated to be up to € 90 billion per year.[36] Better regulation appears to be called for, especially in regard to leased lines.[37]

Meanwhile, the Commission's Connected Continent proposals of 11 September 2013 cast the whole discussion into sharp relief. Does the proposed Regulation start from a proper definition of the problem to be solved? Are the measures proposed likely to solve, or at least ameliorate, the problem or problems? Are they likely to be effective?

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[30] The liberalisation process could be said to have begun in earnest with European Council (1990), Council Directive 90/387/EEC of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision.

[31] Alcatel Lucent http://www.alcatel-lucent.com/.

[32] Siemens http://www.siemens.com/entry/cc/en/.

[33] Ericsson http://www.ericsson.com/.

[34] Nokia http://m.nokia.mobi/mn/view.do;jsessionid=165238164A8BC422307332C2269770A0.cee_prod5?name=MNOKIA.

[35] Based on survey data: 'The most commonly cited problem by business end-users was inability to purchase fixed and mobile services from the same supplier. More than 40% of users also cited problems in finding a supplier that could cover all relevant sites or provide consistent services across all countries.' See Godlovitch, I., Monti, A., Schäfer, R. G. and U. Stumpf (2013), Business communications, economic growth and the competitive challenge, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at; http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf.

[36] Ibid.

[37] Leased lines are dedicated high capacity point to point connections typically used for the provision of services to large businesses or to provide capacity within the core networks of network operators.

1.2. Our Methodology

We have taken a conventional approach to the study with a strong emphasis on (1) extensive collection of publicly available data and documents (including the Commission's proposal), supported by (2) a significant number of interviews to fill gaps and assess views, especially in regard to international best practice. We have then (3) subjected the resultant evidence base to intensive analysis, and (4) drawn policy conclusions and recommendations.

We appreciate the input that many knowledgeable experts provided through formal interviews and informal discussions.[38]

1.3. Structure of this Report

Chapter 2 provides background on the evolution of European networks and services, and on usage trends relevant to those networks. Chapter 3 is an extended discussion of the successes and failures of existing European policy instruments. Chapter 4 provides comparisons to the regulatory of a wide range of the countries with which we trade and compete. Chapter 5 provides estimates of the socio-economic benefits that European regulation provides. Chapter 6 discusses the evolution of the mobile network in parallel with that of the fixed network. Chapter 7 is an extensive assessment of the Commission's Connected Continent proposals. Chapter 8 represents our own assessment as to what should be done. Finally, Chapter 9 provides our findings and recommendations.

[38] Noteworthy input came from the European Commission; current and former NRA staff from Germany, Belgium, Spain, India, and Canada; network operators including AT&T, Vodafone, Telecom Italia, KDDI (Japan), and cable operator Liberty Global; trade associations ETNO (incumbents) and ECTA (competitors); content providers including Google; Analysys Mason; the Florence School of Regulation; the Japanese research institute GLOCOM; and independent experts from the United States, Mexico, Japan, and Singapore.

2. A SINGLE MARKET TODAY?

KEY FINDINGS

- **Electronic communications has evolved significantly since the early days of liberalisation** when fixed voice was the primary service, and mobile a nascent technology. Core networks have converged to enable the provision of a complex mix of services including entertainment and broadband both at home and on the move. Services for businesses have also evolved into sophisticated Information and Communications Technology (ICT) solutions integrating Information Technology (IT) and communications across the EU.
- Data usage is growing for both fixed and mobile. Video is the largest driver of bandwidth demand for both.
- Voice still constitutes the bulk of mobile revenues, but the balance is also changing towards data.
- **Despite significant market entry and intensifying competition, very few telecommunications providers operate on a pan-European scale. Communications providers serving multi-national corporations may be one exception. On the mobile side, some players have operations in several countries, but services are still supplied nationally.** Early attempts at pan-European entry into fixed markets largely failed.

This chapter provides key overall background, and seeks to set the stage for the rest of our analysis. A key concern throughout is that, ten years after implementation of the *European Regulatory Framework for Electronic Communications*, the sought-after pan-European networks have not yet emerged.

We cover the general evolution of network infrastructure services and markets in section 2.1, and the evolution of network usage in section 2.3.

2.1. The Evolution of Network Infrastructure Services and Markets

At the time of liberalisation, around 1998 in most of the EU15, most countries were served by a copper public switched telephone network (PSTN)[39] operated by the former state-owned incumbent network operator (incumbent). Some countries such as the Netherlands, Belgium, the UK, and Spain were also served by cable television networks (cable), which in some cases had been franchised on a regionalised basis such as in the UK, Germany and Belgium. Mobile networks were present, but take-up was relatively low, and national mobile networks were operated mainly by the incumbent as a distinct service from their fixed business.

The primary communications service, telephony, was closely associated with the design of the underlying network. In essence, three separate and distinct services were being offered via three or more separate proprietary networks – fixed telephony, mobile telephony (mobile), and television.

Since that time, Europe has experienced significant developments in networks, services and market dynamics.

[39] The public switched telephone network (PSTN) is a network designed to support circuit-switched voice communications.

2.1.1. Networks and Services

Network infrastructure requires significant capital expenditure (CAPEX), and has tended to follow a process of gradual enhancement, starting with the installation of optical fibre[40] in the core network[41] replacing copper. Today, most operators including fixed incumbents, cable, alternative operators and mobile operators benefit from fibre in their core networks. **The technologies used to transport electronic services have also gradually converged from dedicated service platforms[42] to a common platform based on Internet Protocol (IP).**

As a result, there has been convergence both in network operation and in the services offered to customers. Operators have increasingly integrated their networks to run fixed and mobile services over the same core infrastructure, and have been providing an increasingly rich bundle of retail services. The 'E-communications Household Survey of 2011'[43] shows that on average 43% of EU households were taking bundled services. Fixed telephony is now often sold together with broadband, and increasingly also with TV ('Triple Play'). In some countries, mobility is also being added to the bundle either through mobile telephone and broadband packages or through the addition of Wi-Fi hotspots ('Quadruple Play').

At the same time, services for businesses, which were originally marketed as telephone services and dedicated leased lines, have evolved into sophisticated bundles incorporating not only voice and managed data services, but also often information technology (IT) services such as cloud computing or 'just in time' inventory systems.

2.1.2. Competitive Dynamics

The convergence of previously separate telephone and cable platforms provided increased competition for European consumers in telephone services, and subsequently in broadband Internet services in countries which had existing cable networks in place. This dynamic lies at the heart of platform competition (i.e. inter-modal competition) in Europe[44].

In addition, a key focus of the 1990 Open Network Provision (ONP) Directives[45] (and of their successor Directives, including the Regulatory Framework adopted in 2002)[46] was to establish independent National Regulatory Authorities (NRAs) for electronic communications who were tasked with ensuring access to the networks of operators with Significant Market Power (SMP)[47] – typically but not necessarily former incumbents.

Access obligations driven at European level such as carrier pre-selection (CPS)[48] and local loop unbundling (LLU)[49] enabled the entry of further competitors into telephone and broadband services, thus enabling service competition (i.e. intra-modal competition).

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[40] Optical fibre describes a connection made of glass or plastic. When optical equipment is installed on the line, data can be transmitted using light waves.

[41] The core network is the central part of a telecommunications network. In this part of the network traffic is aggregated and transmitted to reach its destination.

[42] European Council (1990), Council Directive 90/387/EEC of 28 June 1990 on the establishment of the internal market for telecommunications services through the implementation of open network provision.

[43] TNS Opinion & Social (2012), *E-Communications Household Survey*, Special Eurobarometer 381, June 2012 (field work December 2011), at: http://ec.europa.eu/public_opinion/archives/ebs/ebs_381_en.pdf.

[44] See European Parliament (2013b), *Entertainment x.0 to boost broadband*.

[45] See European Council (1990), Council Directive 90/387/EEC of 28 June 1990, as well as subsequent legislation.

[46] *EU Regulatory Framework for Electronic Communications*, available at: http://europa.eu/legislation_summaries/information_society/legislative_framework/l24216a_en.htm.

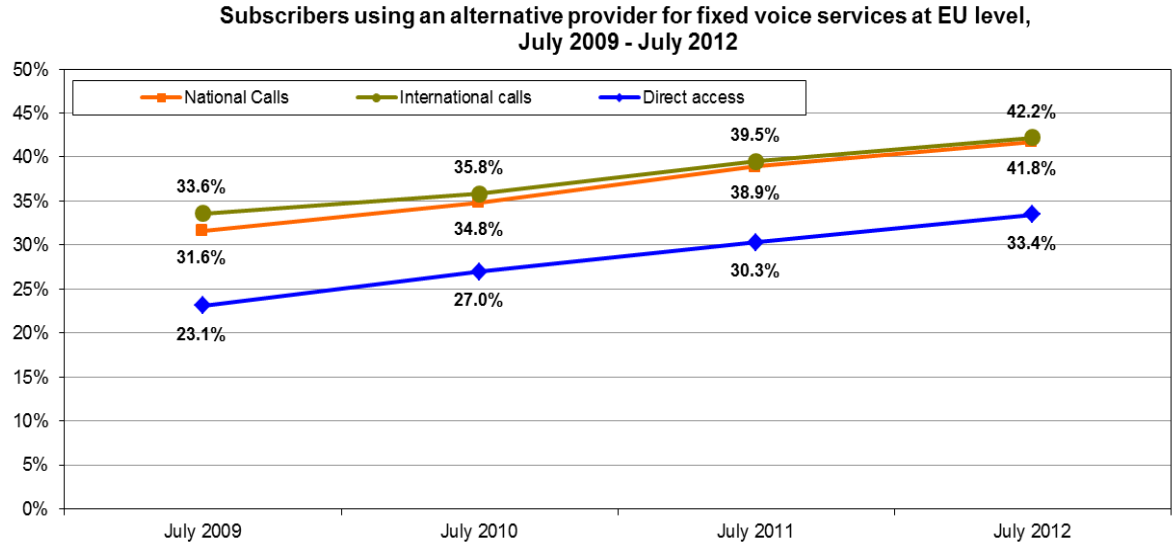
[47] Significant Market Power is further discussed in Section 3.5

[48] Carrier Pre-selection is a mechanism whereby a customer can select their provider of calls separately from the operator which supplies their telephone access line.

Platform competition occurs between distinct infrastructures, notably between fixed telecommunications network and cable television networks; service competition occurs on top of a single shared communications infrastructure, typically with multiple competitors renting and then using underlying communication lines owned by the historic incumbent network operator. Again, the former reflects inter-modal competition; the latter, intra-modal competition (see section 3.5.1).

As a result of increased competition, the retail market shares[50] of former incumbents declined significantly, particularly in services which had previously been offered at a considerable price premium, such as international calls (see Figure 1) and Internet access.

Figure 1: Trends in competitors' market share for fixed voice 2009-2012



Source: Data from the *DAE Scoreboard* spreadsheet on 'financial indicators, telephony, broadcasting and bundled services' downloaded August 2013.

Spectrum liberalisation and the granting of additional licenses for mobile operators also resulted in increased competition in mobile markets. Most European countries now have three or four Mobile Network Operators (MNOs), each with its own parallel infrastructure (see Figure 2),[51] although the mobile operator associated with the incumbent is still the largest in most cases (see Figure 3).[52]

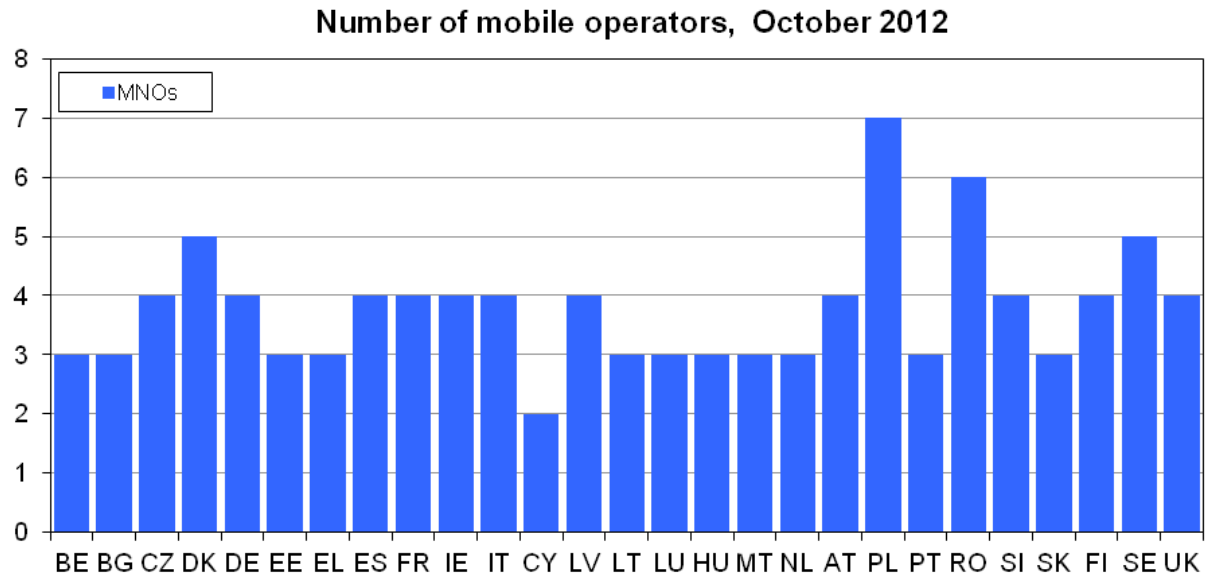
[49] Local Loop Unbundling (LLU) means the rental by a licensed operator of the physical copper access line connecting the customer to the local exchange building – usually for the purpose of providing broadband access to that customer.

[50] The retail market share of an operator is determined through assessing what proportion of customers, volumes or revenues that operator has as a share of the total market. Depending on the metric chosen, results may differ slightly.

[51] For an evolution of the number of MNOs, see Csorba, G., Pápai, Z. (2013), *Does one more or one less mobile operator affect prices? A comprehensive ex-post evaluation of entries and mergers in European mobile telecommunication markets*, 2013-06-24; available at: http://www.cresse.info/uploadfiles/2013_S3_PP1.pdf.

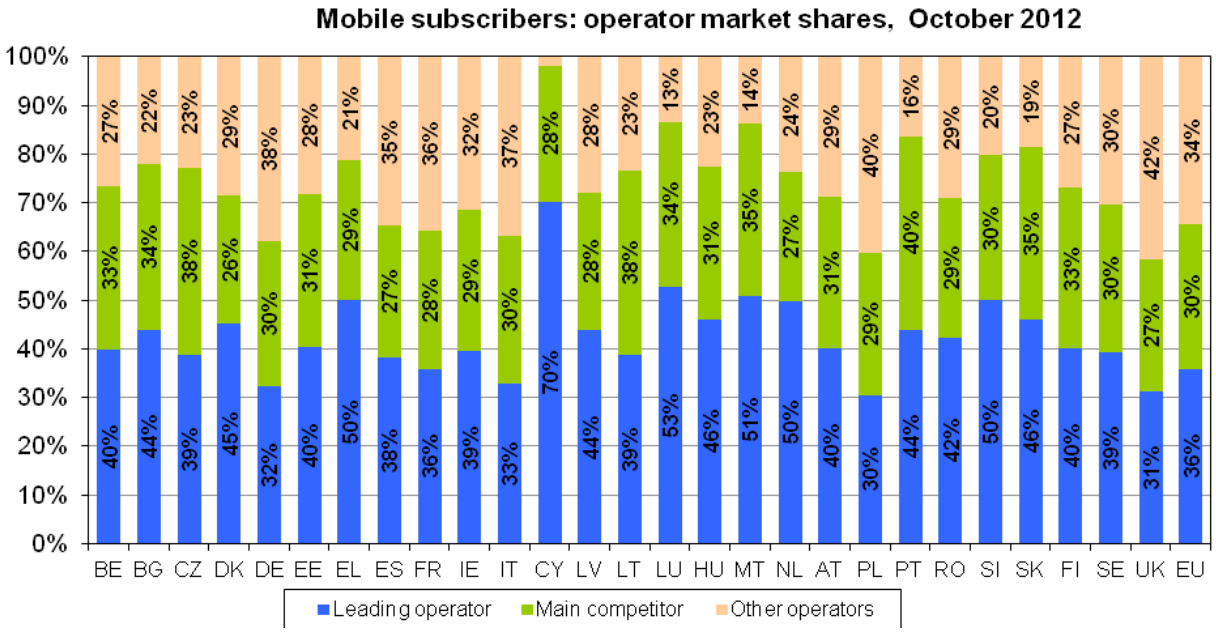
[52] The UK incumbent BT does not operate a mobile network. In most other countries, the 'leading operator' is the operator associated with the historic incumbent, but relative market shares for the leader operator have continued to decline over time.

Figure 2: Number of mobile operators, October 2012



Source: Data from *the DAE Scoreboard* spreadsheet on 'financial indicators, telephony, broadcasting and bundled services' downloaded August 2013.

Figure 3: Mobile subscribers: operator market shares, October 2012



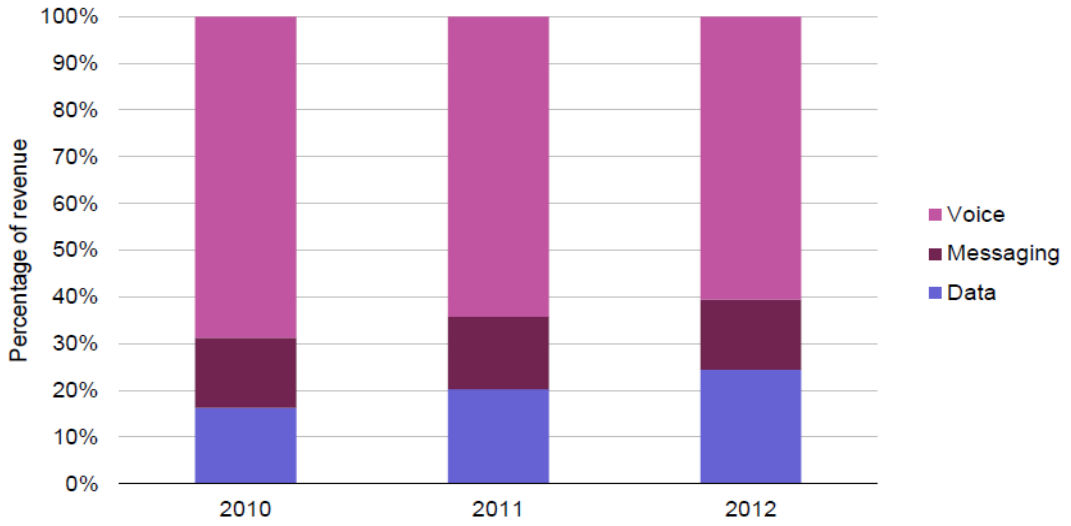
Source: Data from the *DAE Scoreboard* spreadsheet on 'financial indicators, telephony, broadcasting and bundled services' downloaded August 2013.

2.1.3. Revenue Trends

A combination of technological convergence (which reduced costs) and increased competition (which drove retail innovation and price competition) has led to significant changes in the revenue mix of the telecoms sector since liberalisation.

While voice service revenue still represents a significant portion of the total revenue, in both fixed and mobile networks, its relative share has declined in comparison to the share of data revenues. The shift of both traffic and revenue from voice to data is occurring later in mobile networks than in fixed (see Figure 4), but it is expected to accelerate in coming years due to the increasing popularity of tablets and smartphones.

Figure 4: Analysys Mason – mobile retail revenue by type, Western Europe 2010-2012



Source: Analysys Mason Insight (2013) by Rupert Wood.

2.1.4. Next Generation Networks and Services

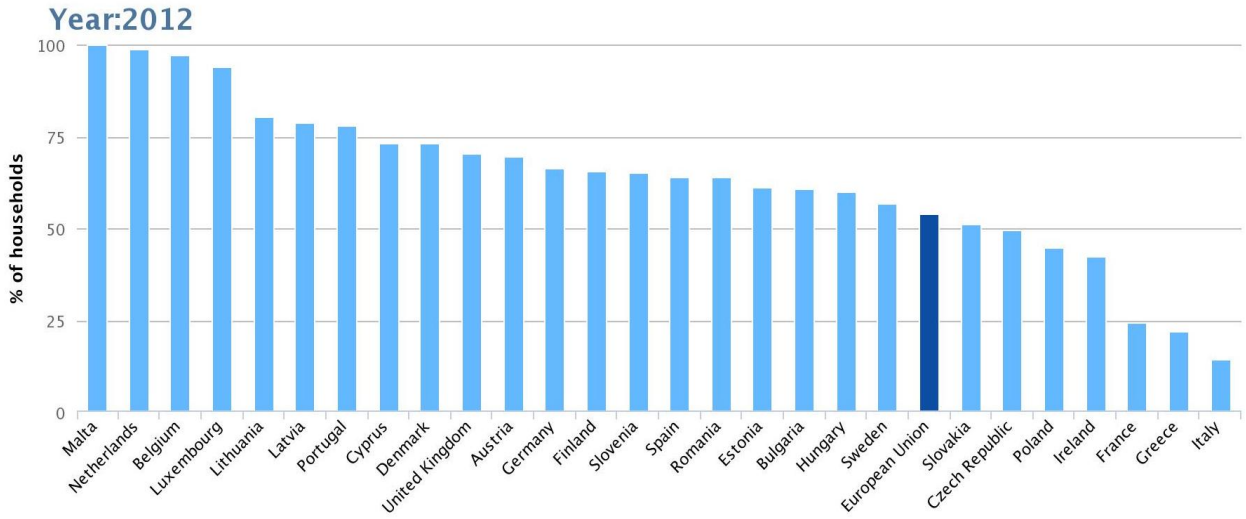
Now that most core networks are fully upgraded from copper to fibre, the next trend in fixed networks is towards rolling out fibre closer to end-users. The main technologies used are (1) hybrid fibre coax (HFC), which has allowed cable operators to offer broadband speeds in excess of 100 Mbps, (2) fibre to the cabinet (FTTC), and (3) fibre to the premise (FTTP), which are the successors to the existing copper infrastructure in the access network.[53]

The 2013 Commission Digital Agenda Scoreboard (DAE Scoreboard)[54] found that 95.5% of homes in the European Union already had access to basic fixed broadband infrastructure in 2012, and that more than 50% of homes (105 million) already had Next Generation Access (NGA) services available in 2012. NGA services were defined in that report as networks capable of delivering 30 Mbps or more, with however substantial variation between countries.

[53] See *Entertainment x.0 to boost broadband deployment* http://www.europarl.europa.eu/document/activities/cont/201310/20131017ATT72946/20131017ATT72946EN.pdf for a discussion on fixed broadband technologies.

[54] *Commission Staff Working Document: Digital Agenda Scoreboard 2013*; available at: https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DAE%20SCOREBOARD%202013%20-%20SWD%202013%20217%20FINAL.pdf.

Figure 5: Total NGA coverage as % households 2012



Source: European Commission (2013g), *Commission Staff Working Document: Digital Agenda Scoreboard 2013*.

Take-up of fast and ultrafast broadband[55] has, however, been slow, although growth has been rapid from a low base. The DAE Scoreboard[56] suggests that on average across the EU, just 4.2% of the population had subscribed to services at speeds greater than 30 Mbps, whilst just 3.4% had subscribed to services at speeds above 100 Mbps as of the end of 2012.[57]

2.2. Cross-border Entry

One of the stated aims of the ONP Directives and their successors was to create a single market in communications in which operators from one country could enter and compete in others (see section 3.3.1). It was envisaged that operators with pan-European scope could emerge as a result of this framework.

Fifteen years following the adoption of the ONP Directives, and eleven years after the adoption of the *European Regulatory Framework for Electronic Communications*, it is clear that cross-border transactions and entry have occurred, but perhaps not in the way that was originally envisaged.

In the mobile market, a number of operators have gained significant scale, offering services in several countries in Europe; however, no fixed operator has presence in more than a very few Member States. Some telecoms incumbents have made cross-border acquisitions of other incumbent operators (such as the acquisitions by Deutsche Telekom (DT)[58] of OTE[59] and Magyar Telecom[60], and the acquisition by Orange (FT)[61] of TPSA[62]), but **early efforts by incumbents and alternative operators (such as Tele2[63], AOL[64], Tiscali[65]) to build**

[55] See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment* for a discussion on the take-up of standard and fast broadband.
[56] Ibid. Data based on COCOM.
[57] 12% were taking services on the basis of NGA lines including speeds greater than 30 Mbps.
[58] Deutsche Telekom: http://www.telekom.com/home.
[59] OTE is the main fixed and mobile integrated operator, and incumbent in the Greek market. See http://www.ote.gr/.
[60] Magyar Telecom is the main fixed and mobile integrated operator, and incumbent in the Hungarian market. See http://www.telecom.hu/.
[61] France Telecom/Orange. See http://www.orange.com/.
[62] Orange Polska (TPSA) is the main fixed and mobile integrated operator, and incumbent in the Polish market. See http://www.orange.pl/orange_polska.phtml.
[63] Tele2 http://www.tele2.com/ originally had ambitions as a multi-national alternative provider of fixed voice and broadband services. Its focus has shifted towards mobile, whilst retaining fixed businesses in certain markets.

multi-national presence as consumer-oriented service providers in other countries have largely failed.

Some Mobile Network Operators (MNOs) have quite substantial European footprints (Vodafone[66] being a prime example), but no MNO enjoys an EU-wide footprint.

Even though some MNOs benefit from a fairly wide geographic reach, a market failure in international mobile Roaming has long been evident (see section 3.6). This largely reflects the fact that mobile markets remain largely national in scope, and that increased network reach has not translated through into pan-European service offerings.

In the business segment, a number of network operators (e.g. British Telecom[67]) have developed a pan-European presence to serve multi-national corporations; however, their strengths and capabilities remain fragmented (often centred on regions where they benefit from ownership of incumbent network assets). **Recent survey data from multi-national corporations suggests that their demands for seamless cross-border business communications services are not being effectively met.[68]**

2.3. The Evolution of Network Usage

Various characteristics of network usage will be covered throughout this report. At the outset, it is helpful to remind the reader of a few key trends.

- Voice networking continues to play an important role in the revenue of the sector; however, data using the Internet Protocol (IP) plays an increasingly important role both to consumers and to network operators.[69] IP-based data now represents the majority of data in both fixed and mobile networks in Europe.
- Video represents the majority of data traffic in both fixed and mobile networks, and its relative role is expected to become even greater over time.[70]
- Traffic continues to grow on the fixed network, which continues to carry the majority of European network traffic.[71]
- Traffic is growing even more rapidly on the mobile network than on the fixed; however, the level of traffic off-load (especially by means of Wi-Fi in the home and at work) exceeds the level of traffic that remains on the large scale cellular mobile network, and implies that the fixed and mobile networks are increasingly intertwined (see section 6.2).
- European policy needs to continue to focus on various divides: rural versus urban, 'well off' versus 'less well off', Western Europe versus some of the newer Member States in the East (where the network was not fully deployed in the past), and a North-South divide as well.

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64 America Online (AOL) was one of the first providers of online access and services in the US and was active in several European jurisdictions. After largely abandoning its initial forays into the provision of Internet access, AOL's focus has been on online services, content and Internet technologies.

65 Italy-based ISP Tiscali provided Internet access services in a number of EU countries, before consolidating back to its home market of Italy.

66 Vodafone http://www.vodafone.com/.

67 See http://www.globalservices.bt.com/uk/en/products/one_enterprise.

68 Godlovitch, I., Monti, A., Schäfer, R.G., Stumpf, U. (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at; http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf.

69 For data relevant to the mobile sector, see section 6.2.

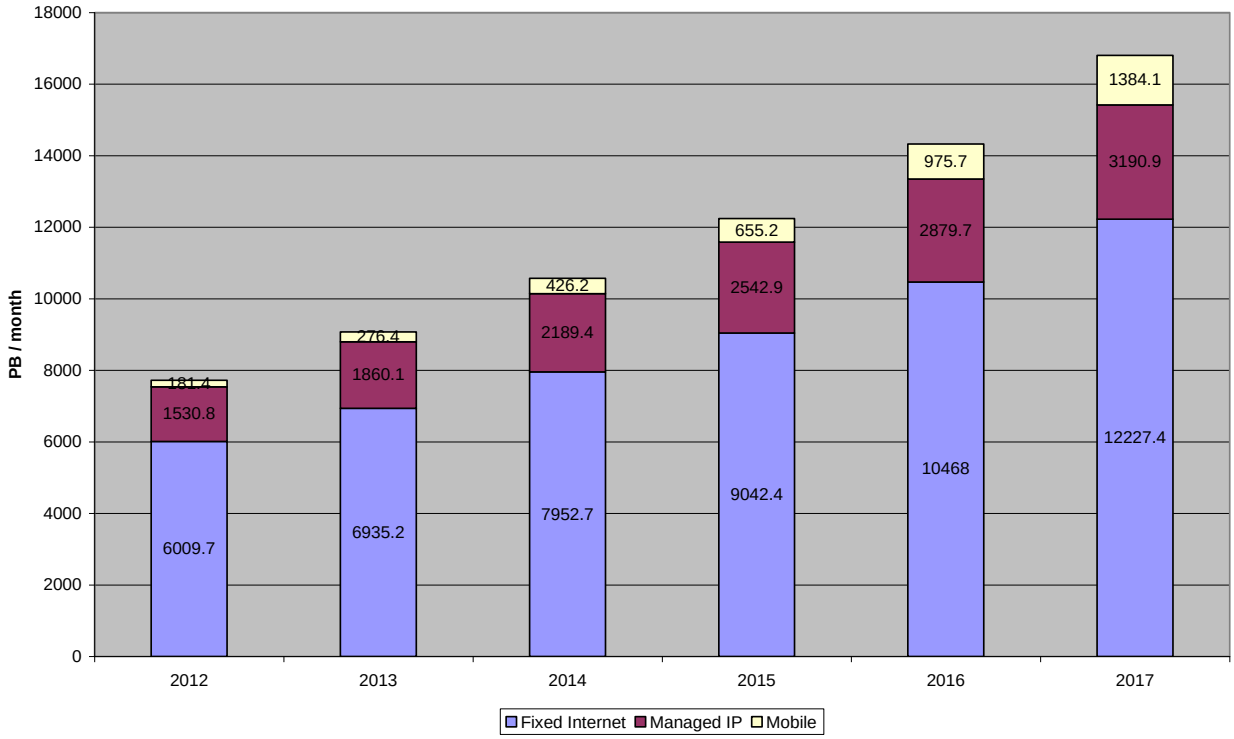
70 European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

71 Ibid.

With all of this in mind, throughout this report we seek to put more emphasis on data services than on voice; to provide a balanced focus between fixed and mobile services; and to bear in mind those who are not well served by electronic communications today, and might not be expected to be well served in the near to medium term.

Both fixed and mobile data traffic are growing, and are expected to continue to exhibit healthy growth. The relative balance of fixed to mobile data traffic is evident in projections from Cisco.[72] Figure 6, which is based on data available in their online database, expresses the estimated and forecast levels of data for fixed Internet traffic, managed IP traffic,[73] and mobile traffic. **Mobile traffic is expected to grow much more rapidly than fixed Internet or fixed managed IP traffic, but nonetheless will still represent only a small fraction of total data traffic even after several years of rapid growth.**

Figure 6: Data Traffic in Western Europe (2012-2017)



Source: Cisco VNI online database,[74] WIK calculations.

The pre-eminence of video traffic is evident in Figure 7, which is also a forecast from the Cisco VNI. According to Cisco, 'The sum of all forms of IP video (Internet video, IP, Video on demand (VoD), video files exchanged through file sharing, video-streamed gaming, and videoconferencing) will continue to be in the range of 80 to 90 percent of total IP traffic […] Taking a more focused definition of Internet video that excludes file sharing and gaming, Internet video will account for 52 percent of consumer IP traffic in 2017 […]'.[75]

[72] Cisco (2013b), *Cisco Visual Networking Index: Forecast and Methodology*, 2012–2017, 29 May 2013.

[73] 'Internet: Denotes all IP traffic that crosses an Internet backbone … Managed IP: Includes corporate IP WAN traffic and IP transport of TV and VoD […]' Cisco (2013b), *Cisco Visual Networking Index: Forecast and Methodology*, 2012–2017, 29 May 2013.

[74] http://www.ciscovni.com/forecast-widget/advanced.html viewed 24 August 2013.

[75] Cisco (2013c), *The Zettabyte Era—Trends and Analysis*, 29 May 2013; available at: http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/VNI_Hyperconnectivity_WP.pdf.

Figure 7: Global consumer IP traffic

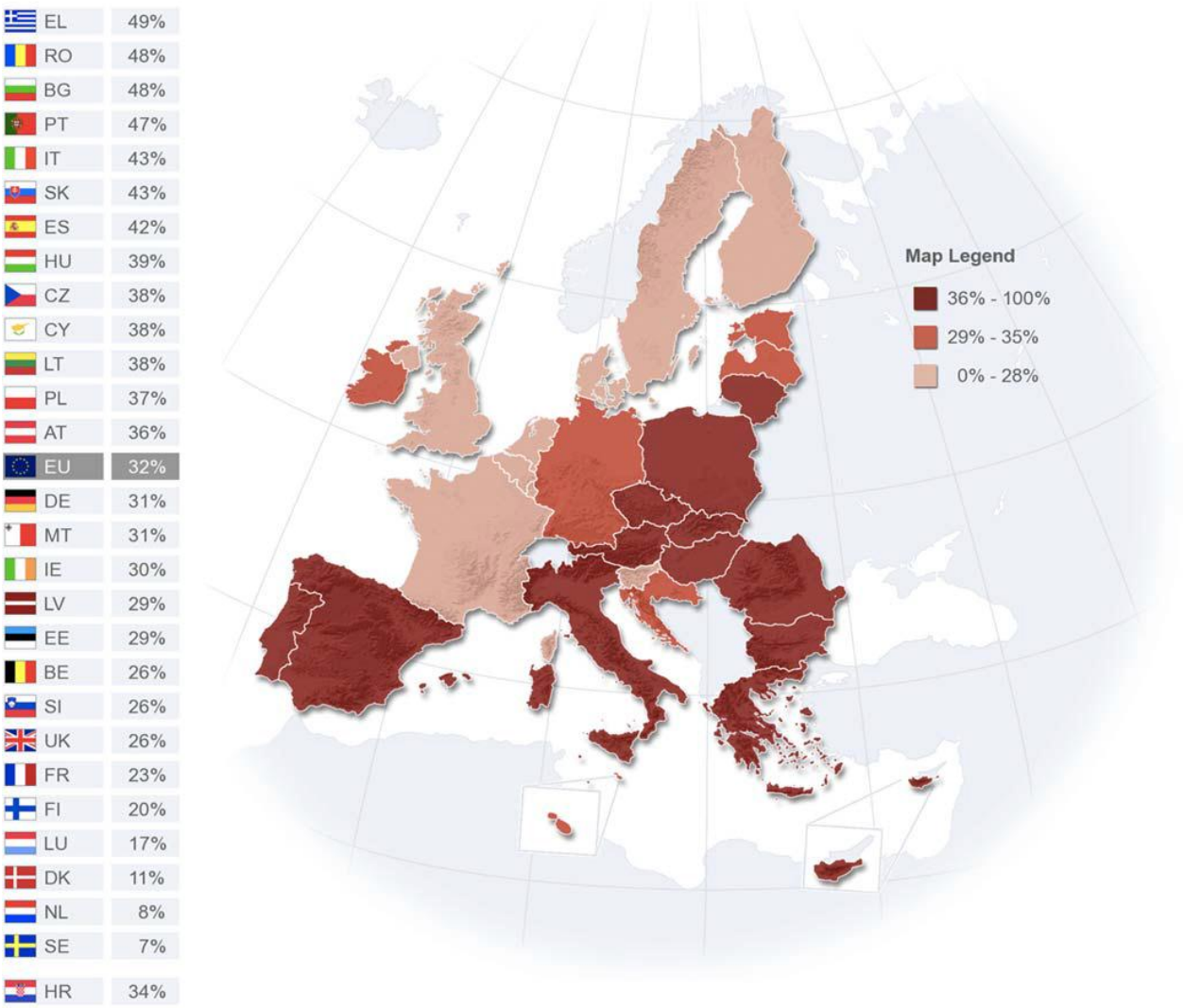
Source: Cisco VNI (2013)[76]

A number of distinct divides are visible in European consumption of electronic communication services.

Access to Internet at home, and specifically access to broadband Internet at home, varies greatly among EU Member States, as is manifest in Figure 8 and Figure 9. Both east-west and north-south divides are clearly in evidence. If you reside in a country that lies to the east of the former Iron Curtain,[77] you are far less likely to have access to the Internet than if you reside in a country further to the west. This presumably reflects the historic lack of development of telecommunications in the former Soviet bloc.[78] Even among countries to the west, the somewhat less prosperous countries to the south (Spain, Italy, Portugal, and Greece) have noticeably lower overall Internet penetration and broadband Internet penetration than do their more prosperous fellows to the north in France, the UK, the BENELUX[79] countries, and Scandinavia.

[76] Ibid.
[77] The former dividing line between countries dominated by the former USSR and those of Western Europe.
[78] The gap in broadband is also obvious in coverage data developed for the Commission by Point Topic (2012), Broadband coverage in Europe in 2011 - Mapping progress towards the objectives of the Digital Agenda, study for the European Commission; available at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=1102 and subsequently, as explained in the companion volume to this study, European Parliament (2013), *Entertainment x.0 to boost broadband deployment*.
[79] Belgium, the Netherlands, and Luxembourg.

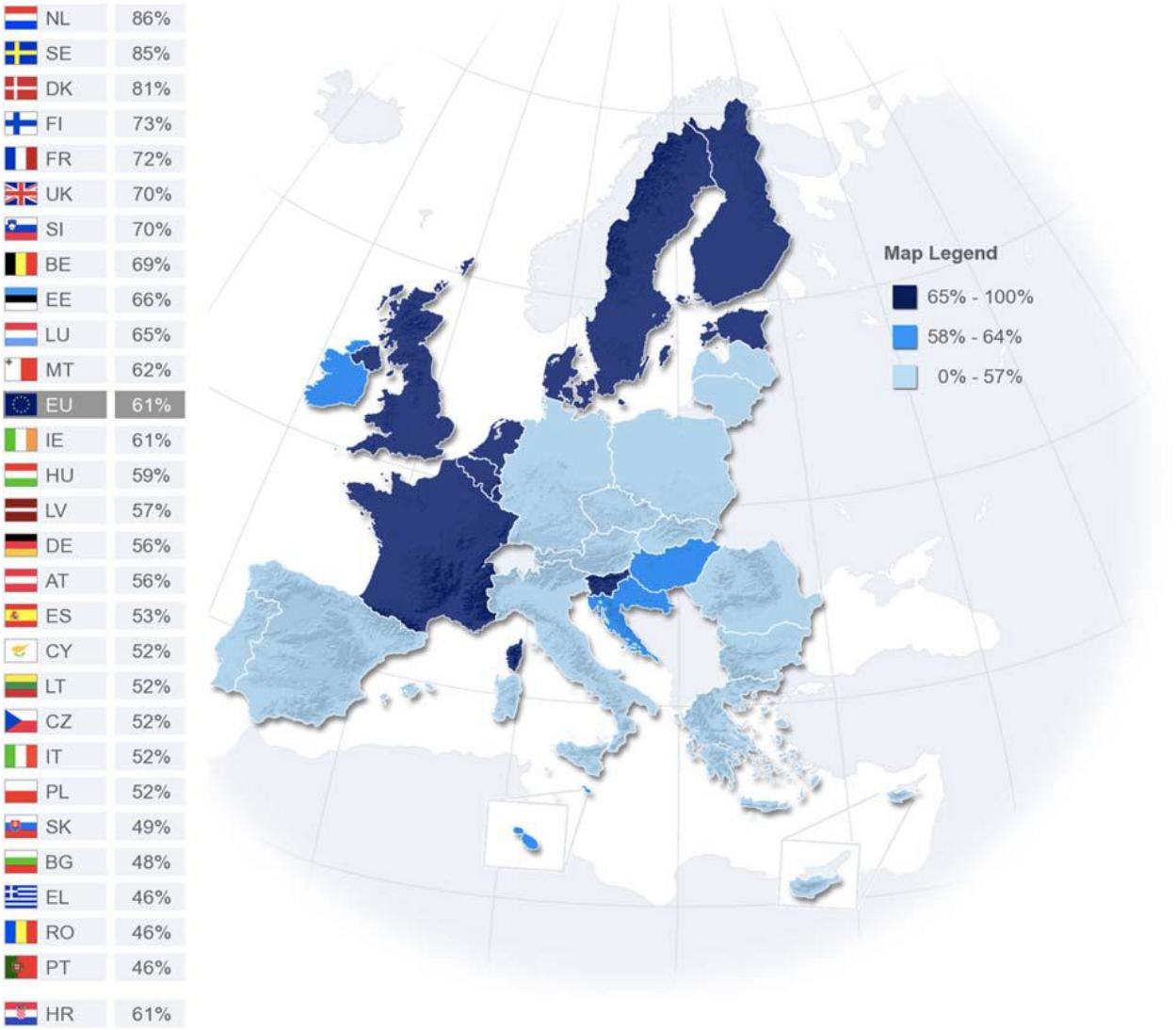
Figure 8: Households with no Internet access at home



Source: *Eurobarometer e-communications household survey* (2013)[80]

[80] TNS Opinion & Social (2013), *E-communications household survey*, Special Eurobarometer 396, August 2013 (based on fieldwork from February-March 2012).

Figure 9: Households with broadband Internet access



Source: *Eurobarometer e-communications household survey* (2013)[81]

Cost in relation to disposable income appears to play a large role in the Digital Divide, as evidenced by survey data reported by EuroStat. 'The cost of an Internet connection was a factor that was mentioned by roughly one in five respondents (19%). This proportion has remained relatively stable over the previous surveys: 18% in December 2011 and 19% in December 2009. Of the cost aspects of an Internet connection, approximately one in ten respondents said the monthly subscription cost is too high (11%), the cost of buying a personal computer and a modem is too high (9%) or the monthly cost of broadband Internet is too high (8%). One in 20 respondents said that the initial installation cost for the broadband network is too high (5%). These results have remained largely unchanged since the December 2011 and December 2009 surveys.'[82]

[81] TNS Opinion & Social (2013), *E-communications Household survey*, Special Eurobarometer 396, August 2013, study for the European Commission; available at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=2630. (based on fieldwork from February-March 2012).

[82] Ibid.

The same survey results, however, suggest that cost is not the only factor, and indeed is not even the largest single factor. 'The first reason given by two-thirds of these respondents for not having household Internet access was that no one in their household is interested in the Internet (65%).'[83] Cost, at 19%, places second. 'The third most common reason given was that the respondent and their household members did not know what the Internet was (7%). A similar proportion reported that they did not have an Internet connection at home because the interested members of their household had sufficient Internet access outside of the house (6%). Other reasons mentioned by a minority of respondents were that their household plans to subscribe in the next six months (5%), that they lived in an area without broadband coverage (1%) or that they were concerned about unsuitable content on the Internet (1%).'[84]

[83] Ibid.
[84] Ibid.

3. ACHIEVEMENTS AND FAILURES OF CURRENT EUROPEAN POLICY INSTRUMENTS

KEY FINDINGS

- European policy in this space seeks to promote the internal market. A great deal of effort (with varying degrees of success) has been made towards achieving regulatory consistency on issues such as broadband access regulation; however, much less attention has been paid to measures to support cross-border service provision and the cross-border usage of content and applications.
- The existing EU Framework gives flexibility to NRAs to adopt regulation suited to local circumstances, and relies heavily on subsidiary guidelines and case by case policing at EU level to achieve consistency. This has not been fully effective in delivering consistent regulation, and has resulted in very complex institutional mechanisms. The Framework fails to identify where consistency is absolutely essential (for instance, for the provision of cross-border services) as opposed to merely desirable.
- The EU telecommunications framework contains a number of potentially conflicting objectives which may be the source of policy tensions.
- Regulation of market power (SMP) (equivalent to competition law dominance) is a key element in the EU telecommunications framework. The concept is theoretically attractive, but practically flawed. In particular **it may be needlessly burdensome for markets such as call termination in which all operators possess market power. It is also not well suited to assessing markets characterised by tight oligopoly or duopoly.**
- **It seems likely that a few basic bottlenecks in the telecommunications sector will persist in the medium to long term.** Case by case analysis will be needed.
- **The Roaming Regulation has been very effective in driving down excessively high wholesale and retail roaming prices, but has not established a competitive dynamic that would make regulation unnecessary. The effectiveness of the Structural Solutions (see section 3.6) enacted in 2012 is unknown and uncertain.**
- The Commission's role in spectrum management has been strengthened by means of the Radio Spectrum Policy Plan (RSPP) (see section 3.10). **There is widespread recognition that the Commission has a key role to play in spectrum management, especially as regards harmonised bands; however, delays in making the 800 MHz band available demonstrate the limits of the Commission's power. These delays must be avoided for the 700 MHz band, which will become available in the coming years.**
- A number of initiatives have been adopted with the aim of supporting Europe's Digital Agenda broadband targets. Our companion study *Entertainment x.0 to boost broadband deployment* suggests that measures to support infrastructure competition combined with targeted State Aid and demand-side initiatives are the most promising means to achieve roll-out targets. Traditional Universal Service obligations are not ideally suited to a multi-operator broadband environment.
- Streamlined authorisation procedures could in principle facilitate cross-border entry, but authorisation is not a major issue for market players today.

We begin this chapter with overall analysis of the regulatory and policy instruments used in Europe today, and then continue with detailed examination of individual thematic areas and associated instruments.

3.1. A Range of Policy Instruments

At the outset, it is important to note that the European policy space as regards electronic communications is exceptionally broad. **As with the parable of the blind men and the elephant,[85] there can be a tendency for those immersed in the issues of the sector to focus on one or two segments with which they deal, and to lose sight of the far broader space of which those segments are but a part.**

First, it is important to bear in mind that **regulation is an important part of European electronic communications policy, but it is only a part**. Many other instruments are relevant, notably including investment policy, industrial policy, and state aid; research and innovation policy; standardisation policy; a range of policies that deal with applications that use the network, including e-government services, cloud services, the Internet of Things (IoT),[86] and more; and the multi-faceted issues associated with intellectual property, and especially with copyright issues in connection with online content. Some of these also constitute forms of regulation, even if they are not specifically regulation of electronic communications; others are not regulatory at all.

Regulatory instruments differ from broad political policy instruments in important ways:

- The **accountability of decision-makers** is different, as we shall shortly explain.
- The **time frames over which consistency must be maintained** can be different as well.

As explained succinctly in Tabellini (2002),[87] it is crucial to bear in mind 'the distinction between "bureaucratic accountability" (i.e. the control of appointed bureaucrats with a narrowly defined mission) and "democratic accountability" (i.e., the control of elected politicians with an open mandate).' 'In a representative democracy, the ultimate instrument for holding politicians accountable is an election. Citizens delegate decisions to representatives (governments, legislators). If citizens are not satisfied with the decisions taken, the delegation is not renewed: the majority loses the elections and is replaced by a new government or a new majority in Parliament. […] Accountability in the EU instead has been achieved through methods that are typical of bureaucratic control, not of political control. **Transfer of power to an EU body has generally been accompanied by a clear operational definition of the policy goals. […] This has two advantages. On the one hand, it limits discretion by the EU policymakers, and hence insures that transfer of power is not abused. On the other hand, it facilitates ex post control. The European Parliament, the media, the Council, can blame or approve the way in which EU decision making power has been used.'**

[85] In one version of this well-known parable, "[…]six blind men were asked to determine what an elephant looked like by feeling different parts of the elephant's body. The blind man who feels a leg says the elephant is like a pillar; the one who feels the tail says the elephant is like a rope; the one who feels the trunk says the elephant is like a tree branch; […]" and so on. Each was correct, albeit from a limited perspective. See Wikipedia contributors (2013), 'Blind men and an elephant'.

[86] The Internet of Things refers to objects, rather than people, communicating with one another.

[87] Tabellini, G. (2002), *The Assignment of Tasks in an Evolving European Union*, CEPS Policy Brief No. 10, January 2002.

In other words, regulatory accountability depends on circumscribing the decision authority of the regulator so as to operate largely within the ambit of a defined scope of authority and a defined set of rules.

For regulatory authority and accountability to be credible, it needs to have some stability over time, and needs in particular to be somewhat insulated from the vagaries of potentially shifting political winds. For this reason, the maintenance of a crisp division of responsibilities in each Member State between the independent National Regulatory Authority (NRA) and the Ministry, which typically has responsibility for industrial policy, is crucial. **If the NRA were to be seen as shifting with the political tides, the integrity of the regulatory process would be undermined.**

Another fundamental dichotomy is relevant: that between ex ante regulation versus the application of competition law ex post. In Europe, these are seen as complementary, but they are not exactly the same in a number of respects. Notably, regulation of electronic communications is sector specific, while competition law is cross sectoral. Further, enforcement of remedies can be straightforward under regulation, but generally speaking competition authorities are ill equipped to monitor the on-going imposition of remedies.

There has been a long-standing desire to evolve the European regulatory framework over time away from the imposition of regulatory remedies, and instead toward action under ex post competition law only when a firm has abused a dominant position. This was and continues to be, in our view, a desirable evolution, to the extent that it is feasible.

The obvious advantage to (incumbent) network operators of such an evolution is that, instead of being constantly subject to regulation, they would be subject to sanctions only if they do something improper.

In practice, a shift away from ex ante regulation in favour of ex post competition law if and as needed might not simplify the system as much as many assume. If it is understood that a certain action is likely to result in fines or penalties ex post, that knowledge has a tendency to constrain the network operator's conduct just as much as an ex ante rule. Moreover, the ex ante rule is likely to be easier to interpret than the risk of ex post penalties – in our experience, for instance, an incumbent may have difficulty in gauging whether a particular retail offer does, or does not, constitute a price squeeze[88] (which would be a typical example of ex post enforcement of competition law). **In other words, ex post competition law would tend to be only infrequently invoked, but its effects may be harder for market players to predict than those of explicit ex ante rules. The shift would probably benefit market players overall, but arrangements would continue to be complex.**

3.2. What is the Single Market?

Before looking into the variety of instruments at EU level relating to the electronic communications sector, it is useful to understand the rationale which is meant to govern these measures.

[88] Where an integrated firm that possesses market power is required to offer an essential input on a wholesale basis to competitors, it will be motivated to set the price high so as to limit the competitor's ability to compete with the integrated firm's retail offerings. If the wholesale charge is too high relative to the retail price, the competitor cannot earn an appropriate margin or profit – its profits are 'squeezed'.

The formal legal mandate[89] under which EU telecoms legislation relating to electronic communications is tabled is as a measure to foster the 'establishment and functioning of the internal market'. **In this context, we should ask what is meant by the 'internal market', or 'European Single Market' as it is otherwise known.**

A paper by Pierre Larouche[90] provides a useful summary. He lists the following aspects as relevant to the meaning of the internal market as interpreted from a legal perspective:

- Ability of telecommunications providers from Member State A to establish themselves in Member State B;
- Ability of customers in Member State A to purchase services from a telecommunications provider in Member State B:
- Ability of customers in Member State A to use services while in Member State B;
- Ability for customers in a given Member State to do business with content providers from across the EU, using electronic communications services; and
- Ability of content providers to conduct business with customers across the EU, using electronic communication services.

Professor Larouche also usefully relates these definitions to issues relevant to the telecommunications sector. The ability of telecommunications providers to establish themselves and offer services anywhere across the EU is a fundamental starting point for sector liberalisation – a 'boilerplate' aspect of the single market, as Larouche puts it. Nonetheless, Larouche notes that not much cross-border expansion has occurred in fixed telecommunications, and he suggests that 'it is not clear what would be gained by increasing the prevalence of cross-border establishment of telecom providers'.

The ability of customers in one country to purchase connectivity services from a telecommunications provider in another is today less relevant in the telecoms sector. In economic terms, fixed telecommunications connectivity – at least to individuals – are not 'tradable'. A customer cannot buy broadband access from a provider located anywhere apart from his home country; however, Larouche notes that corporate users, who may rely on an 'aggregator' of telecoms services based in another country, may represent an exception. Moreover, it is possible that these limitations may themselves be an artefact of the lack of a Single Market. In a future Roaming-free environment, it might conceivably be possible and economically practical to purchase and use mobile access from a supplier based in one country in any country of the EU (or EEA).

Finally, the ability for consumers to do business with content providers across the EU, and for content providers to offer services on a pan-EU basis, puts issues such as Net Neutrality in context as well as issues such as consumer protection and the treatment of user data. **Issues beyond the immediate boundaries of the telecommunications sector such as copyright and access to content also become relevant. In a true single market, it might be envisaged that premium content might be accessible across the EU, either as an over-the-top service or conceivably as a managed service offered cross-border over a quality-assured connection.**

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[89] Article 114 of the *Treaty on the Functioning of the European Union* (TFEU).

[90] Larouche, P. (2013), *Converge, consolidation, uncertainty: future-proofing electronic communications regulation*, discussion paper for CERRE 13 September 2013; available at: http://www.cerre.eu/sites/default/files/130913_CERRE_CES_Telco_DiscussionPaper.pdf.

3.3. Objectives of European Policy for Electronic Communications

As discussed in Section 3.2, the majority of EU telecoms legislation is introduced on the grounds that it will contribute to the internal market. Beyond that, legislators have defined broad objectives that should be followed by Member States and national regulatory authorities.

In this section, we focus specifically on the objectives set out in the *European Regulatory Framework for Electronic Communications*, notably including goals for pan-European networks and trans-European services, and explore the degree to which they are coherent and internally consistent.

3.3.1. Objectives

It is useful to begin by considering the goals and objectives of European policy in this space.

As we explain in greater detail in Section 3.4, the *European Regulatory Framework of Electronic Communications* as amended in 2009 is comprised of a Framework Directive (providing the general structure of regulatory framework) and a series of Specific Directives that address the authorisation of services, access and interconnection obligations, universal service, consumer rights, and consumer privacy.[91]

Article 8 of the Framework Directive ostensibly provides the objectives of the *European Regulatory Framework for Electronic Communications*; however, since many of the stated objectives are not addressed within the Regulatory Framework, they can better be understood as an overall statement of European policy for electronic communications.
The objectives were submitted by the Commission, and reviewed and debated intensely by the European Parliament and the Council in the process leading to enactment of the Framework in 2002, and again in the process leading to its revision in 2009. It is thus fair to view them as a carefully considered statement by the European institutions.
Inasmuch as understanding the objectives of European policy in this space is crucial to our study, we list the stated objectives in full here.

First, Article 8(1) of the Framework Directive requires proportionality, and establishes the importance of technological neutrality throughout, except where spectrum policy requires otherwise.

Article 8(2) of the Framework Directive then directs the NRAs to promote competition by:

- ensuring that users, including disabled users, elderly users, and users with special social needs derive maximum benefit in terms of choice, price, and quality;
- ensuring that there is no distortion or restriction of competition in the electronic communications sector, including the transmission of content; and
- encouraging efficient use and ensuring the effective management of radio frequencies and numbering resources.

Article 8(3) of the Framework Directive goes on to direct NRAs to promote the development of the internal market by inter alia:

[91] Available at: http://ec.europa.eu/digital-agenda/telecoms-rules.

- removing remaining obstacles to the provision of electronic communications networks, associated facilities and services and electronic communications services at European level;
- encouraging the establishment and development of trans-European networks and the interoperability of pan-European services, and end-to-end connectivity;
- cooperating with each other, with the Commission and BEREC so as to ensure the development of consistent regulatory practice and the consistent application of this Directive and the Specific Directives.

Article 8(4) of the Framework Directive concerns itself with the rights of citizens. It calls for

- ensuring all citizens have access to a universal service;
- ensuring a high level of protection for consumers in their dealings with suppliers, in particular by ensuring the availability of simple and inexpensive dispute resolution procedures carried out by a body that is independent of the parties involved;
- contributing to ensuring a high level of protection of personal data and privacy;
- promoting the provision of clear information, in particular requiring transparency of tariffs and conditions for using publicly available electronic communications services;
- addressing the needs of specific social groups, in particular disabled users, elderly users and users with special social needs;
- ensuring that the integrity and security of public communications networks are maintained.
- promoting the ability of end-users to access and distribute information or run applications and services of their choice;

Finally, Article 8(5) of the Framework Directive prescribes a diverse collection of additional over-arching principles, including:

- promoting regulatory predictability by ensuring a consistent regulatory approach over appropriate review periods;
- ensuring that, in similar circumstances, there is no discrimination in the treatment of undertakings providing electronic communications networks and services;
- safeguarding competition to the benefit of consumers and promoting, where appropriate, infrastructure-based competition;
- promoting efficient investment and innovation in new and enhanced infrastructures, including by ensuring that any access obligation takes appropriate account of the risk incurred by the investing undertakings and by permitting various cooperative arrangements between investors and parties seeking access to diversify the risk of investment, whilst ensuring that competition in the market and the principle of non-discrimination are preserved;
- taking due account of the variety of conditions relating to competition and consumers that exist in the various geographic areas within a Member State;
- imposing ex-ante regulatory obligations only where there is no effective and sustainable competition and relaxing or lifting such obligations as soon as that condition is fulfilled.

3.3.2. Observations

As a general observation, we would note at the outset that the objectives in Article 8 are generally well crafted, and provide greater clarity than exists in most jurisdictions.

As a second observation, we would note that both the objectives, and their implementation into specific regulatory action lines, have evolved somewhat over time. They have become richer and more complex. The 2002 Regulatory Framework could be said to have placed primary reliance on ensuring competition, and to have left the rest to market mechanisms. The 2009 framework seems to address a broader range of concerns, and to promote a broader palette of institutional mechanisms in order to encourage efficient investment, and to address the possible need for network neutrality.[92]

As a related matter, the coherence and consistency of expression of the objectives is slightly less than in the original 2002 text (a not unusual phenomenon as regulations are expanded over time). Both 8(1) and 8(5) provide over-arching objectives, and proportionality appears in both. Article 8(5) deals extensively with competition, even though it is primarily an 8(2) theme.

At the same time, **a number of concerns should be immediately evident to the reader**:

- **There are a rather large number of distinct objectives.**
- **It is by no means ensured that all of the objectives are fully mutually consistent (see section 3.3.5).**
- **There is no prioritisation among objectives, nor among groups of objectives.** Is promotion of competition more important than promotion of the internal Single Market? Is competition more important than consumer rights?
- The degree to which these objectives are supported by specific action lines, either in the regulatory framework or through other EU programmes, varies greatly. **Some objectives are heavily supported; others, not at all (see section 3.3.3).**

3.3.3. Action Lines to Implement the Objectives

For many of the stated objectives, substantial mechanisms have been put in place in the Regulatory Framework itself. Others are supported through other EU instruments. Still others appear to enjoy little or no support by operative language in the Regulatory Framework or elsewhere.

Consider, for example, the Article 8(2) emphasis on ensuring 'that there is no distortion or restriction of competition.' The regulatory mechanisms for identification of markets susceptible to ex ante regulation, identification of Significant Market Power (SMP), and imposition of remedies (see section 3.5) directly address the concern.

As another example, the first half of the Universal Service Directive (see section 3.8) seeks to ensure 'that all citizens have access to a universal service'.
As yet another example, the coordination mechanisms of Article 7 of the Framework Directive, together with the creation of BEREC[93] itself, directly addresses the need for NRAs to coordinate […] with each other, with the Commission and BEREC so as to ensure the development of consistent regulatory practice […].'

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[92] See European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S*, available at: http://www.europarl.europa.eu/activities/committees/studies/download.do?language=en&file=36351.

[93] See Regulation (EC) No 1211/2009 of the European Parliament and of the Council of 25 November 2009 establishing the Body of European Regulators for Electronic Communications (BEREC) and the Office, in: *Official Journal of the European Union* L33//1, 18.12.2009; available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0001:0010:EN:PDF.

Now consider, by contrast, the Article 8(3) direction to NRAs to 'contribute to the development of the internal market by […] encouraging the establishment and development of trans-European networks and the interoperability of pan-European services, and end-to-end connectivity […]' Admittedly, 'encouraging' is a rather soft requirement. Be that as it may, it is difficult to identify any operative language at all in the regulatory framework that specifically contributes to the 'establishment and development of trans-European networks'.[94] **Indeed, competition policy (at European and to a lesser degree at Member State level) raises significant hurdles that a prospective trans-European network would have to overcome.**

3.3.4. Confusion, Contradiction and Hubris?

In an insightful 2004 paper, Nicholas Garnham argued that European policy in the electronic communications space has often unwittingly suffered from confusion among conflicting views of the problem that regulation was intended to solve.[95] These conflicting views were in turn rooted in conflicting economic models – for example, as we shortly explain, between a view of competition rooted in neo-classical economics, versus a view of 'creative destruction' as a means to innovation rooted in the views of Schumpeter.

His assessment was viewed as controversial and provocative at the time, and arguably remains so today. Despite that, or perhaps because of it, his work provides one interesting point of departure for our analysis. The discussion that follows is based on his analysis, but also formalises and builds on it.

Garnham argued that the Regulatory Framework that was established through 2002 legislation was largely a response to five key perceived problems, each of which impacted different stakeholders, and each of which implied the need for somewhat distinct (and possibly conflicting) solutions. The five key perceived problems were:

- **Insufficient investment in networks**, leading to inadequacy of networks to meet demand. This was linked to the existence of national monopsonies[96] purchasing from preferred suppliers (e.g. Siemens[97] in Germany, Alcatel[98] in France), and resulted in the inability of the EU telecoms equipment business to compete effectively with North American and Japanese competitors.[99]
- **A lack of consistent nets and services across the EU**, leading to high costs and inefficiency for European (multi-national) enterprises.
- **A regulated monopoly structure that hindered innovation in ICT services**, thus undermining overall European competitiveness.
- **Fragmentation of networks**, resulting in loss of potential economies of scale.
- **Less than optimal economic / social development**, once again reflecting impediments to innovation.

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[94] Pan-European services, by contrast, probably benefit from the overall regulatory harmonisation provided by the Framework. The European Standardisation Organisations (ESOs) and the research under the Framework Programme and the Competitiveness and Innovation Programme (CIP) probably contribute to interoperability.

[95] Garnham, N. (2004), *Contradiction, Confusion and Hubris: A Critical Review of European Information Society Policy*, keynote address to the EuroCPR conference, Barcelona, March, 2004; available at: http://www.cprsouth.org/wp-content/uploads/2011/11/garnham-debate.pdf.

[96] In a *monopsony*, a single buyer confronts many sellers and effectively controls the market. By contrast, in a monopoly market, a single seller confronts many buyers.

[97] http://www.siemens.com/entry/cc/en/.

[98] http://www.alcatel-lucent.com/

[99] Equipment manufacturer competitors at the time would have included Lucent (now part of Alcatel-Lucent, see http://www.alcatel-lucent.com/) and Nortel (now defunct).

Expanding on Garnham's framework and formalising it, we can identify in Table 1 the following causal linkages among the root cause factors that he identified.

Table 1: Root problems that led to the 2002 framework (Garnham analysis)

		Leads to	Caused by
1	Insufficient investment in networks	Inadequacy of networks to meet demand	Fragmentation of networks
1a	Inadequacy of networks to meet demand	Welfare loss	Insufficient investment in networks etc.
1b	Fragmented EU equipment industry	Fragmented / insufficient R&D investment	Fragmentation of EU
1b	Fragmented / insufficient R&D investment	US/JP domination of EU equipment business	Fragmentation of EU
1c	National monopsonies	US/JP domination of EU equipment business	Fragmentation of networks
1d	US/JP domination of EU equipment business	Welfare loss	Fragmented EU equipment industry
1d	US/JP domination of EU equipment business	Welfare loss	Fragmented / insufficient R&D investment
1d	US/JP domination of EU equipment business	Welfare loss	National monopsonies
2	Lack of consistent nets and services across EU	Lack of cross border operation	Lack of pan-European operators
2	Lack of consistent nets and services across EU	Lack of regulatory harmonisation	Nat'l regulation, lack of consistency
2a	Lack of cross border operation	Welfare loss	Fragmentation of networks and services
2b	Lack of regulatory harmonisation	Fragmentation of networks and services	Fragmentation of EU
3	Regulated monopoly structure hinders innovation	Inability to innovate	Fragmentation of EU, path dependency
4	Fragmentation of networks	Loss of potential economies of scale, welfare loss	Fragmentation of EU, path dependency
5	Less than optimal economic / social development	Welfare loss	Inability to innovate
6	Lack of pan-European operators	Lack of consistent nets and services across EU	Fragmentation of EU, path dependency
7	Nat'l regulation, lack of consistency	Fragmentation of networks and services	Fragmentation of EU, path dependency
8	Monopoly rents	Welfare loss	High barriers to competitive entry
9	High barriers to competitive entry	Monopoly rents	Fragmentation of EU, path dependency

Source: Garnham (2004), WIK analysis.

Garnham argued that potential solutions were framed by three distinct economic models, with implications for policy that were not entirely mutually compatible: a 'neo-classical economics model' (implying the need for ease of competitive entry, and prices reflective of costs); a 'Schumpeterian[100] model' (arguing for supra-competitive prices in order to foster disruptive innovation); and a 'Hayekian[101] economic model' (where the choice among competing technologies is made by markets, not by social planners). To these, we could add two other models, nearly directly opposed to one another: a 'laissez-faire' model (where nearly all decisions are left to the market), and an 'industrial policy' model. These different schools of economic thought are somewhat mutually consistent, but also somewhat in conflict with one another as regards the implications for public policy.

Schematically, looking at these models and their implications for consumer prices, and for choice among technologies, we have the breakdown evident in Table 2.

Table 2: Economic theories relevant to European policy (Garnham analysis)

	Economic Theory	Prices	Technological evolution	Beneficiaries	Losers	Contrary to	Theory
1	Neo-classical	Cost-based	Driven by competition	Consumers, business users	Incum-bents	Laissez-faire, Schumpeter	Consumer welfare vs. monopoly rents
2	Schumpeter	Above cost-based	Disruptive	Incumbents		Neo-classical	Values dynamic effects over static
3	Hayek	Market based	Technologically neutral			Industrial policy	Prices the only means to choose facing uncertainty
4	Laissez-faire	Not subject to regulatory control	Technologically neutral	Those with pricing power		Neo-classical, Industrial policy	Reliance on the market
5	Industrial policy	Depends on policy objectives	Industrial policy	Set by policymakers	Set by policy-makers	Hayek, Laissez-faire	Reliance on the policymaker

Source: Garnham (2004), WIK analysis.

The various problems noted in Table 1 impacted different stakeholders, as shown in Table 3. They called for different solutions, both within the Regulatory Framework and in some cases through other policy instruments.

[100] Joseph Schumpeter was a prominent Twentieth Century Austrian-American economist who saw the success of entrepreneurship as fundamental to the long term success and viability of capitalism.

[101] Friedrich Hayek was another prominent Twentieth Century Austrian-American economist. He saw changing prices as a fundamental means of communicating economic information and coordinating plans.

Table 3: Response to the perceived problem (Garnham analysis)

	Problem	Impacts	Response
1	Insufficient investment in networks	Consumers, businesses	Lisbon goals,[102] Framework Programme, EU standards (e.g. GSM)
1a	Inadequacy of networks to meet demand	Consumers, businesses	Universal Service, targeted State Aid
1b	Fragmented EU equipment industry	EU network operators, equipment industry	
1b	Fragmented / insufficient R&D investment	EU network operators, equipment industry	
1c	National monopsonies	EU equipment industry	Liberalisation
1d	US/JP domination of EU equipment business	EU equipment industry	Lisbon goals, Framework Programme, EU standards(e.g. GSM)
2	Lack of consistent nets and services across EU	Multinational businesses	Regulatory framework, 'Article 7', BEREC
2a	Lack of cross border operation	Multinational businesses	
2b	Lack of regulatory harmonisation		
3	Regulated monopoly structure hinders innovation	ICT firms	Liberalisation
4	Fragmentation of networks	EU network operators	
5	Less than optimal economic / social development	Society as a whole	
6	Lack of pan-European operators		None
7	Nat'l regulation, lack of consistency		Regulatory framework, Article 7, BEREC
8	Monopoly rents		Regulatory framework (Access)
9	High barriers to competitive entry	Consumers, businesses	Regulatory framework (Access)

3.3.5. Tensions Among the Objectives

Based on the foregoing analysis, a number of the tensions among models become clear:

- A neo-classical economic view implies the need for low prices, reflective of real cost, for consumers; however,
- a Schumpeterian view argues that prices above pure competitive levels are required in order to achieve disruptive innovation.

[102] The Lisbon Agenda was established in 2000 with the goal of enabling Europe 'to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.' A key goal was to raise research and development spending to 3% of GDP. European Union (2000a), Presidency Conclusions: Lisbon European Council: 23 and 24 March 2000 ('Lisbon Agenda'), at http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/00100-r1.en0.htm.

To some extent, this is an argument about static versus dynamic efficiency. We will be returning to this theme in later chapters.

The degree of policy planning represents another notable point of tension. The Hayekian view (and also the laissez faire view) would argue for letting the market make decisions, and thus also for as much technological neutrality as possible. An industrial policy viewpoint could be significantly at odds with this perspective.

It must be noted that this represents Garnham's 2004 view[103] of the factors that shaped today's Regulatory Framework. In a number of cases, either events played out differently than had been foreseen, or else the changes put in place had unexpected consequences. As a notable example, it had been hoped that breaking the monopsony link between incumbent network operators and national equipment manufacturers (in France, Germany and Sweden, for example) would lead to a constellation of European equipment manufacturers capable of competing effectively on the global stage. Today, it is reasonably clear that European network operators purchase equipment from the best and most capable global suppliers, thus enhancing their efficiency; however, this change might well have benefitted global firms such as Huawei[104] and Cisco[105] more so than any European manufacturer.

3.4. Overview of the Policy Instruments Available to the European Union

In this section, we focus on the policy instruments available, i.e. the tool kit; in subsequent sections of this chapter, we explain how the tools are used to achieve specific policy goals.

We are concentrating on the Regulatory Framework (see section 3.4.1), which has to be seen as the centrepiece of European policy for electronic communications; however, many other complementary instruments interact with it, such as State Aid rules, competition law, industrial policy (including the now shrunken Connecting Europe Facility (CEF)[106] and Regional Funds[107]), and research and standardisation instruments.

3.4.1. The Regulatory Framework for Electronic Communications

In this section, we discuss the general mechanisms available in the *European Regulatory Framework for Electronic Communications*.

Overall Framework

The Regulatory Framework is set forth in five Directives.[108] As previously noted, the primary effect of a Directive is to require Member States to implement corresponding provisions into their respective national laws (a process known as transposition). In the case of the Regulatory Framework, a number of corresponding European actions, notably on the part of the Commission, were also required.

[103] Garnham, N. (2004), *Contradiction, Confusion and Hubris: A Critical Review of European Information Society Policy*, op. cit.
[104] Huawei is a China-based leading manufacturer of networking equipment. See www.huawei.com.
[105] Cisco is a US-based leading manufacturer of networking equipment. See www.cisco.com.
[106] European Commission DG Connection information site on *Connecting Europe Facility*; available at: http://ec.europa.eu/digital-agenda/en/connecting-europe-facility.
[107] See the discussion of the European Regional Development Fund (ERDF) at http://ec.europa.eu/regional_policy/thefunds/regional/index_en.cfm.
[108] For the full text of all of these Directives, including the changes introduced in 2009, see European Commission (2010d), Regulatory framework for electronic communications in the European Union: Situation in December 2009.

The Framework Directive[109] represents the core of the overall system. It establishes the scope of the regulatory system as a whole, which explicitly include transmission but not content. It includes core definitions, and overall mechanisms. It requires the Member States to put competent and independent National Regulatory Authorities (NRAs) in place, and defines many of the interactions between the Commission and the NRAs. It establishes a wide range of regulatory processes and mechanisms, as we will explain.

The Framework Directive is supported by four Specific Directives that address specific regulatory domains:

- *Directive 2002/20/EC (the Authorisation Directive)*,[110] which enables firms to become providers of electronic communications networks or services, and limits the ability of Member States to inhibit competitive entry.
- *Directive 2002/19/EC (the Access Directive)*[111] which fosters competition by enabling network operators to gain access to the facilities of network operators that have Significant Market Power (SMP), and provides for interconnection of networks.
- *Directive 2002/22/EC (the Universal Service Directive)*.[112] The first half of the Universal Service Directive seeks to ensure that all reasonable requests for network access at a fixed location are satisfied at a reasonable price. The second half provides for a range of consumer rights.
- *Directive 2002/58/EC (the Directive on privacy and electronic communications)* establishes a wide range of consumer rights in regard to electronic privacy, and addresses practices such as SPAM[113] and cookies.[114]

The Regulatory Framework was set forth in 2002, with the requirement that Member States implement the Framework fully within national law within eighteen months (July 2003). The Framework was then reviewed (as foreseen in the initial text) in 2006, which led after a lengthy process to a major amendment of all Directives in 2009.

Addressing Market Power

Mechanisms for addressing market power represent a core element of the European Regulatory Framework. One or more predefined remedies are imposed on network operators that have been found, through a transparent and proportionate process, to possess Significant Market Power (SMP).[115] These remedies may not be imposed on network operators that do not have SMP (and must be promptly lifted once a network operator is found to no longer have SMP).

Key provisions appear in Articles 14 and 15 of the Framework Directive. Specific remedies are identified in the Access Directive and the Universal Service Directive.

[109] Ibid.
[110] Ibid.
[111] Ibid.
[112] Ibid.
[113] *SPAM* is unsolicited Internet messages, typically unsolicited e-mail.
[114] Cookies are used by web browsers to record whatever a web site may wish to record.
[115] Market power is the ability of a firm to profitably raise the market price of a good or service over marginal cost.

Two Commission Recommendations that are explicitly foreseen in the Framework Directive lay crucial groundwork for the overall process. The first, the Recommendation on relevant markets (Recommendation 2007/879/EC), identifies a series of potential problem markets that NRAs must analyse for possible SMP.[116] The second, the SMP Guidelines (COM 2002/C 165/03), lays out in detail the procedure that NRAs are to use for market definition and SMP determination.

This entire process is described at length in section 3.5.

Specific Regulatory Instruments

The Regulatory Framework is comprised of a wealth of specific instruments. They are covered in detail at various locations throughout this report.

- The *Access Directive (Directive 2002/19/EC)* provides both for access and for interconnection.[117] Most of these provisions constitute asymmetric regulation imposed only on market players that possess SMP.
- International Mobile Roaming (IMR) is an area somewhat linked to interconnection, but it cannot be dealt with using the same tools. Since 2007, IMR has instead been subject to a series of *Roaming Regulations*, as explained in section 3.6.1.
- A number of consumer rights, such as the right to a contract and the right to information about service provider quality, are embodied in the second half of the *Universal Service Directive (Directive 2002/22/EC).*
- Promoting the deployment of voice and data services is the province of multiple policy instruments, most of which are not specifically regulatory instruments. The prime regulatory tool is universal service, which is also covered in the *Universal Service Directive (Directive 2002/22/EC)*. We cover universal service together with various broadband policy instruments such as State Aid and the *Connecting Europe Facility (CEF)* in section 3.8.
- Spectrum management is an important and growing area of European competence, as we shall see in section 3.10. The EU plays an increasingly important role in coordination and strategic planning.
- Privacy is governed by multiple instruments, including the *Directive on privacy and electronic communications (Directive 2002/58/EC)*, and the *Data Protection Directive (Directive 95/46/EC).*[118]
- The Regulatory Framework has relatively little to say about network and information security; however, the EU maintains a decentralised agency, ENISA, to coordinate European efforts and to promote best practice in regard to network and information security.[119]

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[116] A Member State NRA could choose on its own initiative to define a market susceptible to *ex ante* regulation that is different from, or in addition to, those predefined by the Commission. It would have to notify its decision to the Commission using the same Article 7 notification procedures, and would need to demonstrate (1) high static barriers to entry, (2) no likelihood that the situation would correct itself over the review period, and (3) insufficiency of competition law alone to address the problem (the *three criteria test*).

[117] Access enables one network operator to obtain the use of portions of the network of an operator that possesses SMP at cost-oriented prices, thus enabling it to offer services to its customers. Interconnection enables the customers of two network operators to exchange communications with one another.

[118] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

[119] European Parliament (2011b), *The role of ENISA in contributing to a coherent and enhanced structure of network and information security in the EU and internationally*; available at: http://www.europarl.europa.eu/activities/committees/studies/download.do?language=en&file=42251.

3.5. Mechanisms for addressing market power

3.5.1. Main Features

One of the overarching objectives of the EU Regulatory Framework is to promote competition[120] in the provision of electronic communications networks and services (see section 3.3.1). The European Framework intrinsically liberalises markets, by requiring Member States not to restrict the entry of competitors and to grant a general authorisation for the provision of telecommunications services.[121]

However, a core premise of the framework is that merely permitting market entry would be insufficient to achieve competition because fixed telecommunications markets in particular are characterised by the presence of former-monopoly incumbents, which continue to enjoy advantages due to their legacy infrastructure and large customer-base.

The framework therefore includes provisions which require NRAs to implement appropriate economic regulation, largely in the form of wholesale access obligations whenever they conclude that an operator has significant market power. These measures allow service providers to enter the market by renting inputs such as the local loop[122] from the SMP operator, which are considered essential for competition.

Definition of Significant Market Power (SMP) as Equivalent to Competition Law Dominance

In order to align core principles of ex ante regulation with the application of competition law under the EU Treaty, the EU Regulatory Framework defined significant market power as a market position equivalent to dominance.[123] In this context, significant market power is defined as 'a position of economic strength affording an undertaking the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers'.[124] This is normally assessed through a test which aims to judge whether an operator could sustain a significant price increase above the competitive level (the so-called small but significant non-transitory increase in price (SSNIP) test).[125]

Joint Dominance

Normally, in fixed telecommunications markets, one operator – typically the former incumbent – is found to have significant market power, i.e. to be dominant; however, competition law and the EU Regulatory Framework also allow for circumstances in which more than one operator has significant market power. This is known as joint or collective dominance.[126] The 2002 EU Regulatory Framework includes a list of criteria[127] to help NRAs gauge whether joint dominance exists, which was updated in the 2009 review.

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[120] Article 8(2) of the *Framework Directive*. Besides competition, national regulatory authorities are also required to contribute to the development of the internal market (article 8(3)), and promote the interests of citizens (article 8(4)).

[121] Article 6 of the *Authorisation Directive*.

[122] Local Loop Unbundling (LLU) is a form of access whereby an operator rents the copper access line running from the end-user premise to the local exchange in order to supply services such as broadband and telephony.

[123] Article 14(2) of the *Framework Directive*.

[124] Article 14(2) of the *Framework Directive* based on case law related to the concept of 'dominant position' as referred to in the Article 102 of the TFEU.

[125] Originating from US merger control guidelines, the SSNIP test was first used in Europe in the context of a Nestle/Perrier case in 1992 and was subsequently recognised by the European Commission in its *Notice for the Definition of the Relevant Market* (1997).
See http://europa.eu/legislation_summaries/competition/firms/l26073_en.htm.

[126] Article 14 of the *Framework Directive* refers to the potential for 'joint' dominance in circumstances where two or more undertakings are found collectively to have significant market power.

[127] Annex II of the *Framework Directive*.

These criteria include consideration of whether the market lacks competition and is concentrated, and whether operators have similar market shares and are vertically integrated (i.e. supply both networks and retail services) but refuse to voluntarily make wholesale offers available to potential competitors.

It is notable that, despite the review of these criteria in the 2009 Review of the Regulatory Framework, very few markets have been found to exhibit joint SMP either in the context of the ex ante Regulatory Framework or indeed in competition law more generally. In nearly all mobile markets, as shown in Table 4 there are three or more network operators. This has normally been considered by NRAs sufficient to find that the market is competitive,[128] although recent research has found that the effects of entry on retail prices in the mobile market depend heavily on the nature of the entrant.[129]

Table 4: Number of EU countries with 1-5 active operators between 2000-2012

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1 operator	3	2	1	1	1	0	0	0	0	0	0	0	0
2 operators	8	6	6	6	5	6	4	4	2	1	1	1	1
3 operators	11	13	14	15	14	14	15	14	15	14	14	14	14
4 operators	4	5	5	4	3	4	6	8	9	9	10	11	12
5 operators	1	1	1	1	4	3	2	1	1	3	2	1	0

Source: Csorba, G. and Papai, Z. (2013). [130]

In fixed markets, there are a number of areas and countries in which a de facto duopoly[131] could be said to exist in the access network between cable and the incumbent; one conclusion might be that in such markets, either both or neither operator should face obligations to offer wholesale access to broadband competitors. Such obligations, or the removal of existing obligations, would normally follow from a market analysis in which cable and the incumbent were both included in the wholesale market under consideration; however, NRAs have largely avoided assessing whether joint dominance exists, perhaps due to the perceived legal and practical difficulties with the concept. Instead, NRAs have followed approaches which tend to underline the market power of the incumbent operator, even in cases where cable has a significant presence. Some NRAs in countries where cable is widespread have excluded cable networks from the scope of local access and wholesale broadband markets on the basis that cable services are not typically offered on a wholesale basis.[132]

[128] Spain provides a rare exception in which joint dominance in mobile access and origination was found.

[129] Csorba, G., Pápai, Z. (2013*), Does one more or one less mobile operator affect prices? A comprehensive ex-post evaluation of entries and mergers in European mobile telecommunication markets*, 2013-06-24; available at: http://www.cresse.info/uploadfiles/2013_S3_PP1.pdf. The research found that the entry of a fourth multi-national operator significantly reduced prices; however, consolidation from 4 to 3 did not have a significant effect on prices.

[130] Csorba, G. and Papai, Z. (2013), *Does one more or one less mobile operator affect prices? A comprehensive ex-post evaluation of entries and mergers in European mobile telecommunication markets.*

[131] A duopoly is a market in which two operators between them constitute all or nearly all of the market for a given product or service.

[132] Belgium and the Netherlands, two of the countries with the greatest cable coverage, exclude cable from the relevant wholesale markets for 'wholesale local access' and 'local loop unbundling'.

The Commission appears to support the approach of not including cable within the scope of wholesale markets relevant to broadband;[133] however, the argument could be seen as somewhat circular, given that the primary reason for wholesale access being offered on incumbent networks is the regulatory obligations imposed. Moreover, cable access has been mandated in some circumstances, such as in Denmark, where the incumbent has a significant cable presence alongside its copper infrastructure.[134] This suggests that bitstream access may be technically feasible in principle on cable networks.

Other NRAs have included cable in local access and wholesale broadband markets, but have concluded that cable has a relatively low market share on a nationwide basis; however, the market share of cable in cable areas may be substantially higher and close to that of the incumbent, thereby exhibiting potential duopoly characteristics in those areas. **Overall, the appropriate regulatory response to duopoly remains an unsettled matter in European telecommunications regulation.**

Market Analysis Procedures

Under the EU Regulatory Framework, NRAs are required to define markets using roughly the same principles as are used to define markets under competition law. This requires them to define the relevant product market and associated geographical scope.[135] Product markets are defined by assessing which products are substitutes for each other. Geographic markets describe areas in which supply and demand conditions are relatively homogenous.

European Commission Guidance on Relevant Markets and SMP

Whilst in principle NRAs could define markets independently, in practice their analyses are strongly guided by two non-binding instruments issued by the European Commission, to which NRAs are obliged to take 'utmost account'.

- The 'Relevant Market Recommendation' lists a number of markets which the European Commission considers would be normally 'susceptible to ex ante regulation'.
- The 'SMP Guidelines' describe how NRAs should assess whether or not markets are characterised by significant market power.

The original relevant market recommendation which was adopted at the time of the 2002 EU Regulatory Framework included 18 markets[136] which were considered susceptible to ex ante regulation.

In a subsequent review in 2007,[137] the number of markets included in the Commission's Recommendation was reduced to 7, by removing 5 of the retail markets that were in the original list as well as 2 core network markets and the markets for mobile access and broadcasting.

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[133] *Explanatory note accompanying the Commission Recommendation on Relevant Product and Service Markets* http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/sec2007_1483_final.pdf.

[134] See *Case DK/2012/1340*: wholesale broadband access in Denmark EC comments pursuant to Article 7(3) Directive 2002/21/EC.

[135] Article 14 Framework Directive.

[136] European Commission (2003), *Recommendation on Relevant Markets*, available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:114:0045:0045:EN:PDF. Markets in the original Recommendation which were subsequently removed in the 2007 revision included retail fixed telephony markets, retail leased lines transit and trunk leased lines, a market for mobile access and origination, and a market for wholesale broadcasting transmission.

[137] European Commission (2007), *Recommendation on Relevant Markets*, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007H0879:EN:NOT.

The current list, which is once more subject to an on-going review by the European Commission,[138] includes one retail market (access to the public telephone network at a fixed location) and the following 6 wholesale markets:

- Market 2: Call origination on the public telephone network provided at a fixed location (this market is used to regulate access to and the price of originating calls for providers of carrier pre-selection and call by call selection services)
- Market 3: Call termination on individual public telephone networks provided at a fixed location (this market is used to regulate the wholesale price at which fixed calls are received)
- Market 4: Wholesale physical network infrastructure access (including unbundling of the local loop (LLU)) (this market is used to regulate access to the copper local loop and 'NGA' equivalents (such as a virtual local loop or physical unbundled fibre loop). These wholesale products are mandated to enable the provision of alternative broadband services in circumstances where infrastructure competition alone is not sufficient)
- Market 5: Wholesale broadband access: (this market is used to regulate access to a wholesale broadband service that lies downstream of the local loop [i.e. includes more network components]. The typical use of these services is to provide broadband access in rural areas [where local loop unbundling may not be feasible] and to provide high quality broadband services to businesses on a wide geographic basis).
- Market 6: Wholesale terminating segments of leased lines (this market is used to regulate high quality dedicated connections which are used to provide access for large businesses. Leased lines can also be used within the networks of operators for example to provide high bandwidth connections for mobile base stations))
- Market 7: Voice call termination on individual mobile networks (this market is used to regulate the wholesale price at which mobile calls are received)

Markets were removed from the original list partly on the basis of observed competitive dynamics, which showed that the markets that were removed were tending more towards competition than those which remained. There was, however, also an apparent effect whereby the removal of markets from the list (by reversing the burden of proof for regulation in these markets) also led more regulators to conclude that they were competitive and therefore needed to be deregulated. The Recommendation on Relevant Markets has consequently been considered to be a key tool in driving deregulation in telecoms markets in Europe.

Table 5 shows the current status of SMP and regulation in the markets on the current list (markets 1-7), and on the markets which were included in the previous Recommendation but were subsequently removed. Areas marked red indicate markets in which SMP has been found, whilst yellow areas indicate that a part of the market is characterised by SMP.

[138] Results of the public consultation on the revision of the *Recommendation on Relevant Markets* https://ec.europa.eu/digital-agenda/en/news/results-public-consultation-revision-recommendation-relevant-markets.

Table 5: SMP status in markets notified under Article 7 to the European Commission DG Connect

	2007 RECOMMENDATION							2003 RECOMMENDATION								
	Access to PSTN for res & non-res.	Call orig. on fixed network	Call term. on fixed network	Unbund. access	Broadb. access	Term. segments LL	Voice call term. on mobile networks	Local/nat. call for res.	Internat. call for res.	Local/nat. call for non-res.	Internat. call for non-res.	Retail LL	Transit on fixed network	Trunk segments LL	Access & call orig. on mobile network	Broadcast Transmis.
	Market 1	Market 2	Market 3	Market 4	Market 5	Market 6	Market 7	ex-Mkt 3	ex-Mkt 4	ex-Mkt 5	ex-Mkt 6	ex-Mkt 7	ex-Mkt 10	ex-Mkt 14	ex-Mkt 15	ex-Mkt 18
Austria	3	3	3	3	3	3	3	3	2	3	3	3	1	2	1	2
Belgium	2	1	2	2	2	1	2	2	1	2	1	1	2	1	1	w
Bulgaria	1	2	2	1	1	1	2	1	1	1	1	1	1	1		
Cyprus	2	2	2	3	3	1	2	2	2	2	2	1	2	1	2	2
Czech Republic	2	2	2	2	2	2	2	2	2	2	1	2	1	1	1	2
Denmark	2	2	2	3	3	3	3	2	2	1	1	2	1	1	1	1
Estonia	2	2	2	2	2	2	3	1	1	1	1	1	1	2	1	2
Finland	2	2	2	3	3	1	1	2	1	2	1	1	2	1	V	2
France	3	3	3	3	3	2	3	1	1	1	1	2	1	2	W	3
Germany	2	2	2	3	2	1	2	2	1	2	1	2	2	1	1	2
Greece	2	2	2	3	3	2	3	2	1	2	1	2	2	2	1	1
Hungary	4	3	3	3	3	3	4	2	2	2	2	3	2	2	2	1
Ireland	2	2	3	2	2	2	1	2	2	2	2	2	2	2	1	1
Italy	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2
Latvia	1	2	3	1	2	2	3	2	2	2	2	3	2	1	1	1
Lithuania	1	1	3	2	2	1	2	2	1	2	1	1	1	1	1	2
Luxemburg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Malta	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
Netherlands	3	2	3	3	3	3	2	2	2	2	2	2	2	2	1	2
Poland	2	2	2	2	2	1	3	1	1	1	1	1	1	1	2	2
Portugal	1	1	1	2	2	2	2	1	1	1	1	2	1	2		1
Romania	1	1	2	1	1	1	2	1	1	1	1		1			1
Slovakia	3	3	2	2	2	2	2	2	2	2	2	2	2	1	1	2
Slovenia	2	2	2	3	3	2	3	1	1	1	1	2	2	1	3	2
Spain	3	2	2	2	2	2	3	2	2	2	2	2	2	2	1	2
Sweden	2	2	2	2	2	1	2	1	1	1	1	2	2	1	1	2
UK	2	2	2	2	2	2	3	2	2	2	2	2	2	2	1	1

Effective competition -no ex ante regulation No effective competition - ex ante regulation
Partial competition - partial ex ante regulation

1	1st round-competition/regulation
2	2nd round-competition/regulation
3	3rd round-competition/regulation
4	4th round-competition/regulation

Source: DG Connect market overview, 5 March 2013

Not all changes to the relevant market Recommendation have led to the lifting of regulation. The amendment made in the 2007 revised version to remove the reference to 'metallic' loops in the context of the market for unbundled access was a primary driver for the extension of regulation from copper infrastructure to next generation fibre access networks.

The European Commission is expected to complete a further review of the Recommendation on Relevant Markets in 2014. It can be expected that the review will trigger further efforts to reduce or simplify regulation. Possible issues that may be examined in this review include:

- Whether there is a continued need for regulation of retail telephone line rental or wholesale regulation of markets for voice calls. It may be considered that increased competition in the provision of bundled services which include both broadband and telephony may remove the need for additional regulation to allow call by call carrier selection[139] or carrier pre-selection.[140]
- Whether physical access to unbundled local loops should continue to be treated separately from virtual access[141] or should be included clearly within the same local access market. Such an approach would change the existing preference for physical over virtual access.[142]
- Whether there are any alternatives to the strict regulation of call termination[143] that would address the bottlenecks in this area.
- How access markets for the supply of business communications (currently focused on terminating segments of leased lines) should be defined.

Notwithstanding the on-going quest of the European Commission to reduce regulation, it is noteworthy that a number of markets have exhibited enduring bottlenecks, although for different reasons. These include markets for local access to infrastructure, including local loop unbundling (market 4), markets concerning call termination on fixed and mobile networks (markets 3 and 7), and the market for terminating segments of leased lines. **Local access and business access outside business districts are likely to exhibit bottlenecks due to the economics of duplicating fixed networks in the last mile. Termination bottlenecks arise because calls can only be terminated by the single network operator to which the telephone number is assigned. This results in all carriers being considered to have SMP in termination of calls on their own networks.**

[139] Carrier selection is a mechanism whereby a customer can select their providers of fixed calls on a 'call by call' basis.

[140] Carrier pre-selection is a mechanism whereby a customer can select their provider of calls separately from the operator which supplies their telephone access line.

[141] Physical access requires a dedicated unique connection between the end-user and the point of connection – typically at a local exchange building. With some NGA architectures, notably fibre-to-the-cabinet (FTTC)/VDSL and FTTH PON, there is no single link. In these cases, a 'virtual access connection could be provided in place of a physical connection. There are differences of view amongst telecommunications operators as to whether such virtual links can offer equivalent capabilities to physical connections.

[142] See European Commission (2010a), *Commission Recommendation on regulated access to NGA*, available at http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF. The approach taken favours physical access to NGA networks, whilst allowing virtual access as a temporary solution if physical access is not feasible.

[143] Charges for call termination are currently regulated for all operators at levels which are intended to approach the cost of conveying traffic (on a so-called 'pure LRIC' basis, where LRIC stands for Long Run Incremental Cost).

Geographic Scope of Markets

In addition to defining the product market, NRAs must define the appropriate geographic market. This may be regional, national, or cross-border in scope.

Transnational markets

One of the core objectives in article 8 of the EU Regulatory Framework is to foster the internal market including by encouraging the development of trans-European networks and the interoperability of pan-European services.

Specific provisions exist in the EU Regulatory Framework concerning the analysis and regulation of transnational markets.[144] Where a transnational market is identified which is susceptible to regulation, the Commission, taking account of the views of BEREC, can adopt a Decision[145] identifying the market. In this case, NRAs concerned are obliged to jointly conduct the market analysis and impose any remedies; however, it is noteworthy that no transnational markets have been defined since the adoption of the EU Telecommunications Framework.

In January 2013,[146] it was postulated in a study by WIK that a transnational market exists for retail business communications; however, because the bottlenecks hampering the development of the cross-border retail market (for example wholesale markets for terminating segments of leased lines) were national, it did not seem that the problem could be solved through use of the provisions which permit the co-ordinated regulation of transnational markets[147] under the EU Regulatory Framework as currently drafted. **The study suggested an amendment to the Regulatory Framework which would enable enabling binding Decisions to be taken to harmonise regulation in national wholesale markets in cases where consistent treatment across the EU is needed to foster the development of a transnational retail market. The pan-European nature of the retail market for business communications was also highlighted in a September 2013 study by Ecorys for the European Commission.[148]**

Geographic segmentation

At the other end of the scale, there has been pressure to analyse markets on a more localised basis to take account of regional differences in competition. Due to historic ownership patterns in which fixed incumbent operators tended to be established on a national basis, most markets have typically been found to be national in scope, matching the footprint of the historic incumbent; however, in recent years, an important trend has been to further segment markets, defining regional markets within national boundaries and varying or removing regulation in some parts of the national territory.[149] This can be achieved either:

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[144] Article 15(4) and 16(5) of the Framework Directive.
[145] A Decision, unlike a Recommendation, is a binding instrument.
[146] Godlovitch, I., Monti, A., Schäfer, R.G., Stumpf, U. (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at; http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf.
[147] Article 15(4) and 16(5) Framework Directive.
[148] Ecorys (2013), *Future electronic communications markets subject to ex ante regulation: report by Ecorys, IDATE, and icri for the European Commission*, at http://ec.europa.eu/digital-agenda/en/news/future-electronic-communications-markets-subject-ex-ante-regulation.
[149] These trends have to some extent been supported by Article 8(5)e of the Framework Directive which requires NRAs to take due account of the 'variety of conditions' relating to competition and consumers that exist in the various geographic areas within a Member State.

- by defining a regional market and finding no SMP, thus requiring the removal of regulation; or
- by identifying specific areas within a national market which have greater competitive constraints and varying the conditions of regulation in those areas.

The 'ladder of investment' and implications for deregulation and market segmentation

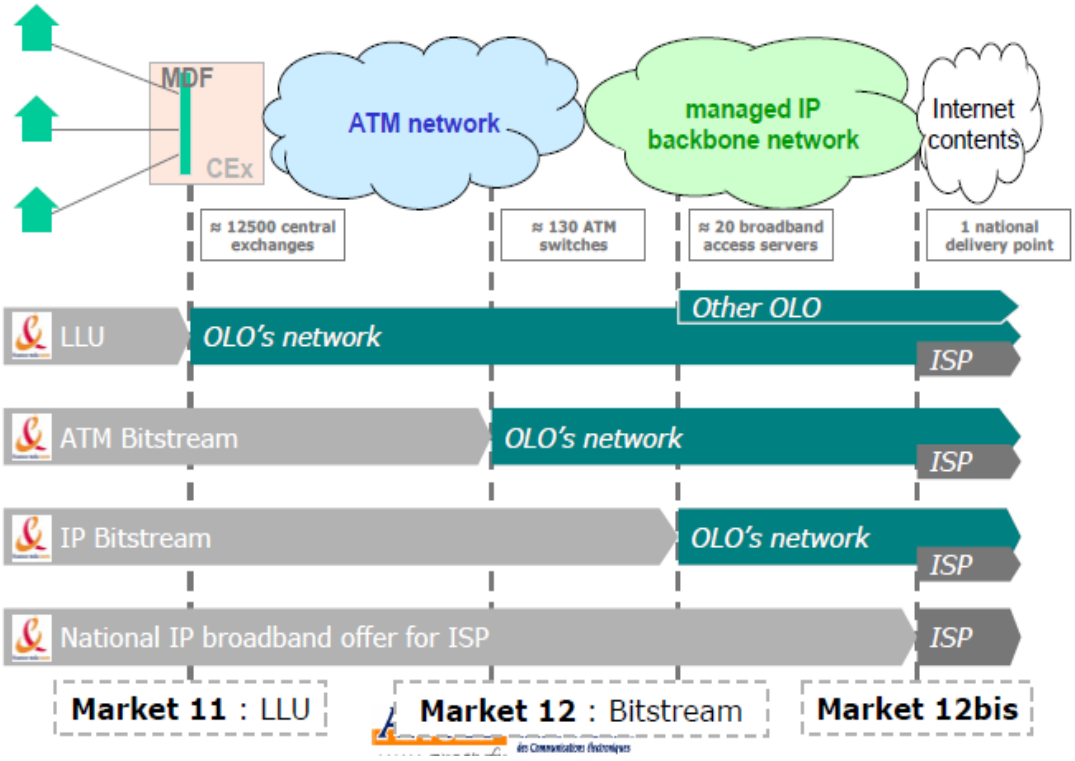
Although it is not enshrined in EU legislation, one concept that has had a significant influence on the way in which broadband markets have been defined and analysed by the European Commission and NRAs is the theory of the ladder of investment.

The ladder of investment was elaborated by Martin Cave in a series of papers.[150] It was conceived as a strategy to promote facilities-based competition in fixed networks on the basis of end-to-end infrastructure duplication. Regulation was to provide a series of access product 'rungs' which new entrants were expected to 'climb' until they had built out their own networks and were no longer reliant on access. The theory held that the ladder of investment should be a temporary construct, ultimately enabling access regulation to be removed once full infrastructure-based competition had been established.

The concept was subsequently embraced by the European Regulators Group (ERG), a fore-runner to Body of European Regulators in Electronic Communications (BEREC) (see section 3.7) in its Common Position on the approach to appropriate remedies in the Framework for electronic communications.[151] The application of the ladder of investment principle was perhaps most rigorous in France, where it was cited by the regulator ARCEP[152] as being a key factor in helping to boost broadband penetration in the French market and in supporting gradual investments by entrants to the fixed market such as Iliad[153] and Neuf Cegetel, later acquired by SFR.[154] Figure 10 shows the product 'rungs' originally introduced by ARCEP with the goal of encouraging gradual investment beginning with a resale model, continuing with bitstream (wholesale broadband access), and proceeding to local loop unbundling.

[150] See for instance Cave, M. (2006), *Encouraging infrastructure competition via the ladder of investment*, *Telecommunications Policy* 30, 223-237.
[151] European Regulators' Group (2006), Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework, ERG (06) 33.
[152] Authorite de regulation des communications electroniques et des postes (ARCEP) http://www.arcep.fr/
[153] Iliad is the owner of the French fixed broadband mobile operator Free. See http://www.iliad.fr/.
[154] See http://www.sfr.fr/.

Figure 10: The ladder of investment in practice - France[155]



Source: Presentation by Jerome Bezzina ARCEP 'Implementing the ladder of investment regulation: The case of broadband in France' June 2007 at the ITU Forum on Telecommunication Regulation in Africa

It is important to note that although **the original aim of the ladder of investment as conceived by Cave was to ultimately phase out regulation, regulators have not felt that a phasing out of regulation was feasible. This begs the question whether the ladder of investment theory (or its practical application) may be flawed.**

A 2010 paper by Bourreau, Dogan and Manant[156] notes the failure of regulators in countries such as Canada and the Netherlands to stand by commitments to phase out regulation and observes that **'implementation of the ladder of investement can be successful only if regulators stick with their ex-ante commitment to burn up the rungs ex post.'**

Another 2012 paper by Garrone and Zaccagnino based on empirical research of local loop unbundling in Europe from 2002-2009[157] **suggests that service-based entry does not lead entrants to subsequent facility-based entry, casting some doubts on the ladder of investment theory.** The study also finds however that an 'increasing price of local loop (one of the mechanisms intended to incentivise facilities-based competition) is not found to stimulate entrants' investment in alternative broadband networks'.

[155] In the diagram – OLO stands for 'other licensed operator' (i.e. non-incumbent operators). ISP means 'Internet Service Provider'. LLU stands for 'local loop unbundling'. Bitstream means 'wholesale broadband access'.
[156] Bourreau, Dogan and Manant (2010), *A critical review of the 'ladder of investment' approach*.
[157] Garrone and Zaccagnino (2012), *A too short ladder: broadband investments and local loop unbundling in EU countries.*

A related possibility could be that the economics in the local loop[158] may make it prohibitively difficult to achieve duplication beyond the one or two infrastructures that typically exist, i.e. the incumbent and in some areas cable. This would imply that, in the absence of access regulation enabling further entry such as local loop unbundling (LLU), local access in Europe would normally be expected to become a natural monopoly or duopoly. Some support for this interpretation can be found in a number of studies assessing the cost of local access (typically in an NGA context), which find that high costs may render extensive duplication of the local access unviable except in specific localised circumstances.[159] If this interpretation is correct, unless other infrastructures become substitutes for fixed local access (see section 6.3), it would tend to suggest that local fixed access is an enduring bottleneck, with little prospect for deregulation in the medium term.[160]

Notwithstanding the fact that fixed local access regulation has persisted in all Member States to date, application of the ladder of investment principle has enabled selective deregulation of downstream markets in some countries.

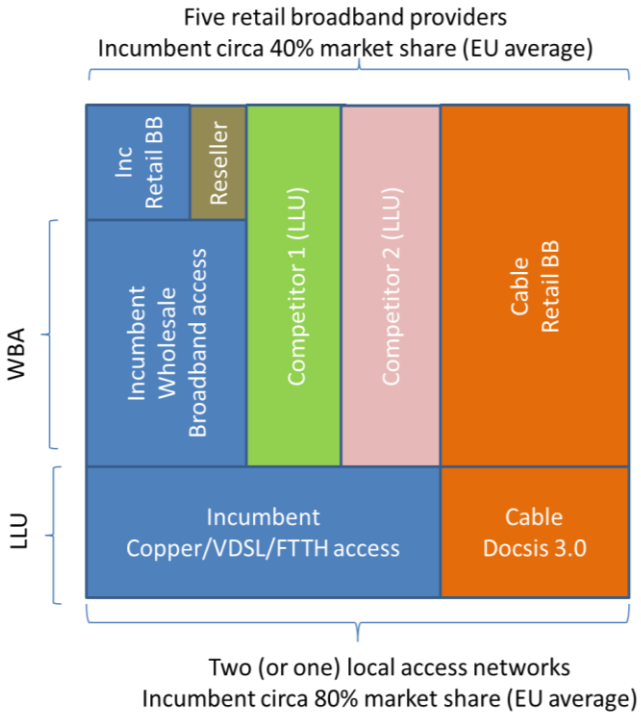
After competition from LLU is taken into account (which typically increases the number of major providers of broadband services to 3 or 4), some NRAs including those in the UK and Portugal have found that the downstream market (wholesale broadband access) is competitive in some areas and have consequently deregulated WBA (but not unbundling) in those areas. Austria and the Netherlands have also substantially deregulated consumer provision of wholesale broadband access, although a major factor in Austria is competition in this segment from wireless broadband. Figure 11 indicates how many parallel infrastructures are typically present in different parts of the value chain. The figure illustrates the difference between the access network (in which duplication is more limited) versus downstream networks (in which duplication has been more extensive).

[158] High sunk costs – economies of scale.

[159] See Analysys Mason (2008a), The business case for subloop unbundling in Belgium, report for BIPT; Analysys Mason (2007), The business case for sub-loop unbundling in Dublin, Final Report for Comreg, at http://www.comreg.ie/_fileupload/publications/ComReg0810a.pdf; and Elixmann, D., Ilic, D., Neumann, K.-H. and T. Plückebaum (2008), The Economics of Next Generation Access, study for ECTA, at http://www.ectaportal.com/en/upload/ECTA%20NGA_masterfile_2008_09_15_V1.zip.

[160] The view of fixed local access as an enduring bottleneck was one of the justifications for the application of functional separation in the UK by regulator Ofcom.

Figure 11: Indicative wholesale and retail market structures in the presence of cable and access-based competition



Source: WIK-Consult.

Notwithstanding theoretical models concerning the cost of the local access network, it is also important to note that end-to-end infrastructure competition of more than two parallel local access networks has occurred in a few specific cases in the context of Next Generation Access. Precise mapping of overlapping infrastructure is not widely available, but this may be the case in several countries in Eastern Europe, certain regions of Portugal and in the Paris area of France. These developments and the potential drivers behind them are described in our companion study *Entertainment x.0 to Boost Broadband Deployment*.[161]

Where market structures with substantial infrastructure competition have emerged, it is possible that some deregulation of the local access market could be possible; however, it is likely that this would only apply to a few locations where specific factors are at play.

Aside from these cases, current evidence would suggest that, unless Europe considers that 'two is enough', the total deregulation in local access markets for NGA is unlikely to be achievable.

The focus of policymakers has more recently turned in the context of the draft European Commission Recommendation on cost orientation and non-discrimination[162] to whether remedies on NGA such as charge controls should be varied in certain geographic areas to take account of greater competition from cable using EuroDOCSIS 3.0.[163]

[161] European Parliament (2013b), *Entertainment x.0 to Boost Broadband Deployment*.

[162] European Commission Recommendation on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment http://ec.europa.eu/governance/impact/ia_carried_out/docs/ia_2013/c_2013_5761_en.pdf.

[163] Pricing flexibility for NGA was permitted to a certain degree in the previous 2010 NGA Recommendation, but under more stringent conditions than in the 2013 Recommendation on cost methodologies and non-discrimination. The policy approach has also changed towards favoring flexibility, rather than merely permitting it in certain circumstances.

This would fall short of a complete deregulation of those regions, whilst aiming to provide greater flexibility in the regulatory regime. This is discussed further in section3.5.1.

Remedies to Address Significant Market Power

A market in which one or more players is found to have significant market power (SMP) is considered by implication to be one in which there is no effective competition. Under the EU Regulatory Framework, appropriate remedies must be introduced in these circumstances.[164]

NRAs are provided in the Access Directive with a 'toolbox' of remedies from which they can select appropriate measures to address the identified competition problem. The potential remedies include:

- Obligation to supply wholesale access of a nature and on terms specified by the NRA.
- Transparency obligations including a requirement to make available technical information and publish a reference offer.
- Obligations not to discriminate between operators. This has been interpreted as a requirement to supply wholesale products on the same terms and conditions to third parties as to the SMP operator's retail division.
- Accounting separation obligations, which require operators to make transparent the wholesale prices they offer externally, and to show which prices are imputed internally when the SMP operator's retail division 'purchases' a wholesale service.
- Price control obligations, whereby an NRA may apply price controls including cost-orientation of wholesale access in circumstances where otherwise a lack of effective competition might result in excessive charges or prices that squeeze out rivals (margin squeeze). Cost-oriented charges are also required to include a fair return on capital including an adjustment to reflect any investment risks borne by the SMP operator.

NRAs have strongly defended their right to freely select from these remedies those which they view as most appropriate to national circumstances; however, a tension exists between the NRA's desire for self-determination and European harmonisation goals. The European Commission has recently put forward, in the context of the Connected Continent proposals, that the characteristics of key wholesale products including virtual unbundled local access (VULA) (a form of local access used for next generation fibre access networks) and terminating segments of leased lines should be harmonised through EU legislation. This is further discussed in section 7.4.

Approaches to charge controls for next generation access networks

One of the main changes in the 2009 Review of the Regulatory Framework was to increase the relative importance of promoting efficient investment as an objective alongside competition and consumer welfare. In concrete terms, this was embedded in amendments to the provisions concerning wholesale charge controls on SMP operators[165] which stated that:

[164] Article 8(2) of the Access Directive.
[165] Article 13 of the Access Directive.

> 'To encourage investments by the operator, including in next generation networks, national regulatory authorities shall take into account the investment made by the operator, and allow him a reasonable return on adequate capital employed, taking into account any risks specific to a particular new investment network project.'

This was widely interpreted including by the Commission in the 2010 Recommendation on Next Generation Access networks as meaning that, when calculating cost-oriented charges for next generation access wholesale products, a risk premium should be added to the cost of capital used to calculate costs. This risk premium was considered sufficient to provide incentives to invest in NGA.

More recently, in the context of the Commission Recommendation on costing and non-discrimination and in the European Commission's Connected Continent proposals, it appears that the position of the European Commission has shifted away from a preference for cost-orientation[166] towards favouring a default position of flexible pricing for wholesale next generation access products, provided that certain conditions are met. These conditions include:

- Competitive constraints preventing excessive retail charging of superfast broadband. This condition is considered likely to be met if there is cable competition or competition from traditional broadband based on local loop unbundling; and
- Effective enforcement of non-discrimination; and
- The use of technical and economic replicability tests[167] to ensure that the wholesale product enables competition from third parties.

These measures are likely to change the default approach towards next generation access regulation, and may lead to different pricing approaches being taken towards next generation access in cable and non-cable areas. This new strategy has been widely praised by SMP operators[168] and financial analysts,[169] but is viewed by many alternative operators[170] as a preference for investment at the expense of competition. **Important questions remain over how this new strategy will impact investment, competition and consumer welfare; however, analysis in our companion study[171] suggests that in practice the pricing approach may be less influential on outcomes than might have been expected. This could either be due to ambiguous effects of pricing policy or due to other factors such as income, willingness to pay, population density, and infrastructure competition having a greater impact on commercial outcomes than regulation.**

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[166] Some exceptions were permitted, but were required to be explicitly justified.

[167] Technical replicability tests are aimed at ensuring that the same product specifications are made available to third parties as to the downstream retail arm of the regulated SMP operator. Economic replicability tests aim to ensure that the wholesale price offered by the SMP operator does not create a margin squeeze when relevant retail costs are considered.

[168] ETNO press release 11 September 2013; available at: http://www.etno.be/home/press-corner/etno-press-releases/2013/249.

[169] Stephen Howard of HSBC has publicly advocated an end to cost-based wholesale regulation of NGA – see presentation at ETNO/Total Telecom Regulatory Summit May 2012 http://www.totaltele.com/res/Presentations/Stephen%20Howard.pdf.

[170] ECTA press release 27 November 2012, available at: http://www.ectaportal.com/en/PRESS/ECTA-Press-Releases/2012/ECTA-CEOs-meet-Vice-President-Neelie-Kroes/.

[171] European Parliament (2013b), *Entertainment x.0 to Boost Broadband Deployment*.

Before the adoption of the September 2013 Commission Recommendation on cost methodologies, some countries had already adopted charging rules for NGA based on cost-orientation, including Belgium, the Netherlands, and Sweden based on the previous 2010 NGA Recommendation.[172] Questions therefore also arise as to whether the change in the rules will result in a changed approach in those countries.
The European Commission has clearly stated that stability is a key objective in their approach towards regulation so as to provide certainty for investors. This is indeed a valuable objective; **however, changes to the rules could in themselves undermine confidence that rules intended to remain in place for many years will in fact be maintained.**

Functional separation

In addition to the standard toolbox of remedies that were included in the original Framework, the 2009 revised Regulatory Framework introduced a further power for NRAs to mandate functional separation[173] as a last resort in cases where the NRA concludes that standard access obligations have failed to achieve effective competition and where access bottlenecks are considered to be enduring. Functional separation is mainly aimed at addressing discrimination by SMP operators in favour of their downstream retail operations. This measure was inspired by the introduction of functional separation in the UK, although the legal basis in the UK is different and stems from competition law.[174] In practice, despite discussions in a number of countries including Sweden and Poland concerning the potential for functional separation, no NRA has used this provision, with most choosing instead to accept alternative voluntary solutions put forward by the incumbent to alleviate concerns about discrimination.[175]

In Italy, the provisions in the Directive concerning functional separation may become relevant as the regulator AGCOM[176] has suggested that it considers that Telecom Italia's proposals to structurally separate the access division[177] (although retaining ownership) would meet the criteria for functional separation.[178]

It is important to note that various interpretations of 'separation' exist. The strongest form (referred to as structural separation) would be a clear ownership separation of a network company. A soft form of separation which has been present since the 2002 EU Regulatory Framework is the concept of accounting separation, whereby separated regulatory accounts (financial details) are made available to the NRA or to the public concerning regulated wholesale products.

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[172] For a discussion of approaches to NGA regulation see section 7 of European Parliament (2013b), *Entertainment x.0 to Boost Broadband Deployment*.
[173] See Article 13a of the Access Directive.
[174] Functional separation in the UK was introduced not as an obligation, but as a voluntary commitment by incumbent BT in lieu of a reference to the UK's Competition Authority which may have imposed more stringent measures including the potential for structural separation.
[175] One example of voluntary solutions was the agreement between Telecom Italia (TI) and Italian NRA AGCOM of January 2009 undertakings leading to what has been referred to by (TI) as an operational separation model (see http://www.totaltele.com/res/Presentations/Stephen%20Howard.pdf), although it is seen as falling short of the legal definition for 'functional separation' as defined in the EU Access Directive.
[176] AGCOM is the Italian *Autorita per le Garanzie nelle Communicazioni*. See http://www.agcom.it/.
[177] In May 2013, Telecom Italia announced that it had agreed to separate its fixed-line network into a new business as a step towards the sale of a minority stake to Cassa Depositi e Prestiti http://www.ft.com/intl/cms/s/0/64814068-c941-11e2-bb56-00144feab7de.html#axzz2j2ETkTDF. Further details have not however, been revealed. With changes to the management of the company following the resignation of Franco Bernabe, further information on the company's strategic direction is expected in November. See http://www.bloomberg.com/news/2013-10-03/telecom-italia-s-patuano-assumes-ceo-role-after-bernabe-resigns.html.
[178] http://www.agcom.it/default.aspx?DocID=11566.

A useful summary of the different forms of separation can be found in a 2006 paper by Martin Cave[179]. 'Functional separation' as envisaged in the EU Framework for electronic communications could be seen as a form of business separation falling short of legal or ownership separation.

Table 6: Degrees of separation

Ownership separation (in whole or part)
6-Legal separation (separates legal entities under the same ownership)
5-Business separation with separate governance arrangements
4-Business separation with localised incentives
3-Business separation (BS)
2-Virtual separation
1-Creation of a wholesale division
Accounting separation

Source: Martin Cave 2006 Six degrees of separation: operational separation as a remedy in European Telecommunications Regulation.

Phase-out of Asymmetric Economic Regulation

When the 2002 EU Regulatory Framework for Electronic Communications was adopted, it was envisaged that it would act as a temporary and transitional measure whereby regulation in markets initially dominated by former state-owned incumbents would be withdrawn once competition developed. Calls by some parties for a sunset clause in the revised 2009 Framework were rejected; however, the Regulatory Framework as revised in 2009 states that 'markets for electronic communications have shown strong competitive dynamics in recent years', and that when conducting reviews of the Framework 'the Commission should assess whether, in light of developments […] there is a continued need for the provisions on sector specific ex ante-regulation […]' to address significant market power.[180]

The expectation that ex ante regulation could be entirely withdrawn is however somewhat at odds with the inclusion of a power to impose functional separation in the 2009 revised Regulatory Framework, which suggests that policymakers believed that in some cases bottlenecks in telecommunications could be enduring. The results of market reviews shown in Table 5, which highlight on-going SMP in fixed local access (the market used to regulate local loop unbundling, and NGA equivalents) , and also (for different reasons)[181] in call termination, tend to lend weight to conclusion that **it is probably not be realistic to withdraw ex ante regulation altogether in the medium term.**

[179] Martin Cave 2006 Six degrees of separation: operational separation as a remedy in European Telecommunications Regulation.
[180] Recital 5 amending Directive.
[181] Call termination is a market in which all operators have been found to have SMP on their individual networks. This is due to the fact that only one network operator is able to complete a call to a given telephone number.

Symmetric Regulation – an Alternative to SMP Measures

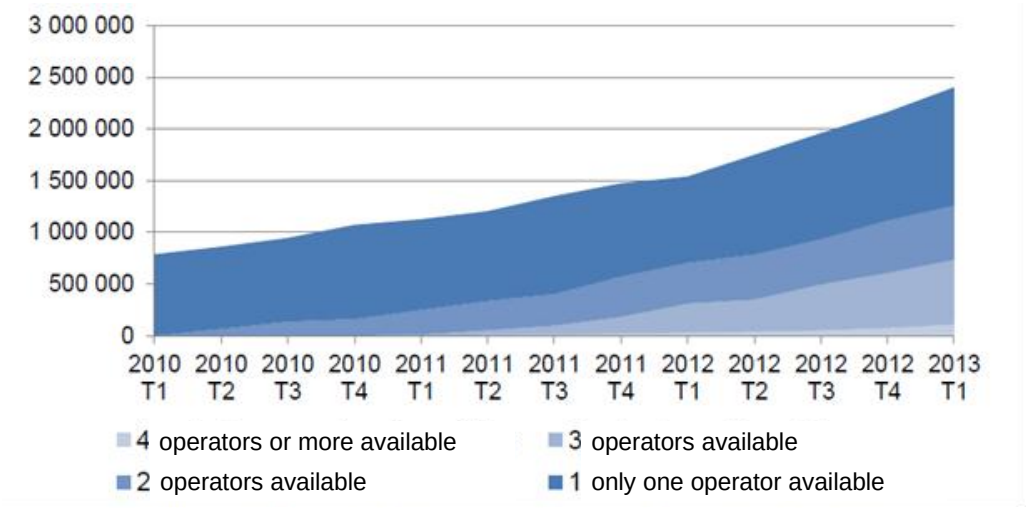
A further confounding measure which seems to go against the expectation of the eventual withdrawal of sector-specific regulation was the introduction in the 2009 revisions to the Regulatory Framework of measures which would allow the symmetric regulation of certain infrastructure, where duplication is considered economically inefficient, thereby enabling access or sharing obligations to be applied on all parties without the need for a full market analysis.[182] This would imply that certain network elements are considered inherently to be enduring bottlenecks regardless of whether the assets were owned or built by a former monopoly provider.

These measures were used to the most significant extent in France, where they supported the introduction of legislation[183] requiring the sharing by all operators of fibre lines at a concentration point[184] identified by the NRA. To a certain extent, this provision replaced SMP fibre access obligations that may otherwise have been imposed on Orange (France Telecom)[185] in the context of the local access market.

In the case of France, the symmetric obligations were intended to address some of the competitive issues arising in the fixed local access network effectively replacing certain obligations that could have been applied under the asymmetric SMP rules (such as an obligation on Orange/France Telecom to provide access to its FTTP network to rivals on regulated conditions). **The outcomes of this approach in France have been interesting. The treatment of the last segment of the FTTP network as an economic bottleneck and effective prohibition on duplicating this segment could have supported a race to invest in which competitors were encouraged to invest first in certain areas in which they had relative strength, knowing that the incumbent would be obliged to share their network rather than to compete with it.** It is certainly the case that there are some areas in France where consumers have a choice of more than one FTTP offer (based on the sharing of the final segment), although this may be focused around the densely populated Paris region. This approach, combined with other factors,[186] may also have encouraged a move towards FTTH in France in contrast with the EuroDOCSIS 3.0 cable and incumbent-led FTTC/VDSL deployments experienced in some other countries such as Belgium and Germany. Further detail on the French model is included in our companion report.[187]

[182] Article 12 of the Framework Directive.
[183] Law no 2008-776 of 4 August 2008 on the modernisation of the economy [*Loi n° 2008-776 du 4 août 2008 de modernisation de l'économie*], LME.
[184] The concentration point in the context of mutualisation of FTTP in France is an aggregation point at which multiple fibre lines can be accessed. French NRA ARCEP has decreed that this point is to be located in the basement of the building in very dense areas such as Paris, and at locations aggregating 1,000 connections in less dense areas.
[185] Orange (France Telecom) http://www.orange.fr/.
[186] The cable operator Numericable played a significant role in the deployment of FTTP in France, starting from a low base in terms of subscribers . The length of the subloop (last portion of the copper access network) in France may also render FTTC/VDSL less effective than in other jurisdictions.
[187] European Parliament (2013b), *Entertainment x.0 to Boost Broadband Deployment*.

Figure 12: Premises served by FTTH: number of operators present via mutualisation

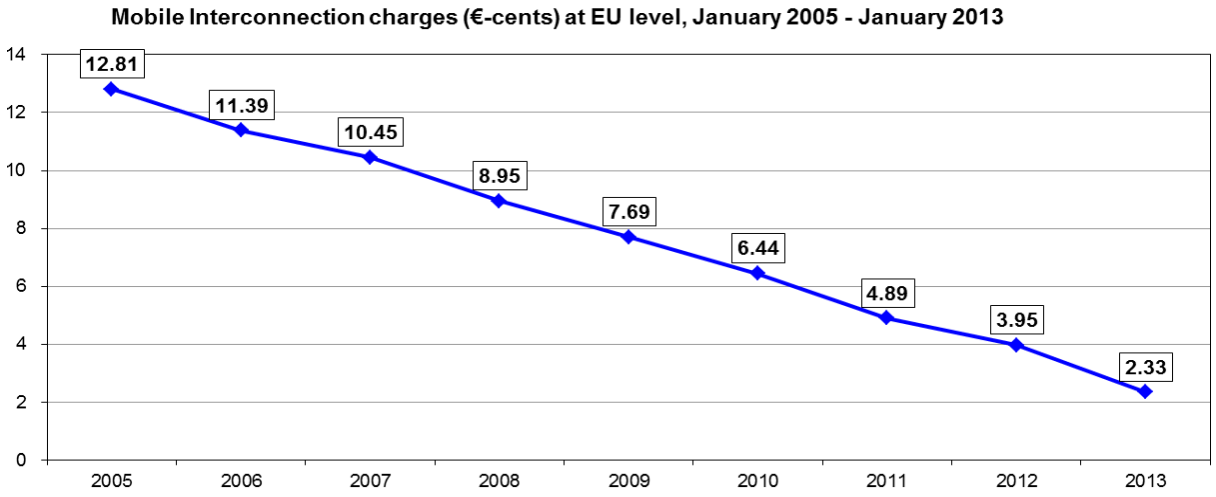


Source: ARCEP Observatoire des marchés des communications électroniques, May 2013. [188]

Another enduring bottleneck that could lend itself to symmetric treatment is termination rates. Even though regulation of fixed and mobile call termination is imposed through 'asymmetric' SMP remedies, all operators have been found to have SMP. Rates charged have declined at a rate that accelerated after the European Commission's Recommendation on termination rates of 2009. The weighted average charge dropped from more than 12 eurocents per minute in 2005 to around 2 euro cents in January 2013 (see Figure 13). Given the precedent of roaming, in which charges have been set symmetrically rather than on the basis of specific national costs, and the fact that termination costs are likely to be similar across countries (if the same modelling approach is used to calculate them) and are an input for cross-border calls, there may be a case for similar treatment of termination.

[188] ARCEP (2013): *Observatoire des marchés des communications électroniques, Services fixes haut et très haut débit (Marché de gros)* (Wholesale market report for broadband and high-speed broadband), May 30 2013.

Figure 13: Interconnection charges for terminating mobile calls EU average (2005-2013)



Source: European Commission DAE Scoreboard. [189]

3.5.2. Objectives

General Objectives

In its Impact assessment published alongside the proposals for the revision of the EU Regulatory Framework in 2007,[190] the European Commission noted, in relation to measures concerning significant market power that 'The overall objective is to ensure that the EU's regulatory environment promotes competition, investment and innovation in electronic communications, so that user needs are met and consumer interests are protected.'

Specific Objectives

In its Impact Assessment the European Commission further identified the specific objectives as follows:

- Ensure effective competition which brings tangible benefits to consumers in particular through greater choice of services and lower prices; and
- Promote investment and innovation in high-speed communications infrastructures and new services.

Options to address

The European Commission considered three options to achieve its goal of ensuring effective competition alongside investment and innovation in high-speed infrastructures and services. These included:

[189] Data from the European Commission DAE Scoreboard spreadsheet on 'financial indicators, telephony, broadcasting and bundled services' downloaded August 2013; available at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=2374.

[190] European Commission (2007a), Impact Assessment for the Review of the EU Framework, available at: http://ec.europa.eu/governance/impact/ia_carried_out/docs/ia_2007/sec_2007_1472_en.pdf.

- Option 1: An 'Open access model' based on structural separation between the network and services. Less stringent solutions such as functional separation were also considered.
- Option 2: A 'regulatory holiday' whereby ex ante regulation would be limited.
- Option 3: No change to the original 2002 EU Regulatory Framework in which the market analysis process and SMP regulation would be tailored to the specific circumstances of each market.

The Commission ultimately rejected regulatory holidays[191] on the basis that they would be likely to undermine competition and investment by alternative operators, and it also rejected structural separation on the basis that it could limit incentives for infrastructure competition and deter investment by the structurally separated operator. Instead, the Commission favoured a modified version of the existing system of SMP regulation whereby the option of introducing functional separation was added to the NRA's toolbox.[192]

Assessment of the Objectives

In its 2007 impact assessment, the European Commission upheld the principle that competition is the most appropriate means to achieve consumer benefits such as greater choice and lower prices. **Evidence shown in a companion study to this one[193] suggests that the EU approach towards broadband regulation has indeed resulted in competitive prices per megabit per second compared with the US and some global rivals.**

The impact assessment is, however, interesting in that (for the first time in a European context) the Commission presents investment and innovation as equal and separate objectives alongside the objective of promoting competition. In contrast, in the 2002 EU Regulatory Framework, efficient investment was considered as a corollary and outcome of effectively competitive markets, rather than as an objective for regulators in its own right.

In presenting innovation and investment in this way,[194] the European Commission paved the way towards changes to the Article 8 objectives in the Framework Directive which could be said to introduce philosophical tensions in those objectives that had not been present before. Previously, most NRAs assumed that providing they applied appropriate SMP regulation to tackle market failure, efficient levels of investment would follow automatically. Much of the 2009 Review of the Regulatory Framework concerned the addition of specific text to foster investment.

[191] The question of 'regulatory holidays' for next generation access was originally raised in the context of the German Government's amendment of its national telecoms legislation to allow differentiated treatment for the regulation of Deutsche Telekom's upgraded 'next generation' network. The European Commission successfully launched infringement proceedings on the basis that such special treatment was against the provisions of the EU telecommunications framework. http://www.euractiv.com/infosociety/eu-court-sets-precedent-germany-news-223175.

[192] European Commission (2007a), *Impact Assessment for the Review of the EU Framework*, page 46, available at: http://ec.europa.eu/governance/impact/ia_carried_out/docs/ia_2007/sec_2007_1472_en.pdf.

[193] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

[194] Interestingly, this was not reflected in the context of the policy option they pursued.

3.5.3. Evaluation

In this section, we assess the extent to which the SMP provisions in the 2002 Framework as amended in 2009 (and recent proposals to further revise it in the context of the Connected Continent proposals) have successfully promoted (or would promote) competition and investment in fixed next generation access networks, and the extent to which the approach taken is efficient and coherent.

Effectiveness

The European Commission noted in its 2007 impact assessment[195] that existing measures to address SMP (especially access regulation) had been effective in promoting competition, choice and value for consumers, particularly in broadband services. They noted significant progress made in broadband adoption, particularly in countries which had strictly enforced competition rules. However, they also noted that going forward, SMP regulation might need to be calibrated explicitly to ensure sufficient investment incentives in next generation access infrastructure in which the EU seemed at that stage to be falling behind other regions.

Impact of the EU regulatory framework on NGA investment

In recent years, networks capable of offering 30 Mbps or more have been rolled out to more than 50% of EU Households.[196] This happened within the context of the revised EU Framework and associated Recommendation[197] which made clear that there should be no regulatory holidays on NGA and advocated that investment could be promoted by ensuring that risks were properly reflected through the cost of capital in cost-based regulated wholesale charges.

However, NGA investment did not occur precisely as anticipated, and in particular was not primarily incumbent-led. The majority of NGA lines today are supplied by means of EuroDOCSIS 3.0 cable networks, which covered 74% of the 54% households which were NGA-enabled in 2012.[198] FTTC/VDSL coverage from incumbent operators is growing rapidly and reached around 25% of households in 2012.[199] In some countries such as the UK and Belgium, **there is relatively clear evidence that this roll-out was stimulated by a cable roll-out which preceded it, suggesting that infrastructure competition was the primary factor driving deployment.** Similar patterns can be observed in the deployment of FTTH, whereby most deployments appear to have been initiated by third parties including alternative operators and municipalities.[200]

Meanwhile, despite the adoption of Commission's 2010 Recommendation on Next Generation Access, regulation of access to SMP operator's NGA networks was applied in many different ways across Europe, **with the effect that de facto regulatory holidays or regulatory flexibility beyond that foreseen by the Commission persisted for some time in many countries.[201]**

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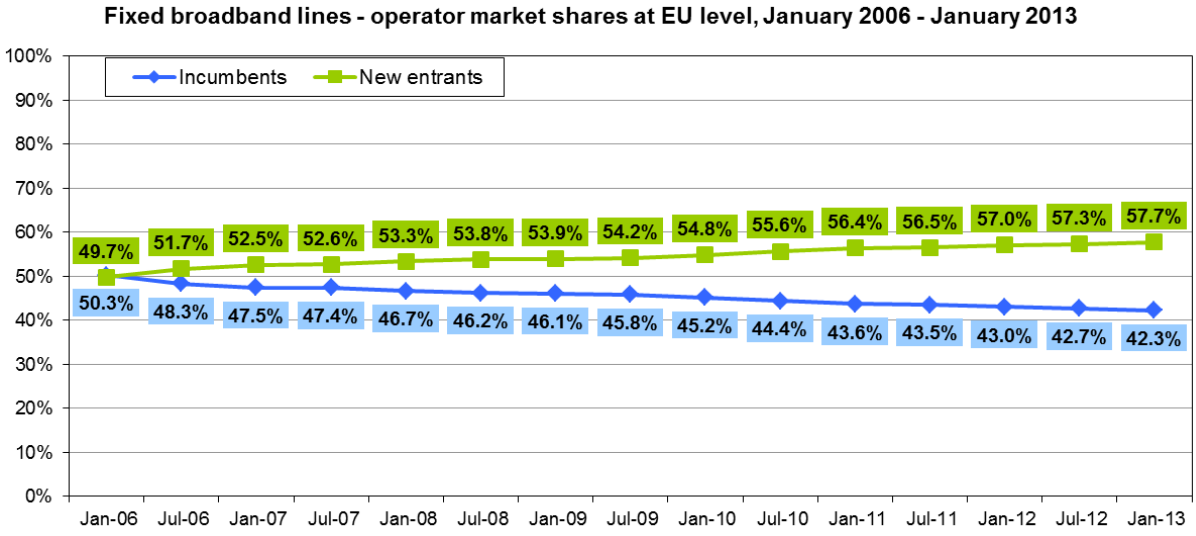
[195] European Commission (2007a), *Impact Assessment for the Review of the EU Framework*.
[196] See companion study, European Parliament (2013b): *Entertainment x.0 to Boost Broadband Deployment*.
[197] European Commission (2010a), Recommendation on Next Generation Access.
[198] European Commission (2013i), Digital Agenda Scoreboard, Broadband chapter, available at: https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DAE%20SCOREBOARD%202013%20-%202-BROADBAND%20MARKETS%20.pdf.
[199] Ibid.
[200] See our companion study European Parliament (2013b): *Entertainment x.0 to Boost Broadband Deployment*.
[201] For selected countries, see table 21 European Parliament (2013): *Entertainment x.0 to Boost Broadband Deployment*. Also Kiesewetter, W., Lucidi, S., Neumann, K.-H. and U. Stumpf (2012), *NGA Progress Report*, WIK-Consult study for ECTA; available at:

In the context of lack of strict implementation of SMP regulation as regards NGA, it is difficult to gauge what effect, if any, the intended SMP measures in the EU Regulatory Framework had on investment in NGA by cable operators, incumbents or alternative investors. **It is conceivable that regulation did not ultimately play the pivotal role that was expected, and that instead market forces and competitive pressure provided the stimulus, where alternative players were in a position to exert this influence.** Indeed on reviewing developments in selected countries, a key conclusion from our companion study on broadband[202] is that competitive dynamics rather than differences in SMP regulation (including charge levels for copper LLU and NGA-based access), seem to have played the greatest role in driving NGA deployment.

Impact on competition

Changes to the 2002 Regulatory Framework, and in particular the introduction of the potential (albeit in exceptional circumstances) for functional separation, were introduced partly on the basis that they would further strengthen competition to the advantage of consumers; however, **data suggests that there was no step change in the levels of competition following the adoption of the 2009 package.** Entrants' share of the broadband market increased by three percentage points to 57% between 2009-2012 in line with longer-term trends in which entrants gained 11 percentage points market share since the transposition of the EU Regulatory Framework in July 2003. While it could perhaps call into question the efficacy of (or indeed justification for) the functional separation provision, this 'business as usual' outcome for competition in broadband overall is not however necessarily cause for concern.

Figure 14: Fixed broadband EU average market shares 2006-2013



Source: DAE Scoreboard, broadband indicators downloaded August 2013, http://ec.europa.eu/digital-agenda/en/download-data.

http://www.wik.org/index.php?id=studiedetails&L=1&tx_ttnews%5Bpointer%5D=2&tx_ttnews%5Btt_news%5D=1411&tx_ttnews%5BbackPid%5D=85&cHash=faa66cf28a16361c5df48e2e56ba3a8f.

[202] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

Of potentially greater concern, our companion study[203] found that access-based competition in next generation networks is significantly less developed than for basic broadband. This could potentially result from a lack of access obligations in some countries or could indicate challenges with implementation of existing obligations.

One conclusion that could be drawn is that access-based competition in standard broadband networks continued (and would have continued) irrespective of the revisions to the EU Framework for electronic communication, because its foundations lay in a harmonising Regulation which mandated access to the Unbundled Local Loop as a standardised remedy under standard terms and conditions.[204] When presented with the comparatively new challenge however of achieving a harmonised approach towards access on NGA networks, the EU Regulatory Framework combined with EU Recommendations which supported the concept of regulated access to NGA networks[205] did not by themselves result in a high degree of uniform implementation. This observation does not imply that harmonisation of access conditions was absolutely required in this case, only that it did not result from the legislative system despite the apparent intentions of legislators.

Procedural effectiveness

A further concern with the effectiveness of the existing SMP regime, which is relevant in the context of possible emergent duopolies in NGA, is that it does not clearly address the issue of how to deal with duopolies.

Existing mechanisms for SMP regulation also do not seem to be adequate to address bottlenecks at national level which are hampering the development of transnational markets.

Efficiency

The detailed requirements involved in analysing markets and applying remedies on the basis of SMP are comparatively complex and time-consuming for NRAs compared with more mechanistic approaches such as the approach in the previous ONP directives to mandate access on operators with market shares above 25%, or indeed more binary approaches such as a presumption towards regulatory holidays or towards symmetric access regulation imposed on all operators.

The complexity of SMP measures would normally be justified on the basis that it allows approaches which are tailored to specific national (or sub-national) markets; however, it is unclear whether this tailoring has delivered more effectively against objectives for competition, investment and consumer welfare than less refined, more mechanistic approaches. As discussed in section 3.7, **it is worth considering in this context whether there is a trade-off between the complexity of the SMP regime in the EU Regulatory Framework and the potential to achieve effective implementation.**

[203] Ibid.
[204] EU Regulation December 2000 on unbundled access to the local loop; available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:336:0004:0004:EN:PDF.
[205] EC 2007 Recommendation on Relevant Markets and EC 2010 Recommendation on NGA both imply a preference for regulated access to NGA where SMP is found.

As discussed in section 3.7, alternative approaches which would reduce the analytical burden on NRAs include greater reliance on specifications in EU Directives and Regulations which define common market definitions and remedies, such as the EU Local Loop unbundling Regulation of 2000; or planned harmonised virtual access products; and/or a change towards a more systematic use of symmetric remedies; or indeed regulatory holidays, if regulation is not warranted in a given situation.

Coherence

The introduction of nuances and additional options within the revised 2009 Framework has created internal tensions in a number of respects.

- The overall aim of removing sector-specific ex ante regulation and moving to competition law[206] could be seen as contradictory to the presumptions of persisting bottlenecks which underlie the introduction of symmetric access regulation[207] and functional separation[208] in the revised Regulatory Framework. These **opposing signals may send confusing messages to investors** (see section3.5.1).
- The perceived lack of clarity around the joint dominance[209] concept leaves an open question as to how duopolies should be handled within the EU Regulatory Framework (see section 3.5.1). This is not a new issue, but is further clouded by the introduction of symmetric regulation within the Regulatory Framework, and by Regulations which apply obligations on all operators independent of an assessment of dominance.
- **The introduction of 'investment and innovation' as a parallel objective separate from competition[210] could suggest that these are in some ways competing rather than complementary objectives, creating tension with the focus on SMP regulation as a central tenet of the Framework.**

The introduction of text in the 2009 revision of the Directives that comprise the Regulatory Framework highlighting the benefits of segmenting market definitions and regulation along regional lines could be seen as providing some tension with the goal of achieving transnational markets.[211] Further clarity on the circumstances in which local versus transnational analyses are relevant would be helpful.

- **Recent legislative measures and proposals including the various Roaming Regulations[212] and draft Regulation on measures to reduce the cost of deploying high-speed electronic communications networks[213] (both of which concern access to telecommunications or related infrastructure) also provide some tensions with the SMP provisions in the EU Regulatory Framework**, in that they seem to imply that the Framework for asymmetric regulation applied by NRAs at national level is not adequate in dealing with certain core bottlenecks to competition.

[206] Recital 5 of Directive 2009/140/EC amending the *EU Framework for Electronic Communications*.
[207] Article 12 of the *Framework Directive*.
[208] Article 13a of the *Access Directive.*
[209] Article 14 of the *Framework Directive.*
[210] Article 8 of the *Framework Directive.*
[211] Article 8 of the *Framework Directive.*
[212] See for example Regulation No 531/2012 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:172:0010:0035:EN:PDF on Roaming on public mobile communication networks within the European Union.
[213] See draft Regulation to reduce the cost of rolling out high-speed electronic communications networks http://ec.europa.eu/digital-agenda/en/news/proposal-regulation-european-parliament-and-council-measures-reduce-cost-deploying-high-speed.

The introduction of harmonised virtual access products put forward in the European Commission's Connected Continent proposals also creates similar tensions. In an environment in which there is an increasing overlay of symmetric and/or directly applicable EU measures on top of the asymmetric SMP provisions of the EU Regulatory Framework for Electronic Communications, there is a need to re-evaluate and refine the role of SMP regulation and also to provide a more realistic perspective on the (relatively low) prospects of entirely removing ex ante regulation in the medium term.

Table 7: SMP regulation – areas of tension within EU legislation

	Supporting measures	Contrary indications
Phase-out of ex-ante regulation and reliance on infrastructure competition…	Recital 5 2009/140/EC: aim is to progressively reduce ex-ante sector specific rules	Article 13a Access Directive: permits functional separation where there are 'important and persisting competition problems'
… or enduring bottlenecks?	Article 16 Framework Directive: prohibition on applying SMP remedies where markets found effectively competitive	Article 12 Framework Directive: NRAs to have power to impose obligations on sharing of wiring up to first distribution point… where duplication would be economically inefficient
Achieving transnational markets…	Article 8 Framework Directive: NRAs should encourage establishment of trans-European networks	Article 7 Framework Directive: NRAs must take account of the variety of conditions… that exist in the various geographic areas within a Member State
… or favouring geographic segmentation?	Article 15 Framework Directive: Commission may adopt a decision identifying transnational markets	
Asymmetric (SMP) regulation on case by case basis…	Article 15 and 16 Framework Directive: require NRAs to conduct case by case assessments of the market and apply appropriate remedies if SMP found from a toolbox	Article 12 Framework Directive: allows symmetric regulation of certain assets (sharing of wiring)
… or obligations on all?		Draft Regulation 'reducing the cost' envisages wider duct access obligations
Addressing oligopolistic markets through SMP mechanism?	Article 14 and Annex II Framework Directive: 'joint dominance' preferred test to assess concentrated markets	'Joint dominance' rarely put to the test
		Are 'symmetric' obligations intended as an alternative?
Promoting competition…	Article 8(2) and 14-16 Framework Directive require NRAs to impose obligations whenever SMP is found	Article 8(5) Framework Directive requires NRAs to take into consideration issues beyond 'competition'
… or promoting efficient investment and innovation?		

Source: WIK-Consult.

3.6. Mechanisms to Promote Affordable International Mobile Roaming (Roaming, or IMR)

In this section, we explain the main features of the regulation of international mobile roaming in Europe, provide comparisons to the United States, and provide an overall assessment.

3.6.1. Main Features

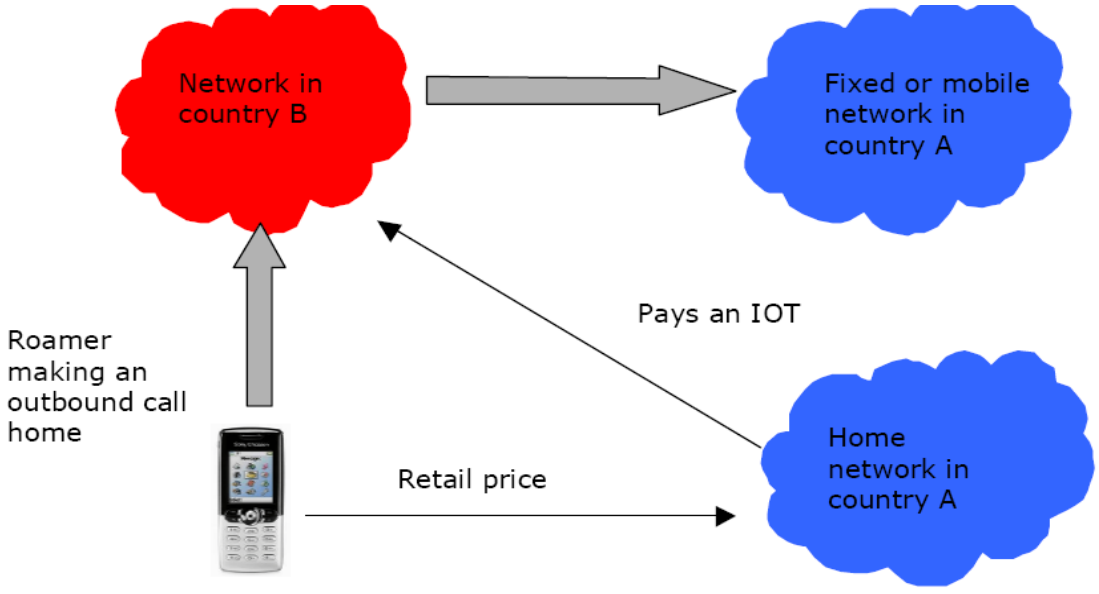
There is a long history in Europe of concern with high retail prices and wholesale charges for International Mobile Roaming (IMR).

It may be helpful at the outset to understand the flow of traffic and of payments for IMR under a few of the most common scenarios. These traffic and payment flows are quite different for calls placed, calls received, SMS, and data.[214]

Figure 15 graphically depicts the flow of payments for voice calls placed when a user with mobile service from country A is roaming in country B. The roamer's Home Network (HN) in country A makes a wholesale payment (sometimes referred to as an Inter-Operator Tariff (IOT)) to the Visited Network in country B. To the Home Network, this payment is a real cost.[215] The Visited Network in country B is responsible for providing the call, and typically pays a termination fee to the fixed or mobile terminating network (whether it is in country A, B, or some third country C) if the call is not on-net.

The roaming individual makes a retail payment to his or her home network in country A. This payment typically reflects a mark-up on the wholesale payment that the Home Network operator makes to the operator of the Visited Network (VN).

Figure 15: Typical flow of payments for voice calls originated while roaming



Source: ARCEP, The Market for International Roaming, February 2006.

[214] The description of payment flows is based on Marcus, J.S., and Philbeck, I. (2010), *Study on the Options for addressing Competition Problems in the EU Roaming Market, a study for the European Commission*.

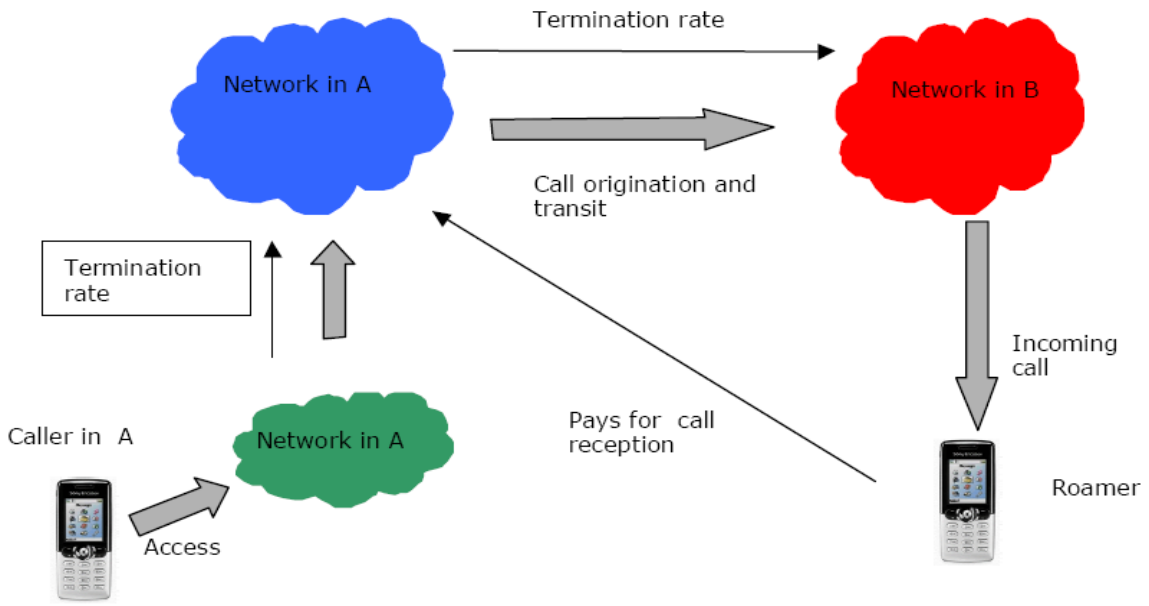
[215] If the Home Network and the Visited Network are part of the same corporate group, however, they might view payments within the group differently.

Figure 16 graphically depicts the flow of payments for voice calls received when a user from country A is roaming in country B. A caller in country A typically pays the normal domestic price to his or her fixed or mobile network operator, which is appropriate since the caller does not necessarily know that the called party is outside of country A. A caller in some other country would generally pay the price for an international call to country A.

The roaming individual makes a retail payment to his or her Home Network in country A. This is unusual inasmuch as it is one of the few instances where the recipient of a normal voice call is obliged to pay to receive it.

No wholesale roaming payment is applicable to calls received while roaming; however, the Home Network generally pays a mobile termination fee to the Visited Network (and receives a mobile termination fee from the caller's network if the call is not on-net). The relative level of these two payments is key to the profitability of the Home Network.

Figure 16: Typical flow of payments for voice calls received while roaming



Source: ARCEP, The Market for International Roaming, February 2006.

Mobile Network Operators (MNOs) typically conclude international roaming agreements with one or more MNOs in each country that the MNO's customers are likely to visit. The **MNO typically seeks to steer as much as possible of its voice, SMS and data traffic to one or two preferred network partners in each country based on a general agreement for voice, SMS and data.**

The Roaming Regulations of 2007[216] and 2009[217] consisted solely of wholesale and retail price controls. The Roaming Regulation of 2012[218] consists of two primary mechanisms:

- Continued and expanded controls to wholesale and retail roaming prices; and
- Structural Solutions, as explained later in the section.

The prices mandated in successive Roaming Regulations are as shown in Table 8.

Table 8: Overview of retail and wholesale roaming price caps 2012-2022

	RR 2012 1 July 2012	RR 2012 1 July 2013	RR 2012 1 July 2014
Data (per MB)	70 cents	45 cents	20 cents
Voice-calls made (per minute)	29 cents	24 cents	19 cents
Voice-calls received (per minute)	8 cents	7 cents	5 cents
SMS (per SMS)	9 cents	8 cents	6 cents
Data (per MB)	25 cents	15 cents	5 cents
Voice (per minute)	14 cents	10 cents	5 cents
SMS (per SMS)	3 cents	2 cents	2 cents

Source: WIK

The price controls have generally been effective; however, **there are no indications that overall prices for voice calls and SMS have become competitive in such a way as to spontaneously lead to prices significantly below the mandated caps.** This is visible in statistics maintained by BEREC.[219] Figure 17 shows average wholesale price for voice calls made both before and after the Roaming Regulation took effect within the EEA (the Roaming Regulation is relevant to the EEA, including not only all EU Member States but also Norway, Iceland, and Liechtenstein). Figure 18 shows the equivalent retail price evolution for voice calls made.

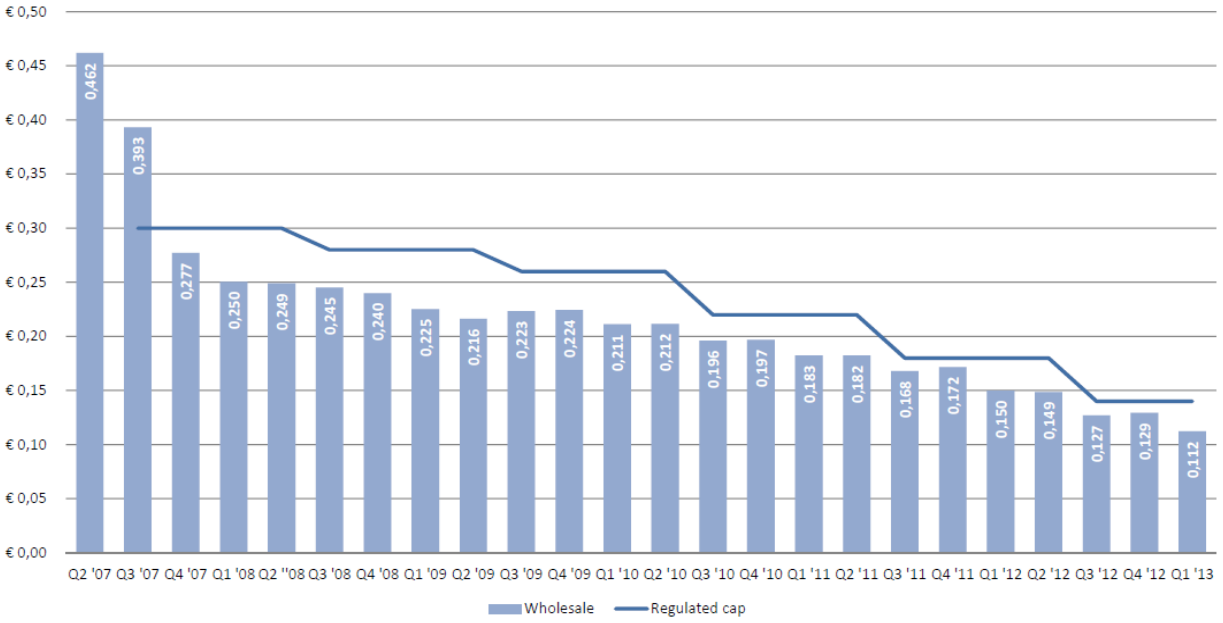
[216] European Union (2007*), Regulation (EU) No 717/2007 of the European Parliament and of the Council of of 27 June 2007 on roaming on public mobile telephone networks within the Community and amending Directive 2002/21/EC.*

[217] European Union (2009b), *Regulation (EU) No 544/2009 of the European Parliament and of the Council of 18 June 2009 amending Regulation (EC) No 717/2007 on roaming on public mobile telephone networks within the Community and Directive 2002/21/EC on a common regulatory framework for electronic communications networks and services.*

[218] European Union (2012b), *Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union.*

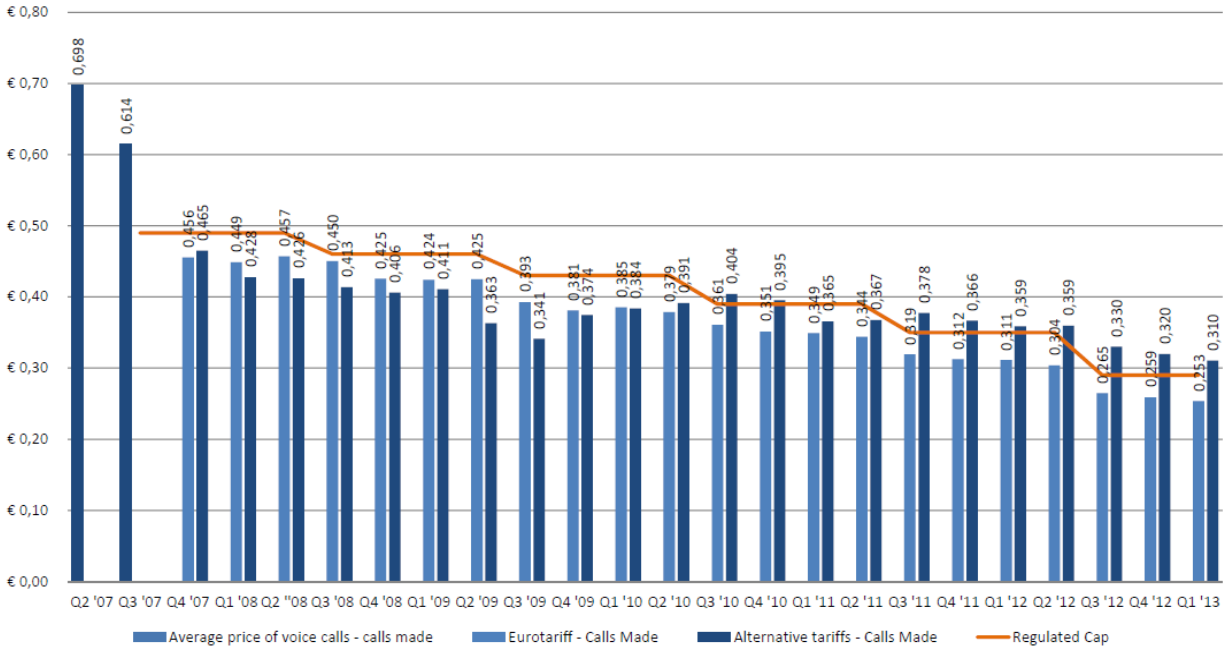
[219] BEREC (2013a), *International Roaming: BEREC Benchmark Data Report, July 2012 – March 2013*, BoR (13) 102, September 2013.

Figure 17: EEA average wholesale non-group price per minute for intra-EEA roaming voice calls made



Source: BEREC (2013), Benchmark Data Report, July 2012 – March 2013.

Figure 18: EEA average retail price per minute for intra-EEA roaming voice calls made



Source: BEREC (2013), Benchmark Data Report, July 2012 – March 2013.

Wholesale prices are simply capped. Retail prices are managed through a default EuroTariff; however, the user can opt out of the plan if desired in order to choose an alternative plan. It is clear from Figure 17 and Figure 18 that wholesale and retail prices are well below that levels that prevailed before regulation was introduced in 2007, but only marginally below the capped rates.

Interestingly, it is also clear that the alternative roaming retail price plans do not necessarily represent a great bargain. Since 2010, users typically pay somewhat more for these plans on average than they would under the default EuroTariff; however, the plans may offer price protection or convenience that also has value to the consumer.

The 2012 Roaming Regulation went beyond the price control enacted in 2007 and 2009. It sought to remedy the high cost of roaming at its source by opening up the networks to virtual operators and resellers. Key provisions of the Roaming Regulation of 2012[220] were:

- From 1 July 2014, customers have the option to sign up with an Alternative Roaming Provider (ARP), which may be different from their domestic mobile provider, for a separate mobile contract for roaming whilst keeping the same phone number.
- Mobile Virtual Network Operators (MVNOs)[221] and resellers have the right to access other EU/EEA mobile network operators' networks at regulated wholesale prices in order to provide roaming services (together with national services) to their customers.
- Neither domestic nor roaming providers are permitted to prevent customers from accessing regulated data roaming services provided directly on a visited network by an alternative roaming provider. In other words, providers in a visited Member State cannot be prevented from offering data roaming services to consumers with a subscription in a different Member State.

BEREC was tasked with establishing guidelines as to how all of this should work. In documents BoR (12) 67 and BoR (12) 68, they described two basic mechanisms:

- A Single IMSI solution in which the subscriber has a single network identity.[222] The Home Network (HN) resells its roaming capabilities, including its roaming arrangements, to resellers or MVNOs. The consumer uses his or her normal phone number with the normal SIM card.
- A Local Break-out (LBO) solution with local provision of data services (but not voice or SMS) directly by a visited network operator. This solution almost completely bypasses the home network operator.

In a 2010 study for the European Commission,[223] we expressed grave doubts as to the advisability of structural solutions in general. The costs would be substantial,[224] while the take-up by consumers was unlikely to be sufficient to justify the costs. Roaming alternatives have always existed, including 'plastic roaming' where the consumer buys a pre-paid SIM for the visited country; however, take-up has been low for a variety of reasons, including the need for the consumer to identify a preferred provider in each country to which he or she travels. Most of those arguments continue to apply to the Single IMSI solution.

[220] See particularly Articles 3, 4, and 5.
[221] A mobile virtual network operator (MVNO) is a provider of mobile services that does not own the wireless network infrastructure over which it provides services to customers. The extent to which an MVNO may tailor its services so as to distinguish them from its host operator is dependent on the nature of the contract it has with the owner of the underlying network – the mobile network operator (MNO).
[222] The International mobile subscriber identity (IMSI) is a unique identifier associated with a subscriber to a mobile network, which is normally present in the SIM card.
[223] Marcus, J. S. and I. Philbeck (2010), *Study on the Options for addressing Competition Problems in the EU Roaming Market*, available at: http://ec.europa.eu/information_society/activities/roaming/regulation/consult2011/index_en.htm.
[224] Market players are telling us that they are incurring costs that run to double digit millions of euros.

In a 2012 study for the Internal Market Committee (IMCO) of the European Parliament,[225] we noted the LBO – which was not an option that we considered in 2010 – might conceivably be a game changer; however, it would achieve its potential only if a number of prerequisite conditions were fulfilled, one of which was the formation of alliances of LBO providers that would enable packaging of multi-country LBO offers to most of the frequently visited Member States.

The effectiveness of these Structural Solutions is not yet known. Their success depends crucially both on the willingness of disruptive entrants to offer the services, and the willingness and ability of consumers to utilise them.

The European Commission appears to have lowered its expectations in regard to the Structural Solutions. In Connected Continent, they note: 'While the Roaming III Regulation with its structural measures will inject greater competition into the market it is not expected of its own to create a situation where customers can confidently replicate their consumption behaviour in their home Member State when travelling abroad and thereby to end roaming surcharges overall in Europe.'[226]

The Commission's Connected Continent proposals have likely reduced the probability of success quite substantially. **The roaming elements of Connected Continent might conceivably exempt some network operators from the obligation to enable the Structural Solutions, and also signals the Commission's intent to quickly lower the price of Roaming in such a way that alternative providers would have no prospect of making a return on their investments. This likely undermines the business plans of prospective alternative providers of both Structural Solutions whether Connected Continent is adopted or not.**

3.6.2. Comparison to the United States

In the course of our interviews, a number of respondents suggested that the United States had eliminated roaming. This is generally true for domestic roaming within the United States, but not at all true for international roaming.

Domestic roaming within the United States largely disappeared after 1996, not as a direct result of regulation, but rather as a result of the initiative of a single market player within a different regulatory system that was more amenable to the resulting transformation (notably due to the widespread use of bill and keep wholesale call termination).

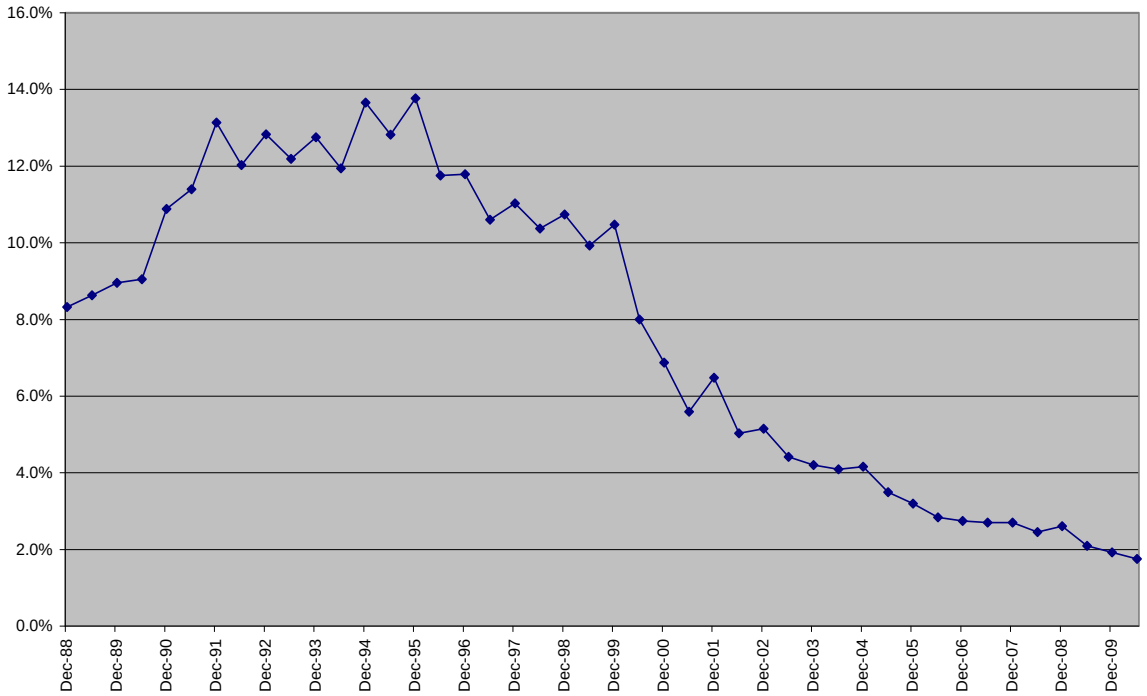
[225] European Parliament (2012a), State-of-the-Art Mobile Internet Connectivity and its Impact on e-Commerce, study by WIK for the European Parliament's Committee on Internal Market and Consumer Protection (IMCO), July 2012; available at: http://www.europarl.europa.eu/committees/de/studiesdownload.html?languageDocument=EN&file=75195.

[226] European Commission (2013e), Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, … , 11 September 2013, COM(2013) 627 final. Page 12.

Roaming within the United States was once a significant portion of the revenue structure, representing some 14% of MNO revenues in the U.S. in 1998.[227] The introduction of Digital OneRate by AT&T Wireless[228] in 1998 transformed the industry. Roaming (both domestic and international) represents only 1.9% of U.S. mobile industry revenues today.[229] Digital OneRate provided for the first time a nationwide flat rate package at an affordable price. There were no per-minute usage charges, no long distance charges, and no domestic roaming charges. Domestic U.S. roaming (which is somewhat comparable in scope to roaming within Europe) has steadily declined in economic significance ever since.

Digital OneRate led to a dramatic gain in AT&T Wireless's market share. It is worth noting that AT&T Wireless had a nationwide footprint when most of its competitors did not. It also had the mentality of a disruptive market player, inasmuch as AT&T had purchased the former industry maverick McCaw Cellular Communications. It is said that, to accomplish anything in life, one needs both resource and motive. AT&T Wireless had both the motivation and the ability to shake up the prevailing arrangements in the U.S., and to profit from doing so. We do not appear to have such a market player in Europe.

Figure 19: Roaming as a percentage of total service revenues for US Mobile Network Operators (1988-2009)



Source: Marcus and Philbeck (2010), based on data from CTIA (2010), Semi-Annual Wireless Industry Survey.

[227] Marcus and Philbeck (2010), *Study on the Options for addressing Competition Problems in the EU Roaming Market, Study for the European Commission*.

[228] For background on AT&T Wireless and McCaw Communications, see Wikipedia contributors, 'AT&T Wireless Services', Wikipedia, The Free Encyclopedia, http://en.wikipedia.org/w/index.php?title=AT%26T_Wireless_Services&oldid=577646945 (accessed October 30, 2013).

[229] US FCC (2013), Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services. See Table 41. As the report notes, however, domestic roaming in the U.S. continues to be important for coverage. 'No mobile wireless provider – including the four nationwide providers – has built out its entire licensed service area, and consequently all providers employ roaming to some extent to fill gaps in their coverage. […] [R]oaming remains particularly important for small and regional providers with limited network population coverage to remain competitive by meeting their customers' needs for nationwide service.'

Some interview respondents were under the impression that the U.S. is now in the process of eliminating international mobile roaming as well. They typically pointed to a recently announced Simple Choice service plan offered by T-Mobile in the United States, which purports to offer free data roaming to 100 countries worldwide, and voice calls from those same countries at just twenty US cents per minute.[230]

Our experience with European roaming plans tells us that customers typically pay a premium for plans that provide the protection of a flat rate. In this case, the wholesale price that T-Mobile pays for voice calls made in most of the countries served by Simple Choice (outside, perhaps, the EEA) is presumably well in excess of 20 US cents. If they are charging a usage-based price that is less than their usage-based cost, it is fair to assume that (1) their flat rate is high enough to cover their expected average costs, and (2) the expected level of usage is low enough, or can be made low enough, that most users will not consume more than they are paying for.

In this case, both appear to be true. The least expensive qualifying plan costs $50 US per month(or about € 36 per month), somewhat in excess of typical European plans; the speed is limited to 128 Kbps, which limits usage (and probably makes the plan unsuitable for video while roaming); and there may well be usage caps on data roaming (which appears in fact to be the case for domestic roaming under T-Mobile's domestic plans offering unlimited data).[231] The plan also likely benefits from the much lower propensity of Americans to travel internationally in comparison with Europeans – only 113 million Americans have a passport, out of a population of 314 million.[232] In other words, the plan may be quite attractive for Americans who have no better options, and in light of typical American usage patterns, but it by no means signifies an end to charges for international mobile roaming.

3.6.3. Objectives

The Roaming Regulation in its various incarnations has not been altogether clear as to its goals; however, it seems reasonably clear that the objectives include (1) reducing excessive prices charged to consumers, (2) establishing a competitive dynamic that would make further regulation unnecessary, and (3) strengthening the Single Market.

Reducing consumer prices to cost-based levels has its appeal, but in purely economic terms the transfer of economic welfare from suppliers to producers is neutral. Economic benefit is present only to the extent that lower prices to consumers result in increased consumption, thus reducing economic deadweight loss. **In the case of international mobile roaming for voice services, the increase in consumption has been shown to be small due to low price elasticity of demand; consequently, the net economic benefit of lowering prices for consumers is real and positive, but considerably smaller than one might expect.[233]**

All told, the strengthening of the Single Market has to be seen as the primary and most important objective.

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[230] See T-Mobile (2013), T-Mobile Makes the World Your Network - at No Extra Charge - and Now Delivers Nationwide 4G LTE, at http://newsroom.t-mobile.com/phoenix.zhtml?c=251624&p=irol-newsArticle&ID=1863209&highlight.

[231] Based on T-Mobile's web site, as viewed 26 October 2013, at http://support.t-mobile.com/docs/DOC-9455, http://support.t-mobile.com/docs/DOC-3299, http://www.t-mobile.com/cell-phone-plans/individual.html, and http://newsroom.t-mobile.com/phoenix.zhtml?c=251624&p=irol-newsArticle&ID=1863209&highlight.

[232] See the US Department of State web site, at http://travel.state.gov/passport/ppi/stats/stats_890.html.

[233] Again, for a more complete explanation, see Marcus and Philbeck (2010).

3.6.4. Evaluation

The wholesale and retail pricing mechanisms of the Roaming Regulations of 2007, 2009 and 2012 have been highly effective in reducing wholesale and retail prices of roaming in the EU/EEA. This has produced societal gains in the form of reduction of deadweight loss, as we explain shortly. More significantly, they have produced socio-economic benefits by furthering the overall evolution of the Single Market.

The reductions in retail and wholesale price to date have stimulated additional usage of voice services, although not as much as might ideally have been hoped for. The study for the impact assessment conducted for the Commission in preparation for the 2012 Regulation found a demand elasticity of just -0.27 for roaming voice services (calls originated); thus, the lower prices do more to transfer welfare from network operators to consumers than to reduce deadweight loss (see section 5.2).[234] Data roaming likely generates greater benefits.

The Roaming Regulations have not created a competitive dynamic that would make further regulation unnecessary. As of now, nobody knows how to do that.

3.7. Mechanisms for Ensuring Consistent Regulatory Decisions

The debate about achieving consistency in the application of the EU Regulatory Framework has been brought into sharp focus through the European Commission's submission to the Parliament in September 2013 of its Connected Continent proposals.[235]

In putting forward a wide-ranging package, the European Commission has implied that the existing Framework adopted in 2002, like its predecessor the *Open Network Provision (ONP) Directives*, has not been effective in achieving a Single Market for electronic communications.

The Commission's new proposal covers a number of areas including:

- A special authorisation regime for operators present in more than one country which would operate alongside the current authorisation regime.
- Harmonisation of certain virtual access products needed to replace local loop unbundling in an NGA environment and to facilitate communications for multi-national businesses.
- Increased powers for the European Commission in vetoing[236] SMP remedies applied by national regulatory authorities on 'European' operators.
- Increased harmonisation and the introduction of case by case monitoring as regards spectrum.
- Provisions on Net Neutrality[237] and Roaming.

[234] For a more complete explanation, see Marcus, J. S. and I. Philbeck (2010), Study on the Options for addressing Competition Problems in the EU Roaming Market, Study for the European Commission; available at: http://ec.europa.eu/information_society/activities/roaming/docs/cons11/wik_report_final.pdf.

[235] European Commission proposals for a Regulation on a 'Connected Continent' http://ec.europa.eu/digital-agenda/en/news/commission-proposes-major-step-forward-telecoms-single-market.

[236] Article 7a of the existing EU Framework Directive contains provisions which allow the European Commission to make 'Recommendations' on national regulatory authorities to withdraw or amend decisions concerning the application of SMP remedies, but fall short of an absolute veto by the Commission in this regard. Article 35 of the draft 'Connected Continent' Regulation proposes to extend the powers of the Commission to permit a veto on remedies when such remedies are applied to operators having a multi-national presence.

We discuss the Commission's proposals in greater detail in Chapter 7.

In this section, we will consider more broadly what are the circumstances in which consistency is necessary in view of objectives relating to the Single Market, which types of approach are more likely to deliver consistent outcomes and what effect the different approaches have on the institutional set-up including the duties ascribed to BEREC, Communications Committee (COCOM) COCOM[238] and the portion of the European Commission that deals with notifications pursuant to Article 7 of the Framework Directive.

When is consistency necessary?

The formal legal mandate[239] under which EU telecommunications legislation is tabled is as a measure to foster the 'establishment and functioning of the internal market'. Initially, EU telecommunications legislation was introduced as a liberalising measure with the aim of providing a level playing field for market entry in all Member States, enabling operators from one country to freely enter others.

Now that prohibitions on market entry have largely been removed, the European Commission has focused in subsequent legislative and soft law proposals on achieving greater consistency in all areas of regulation; however, the justifications for consistency vary. Only in a few cases do these genuinely relate to cross-border markets or issues with a cross-border dimension.

In its 2007 Impact Assessment relating to the review of the EU Regulatory Framework, the European Commission specifically identified as services with a direct cross-border dimension, communications for businesses (which may be offered to multi-national corporations), VoIP and 'over-the-top' services,[240] which may involve customers purchasing a service originating from a different country. Policies concerning frequencies were considered to be another area with a direct cross-border dimension.

The European Commission also identified a need for consistency in relation to the implementation of regulatory remedies imposed on undertakings with SMP, including remedies to promote competition in broadband, which generally takes place at a national level. Consistency in this area was considered necessary in order to provide similar conditions in different markets so as to encourage operators to expand from one market to another, and also in order to provide best practice outcomes for consumers in terms of product offerings, choice and value across the Single Market.

Whilst the justification for achieving consistency in relating to cross-border services seems clear, and some provisions were made in the Regulatory Framework with the apparent intention of addressing cross-border markets (especially Article 15(4) of the Framework Directive), these provisions have never been used.

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[237] 'Net neutrality' is the term commonly used to refer to provisions which aim to ensure that users of electronic communications services are able to access the content and applications of their choice. Article 23 of the draft 'Connected Continent' package propose to secure this objective by prohibiting the blocking or degrading of Internet traffic (subject to reasonable traffic management practices) whilst expressly permitting the provision of 'managed services' alongside a 'best efforts' Internet.

[238] The Communications Committee (COCOM) is a committee established under article 22 of the Framework Directive. It is composed of the representatives of Member States, and assists the Commission on identified aspects concerning the implementation of the regulatory framework for electronic communications.

[239] Article 114 of the EU Treaty.

[240] 'Over-the-top' (OTT) services normally refer to content or applications which are offered over the Internet without the broadband network or service provider being directly involved in their provision.

Conversely, the Commission has taken several initiatives since 2009 aimed at promoting consistency in the application of SMP regulation with the express intention of delivering best practice outcomes for consumers and fostering investment (in the context of the DAE objectives).
The Commission's new Connected Continent proposals will inevitably trigger debate about the meaning of the Single Market and whether the proposals covered address genuine concerns over the provision of cross-border services.

We believe there is justification for greater consistency both for cross-border services and services relevant to national broadband; however, less has been done to date concerning cross-border services, and therefore increased focus could now be warranted.

3.7.1. Main Features

Methods to Achieve Consistency: Harmonised Obligations vs. Harmonised Procedures

The Framework for the telecommunications sector consists of Directives, which Member States are required to transpose into national law. Directives by their nature allow some flexibility for interpretation in the process of implementation by Member States.

The degree of flexibility depends to a large degree, however, on the wording of the Directives and on how much decision-making is delegated to national and local authorities rather than being set out in legislation.

The original Open Network Provision (ONP) Directives which liberalised the European telecommunications sector from the 1990s[241] were in many respects quite 'directive' in that they specified specific measures that Member States were obliged to implement such as carrier pre-selection (the ability to select different providers for international calls for example), and the regulation of a minimum set of retail leased lines under defined terms.[242]

In contrast, the current EU Regulatory Framework adopted in 2002, and amended in 2009, leaves a considerable degree of flexibility to Member States and national regulatory authorities as regards the measures they adopt both as regards access obligations and implementation of consumer protection measures such as universal service. The aim appears to be to achieve consistency through harmonised procedures such as the market analysis process[243] and delegated acts such as soft law Recommendations from the European Commission. In turn, the reliance on delegated acts requires the creation of institutional mechanisms to provide checks and balances and to 'police' the implementation of the Framework and the various Recommendations deriving from it.

Whilst the EU Regulatory Framework is designed with flexibility in mind, it is notable that a number of directly applicable Regulations have been adopted relating to telecommunications, which effectively overlay specific obligations on a more 'one-size-fits-all' basis.

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[241] European Council (1990), Council Directive on the establishment of the internal market for telecommunication services, at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31990L0387:EN:HTML.

[242] Annex II of the ONP leased lines Directive (Council Directive 92/44/EEC of 5 June 1992) directive defined a minimum set of leased lines with harmonised technical characteristics, which were required to be offered across the EU.

[243] Articles 14-16 *Electronic Communications Framework Directive*.

In particular, there have been a number of Regulations governing mobile roaming,[244] and the European Parliament and Council are currently considering a proposed regulation concerning measures to reduce the cost of deploying high speed communications networks[245] (which would harmonise the conditions for access to ducts and co-ordination of civil works across different sectors). The recent Connected Continent proposals would overlay obligations concerning harmonised remedies for virtual access, and would aim to harmonise the approach towards charge controls on NGA. All of these Regulations effectively limit the scope of NRAs to benefit from flexibility.

Achieving Harmonisation in a Flexible Framework

Recommendations, binding Decisions and 'delegated acts'

In order to provide some structure to the flexibility permitted to NRAs, the 2002 EU Regulatory Framework and the 2009 revisions to it included provisions allowing the European Commission to issue Recommendations or Decisions with the aim of harmonising application of the Directives in order to further the objectives of the Regulatory Framework.[246] Recommendations can be adopted on a wide range of subjects falling within the scope of the Directives. They are technically non-binding, but NRAs are obliged to give utmost account to them.

Decisions, on the other hand, are restricted to measures relating to SMP regulation and numbering. They are binding measures which may only be proposed by the Commission two years following the adoption of a Recommendation on the same subject.

The Commission has adopted a number of Recommendations under the 2002 Regulatory Framework and its successor, the most prominent of which have been Recommendations on relevant markets,[247] termination rates,[248] and next generation access.[249] An additional Recommendation was issued in September 2013 on methodologies for non-discrimination and costing.

No binding Decisions have yet been adopted; however the new Connected Continent proposals from the European Commission envisage binding Decisions (referred to as 'Implementing Acts') in a number of areas including the technical details of virtual access products, authorisation conditions for spectrum, and potentially harmonised interpretation of the rules governing net neutrality. Before adopting binding Decisions, the European Commission is obliged to consult COCOM, a committee of member state representatives, and cannot adopt a Decision in the event of a negative opinion. **Thus, Decisions or Implementing Acts effectively require the consent of a body derived from the Council, but do not give a significant role to the European Parliament.**

[244] *Regulation (EU) No 531/2012* June 2012.
[245] European Commission, Proposal for a Regulation on reducing the cost of broadband deployment.
[246] Article 19 Framework Directive.
[247] 2007 European Commission *Recommendation on relevant product and service markets* http://ec.europa.eu/information_society/policy/ecomm/doc/library/proposals/rec_markets_en.pdf.
[248] 2009 European Commission *Recommendation on the regulatory treatment of fixed and mobile termination rates in the EU* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:124:0067:0074:EN:PDF.
[249] 2010 European Commission Recommendation on regulated access to Next Generation Access Networks http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF.

In the European Commission's recent proposals concerning the Single Market, they also propose that they be given the right to adopt changes without consultation to the Annex that determines the terms of harmonised virtual access products. Such delegated acts would become binding if no objections were received within two months from the European Council or Parliament. **This would represent a very significant concentration of power in the hands of the European Commission.**

Intervention in national cases: Article 7 procedures

One of the most significant innovations of the 2002 EU Regulatory Framework was a provision which allowed the European Commission to review and comment on the draft market analyses of NRAs and, in the case of market definitions and SMP, to veto the findings of NRAs if the Commission considered that these would create a barrier to the Single Market or were contrary to the objectives enshrined in article 8 of the Framework Directive.[250] In the 2009 review of the EU Regulatory Framework, a further provision was added which effectively enabled the European Commission to make a strong Recommendation effectively requiring NRAs to change or withdraw remedies applied to SMP operators if the Commission obtained the agreement of the EU regulators' group BEREC.[251] **Until recently, these measures had effectively amounted to a veto; however, the German Bundesnetzagentur (BNetzA)[252] has challenged the Commission's powers in this respect by refusing to withdraw its proposals concerning charge controls for call termination.[253]**

The European Commission often follows the principles of its own Recommendations when commenting on national cases under the Article 7 procedure. In this context, Recommendations can provide helpful guidance to market participants and NRAs on the likely position of the European Commission; however, this interrelationship can also present questions over whether the Commission is acting as both 'judge and jury'.

The proposals for a Connected Continent Regulation include several aspects aimed at further extending and strengthening the European Commission's powers in national cases. These include similar procedures for the European Commission to vet national allocations of spectrum, and national approaches towards Net Neutrality. **The proposals also include a measure to formally allow the European Commission to veto a decision taken by an NRA concerning remedies imposed under SMP regulation when applied to a 'European' operator, rather than the strong Recommendation that currently exists.[254]**

Checks and balances: The role of institutions in a 'flexible' framework

Because today's framework relies heavily on delegated acts and national flexibility with EU oversight, there has been an important role for EU institutions in providing input and/or checks and balances against the authority of the European Commission. Prime amongst these are the Body for European Regulators in Electronic Communications

[250] Article 7 Framework Directive.
[251] Article 7a Framework Directive. Whilst the European Commission's decision on remedies is not binding, the involvement of BEREC in applying peer pressure has proved effective in practice in compelling NRAs to comply with the EC's Recommendations on remedies.
[252] The Bundesnetzagentur (BNetzA) is the NRA for Germany. See http://www.bundesnetzagentur.de/EN/.
[253] BNetzA announces final mobile termination rates; available at: http://www.bundesnetzagentur.de/SharedDocs/Pressemitteilungen/EN/2013/130719_MobileTerminationRates.html.
[254] Article 7a Framework Directive.

(BEREC), the Radio Spectrum Policy Group (RSPG),[255] and the Communications Committee (COCOM). Their role is described in more detail below.

Body of European Regulators for Electronic Communications (BEREC)

BEREC was established through an EU Regulation[256] in order to give a formal context to the collaboration between European regulators. This collaboration had begun informally through the initiative of the regulators themselves, with the creation of the Independent Regulators Group (IRG)[257] in 1997. It was progressively formalised, firstly through the creation, in the context of the 2002 EU Regulatory Framework, of the European Regulators Group (ERG) (which however still lacked formal status as a European institution), and then through the creation in 2009 of BEREC.

BEREC plays an important role in giving input to the European Commission in areas where the Commission has the power to harmonise policy or pass judgement on national cases. In particular, the European Commission must take 'utmost account' of BEREC's view before finalising Recommendations or Decisions, and must work together with BEREC to reach an agreed conclusion before effectively compelling an NRA to change national remedies proposed to be imposed on SMP operators.

In addition to advising the European Commission, BEREC also acts as a co-ordinating point for the collection of data and regulatory comparisons amongst NRAs, and as the source of best practice guidance on the application of regulation.

BEREC's policy decisions are governed by a Board consisting of the Heads of NRAs, led by a Chairman elected on an annual basis from amongst the Heads. The activities of BEREC are supported by a Secretariat based in Riga, Latvia; however, the majority of policy development continues, as in the past, to be carried out by representatives from NRAs who act as Chairs for particular subjects and working groups. **Most of BEREC's formal meetings and hearings are also held in Brussels, either at the premises of the European Commission or at the premises of the IRG (which continues to maintain a small staff and office in Brussels in parallel with BEREC).**

In theory, the BEREC Board may take policy decisions based on a qualified majority;[258] however, in practice, decisions are usually taken on a consensual basis. This, combined with the fact that the **Heads of NRAs are considered primarily to be motivated by a desire for self-determination, has led to some criticisms that BEREC delivers verdicts based on a 'lowest common denominator', or prioritises flexibility over consistency in the Single Market.**

A related issue raised in the context of the ongoing Review of BEREC[259] is whether BEREC is sufficiently focused on Single Market issues as opposed to the (more national) interests of its members.

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[255] The Radio Spectrum Policy Group (http://rspg-spectrum.eu/) is an advisory group that assists the European Commission in the development of Radio Spectrum Policy. It was established under Commission Decision 2002/622/EC, following the adoption of the Radio Spectrum Decision 676/2002/EC.

[256] *Regulation (EC) No 1211/2009 establishing the Body of European Regulators for Electronic Communications* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0001:0010:EN:PDF.

[257] Independent Regulators Group (IRG) http://www.irg.eu/.

[258] Article 4(9) Regulation establishing BEREC.

[259] *Study for European Commission on Evaluation of BEREC and the BEREC Office*, see PriceWaterhouseCoopers (PWC) (2012), Study on the Evaluation of BEREC and the BEREC Office, study for the European Commission, 21 December 2012; available at: http://ec.europa.eu/digital-agenda/en/news/study-evaluation-berec-and-berec-office.

In the European Commission's Connected Continent proposals, they have proposed that an independent Chair should be appointed for BEREC with a three year term in place of the current rotating chairmanship from amongst the Heads of the NRAs (see also section 7.8.2).

Communications Committee (COCOM)

The EU Regulatory Framework also established a committee of the representatives of Member States, the Communications Committee (COCOM). After taking account of the views of BEREC, the European Commission must formally consult COCOM on Recommendations and Decisions prior to adopting them. COCOM's views on Recommendations are not binding on the Commission; however, the Commission must gain COCOM's approval before adopting a binding Decision (discussed below). Member State representatives are often assisted by representatives of the NRA within COCOM.

Measures aimed at fostering transnational markets

Consistency in the context of the EU Regulatory Framework can often be interpreted as achieving 'similar outcomes in similar circumstances' in markets which are nonetheless national in scope; however, the 2002 EU Regulatory Framework as amended in 2009 also contains specific aspects aimed at fostering co-ordination where markets or services are considered cross-border.

The Commission, after taking account of the views of BEREC, can adopt a binding Decision identifying a transnational market.[260] As noted in section 3.5.1, **no transnational markets have in fact been defined since the adoption of the EU Regulatory Framework;** however, it might be appropriate to treat retail business communications as a transnational service.

The Framework Directive also provides[261] for a procedure to resolve cross-border disputes. In this case, the competent regulatory authorities are required to co-ordinate their efforts and may consult BEREC to support the resolution of the dispute. Again, it is unclear whether this measure has been used in practice.

The Commission has powers to put forward measures for technical harmonisation concerning numbers or number ranges where this may contribute to the development of pan-European services.

Measures were also introduced in the 2009 revision of the Regulatory Framework to foster the adoption of multi-annual radio spectrum policy programmes. These are further discussed in section 3.10.

[260] Article 15(4) and 16(5) Framework Directive.
[261] Article 21 Framework Directive.

3.7.2. Objectives

General Objectives

A core objective included in the European Commission's 2007 Impact Assessment on the revisions to the EU Regulatory Framework[262] that were ultimately enacted in 2009 was to deliver a Single Market in electronic communications through consistent and effective regulation whilst respecting the principles of subsidiarity and proportionality. It is clear from the recent Connected Continent proposals of the European Commission that these objectives are still valid.

Specific Objectives

In fulfilling the general objective, the Commission identified the following specific objectives:

- To remove persisting inconsistencies in implementation of the Regulatory Framework in the Member States, in particular with respect to application of regulatory remedies;
- To encourage development of cross-border services and services with pan-European potential; and
- To improve effectiveness of the national appeals procedures.

In achieving these objectives under the 2009 revisions to the Regulatory Framework, the Commission considered (but ultimately rejected) the option of creating a single European regulatory authority with decision-making powers in national market reviews, and with responsibility for EU aspects of spectrum management.[263] They also rejected the status quo. Whilst the European Parliament and Council ultimately approved the Commission's preferred option of increasing their ability to override an NRA's decisions on remedies, and to create BEREC, the result conferred considerably less power on the Commission than in the Commission's original vision. In particular, the Commission did not secure an outright veto on remedies proposed by NRAs (although it could in practice with the support of BEREC exercise such a veto). The role of the appointed Director of BEREC was weaker than the Commission proposed, such that the ultimate authority for decisions rests with BEREC's Board of Regulators.

Assessment of the Objectives

The Commission's objective of achieving greater regulatory consistency in remedies and of supporting the development of cross-border services appears laudable. Consistency of regulation can be helpful in achieving best practice outcomes for consumers and businesses, and in providing certainty for operators investing in-country or on a cross-border basis. Moreover, as discussed in section 8.1, consistent approaches can be essential in some cases to supporting genuinely cross-border services.

The European Commission had evidence prior to the 2009 review that inconsistencies remained despite the presence of the EU Regulatory Framework. One example cited by the Commission in the 2007 Impact Assessment was the wide range of variations in mobile termination rates:[264]

[262] European Commission (2007), Impact assessment on the proposal for a Directive amending the EU telecommunications framework.

[263] This was considered within the Impact Assessment as 'option 1' in achieving 'regulatory consistency and effectiveness'.

[264] See European Commission (2007), Impact assessment on the proposal for a Directive amending the EU telecommunications framework, section 7.1.2, *Inconsistency in remedies imposed by NRAs*, available at http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=SEC:2007:1472:FIN:EN:PDF.

> 'The second Commission Communication on market reviews under the EU Regulatory Framework and the accompanying Staff Working Document provide concrete examples of inconsistent application of remedies. The average mobile termination rates (MTR) for example vary considerably across Member States. While part of this variation can be explained by different underlying costs of operators in different countries, the rest is due to different price setting methodologies used by the NRAs, different timeframes for reducing the MTRs, or the application of asymmetrical MTRs whereby some NRAs authorise higher termination rates for smaller operators.'

Yet despite the adoption of a Recommendation on termination rates in 2007,[265] the Commission had little power to enforce consistent approaches. In the context of NGA, some regulators, notably the CMT[266] in Spain, appeared to side-step the Commission's attempts to crack down on regulatory holidays by finding that the incumbent had SMP in NGA networks (a decision over which the Commission had a veto), but failing to impose remedies (a decision over which the Commission had no control prior to the 2009 revisions to the Regulatory Framework).[267]

Moreover, the Commission was right to point out in its impact assessment that for certain retail applications with a cross-border dimension, consistency of regulation is essential. Services to pan-European enterprise customers ideally require the same technical and service level specifications in order to enable a seamless offering cross-border. Consistent treatment of VoIP and approaches to 'over-the-top' services is important in enabling customers in one Member State to access services provided in another. In its impact assessment of 2007, both these cases where cited as examples of fragmentation hampering the development of the Single Market.

3.7.3. Evaluation of Measures to Achieve Consistency

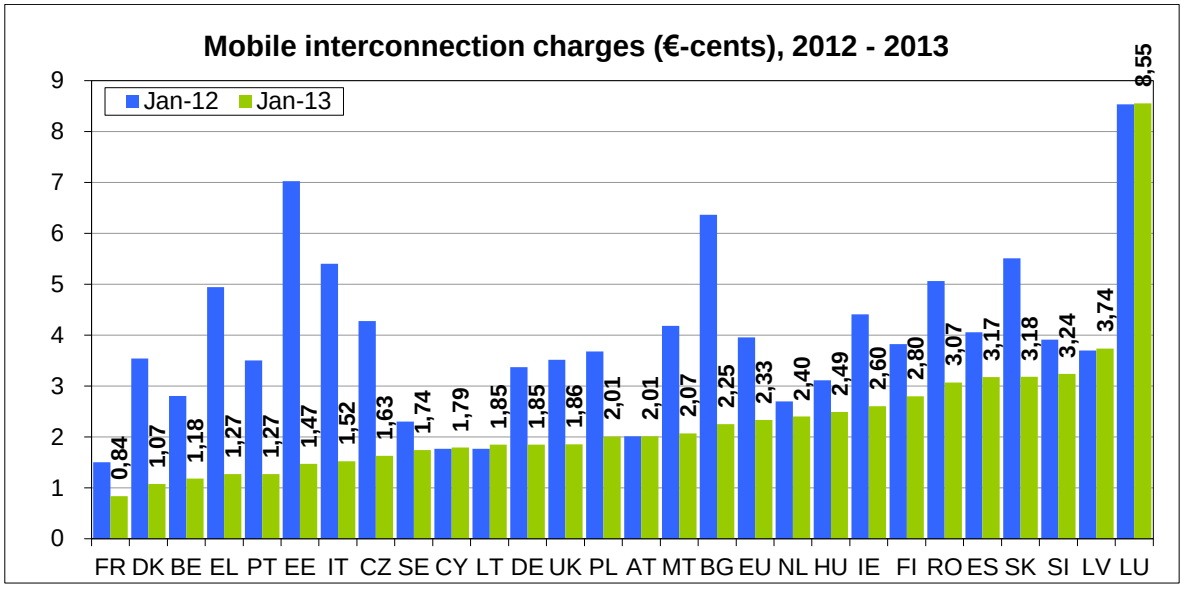
Effectiveness

In assessing the effectiveness of the current EU Regulatory Framework in achieving consistency, it is helpful to examine the cases which were highlighted to justify the revisions made in 2009.

One relative success was in mobile termination rates. The Commission actively used its expanded powers under article 7 of the EU Regulatory Framework to 'prosecute' countries which failed to implement its recommended cost methodology for mobile termination rates. As a result, mobile termination rates in most countries have fallen below €0.025 (although variations still remain – see Figure 22). Reductions in fixed termination rates have also allowed the development and commercialisation of offers and bundles in which fixed cross-border calls within the EU are charged at the same rate as national calls or are available on an unlimited basis with a small fee.

[265] Commission Recommendation on the regulatory treatment of fixed and mobile termination rates in the EU http://ec.europa.eu/governance/impact/ia_carried_out/docs/ia_2009/c_2009_3359_en.pdf.
[266] Comision del Mercado de las Telecomunicaciones (CMT).
[267] See Commission serious doubts letter concerning Spain market 5 ref 2008 D/206852.

Figure 20: Mobile interconnection charges EU 2012-2013



Source: European Commission (2013), DAE Scoreboard spreadsheet covering financial indicators, fixed and mobile telephony.[268]

It is difficult, however, to identify other areas where greater consistency in regulatory remedies was achieved following the adoption of the revised Regulatory Framework in 2009. One key aim of the Framework revisions was to achieve a consistent approach fostering competition and investment in next generation access networks; however, despite a 2010 Recommendation on NGA adopted immediately following the adopted of the revised Framework, approaches towards the regulation of NGA-based networks differ widely today even where circumstances appear relatively similar.[269]

The new Commission Recommendation on costing and non-discrimination adopted in September 2013 is widely viewed as a departure from some of the Commission's previous recommendations as regards NGA wholesale pricing. Given that some of its provisions (notably regarding principles for copper wholesale access prices) have already been questioned by BEREC in the context of national cases,[270]and that some Member States have already adopted approaches to NGA pricing from the previous Recommendation which could be seen as conflicting with the new guidance,[271] **it seems unlikely that the new Recommendation will in and of itself stem the controversy and provide complete predictability going forwards on the subject of wholesale price regulation.**

[268] At http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=2374, downloaded August 2013.

[269] Kiesewetter, W., Lucidi, S., Neumann, K.-H. and U. Stumpf (2012), NGA Progress Report, WIK-Consult study for ECTA; available at: http://www.wik.org/index.php?id=studiedetails&L=1&tx_ttnews%5Bpointer%5D=2&tx_ttnews%5Btt_news%5D=1411&tx_ttnews%5BbackPid%5D=85&cHash=faa66cf28a16361c5df48e2e56ba3a8f.

[270] See for example BEREC Opinion on Italian LLU charging *case IT/2013/1489-1490*; available at: http://berec.europa.eu/eng/news_consultations/whats_new/1617-berec-has-adopted-a-berec-opinion-on-phase-ii-investigation-it20131489-1490.

[271] See European Parliament (2013b), *Entertainment x.0 to boost Broadband Deployment*. Table 21 shows that cost-orientation of NGA wholesale charges has already been implemented in Belgium. Netherlands and Sweden

Pan-European services

Arguably consumer broadband services may be sufficiently dependent on local circumstances that a lack of consistency may not be fatal to the European project; however, more seriously, there is little evidence of increased consistency supporting the development of pan-European services stemming from the revised EU Regulatory Framework.

In its 2007 impact assessment,[272] the European Commission noted that regulatory consistency across the EU was particularly important for providers of services to international business users. **Citing a report commissioned by BT,[273] the Commission concluded that 'international business customers expect a similar level and quality of services across national borders.'**

A 2013 study by WIK-Consult found, however, that many of the business communications problems previously identified still persist.[274] An end-user survey identified continued problems of lack of competition, and lack of consistency in the market. The study also found that regulation of wholesale leased lines, which are key inputs to the provision of pan-European business services, and which were subject to a Commission Recommendation in 2005,[275] continues to be variable amongst the Member States with substantial differences in pricing and provisioning terms.[276]

[272] See European Commission (2007), Impact assessment on the proposal for a Directive amending the EU telecommunications framework, section 7.1.2.

[273] BT (2007), *The Economic Benefits from Providing Businesses with Competitive Electronic Communications* (the document is comprise of a number of reports written by several authors).

[274] Godlovitch, I., Monti, A., Schäfer, R.G. and U. Stumpf (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at: http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf

[275] European Commission Recommendation of 21 January 2005 on the provision of leased lines in the EU http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:024:0039:0044:EN:PDF

[276] Godlovitch, I., Monti, A., Schäfer, R.G. and U. Stumpf (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at: http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf

Table 9: Approaches to regulation of business access (partial private circuits (PPCs) and wholesale Ethernet services (WES)) at 2012

Country	Regulated PPCs available?	Cost orientation?
AT	Geographically segmented with major cities excluded and no regulation >155Mbit/s	
BE	Yes, awaiting BIPT decision following consultation	Yes
CZ	No regulation >2Mbit/s (3 criteria test not met)	No price control
DE	Yes, but no regulation >155Mbit/s	Yes
DK	Yes	Copper <2Mbit/s but not above
ES	Yes (but no lines >70km traditional interfaces or >35km Ethernet interfaces)	Copper traditional, retail minus for Ethernet
FR	Yes	No cost orientation >10Mbit/s
HU	No regulation >2Mbit/s (3 criteria test not met)	No price control
IE	Yes, but no regulation >155Mbit/s for trunk between certain listed cities.	Yes
IT	Terminating segment of leased lines are regulated (but lines to mobile operators excluded)	Yes, price cap (less stringent for WES and >155Mbit/s)
NL	Yes	Yes
PL	Yes	Yes
PT	Yes	Yes, but not WES (retail minus)
RO	No regulation >2Mbit/s (3 criteria test not met)	No
SE	Yes (proposed up to 30Mbit/s, DWDM unregulated)	Yes (where regulation applied)
UK	Yes (limited geographic segmentation), no remedies >1Gbit/s	Yes

Source: WIK-Consult research, drawn from 2013 study Business communications, economic growth and the competitive challenge.

Cross-border entry

An expectation arising from all the EU liberalising measures perhaps underlined by the objective of encouraging 'trans-European networks and the interoperability of pan-European services', was that operators would expand cross-border increasing competition across the EU. In practice, such expansion has occurred to some extent with mobile networks, but has failed to deliver pan-European services. Indeed, the EU Roaming Regulations[277] can be seen as a direct acknowledgement of the failure of the EU framework to deliver borderless offerings in this respect.

On the fixed side, some operators such as BT Global Services[278] have become specialised in offering pan-European services to multi-national corporations; however, they claim to experience difficulties in effectively meeting customer needs due to the fragmentation of conditions in the local markets in which they procure access links.

[277] See Regulation (EU) No 531/2012 of the European Parliament and of the Council of 13 June 2012 on roaming on public mobile communications networks within the Union.
[278] BT Global Services https://www.globalservices.bt.com/uk/en/home.

In the residential space, there is a notable absence of common offers in fixed services throughout the EU, despite cross-border consolidation by cable operators and some cross-border acquisitions by incumbents. Indeed some of the main competitors in the provision of residential broadband services are localised and specialise either in particular regions or Member States. **Given however that the residential broadband market is not by nature pan-European,[279] the lack of cross-border providers of residential services should not necessarily be seen as a failure.**

Efficiency

Achieving harmonisation in the context of a flexible framework requires the introduction of common procedures, and of European institutions that can police the effective implementation of the Regulatory Framework. This inevitably increases the complexity of policymaking. Such an approach might be warranted, despite inherent overheads, if demonstrably better results were achieved as a result.

However, evidence to date as detailed in the discussion above concerning the effectiveness of the flexible system (section 3.7.3) does not conclusively demonstrate that the tailored approach has delivered more effective results in terms of positive tangible outcomes for European consumers, investors or in the development of pan-European networks and services. In this context, there is much room for improvement in terms of efficiently achieving European policy goals for a Single Market in telecommunications.

Coherence

It is notable that the flexible framework has been increasingly overlaid with parallel or overlapping measures which harmonise the application of EU regulation in a more 'directive' fashion. These measures include the Roaming Regulations, a proposed Regulation on measures to reduce the cost of deploying high speed electronic communications networks,[280] and now potential Connected Continent measures aimed at securing a Single Market for telecommunications.

There is a risk in this context that investors may suffer uncertainty on two fronts – firstly from a framework which leaves much to national interpretation, and secondly from additional measures which demonstrate that policy-makers are not afraid to take definitive action, on top of or independently from obligations introduced under the existing framework.

The co-existence of the two approaches can also lead to some inconsistencies. For example, there may be some tension between a potential EU-wide Regulation encouraging duct access from all parties and a system of SMP regulation in the EU Regulatory Framework under which the incumbent has special obligations concerning duct access. The 'one-size-fits-all' approach to wholesale charges for Roaming call origination may also be viewed as differing from the cost-based calculations for call termination typically carried out under the SMP framework at a national level.

[279] Because 'connectivity' depends on a physical access connection which is local to the user, it is not possible to purchase a residential access link from a supplier operating in another country – see section 3.2.

[280] Draft Regulation on measures to reduce the cost of deploying high-speed electronic communications networks http://ec.europa.eu/digital-agenda/en/news/proposal-regulation-european-parliament-and-council-measures-reduce-cost-deploying-high-speed.

3.7.4. Evaluating BEREC

A topical question given the on-going evaluation of BEREC and the BEREC Office concerns the role BEREC has played in meeting its own objectives and the wider goal of consistent regulation leading to a Single Market for electronic communications.

Under the terms of the 2009 EU Regulation, BEREC is tasked with:

- disseminating best practice amongst NRAs,
- delivering opinions on draft recommendations of the European Commission, and
- providing advice and assisting the European institutions on matters concerning regulation.

Its role is particularly significant in respect to actions taken by the European Commission to veto market review decisions of national regulators or to adopt Recommendations or Decisions, because in this context the European Commission is legally obliged to take 'utmost account' of BEREC's opinion.

The input that BEREC provided in the context of these technical decisions by the Commission has to all accounts been timely and valuable, leading to important clarifications or amendments to the Commission's proposals. Until recently, with notable cases on LLU charge controls in Austria and Italy,[281] expert teams within BEREC had also upheld the concerns of the European Commission on several occasions when called on to challenge decisions made by NRAs, suggesting a growing maturity in supporting Single Market measures, alongside the confidence to challenge the Commission when considered appropriate. BEREC has also proved a useful repository of benchmark data, and has followed up legal initiatives such as the Roaming Regulation. **As regards its contributions to initiatives made by others, BEREC can be considered to have fulfilled its obligations.**

However, one area in which BEREC has been less successful, despite its efforts to conduct monitoring exercises,[282] is in achieving consistency amongst its members on the basis of its own-initiative best practice guidelines. This is not a surprise, given BEREC's constitution. BEREC's decision-making is governed by the Heads of NRAs, who individually have an interest in maintaining self-determination, and beyond a commitment of its members to justify departures from BEREC guidelines it lacks any clear power or remits to enforce decisions on its members.

Had the original Commission proposal[283] been adopted, with a stronger role for the independent Director of BEREC, it is possible that BEREC's incentives might have shifted more towards Single Market goals.

[281] See BEREC Opinion on *cases IT/2013/1489-1490 and AT/2013/1475-1476*.

[282] See September 27 press release highlighting commitment to monitor implementation of 2012 broadband best practice guidelines http://berec.europa.eu/eng/news_consultations/whats_new/1630-press-release-berec-launches-process-to-monitor-implementation-of-broadband-best-practices.

[283] The European Commission had originally proposed a Regulation to establish a *European Electronic Communications Market Authority (EECMA)* – see: http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=COMfinal&an_doc=2007&nu_doc=699. This Regulation gave significant powers to the Director of the Authority (see article 29), who was proposed to be an independent official with a five year term. The role of the 'Director' was substantially weakened in what became the final version of the Regulation, establishing BEREC

It is noteworthy that recent Connected Continent proposals from the European Commission for an independent professional Chairman for BEREC go in the same direction; equally, however, one could argue that the role of 'Single Market enforcer' is already fulfilled by the European Commission itself, which remains as the initiator of most measures in the telecommunications sector.
Perhaps a more relevant question for an impact assessment is whether BEREC could have delivered the same valuable input in the context of initiatives of the European Commission or legislative measures, at lower cost and with less administrative overhead, had it remained a rather informal body similar to the previous European Regulators Group (ERG), which played a somewhat similar role in providing input to the European Commission. Maintaining a less formal status would also have permitted it to retain its entire base of operations in Brussels rather than the artificial split whereby its administrative office is based in Riga, whilst most official activities still seem to be focused in Brussels or elsewhere.

The answer to this question depends on the demands placed on BEREC, and on how reliant it therefore is on the significant budget and associated administrative support provided by the BEREC Office.

3.8. Broadband and Next Generation Access (NGA) Policy: Regulatory Aspects, Universal Service, State Aid Rules, and Industrial Policy

3.8.1. Main Features

One of the main priorities of the European Commission in recent years has been to foster the development and take-up of broadband Internet services. In 2010, the European Commission adopted specific targets of achieving universal availability of standard broadband by 2013, of fast broadband (defined as speeds of > 30 Mbps) by 2020 and achieving take-up of ultrafast broadband (defined as speeds of > 100 Mbps) by 50% of households as of 2020 – the so-called Digital Agenda for Europe (DAE) broadband targets.[284] Our companion report *Entertainment x.0 to boost broadband deployment*[285] evaluates the DAE targets and puts Europe into perspective against international comparator countries as regards the deployment, take-up and usage of fast broadband.

The DAE targets have been supported through a diverse range of initiatives at EU level. These include:

- A draft Regulation by the European Commission to reduce the costs of deploying broadband, for example through better co-ordination of public works and duct sharing.[286]
- The Connecting Europe Facility, a fund which was originally envisaged by the Commission as offering € 9 billion of support in grants and loans for NGA deployment; however, the funding levels were drastically reduced by the European Council to € 1 billion.[287]

[284] Communication from the Commission on a 'Digital Agenda for Europe' 2010; available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF.
[285] European Parliament, *Entertainment x.0 to boost broadband deployment*.
[286] Proposal for a Regulation of the European Parliament and Council on measures to reduce the cost of deploying high-speed electronic communications networks; available at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=1879.
[287] European Commission DG Connection information site on 'Connecting Europe Facility'; available at: http://ec.europa.eu/digital-agenda/en/connecting-europe-facility.

- A European Commission Recommendation on cost methodologies and non-discrimination (2013),[288] which advocates stable charges for copper local loop unbundling and pricing flexibility for wholesale NGA products supplied by SMP operators if certain conditions are met.
- A European Commission Recommendation on Next Generation Access (2010),[289] which advocates a range of tools to encourage deployment. Noteworthy is the focus on offering wholesale access to a range of next generation wholesale inputs supplied by SMP operators at cost-based rates, with measures to ensure a fair return by supporting an uplift on the cost of capital[290] to reflect risk promoting mechanisms (including term and volume discounts).
- Guidelines from DG Competition concerning State Aid for broadband, which clarify the circumstances in which State Aid may be granted for next generation networks[291] and how the selection process should be conducted.[292]

In addition and in some senses as an alternative to State Aid, Universal Service provisions within the EU Regulatory Framework may, in principle, be applied to broadband, although they have not been widely used for these purposes. The European Commission has also encouraged Member States to adopt National Broadband Plans to stimulate achievement of the DAE goals at national level.

In our companion study,[293] we discuss the implications of these instruments and the extent to which they have had a significant effect on fast broadband coverage and take-up. We also look at other policies which may have influenced coverage and take-up in international markets, including factors such as population density, regulatory holidays, and demand stimulation policies such as subsidising computers.

3.8.2. Objectives

The objectives set by the European Commission concerning broadband (and alluded to in subsequent initiatives) refer to specific coverage and take-up targets:

- Universal coverage of basic broadband[294] by 2013
- Universal coverage of 30 Mbps by 2020
- 50% take-up of 100 Mbps by 2020

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[288] Commission Recommendation 2013 on consistent non-discrimination obligations and costing methodologies C(2013) 5761 final.

[289] Commission Recommendation 2010 on regulated access to Next Generation Access Networks; available at: http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF.

[290] The 'cost of capital' refers to the cost of making use of a company's funds (debt and equity financing) in order to make investments. It represents the minimum return that would be expected on investments by shareholders, and is therefore often used to evaluate new projects. When setting 'cost-oriented' rates, NRAs include a 'cost of capital' specific to the project under consideration in order to provide a 'fair return' on the investment.

[291] The European Commission broadband state aid guidelines permit public funding to be used for NGA networks in so-called NGA 'white areas' (areas not expected to be served by NGA networks within 3 years) and in certain circumstances following a review by the Commission, in NGA 'grey areas' (areas served by only one NGA network). State aid may only be granted in NGA 'black areas' (areas served by more than one NGA network) if the envisaged state aid would represent a 'step change' compared with existing services. This implies that existing services are not provided via fibre and are not expected to achieve speeds of 100Mbps in the near future.

[292] EU Guidelines for the application of State aid rules in relation to the rapid deployment of broadband networks; available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:025:0001:0026:EN:PDF.

[293] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

[294] See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*, chapter 3.

These are justified on the basis of an assumption, which is not easy to test on the basis of available data, that superfast broadband will confer economic and societal benefits over and beyond those already achieved through the widespread dissemination of basic broadband, potentially because it may unlock the ability to use innovative new applications and transform the use of the Internet (even if such developments have not yet taken place).

3.8.3. Evaluation

We conclude in the context of our companion study[295] that the overall objectives behind setting targets for fast and superfast broadband in Europe are justified; however, they lack sufficient clarity to allow them to provide a reliable yardstick. In particular, download speeds for basic broadband and upload speeds for fast and superfast broadband are not clearly defined, and there are no conditions relating to the quality of connections (ability to use real-time applications) and the potential to use these connections to access all applications of the user's choice. Moreover, it is unclear whether the targets are to be interpreted as applying to Europe on average or on a country by country basis. We make specific recommendations to refine the definitions in that report.

As regards the instruments which have been put in place or proposed to achieve the broadband targets, we conclude in the context of our companion report[296] that:

- **Infrastructure competition is the most significant driver of fast broadband deployment**. For this reason, measures such as the draft Regulation to reduce the cost of deployment should if well-implemented have a significant effect. We also recommend measures to promote network sharing in the final segment of fibre-to-the-premises infrastructure, and to encourage municipal deployments in areas where commercial deployments are not in prospect.
- **Access regulation (the main focus of the European Commission Recommendations on NGA and cost methodologies) has an ambiguous effect on fast broadband roll-out and may not be best suited as a measure to foster deployment** (although it may contribute to other valid objectives such as competition and take-up). Regulatory certainty is nonetheless an important goal.
- **Subsidies will be required to meet the DAE targets**, but universal service is no longer an appropriate mechanism in a multi-carrier broadband environment. Universal service mechanisms should be phased out in favour of reliance on state aid and end-user measures such as vouchers to support affordability. The need for renewed attention on State Aid may ultimately **put into question the wisdom of rejecting the European Commission's proposals for significant funding under the Connecting Europe Facility[297] if one believes that achieving the DAE targets should be a priority.**

[295] Ibid.
[296] Ibid.
[297] The European Council conclusions of February 2013 concerning the multiannual financial framework allocate one billion euro to telecommunications under the Connecting Europe Facility (see: http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/135344.pdf). This is a significant reduction from the nine billion euro originally proposed by the European Commission.

- **Insufficient attention has been given to demand-side measures**, which might be the most cost-effective in achieving high usage of broadband (irrespective of the speeds consumers actually receive). Copyright issues deserve particular attention in this regard, while clear Net Neutrality rules will be needed to ensure consumers can receive a range of compelling content and that network operators can make differentiated offers. The use of targeted mechanisms such as subsidies and **tax breaks to stimulate broadband take-up has also not been properly explored in a European context.**

Some of our recommendations from the companion study such as those on Universal Service and network sharing are repeated here because they may require amendments to legislation affecting the electronic communications sector. Others of our suggestions, particularly those more closely related to industrial policy (such as the judicious use of State Aid, tax breaks, vouchers, and municipal deployments), could only realistically be delivered today on a national basis through the initiative of national governments.

3.9. Mechanisms for Authorising New Services

Mechanisms for obtaining authorisation to offer electronic communication services tend not to receive a great deal of attention in the regulatory literature in Europe, but authorisation is a major component of the European Regulatory Framework. One of the five Directives that comprise the Framework deals solely with authorisation.[298]

In many parts of the world, authorisation and licensing restrictions represent a major impediment to competitive entry, thus reinforcing the market power of the incumbent.

3.9.1. Main Features

A prerequisite for entry into European telecommunications markets is to be authorised to operate networks and services in the relevant countries. The conditions governing authorisation are contained in the Authorisation Directive.[299] This aimed to enable an internal market in the provision of electronic communications services through the harmonisation and simplification of authorisation rules. In particular, the Directive prohibits the use of individual licenses that would limit the number of operators within a market, with the exception of rights of use granted for certain radio frequencies[300]. A further provision introduced following the review of the EU Regulatory Framework concluded in 2009 was that operators providing cross-border communications services to undertakings located in several Member States would not be required to submit more than one notification per country of operation.

Authorisations must be granted promptly and automatically following a notification, and the conditions attached to general authorisations are restricted to those specified in a list in the Annex to the Authorisation Directive. The types of obligations that could be covered in a general authorisation, applying to all operators irrespective of SMP, include:

- Provisions concerning administrative charges and any contributions to a universal service fund (if appropriate)

[298] Directive on the authorisation of electronic communications networks and services 2002/20/EC; available at: http://europa.eu/legislation_summaries/information_society/legislative_framework/l24164_en.htm.
[299] Ibid.
[300] Certain wireless applications such as the provision of mobile communications require the provision of 'licensed' spectrum.

- Provisions regarding interconnection and interoperability
- Consumer protection rules
- Data and privacy protection
- Enabling of lawful intercept
- Requirements to provide information to the NRA
- Restrictions concerning the transmission of illegal content
- Environmental and planning requirements

3.9.2. Objectives

Because the review of the Framework concluded in 2009 did not propose significant changes to the Authorisation regime, and the original 2002 Framework was adopted before the introduction of impact assessments, we are aware of no published statement on the objectives of the Regulatory Framework in regard to authorisations and licensing; however, one can deduce from the Directive itself that the main aims of moving towards general authorisations with harmonised conditions were to lower barriers to entry and to foster cross-border operations.

More recently, the European Commission has introduced proposals in its draft Regulation for a Connected Continent that would require an operator active in more than one EU market to submit only one authorisation in its 'Home' market, with the Home NRA responsible for enforcing serious breaches against the authorisation in collaboration with the NRA in the Host country (see section 7.2). These proposals are also aimed at promoting the Single Market by lowering barriers to cross-border provision and by simplifying administrative requirements on cross-border operators.

3.9.3. Evaluation

It is once again convenient to assess the effectiveness of these arrangements in terms of effectiveness, efficiency and coherence.

Effectiveness

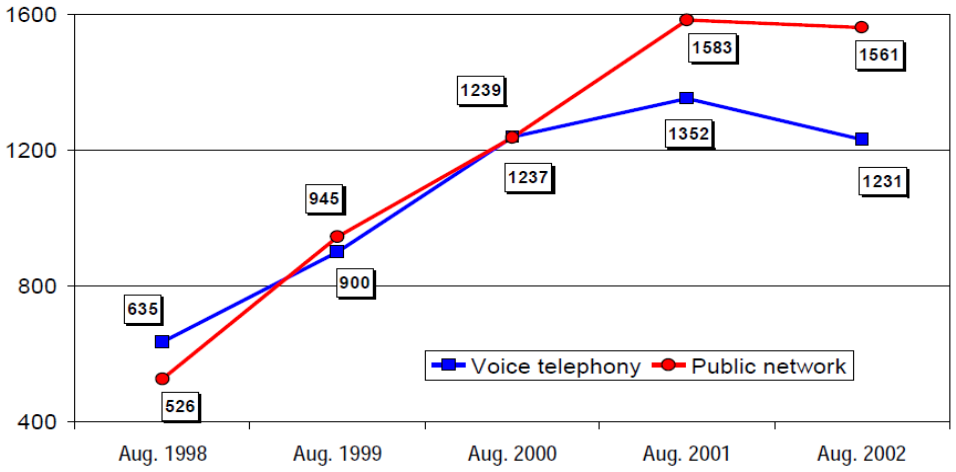
It is evident that the move from often complex and bureaucratic licensing systems towards general authorisations for which only a notification was needed reduced 'red tape'. This can be considered to have been effective.

However, evidence and interviews[301] with operators suggest that **red tape is not a major barrier to market entry or cross-border expansion in telecommunications services today, and it is not clear that it was a major barrier even before the introduction of the current Regulatory Framework.**

The Implementation Reports of the European Commission (precursors to the Digital Agenda Scorecards issued today) show that the absolute number of authorised operators in the EU grew steadily even prior to the adoption of simplified authorisation conditions, when the authorisation process was more complex, suggesting that this factor even if an annoyance was not a deal-breaker in preventing market entry.

[301] Discussions with multiple network operators indicate that authorisations could be improved, but are not the primary concern affecting operators offering or planning to offer services cross-border.

Figure 21: Number of authorised network operators in the EU (1998-2002)



Source: 8th Implementation report of the European Commission on the Framework for electronic communications, 2002.

In similar vein, several reports suggest that conditions other than authorisations were more important in determining the success of cross-border service provision.

A 2013 report from WIK-Consult[302] suggests that conditions for key access products were considered by interviewed cross-border business service providers to be of greater concern than authorisation conditions. An earlier report by WIK-consult and Cullen concerning VoIP[303] found that **numbering conditions were considered a far more significant barrier to pan-European service provision by VoIP providers than obtaining the authorisation itself.**

Efficiency

The current system seems to be functioning efficiently and reasonably well. The various studies cited earlier in this section, including the WIK-Cullen study of the regulation of VoIP in 2008, suggest that market players do not view authorisation per se as being burdensome.

It could be argued that a single authorisation would be even more efficient than the current requirement for authorisation in each country; however, whilst it may be more efficient for the operator from an administrative perspective, **it appears that the mechanisms to enforce such regimes including cross-border cooperation could radically increase complexity on the part of individual NRAs and BEREC, thus reducing overall efficiency.** It is not clear that any potential benefits of this approach would outweigh the likely loss of efficiency, especially if the 'Single Market gains' that could be achieved through the authorisation regime are minimal.

[302] Godlovitch, I., Monti, A., Schäfer, R. G. and U. Stumpf (2013), *Business communications, economic growth and the competitive challenge*, WIK Report for ECTA, Bad Honnef, 16 January 2013; available at http://www.ectaportal.com/en/upload/File/Reports/ecta_businesscustomers_final_5_clean.pdf.

[303] Marcus, J. S., Elixmann, D., Wernick, C. and the support of Cullen International (2008), *The Regulation of Voice over IP (VoIP) in Europe*, a study prepared for the European Commission, 19 March 2008.

Coherence

The current regime is generally coherent, in the sense of being consistent with overall goals of ease of competitive entry. There are no obvious mismatches with the rest of the Regulatory Framework.

The Commission's proposal to provide a streamlined cross-border authorisation regime for European operators risks either lack of content or incoherence with measures that are applied at a Member State level. For example, **it is hard to see how the nationally specific regime of market analysis and regulation based on SMP could be managed and enforced by a home NRA in cases where the incumbent in one country operates as an incumbent in another** (our understanding is that this aspect would not be covered under the Commission proposals). Environmental and planning conditions are also likely to be nationally specific, as are decisions concerning universal service. Once nationally-specific factors are stripped out, the elements remaining which could truly be enforced on a cross-border basis might be limited. Overall, the relationship between the Commission's new authorisation proposals and the existing Authorisation Directive, which has been found to be reasonably effective, is not clear. **The new approach therefore risks introducing significant uncertainties and potential contradictions.**

3.10. Spectrum Management

Spectrum management reflects a complex division of responsibilities between the Commission and the Member States.

3.10.1. Main Features

European spectrum management has historically been primarily the prerogative of the Member States; however, the Commission always had a coordinating role, especially in regard to the establishment of harmonised radio spectrum bands.

In the course of the opening up of the first Digital Dividend,[304] where broadcast spectrum in the valuable 800 MHz band was turned over for more productive use for mobile services such as mobile broadband, the Commission played a more active role, and for the first time European stakeholders recognised that greater spectrum coordination was needed at European level. Had each Member State made its own decisions without regard to its neighbours, high power high antenna broadcasting would have been operating directly adjacent to medium power mobile broadband services in adjacent countries. Harmful interference would have been problematic.[305] The Commission drove a coordinated solution favouring mobile broadband, thus mitigating interference problems.[306]

The lesson was not lost on spectrum experts and policymakers. An expanded role for the Commission was in the common interest.

[304] Analysys Mason (2009), Exploiting the Digital Dividend – a European approach, 14 August 2009.
[305] Ibid.
[306] European Commission (2010c), Commission Decision of 6 May 2010 on harmonised technical conditions of use in the 790-862 MHz frequency band for terrestrial systems capable of providing electronic communications services in the European Union.

The revised Framework Directive of 2009 empowered the Commission (taking utmost account of the opinion of the Radio Spectrum Policy Group (RSPG), a group of national experts) The European Commission adopted its proposal for a first Radio Spectrum Policy Programme (RSPP)[307] on 20 September 2010, and the European Parliament and Council approved the RSPP on 15 February 2012. The RSPP is a key element of the amendments to the regulatory framework for electronic communications that were enacted in November 2009.

The RSPP sets out the guiding principles and the objectives to be followed by Member States and EU institutions in the field of radio spectrum, and indicates the initiatives that should be taken to allow a swift implementation of these principles and objectives.

3.10.2. Objectives

The Framework Directive as amended in 2009 is fairly clear in expressing the objectives of spectrum management at European level. First, Article 8a(1) states: 'Member States shall cooperate with each other and with the Commission in the strategic planning, coordination and harmonisation of the use of radio spectrum in the European Community. To this end, they shall take into consideration, inter alia, the economic, safety, health, public interest, freedom of expression, cultural, scientific, social and technical aspects of EU policies as well as the various interests of radio spectrum user communities with the aim of optimising the use of radio spectrum and avoiding harmful interference.'

Goals can also be inferred from the exceptions to technological and service neutrality. Technology neutrality is required. Proportionate and non-discriminatory restrictions are permitted only for circumscribed reasons, per Article 9(3):

- avoid harmful interference
- protect public health against electromagnetic fields;
- ensure technical quality of service;
- ensure maximisation of radio frequency sharing;
- safeguard efficient use of spectrum; or
- ensure the fulfilment of a general interest objective

Service neutrality is also required by Article 9(4) except to ensure the fulfilment of a general interest objective such as:

- safety of life;
- the promotion of social, regional or territorial cohesion;
- the avoidance of inefficient use of radio frequencies; or
- the promotion of cultural and linguistic diversity and media pluralism, for example by the provision of radio and television broadcasting services.

The Authorisation Directive contains language that is broadly consistent with the Framework Directive.

[307] European Union (2012), Decision No 243/2012/EU of the European Parliament and of the Council of 14 March 2012 establishing a multiannual radio spectrum policy programme.

3.10.3. Evaluation

Spectrum management plays an increasingly central role in light of Digital Agenda for Europe objectives to make fast and ultra-fast broadband available to all Europeans. Mobile and (to a lesser degree) fixed wireless service will be used to reach parts of the national territory that cannot be cost-effectively served with fixed network solutions, and mobile will also serve as a complement to fixed in denser areas.

The Commission plays an important coordinating role, but lacks the authority to enforce decisions.

A conspicuous example where this has been problematic has been in reassignment of the previously mentioned 800 MHz band.[308] A few Member States (notably Germany, to its credit) promptly auctioned 800 MHz spectrum, but in many others the process is still on-going.[309] This is a concern, first because the spectrum is still not being put to the most productive use (such as mobile broadband), and second because it is an evil omen for the prospects of the next Digital Dividend band, the 700 MHz band that will become available after the 2015 ITU World Radiocommunications Conference (WRC).[310]

3.11. Privacy and Security

A number of instruments and mechanisms exist to foster consumer privacy and network and information security within the European Union. These seem to be adequately addressed in other reports for the European institutions,[311] and in any case are largely orthogonal to the issues dealt with in this report.

[308] Under Article 6(4) of the RSPP, the band should already substantially be available for wireless broadband. 'By 1 January 2013, Member States shall carry out the authorisation process in order to allow the use of the 800 MHz band for electronic communications services. The Commission shall grant specific derogations until 31 December 2015 for Member States in which exceptional national or local circumstances or cross-border frequency coordination problems would prevent the availability of the band […]'.

[309] See European Commission (2013h), Europeans suffering because most Member States are too slow delivering 4G mobile broadband spectrum, 23 July 2013. As of July 2013, spectrum had been made available in only 11 Member States: DK, DE, IE, FR, IT, LU, NL, PT, SE, UK; and Croatia. By the end of 2013, the band should be available in LT, ES, AT, SK, FI, CZ, HU, BE, and EE. Delays into 2014 are expected in RO, SI, PL, EL, and MT, into 2015 in LV and CY, and into 2017 in BG!

[310] The so-called 700 MHz band is actually 698–806 MHz. The 2012 World Radiocommunication Conference (WRC-12) of the International Telecommunications decided to reallocate the 700 MHz band to include mobile services (which includes mobile broadband), immediately following the 2015 WRC (WRC-15). See International Telecommunications Union (2013), Final Acts - WRC-12, Geneva.

[311] See European Parliament (2011b), *The role of ENISA in contributing to a coherent and enhanced structure of network and information security in the EU and internationally*; European Parliament (2012b), *Data Protection Review: Impact on EU Innovation and Competitiveness*; European Parliament (2011c), *Does it help or hinder? Promotion of Innovation on the Internet and Citizens' Right to Privacy*; and Marcus, J. S., Carter, K. et al. (2008), *Comparison of Privacy and Trust Policies in the Area of Electronic Communications*, a study prepared for the European Commission.

4. COMPARISONS TO OTHER REGIONS AND COUNTRIES

KEY FINDINGS

- **Different countries and regions around the world have approached these issues in different ways, and with substantially different outcomes as a result.**
- Europe has a quite huge number of fixed and mobile network operators. Even today, network services tend to be sold primarily as national rather than European products. There is, as has widely been noted, no truly pan-European network today.
- By contrast, the network tends to be more concentrated in many of the regions with which Europe competes. In the US, for example, the vast majority of customers are served by three fixed operators and four national mobile operators (even though there are huge numbers of tiny fixed operators), and there is substantial overlap between these groups.
- Our comparison countries include the United States, Canada, Australia, New Zealand, Japan, Singapore, Mexico, and India. These countries vary greatly in the nature and effectiveness of their regulatory institutions.
- The character of access regulation is a useful measure of regulatory institutions. The comparator countries have very different arrangements, ranging from structural separation, to unbundled local loops, to laissez faire lack of regulation.
- Call termination arrangements are another useful measure for comparison. Some countries regulate call termination much as Europe does. Others require payment to fixed network operators, but in effect not among mobile operators. Japan does not regulate mobile-to-mobile termination rates at all.
- **Each regulatory system needs to be understood as a whole. Each has strengths and weaknesses.**

Different countries and regions around the world have approached these issues in different ways and with substantially different outcomes as a result. A great deal can be learned by objective comparisons.

Comparisons are possible among many different dimensions. Countries differ for instance in terms of (1) institutional arrangements, including the areas of competence of the regulatory agency;[312] (2) the nature and degree of effectiveness of procompetitive regulation; and (3) market structures, which are partly a cause and partly a result of public policy interventions. Market structure issues related to broadband are covered in far greater depth in a companion report to this one.[313]

[312] See Marcus, J. S. and J. Rendon Schneir (2010), *Drivers and Effects of the Size and Composition of Telecoms Regulatory Agencies*, presented at ITS Europe, Copenhagen, September 2010; available at: http://ssrn.com/abstract=1675705; and Marcus, J. S. (2012), Structured Legislation – Toward the Synthesis of Better Law and Regulation of Electronic Communications, in *Legisprudence*, International journal for the study of legislation, Vol. 6, No 1, 2012, p 1-33.

[313] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment.*

In this chapter, we have taken the regulation of access and of voice call termination as being relevant bellwethers of the degree to which regulation and policy support procompetitive outcomes. In countries where network neutrality has been a major discussion, such as the United States, we treat it as an access issue. We have chosen to place little focus on the substance and character of the underlying legislation, because we think it is less instructive for an audience of European policymakers. We begin with an overall discussion of the distinction between networks and services, and the interactions that this has with global competition.

4.1. Networks, Services, and Global Competition

In understanding European competitiveness with other regions of the world, it is important to distinguish between (1) networks and the (2) applications and (3) content that flow over those networks. Each represents an aspect of the Digital Single Market, but they are distinct aspects, and Europe's competitive position in each is different. **A common theme, however, is that European fragmentation impacts Europe's global competitiveness.**

These differences come into play at many different levels. It is important to distinguish between (1) the ability of European providers of electronic communications and related services to compete outside of Europe; versus (2) the cost-effectiveness of all sectors within Europe, i.e. European macroeconomic efficiency.

Europe has a quite huge number of fixed and mobile network operators. Even today, network services tend to be sold primarily as national rather than European products. There is, as has widely been noted, no truly pan-European network today.

By contrast, the network tends to be more concentrated in many of the regions with which Europe competes. In the US, for example, the vast majority of customers are served by three fixed operators and four national mobile operators (even though there are hundreds of tiny fixed operators),[314] and there is substantial overlap between these groups. China is also a highly concentrated market overall.[315]

Europe has a strong technological base, but we are by no means a leader in generating successful ground-breaking commercial applications. As our companion study for the Parliament[316] notes, 'Ubiquitous market solutions include a wide range of services and platforms, including eCustoms services developed by SAP, the eBay market place, Microsoft's cloud services and Skype VoIP service, the Facebook Platform and Facebook Connect, a range of offerings from Google, and the Apple app store. The ubiquitous market solutions have been, with the exception of Skype and SAP, developed in the US.'[317] For that matter, even Skype is now owned by Microsoft, a US-based enterprise.

[314] The NTCA Rural Broadband Association, for instance, claims some 900 members. See http://www.ntca.org/about-ntca/about-ntca/.

[315] For a market overview, see the US International Trade Administration (2010), Telecom Market Summary: China, 28 February 2010, at http://web.ita.doc.gov/ITI/itiHome.nsf/9b2cb14bda00318585256cc40068ca69/7a19947d610987658525788c0041ea3d/$FILE/telecom%20market%20snapshot-china.pdf.

[316] European Parliament (2013c), *Ubiquitous Developments of the Digital Single Market*.

[317] For background on these firms, see their web sites, at www.sap.com, http://pages.ebay.com/aboutebay/thecompany/companyoverview.html, http://www.microsoft.com/en-gb/about/default.aspx, www.skype.com, https://www.google.com/intl/en/about/, https://www.facebook.com/facebook, and www.apple.com, respectively.

Analogous challenges face Europe in regard to content. Europe's diversity is a strength; nonetheless, it has costs. Europe consists of numerous media markets, fragmented along national, cultural and linguistic lines. Very little of our production of audio-visual media is geared toward worldwide or even European distribution. **As a result, Europe produces more films per year than Hollywood, yet Hollywood tends to dominate our distribution channels and media revenues in Europe; moreover, European films, although often of excellent artistic qualify, earn far less than American films in the global marketplace.**[318] Analogous issues impact many areas of European media, but there are also a few areas of relative strength or potential strength.[319]

4.2. The United States and Canada

Much of EU policy in the electronic communications space was inspired by the US procompetitive example circa 1996; however, the US took a markedly different path during the period 2002-2005.[320] The copper and fibre last mile was almost totally deregulated.

Canada can be viewed as a progressive country with generally effective regulatory institutions. Their ability to diverge from the policies of their large neighbour to the south are limited, especially in areas such as spectrum management (bearing in mind that most Canadians live within 100 kilometres or so of the US border).

4.2.1. Institutional Arrangements

In the United States, the Federal Communications Commission (FCC)[321] has responsibility for telecommunications, including cable television, and also for broadcasting and media. The FCC also has responsibility for spectrum management, with however the unique exception that spectrum management for the Federal Government itself is dealt with by the National Telecommunications and Information Administration (NTIA),[322] a unit of the US Department of Commerce. The NTIA also deals with industrial policy issues, and is the lead agency in most matters relating to the Internet. To put this in terms familiar to Europeans, if the US FCC could be likened to an NRA, then the NTIA could be likened to the relevant European Ministry.

[318] This has been a consistent trend for many years. In 2008, for instance, the European Union produced some 1,142 feature films, in comparison with just 520 for the USA; nonetheless, US films generated 65.6% of cinema revenues in Europe for the same year. The proportion of European fiction broadcast by European television channels was just 39.1% in 2007. All data are from the European Audiovisual Observatory.

[319] Marcus, J. Scott, Stephen Adshead, Phillipa Marks, Gilles Fontaine, et al. (2011), Impact Assessment integrating ex ante evaluation requirements in view of the preparation of a proposal for the next MEDIA Programme after 2013, study for the European Commission.

[320] Federal Communications Commission (FCC) Office of Strategic Planning and Policy Analysis (OSP) (2002), *The Potential Relevance to the United States of the European Union's Newly Adopted Regulatory Framework for Telecommunications*, Working Paper 36, July 2002; available at: http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-224213A2.pdf. See also Marcus, J. S. (2005), *Is the U.S. Dancing to a Different Drummer?*, Communications & Strategies, no. 60, 4th quarter 2005; available at: http://www.idate.fr/fic/revue_telech/132/CS60%20MARCUS.pdf.

[321] See www.fcc.gov.

[322] See www.ntia.doc.gov.

Competition law (antitrust) plays a much more limited role in the United States than in Europe. Pursuant to a number of court cases,[323] competition law is largely pre-empted by sector-specific regulation. More specifically, the provisions of the Communications Act of 1934[324] as amended cannot constitute a separate cause of action under competition law. It is also worth noting that competition law in the United States differs in many ways from that of Europe.

In Canada, the Canadian Radio-television and Telecommunications Commission (CRTC)[325] has the functions that we associate with an NRA. Spectrum is managed by Industry Canada[326], which is effectively the Ministry. Competition law is in practice largely excluded from interacting with regulation

4.2.2. Procompetitive Instruments

Regulation of electronic communications in the United States reflects a sharp dichotomy between two legal (not economic) classifications: telecommunication services and information services. Telecommunication services are subject to numerous regulatory obligations; information services were historically subject to few if any explicit obligations.[327]

Core Internet services were always treated as information services, and thus largely unregulated; physical access to the Internet was, however, historically treated as a regulated telecommunication service. As long as this was the case, the US regulatory system worked more or less similarly to that which Europe adopted in 2002-2003.[328] Through a series of regulatory decisions taken during roughly the period 2002-2005, the FCC classified **Internet access when sold bundled with Internet service to be an information service, thus generally exempting it from regulation.[329]** This effectively eliminates all regulatory obligations to provide wholesale access to DSL, cable, and mobile broadband, whether the network operator has market power or not. At the same time, **broadband access over optical fibre was fully deregulated.**

Canada did not follow the US lead in this regard. Local loop unbundling remains in effect, as does wholesale broadband access (with the requirement that the speed of the wholesale offering may not be less than that which the incumbent uses for its own services).[330]

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[323] Notably *Goldwasser v. Ameritech Corp*. 222 F.3d 390 (7th Cir. 2000) and Law Offices of *Curtis V. Trinko, L.L.P. v. Bell Atlantic Corp*., 294 F.3d 307 (2nd Cir. 2002).

[324] Codified at 47 U.S.C. 151 through 614.

[325] See www.crtc.gc.ca/eng/home-accueil.htm.

[326] See www.ic.gc.ca/eic/site/ic1.nsf/eng/home.

[327] For a more extensive comparison of the US and the EU, especially in regard to network neutrality, see our study for the European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*

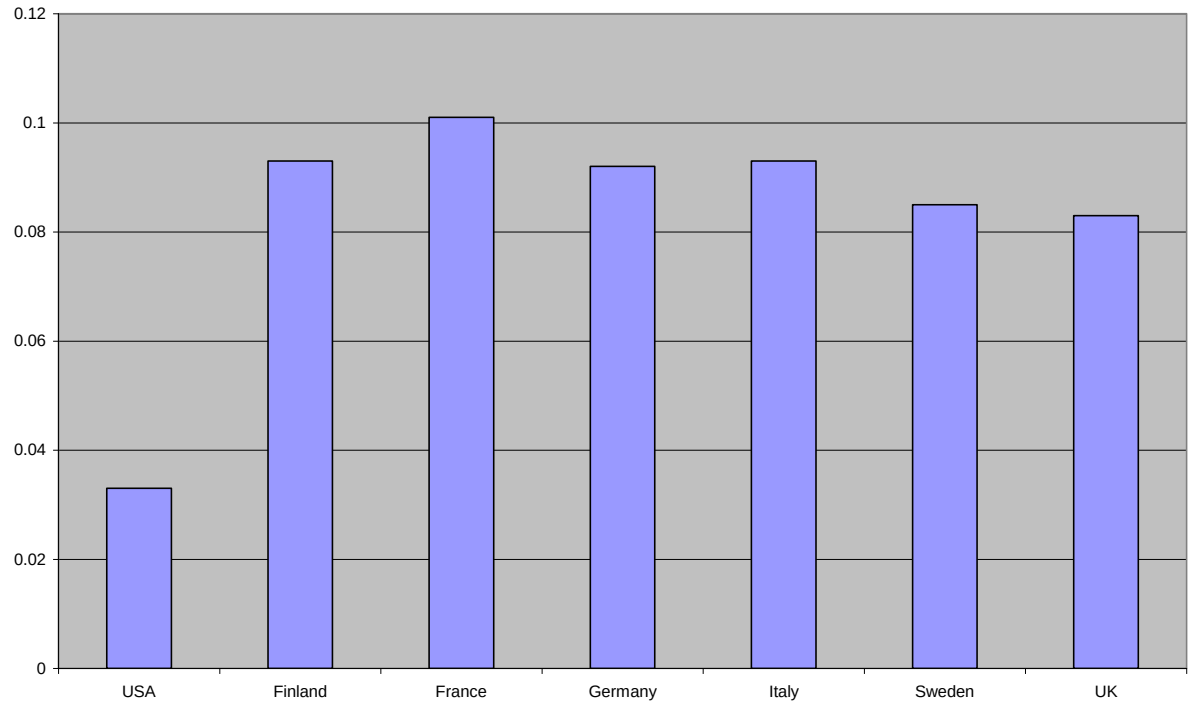
[328] J. Scott Marcus, Federal Communications Commission (FCC) Office of Strategic Planning and Policy Analysis (OSP) (2002), *The Potential Relevance to the United States of the European Union's Newly Adopted Regulatory Framework for Telecommunications*, Working Paper 36, July 2002, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-224213A2.pdf.

[329] See for instance Marcus, J. S. (2005), *Is the U.S. Dancing to a Different Drummer?*, Communications & Strategies, no. 60, 4th quarter 2005; available at: http://www.idate.fr/fic/revue_telech/132/CS60%20MARCUS.pdf.

[330] See CRTC (2010), Wholesale high-speed access services proceeding, Telecom Regulatory Policy CRTC 2010-632; available at: http://www.crtc.gc.ca/eng/archive/2010/2010-632.htm; and CRTC (2011), Bell Aliant Regional Communications, Limited Partnership and Bell Canada – Monthly recurring rates and service charge rates for unbundled loops in Ontario and Quebec, Telecom Decision CRTC 2011-24; available at: http://www.crtc.gc.ca/eng/archive/2011/2011-24.htm.

The United States has had call termination rate arrangements that, their considerable complexity and opacity notwithstanding, have generated substantial consumer benefits. **Strong regulatory obligations of symmetry and parity of rates created a framework where mobile operators freely chose to set zero termination payments among one another (so-called 'bill and keep') in most cases.** Fixed network voice call termination was often, but not always, cost based. **These wholesale arrangements encouraged retail arrangements with flat rate packages including large numbers of off-net voice minutes** (with both calls placed and calls received counted), and **these arrangements in turn encouraged much higher usage of the mobile network than in Europe.** Figure 22 provides a rough estimate of retail price per minute of use in the US (in US cents as of 4Q2011) versus selected Member States, while Figure 23 provides the monthly voice minutes of use in the same countries.[331] Data was historically often on a flat rate 'all you can eat' basis; however, most US plans today entail usage caps or other volume controls.

Figure 22: Price per voice call minute in the US versus selected EU Member States (2011)

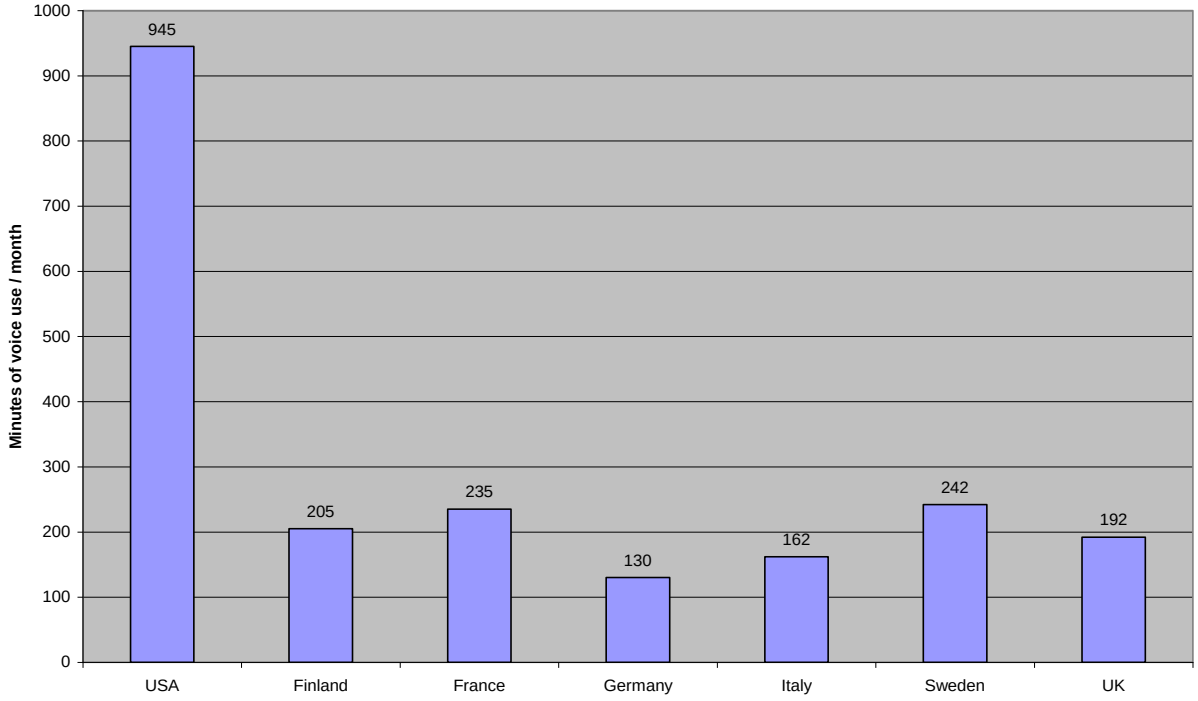


Source: Bank of America Merrill Lynch (2011), Global Wireless Matrix 4Q11.[332]

[331] Bank of America Merrill Lynch, Global Equity Research (2011), *Global Wireless Matrix 4Q11*, 19 April 2012; as reported in US FCC (2013), Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, 21 March 2013. Note that the Service-based revenue per minute of use is an imperfect proxy for retail revenue, since it also includes a small percentage of wholesale termination revenue.

[332] Ibid.

Figure 23: Minutes of voice use per month in the US versus selected EU Member States (2011)



Source: Bank of America Merrill Lynch (2011), Global Wireless Matrix 4Q11.[333]

In 2011, after many years of preparatory work, the US sought to modernise its interconnection arrangements (and also universal service) by means of the comprehensive *Connect America Fund (CAF) Order*.[334] With the CAF Order, the FCC set up a system under which intrastate termination charges would, on the whole, phase down from current levels down to $0.0007 (about € 0,0005 at current exchange rates) and then to bill and keep over time. The long term approach to VoIP-to-VoIP interconnection was deferred to another day, but VoIP interconnection to traditional PSTN networks would be under the same rules as PSTN-to-PSTN interconnection. They expressly applied the same rules to VoIP traffic and traditional switched traffic. Access charges began to decline in July 2012, with a second step having occurred in July 2013.

Canada historically used capacity-based charging (CBC), which means that charges were based on the interconnect capacity required rather than the number of minutes exchanged.[335] There are a number of practical advantages to such an approach, given that network deployment costs tend to be driven by capacity rather than usage. Canada is currently evolving in the direction of comprehensive bill and keep arrangements, and is thus tracking the evolution of US developments.

[333] Bank of America Merrill Lynch, Global Equity Research (2011), *Global Wireless Matrix 4Q11*, 19 April 2012; as reported in US FCC (2013), Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, 21 March 2013.

[334] Federal Communications Commission (FCC) (2011), In the Matter of Connect America Fund: A National Broadband Plan for Our Future; Establishing Just and Reasonable Rates for Local Exchange Carriers; High-Cost Universal Service Support; Developing an Unified Intercarrier Compensation Regime; Federal-State Joint Board on Universal Service; Lifeline and Link-Up; Universal Service Reform – Mobility Fund, Report and Order and Further Notice of Proposed Rulemaking. This complicated order is 752 pages long.

[335] Analysys Mason (2008b). Case studies of mobile termination regimes in Canada, Hong Kong, Singapore and the USA.

Network neutrality has been an even more intensely debated topic in the US than in the EU, presumably because US consumers and content providers have been concerned about the concentrated (effectively duopoly) broadband marketplace.[336] Where informed consumers have more choice, as is the case in most EU Member States, anticompetitive discrimination is likely to be unprofitable. Concerns about possible network neutrality infringements led the FCC to issue the Open Internet ruling in 2010.[337] The three key provisions of the Open Internet ruling are:

- **'Rule 1: Transparency:** A provider of broadband Internet access service must publicly disclose accurate information regarding the network management practices, performance, and commercial terms of its broadband Internet access services sufficient for consumers to make informed choices regarding use of such services and for content, application, service, and device providers to develop, market, and maintain Internet offerings.'
- **'Rule 2: No Blocking:** A provider of fixed broadband Internet access service, insofar as such person is so engaged, shall not block lawful content, applications, services, or non-harmful devices, subject to reasonable network management. A provider of mobile broadband Internet access service shall not block consumers from accessing lawful websites, subject to reasonable network management; nor shall such person block applications that compete with the provider's voice or video telephony services, subject to reasonable network management.'
- **'Rule 3: No Unreasonable Discrimination:** A provider of fixed broadband Internet access service, insofar as such person is so engaged, shall not unreasonably discriminate in transmitting lawful network traffic over a consumer's broadband Internet access service. Reasonable network management shall not constitute unreasonable discrimination.'

Legal challenges are still ongoing, but our prediction is that the Open Internet ruling will be sustained in most respects.

4.2.3. Market Structures

In the US, competition based on loop unbundling, shared access[338] and bitstream[339] had peaked at roughly 7% of all DSL[340] in 2003, then declined to negligible levels once regulatory support was withdrawn.[341] In assessing the results, it is important to bear in mind that nearly every US household is reachable not only by the fixed (and mobile) networks, but also by highly capable cable television infrastructure; thus, the results are

[336] See Chapter 5 of European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*

[337] Federal Communications Commission (FCC) (2010), Report and Order, In the Matter of Preserving the Open Internet; Broadband Industry Practices; GN Docket No. 09-191, WC Docket No. 07-52, 23, December 2010.

[338] Shared access is a form of unbundling where the competitive operator obtains only high frequency use of the line as a means of carrying data. The incumbent retains the use of the low frequencies on the copper loop, with which it is able to provide voice services.

[339] With bitstream access, a competitor gains access to the incumbent's high-speed access link to the customer premises in order to provide high-speed services to customers. The incumbent may also provide transmission services to its competitor.

[340] DSL stands for *Digital Subscriber Line (DSL)*. DSL is a type of high speed Internet broadband access that communicates through a phone line, but produces a continuous connection that does not interfere with the line. DSL creates an asymmetric connection, where the downstream data is much faster than the upstream. ADSL and VDSL are both forms of DSL.

[341] European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.* For background, including a graph of the decline, see Marcus (2005), *Is the U.S. Dancing to a Different Drummer?*, *Communications & Strategies*, no. 60, 4th quarter 2005.

somewhat different than that which might be expected if a similar deregulation were attempted in Europe. **Most Americans can choose between two broadband infrastructures, cable and traditional telecommunications. What is absent in the US today are the so-called altnet competitors, i.e. those buying access from incumbents.**

The US has achieved about 50% more fibre deployment than Europe; however, all indications are that fibre deployment has more or less reached its high water mark. Cable has been gaining market share at the expense of ADSL[342] and VDSL[343] services, leading to concerns over a possible shift over the next few years from a de facto duopoly to a de facto near monopoly.[344]

LTE[345] deployment and adoption are much more extensive in the US than in the EU. Mobile broadband likely plays a larger role in the US than in Europe; however, it still tends to serve primarily as an economic complement to fixed broadband, rather than a substitute.

4.2.4. Effectiveness and Efficiency

US regulatory practice has inspired many elements of regulatory best practice throughout the world. Liberalisation of the industry, spectrum auctions and the use of market mechanisms, and licence exempt[346] spectrum all have important roots in the United States.

At the same time, US regulatory practice today could be said to be complicated and idiosyncratic. This poses challenges when other countries seek to benefit from possibly interesting US regulatory practices. Indeed, the legal foundation for U.S. regulatory policy for telecommunications has grown by accretion since enactment of the Communications Act of 1934, leading to a progressive decline in the comprehensibility and coherence of the system as a whole.[347] This has contributed to making FCC decisions vulnerable to legal challenges.

Compared to European NRAs, the US FCC is far more engaged in litigation, but conducts far less economic analysis. This is visible in the mix of skills in the staff. A 2010 article found that the US FCC (and also the Canadian CRTC) have a far higher proportion of lawyers, and a far lower proportion of economists, than the typical European NRA (see Figure 24).[348] This was particularly pronounced among the 38 FCC senior managers, 22 of whom were lawyers; however, there was only one engineer, and no economists at all.

[342] Asymmetric Digital Subscriber Line. ADSL creates an asymmetric connection, where the downstream data is much faster than the upstream.

[343] Very high bitrate Digital Subscriber Line. VDSL uses copper networks in the access. VDSL is deployed over existing wiring used for analog telephone service and lower-speed DSL connections. VDSL is an upgrade of ADSL, providing higher speeds, but shorter loop lengths.

[344] See for instance Crawford, S. (2013), *Captive Audience: The Telecom Industry and Monopoly Power in the New Gilded Age*.

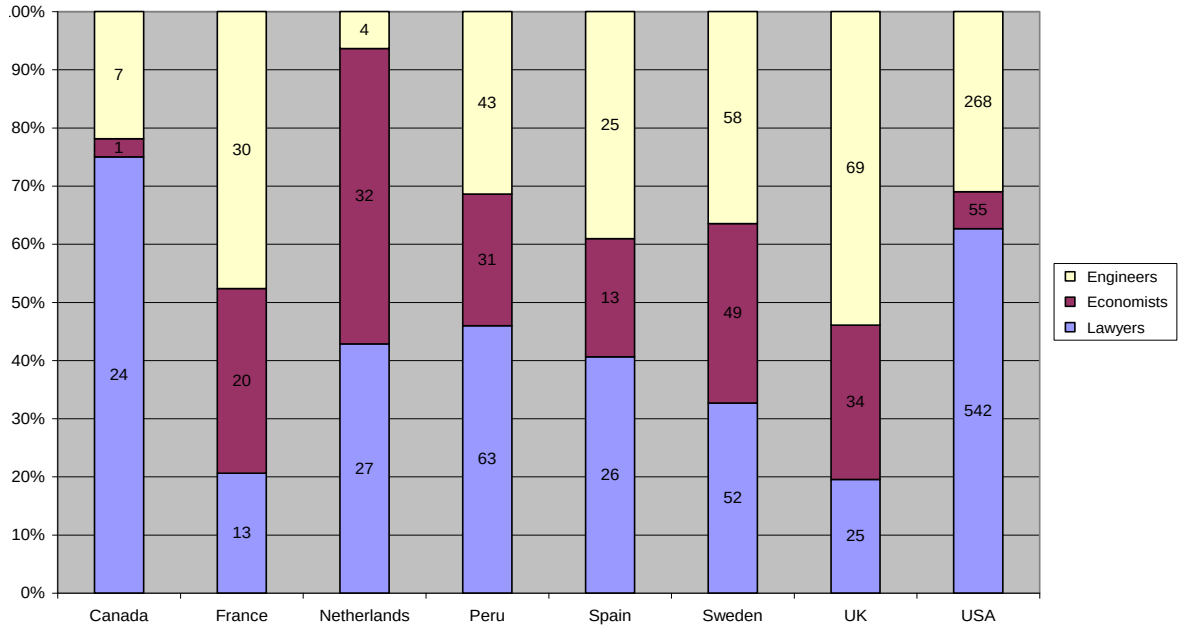
[345] Long Term Evolution. LTE (4G) is the successor of UMTS (3G) and is a fully packet switched concept (all IP) for mobile broadband electronic services, including voice.

[346] Licence exempt spectrum can be used by any application, subject to certain rules, without a spectrum licence. This approach was pioneered in the US (where it is referred to as *unlicensed spectrum*), and is fundamental to the use of technologies such as Wi-Fi.

[347] See Marcus, J.S. (2012), *Structured Legislation – Toward the Synthesis of Better Law and Regulation of Electronic Communications*. In Legisprudence, International journal for the study of legislation, Vol. 6, No 1, 2012, p 1-33.

[348] Marcus, J. S. and J. Rendon Schneir (2010), *Drivers and Effects of the Size and Composition of Telecoms Regulatory Agencies*, presented at ITS Europe, Copenhagen, September 2010; available at: http://ssrn.com/abstract=1675705.

Figure 24: Staff composition mix among different NRAs (2010)



Source: WIK[349]

4.3. Australia and New Zealand

Australia is a particularly interesting case. The government is investing up to €3,000 per household to connect the whole country using FTTP.[350] The government has gone to considerable lengths to ensure that the government-owned National Broadband Network (NBN)[351] will be a commercial success, even to the point of purchasing two functioning cable networks (and their respective customers) operated by Telstra[352] and Optus[353] that serve 20% of Australians in order to prevent competition with the NBN. The NBN is a heroic venture in some respects; in other ways, it could be viewed as a belated attempt to re-invent a national government-owned monopoly incumbent, and thus a reversal of the liberalisation process.

Plans for the NBN are in flux at the moment. The NBN was a major bone of contention in the just-completed Australian elections. The new administration is expected to implement a less ambitious but more cost-effective plan for the NBN that employs a mix of FTTC/VDSL[354] and possibly cable.

In New Zealand, a different approach was followed for the management of the FTTH[355] infrastructure. The Government committed NZD 1.35 billion (about 800 million euro at current exchange rates) for the deployment of an FTTP network, and awarded funds to private companies according to regional areas, with the majority (70% of fibre lines) going to the network operated by the former incumbent Chorus.[356]

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[349] Ibid.
[350] The most remote 7% of households will be connected using mobile or satellite.
[351] NBN Co http://www.nbnco.com.au/.
[352] Telstra http://www.telstra.com.au/.
[353] Optus https://www.optus.com.au/.
[354] With Fibre-to-the-Cabinet (FTTC), a fibre optic path is terminated in a street cabinet. The final connection to the subscriber's premises is a physical medium other than optical fibre. VDSL is Very high bit rate DSL. VDSL uses copper networks in the access. VDSL is deployed over existing wiring used for analogue telephone service and lower-speed DSL connections. VDSL is an upgrade of ADSL, providing higher speeds, but over shorter loop lengths.
[355] With Fibre-to-the-Home (FTTH), a fibre optic communications path is terminated on or in the premise for the purpose of carrying communications to a single subscriber.
[356] See http://www.chorus.co.nz/.

4.3.1. Institutional Arrangements

In Australia, the Australian Competition & Consumer Commission (ACCC)[357] is an extremely broad agency that Europeans could view not only as the National Competition Authority (NCA),[358] but also as the sectoral regulator (NRA) for electronic communications, not to mention rail, aviation, post, water, energy, and more.

At the same time, the ACCC does not deal with broadcasting, nor with spectrum management. These are the province of the Australian Communications and Media Authority (ACMA).[359] Both agencies deal with various aspects of consumer protection.

In the past, New Zealand was something of a global anomaly. They operated for many years without a sector-specific telecoms NRA. This ultimately proved to be unworkable – it led to interminable interconnection disputes. Dissatisfaction among the public and the Government with the long delay under the previous light-handed regulatory regime manifested itself in due course in the passage of a new Telecommunications Act in December 2001. The Telecommunications Act provided for a dispute resolution regime for access to regulated telecommunications services. In addition, a Telecommunications Commissioner was established within the New Zealand Commerce Commission[360], with powers to regulate ex ante certain services.[361]

4.3.2. Procompetitive Instruments

Australia historically had a familiar standard set of cost-based access remedies. These were coupled with a relatively weak functional separation, limited primarily to accounting separation.

With its plans for a National Broadband Network, the Government is effectively moving to renationalise the access network, and has agreements in place with the former incumbent and cable operators that would effectively buy out infrastructure competitors and transfer existing customers on the cable and copper networks onto the state-owned fibre infrastructure provider. This would serve to minimise network duplication, effectively establishing a monopoly in the access network. The Australian NBN aims to connect 93% of Australian households to FTTP by 2020, with an initial intention to do so at speeds of 100 Mbps; however, plans were announced to make 1 Gbps speeds available by the end of 2013.[362]

New Zealand had a functional separation regime similar to that of the UK in place for several years.[363] More recently, as New Zealand moved to provide state aid to the deployment of FTTH infrastructure, they sought to ensure that subsidised firms would not at the same time compete in the retail market. Telecom New Zealand, which had felt constrained by the functional separation regime, decided to switch to a full structural separation of the Chorus access entity. This should effectively address access and non-discrimination concerns.

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[357] See www.accc.gov.au.
[358] A National Competition Authority (NCA) is an authority invested with the power to apply competition law normally including provisions aimed at sanctioning the abuse of a dominant position or equivalent.
[359] See www.acma.gov.au/.
[360] See www.comcom.govt.nz.
[361] Haucap, J. and J. S. Marcus (2005), *Why Regulate? Lessons from New Zealand*, *IEEE Communications Magazine*, November 2005.
[362] Swan, J. and A. Moses (2013), *NBN customers set for world-leading download speeds to happen by end of the year*, *Sydney Morning Herald*, 19 April 2013.
[363] Bleisch, R. and J. S. Marcus (2009), *International Experience with Vertical Separation in Telecommunications – The Case of New Zealand*, ITS, Bahrain, 2009, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1587438.

Both countries effectively regulate voice call termination rates. In the case of New Zealand, it is a lightweight form of regulation, where benchmarks are used to estimate reasonable rates, and the network operators in practice sign contracts with the government rather than being literally subject to regulation. Roaming between the two countries has been a concern, but is not subject to substantial regulation.[364]

4.3.3. Market Structures

For Australia, Telstra[365] is one of the most powerful incumbents in the world. It has important interests in fixed, mobile, cable television, and content (especially sports content).

The Australian cable television environment is unique. Incumbent Telstra and competitor have cable networks that serve almost exactly the same 20% of the Australian population.

4.3.4. Effectiveness and Efficiency

Our perception is that regulatory institutions in both countries are innovative, well-run, and led by highly competent staff. We have some concerns that the Australian NBN may represent something of an over-reach.

4.4. Japan

Japan is quite a different model. Thanks to effective regulation of the copper last mile, competitors achieved substantial success with DSL. Fibre unbundling has however been relatively ineffective, resulting in a degree of re-monopolisation by NTT East[366] and NTT West.[367]

4.4.1. Institutional Arrangements

In Japan, the Ministry of Internal Affairs and Communications (MIC)[368] serves both as Ministry and as NRA, and also as competition authority for the sector. The MIC deals with a huge range of public infrastructure services, including the public service personnel system, local administration and finance, electoral systems, fire fighting and disaster prevention, information and communications, and postal services.

The Ministry of Internal Affairs and Communications deals with spectrum management. The Ministry of the Economy, Trade and Industry (METI)[369] deals with digital services.

The Japanese government retains a substantial fraction of the shares of incumbent NTT.[370]

4.4.2. Procompetitive Instruments

Broadband deployment in Japan was initially stimulated by cable, but took off when local loop unbundling was introduced starting in 1999. This was a hugely successful initiative.

[364] For an assessment of the costs of roaming between Australia and New Zealand, see Marcus et al. (2012), *Trans-Tasman Roaming: Service Costs*.
[365] See www.telstra.com.au.
[366] See www.ntt.com.
[367] Ibid.
[368] See www.soumu.go.jp/english.
[369] See www.meti.go.jp/english.
[370] See www.ntt.com.

Unbundling also nominally exists for Fibre to the Premises (FTTP) using Passive Optical Networking (PON);[371] however, the competitor needs to acquire eight lines at a time. For an entrant, this is rarely practical; consequently, unbundled fibre loops are hardly ever used.

Mobile voice interconnection differs from that in many other markets. MTRs were totally unregulated for many years, and continue to be only lightly regulated. This appears to have resulted in relatively high retail prices to consumers.

Statistics from the Bank of America Merrill Lynch (BoAML) Wireless Matrix[372] for the years 2003 to 2009 suggest that market leader NTT DoCoMo was setting Mobile Termination Rates (MTRs) at levels close to their own average service-based revenue (SBR) per Minute of Use (MoU). This would tend to put pressure on competitors, as a form of price squeeze.

4.4.3. Market Structures

For copper-based ADSL, Softbank[373] achieved a larger market share than NTT East and NTT West combined. For fibre-based GPON,[374] however, the retail market shares of NTT East and NTT West are more than 70%. Nearly all competitive GPON is facilities-based.

The combined market share[375] of NTT East and West (by number of lines) regarding FTTB/H[376] is 73.4 %, followed by KDDI[377] with a market share of 10.6 % and electrical power system businesses (powerline communications carriers) with a market share of 8.9%.

The market situation is very different in the DSL market. The number of DSL contracts has continued to decrease reaching a level of just 6.0 million at the end of September 2012. In the DSL market, the key player is Softbank BB with a market share of 39.1%; NTT East and West come in second with a market share of 34.7 %.

Among mobile operators, NTT DoCoMo is estimated to have some 62.6 million customers in 2013, compared with 38.5 million for KDDI and 32.6 million for Softbank.[378]

4.4.4. Effectiveness and Efficiency

Industrial policy plays a large role. There are many areas of strength, but some of apparent weakness, including an ineffective GPON unbundling programme and the failure to control mobile termination rates.

[371] Passive Optical Networking (PON) is a form of high speed fibre access to the network that involves no active components.
[372] BoAML (2011), Global Wireless Matrix 1Q11, 28 April 2011.
[373] Softbank http://www.softbank.jp/en/.
[374] GPON is a form of Passive Optical Network (PON).
[375] Source for all of the figures in this paragraph: MIC statistics, ibid.
[376] With Fibre-to-the-Home (FTTH), a fibre optic communications path is terminated on or in the premise for the purpose of carrying communications to a single subscriber.
[377] KDDI Corporation http://www.kddi.com/english/.
[378] BoAML (2013), Global Wireless Matrix 1Q13, 15 April 2013.

4.5. Singapore

This small, highly urbanised country has a strong penchant for industrial policy, and one of the most advanced broadband deployment strategies in the world.

4.5.1. Institutional Arrangements

The Infocomm Development Authority (IDA)[379] of Singapore serves as the NRA, and also covers spectrum and sector-specific competition issues.

The IDA also has functions comparable to those of a Ministry, and thus duties that go well beyond telecommunications regulation. It is a development agency, promoting issues such as electronics, cloud computing, and data analytics. It sets out policies, gives out grants, and funds public-private partnerships.

4.5.2. Procompetitive Instruments

Singapore is known for its forward-looking structural separation arrangements in support of fibre-based ultra-fast broadband deployment.

There have been suggestions from stakeholders that these arrangements are unravelling. A recent article summarises as follows: 'What was originally intended in Singapore was that the NBN network (OpenNet) would be owned separately from the NBN operating company (Nucleus Connect) and the operators (Singtel, Starhub, myRepublic[…]) would compete at the retail level. In addition, (this happened during the tender process) the passive assets of Singtel (ducts, […]) used by OpenNet would be operationally separated from Singtel and placed into a trust – the NetLink Trust, which would be managed separately from Singtel.[380]

This would create a four layer structure:

- Passive asset owner (Netlink Trust)
- Network owner (OpenNet)
- Wholesale network operator (Nucleus Connect)
- Competitive retail service providers[381]

The intent was that full separation of ownership would ensure non-discriminatory provision of services, and would thus prevent entities in the regulated lower three layers from favouring their own affiliated retail operations. The concern is, that in a tiny market like Singapore with just five million inhabitants, cross-ownership relationships are unavoidable. SingTel[382] (the incumbent, and a retail provider of services) currently owns 100% of Netlink's assets, even though Netlink is managed as a trust. It is now proposed that Singtel could also own 100% of Nucleus Connect's assets as well. At that point, non-discrimination provisions are no longer self-enforcing.

[379] See www.ida.gov.sg.
[380] Information about the firms is available on their respective web sites.
[381] Bratby, R. (2013), *How much space do you need for structural separation*?, 26 September 2013, at http://robbratby.com/2013/09/26/how-much-space-do-you-need-for-structural-separation/.
[382] Singtel http://home.singtel.com/.

Voice call termination was implemented using a unique Mobile Party Pays (MPP) system. A 2008 Analysys Mason study summarised the arrangements succinctly: 'The mobile termination rate is set at zero. As such, the following standards apply for calls between fixed and mobile customers: (1) Fixed-mobile and mobile-mobile calls – For any calls that terminate on a mobile operator's network, no termination charges are assessed. Thus, this system can be defined as a BAK system with no provisions for compensation of traffic imbalances. (2) Fixed-fixed and Mobile-fixed calls – A low cost-based termination rate … is assessed for all traffic that terminates on incumbent fixed networks.'[383]

4.5.3. Market Structures

The Singaporean market has been described as small and concentrated.

For mobile, Singtel is estimated to have 3.9 million customers in 2013, Starhub and MobileOne 2.2 million customers each.[384]

4.5.4. Effectiveness and Efficiency

Stakeholders provided various views on the effectiveness. Some felt that Singapore's strong focus on industrial policy was sometimes counter-productive.

4.6. Mexico

Mexico is an OECD[385] member, but is also in many respects a developing rather than a developed country. Regulatory institutions have struggled to deal with a deeply entrenched incumbent. These challenges are well recognised.[386] The country is now in the midst of a massive reform effort.

4.6.1. Institutional Arrangements

COFETEL[387] has acted to date as the NRA, and is also responsible for spectrum. It does not have competition law responsibilities.

The new Ifetel[388] (see section 4.6.4) will function as the NRA, including responsibility for spectrum management and for the broadcast sector. It will also function as the national competition authority for the sectors that it regulates. Going forward, specialised courts will deal with telecommunications issues.

4.6.2. Procompetitive Instruments

Mexico does not have effective wholesale remedies (such as local loop unbundling) for the fixed network. There is a price basket procedure that seeks to protect consumers from retail level over-pricing; however, it has little practical effect, because there is sufficient competition from cable to motivate the incumbent to price below the price basket levels.[389]

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[383] Analysys Mason (2008b), Case studies of mobile termination regimes in Canada, Hong Kong, Singapore and the USA. Stakeholders confirm that this is still the case.
[384] BoAML (2013), Global Wireless Matrix 1Q13, 15 April 2013.
[385] The OECD is the Paris-based Organisation of Economic Cooperation and Development. See www.oecd.org.
[386] Ypsilanti, D., Díaz-Pinés, A. et al. (2012), OECD Review of Telecommunication Policy and Regulation in Mexico.
[387] The Federal Commission of Telecommunications (Comisión Federal de Telecomunicaciones) (CoFeTel) has until very recently been the regulator of telecommunications in Mexico, i.e. the Mexican NRA. See www.cft.gob.mx.
[388] IFETEL is the new Mexican NRA, replacing COFETEL.
[389] Dieter Elixmann, Markus Fredebeul-Krein, Federico Kuhlmann, J. Scott Marcus, and Werner Neu (2012), *Price Cap Regulation in Mexico for the period 2011-2014*. WIK, 9 July 2012.

The setting of termination rates is complicated, and has historically been subject to strategic litigation. In the past, the payments could not be collected until the appeals process had been exhausted, which gave the incumbent a strong incentive to litigate without end. In May 2011, a decision of the Supreme Court held that COFETEL's resolutions in regard to interconnection are not subject to suspension, cost-based interconnection rates should bring interconnection revenues and costs into rough balance.

4.6.3. Market Structures

Markets are highly concentrated. Carlos Slim, one of the richest men in the world, controls America Movil.[390] America Movil (which has more than 260 million wireless subscribers across the Americas) controls in turn around 80 percent of Mexico's fixed-line market, and some 70 percent of mobile phone traffic. Meanwhile, Televisa[391] has over 60 percent of the television market, and could also be viewed as an entrenched incumbent in its market.[392] The two television operators jointly founded a third mobile operator, Iusacell,[393] to compete with America Movil and Telefonica;[394] however, Iusacell is still struggling to gain traction.

4.6.4. Effectiveness and Efficiency

COFETEL is competent, in our view, but they have struggled to enforce their decisions.[395]

One of the first major initiatives of the new government of President Enrique Pena Nieto this year (with support of the opposition party as well) has been to enact a constitutional amendment in order to found a new National Regulatory Authority (NRA), Ifetel, which will have expanded powers, including the ability to apply asymmetric regulation on dominant players and even force them to sell assets.[396]

The Commissioners of the new agency have been appointed, and the rules of order for the new agency have been adopted. It is hoped that these promising reforms will restore some balance to the sector, but it is too soon to say.

4.7. India

India is a huge country, with substantial high technology capabilities, yet in most respects it is a developing country.

4.7.1. Institutional Arrangements

The Telecommunications Regulatory Authority of India (TRAI)[397] functions as the NRA, but is not responsible for spectrum. The Competition Commission of India[398] deals with competition issues for all sectors, including telecommunications.

[390] See http://www.americamovil.com/.
[391] See http://www.televisa.com/.
[392] Graham, D. (2013), *Threat of break-up looms over Mexican telecoms tycoon Slim*, Reuters, 10 June 2013.
[393] See www.iusacell.com.mx/.
[394] See www.telefonica.com.mx.
[395] Ypsilanti, D., Díaz-Pinés, A. et al. (2012), *OECD Review of Telecommunication Policy and Regulation in Mexico.*
[396] Graham; D. (2013),*Threat of break-up looms over Mexican telecoms tycoon Slim*, Reuters, 10 June 2013; Harrup; A. (2013), *Mexican President Signs Telecommunications Reform into Law*, Wall Street Journal, 10 June 2013.
[397] See www.trai.gov.in.
[398] See www.cci.gov.in.

4.7.2. Procompetitive Instruments

There is no local loop unbundling in India. In light of the low penetration of the fixed network, this is probably appropriate.

Voice call termination charges are among the lowest in the world, and are the same for the fixed and the mobile networks. For domestic fixed or mobile calls, the TR is € 0,0024 at current exchange rates, while for international it is € 0,0048.

4.7.3. Market Structures

Market structures are complex, and markedly different from those in Europe. The fixed network reaches only a small fraction of the huge population. Cable television is much more widespread, but fragmented into tens of thousands of operators, and largely not upgraded to modern technology. The mobile market is split among multiple national providers.[399]

4.8. Comparisons of the European Union to Other Regions

Summarising the material of the previous sections of this chapter, we see that Europe differs in important respects in its regulatory institutions from some of the regions of the world with which we compete.

It is important to bear in mind that each system has its weaknesses and strengths, and that each is in some degree a response to path dependencies.

Table 10: Telecommunications regulation in selected countries

	Division of Tasks	Access Regulation	Termination Rates	Assessment
Europe	Complex allocation between Commission and Member States. Competition law distinct but complementary.	Cost-based regulation.	Cost-based regulation.	Effective in terms of static efficiency, possible room for improvement in terms of dynamic efficiency.
United States	Complex Federal/state allocation. Competition law largely excluded from regulation. Spectrum management split FCC/NTIA.	No regulation of fibre access. Blanket regulatory exemption for Internet services, including broadband. Net neutrality rules.	Obligations of symmetry led to Bill and Keep for mobile-to-mobile. Complex fixed termination arrangements. Migration to full Bill and Keep in progress.	De facto duopoly for broadband. Complex regulatory arrangements overall.
Canada	Primarily federal authority. CRTC is NRA, Industry Canada manages spectrum.	Cost-based access to unbundled local loop, and also wholesale broadband access.	All interconnection prices in Canada were subject to capacity-based charging. Bill and keep is the direction long term.	Generally well run. Practice often follows US models; however, the approach to ULL is very different from that of US.

[399] Jain, R. and J. S. Marcus (2013), *Fast Broadband Deployment in India – What role for cable television?*, presented at ITS Regional Conference in New Delhi, February 2012.

	Division of Tasks	Access Regulation	Termination Rates	Assessment
Australia	ACCC serves as primary NRA. ACMA manages spectrum and broadcasting.	Separation of incumbent is in progress as part of deployment of National Broadband Network.	Cost-based regulation. Evolving toward structural separation.	Possible policy over-reach. May change due to recent elections.
New Zealand	NZ Commerce Commission serves as NRA, and as competition authority.	Evolved from functional separation to full structural separation.	De facto cost-based control through deeds rather than regulation.	Had no NRA in the past. Now follow UK models. Pragmatic and effective.
Japan	MIC is the NRA and NCA. METI deals with digital services. Ministry of Internal Affairs and Communications for spectrum.	Both copper and fibre are subject to unbundling; however, ULL for GPON is in groups of 8 lines, thus ineffective and rarely used.	Mobile termination is unregulated.	Strong industrial policy focus. Areas of great strength, but also some areas of noteworthy weakness.
Singapore	IDA is the NRA, and also covers spectrum and sector-specific competition issues.	Dealt with for fibre thru a complex four-way structural separation that is showing signs of strain. Regulation for residential mkt, little support for business needs.	No charges are assessed for calls that terminate on a mobile network. For calls that terminate on a fixed network, a low cost-based charge is assessed.	IDA is also a development agency, setting out policies, promoting issues such as electronics, cloud computing, and data analytics.
Mexico	New agency replaces COFETEL (historic NRA), increased powers, can impose separation.	Retail price caps, but no effective wholesale access regulation.	Regulated with increasing effectiveness.	Historically ineffective regulation. Promising move to new institutions.
India	TRAI is the NRA. Does not mange spectrum. Separate Competition Commission.	Not regulated.	Low termination fees for both fixed and mobile networks.	Strengths and weaknesses.
China	Ministry of Information Industries functions as NRA. SARFT deals with broadcasting and content.	Different categories of licences, and interventions by the regulator against unfair practices.	Hong Kong has had a system with distinctive arrangements, but is moving to a system of negotiated rates.	MII is also a development agency, setting out policies, promoting issues such as electronics, cloud computing, and data analytics.

5. ASSESSMENT OF COSTS AND BENEFITS TO EUROPE

KEY FINDINGS

- **The direct economic impact of many European regulatory interventions can best be understood by assessing their impact on retail prices.**
- **Reducing prices to levels approaching those that would exist under perfect competition serves to reduce deadweight loss. This benefits society.** The reduction also transfers welfare from producers to consumers, which in a static environment is in principle neutral to overall societal welfare (but important to consumers).
- An analysis of the effects of welfare gains due to the regulation of Mobile Termination Rates suggests a gain in societal welfare (due to the reduction of deadweight loss) of from € 2.8 billion (in 2005) to € 11.8 billion (in 2010) per year over the period 2005 through 2010, and a much larger transfer of surplus to consumers. Over the same period, the consumption of voice minutes can be assumed to have increased by 17% (in 2005) to 38% (in 2010) per year as a result, a significant consumer benefit.
- A similar analysis of the effects of welfare gains due to the regulation of prices for International Mobile Roaming suggests an average a gain in societal welfare (due to the reduction of deadweight loss) of € 4.5 billion per year over the period from 2012 through 2014.
- The regulation of last mile access can be presumed to generate substantial gains in societal welfare as well.
- A recent study by Analysys Mason for the Commission considers the benefits going forward of policy intervention to support NGA deployment and adoption. They compare a 'do nothing' business as usual scenario to a 'modest intervention' scenario, where governments invest an additional € 5.8 billion, which leads to an additional € 19.2 billion in private investment. This investment supports supply side measures to increase the availability of fixed wireline networks. The intervention drives a modest increase in consumer surplus for the period 2012 to 2020, but a significant increase in macroeconomic benefits from € 181 billion to € 270 billion. The modest intervention also increases the jobs created by NGA deployment from 1.35 to 1.98 million.
- The MTR and roaming examples deal with static economic effects driver (i.e. fixed in time) by lower prices, while the NGA deployment example deals with dynamic macroeconomic effects over time driven by investment. **In understanding the overall benefits to society, both static and dynamic effects are important.**
- The European regulatory system is economically intensive, and thus imposes costs on NRAs and on market players; however, these costs can be presumed to be small in comparison with the gains that European regulation provides.

There are many possible dimensions in which the costs and benefits of the European policy framework for electronic communications, including the Regulatory Framework, could be assessed. In this chapter, we take a primarily static economic view, using notions of welfare transfer and deadweight loss as unifying themes for the discussion.

In this chapter, we present the substantial socio-economic benefits of two of the most noteworthy policy interventions of the past decade, the regulation of Mobile Termination Rates and the regulation of International Mobile Roaming. The imposition of access remedies and the setting of cost-based wholesale prices for access to the last mile can be presumed to have had similarly beneficial effects, and to have made a major contribution to the low prices for broadband (and the correspondingly high adoption rates for basic broadband) that Europeans presently enjoy (as discussed in our companion volume, 'Entertainment x.0 to boost broadband deployment').[400]

5.1. Costs and Benefits of Lower Mobile Termination Rates (MTRs)

Mobile termination rates (MTRs) are the rates for the wholesale interconnection payments that mobile network operators (MNOs) make to one another. The network originating the call makes the payment to the network that must terminate or complete the call. This payment is felt to compensate the cost incurred by the operator of the party that receives the call in under prevalent Calling Party Pays (CPP) arrangements, given that the party receiving the call typically makes no payment.

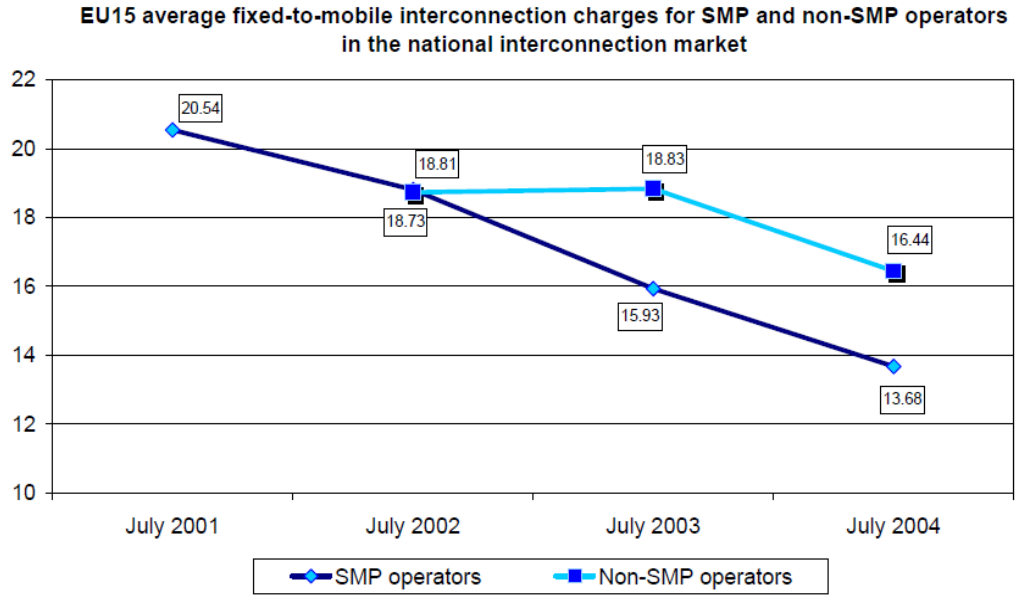
Prior to the introduction of the *European Regulatory Framework for Electronic Communications* in 2002-2003, mobile termination rates (MTRs) were largely unregulated in most EU Member States. MTRs across the EU averaged more than € 0.20 (see Figure 25), a rate that clearly bore little or no relationship to the true underlying cost of providing the service.

The reasons for these high prices are complex. Briefly, as long as only a single network operator is able to complete a call to a given phone number, that network operator possesses terminating monopoly power. This form of market power is independent of any market power that may or may not exist on the last mile access.

The Regulatory Framework has required that both fixed and mobile network operators be analysed regarding their termination market power on their individual networks. This results more or less automatically in their being found to have Significant Market Power (SMP), which results in turn in cost-based controls on the fixed and mobile termination rates that they can charge. As a result, wholesale MTRs have been moving steadily downward since the system was put in place (see Figure 25). Initially, small 'non-SMP' MNOs were permitted to charge more than larger MNOs (as shown in Figure 25), but in recent years there have been requirements to use a common rate for all MNOs. The process has accelerated considerably since the Commission introduced true Long Run Incremental Costs (LRIC)[401] guidance in 2011, but our focus in the analysis in this section will be on the period prior to that decision.

[400] European Parliament (2013), *Entertainment x.0 to boost broadband deployment*.
[401] European Commission (2009), *Commission Recommendation of 7.5.2009 on the Regulatory Treatment of Fixed and Mobile Termination Rates in the EU*, C(2009) 3359 final.

Figure 25: MTRs at the time the Regulatory Framework was first introduced



Source: *European Electronic Communications Regulation and Markets 2004 (10th Report).*

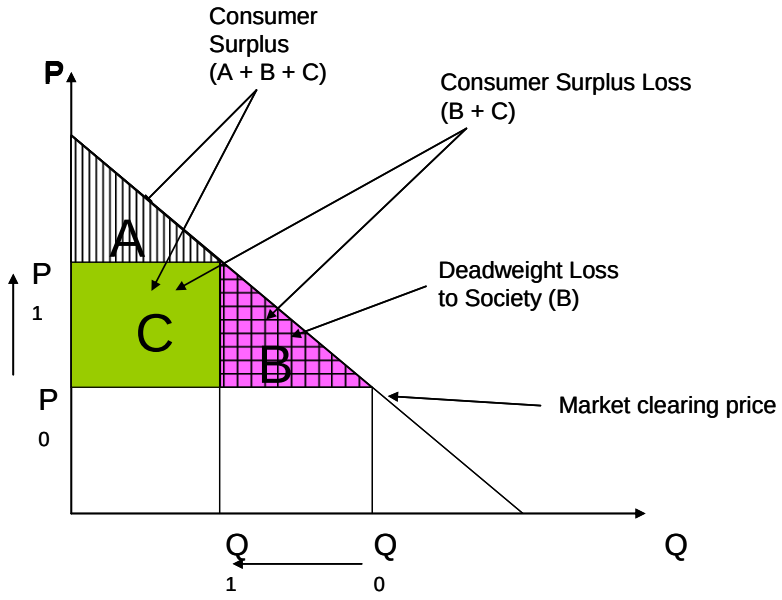
The decision to bring MTRs into line with underlying costs has had large impacts on the telecommunications sector, and on consumers.

In understanding the benefits to consumers, it is helpful to review the basic economics, beginning with the Harberger Triangle (see Figure 26). In an ideal competitive market, prices would be set at the exact level where the supply and demand curves cross. In Figure 26, the line that slopes downward to the right is the consumer demand curve, while the supply curve is not shown since it is not critical to this discussion. The point identified as the 'market clearing price' is the expected and optimal pricing point in an ideal competitive market.

If prices are distorted, societal welfare is reduced. Market power is such a distortion, which leads not only to higher prices, but also to lower consumption as a result. This is due to the price elasticity of demand, the tendency to consume more of things that are inexpensive, and less of things that are expensive.

If prices are set at this ideal point, the consumer surplus corresponds to the areas labelled A, B, and C in Figure 26. It is the entire area above the price charged, but below the demand curve. It can be thought of as the degree to which consumers would have been willing to pay more than they were required to pay.

Figure 26: The Harberger triangle



Source: WIK.

If a market distortion (for instance, the termination monopoly) artificially inflates the price charged, the price moves up from P_0 to P_1, while the quantity correspondingly moves to the left from Q_0 to Q_1. This reduces the consumer surplus (previously A+B+C) by the sum of the areas B+C. All that remains as consumer surplus is A.

This change entails, however, two distinct effects. Area C represents a transfer of surplus (or welfare) from consumers to producers. To an economist, since we tend to look at societal welfare in terms of the sum of consumer surplus and producer surplus, this transfer is in principle neutral – it is an allocative effect that neither adds to nor detracts from the overall welfare of society.[402]

The area in triangle B, however, is truly and unambiguously problematic. It represents consumption that should have taken place, but did not. It is referred to as a deadweight loss.

It is reasonably clear that prices had been greatly inflated in this way when the Regulatory Framework was introduced. Only today are termination rates approaching cost-based levels. Thus, each reduction in MTR to date has reduced deadweight loss. Going forward, at some point in the (possibly near) future where the MTR is no longer in excess of true costs, reductions in MTR will no longer reduce deadweight loss.

In order to make a rough estimate of the magnitude of the benefit, it is necessary to have some sense of what retail prices would have been in the absence of regulation. **There is no perfect answer to this counter-factual question, but we propose that it is not unreasonable to begin by assuming that MTRs in Europe would have spontaneously fallen at rates similar to those in highly developed countries in which MTRs are unregulated.**

[402] There may still be public policy implications, for instance as a matter of consumer protection, but welfare transfers are neutral in terms of overall economic welfare.

Japan is a rare example of such a country (see section 4.4.2). During the period 2004-2009, MTRs (in euro) were unregulated and fell at a Compound Annual Growth Rate (CAGR) of 6.2%. If we assume that MTRs would have declined at only 6.2% per year rather than the actual rate, we have the basis for a counter-factual scenario corresponding to a European Union without the Regulatory Framework.

Table 11: Evolution of MTRs in Japan (2004-2009)

Japan	2004	2005	2006	2007	2008	2009
Avg MTR (€ cents)	27.6	26.3	24.1	21.5	20.9	20.0
CAGR		-4.5%	-6.5%	-8.0%	-6.7%	-6.2%

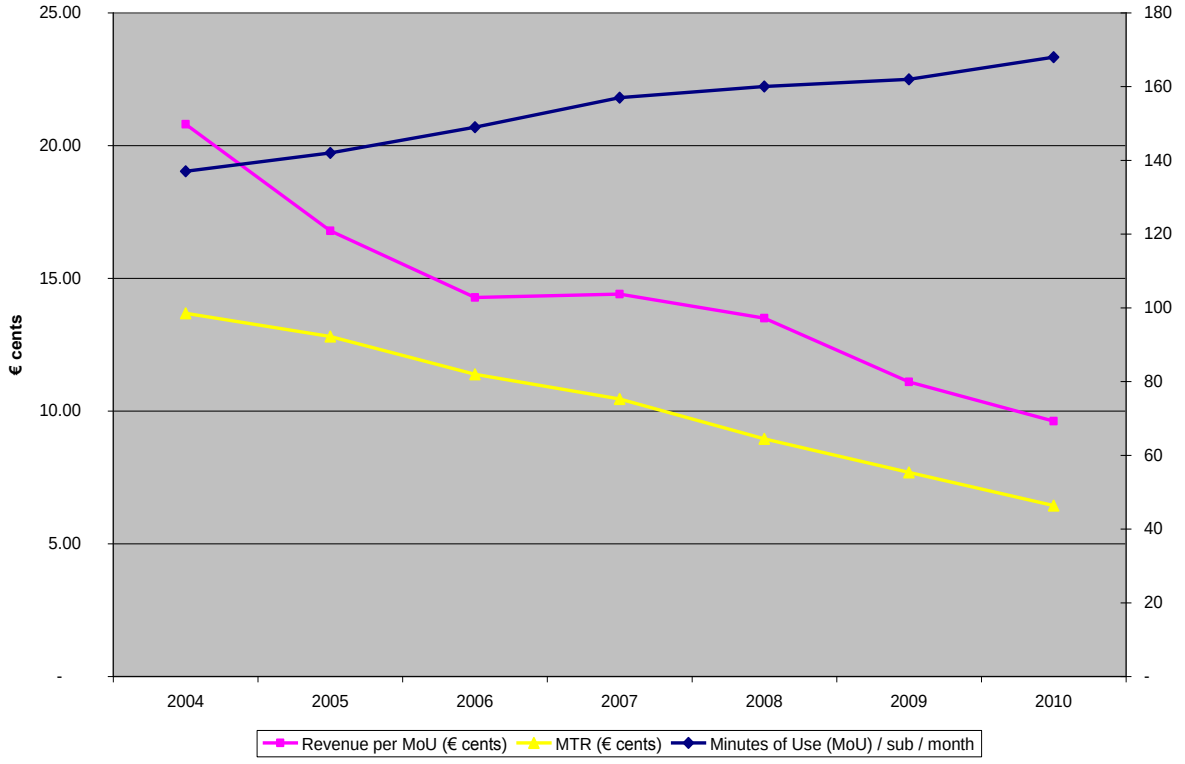
Source: BoAML Global Wireless Matrix 1Q11, [403] WIK calculations.

One must then extrapolate to understand how retail prices would have evolved in the counter-factual scenario. As a measure of retail price, use voice Service-based Revenue (SBR) per Minute of Use (MoU), taking the Merrill Lynch Quarterly Wireless Matrix as a source for the data.[404] Retail prices are always challenging for economists due to the large number of plans, uncertainty as to how many people use each plan, uncertainty as to what they do with the plan, and prevalence of introductory offers. The use of normalised revenue figures avoids all of these problems, although it introduces a few other methodological complexities.[405]

The prevailing view among most experts is that lower MTRs lead to lower retail prices and higher usage.[406] Actual data for Europe are consistent with this view.

[403] The data source is BoAML (2011), *Global Wireless Matrix* 1Q11, 28 April 2011.
[404] BoAML (2011), *Global Wireless Matrix* 1Q11, 28 April 2011.
[405] SBR/MoU is an imperfect proxy to the extent that it also includes wholesale termination payments; however, these payments represent not more than 15% of the total, according to Merrill Lynch. The payments are less for calls placed to the fixed network, and are zero for the considerable volume of on-net calls.
[406] See for instance Tera Consultants (2010), *Study On The Future Of Interconnection Charging Methods, study for the European Commission*, 17 June 2010; and Growitsch, C., Marcus, J. S. and C. Wernick, *The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand*, a research project for the German BNetzA, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586464.

Figure 27: Termination rates, Minutes of Use (MoU), and Service-based Revenue (SBR) per Mou for Europe (2004-2010)



Sources: BoAML Global Wireless Matrix 1Q11, [407] DAE scorecard, 10th Implementation Report, WIK calculations[408]

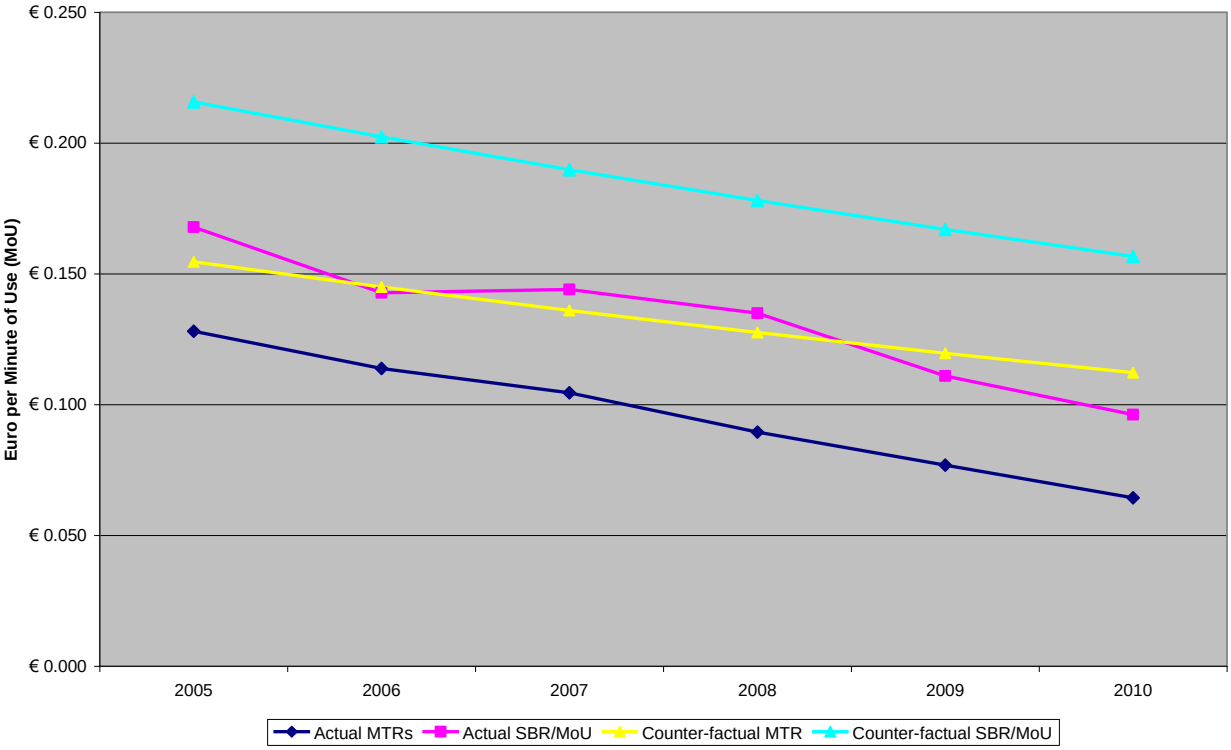
As a simple rule of thumb, we note that the average SBR/MoU over the period 2003-2010 was between 1.26 and 1.51 times as great as the average MTR, with a simple arithmetic mean among these observations of 1.4. For our counter-factual scenario, we assume that the average SBR/MoU for Europe (as a measure of retail price) would have been about 1.4 times as great as the assumed MTR.

Taking all of this together, we obtain the following actual and counter-factual evolution of MTRs and of corresponding retail price (as measured by SBR/MoU) and voice Minutes of Use for Europe.

[407] Source of data: MoUs and SBR/MoU are from the Bank of America/Merrill Lynch (2011), Global Wireless Matrix 1Q11, 28 April 2011. Note that the BoAML definition of Europe is not an exact match for the EU, but rather comprises Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the UK. MTRs for 2005-2013 are from worksheet 9 of the financial indicators, fixed and mobile telephony spreadsheet of the Digital Agenda for Europe Scorecard, downloaded 27 September 2013. MTRs for 2002-2004 are from Annex 2 of the European Electronic Communications Regulation and Markets 2004 (10th Report), {COM(2004)759 final}, Figure 32, page 36.

[408] Ibid.

Figure 28: Actual and counter-factual evolution of MTR and retail price in Europe with and without MTR regulation (2005-2010)



Source: WIK.

It is also necessary to make assumptions about how voice traffic would have evolved in the counter-factual world. We assume a long term own-price elasticity of demand of -0.5, which is broadly consistent with many other results, including our own.[409] This implies that a 2% decrease in price would result in a 1% increase in the number of calls placed.

The resulting computations suggest a reduction in deadweight loss of € 36.6 billion from 2005 through 2010, and a welfare transfer from MNOs to consumers of € 205.5 billion.

[409] A review of empirical results in the literature appears in Haucap, J., Heimeshoff, U., and Karacuka, M. (2010), *Competition in the Turkish Mobile Telecommunications Market: Price Elasticities and Network Substitution*, DICE Discussion Paper No. 12, November 2010. See also Growitsch, C., Marcus, J. S. and C. Wernick (2010), *The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand*, in: COMMUNICATIONS & STRATEGIES, 80, 4th Q. 2010; available at http://www.wik.org/fileadmin/Aufsaetze/MARCUS_et_al_Growitsch_MTR.pdf.

Table 12: Estimated European welfare transfer and reduction of deadweight loss due to regulation of MTRs (2005-2010)

Actual European Experience	2005	2006	2007	2008	2009	2010	Total
Actual retail SBR per MoU (€ / MoU)	€ 0.168	€ 0.143	€ 0.144	€ 0.135	€ 0.111	€ 0.096	
Actual avg MTR (€ / MoU)	€ 0.128	€ 0.114	€ 0.105	€ 0.089	€ 0.077	€ 0.064	
Actual Minutes of Use (MoU) / subscriber / month	142	149	157	160	162	168	
Voice traffic per year (million minutes)	679,896	770,628	887,364	958,080	997,272	1,038,240	5,331,480
Service-Based Voice Revenue per year (€ million)	€ 114,155	€ 110,046	€ 127,780	€ 129,341	€ 110,697	€ 99,879	€ 691,897
Counter-factual: Europe without MTR regulation	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Predicted retail SBR / MoU (€ / MoU)	€ 0.216	€ 0.202	€ 0.190	€ 0.178	€ 0.167	€ 0.157	
Predicted MTR	€ 0.155	€ 0.145	€ 0.136	€ 0.128	€ 0.120	€ 0.112	
Absolute Price Difference (€/min)	€ 0.048	€ 0.060	€ 0.046	€ 0.043	€ 0.056	€ 0.060	
Relative Price Difference	28.48%	41.70%	31.81%	31.88%	50.45%	62.83%	
Price elasticity of demand	-0.60	-0.60	-0.60	-0.60	-0.60	-0.60	
Relative quantity change to voice MoU	-17.09%	-25.02%	-19.09%	-19.13%	-30.27%	-37.70%	
Change in voice traffic per year (million minutes)	-116,201	-192,822	-169,358	-183,259	-301,872	-391,413	-1,354,925
Voice traffic per year (million minutes)	563,695	577,806	718,006	774,821	695,400	646,827	3,976,555
Service-Based Voice Revenue per year (€ million)	€ 121,604	€ 116,920	€ 136,281	€ 137,947	€ 116,131	€ 101,322	€ 730,205
Comparing the actual to the counter-factual	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**Total**
Change in Deadweight Loss	€ 2,779	€ 5,741	€ 3,879	€ 3,943	€ 8,452	€ 11,830	€ 36,624
Transfer of Consumer Surplus	€ 26,959	€ 34,409	€ 32,888	€ 33,346	€ 38,942	€ 39,098	€ 205,642
Increased cost of supply	-8.55%	-12.51%	-9.54%	-9.56%	-15.13%	-18.85%	

Source: WIK.

The same computations also suggest an increase in the number of Minutes of Use (MoU) of from 17% to 38% per year in response to lower prices. The purely economic view may tend to understate the importance of this consumer benefit because prices were falling throughout the study period, and the greater increases in usage occur in years when prices were much lower.

We have chosen throughout to model solely the changes in consumer surplus, ignoring the supply curve. The impact of the supply is less in telecommunications than in many other industries due to the need for large capital investments, and the presence of large positive returns to scale. In other words, the increased number of minutes provides economies of scale to producers, in addition to the benefits that we modelled. Had we included supply factors, the reduction in deadweight loss would have been somewhat greater, which is to say that our estimate is conservative.[410]

5.2. Costs and Benefits of the Roaming Regulation

In preparation for the Roaming Regulation of 2012, the European Commission prepared an Impact Assessment.[411] That analysis included a comprehensive analysis of the welfare effects, comparing a continuation of 'business as usual' against a completely unregulated system, based on a consulting study.[412] Several other options were assessed, including caps on retail prices for data, and structural solutions for roaming, but these are not directly of interest for the question at hand.

The analysis is well done, and follows the same general approach as that used for the analysis of societal welfare due to MTR regulation in section 5.1.

The data volumes for 2009 were based on data collected twice per year by BEREC.

[410] We caution, however, that the estimate is highly sensitive to the assumed own price elasticity of demand at (national) market level for voice services.

[411] European Commission (2011), *Commission Staff Working Paper: Impact Assessment Of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 Of The European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community, {COM(2011) 407 final}, {SEC(2011) 871 final}, 6 July 2011.*

[412] The economic analysis, which appears in European Commission (2011) (the impact assessment of the Roaming Regulation, cited above), is attributed to Steffen Hoernig.

Table 13: Volumes and prices of roaming calls made and received, SMS, and data (2009)

MEMBER STATE	RETAIL SERVICES							
	Retail voice calls made		Retail voice calls received		Retail SMS		Retail data	
	Volume (m min)	AUR (€/min)	Volume (m min)	AUR (€/min)	Volume (m)	AUR (€)	Volume (m MB)	AUR (€/MB)
AT	-	-	-	-	-	-	-	-
BE	256,9	0,46	173,6	0,21	194,1	0,19	13,9	3,37
BG	18,0	0,61	34,8	0,24	13,0	0,17	0,4	5,27
CY	22,0	0,55	17,7	0,20	19,5	0,15	0,5	1,31
CZ	39,4	0,53	63,9	0,20	121,4	0,18	3,5	3,97
DK	-	-	-	-	-	-	-	-
EE	37,6	0,53	63,1	0,12	14,9	0,18	0,4	3,89
FI	76,4	0,49	60,7	0,21	47,5	0,17	4,4	3,11
FR	453,0	0,47	312,0	0,21	240,5	0,16	30,2	4,63
DE	834,0	0,49	700,4	0,20	375,7	0,20	60,7	2,25
GR	54,4	0,51	59,4	0,24	22,8	0,18	1,7	5,12
HU	50,7	0,50	71,6	0,22	51,3	0,19	2,8	2,88
IE	-	-	-	-	-	-	-	-
IT	364,0	0,49	370,4	0,20	278,7	0,16	24,8	3,37
LV	11,1	0,47	26,5	0,10	19,2	0,13	0,4	3,59
LT	13,4	0,51	23,2	0,21	31,2	0,15	0,5	3,67
LU	-	-	-	-	-	-	-	-
MT	4,0	0,58	2,6	0,29	5,6	0,17	0,3	1,95
NL	388,0	0,48	287,6	0,21	246,4	0,20	28,8	2,09
PL	171,5	0,49	216,8	0,21	248,8	0,17	5,2	3,69
PT	79,3	0,47	117,7	0,18	47,2	0,20	5,4	2,65
RO	59,3	0,48	106,0	0,21	52,7	0,16	3,4	2,97
SK	51,7	0,51	64,1	0,21	48,2	0,19	1,8	3,80
SI	21,5	0,54	28,1	0,23	22,5	0,17	0,7	4,97
ES	271,6	0,50	319,7	0,20	74,4	0,18	26,8	3,24
SE	-	-	-	-	-	-	-	-
GB	811,4	0,37	504,2	0,14	699,4	0,13	60,0	1,23
TOTAL	**4.089,4**	**0,46**	**3.624,3**	**0,19**	**2.874,9**	**0,17**	**276,4**	**1,71**

Source: European Commission, Impact Assessment (2011) (Steffen Hoernig).

Based on this BEREC data, the annex to the Commission's Impact Assessment shows the calculation of the own price elasticity of demand as a function of the evolution of prices and quantities consumed.[413] Elasticities for all services were calculated jointly, since the services are somewhat substitutable for one another (e.g. data for SMS). Their key results were:

[413] European Commission (2011), *Commission Staff Working Paper: Impact Assessment Of Policy Options in Relation to the Commission's Review of the Functioning of Regulation (EC) No 544/2009 Of The European Parliament and of the Council of 18 June 2009 on Roaming on Public Mobile Telephone Networks within the Community, op. cit.*

- Calls made -0.27[414]
- Calls received -0.24
- SMS -0.24
- Data -1.23

Average unit revenue (e.g. revenue per Minute of Use) were then computed for each roaming service.

Table 14: Projected 2012 prices roaming prices with and without regulation

2012	Retail voice calls made (€/min)	Retail voice calls received (€/min)	Retail SMS (€)	Retail data (€/MB)
Option 1 – No Regulation	1,87	0,46	0,72	3,31
Option 2.a - Price-Cap - "Continuation à l'Identique" (Baseline scenario)	0,35	0,11	0,11	2,65

Source: European Commission, Impact Assessment (2011) (Steffen Hoernig).

The conclusion was that, in comparison with a continuation of the rules of the Roaming Regulation of 2009, a total elimination of regulation of roaming would have led to the following changes in societal welfare over the period 2012-2014:

- A decrease of consumer surplus of € 18,600 million
- An increase of producer surplus of € 5,000 million
- A net loss of societal welfare of € 13,600 million

In other words, returning to the Harberger Triangle discussion of section 5.1, continuation of the Roaming Regulation of 2009 without change would have transferred five billion euro from network operators to consumers (in comparison with getting rid of the Roaming Regulation). That transfer is in principle neutral in terms of societal benefits.[415]

The same change would, however, also result in overall gains to society of 13.6 billion euro over the period 2012-2014 thanks to voice and data services that would be consumed at the lower prices that would be ensured by the continuation of the regulation, and that would not have been consumed at the higher price that could be expected absent regulation. These gains (representing a reduction in deadweight loss) are a clear and unambiguous gain to society.

[414] This estimate is fully consistent with a rough estimate in Marcus, J.S., Philbeck, I. (2010), *Study on the Options for addressing Competition Problems in the EU Roaming Market.*

[415] It is neutral in a static view. When one considers dynamic effects (i.e. the impact on the willingness and ability of the network operators to invest in their networks), there is probably some negative impact from the transfer.

5.3. Benefits of Achieving the Digital Agenda

A number of European policy instruments that seek to foster broadband deployment (including State Aid) have effects that are entangled with one another, and thus difficult to analyse individually; however, it is possible to estimate their collective effects.

A noteworthy recent study conducted by Analysys Mason on behalf of the European Commission assesses the incremental societal benefits of fast and ultra-fast broadband.[416] Analysys Mason (2013a) estimates overall societal effects of the relevant sectoral investments using input-output analysis, and assesses consumer welfare gains using a technique developed by Shane Greenstein and R.C. McDevitt.[417] Analysys Mason (2013a) finds substantial benefits from adoption of ultra-fast broadband. We consider the analysis to be competently done and helpful, but it is a single result, and like any analysis rests on a great many assumptions.

Analysys Mason (2013a) compares a 'do nothing' scenario, with private investment (i.e. CAPEX) in Next Generation Access (NGA) of € 76.4 billion, to a 'modest intervention' scenario, where governments invest an additional € 5.8 billion and doing so triggers an additional and much larger € 19.2 billion in private investment. The interventions have multiple effects, both of which result in increased adoption of fast and ultra-fast services. The investment is used primarily for supply side measures to increase the availability of fixed wireline networks, and secondarily by means of cost reduction measures that increase the viable limit of market-led deployment. Both serve to reduce net cost (and risk) to investors.

The intervention has the following effects in the year 2020:

- increases the proportion of households connected to 30 Mbps broadband from 42% to 49%;
- increases the proportion of households passed by 100 Mbps NGA from 50% to 61%; and
- increases the proportion of households connected to 100 Mbps NGA from 26% to 34%.

The intervention drives a modest increase in consumer surplus for the period 2012 to 2020 from € 26.5 billion (for the baseline 'do nothing' case) to € 28.6 billion. More important, it drives an increase in macroeconomic benefits (as measured by the input-output methodology)[418] from € 181 billion to € 270 billion. The modest intervention also increases the jobs created by NGA deployment from 1.35 to 1.98 million.

The examples in sections 5.1 and 5.2 deal with static economic effects driver by lower prices. This analysis is much more a matter of dynamic macroeconomic effects driven by investment. In understanding the overall benefits to society, both are important.

[416] Analysys Mason (2013a), *The Socio-Economic Benefits of Bandwidth*, study for the European Commission.

[417] They progressively refined these techniques in a series of papers from 2009 through 2012. See for instance Greenstein, S. and R. C. McDevitt (2009), *The global broadband bonus: Estimating broadband Internet's impact on seven countries*. The apparently low incremental WTP is also a concern relative to this analysis.

[418] Input-output modelling is used to estimate how economic impacts ripple through different branches of an economic system. Linkages between sectors of the economy, where the output of one becomes the input to another, are modelled through a matrix (i.e. a table). Thus, the use of this model made it possible to assess not only the direct expenditures that broadband deployment would drive in construction and related employment, but also for instance the impact of expenditures that the workers would make on food, clothing, and other services.

Analyses of welfare gains do not always pay as much attention to the costs associated with the possible market distortions that subsidies and interventions potentially introduce. Interventions are usually assumed to be costless, other than the direct level of subsidies themselves.

5.4. Costs of Regulation in Europe

As noted in section 4.2.4, European regulatory practice is driven by economics to a greater extent than that in many other regions, notably including the US and Canada. This requires a much heavier mix of economists than in other regions, presumably with associated costs.

On the other hand, continental Europe is much less prone to litigation than for instance the US, which means that the number of lawyers required in European NRAs tends to be proportionately less than in North America.

In terms of the time that it takes to reach a decision, these two factors work in opposite directions. Our sense is that **European regulatory institutions are in practice significantly faster in making and implementing decisions than their North American counterparts, but we know of no data that would either support or refute such a hypothesis. To the extent that the time to reach a final decision determines the period of legal or policy uncertainty, it implies additional indirect costs to the industry.**

Relative to the market players, similar considerations hold. We conjecture that European network operators have greater need for economics support than their North American counterparts, but less need for legal staff and support.

The direct costs in terms of staff to implement the regulatory framework are probably quite small in comparison to the static efficiency gains that flow from good regulation (as described in sections 5.1 and 5.2).

6. THE CONVERGENCE OF THE FIXED AND MOBILE NETWORKS

KEY FINDINGS

- The evolution of digital mobile network technology has been going on for many years, from GSM (2G) to EDGE (2.5G), UMTS (3G), HSPA (3.5G) and now on to LTE (4G). Each stage of this migration brings an increase in the volume of voice calls and data transfers that the network can handle, together with an increase in the bandwidth (speed) that can be obtained over mobile connections.
- Nominal bit rate capabilities of mobile technologies are ever more impressive, but they must be interpreted with care. The actual bit rates that can be obtained in practice is determined by many factors, such as the mobile operator's choices in network dimensioning and radio planning, the data consumption of the other mobile data users active in the particular radio cell in which the user happens to be, and the distance to the serving base station.
- Voice traffic in mobile networks has experienced steady growth over a period of many years. In the past few years, the evolution of traffic growth entered a second phase where data traffic exploded, primarily due to the rapid adoption of smart phones and tablets. Today, there are indications that we may be entering a third phase of mobile data traffic evolution where the majority of traffic from nominally mobile devices is in fact sent over private Wi-Fi at home or at work. The fixed and mobile networks are increasingly intertwined.
- **Mobile telephony is increasingly being used as a substitute (rather than a complement) for fixed telephone services, at least for residential consumers. This tendency could have significant implications on market analyses, and on the imposition of remedies aimed at promoting competition in fixed voice telephony.** If mobile voice were considered a full economic substitute for fixed voice, it is likely that the combined market for fixed and mobile voice call origination would be found to be competitive in most if not all Member States.
- The degree of substitutability of fixed for mobile is a complex empirical question. Businesses appear to be much less able to substitute mobile services for fixed than are residential consumers. **It seems unlikely that mobile will represent a full and comprehensive substitute for fixed broadband in Europe in the medium term.**

This chapter provides a focus on wireless and mobile networks. We consider their technological evolution, the evolution of their usage by consumers, the linkages between fixed and mobile networks, and the implications of all of this for public policy.

All technical terms (such as GSM, EDGE, and so on) are expanded and defined in the Glossary at the beginning of this report.

6.1. The Technological Evolution of Wireless

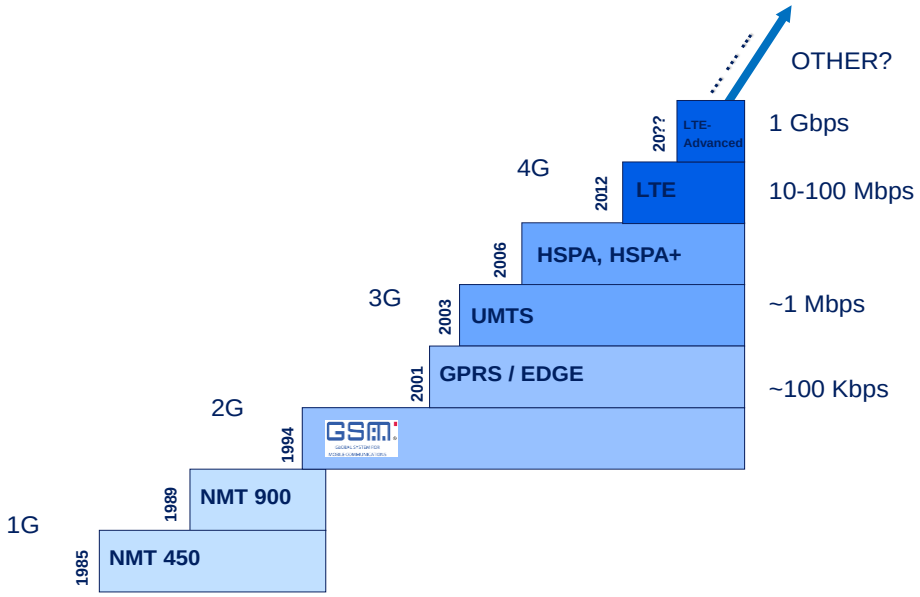
Technology for wireless communications falls into a number of different categories and application types that include:

1. Technology for mobile networks such as GSM (2G), EDGE (2.5G), UMTS (3G), HSPA (3.5G) LTE (4G), and wireless in-home networks such as Wi-Fi.
2. Wireless Local Loop technology such as some specific non-mobile types of Wimax[419] technology.
3. Short-range communication technology such as NFC, and Zigbee.

In this section we will describe the evolution of mobile and in-home network technology, as these are relevant for 'fixed-mobile convergence'.

The evolution of digital mobile network technology has been going on for many years, from GSM (2G) to EDGE (2.5G), UMTS (3G), HSPA (3.5G) and now on to LTE (4G, starting from Release 8 defined by the 3GPP standardisation body).

Figure 29: The evolution of digital mobile network technology

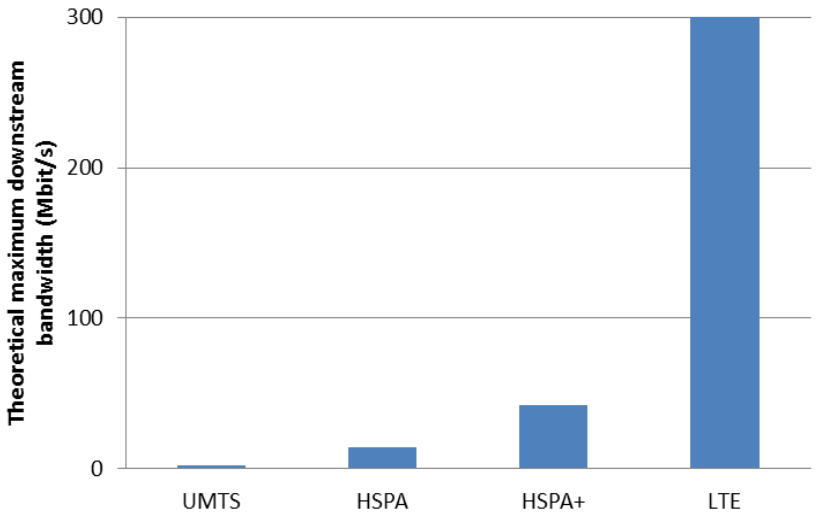


Source: TNO.

Each stage of this migration brings an increase in the volume of voice calls and data transfers that the network can handle, and an increase in the bit rates (speeds) that can be obtained over mobile connections. The theoretical maximum bandwidth that can be achieved with LTE over 20 MHz of spectrum is 300 Mbps downstream and 75 Mbps upstream, which is a substantial improvement over HSPA+ with 42 Mbps downstream and 11 Mbps upstream (Figure 30).

[419] WiMAX is a technology standardised by the IEEE which provides wireless access of fixed and nomadic users to the Internet.

Figure 30: Theoretical maximum downstream bandwidth for successive mobile technology generations



Source: TNO based on 3GPP specifications.

Maximum bit rate numbers like these should be interpreted with care. The actual bit rates that can be obtained in practice are determined by many factors, such the amount of spectrum that the mobile operator can exploit. Using more spectrum basically widens the channel and therefore the bit rate that can be offered to customers. In addition to spectrum, the mobile network operator's decisions in network dimensioning and radio planning play an important role. Finally, the bit rate that an individual customer may achieve is also strongly dependent on local and dynamic factors such as:

- the data consumption of the other mobile data users using the same radio cell;
- The distance to the serving base station; (further away from the serving base station, the received signal strength is reduced, which reduces the achievable bit rate)
- The customer's indoor or outdoor environment, and obstacles that may block the connection to the base station (again, if signal strengths are reduced, the achievable bit rate is also reduced);[420]
- The way the customer uses his or her device (including whether it is held in the hand away from the body, or held against the head, which may impact the reception of signals); and
- Whether the customer is moving or not, and at what speed. Movement of a device leads to variations in the characteristics of the radio channel between the device and its serving base station. The communication system needs to adjust to these variations. If the variations are rapid and severe, for instance at higher speeds of movement, the achievable bit rate is reduced. On the other hand, very local signal dips exist. If a device is in a completely static position, and it happens to be in such a dip, it may experience a low achievable bit rate.

[420] What constitutes an obstacle is itself related to the transmission frequency that is used. Frequencies below 1 GHz, for example, penetrate buildings much better than higher frequencies.

For LTE, the typical downstream bit rate can be expected to be in the range between 10 and 100 Mbps, depending on the network dimensioning, spectrum allocation and network load. This represents a substantial increase compared to HSPA and earlier mobile technology generations (Table 15). Preliminary results from the first live LTE networks have confirmed that LTE can indeed provide substantially higher bit rates than UMTS/HSPA.

Table 15: Typical maximum downstream bandwidths for successive mobile technology generations

Mobile technology generation	Range of typically achievable maximum downstream bit rate (Mbps)
HSPA	2-5
HSPA+	5-25
LTE	10-100

Source: TNO estimates.

The higher bit rates in LTE come from its higher spectral efficiency (e.g., more bits per second per Hz of spectrum), achieved by a number of technical elements such as a more extensive use of MIMO (Multiple Input Multiple Output, i.e. the use of multiple antennas in both mobile terminal and mobile network). Another rather substantial part of the increase in bandwidth simply comes from the larger amount of spectrum that is or will be available for LTE. Spectrum allocations increasingly become technology neutral, which means they can be used for older technologies as well, such as HSPA. However, for spectrum bands that become available for mobile broadband, the trend in the industry is to produce devices that support LTE rather than older technologies.

The increase in bit rate offered by LTE is important, but it is not the only improvement over UMTS/HSPA. **Broadband is about more than just bit rates, and this is also reflected in the design of LTE.** A key design goal has been to reduce the delay (latency) that IP packets experience on their path through the network. For real-time applications, like two-way voice or video, small delays are crucial for guaranteeing a proper Quality of Experience (QoE) for customers. Also for non-real-time applications the latency can play a significant role: while the latency of a single data exchange can be rather low, if many exchanges are required, the sum could be significant. For instance the synchronisation of an email box may entail tens of data exchanges each suffering from the network latency.

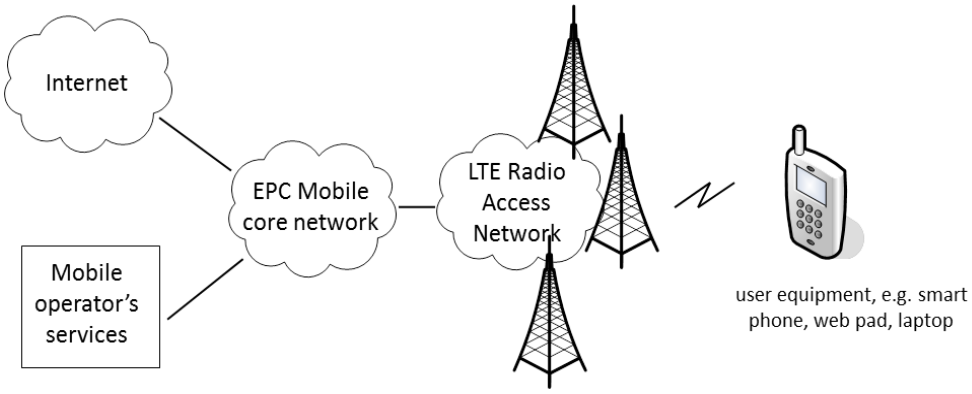
In parallel to and in close alignment with the development of LTE, a new generation of the mobile core network has been developed: the Evolved Packet Core (EPC) (see Figure 31). A clear improvement over earlier generations of mobile radio and core networks is the consistent and streamlined 'All-IP'[421] design of the LTE radio access network and the EPC. This brings an improved set of Quality of Service (QoS) classes, to the benefit of applications that have specific requirements for the quality of mobile data connections. Another improvement in the EPC is that is has been designed from the start to support multiple access technologies. Specifically, the EPC standards contain the functions and interfaces to integrate services over LTE and Wireless Local Access Networks (WLAN, such as Wi-Fi).

[421] Earlier mobile technologies were based partly or fully on circuit-switched technology. Packet switching based on the Internet Protocol (IP) is fundamental to the design of LTE, and is used throughout.

Wi-Fi technology itself is also under continuous development. The data-rates that can be supported now range up to 1 Gbps (with modems based on 802.11ac)[422] and will reach even higher levels with future upgrades such as 'WiGig' (modem based on 802.11ad).[423]

These data-rates are typically achieved using additional frequency bands such as the 5 GHz and 60 GHz bands, while current technology is predominantly active in the 2.4 GHz band which has a significantly smaller bandwidth.[424]

Figure 31: Mobile network operators can use the combination of the LTE Radio Access network and the EPC mobile core network to provide Internet access and other services



Source: TNO.

The roll-out of LTE in Europe has started, with commercial deployments in most of the countries within the European Union. The pace of the roll-out is determined by the mobile operators, based on the business cases that they develop, the availability of suitable spectrum and attractive terminals (handsets) suitable for European frequency bands, and the (expected) behaviour of their competitors. In a number of countries, such as Germany, France, Italy and Spain, the licence conditions include coverage obligations for rural areas.[425] These obligations guarantee a certain specified availability of LTE in those countries, also in areas where the mobile operator business case may be negative.

Further Technical evolution to LTE-Advanced

After LTE, the evolution of mobile access network technology will continue with LTE-Advanced (LTE-A), starting with 3GPP Release 10. LTE-A is projected to offer a (theoretical) maximum downstream speed of 1 Gbps, which is a substantial increase above the 300 Mbps of LTE. This increase is obtained through a combination of approaches, including:

[422] The IEEE 802.11ac.
[423] The IEEE 802.11ad standard (advanced Wi-Fi standard, also known as WiGig) enables transmission in the 60 GHz band and theoretical speeds up to 7 Gbps.
[424] The 2.4 GHz band contains only 100 MHz, and is heavily utilised. The 5 GHz band contains far more MHz, and is only lightly utilised. See Marcus and Burns (2013), Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum.
[425] Arthur D. Little (2012), LTE Spectrum and Network Strategies, Telecom & Media Viewpoint, March 2012; available at: http://www.adlittle.com/viewpoints.html?&no_cache=1&view=534.

- More flexible use of available spectrum bands. LTE-A has been designed to aggregate spectrum from a number of bands, such as 800, 900, 1800, 2100 and 2600 MHz, for use in a single connection – thereby increasing the connection's speed. The 900 and 2100 are typically used for 2G and 3G networks today, but when these networks are phased out in the future, the spectrum can be used in LTE-A networks.
- Further improvements in spectral efficiency.[426]
- More extensive use of MIMO (Multiple Input Multiple Output).[427]
- The integration of smaller cells (femtocells,[428] metrocells[429] and Wi-Fi) into the mobile network based on conventional macro-cells[430] is referred to as the migration to heterogeneous networks (hetnets). In LTE-A these smaller cells play a more prominent role, as well as the Heterogeneous networks in which they cooperate with the conventional macro-cells. Apart from the use of more spectrum, the deployment of a larger number of smaller cells is traditionally the most powerful way to increase mobile capacity. Smaller cells provide coverage and capacity in homes and offices, but also high-traffic zones such as shopping malls and stations. They include solutions based on licensed spectrum such as femtocells (typically installed by the customer) and metrocells (installed and managed by the mobile network operator) as well as Wi-Fi-based solutions which use licence exempt spectrum.

High-performance mobile networks require improvements in fixed networks

It is important to note that fast mobile data connections increasingly depend in several ways on fast fixed networks. First, in order for mobile data users to benefit from the increased bandwidth over the radio interface, the antenna sites need a high-capacity backhaul connection to the mobile core network. This will in many cases be a fixed connection, with microwave[431] links as an alternative to the fixed network in situations where fixed connections are difficult to install or prohibitively expensive. Fixed connections can involve far greater investments than microwave links because of the installation costs associated with digging and laying cables.

Current and novel microwave technologies support bit rates beyond several Gbps, and thus provide a long-lasting alternative. Second, to enable the high data-rates for large numbers of customers, there is a need for a denser grid of base station sites, each of which serving a smaller area. In a denser network the available bandwidth per site can thus be shared with fewer customers, increasing the bandwidth per customer. Third, despite the increased radio capacity offered by LTE, it will be attractive and even necessary in many situations to off-load mobile traffic to fixed (e.g., DSL, cable and fibre) networks to reduce the traffic load on the mobile network. As can already be seen today, a substantial part of the data from wireless devices (e.g., smartphones, tablets and laptops) is foreseen to be not carried by mobile networks, but instead transferred to fixed broadband networks via Wi-Fi or possibly by femtocells (see section 6.3.2).

[426] As technologies improve, the number of bits/Hz that can be carried progressively increases. The same spectrum band can carry more traffic (as is already the case, for instance, with digital television).
[427] MIMO is a transmit-receive concept applied in mobile networks, based on the use of multiple input and multiple output antennas.
[428] A femtocell is a small, low-power cellular base station, typically designed for use in a home or small business.
[429] A metrocell is a compact and discrete mobile phone base station, unobstrusively located in an urban area.
[430] A macro-cell denotes a normal, full sized base station as used in a conventional mobile network.
[431] Microwaves are a form of electromagnetic radiation with wavelengths ranging from as long as one meter to as short as one millimetre. They are widely used for point-to-point communications (and also for microwave ovens).

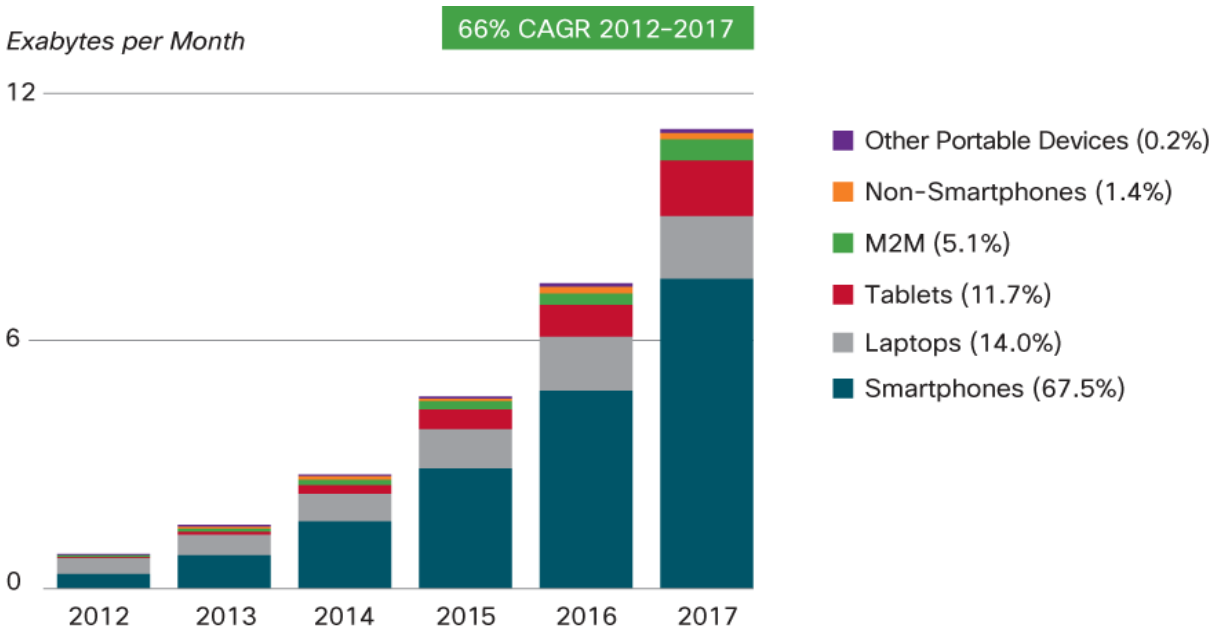
Thus, the further uptake of wireless devices and applications stimulates the development of both mobile and fixed network infrastructures, but it is also dependent on a constructive interaction between the two.

The importance of these progressive technological improvements has been perhaps most visible in Austria,[432] where mobile broadband frequently represents an economic substitute for the fixed broadband access, rather than an economic complement (i.e. something that would be used in addition). The Austrian NRA recognised this evolution by treating fixed and mobile broadband as a single market for purposes of regulatory analysis, as we explain in section 6.3.

6.2. The Evolution of the Usage of Wireless Networks

Voice traffic in mobile networks has experienced steady growth over a period of many years. In the past few years, the evolution of traffic growth entered a second phase where data traffic exploded, primarily due to the rapid adoption of smart phones and tablets, as noted in section 2.1. These trends are clearly visible in Figure 32 and Figure 33.

Figure 32: Growth of mobile data (2012-2017)

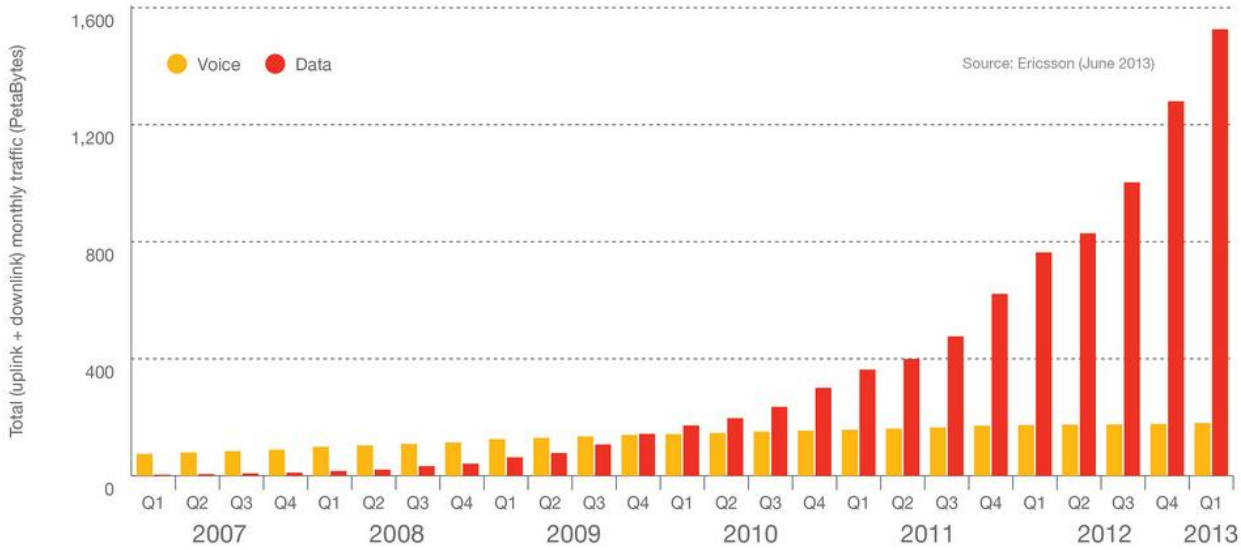


Figures in legend refer to traffic share in 2017.
Source: Cisco VNI Mobile Forecast, 2013

Source: Cisco Mobile VNI (2013).[433]

[432] A European Member State.
[433] Cisco (2013a), *Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update*, 2012–2017, 6 February 2013.

Figure 33: Estimated global voice and data traffic uplink and downlink (PB/month)



Source: Ericsson Traffic and Market Report, June 2013.

Today, there are indications that we may be entering a third phase of mobile data traffic evolution, as demonstrated by a recent WIK/Aegis study for the European Commission.[434] Recent data generated by handset applications strongly suggests that, as large as the explosion of mobile data traffic may be, it might represent only the tip of an even larger iceberg. **The majority of traffic from nominally mobile devices such as smart phones and tablets under the Android operating system is in fact being sent by means of private Wi-Fi in many European countries.** It is possible that the mobile network operators did not fully appreciate the magnitude of this phenomenon because in most cases the off-loaded traffic is completely invisible to them. Handset application results analysed by Mobidia and Informa appear in Figure 34.

[434] Marcus, J. S., Burns, J. (2013), *Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum*, study for the European Commission.

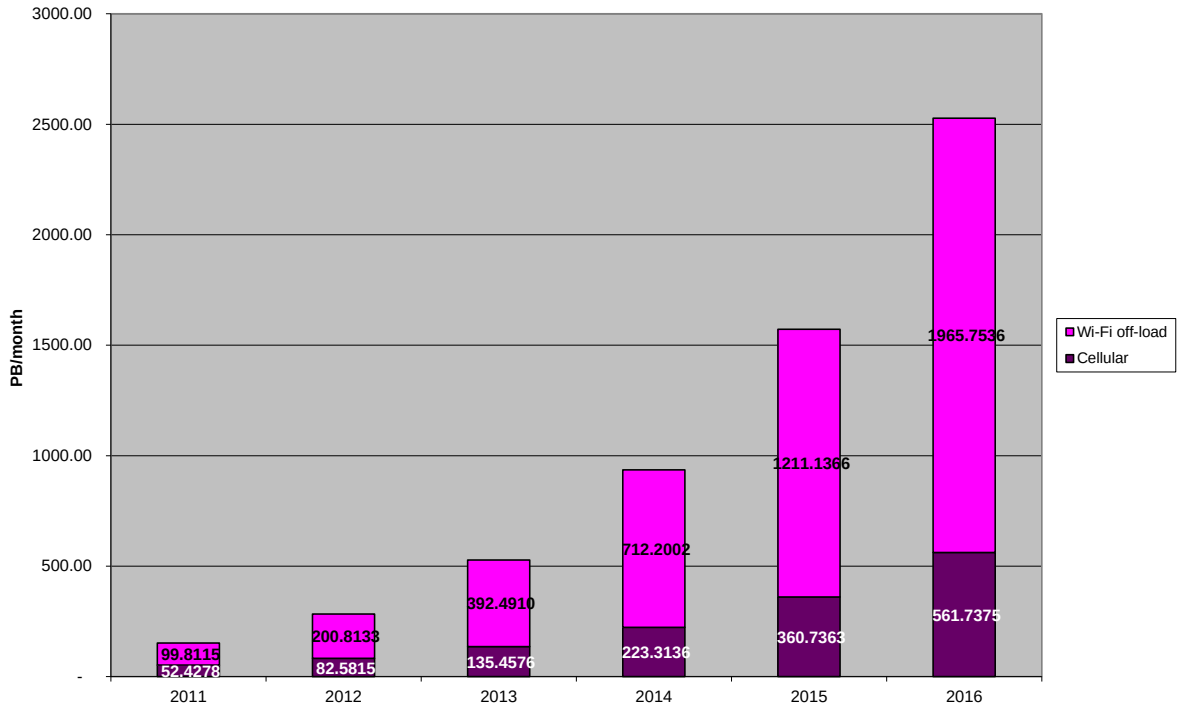
Figure 34: Fraction of Android smart phone originated traffic sent over cellular, private Wi-Fi, and public Wi-Fi networks

Source: Informa/Mobidia (2013). [435]

The net effect is that mobile data traffic, while still growing rapidly, is not growing as rapidly as had been expected just one year ago. If these data turn out to be fully representative and correct, it would imply that the majority of data traffic from nominally mobile devices today is already off-loaded, primarily to private Wi-Fi at home and at work; moreover, an even larger fraction of traffic can be expected to be off-loaded to Wi-Fi and perhaps to femtocells/metrocells in the years to come, as shown in Figure 35.

[435] Informa/Mobidia (2013), Understanding the Role of Managed Public Wi-Fi in Today's Smartphone User Experience: A global analysis of smartphone usage trends across cellular and private and public Wi-Fi networks, White Paper, February 2013; available at: http://www.mobidia.com/admin/whitepaper/5.pdf. Their measurements of public versus private Wi-Fi are based on whether an IP proxy redirect is used. Self-provisioned Wi-Fi is assumed to be private, Managed Wi-Fi is assumed to be public.

Figure 35: Observed or predicted mobile data off-load



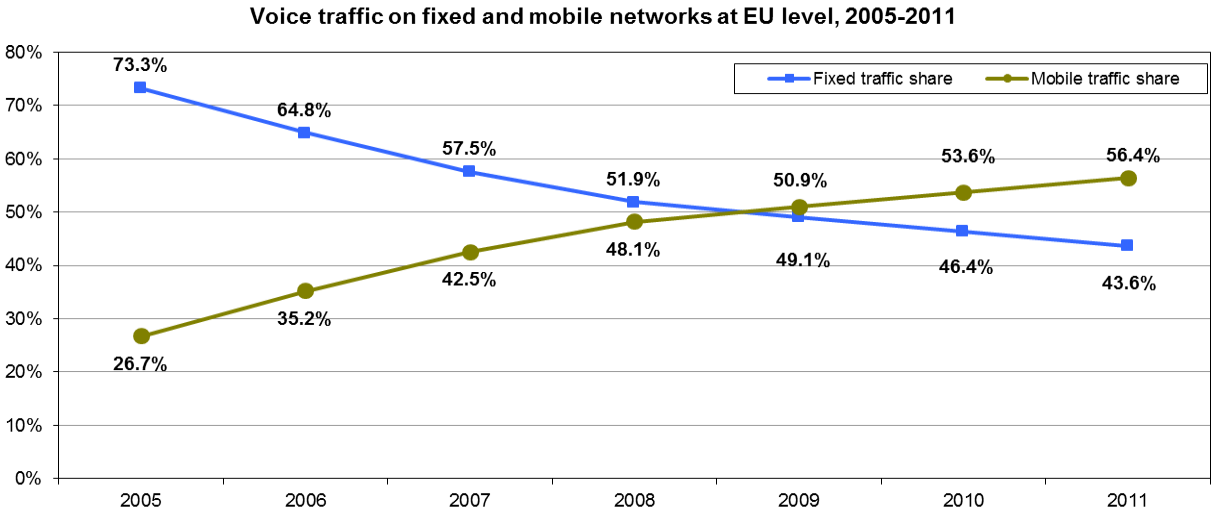
Source: Cisco VNI (2012) and Informa/Mobidia data, WIK calculations.

All of this has rather unexpected implications for fixed-mobile substitution, the progressive tendency of traffic to migrate from the fixed network to the ubiquitously available and increasingly affordable mobile network. Most forms of traffic off-load from the mobile macro cellular network result in the traffic being back-hauled over the fixed network, typically from the consumer's own Wi-Fi router. This effectively converts mobile traffic back into fixed network traffic, and thus implies a much more complicated set of linkages between fixed and mobile networks than has been assumed to date.

6.3. Policy Implications

There is increasing evidence that mobile telephony is being used as a substitute for fixed telephone services, at least for residential consumers. In 2009, the volumes of mobile minutes passed fixed volumes for the first time in Europe (as is evident in Figure 36, and also in Figure 33). These trends have been supported by continued reductions in the charges for terminating mobile traffic, which represents a wholesale cost to fixed and mobile network operators in regard to their traffic to other MNOs. This reduction in cost has in turn allowed lower retail prices and cheaper bundles for mobile calls.

Figure 36: Voice traffic on fixed and mobile networks (2005-2011)



Source: Digital Agenda Scoreboard 2013 spreadsheet on financial, telephony, broadcasting and bundled services indicators downloaded September 2013.

6.3.1. Substitution of Mobile Voice Services for Fixed

The degree to which this substitution is effective could have significant implications on market analyses and on the imposition of remedies aimed at promoting competition in fixed voice telephony.

In all Member States, the traditional incumbent is currently considered to have significant market power (SMP) in the market for fixed call origination.[436] This has led to near universal application of obligations on incumbents to provide carrier selection (CS) or carrier pre-selection (CPS), whereby a consumer can choose an alternative provider for (international or other) calls either as a default or on a call by call basis.[437]

The market for mobile call origination, by contrast, does not even appear in the list of markets susceptible to ex ante regulation (i.e. the list of markets that NRAs are required to analyse). Given that almost all Member States have three or more MNOs today (see Figure 2 and Table 4), the market for mobile call origination is generally felt to be competitive.

If mobile voice were considered a full economic substitute for fixed voice, it is likely that the combined market for (fixed and mobile) voice call origination would be found competitive in most if not all Member States. Were this to be the case, then CPS obligations, which were originally introduced in the context of the 1998 Open Network Provision (ONP) framework, would be removed.

[436] This is Market 2 in the European Commission' 2007 Recommendation on Relevant Markets, *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*, C(2007) 5406 rev 1.

[437] Typically, the user dials a special, dedicated code before entering the number.

Another possible implication of finding mobile telephony to be a fully effective economic substitute for fixed telephony might be the deregulation of access to fixed telephone networks, which is currently regulated at the retail level in some countries[438] and also at the wholesale level, through the provision of wholesale line rental (WLR), a wholesale product which enables alternative providers to resell telephone access lines to end-users. The fact that fixed and mobile voice calls seem at first blush to fulfil the same function does not automatically mean that they are perfect substitutes for one another. They could, alternatively, serve as economic complements for one another, in which case an increase in mobile voice call minutes originated would not imply a reduction in fixed voice call minutes. Consider, for example, the relationship between smart phone ownership and personal computer ownership. One might imagine that smart phone owners would be less likely than non-owners to also own a personal computer, since the smart phone provides many of the same functions. In reality, we strongly suspect that smart phone owners are more likely than non-owners to own a personal computer (PC). If so, this would be a complementary relationship that implies that the two devices are not equivalent and are not part of the same market.[439]

It is possible, either in the context of the on-going review of relevant markets or in some subsequent review, that mobile voice may be found to be a full substitute for fixed voice; however, when considering deregulating this market, it would be important to separately review the implications on business calls, for which mobile telephony may provide fewer competitive constraints. Businesses tend to generate higher volumes of calls, to demand higher quality, and to be more sensitive to price than consumers. At the same time, businesses may be more able than consumers to use competitive alternatives, including VoIP-based alternatives.

6.3.2. Substitution of Mobile Broadband Data Services for Fixed

In recent years, a great deal of attention under the European Regulatory Framework has been paid to the regulation of access to fixed networks for the provision of broadband services. Two mechanisms used to do so are Local Loop Unbundling (LLU) and Wholesale Broadband Access (WBA), the latter being a downstream access product which includes more network components.[440] **If mobile broadband were found at some future date to be a substitute for fixed broadband, potentially major elements of the SMP-based regulation applied today would suddenly be inappropriate.**

As with voice services, if mobile broadband services were found to be an effective substitute for fixed, the combined fixed and mobile broadband market would most likely be found not to be subject to SMP. This would necessarily result in prompt lifting of any SMP-based remedies that might have previously been imposed.

Most NRAs have considered the issue of fixed/mobile broadband substitution, but to date only two NRAs have proposed to find fixed broadband markets effectively competitive on this basis and therefore no longer subject to regulation.

[438] Certain countries continue to impose retail price caps on retail telephone line rental from the incumbent, or impose obligations such as the obligation not to unreasonably bundle line rental with other retail services.

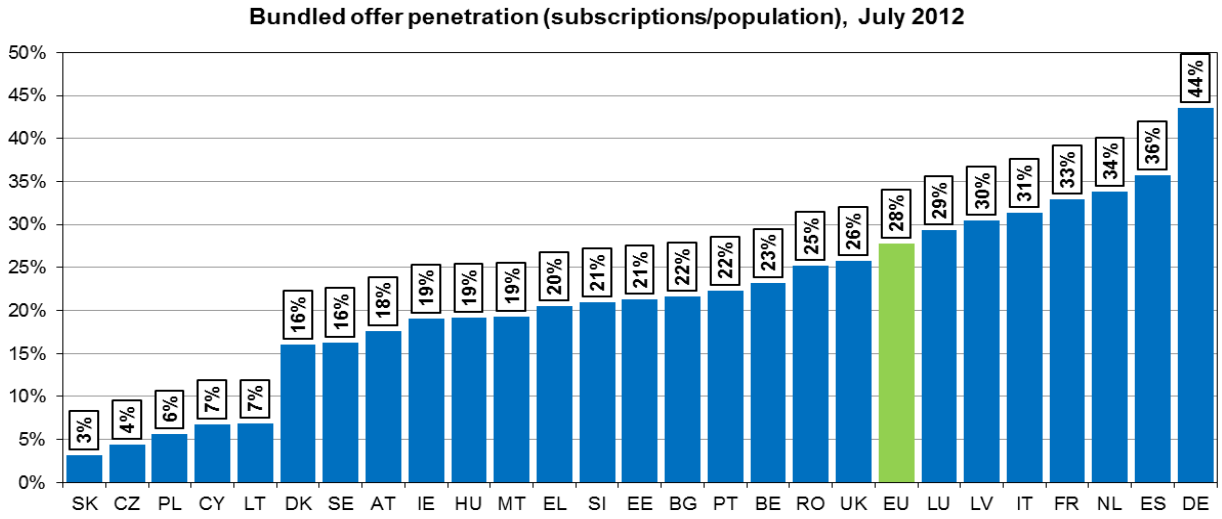
[439] Formally, this can be determined by assessing the cross-price elasticity of demand, which denotes the way in which the price of one product influences demand for the other. For substitutes, the cross elasticity of demand is positive, while for complements, it is negative.

[440] See Figure 10 for a diagram showing the network components used in different wholesale products along the value chain.

In 2009, the Austrian NRA RTR proposed to deregulate wholesale broadband access, following the findings of a survey of end-users in which a significant proportion claimed they would be willing to switch from fixed to mobile in response to a price increase.[441] The RTR concluded however that mobile broadband was not a substitute for fixed in the business segment, and therefore retained regulation of wholesale broadband access for businesses. Given that much of the fixed network in Austria has already been upgraded with ultra-fast technologies (DOCSIS 3.0 cable and FTTC/VDSL) which offer higher speeds and greater capabilities, and as bundles with television become more prevalent in the market, it is unclear whether the RTR will continue to find mobile broadband to be a substitute for fixed. This was something of a deregulatory precedent in the EU; however, it is important to note that local loop unbundling, which was the most significant remedy in the broadband market in Austria, remained in place.

In Finland, the NRA proposed to deregulate wholesale broadband access lines below 8 Mbps on the basis that mobile broadband was a substitute; however, this proposal was challenged by the European Commission and subsequently withdrawn.[442] In the Czech Republic, a proposal by the NRA that broadband markets should be deregulated on the basis of competition from Wi-Fi was also challenged by the European Commission.[443]

Figure 37: Penetration of bundled offers (subscriptions/population) as of July 2012



Source: Digital Agenda Scoreboard 2013 spreadsheet on financial, telephony, broadcasting and bundled services indicators downloaded September 2013.

6.3.3. Implications for SMP Regulation of Last Mile Fixed Network Bottlenecks

One of the stated aims of the EU telecoms framework is that asymmetric regulation could eventually be phased out as competition develops. How much competition is likely to emerge?

[441] See article 7 case *AT/2009/0970.*
[442] See article 7 case *FI/2012/1328-1329.*
[443] See article 7 case *CZ/2012/1322.*

As we explain in the companion report to this one,[444] cable coverage in Europe is substantial, and much of it has been upgraded to support broadband; however, it reaches only about half of Europeans, it is not present in every country, and the footprint is not expected to expand significantly from now to 2020.

The economics of fixed networks make replication difficult in the last mile of telecommunications networks, and the migration to fibre-based NGA is making replication even harder.[445]

This means that the substantial majority of Europeans are likely to be reached by an access line provided by a single telecommunications network, not more. About half of Europeans are also served by broadband-capable cable. An additional handful are served using other physical transmission media, such as fixed wireless or powerline,[446] but this number is small and shows no signs of growing.

Collectively, these statements imply that, in the absence of service-based competition, nearly all of Europe would be served by either one or two physical fixed networks. Most regulatory experts would argue that competition between two infrastructures (i.e. a duopoly like in the U.S.) does not represent effective competition. This seems to imply that effective facilities-based competition in broadband (i.e. in the absence of the service-based competition that access regulation enables) is likely to occur only in two scenarios. Either:

- **mobile broadband would have to become fully substitutable for fixed**; or
- **some other service such as powerline or fixed wireless (WiMax) would have to evolve into a commercially fully viable substitute**, which at present seems unlikely.

Even if mobile broadband were to become substitutable for fixed broadband and voice, a range of other bottlenecks would probably still require access regulation on an ongoing basis.

- Any substitutability between fixed and mobile broadband is likely to be limited to residential broadband. Broadband access for businesses including both asymmetric access and leased lines would probably continue to require regulation.
- Mobile broadband typically requires fixed backhaul which in many cases may not be economically viable to replicate. Competition in mobile broadband may thus be dependent on the availability of regulated access to wholesale leased lines as well as potentially dark fibre[447] and/or duct access.
- Other bottlenecks, notably including the termination monopoly bottleneck on both fixed and mobile networks, exist independently of last mile bottlenecks.[448]

[444] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.
[445] Elixmann, D., Ilic, D., Neumann, K.-H. and T. Plückebaum (2008), *The Economics of Next Generation Access*, study for ECTA; available at: http://wik.org/uploads/media/ECTA_NGA_masterfile_2008_09_15_V1.pdf.
[446] Powerline is the provision of broadband Internet access over the consumer's electrical connection.
[447] Dark fibre refers to an optical fibre line that has not been activated through the use of optical equipment to send light signals (and hence communications) down the line.
[448] The termination monopoly derives from the fact that only a single network operator is able under present technology to complete a call to a given telephone number. See Marcus and Elixmann (2008).

7. THE EUROPEAN COMMISSION'S CONNECTED CONTINENT PROPOSALS

KEY FINDINGS

- We agree with the **European Commission's implied assessment that the existing EU regulatory framework has failed to achieve effective harmonisation in key areas;** however, we fear that solving the problem with a Regulation as proposed is unwieldy and highly likely to result in confusion and overlap with existing measures.
- **Some of the topics addressed in the Commission's Connected Continent proposals are urgent and directly related to the Single Market. These include (1) the need for harmonisation of upcoming spectrum allocations; (2) the need for harmonised wholesale inputs for pan-European business communications; and (3) the need for harmonised rules for network neutrality to provide a predictable environment for network operators and online services. These urgent topics could (with suitable amendments) be addressed through discrete, targeted legislative measures.**
- **The proposed approach to roaming is unlikely to be effective. There is no incentive for mobile network operators to form such alliances. Meanwhile, the proposal substantially undermines the viability of the Structural Solutions to roaming enacted in 2012.**
- Proposals to achieve 'roam like home' and to cap retail prices for intra-EU international calls have benefits in terms of achieving a Digital Single Market, but they represent a significant shift away from the existing preference for wholesale regulation towards retail regulation. These measures should also have implications for the way in which termination rates are set, inasmuch as these are key inputs to retail prices. **The European institutions should evaluate the feasibility of an integrated approach to cross-border communications that would encompass international mobile roaming, international calls, termination rates, and potentially the European numbering space.**
- **Other issues raised (including authorisation, where we find the Commission's proposals unwieldy) may be better suited to an overall review of the electronic communications framework.** Changes to institutional arrangements and the objectives for applying regulation in particular deserve a more thorough and coherent review.

The European Commission has just issued its Connected Continent proposals.[449] This chapter provides a detailed assessment.

[449] European Commission, *Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012, 11 September 2013, COM(2013) 627 final.*

7.1. Overall Design

In understanding the Commission's proposal, it is necessary to assess what it does and does not seek to do. Thus, it is useful to begin with a few words about how they defined the problem they were seeking to address.

The Commission's approach is best understood in terms of the Impact Assessment that they provided with the proposal.[450] They consider the overall challenges that Europe faces in this space, including fragmented markets, investment in network infrastructure that is arguably insufficient in comparison with other regions of the world with which Europe competes, challenges to cross-border information services, and transaction costs for users and providers of networks;[451] however, the proposed Connected Continent Regulation itself is driven by four somewhat more narrow regulatory concerns, rather than by a bottom-up assessment considering a wider range of policy instruments:

- Inconsistent national authorisation schemes
- Lack of coordination in spectrum assignments
- Lack of pan-European network access inputs with consistent capabilities
- High prices for roaming and international calls, inconsistent consumer protection.

7.1.1. The European Commission's Proposal

The European Commission's Connected Continent proposal contains a wide range of measures. In a presentation given to the ITRE committee of the European Parliament,[452] the Commission suggested that the package should be viewed as covering three broad themes:

1. Single EU Authorisation
2. European inputs to support high speed broadband, encompassing provisions aimed at harmonising spectrum allocation procedures and virtual access products
3. A single consumer space, encompassing provisions to harmonise contractual conditions, access to the Internet (commonly known as net neutrality provisions), and provisions to curb excess charges for intra-EU international calls and roaming.

In addition, there are a number of provisions aimed at adjusting the current balance of power between the institutions with the aim of fostering greater harmonisation. The European Commission expressly says that a central regulatory body is not needed at this time; however the Communication accompanying the proposals[453] does not rule this out as an option for the future.

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[450] European Commission (2013j), *Impact Assessment accompanying the document: Proposal for a Regulation of the European Parliament and of the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, […], SWD(2013) 331 final*. Their view of the problem apparently appears in Chapter 3.

[451] These concerns are somewhat similar (but not identical) to those raised in a study for the Commission, Ecorys (2011): *Steps towards a truly Internal Market for e-communications in the run-up to 2020*. That study identified regulatory uncertainty, national heterogeneity of implementation in the implementation of regulation, national discretion in spectrum policy, and a lack of necessary technical standards as key concerns.

[452] European Commission presentation to ITRE Committee 25 September 2013.

[453] *Communication on the Telecommunications Single market COM(2013) 634 final*, available at http://ec.europa.eu/digital-agenda/en/connected-continent-single-telecom-market-growth-jobs.

The new Regulation, if enacted, would co-exist with the Framework Directive, the Specific Directives (the Directives dealing with Authorisation, Access and Interconnection, Privacy, and Universal Service and User Rights), the Roaming Regulation, and a range of other policy instruments. In some cases, the overlapping portions of the existing framework are explicitly excised, as for instance with the consumer protection portions of the Universal Service Directive. In many other areas, however, the old and the new regulatory arrangements would be intertwined (see section 7.1.2).

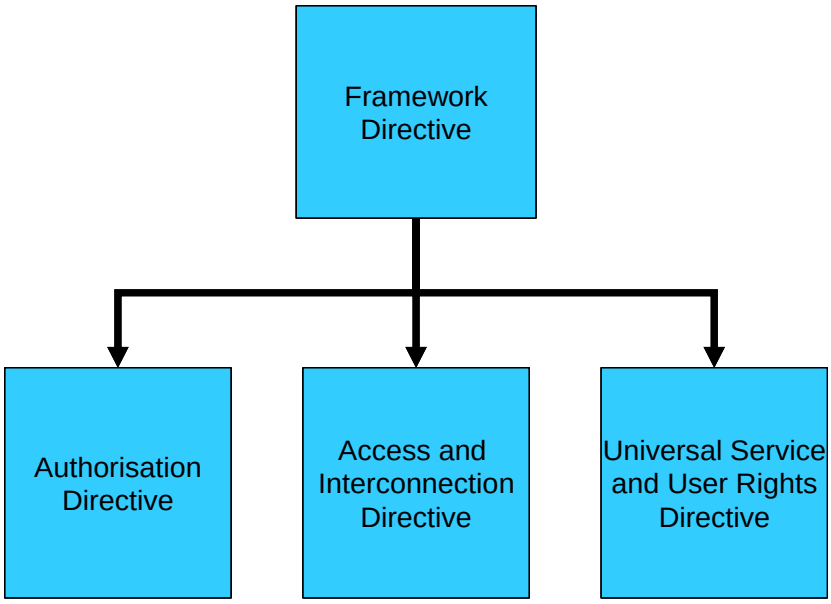
7.1.2. Assessment

In terms of overall design, constructing the bulk of the package as a single Regulation seems to be problematic. **It will inevitably be difficult to determine where the old regime leaves off, and the new one begins.**

The text of Article 35 of Connected Continent is telling; however, it is symptom of the problem, not a cause: 'Directive 2002/21/EC [the Framework Directive][454] is amended as follows: […] In Article 1, the following paragraph 6 is added: 'This Directive and the Specific Directives shall be interpreted and applied in conjunction with the provisions of [this] Regulation […]'

A strength of the existing Regulatory Framework (see section 3.4.1) that is often overlooked is its modularity and relative clarity of architecture and structure (see Figure 38).[455] Functions are appropriately grouped. Each function is addressed once, and only once. Defined terms are nested such that common terms are defined in the Framework Directive, more specific terms only in the Directive to which they apply.

Figure 38: Key elements of the existing Regulatory Framework



Source: WIK.

[454] For the 2009 version of the Framework Directive (and also of the Authorisation, Access and Interconnection, and Universal Service Directives, see European Commission (2010d), Regulatory framework for electronic communications in the European Union: Situation in December 2009.

[455] There is, of course, much more, including the Privacy Directive and a range of Recommendations, but their linkages to the basic structure of the Regulatory Framework is clear enough. Again, the reader is encouraged to review section 3.4.1.

All of this contributes to the coherence of the Regulatory Framework, and greatly enhances its comprehensibility and its ability to gracefully evolve over time.[456]

Conversely, legal and regulatory instruments that grow by accretion over time (as has arguably been the case in the United States) tend to be more difficult to maintain.[457] This is probably a significant factor in the large number of lawyers that the U.S. FCC needs in order to be able to operate (see section 4.2.4).

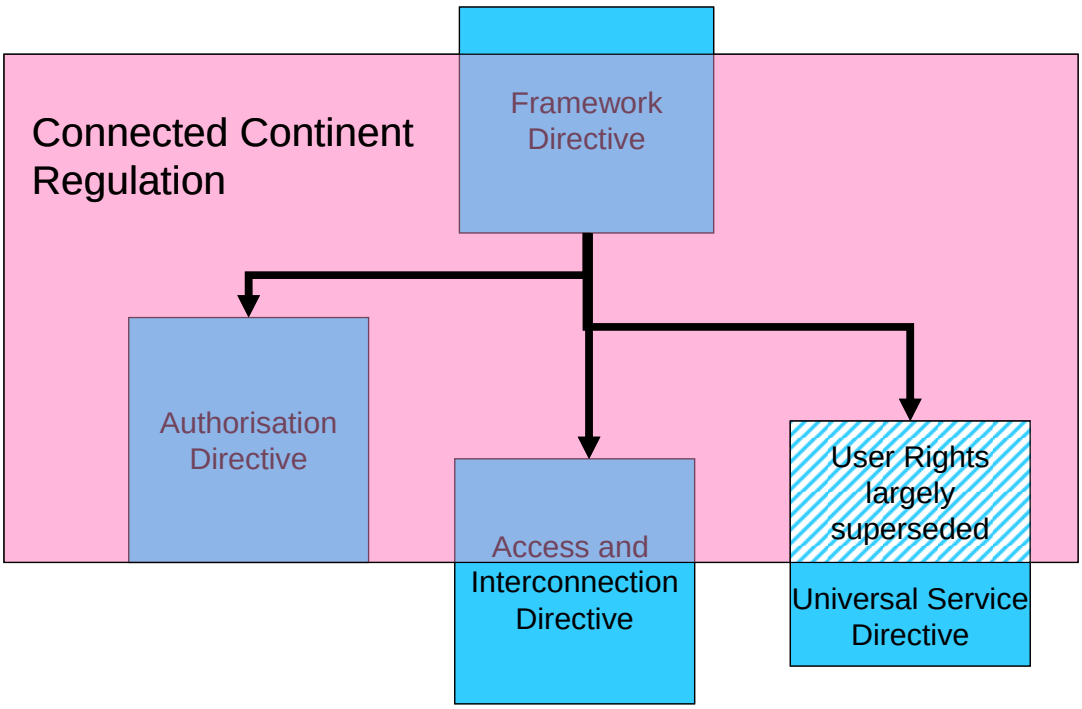
The new Connected Continent Regulation would not replace the existing Regulatory Framework,[458] but rather would be intertwined with it. As a few small examples, consider:

- Articles 3 through 7 of Connected Continent would establish a new authorisation regime in parallel with the old, but presumably still dependent on all of the provisions of the Directive, including the limitations on conditions that can be imposed in connection with general authorisations, numbers, and spectrum that appear in the Annex of the Directive. The charging aspects of Article 3(3) of the Regulation interact with those of Article 13 of the Directive.
- The virtual access products defined in Articles 17 and 18 of Connected Continent are aimed at influencing existing remedies imposed at national level and thereby constrain the principle of flexibility for NRAs. They also depart from previous guidelines in the Access Directive (Article 9 and Annex II) concerning the specifications for physical access products. Proposals concerning charging for NGA are interlinked with the recently adopted European Commission Recommendation on cost methodologies and non-discrimination, and could if changed through the legislative procedure, lead to inconsistencies with this Recommendation.
- Connected Continent intersects with the Framework Directive in numerous ways, with effects that are difficult to estimate. The introduction of home and host NRAs into the Article 7 (Framework Directive) process as envisioned in Article 35(2)(b) of Connected Continent has unpredictable consequences, as does the introduction of 'the global competitiveness of the Union economy' into the Three Criteria Test in Article 35(3)(a) of Connected Continent.
- Connected Continent also appears to overlap the spectrum management aspects of the Framework Directive and the Authorisation Directive.
- In the Universal Service Directive, key portions of the End-User Interests and Rights in Chapter IV are deleted in favour of expanded but somewhat equivalent provisions in Connected Continent. The deletions entail contracts (Article 20), publications of information (Article 21), quality of service (Article 22), and change of providers (Article 30). This deletion is not problematic per se, however, since it prevents overlap.

[456] See J. Scott Marcus (2012), *Structured Legislation – Toward the Synthesis of Better Law and Regulation of Electronic Communications*, in *Legisprudence*, International journal for the study of legislation, Vol. 6, No 1, 2012, p 1-33.
[457] Ibid.
[458] Again, for current (2009) versions of the Directives that comprise the Regulatory Framework, see European Commission (2010d), *Regulatory framework for electronic communications in the European Union*: Situation in December 2009.

The overlaps noted here do not necessarily represent insurmountable problems, but they are typical of a large number of linkages, some perhaps unsuspected, not all of the effects of which can be predicted. The overlay of the new Connected Continent on the existing Directives is by no means simple, as shown in Figure 39. **Connected Continent is so large, complex, and interwoven with the existing Regulatory Framework that it is hard to visualise and understand all of the interdependencies that it poses with the existing Regulatory Framework.**

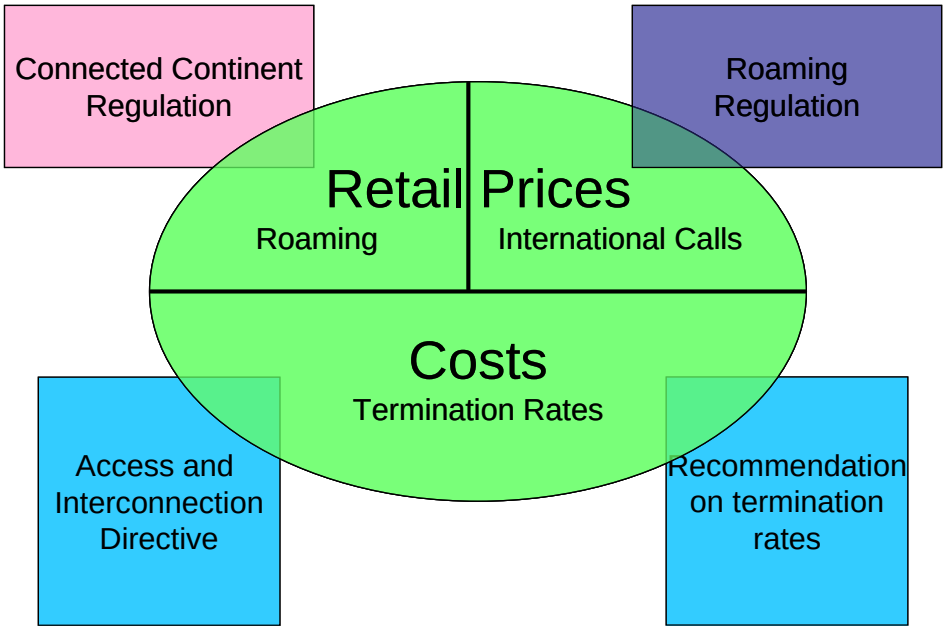
Figure 39: The intersection of Connected Continent with the key Directives comprising the existing Regulatory Framework



Source: WIK

Conversely, as we explain in section 7.5, the area of international mobile roaming and intra-EU international calls is indicative of a different but related problem. Topics that should be closely interlinked appear in separate instruments, thus making the relationships unobvious, and risking disconnects between retail prices and underlying wholesale costs. Article 37 of Connected Continent would amend the Roaming Regulation, while Article 21 would introduce new controls on international intra-EU calls to fixed and mobile networks. The price of international calls is dealt with (for whatever reason) in the 'Harmonised rights of end-users' section of Connected Continent, with no discussion of underlying costs. Termination rates, which represent an underlying cost for both services that needs to be considered in light of the retail price levels that are sought in Connected Continent, are not discussed and thus remain subject to the Access and Interconnection Directive and to the Commission's 2009 Recommendation on fixed and mobile termination rates. In terms of the legislative instruments employed, this leads to a fragmented design, as depicted in Figure 40.

Figure 40: Prices and costs of intra-EU Roaming and of international calls



Source: WIK

All of this is not to say that it is impossible to overlay a Regulation on top of one or more Directives. The Roaming Regulation is itself a case in point. It is a Regulation that co-exists comfortably with the pre-existing Directives, but the case is distinguishable from that of the proposed Connected Continent Regulation. First, the Roaming Regulation, particularly when one considers only the pre-2012 price control and bill shock warning provisions, deals with a narrow, bounded issue. Second, the deletion of one market[459] from the Commission's list of markets susceptible to ex ante regulation[460] removed nearly all overlap. Third, even though international mobile roaming had nominally been subject to regulation since 2003,[461] in practice the regulation had never been effective. Finally, the Roaming Regulation deals with prices and costs together in an integrated way, and at a level of detail that is appropriate for the price levels that the Regulation requires. Taking all of this together, the Roaming Regulation represented a small, bounded, surgical change to the pre-existing Regulatory Framework, and introduced no significant long term conflicts or overlaps. Moreover, the pre-2012 Roaming Regulation was relatively simple and easily understood instrument that did not greatly add to the complexity of the Regulatory Framework as a whole.

In sum, the same does not apply to the large proposed Connected Continent Regulation. **The proposed Regulation is replete with potential overlaps and complexity with the existing Regulatory Framework, as depicted in Figure 41.**

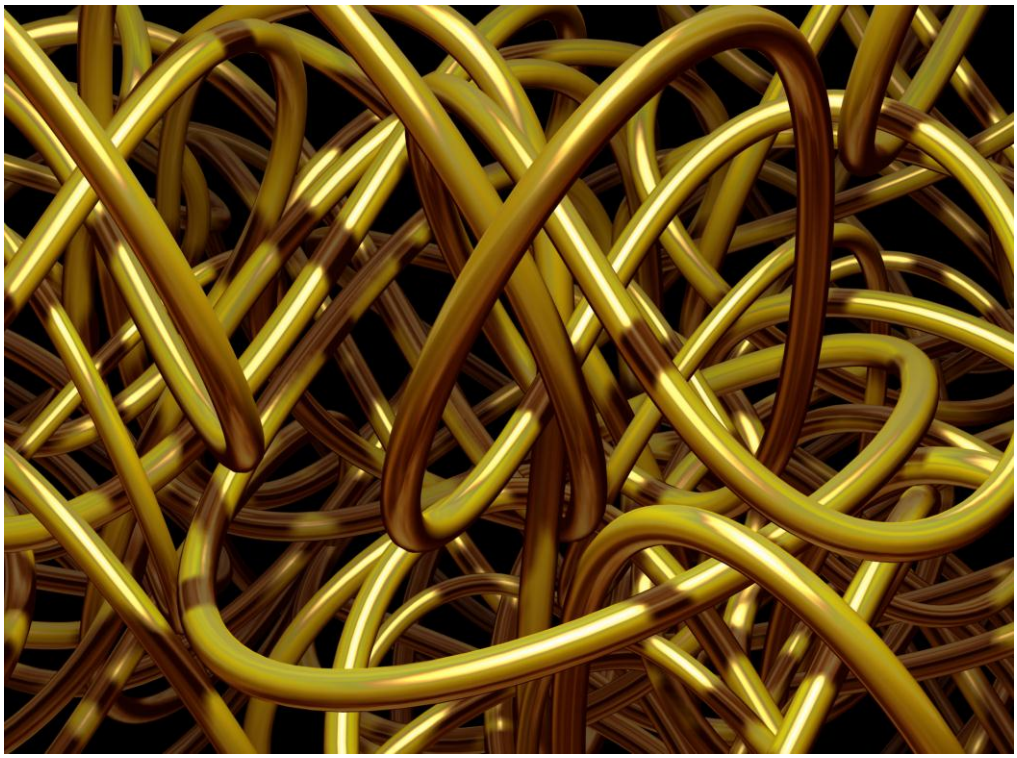
[459] Market 17 (wholesale national market for international roaming on public mobile networks) of the 2003 European Commission Recommendation on Relevant Markets: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:114:0045:0045:EN:PDF.

[460] See European Commission (2003). Market 17 in the Commission's 2003 Recommendation on markets susceptible to ex ante regulation was the wholesale national market for international roaming. In practice, NRAs found the market impractical to analyse at Member State level.

[461] The inclusion of a wholesale market for international roaming in the 2003 Commission Recommendation on Relevant Markets implies that it was considered from that time a market normally susceptible to ex ante regulation.

This approach risks undermining the structural and architectural integrity and coherence of the existing Regulatory Framework, and thus making it more difficult to understand, more difficult to operate, and more difficult to maintain over time.[462]

Figure 41: A schematic view of the Regulatory Framework envisioned in the Connected Continent proposals



Source: © diez-artwork - Fotolia.com.

We appreciate the Commission's interest in a single decision on a single regulatory instrument, but this approach entails a great many risks. First, as noted, the Regulation embedded in the proposals is too large and unwieldy. Second, large parts of the proposal require substantial refinement and amendment before they would be suitable for enactment.

An all-or-nothing approach risks sacrificing the many potentially valuable ideas contained in the Commission's Connected Continent proposals.

Our preferred alternative would be to re-structure the proposed package as a series of modular, bite-sized measures, each tailored to a more narrow purpose, each with a clear relationship to existing instruments (as described in section 3.4) and with the choice of Regulation versus amendment to the existing Directives in each instance driven by the functional needs of the task that is to be performed. In this process, it could also be helpful to distinguish between those measures that are truly urgent, versus those that would benefit from further reflection.[463]

[462] See J. Scott Marcus (2012), Structured Legislation – Toward the Synthesis of Better Law and Regulation of Electronic Communications, op. cit.

[463] This stepwise, prioritised approach would also be broadly consistent with the thrust of the approach put forward in European Parliament (2013e), *Roadmap to Digital Single Market: Prioritising Necessary Legislative Responses to Opportunities and Barriers to e-Commerce*.

7.2. Authorisation

7.2.1. The European Commission's Proposal

The Commission's proposed Connected Continent package proposes that telecommunications operators need only to register in a single Member State in order to be authorised to operate across the EU. It creates a category of operator entitled 'European electronic communications provider',[464] which would be eligible for differential treatment compared with operators present in only one Member State. These advantages include:

- Limited obligations to contribute administrative charges to NRAs and to contribute to universal service funds, resulting in a waiver on authorisation contributions if they constitute less than 0.5% of the total national electronic communications turnover, or less than 3% in the case of universal service contributions.
- The right to call on their home NRA to engage in a dispute in another host country in which they operate
- Protection from being 'disqualified' from operating in a host country due to breach of authorisation conditions unless the home member state consents.

In order to implement these provisions, greater co-ordination is envisaged between BEREC (as repository of authorisations) and amongst individual NRAs.

In addition, SMP remedies affecting European electronic communications providers are proposed to be subject to a potential veto by the European Commission, which would not be applicable to operators with a purely national scope of focus.

7.2.2. Our View

As noted in section 3.9.2, we do not believe that authorisation is a serious problem under the European Regulatory Framework at present. The existing Authorisation Directive already (1) limits the information that an NRA can require as part of a Notification, (2) limits the conditions that the NRA can impose, (3) limits the charges that can be imposed, (4) requires the NRA to provide a prompt response, and (5) explicitly authorises the prospective network operator or service provider to proceed as if authorised if the NRA fails to respond.

Stakeholders have (with rare exceptions) told us in the past, and continue to tell us, that authorisation per se is not an over-riding concern. For a network operator, even a small one, the cost is negligible[465] in comparison to the infrastructure that is needed in a Member State. The need for authorisation may perhaps be an issue for fledgling over-the-top (OTT) operations (but bearing in mind that 'information society services'[466] are not generally subject to the Regulatory Framework in the first place).

[464] Article 2(1).

[465] Marcus, J. S., Elixmann, D., Wernick, C. and the support of Cullen International (2008), The Regulation of Voice over IP (VoIP) in Europe, a study prepared for the European Commission, 19 March 2008.

[466] The electronic communications framework primarily affects providers of electronic communications networks and services as distinct from information society services. The definitions in Article 2 of the Framework Directive note that the definition of an '"electronic communications service" does not include information society services, as defined in Article 1 of Directive 98/34/EC, which do not consist wholly or mainly in the conveyance of signals on electronic communications networks'.

The recent proposals from the European Commission distinguish between a home Member State (the Member State where the European electronic communications provider has its main establishment) NRA and a host Member State (any Member State different from the home Member State where a European electronic communications provider provides electronic communications networks or services) NRA. We are not convinced that a single EU-wide authorisation regime enforced by the home NRA would be more effective than multiple authorisations based on a harmonised template of conditions, as is largely the case today. The Connected Continent proposal includes a potentially counter-productive involvement of the home Member State NRA in the host Member State regulatory process.[467] These provisions seem likely to increase asymmetries in the treatment of operators within each of the Member States.

Overall, these proposals appear to risk introducing substantial complexity and new potential problems into an area that was not a significant problem in the first place.

Perhaps more important is that the limited beneficial effects that are sought can be much more simply achieved with three small, surgical changes to the existing Directives. There is no need to introduce the risk, complexity, disruption, and overlapping and ambiguous responsibilities put forward by the Commission.

- **A standard Notification application form could be provided as a new Annex to the Authorisation Directive**, and all NRAs required to accept it as an alternative to whatever other forms they might use. In that way, a prospective network operator could simply submit 28 identical or nearly identical forms to each of the NRAs in order to become authorised.
- The Commission sensibly proposes waiving authorisation fees for small (in terms of turnover) applicants. The Authorisation Directive already contains provisions capping authorisation fees. **A sentence could be added to the Directive to require that fees be waived altogether for small enough applicants.**
- The Commission sensibly proposes waiving payments into any universal service fund for small (in terms of turnover) applicants. Again the Universal Service Directive already contains provisions about fees. In the few Member States that have a universal service fund, a waiver of payments for small network operators is already viewed as a best practice. **Again, a sentence could be added to the Universal Service Directive to require that universal service payments be waived altogether for small enough market players in those Member States that implement universal service payments.** In our companion report,[468] we recommend the phase-out of universal service altogether to be replaced by a combination of state aid and targeted measures to support low income consumers.

[467] Per Article 35, 'When the intended measure aims at imposing, amending or withdrawing an obligation on a European electronic communications provider within the meaning of Regulation [XXX/2014] in a host Member State, the national regulatory authority of the home Member State may also participate in the cooperation process.'

[468] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment.*

7.3. Spectrum Management

Articles 8 through 16 specify a series of measures that seek to coordinate the assignment and use of harmonised radio spectrum for wireless broadband communications. Taken as a whole, we view this section of the proposed Regulation as a valuable and sensible contribution.

Articles 9 through 11 provide regulatory principles and considerations that must be taken into account. They represent a good expression of best practice for Spectrum Management Authorities (SMAs), but we suggest that much of the text might be more suitable for the recitals of a Regulation than for the operative text. There are a great many principles here, and they are expressed in very broad terms. Judging whether a Member State has complied or not might prove to be challenging in practice. Only those that address likely problems should be in the operative text, and then they should be targeted narrowly.

In Recital 17 of the proposed Regulation, the Commission rightly identifies a key concern. Referring to the Digital Agenda for Europe broadband goals, they note that '[…] the Union has fallen behind other major global regions […] in terms of the roll-out and penetration of the latest generation of wireless broadband technologies that are necessary to achieve those policy goals. The piecemeal process of authorising and making available the 800 MHz band for wireless broadband communications, with over half of the Member States seeking a derogation or otherwise failing to do so by the deadline laid down in the Radio Spectrum Policy Programme (RSPP) Decision …, testifies to the urgency of action even within the term of the current RSPP. Union measures to harmonise the conditions of availability and efficient use of radio spectrum for wireless broadband communications … have not been sufficient to address this problem.'

It is Article 12 that responds to this concern, and with some of the most useful text in the entire proposed Regulation. Article 12 calls for Spectrum Management Authorities (SMAs) to establish timetables for the granting, reassignment, or renewal of rights of use for wireless broadband communications. The Commission would be empowered to use implementing acts to establish common timetables for assignment of individual rights, coordinated duration for the rights, and coordinated expiry dates. These arrangements could have enormous value, not only for dealing with remaining delays in assignment of 800 MHz spectrum, but also for preventing similar delays in the assignment of a second 'Digital Dividend'[469] in the 700 MHz band that is expected to become available after the next WRC[470] in 2015.

Article 13 would oblige Member State SMAs to notify the Commission of any granting of individual rights or general authorisations associated with radio spectrum for wireless broadband communications by means of a process analogous to the Article 7 procedure. This is a fairly intrusive process, and possibly a bit more than is strictly necessary; however, it is clear that the system needs something along these lines in order to make effective the powers proposed in Article 12.

Articles 14 and 15 seek to proactively address potential impediment to the deployment of Wi-Fi or small cell networks for purposes of mobile traffic off-load.

[469] 'Digital Dividend' refers to spectrum made available following the introduction of technologies which allow more efficient use of spectrum to deliver services previously offered. In recent years, the 'digital dividend' was used to refer to the spectrum made available following the switch-over from analogue to digital TV.

[470] The World Radiocommunication Conference (WRC) is organised every four years by the International Telecommunication Union (ITU) to review, and, as necessary, revise the Radio Regulations, the international treaty governing the use of the radio-frequency spectrum and satellite orbits.

A recent study for the European Commission found that mobile traffic off-load is already much more significant than many experts had anticipated, and contributes significant socio-economic benefits to Europe.[471] The proposed Regulation seeks to clear away potential barriers to cooperative Wi-Fi networks, and to simplify administrative impediments to getting the access points deployed. A small access point should be far easier to deploy than a large one, but there could potentially be a very large number of access points. These sensible and directionally appropriate measures respond directly to the recommendations of the study.[472]

7.4. Wholesale Access Remedies

7.4.1. The European Commission's Proposal

Section 2 of the draft Regulation aims to harmonise the specifications of certain virtual access products which are considered to be essential to the functioning of the Single Market. The main justification is that these products are needed to serve pan-European corporations, which prefer to receive services from a single supplier across the EU, and that harmonising products will facilitate cross-border entry in consumer broadband.[473]

Three products are listed in Annex I of the Regulation. These can be summarised as follows:

- Virtual Unbundled Local Access (VULA): a local access product, intended as a substitute for copper local loop unbundling, typically (but not only) used for the provision of residential broadband over a next generation access network (FTTC/VDSL or FTTP).
- Wholesale broadband Access: a IP-based 'bitstream' product typically available at regional or national level allowing provision of broadband services across a wide part of the national territory. Typical uses are for customers in rural areas where local access may not be viable, or for smaller site of corporate customers. For a schematic diagram of bitstream products see Figure 10.
- Terminating segments of leased lines: high quality dedicated links offering symmetric high bandwidths, typically used to connect larger sites for corporate customers or as backhaul for the provision of fixed and mobile broadband.

The draft Regulation proposes[474] that by 1 January 2016, the Commission will adopt further implementing measures specifying the service conditions for VULA. It also gives the Commission the power to adopt delegated acts,[475] subject to 'comitology'[476] procedures, to harmonise conditions for the other products (wholesale broadband access and leased lines), but there is no obligation or deadline associated with these products.

[471] Marcus, J. S., Burns, J. (2013), *Impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum*; study for the European Commission.
[472] Ibid.
[473] Standardisation of wholesale broadband access was initially raised in the context of a 2011 CEO Roundtable organised by Vice-President Kroes, the results of which were reported at http://europa.eu/rapid/press-release_MEMO-11-508_en.htm?locale=en.
[474] Article 20.1.
[475] Delegated acts are instruments that can be adopted by the European Commission, usually subject to the approval of a body representing member state Governments such as COCOM.
[476] Comitology procedures set out the rules by which rule-making may be delegated to the Commission with the assistance of relevant committees (normally composed of member state representatives).

Two other aspects in this section of the draft Regulation are worth noting. As regards the VULA product, NRAs are required to assess whether virtual products along the lines of those specified in the Regulation should be applied instead of other potential wholesale products such as physical unbundling of fibre loops (fibre LLU) or unbundling of copper sub-loops (SLU).[477] In this context, virtual products are presented as equal, or potentially preferable to physical products. This provision represents a shift away from the provisions of the 2010 EC NGA Recommendation,[478] which actively promotes physical unbundling of next generation access networks, with virtual access treated as a temporary remedy. NRAs are also explicitly required to assess levels of price competition, the presence of infrastructure-based competition and measures to protect against discrimination when considering whether or not to apply a remedy of cost-orientation to VULA products. This reflects the provisions of the EC Recommendation on costing and non-discrimination,[479] and again represents a departure from the previous 2010 NGA Recommendation which advocated adherence to cost-orientation for NGA-based wholesale products, requiring exceptions to be justified.

Separately, the draft Regulation also envisages[480] a mechanism whereby operators are obliged to meet reasonable requests for an 'assured service quality' (ASQ) connectivity product. One ground which is considered to be reasonable when denying such requests may be a failure of the other party to reciprocate. The nature of the ASQ product is not entirely clear, but it appears to be a product that would facilitate enhanced quality delivery of calls, content and data-critical applications.

7.4.2. Assessment

Harmonising key remedies for wholesale access is in general a positive approach, but the European Commission's proposals, as currently drafted, may not achieve harmonisation for the products which matter most for the Single Market.

The draft legislation itself does not actually harmonise product conditions such as service levels, but in the case of VULA leaves this to implementing measures to be adopted by 1 January 2016 and in the case of leased line terminating segments makes no commitment at all.

There is a very strong rationale for creating near identical conditions for terminating segments of leased lines across Europe, because harmonised products are demanded by pan-European suppliers of services to multi-national corporations. Business communications is one of the few electronic communications sector retail markets that could be characterised as genuinely cross-border. Similar justifications exist for business-grades of wholesale broadband access.

There is also a rationale for harmonising VULA products, but this may be more to secure the effectiveness of regulation in each country than to serve a cross-border market per se. The primary (although not only) use of these products is to serve residential customers, who are by nature present only in a single country.

[477] The copper subloop is a partial local loop providing access from the end-user to a concentration point such as a street cabinet. Copper subloops are used together with VDSL technology and fibre-to-the-cabinet (FTTC/VDSL) to offer fast broadband.

[478] NGA Recommendation; available at: http://eur-lex.europa.eu/LexUriServ/%20LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF.

[479] *Recommendation C(2013) 5761 final on consistent non-discrimination obligations and costing methodologies to promote competition and enhance the broadband investment environment.*

[480] Article 19.

Moreover, depending on the network architecture used for next generation access (e.g. where point-to-point fibre-to-the-home has been installed),[481] physical access may be more appropriate than VULA in some countries – meaning that VULA may not be a uniform remedy.

In order to achieve effective harmonisation for products which are used as inputs for pan-European services such as terminating segments of leased lines, not only should the service specification for all key wholesale products be harmonised, but the approach towards market analysis (i.e. common principles for the scope of the market definition and remedies applied) should also be harmonised as this determines whether or not provision of wholesale inputs used for cross-border services is mandated at a national level. This would require much more detail than is present in the proposed Commission text.

As regards departing from the standard principle of cost-orientation for VULA, we note that a European Commission Recommendation has just been adopted on this subject. **While flexible pricing (subject to a margin squeeze test[482]) may be appropriate in some circumstances, particularly early on in the roll-out process for NGA, we would not advocate specifying the conditions for NGA pricing in EU legislation, which is intended to be maintained over a longer period. This is because the optimal pricing mechanism for wholesale access to NGA may change over time as NGA technologies mature, and depending on whether margin squeeze tests prove adequate over time to protect consumer welfare.**

Existing requirements in the Access Directive[483] that ensure that 'NRAs must (irrespective of the price control mechanism followed) take into account the investment made by the operator and allow him a reasonable rate of return on adequate capital employed, taking into account any risks' remain adequate, in our view. We do not see the need to further elaborate these at this time.

7.5. Roaming and International Calls: Retail Regulation of Cross-border Communications within the Single Market

7.5.1. The European Commission's Proposal

Connected Continent proposes two major consumer-oriented policies which aim to remove what the Commission views as anomalies within what should be a single European market. The proposals are linked in nature, but covered in separate parts of the Commission's proposal, and enacted in different Regulations.

One is a proposal to ban telecommunications operators from charging more for an intra-EU fixed international call than a call made at long distance domestic tariffs, or to charge more for an intra-EU mobile international call than the maximum regulated retail roaming charge.

[481] See European Parliament (2013) *Entertainment x.0 to Boost Broadband Deployment*.
[482] Margin squeeze tests are aimed at ensuring that there is an adequate margin between the retail and wholesale price to enable an efficient operator to make a fair return.
[483] Article 13.

The other deals with roaming, and consists of two main elements. The first of these, which would be implemented through a new Article 4a in the Roaming Regulation, encourages the formation of Roaming Alliances so as to drive roaming prices down to levels corresponding to those of domestic prices, in exchange for which MNOs would be exempted from obligations to support the Structural Solutions enacted just a year ago, in 2012, but not yet implemented (see section 3.6.1). The second element calls for continued price reductions in the cost of roaming, including a ban on charges for incoming roaming calls from July 2014.[484]

7.5.2. Assessment

The overall objectives are appropriate. Reducing prices for Roaming and for international calls within the EU/EEA to levels approaching domestic rates clearly contributes to the Single Market, and facilitates the provision of certain cross-border services. These specific proposals regarding Roaming and international calls are, however, seriously problematic.

We see the **need for a better integrated approach** that (1) reflects a proper understanding of the economics of roaming; (2) properly balances costs with benefits; (3) realistically assesses likely consumer take-up of services; (4) properly gauges the likely incentives and actions of the mobile network operators, and (5) acknowledges where we are in the process relative to previous Roaming Regulations already enacted (and in some cases not yet fully implemented).

Most notably, **we have great doubts as to the likely effectiveness of the proposed new Roaming Alliances.** We question whether MNOs would find the value proposition put forward in the proposed new Article 4a of the Roaming Regulation to be attractive. Creating the necessary alliances would pose challenges (including the need to clear them through competition authorities), and there is simply no incentive for MNO groups to enter into the alliances.

- Participating MNOs would be exempted from the price caps in the Roaming Regulation, but they would win that freedom by pricing well below the caps.
- Participating MNOs would be spared the cost of implementing the Structural Solutions; however, those costs will have already been sunk by July 2014, before any Regulation could come into place, and long before an alliance could put in place and approved.
- The competition from which they would be freed is also not likely to concern them greatly, and moreover has already been undermined by the Connected Continent proposal itself, as explained in Section 3.6.4.

A deeper issue with the Commission's proposals concerning roaming and intra-EU international calls is philosophical. In the past, the European preference for addressing excessive charges[485] in given market segments is through wholesale regulation to address the anomaly through competitive forces – a primacy of wholesale regulation over retail regulation.

[484] See the proposed revisions to Article 8(2) of the Roaming Regulation.

[485] In economic terms, charges can be viewed as excessive when they are significantly above cost (including a reasonable return on capital employed). Differences of opinion exist over whether in the telecoms sector, charges should be taken 'as a whole' (i.e. the whole bundle including international calls and roaming) or whether charges for individual elements should be considered.

In the case of Roaming, it has long been clear that regulation of wholesale prices alone would not ensure correspondingly low retail prices; however, the extension of retail price controls to intra-EU international calls breaks new ground.

The Connected Continent impacts two existing wholesale approaches.

- **Roaming:** The proposals on roaming can be seen as an alternative to the Structural Solutions introduced in the Roaming Regulation of 2012, which sought a long term solution to high roaming prices by unleashing competitive forces (see Section 3.6.1). Whether this approach, which is not yet implemented, would have been effective is unclear; however, whether Connected Continent is adopted or not, it has likely undermined the business plans of potential providers of structural roaming solutions, as we explain in Section 3.6.4.
- **International intra-EU calls:** The proposal to cap intra-EU international call charges would, on the fixed side, effectively reverse a policy operated since 1998 of favouring carrier pre-selection or call by call selection, a form of wholesale regulation which enables customers to choose an alternative supplier for international (and other) calls.

The niche for competition in international (and other) calls, currently occupied by providers of call by call and pre-selection, would be reduced. The nascent market for alternative Roaming providers would likely be still-born.

While Roaming and international intra-EU calls are clearly set out in Connected Continent, one aspect that is closely related but missing from the proposals is a coordinated approach towards fixed and mobile termination rates. **Controlling prices without controlling underlying costs is risky.** Eliminating charges for Roaming voice calls received depends on mobile termination rates (MTRs) being nearly identical, since the home network operator's margin depends critically on the difference between an MTR that it receives from the caller's network and the MTR that it pays to the visited network. Charging identical rates for intra-EU calls compared with domestic calls implies that the cost of terminating calls, which is a key input, must be the same or at least very similar in different countries. It is possible that the costs for termination across Europe may be similar, particularly if calculated on a basis which only covers the cost of the traffic and not overheads or other costs;[486] however, actual charges for termination rates set by NRAs are not identical (see Section 8.1.3).

Meanwhile, in terms of institutional and legislative design, it seems awkward to have Roaming dealt with through the Roaming Regulation, international intra-EU calls dealt with through the new Regulation proposed in Connected Continent, and termination rates dealt with in the Access and Interconnection Directive and the Commission's Recommendation (see Section 7.1.2). The issues are closely interrelated.

[486] Pure LRIC methodology as recommended in the EC Recommendation on termination rates 2007.

7.6. Network Neutrality

The Commission proposals in regard to network neutrality seem to us to be prudent and sensible. They codify the rights of consumers 'to access and distribute information and content, run applications and use services of their choice via their internet access service', thus giving consumers for the first time enforceable rights in regard to goals that already appear in Article 8 of the Framework Directive.[487] Article 23 stipulates, with minor exceptions, that 'providers of internet access services shall not restrict the freedoms […] by blocking, slowing down, degrading or discriminating against specific content, applications or services, or specific classes thereof'.

In a previous study for the Parliament, we noted that quality differentiation in competitive markets (as we generally have in Europe) tends to benefit both providers and consumers.[488] Policymakers should consequently be careful not to needlessly obstruct welfare-enhancing quality discrimination. There are some risks associated with quality discrimination, but they can be constrained if consumers are well informed, if alternative providers are available, and if switching costs are sufficiently low.

It is Article 23 of the proposed Regulation that provides basic network neutrality protections, but it needs to be understood in the context of the other consumer protection provisions of Chapter IV of the proposed Regulation, which ensure that the necessary preconditions of informed consumers who are able to switch are met (and expand somewhat on their equivalents in the Universal Service Directive).
It is noteworthy that the language of Article 23 assures network operators of the ability to provide 'specialised services with an enhanced quality of service'. For reasons that should already be clear, we consider this to be entirely appropriate.

There is, however, a risk at present that unwise acts at Member State level might interfere with the provision of services with an enhanced quality of service. Were that to happen, it could potentially lead to a patchwork quilt of legal and regulatory impediments that could impede quality-of-service-aware offers, thus negatively impacting the Single Market and the broader economy. We therefore welcome the language that effectively protects network operators and service providers from interference in offering specialised services. 'In order to enable the provision of specialised services to end-users, providers of content, applications and services and providers of electronic communications to the public shall be free to enter into agreements with each other to transmit the related data volumes or traffic as specialised services with a defined quality of service or dedicated capacity.' These provisions facilitate the creation of QoS-aware services between network operators, thus possibly enabling QoS-aware cross-border services that could contribute to the Single Market.[489]

The use of a Regulation for the functions of Article 23 is in our view indispensible, since a key objective is to avoid a wide potential range of divergent and mutually inconsistent provisions in the Member States.

Article 23 also mandates that the provision of specialised services may not impair the general quality of internet access services.

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[487] *Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services* ("Framework Directive"); available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0021:EN:NOT.

[488] European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*

[489] We noted the potential benefits in European Parliament (2011a), Network Neutrality: Challenges and responses in the EU and in the U.S.

Competition in the Internet access market, stimulated by transparency and sufficiently low switching cost, may be sufficient to prevent quality impairment of internet access. The explanatory text states that NRAs should take a variety of technical parameters into account in their assessment of the quality of Internet access and, when required, the imposition of minimum requirements. **We expect that formulating requirements for the quality of Internet access and monitoring compliance with them will prove to be challenging.**

Finally, we emphasise that Net Neutrality is an extraordinarily complex area that involves not only classic economic concerns, but also important aspects of free expression. It will continue to be actively debated by experts[490] and by the public at large. There is ample room for reasoned, passionate disagreement. **The need for prompt action notwithstanding, there is also a need for full public consultation and debate before action is taken. This is true for all aspects of Connected Continent, but it may be particularly true for Net Neutrality.**

7.7. Consumer Protection and Standard Contract Terms

7.7.1. The European Commission's Proposal

Chapter 4 of the draft Regulation puts forward provisions which aim to harmonise the rights of end-users. These include provisions on network neutrality and caps on charges for intra-EU international calls, which are addressed elsewhere in this chapter.

Other significant provisions relate to consumer contracts. Key elements which go beyond existing legislation[491] are as follows:

- Contractual service quality (including speed) commitments:[492] the draft Regulation includes a requirement for operators to publish data on actual download and upload speeds, and information on how any limitations on volumes, speeds or other parameters might impact the use of content and applications. Consumers would also have access to certified evaluation tools to enable them to compare the performance of different services. If there are significant discrepancies between received speeds and the speeds specified in the contract, this would be considered a breach of contract.[493]
- Contract termination permitted from 6 months:[494] the draft Regulation provides that all consumers and other users (unless they agree otherwise) should have the right to terminate contracts with one month notice after six months have elapsed regardless of contract duration. Consumers would need to reimburse any costs associated with promotions or equipment subsidies if taking advantage of this provision. Bundled offers including electronic communications services would be covered by the provisions. These proposals are based on provisions recently introduced in Belgium, which led to widespread switching amongst mobile customers and consequent price reductions.[495]

[490] There is an extensive literature, and it continues to grow. See for instance the collection of articles in Belli and De Phillipi (eds.) (2013), *The Value of Network Neutrality for the Internet of Tomorrow.*
[491] Existing legislation on consumer contracts, which is replaced by these provisions is contained in the Directive 2002/22/EC of the European Parliament and of the Council of 7 March 2002 on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive); http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0022:EN:NOT.
[492] Article 26.
[493] Article 28.5.
[494] Article 28.
[495] http://www.telecompaper.com/news/mobile-telephony-prices-halved-in-belgium-bipt--969496.

- End-users to control the switching process: the draft Regulation includes provisions that mean that end-users would only have to inform their new provider of their decision to switch rather than explicitly terminating the contract with their existing provider. These proposals seek to simplify the switching process and to avoid attempts by operators to 'save' existing customers.

7.7.2. Assessment

Consumer contract and switching conditions are not a major barrier to the Single Market for electronic communications networks and services (as opposed to OTT services purchased cross-border, where lack of understanding of foreign contract terms might create a barrier); **however, harmonising these conditions can be useful in spreading best practice and therefore contributing to the welfare of citizens overall.**

We find the Commission proposals to embed quality of service within consumer contracts a positive initiative, which could help reduce the gap between headline and actual speeds,[496] although **it is vital in this circumstance that similar contractual conditions are introduced at the wholesale level for operators relying on inputs from the SMP operator.** The proposal to mandate consumer-led switching is also positive. **The effect of reducing contract durations to 6 months may help to boost competition in mature services with a stable level of demand. It could however weaken incentives for long-term investment in new networks and services. Again, consistency with wholesale contract terms would also need to be ensured.**

7.8. Institutional Design Issues

The draft Regulation introduces a number of proposals which would shift the balance of power away from Member States and National Regulatory Authorities towards the European Commission. It also introduces an important change to the institutional set-up of BEREC, which could affect the management of the organisation and its incentives as regards promoting consistency as opposed to diversity in regulatory approaches.

7.8.1. Article 7 Procedures

In the existing EU regulatory framework for electronic communications, the European Commission has an effective veto over the decisions made by NRAs as regards market definition and the designation of operators having SMP;[497] however, the Commission does not have an outright unilateral veto over the remedies adopted by NRAs, but must instead engage with BEREC in a multi-lateral process before making final Recommendations.[498]

The draft Regulation proposes[499] that for the specific case of remedies applying to a European electronic communications provider (a provider with operations in more than one member state), the Commission should have the power to take a Decision requiring the NRA to withdraw or amend the measure.

[496] This was among our recommendations in a companion study, European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.
[497] Article 7 *Framework Directive*.
[498] Article 7a *Framework Directive*.
[499] Article 35.2.

7.8.2. BEREC

Under the terms of the current BEREC Regulation,[500] the main decision-making body of BEREC (its Board) consists of Heads of the NRAs, one of whom is selected as Chairman on a rotating annual basis. The draft Regulation[501] proposes that the Board should instead be represented by a full-time independent Chairman who is engaged as a temporary agent of the Office of BEREC with a 3 year term of office, extendable once.

This would result in a significant change to the incentives of the head of the organisation. A Chairman selected from amongst the Heads of NRAs on an annual basis would naturally maintain a strong affiliation with his national authority, and would be likely to favour the need for self-determination amongst NRAs against the more federalist ambitions of the European Commission. He or she may also be inclined to maintain close working relations with his colleagues.

In contrast, **the incentives of an independent Chairman employed by the BEREC Office for a fixed term might tend to favour harmonisation over national specificities.**

The nature of the Chairman is a separate question from the length of term. If the primary concern is continuity as opposed to loyalty to the interests of NRAs (versus European harmonisation), adjusting the length of term or making it renewable could be achieved without changing the nature of the office.

7.8.3. A Single Regulator in the Longer Term?

In addition to the incremental proposals included in the draft Regulation, the European Commission proposes to conduct a review at a later stage on whether a single European regulator is justified. Such a far-reaching solution, would affect not only BEREC and national NRAs, but might also largely remove the need for a cross-check by the Commission under the existing Article 7 procedure.

7.8.4. Assessment

It is clear from the whole backdrop to the debate on the Commission's initiative that there are concerns that the **existing institutional set-up has not delivered an adequate level of consistency in areas which the Commission considers important.**

We share some of the Commission's concerns about consistency (although it is possible that not all aspects of regulation are as fundamental to the Single Market as may be suggested); however, we do not believe that adding further complexity to already complex institutional structures will help to solve the lack of consistency. Rather than making short term adjustments to the existing framework, **we would suggest a longer period of reflection on how best to achieve consistency.**

While a European regulator is clearly one option in this debate, we would not consider it the most promising solution. One reason not to pursue the option of a European regulator is that we believe a more efficient solution exists to address genuine Single Market issues – primarily greater clarity in European legislation.

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[500] BEREC Regulation number 1211/2009, avalailable at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:337:0001:0010:EN:PDF.

[501] Article 38.

Another reason is that national circumstances genuinely vary for fixed residential networks in particular, and we do not expect significant cross-border consolidation among fixed network operators; consequently, the benefits of local knowledge will remain important. Another concern is that through an over-intense focus on an institutional debate which is likely to prove controversial amongst the co-legislators, Europe may lose time in addressing implementation concerns that may deliver more immediate tangible benefits.

7.9. Objectives Warranting the Imposition or Removal of Ex Ante Regulation

7.9.1. The European Commission's Proposal

One proposal in the draft Regulation which could easily be overlooked, but has significant consequences, concerns the objectives which the European Commission must follow when defining markets potentially susceptible to ex ante SMP regulation within the Recommendation on Relevant Markets.[502]

Article 35(3) of the draft Regulation suggests that, alongside traditional considerations relating to competition, the Commission should '[…] have regard in particular to the need for convergent regulation throughout the union, to the need to promote efficient investment and innovation in the interests of end users and of the global competitiveness of the Union economy […]'.

The proposal to explicitly add objectives relating to convergence, innovation, investment and global competitiveness when considering the appropriateness of ex ante regulation marks a clear departure from competition law principles which have governed the EU telecommunications framework to date. Under existing legislation, the decision on whether or not to regulate primarily concerns factors relevant to competition including the existence of barriers to entry, trends towards competition, and the adequacy or otherwise of competition law in addressing the problem (referred to by the European Commission as the three criteria test).

Furthermore, the draft Regulation explicitly requires that the Commission should 'consider all relevant competitive constraints, irrespective of whether the networks, services or applications which impose such constraints are deemed to be electronic communications networks, services or other types of application which are comparable from the perspective of the end-user'. This is clearly a reference to services such as Voice over the Internet (VoIP) such as Skype,[503] or OTT video services such as Youtube.[504]

The inclusion of OTT services in the analysis may not make much difference inasmuch as services considered to be economic substitutes under competition law would be reflected in the analysis concerning relevant markets, even if they were not electronic communications services; however, their explicit inclusion is symbolic in that it signals that OTT services may in future be considered more likely to be substitutes than in the past, with consequent implications for deregulation of certain telecommunications services such as voice calls.

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[502] European Commission (2007b), Commission *Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation, (2007/879/EC).*

[503] See http://www.skype.com/.

[504] See http://www.youtube.com/.

7.9.2. Assessment

We have highlighted in section 3.3 that the objectives ascribed to NRAs in article 8 of the Framework Directive (and by extension to the Regulatory Framework as a whole) present some tensions; however, if there is a desire to address these tensions, it should be done at the level of the Regulatory Framework as a whole rather than specifically as regards the choice of markets to include in the Recommendation on Relevant Markets.

As regards the Recommendation on Relevant Markets, in its current form it is coherent with provisions in the EU Regulatory Framework that take a competition law and competition economics approach towards addressing bottlenecks in the telecommunications sector. Changing the approach towards the Recommendation whilst leaving the principle of SMP regulation intact would tend to introduce inconsistencies within the package.

This is not a change that should be taken without full review. The explicit inclusion of soft industrial policy criteria such as the 'global competitiveness of the Union economy' potentially confers decision-making powers solely on the Commission that by their nature are in part political, and not solely regulatory. Doing so risks undermining the effectiveness of the Regulatory Framework, which despite its imperfections has demonstrated its value.

The proposals to explicitly consider OTT and other services as potential substitutes for telecommunications services do not seem to represent a major game-changer in that these considerations should be reflected in a competition law-based review in any event. One could equally therefore question why they are necessary as a legislative provision, as distinct from accompanying the Commission's draft Recommendation on Relevant Markets.[505]

7.10. Overall Assessment

Our overall assessment is that the European Commission's proposed Connected Continent package contains a number of elements which are positive in their own right, not all of which are related to the Single Market. **Positive aspects include some of the provisions to protect consumers, including proposals to streamline net neutrality provisions, switching procedures and give contractual safeguards to consumers on the quality of their broadband connections.**

Provisions on virtual wholesale products could also make a positive and valuable contribution to the Single Market, if amendments were made to the Commission's proposals.

The goals on spectrum co-ordination also seem laudable and relevant to pan-European service provision.

Other elements such as the single EU authorisation seem 'over-engineered', and may be addressing non-issues from a Single Market perspective.

[505] The Commission is due to adopt a revised Recommendation on Relevant Markets in 2014.

Attempts to change BEREC's structure and increase the Commission's powers concerning remedies applying to 'European operators', may further increase existing institutional complexities. As we suggest in section 3.7, other mechanisms may be better suited to achieving consistency.

Beyond the specific contents of the proposal, we have wider concerns about its interaction with the EU Regulatory Framework, and the potential confusion that may ensue.

In the short term, we suggest that fixes could be made to a number of the more urgent aspects through discrete and targeted regulatory measures, which could either be in the form of directly applicable Regulations or amendments to existing Directives to ensure consistency. These could be split into:

- Net neutrality, consumer contracts and switching
- Regulation concerning harmonised virtual wholesale inputs
- Regulation to harmonise timing and conditions for the allocation of the spectrum (with an eye to the 700MHz band)
- If desired, a Regulation aimed at consistently addressing cross-border communications issues to achieve 'roam like home' and to abolish intra-EU international call surpluses. This measure would also need to address wholesale call termination charges.

We do not see provisions on authorisation as urgent. These could in time be addressed through appending a template notification form to the Authorisation Directive. More generally, when considering the next review of the EU Regulatory Framework,[506] it would be helpful for policymakers to reflect on whether the balance between consistency and flexibility was correctly set in the legislation. More specific direction in the legislation on those issues which are really important for the Single Market could also allow for more discretion on other issues and less institutional complexity going forwards.
Table 16 summarises our assessment of the Commission's Connected Continent proposals, showing in each case whether they contribute to the Single Market or to other objectives, whether they are effective and efficient in achieving what the Commission set out to do, and highlighting potential consequences in other areas.

Table 16: Assessment of European Commission's Proposals against Single Market objectives

Provision	Contribution to single market?	Other objectives?	Effectiveness	Efficiency	Collateral damage
Single EU authorisation with greater involvement of 'home' NRA	Cross-border entry		0	--	Increased institutional complexity Arbitrary discrimination amongst providers based on their

[506] The EU Regulatory Framework as revised in 2009 envisages a review three years following application. Preparations for such a review would normally therefore commence around 2014.

Provision	Contribution to single market?	Other objectives?	Effectiveness	Efficiency	Collateral damage
					geographic scope
Co-ordinated allocation of spectrum under supervision of EC	Pan-EU service provision (mobile)		?	--	
Harmonised specifications for virtual access products (required for VULA, optional for WBA and leased lines)	Cross-border service provision (leased lines and WBA)	Consistency in SMP regulation to promote competition and investment	+	+	
Retail charge caps on intra-EU 'international' calls	Consistent retail prices for calls		+++	+++	Replaces and therefore reduces competition in intl. calling segment Impact on domestic rates?
Opt-out from access obligations if offer 'Roam like home' through alliance	Use of services abroad, consistent retail prices for calls		---	---	If effective, would replace competition in roaming segment. Impact on domestic rates?
Consumer contracts and switching		Higher levels of consumer protection, promoting competition	+++	+++	6 month contract periods could limit network investment
Net neutrality: prohibition on blocking Internet with permission to offer managed services	Access to and supply of content EU-wide		++	+++	
Increased powers for EC to veto remedies affecting European operators		Consistency in SMP regulation to promote competition and investment	?	--	Introduces arbitrary 'discrimination' amongst treatment of operators depending on their footprint
Changes to objectives when selecting markets susceptible to ex ante regulation		Boosting investment, signalling a reduction in ex ante regulation	?	?	Introduces concepts with may be inconsistent with a pure competition-law based approach towards market analysis

8. OVERALL ASSESSMENT

KEY FINDINGS

- **Europe's telecommunications sector remains fragmented.** In some cases (where services are genuinely national such as fixed broadband access), this is not a concern. In others such as business communications, operators are struggling to offer effective trans-European services.
- **The EU telecommunications framework has failed to distinguish where harmonisation is most essential for the Single Market, but has nonetheless achieved substantial consistency. It is essential to carefully distinguish and prioritise discrete implementation elements and to conduct a root and branch review of the Framework as a coherent whole.** Where harmonisation really matters, we advocate specifying the rules in legislation.
- **As regards individual measures, we find many of the topics included in the Commission's proposals to be directionally appropriate. We broadly support the proposed measures on (1) Net Neutrality, (2) contractual safeguards for consumers, and (3) harmonised wholesale inputs. We also support the aims of (4) the proposed measures to harmonise spectrum allocation.**
- **Roaming and international calls would benefit from an integrated examination.** A coherent approach would be needed to address not only retail aspects of international roaming calls and intra-EU international calls, but also wholesale aspects including termination rates and the European numbering space.
- Only small surgical (and non-urgent) adjustments are needed to achieve the Commission's aims as regards authorisation.
- A review of the EU regulatory framework could cover institutional issues and the best approach to achieve consistency alongside other key debates such as the objectives for regulation, the role of SMP regulation versus other alternatives, and a potential phase-out of universal service in favour of alternative regimes.
- **Consolidation is inevitably a part of the discussion of achieving pan-European networks and trans-European services; however, policymakers look to cross-border mergers, while market players seem to be more interested in in-country mobile mergers.** Cross-border mergers of fixed operators offer few advantages either to market players or to residential consumers.
- Cross-border mergers could potentially facilitate multi-Member State services, which would primarily benefit business customers rather than residential consumers. Given that MNOs with multi-Member State presence have not offered aggressive packages to business customers to date, there is reason to doubt that consolidation alone would produce trans-European services.
- **A frank discussion at European level of the tensions among European goals, and of the proper balance between static efficiency versus dynamic efficiency (and their respective implications for competition and for retail prices) would now be timely.**

This chapter provides our overall assessment, which drives our recommendations to policymakers. We have not limited ourselves to the topics introduced in the Commission's Connected Continent proposals of 11 September 2013.[507]

8.1. Regulatory Harmonisation and Institutional Design

Liberalisation of the electronic communications sector was a key element of Europe's internal market policy. When markets were originally opened mostly around the late 1990s, it was envisaged that EU companies would enter neighbouring markets creating cross-border giants in electronic communications and revitalising competition in the sector.

The outcome has fallen somewhat short of expectations. A period of rapid cross-border expansion was followed by contraction and consolidation. Today, there are very few genuinely pan-European companies (see Section 2.1).

One conclusion that could be drawn is that the market has failed and that regulation must bear a large part of the blame. This is one of the main justifications put forward for the European Commission's Connected Continent proposals. We believe this conclusion is only partly correct. Another rather more nuanced conclusion might be that:

- Services present today which are pan-European such as business services have survived despite regulation. They have been forced to adapt their businesses to a pan-European scale due to demands from their client-base for pan-European services, despite imperfect business conditions.
- Consumer broadband services may be local rather than intrinsically pan-European in nature. Perhaps there are not significant (or sufficient) synergies that can be gained from operating cross-border to outweigh the benefits of local knowledge.
- The patchy nature of spectrum allocations has not helped the business case for pan-European mobile provision, but factors other than regulation may have been even more significant in preventing pan-European provision for example, lower EBITDA[508] levels achieved by smaller players in the sector. Even where providers have developed cross-border networks, the services are typically not cross-border.
- Some inherently pan-European 'over-the-top' services such as VoIP (such as Skype) have been supplied on a pan-European or global basis despite inconsistencies in regulation relating for example to numbering, but have faced problems in reaching all potential customers. Further problems outside the telecoms sector (e.g. related to copyright) have hampered OTTs attempting to supply premium content across the EU Single Market.

Overall, our view is that the expectations of what a Single Market should look like in telecommunications may need to be tempered in some areas (perhaps it is not as vital as sometimes suggested), while in others (where harmonisation is genuinely vital) much more could be done to achieve a consistent approach.

[507] European Commission (2013), *Proposal for a regulation of the European Parliament and the Council laying down measures concerning the European single market for electronic communications and to achieve a Connected Continent, and amending Directives 2002/20/EC, 2002/21/EC and 2002/22/EC and Regulations (EC) No 1211/2009 and (EU) No 531/2012, 11 September 2013, COM(2013) 627 final.*

[508] Earnings before Interest Tax Depreciation and Amortisation – a measure of profitability.

It seems to us that conditions to enable pan-European business service provision, to align numbering regimes for the provision of over-the-top services, and to provide harmonised conditions for the supply and receipt of pan-European content and applications need more attention. Arguably for these services, identical conditions are an important enabler.

Much more attention has been given to conditions to boost investment and competition in standard and fast broadband, and to roaming. It is interesting, however, to observe the different effects which have been achieved with different policy tools.

Roaming is undoubtedly a Single Market issue. Even if the outcomes are still debated today, the use of directly applicable Roaming Regulations has delivered strictly harmonised outcomes.

Harmonisation to support broadband provision in Europe has less to do with the classic Single Market objectives. It can rather be seen as a way to 'level up' performance across Europe, for example to meet targets set at EU level. Exact replication of regulation may not be strictly necessary, but Europe could benefit from harmonising policies and practices that have proven to be successful, whilst allowing scope for experimentation.

Evidence from our companion study on broadband[509] suggests that Europe has made significant achievements in standard broadband. Interestingly, a key element of the policy approach taken towards standard broadband was harmonised through a Regulation on unbundling of the local loop, effective in 2000. The policy approach remained harmonised even after the repeal of the Regulation.

In contrast, despite significant attempts at harmonising policy-approaches for fast broadband (for example through amendments concerning NGA in the 2009 telecommunications review, the 2010 NGA Recommendation and recent 2013 Recommendation concerning cost methodologies), regimes and outcomes for fast broadband remain diverse.[510]

Efforts to harmonise the approach to termination rates across the EU notably through an EC Recommendation in 2007 seem to have been more successful, but were extremely resource intensive, and still have not delivered in all cases outcomes expected by the European Commission.[511]

To some extent, the existing EU framework for electronic communications must take a large part of the blame for failing to achieve consistency, and for failing to identify areas where harmonisation is most important (for services with a Single Market dimension), as opposed to those where it can be helpful (if harmonised towards best practice) but is not essential.

Our assessment is that by providing for a flexible approach where harmonisation is delivered through the use of delegated instruments and policed by a number of institutions, the current Regulatory Framework has failed to achieve harmonisation where it matters. Where it has delivered harmonisation (for example in the context of termination rates), it has done so at considerable cost.

[509] European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.
[510] See Table 21 European Parliament (2013b), *Entertainment x.0 to boost broadband deployment.*
[511] See Figure 20.

Proposals to overlay the existing Regulatory Framework with a much more directive Regulation on the Single market merely serve to illustrate this problem.

Recommendation 1: Change the Framework to specify regulatory measures in legislation for those aspects of regulation where harmonisation matters

Allowing flexibility as the default with complex institutions to manage harmonisation has failed to deliver consistency efficiently where it really matters. A future framework should codify key elements of European regulation. These should be mandatory for issues directly related to the Single Market. For other areas, exceptions should be permitted where justified by NRAs, thereby 'reversing the burden of proof'. This approach could provide greater transparency and predictability for operators and investors.

Recommendation 2: Streamline the role of the Commission and BEREC to police exceptions than enforce the rule

If more detail on regulation is encoded in European legislation, this should leave the Commission and BEREC free to focus on judging exceptions to the rules outlined rather than on enforcing common rules. This should reduce the need for Recommendations and allow a simplified Article 7 process in which only deviations (where permitted) from legislative requirements need be notified to the European Commission. This could enable the Commission to operate more effectively considering the fewer resources it has been allocated historically. The burden on BEREC would also be reduced. A single European regulator or 'Euroregulator' for telecommunications would not be needed in this scenario.

Notwithstanding a streamlined approach to regulation, the recent review[512] of BEREC has revealed that improvements could still be made to its functioning.

BEREC is and should remain primarily a body devoted to harnessing the expertise of individual NRAs. For this reason, we believe that BEREC should remain governed by the head of an NRA acting as Chairman on a rotating basis rather than by an independent professional Chairman whose loyalties would tend to lie with BEREC as a standalone organisation; however, allowing the one year term of the BEREC Chairman to be extended could help to provider greater continuity. If more of the EU's regulatory rule-setting is conducted through legislation enacted through the Council and Parliament, it would also make sense for BEREC to have a greater presence in Brussels to enable it to provide advice to the co-legislators.

Recommendation 3: Allow a one year extension to the term of the rotating BEREC Chairman. Provide a greater presence for BEREC in Brussels

The recent review of BEREC has revealed that some improvements could be made to its organisation. We do not believe a move to an independent Chair is warranted; however, BEREC's efficiency could be improved by allowing for a one year extension on the term of the BEREC Chair (who would continue to be the head of an NRA) and by enabling BEREC to have a greater presence in Brussels in order to be well-situated to advise the co-legislators on initiatives affecting the market.

[512] PriceWaterhouseCoopers (PWC) (2012), *Study on the Evaluation of BEREC and the BEREC Office*, study for the European Commission, 21 December 2012.

8.1.1. Authorisation

As explained in Section 7.2, minor enhancements to the authorisation process are appropriate, and can be achieved with three small, surgical changes to the existing Directives.

- A standard Notification application form should be provided in two or three of the widely understood languages as a new Annex to the Authorisation Directive, and all NRAs required to accept it as an alternative to whatever other forms they might use. In that way, a prospective network operator could simply submit 28 identical or nearly identical forms to each of the NRAs in order to become authorised.
- A sentence should be added to the Authorisation Directive to require that fees be waived altogether for small enough applicants.
- A sentence should be added to the Universal Service Directive to require that universal service payments be waived altogether for small enough market players. This is already viewed as best practice in Member States that implement universal service funds. In the longer term, universal service could be phased out, to be replaced by state aid and by measures targeted at end-users directly.

We would also note the complementary recommendations that BEREC made in their assessment of the Authorisation in 2011.[513] They suggested:[514]

- Accepting notifications in the English language.
- Simplification of the regime of the documents to be submitted to NRAs, especially concerning certified translations.
- Establishing an English-speaking contact point for Notifications.
- Published guidelines together with harmonisation of national Notification forms.

Recommendation 4: Revise the Directives to simplify authorisation for pan-European operators

Revise the Authorisation Directive to provide a standardised Notification Form, and to eliminate payments for small undertakings.

8.1.2. Broadband Deployment

In our companion study *Entertainment x.0 to boost broadband deployment*,[515] we made numerous recommendations that are also relevant in this report. Significantly, we suggested phasing out conventional universal service altogether. Universal service is an outdated measure in a multi-player broadband environment, which realistically is the environment that we face today. Conventional universal service could be phased out, in favour of other mechanisms, notably including state aid. Since affordability would still be an issue for some, state aid measures would need to be complemented by direct measures to promote affordability such as direct subsidies, and vouchers for those on income support programmes.

[513] BEREC (2011), *BEREC Report on the Impact of Administrative Requirements on the Provision of Transnational Business Electronic Communication Services*, BoR (11) 56.

[514] BEREC also suggested online application procedures. Our feeling, based largely on a companion study for the Parliament, is that this would be counter-productive unless a common online system were developed for all Member States. See European Parliament (2013c), *Ubiquitous Developments of the Digital Single Market*.

[515] European Parliament (2013), *Entertainment x.0 to boost broadband deployment*.

Recommendation 5: Consider phasing out universal service altogether and relying instead on state aid together with measures to support end-users directly

Universal service is not the most effective instrument for delivering basic broadband connectivity to all in the broadband age. It should be phased out in favour of more suitable tools, notably including state aid. Targeted instruments could then be used to address affordability issues that would remain for some users.

In that same study, we also recommended:

- Consideration of setting specific targets in relation to mobile broadband in order to foster the availability of broadband anytime anywhere.
- Further attention and study for measures to promote broadband adoption by means of demand stimulation.

8.1.3. Cross-border Communications

Reducing the cost of all cross-border communications, including voice calls and SMS, to rates approaching domestic rates is an appropriate goal, and potentially represents an important contribution to the Single Market.

In a previous study for the Parliament,[516] we noted that it is impractical and imprudent to require the price for services to be absolutely identical unless the costs are either identical, or else close enough so as to make no difference. That is clearly not the case today, and one of the key costs is itself a regulatory artefact – the Mobile Termination Rate (MTR).

Data published by the Commission[517] demonstrate that the spread between the lowest and the highest MTR in the Union today is on the order of € 0.08, and that differences in the range of € 0.02 to € 0.03 are common. These differences are declining over time, but may still be too large to ignore (see Figure 42). For example, the data suggest that when a roaming call is placed to a French subscriber roaming in Spain, the receiving French MNO would receive on average € 0,0084 per minute, but would have to pay € 0,0317, thus making a net payment of € 0,0233 per minute. If that were the case, and in the absence of charges for roaming it is possible that roaming would no longer be offered between all pairs of countries.

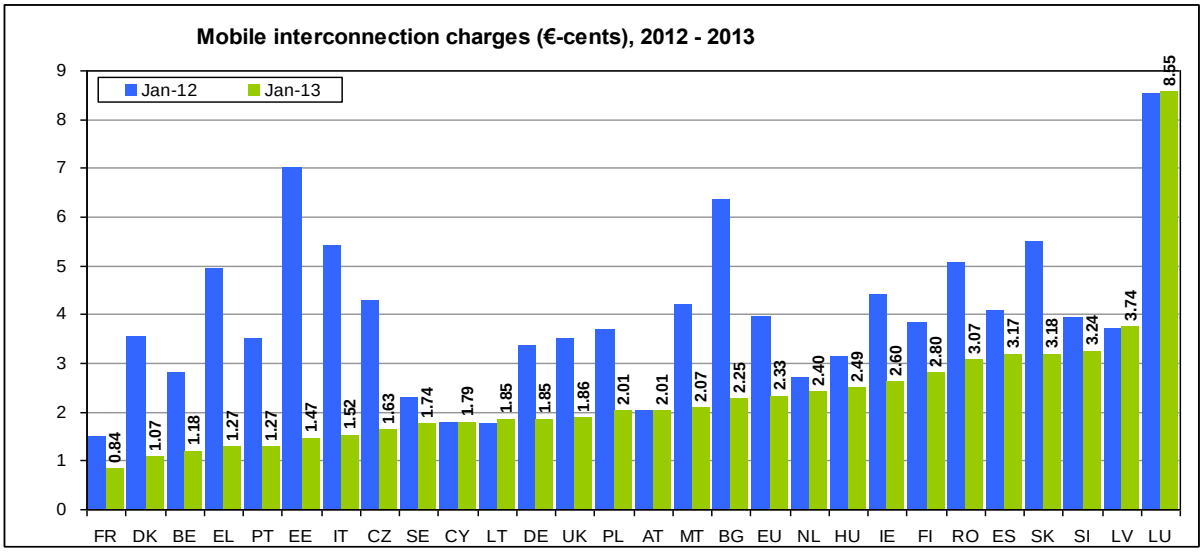
MTRs are still declining in a number of the Member States. This will reduce any mis-match, but is unlikely to eliminate it. It cannot be excluded that the existing approach of a Commission harmonising Recommendation on the setting of MTRs has already achieved close to the limit of consistency that can be achieved without more direct control.

Aside from that, many other costs (labour costs, for example) may differ to a degree that is too great to ignore.

[516] European Parliament (2012a), *State-of-the-Art Mobile Internet Connectivity and its Impact on e-Commerce*, study by WIK for the European Parliament's Committee on Internal Market and Consumer Protection (IMCO), July 2012; available at: http://www.europarl.europa.eu/committees/de/studiesdownload.html?languageDocument=EN&file=75195.

[517] DAE Scorecard, financial fixed and mobile spreadsheet, downloaded 27 Sep 2013.

Figure 42: Mobile Termination Rates (2012-2013)



Source: DAE Scorecard, financial fixed and mobile spreadsheet, downloaded 27 Sep 2013. [518]

The price of international calls is heavily dependent on the price of international fixed and mobile call termination, which is an underlying wholesale cost to the network operator that originates the call. The same is true for the Visited Network for calls placed while roaming. **For calls received while roaming, the difference between the MTR that Home Network receives, and that which it pays to the Visited Network, is critical to profitability.**

We also observe that, at the time when the first Roaming Regulation was enacted in 2006-2007, a conscious decision was made not to peg the wholesale payment for roaming to the MTR. Instead, a value that was in the right general range was chosen through the political process and embedded in the regulation. This ensured consistency across Europe, avoided protracted legal battles over rate-setting, and provided certainty for the MNOs and for consumers. We see no fundamental reason why the same principles could not now apply to the MTRs themselves; however, we note that this is a significant change, with implications for industry structure that would require careful study.

All of these considerations have important implications going forward. We venture the following somewhat radical recommendations.

[518] Digital Agenda for Europe scorecard, viewed 27 September 2013; available at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?action=display&doc_id=2374.

Recommendation 6: Evaluate an integrated approach to capping (1) retail roaming rates, (2) intra-EU call charges, and (3) termination rates

There is an important choice to be made between continuing current policies of using wholesale regulation at Member State level to address competitive issues in market segments, versus moving to retail regulation that is fully consistent at European level. There are potential shortcomings with both approaches and particular risks in a less than fully integrated approach that attempts to mix the two. A comprehensive review is needed, because the implications of moving to retail regulation are complex and would change market structures. If retail regulation of roaming or international calls is pursued to create a single European calling space, this might best be addressed through a single Regulation covering roaming, intra-EU call charges and termination rates as a coherent package. The European numbering space could also be considered within such a review.

8.1.4. Wholesale Access Remedies

It has been taken almost as a universal truth that Europe's current approach of applying (and in turn withdrawing) ex ante regulation on the basis of the competition law test of dominance or significant market power is the most appropriate mechanism to address market failure.

The SMP approach is theoretically coherent and has many positive attributes; however, it also has a number of shortcomings:

- It can be complex to apply, and the burdens of applying the test may outweigh its benefits for specific cases when the bottlenecks are well-known and universal, such as call termination.
- It is also ill-suited towards dealing with market failures in markets characterised by tight oligopolies such as duopolies.

While we do not advocate abandoning the principle of SMP regulation, we do advise considering other solutions such as symmetric regulation or rates set in EU legislation in specific cases where this would be more efficient. Two cases in point are the regulation of termination rates and the regulation of in-building wiring and terminating segments of FTTP infrastructure. Legislation should be clear about which is the preferred approach for such services, so as to avoid 'double jeopardy'. Legislated rates should only be considered in cases where costs are demonstrably similar across the EU. It would also be helpful to review what is considered a tight oligopoly in the telecommunications sector, and what might be the preferred regulatory outcome in such cases.

Recommendation 7: Consider whether certain services would be better regulated through symmetric regulation rather than a full SMP analysis

We support the general principle that regulation should be based on SMP, and must be phased out when SMP no longer exists; however, there are some cases where it may be more efficient to rely on symmetric regulation, especially when bottlenecks are universal and well-known. Two cases which may warrant a departure from a strict SMP analysis are termination rates (see also Recommendation 6) and in-building wiring/terminating segments of fibre-to-the-home infrastructure. Duct access could also take on a more symmetric character if the draft Regulation to reduce broadband deployment costs were adopted.

Recommendation 8: Evaluate the implications of joint dominance for SMP regulation

An independent study should be commissioned to assess the implications of duopoly or tight oligopoly for the application of SMP regulation, particularly in light of known shortcomings in applying the concept of joint dominance, and should make policy recommendations in this context.

Harmonised wholesale products are an essential input for pan-European business service provision, and may also be useful in achieving consistency of best practice regulation for wholesale products used for consumer broadband.

For products which are inputs to retail cross-border services such as business communications, harmonisation should be mandatory and should cover not only product specifications, but also the approach to market analysis and remedies.

More flexibility may be appropriate for wholesale inputs used to provide national consumer broadband, so as to permit some variations depending for example on the architecture used and the maturity of the market.

Recommendation 9: Mandate conditions and harmonise approach towards market analysis for key wholesale inputs used for pan-European business services

Inputs used for pan-European business services should be available on harmonised terms and conditions with a similar approach taken to the market analyses at national level. Policymakers could consider a separate Regulation for this purpose, which may also cover standardised products for residential access (see also Recommendation 7).

Recommendation 10: Propose standardised conditions for key wholesale inputs used for residential broadband such as virtual unbundled local access

A standardised template for virtual unbundled local access could help to promote best practice and facilitate cross-border entry for providers of services to consumers and small businesses. Such a template could be included within a Regulation on virtual access products, but with greater flexibility to deviate if national circumstances such as architectures warrant alternative solutions. Pricing for NGA wholesale products may also be subject to national specificities.

The current EU telecommunications framework provides an expectation that ex ante regulation will ultimately be phased out so that there would be full reliance on competition law. This may not be a realistic prospect in the medium term. Our assessment is that certain elements such as links for mobile backhaul and business services may continue to require regulation even if mobile broadband became a full substitute for fixed residential broadband.

Recommendation 11: Limiting sector-specific regulation to areas of market failure should be the stated goal rather than phase-out

The entire phase-out of sectoral legislation in the telecoms sector is unlikely to be realistic in the medium term. Certain aspects such as links for mobile backhaul and business services may still require regulation even if mobile broadband became a full substitute for fixed residential broadband. The EU Regulatory Framework should identify 'limitation' rather than 'eradication' of sectoral regulation as its end-goal.

8.1.5. Network Neutrality

For reasons explained in Section 0, we consider the Commission's network neutrality proposals to be well thought out, and the language of Article 23 to be sensible and well crafted (even though we anticipate that some elements would be challenging to implement). Something along these lines needs to be part of a Regulation, in our view, and needs to dovetail with suitable consumer protection language.

Recommendation 12: Policymakers should support the network neutrality provisions of the proposed Regulation, and should enact them such that consumers are informed and can switch providers

The network neutrality provisions of Article 23 of the Commission's proposed Regulation are sensible, and deserve the support of policymakers. They should be enacted in such a way that consumers are informed of any restrictions, and can switch providers if they are dissatisfied with restrictions. This implies that they should be supported either by the consumer protection provisions of Chapter IV of the proposed Regulation, or else by the somewhat less comprehensive but broadly similar provisions in the Universal Service Directive.

8.1.6. Consumer Protection

Proposed measures from the European Commission to protect consumers by giving contractual safeguards over service quality (such as broadband speeds) and to facilitate switching by making the process consumer-led, are positive and should be adopted. Proposals to set minimum contract terms of 6 months should be evaluated to assess their effects on investment.

Recommendation 13: Amend universal service and consumer rights directive to contractualise service quality standards and improve switching

We support amendments to the Universal Service and consumer rights Directive to make operators accountable for quality standards through inclusion of measures in consumer contracts. We also support provisions to make switching the responsibility of the new provider, thereby making the process more consumer-led. Such provisions could be contained together with measures on net neutrality in a single legislative measure relating to consumer protection.

8.1.7. Spectrum Management

European spectrum management arrangements are inherently complex because of the large number of countries involved, the many applications covered (including mobile, broadcast, military, transport, and disaster relief), and the various overlapping organisations that deal with spectrum management issues. There are limits to what can be done in the near term to achieve a more coherent system.

The Commission's proposed Regulation sensibly restricts itself to the most immediate problem at hand, the assignment of the 800 MHz and soon the 700 MHz bands to harmonised wireless broadband.

The provisions of Article 12, which provides for coordinated windows for assignment and expiry, is urgently needed (see Section 7.2). The support for small cells is less time-critical, but could logically be included as part of the same package.

It is reasonably clear that the Commission's existing powers were not sufficient to obtain prompt and effective release of 800 MHz spectrum into the market. A Regulation that achieves the purpose of the Commission's proposed Article 12 is called for.

Recommendation 14: Enact a Regulation that achieves the key purposes of the Commission's spectrum management proposals

A Regulation that provides for coordinated windows for assignment and expiry of radio spectrum suitable for harmonised wireless broadband is urgently needed to address delays in assignment of the 800 MHz band, and likely future delays in assignment of the 700 MHz band.

8.1.8. Overall Assessment

In Table 17, we provide our assessment of what should be done going forward. In those areas where our recommendations correspond to an element of the Commission's proposals, we so note. It may be helpful in this context as a final Recommendation to highlight how we would suggest to manage the multitude of changes (some potentially fundamental) from a practical perspective.

Recommendation 15: Fast-track priority measures through separate Regulations, conduct review on roaming/calls measures, and address remaining issues through a root and branch review of the EU Regulatory Framework

We advise fast-tracking issues which are considered a high priority through separate discrete legislative instruments which could be in the form of Regulations relating to spectrum, virtual wholesale products, and net neutrality and associated contractual obligations. Issues related to roaming and other cross-border communications may also be well suited to a Regulation, but require further study and should be dealt with in an integrated way. Other subjects may be better addressed through a comprehensive review of the EU telecommunications framework, so as to avoid any potential overlap or confusion.

Table 17: Our assessment of the European Commission's Proposals and proposals for legislative reform

Ref	Priority	Topic	Commission proposal	Our suggestion
Next steps				
Rec 15 (page 196),[519]	High	Approach to regulatory reform	Adopt Connected Continent proposals as a complement to existing EU telecoms legislation	Fast-track priorities (1) spectrum (2) virtual wholesale products and (3) Net Neutrality, conduct review on Roaming/international calls measures. Address remaining issues through a root and branch review of the EU Regulatory Framework.
Overarching principles				
Rec 15 (page 196)	Medium	Objectives of regulation	Unchanged for NRAs, but Commission proposes that when identifying markets for 'ex ante regulation' it should have regard to the 'need for convergent regulation… and to promote efficient investment and innovation in the interests of end-users and of the global competitiveness of the Union economy'. These should be considered alongside competitive factors.	Review objectives for the Framework as a coherent whole. Applying objectives related to industrial policy objectives to aspects of the Framework which are based on competition law principles, risks inconsistency and confusion.
Rec 1, 2, 3 (page 189)	Medium	Institutional balance – flexibility vs. harmonisation	Increase in existing powers for European institutions including greater powers for the Commission on remedies affecting European operators, and strengthened role for BEREC Chair with Chair independent professional with 3 year term. Over longer term, Commission suggests considering single European telecoms regulator	Reject greater institutional complexity. Instead we would propose to 'reverse the burden of proof' in favour of harmonisation for identified policies affecting the Single Market. This could be achieved by specifying key requirements for harmonisation in more detail in the legislation, with the option for NRAs to put a case for 'exceptions'. This would put less burden on the Commission and BEREC.

[519] See European Parliament (2011a), *Network Neutrality: Challenges and responses in the EU and in the U.S.*

Ref	Priority	Topic	Commission proposal	Our suggestion
Rec 7, 8, 11 (pages 193, 194, 195)	Medium	Review SMP, core bottlenecks	-	Clarify ex ante regulation expectations. Consider alternative approaches to SMP for certain services. Study implications of consolidation on SMP.
Specific measures				
Rec 4 (page 190)	Low	Authorisation	Single EU authorisation with greater involvement of 'home' NRA in dealing with infringements in 'host' country	Change direction. Annex a template authorisation form to Authorisation Directive
Rec 14 (page 196)	High	Spectrum	Co-ordinated allocation of spectrum under supervision of EC	A separate Regulation to harmonise release windows for the 700MHz band will be urgently needed. Longer term review of institutional approach to spectrum needed in review of telecoms framework
Rec 9, 10 (page 194)	High	Virtual wholesale inputs	Harmonised specifications for virtual access products (required for VULA, optional for WBA and leased lines)	Harmonise treatment of the three key virtual products in (potentially separate) legislation – harmonising not only product specifications, but approaches towards market definition and analysis.
Rec 13 (page 195)	Medium	Consumer contracts and switching	Contractualise broadband service quality, allow break clause after 6 months. Consumer-led switching.	Broadly support Commission proposals, but investigate effects of 6 month break-clause before mandating.
Rec 12 (page 195)	High	Net neutrality	Ban blocking and throttling of the Internet, but permit managed service innovation.	Broadly support Commission proposals.

Ref	Priority	Topic	Commission proposal	Our suggestion
Rec 6 (page 193)	Medium	Cross-border communications		
		Roaming	Opt-out from access obligations if offer 'Roam like home' through alliance	Either continue the status quo, or else proceed with a coherent solution that deals with roaming, international calls, termination rates in an integrated way. EU numbering might also be addressed in same instrument.
		Intra-EU international calls	Ban surcharges on intra-EU international calls	
		Termination	Not covered	
		EU numbering plan	Not covered	
Rec 5 (page 191),[520]		Fostering fast broadband		
		Lowering deployment costs	Separate Regulation aimed at lowering the cost of broadband deployment	Rapid adoption along the lines of Commission proposals
		NGA wholesale regulation	Commission proposes to clarify in legislation circumstances in which wholesale access to NGA need not be cost-oriented	Leave NGA pricing flexibility to NRAs for now as local circumstances may differ. No need to hardwire in legislation at this stage
		State aid and USO	Not covered	Propose renewed attention on state aid + demand-side measures, possible phase-out of USO provisions
		Network sharing	Not covered	Propose mandated sharing of fibre final segment

[520] See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

8.2. Industry Consolidation

Pan-European networks have long been an objective of European policy, and are (as noted in Section 3.3.1) explicitly recognised as a goal in Article 8 of the Framework Directive.[521]

The current focus on the Digital Single Market has inevitably brought the question of industry consolidation into sharper focus; however, it is important to remember that there are different forms of industry consolidation, with distinctly different implications for policymakers, consumers, and market players.

Consolidation raises vexing political and policy issues. It is perhaps for this reason that consolidation was not explicitly addressed in the Commission's proposals. In this study for the Parliament, we have somewhat more flexibility, and we are availing ourselves of the opportunity to make a few possibly obvious points.

8.2.1. Consolidation and the Digital Single Market

Relative to European policy, there are several key reasons why policymakers might welcome industry consolidation:

- **Scale economies:** In many things, bigger is better. Larger network operators would tend to have less overhead cost[522] relative to their operations, and would be better able to bargain with suppliers. They would also be stronger in international competition.
- **Cross-border services:** Large multinational network operators can provide seamless services across their entire footprint, which could ideally approach the size of the entire EU.

It is possible for network operators to expand by building out new network capabilities in other Member States, just as it is possible for them to build out new network capabilities in countries outside of Europe. There are significant start-up costs in doing so, and a significant learning curve for each country. Network operators often find it more cost-effective to acquire an existing network operator in the existing country in order to start with an established base of operations, a customer base, and a staff with local knowledge.

This preference for growth through acquisition is likely to continue to be the case. A Europe-wide authorisation, for instance, would not change this.

A key concern for policymakers has been the standard competition law fear that the expanded, consolidated firm would use its market power to the detriment of consumers. This is a real concern, but it has different implications for some acquisitions than for others, and perhaps needs to be seen in context.

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[521] *Directive 2002/21/EC of the European Parliament and of the Council of 7 March 2002 on a common regulatory framework for electronic communications networks and services* ("Framework Directive"); available at: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32002L0021:EN:NOT.

[522] Corporate overhead functions, for instance, represent a smaller proportion of total cost. In purchasing equipment and services, they would tend to have greater bargaining power.

First, as is well understood, mergers between entities whose geographic markets do not overlap are typically not viewed as problematic. There are no consumers who are subject to greater market power. It should in principle be possible, other things being equal, to quickly wave such mergers through the approval process.

Second, it would appear to be timely for Europe to have a serious discussion about the level of profitability that we wish our network operators to have. At the time of initial liberalisation, historic incumbents tended to have high profits that were supported by various institutional arrangements. The regulatory framework sought to reduce excessive charges by introducing competition, and has generally been quite effective in doing so. There are substantial differences from one company to the next, but taken as a whole, the sector is in some degree of decline today in terms of share valuation, revenues and profits (see Section 2.1.3, and also our companion study on broadband in Europe).[523]

That individual profits have declined from the very high 2003 levels is generally a good thing for Europe, not a bad thing (see for instance Sections 5.1 and 5.2); however, where they should go from here is another question. Continued decline of the sector should raise several concerns:

- The societal welfare of Europe is the sum of producer welfare and consumer welfare. Reductions in producer welfare (e.g. the profitability of network operators) unless somehow offset make us all poorer. **Mere transfer of welfare from producers to consumers does not make us better off.** Only if there are changes in the level of consumption (e.g. consumers are able to place more voice calls or send more data thanks to a lower price), and thus in the level of deadweight loss, is there a net change in societal welfare.
- **There is a significant risk that the static efficiency achieved through low prices and high consumption negatively impacts dynamic efficiency.** Reducing the profitability of market players also tends to reduce their ability and incentive to invest in modernisation of facilities. This is a classic economic debate, for which there is no simple economic answer.
- To the extent that the profitability of our sector is undermined, it not only weakens our network operators when they seek to acquire valuable overseas territories, but also potentially makes them vulnerable to outside acquisition. **We should welcome Foreign Direct Investment (FDI) in general, but we in Europe need to carefully consider the degree to which we are willing to risk ceding control over strategically critical communications infrastructure.**

8.2.2. Consolidation Across Member States Borders

As previously noted, mergers between network operators in different Member States represent a channel toward achieving pan-European networks that are potentially capable of offering multi-Member State or trans-European services, and thus a possible avenue to the Digital Single Market.

[523] See European Parliament (2013b), *Entertainment x.0 to boost broadband deployment*.

Cross-border mergers and acquisitions potentially benefit both participants due to multiple factors, including:

- Economies of scale (including enhanced bargaining power that may confer, for instance, the ability to get better prices when purchasing network equipment) and possibly of scope;
- Elimination of some redundant staff (for example, duplicate corporate accounting functions might not be needed once the merger is complete);
- Internalisation of payments such as wholesale roaming charges and call termination, which means that they pay the true cost rather than the regulated rate;
- Enhanced ability to offer cross-border services.

Our sense is that the network operators themselves see far more benefit in mobile mergers than in fixed (although the two often go together in practice, since most incumbents have both fixed and mobile operations).

Oligopoly pricing effects appear to have little relevance to cross-border mobile mergers today (unless the firms already operate in the same geographic market). Mobile markets tend primarily to be national in character. It is possible, however, that mergers that create sufficiently large groups at European level might eventually create market power effects at European level.

There would arguably be an advantage to the merging entities because, in calling one another's customers, they would confront their respective real costs rather than the cost of paying an international termination rate; however the net effect is likely to be small in most cross-border mergers. First, the difference between the real cost and the termination rate has been declining steadily since 2003, and is now fairly small; second, the fraction of traffic between a pair of potentially merged cross-border networks tends to be only a very small fraction of the total.

One factor whereby MNOs profit from cross-border mergers, but only marginally from single Member State mergers, is international mobile roaming. The merged entity can offer roaming-in as a Home Network (HN) in more countries, and can also offer a larger number of its own roaming-out subscribers who can be steered to another MNO's Visited Network (VN). This enhances the merged entity's negotiating power, which will tend to enable it to negotiate more favourable wholesale roaming rates.

There is also a tendency for the merged entity to benefit because its roamers on a VN that is under common ownership with the HN generate costs based on the actual costs of the roaming service, not the significantly higher wholesale roaming charges. For a large group (consider for instance Vodafone[524]), this could be a significant factor – when a Vodafone customer from Germany roams in Italy (where Vodafone is also present), Vodafone is not obliged in general to make above-cost wholesale payments to a competing mobile network operator.

[524] See www.vodafone.com.

8.2.3. Consolidation within a Member State

Single Member State mergers are perhaps of less interest than cross-border mergers to policymakers seeking a Digital Single Market, but they may be of greater interest to the market players themselves.

Single Member State mergers potentially benefit both participants due to multiple factors, including:

- Economies of scale (for instance, the ability to get better prices when purchasing network equipment) and possibly of scope;
- Elimination of redundant staff (for example, duplicate corporate accounting functions might not be needed once the merger is sufficiently complete);
- Internalisation of payments such as termination, which means that they pay the true cost rather than the (still possibly somewhat higher) regulated rate;
- A degree of pricing power that might flow from having a greater share of the relevant market (as discussed shortly); and
- Additional pricing power that might be conferred on firms with a larger market share due to on-net off-net price discrimination (charging a higher retail price when a consumer calls another network's customer than when he or she calls a customer on the MNO's own network). A larger firm has greater ability to do this than a smaller one (although the scope for doing so declines as MTRs decline).

Network operators generally benefit from higher prices, because the own price elasticity of demand (see Sections 5.1 and 5.2) for most telecommunication services tends to be less than 1 in absolute value (i.e., it is less negative). A typical price elasticity for voice services might well be between -0.4 and -0.6.[525] At a price elasticity of -0.5, if price declines 2%, the amount of services consumed would increase 1%, i.e. half as much. If the price elasticity of demand at current prices were greater (more negative) than -1.0, then a decline in prices would actually increase revenue (but not necessarily profit, because costs might also increase).

Scale economy factors are relevant to both in-country and cross-border mergers, but pricing effects will tend to be stronger for mergers in a single Member State. With that said, what is known about these pricing effects? How great are they likely to be?

A number of studies deal with precisely the question of the impact of market entry and/or mergers in the mobile market on retail price. A methodologically strong study by Csorba and Papai based on a panel data regression using all 27 Member States from 2003-2010 has just appeared.[526] It assesses the price effects of mergers and of competitive entry within a Member State.

[525] Many studies have evaluated these demand elasticities. See for instance Marcus, J. S., Growitsch, C. and C. Wernick (2010), *The Effects of Lower Mobile Termination Rates (MTRs) on Retail Price and Demand*, a research project for the German BNetzA, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1586464. Market elasticities are generally in this range, and generally not greater than -1.0; however, the firm-specific own-price elasticity may be greater.

[526] Csorba, G. and Z. Pápai (2013), *Does one more or one less mobile operator affect prices? A comprehensive ex-post evaluation of entries and mergers in European mobile telecommunication markets*, presented at the CRESSE Conference in Corfu, June, 2013.

The results need to be interpreted with caution. Comparison of retail prices tends to be challenging, no matter how much care is taken in collecting the data, because of:

- the large number of retail plans
- lack of information about how many consumers use a given plan, and how much they consume under the plan,
- the need to assume baskets of usage that do not necessarily bear any relationship to the usage that real consumers make of their respective plans, and
- lack of information about special introductory offers and discounts.

Csorba and Papai (2013) relies on the Teligen[527] retail price basket data prepared for the European Commission, which implies that all of these concerns are potentially relevant.

The key findings of Csorba and Papai can be briefly summarised as follows:

- **Where a small disruptive player (e.g. with presence in a single Member State) entered an established mobile market, there was a strong drop in retail prices in the first year, but no sustained effect on prices in the second or subsequent years.**
- **Where a disruptive player with presence in Multiple States (specifically Hutchison/3)[528] entered an established mobile market, there was little change in the first year after the merger, but then a strong and sustained drop in retail prices in the second and subsequent years**.
- **An initial version of the work did not find a statistically significant tendency for prices to increase after a four-to-three merger; however, they report that more recent work seems to suggest increased prices following the only four-to-three merger in their data**.

The magnitude of the market entry effect on retail prices in the Member State where the entry or merger occurred is substantial. They note that '…the entry of a multinational firm to the 4th position (these types of entries always correspond to Hutchison) does not affect prices in the first year, but then decreases them considerably from the second year onwards. These findings indicate that although local entrants might have been associated with more aggressive price strategies, their entry does not lead to a long-run competitive impact on 3-to-4-firm markets.' Their analysis demonstrates a highly statistically significant ($p<0.01$) price decline of 42% in the third and subsequent years after entry of a market player such as Hutchison/3.

As we saw in Section 5.1, increases in retail price above the level that would exist under perfect competition tend to transfer surplus from consumers to producers (which is in principle neutral to the overall economy), and also to increase deadweight loss (which is negative to static efficiency); however, they may also increase the willingness and ability of firms to invest, and may thus increase and improve dynamic efficiency.

[527] Teligen (2010), Report on Telecoms Price Developments from 1998 to 2010.
[528] Hutchinson/3 http://www.hutchison-whampoa.com/en/global/home.php.

The study inevitably raises more questions than answers for policymakers. When a (fourth) mobile market player exits a market, should there be an immediate rush to open new spectrum in order to enable a fourth firm to enter? What are the societal costs and benefits of this fairly common policy? How much of an increase in profitability could be deemed acceptable in a four-to-three mobile merger?

8.2.4. Overall Assessment

Our overall assessment is:

- Cross-border mergers can contribute to the Digital Single Market;
- Mergers and acquisitions within a single Member State tend to primarily benefit the merging parties, which however can also confer macroeconomic benefits on Europe;
- Scale economies are relevant both to single Member State and to cross-border mergers;
- Pricing effects might have significant relevance relative to mergers in a single Member State, but probably less relevance today to most cross-border mergers;
- Cross-border mergers can benefit roaming revenues; however, this factor is declining over time.

Recommendation 16: European competition policy should remain tolerant of cross-border mergers

This does not lead us to make specific policy recommendations for cross-border mergers, since European policy is already reasonably tolerant of cross-border mergers and acquisitions where the territories do not overlap.

Recommendation 17: Policymakers should consider the target profitability of network operators, and consider implications for single Member State merger decisions

A discussion is needed at European and national level as to the appropriate level of profitability for European network operators. The results would need to be reflected in merger policy. This is especially relevant to four-to-three mobile mergers in a single Member State.

9. CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a recapitulation of the key findings and recommendations throughout the report.

9.1. Findings and Conclusions

We present our findings, proceeding chapter by chapter.

9.1.1. A Single Market?

- Electronic communications has evolved significantly since the early days of liberalisation when fixed voice was the primary service, and mobile a nascent technology. Core networks have converged to enable the provision of a complex mix of services including entertainment and broadband both at home and on the move. Services for businesses have also evolved into sophisticated solutions integrating IT and communications across the EU.
- **Data usage is growing for both fixed and mobile. Video is the largest driver of bandwidth demand for both.**
- **Voice still constitutes the bulk of mobile revenues, but the balance is also changing towards data.**
- **Despite significant market entry and intensifying competition, very few telecommunications providers operate on a pan-European scale**. Communications providers serving multi-national corporations may be one exception. On the mobile side, some players have operations in several countries, but services are still supplied nationally. Early attempts at pan-European entry into fixed markets largely failed.

9.1.2. Achievements and Failures of Current European Policy Instruments

- European policy in this space seeks to promote the internal market. A great deal of effort (with varying degrees of success) has been made towards achieving regulatory consistency on issues such as broadband access regulation; however, **much less attention has been paid to measures to support cross-border service provision and the cross-border usage of content and applications.**
- The existing EU Framework gives **flexibility to NRAs** to adopt regulation suited to local circumstances, and relies heavily on subsidiary guidelines and case by case policing at EU level to achieve consistency. This **has not been fully effective in delivering consistent regulation, and has resulted in very complex institutional mechanisms.** The Framework fails to identify where consistency is absolutely essential (for instance, for the provision of cross-border services) as opposed to merely desirable.
- **The EU telecommunications framework contains a number of potentially conflicting objectives which may be the source of policy tensions**.

- **Regulation of market power (SMP) (equivalent to competition law dominance) is a key element in the EU telecommunications framework. The concept is theoretically attractive, but practically flawed.** In may be needlessly burdensome for markets such as call termination in which all network operators possess market power. It is also not well suited to assessing markets characterised by tight oligopoly.
- It seems likely that a few basic bottlenecks in the telecommunications sector will persist in the medium to long term. Case by case analysis will be needed in order to determine how best to address them.
- **The Roaming Regulation has been very effective in driving down excessively high wholesale and retail roaming prices, but has not established a competitive dynamic that would make regulation unnecessary.** The effectiveness of the structural solutions enacted in 2012 is unknown and uncertain. No general solution is known.
- **The Commission's role in spectrum management has been strengthened by means of the Radio Spectrum Policy Plan (RSPP).** There is widespread recognition that the Commission has a key role to play in spectrum management, especially as regards harmonised bands; however, delays in making the 800 MHz band available demonstrate the limits of the Commission's power. These delays must be avoided for the 700 MHz band, which will become available in the coming years.
- A number of initiatives have been adopted with the aim of supporting Europe's digital agenda broadband targets. **Our companion study *Entertainment x.0 to boost broadband deployment* suggests that measures to support infrastructure competition combined with targeted state aid and demand-side initiatives are the most promising means to achieve roll-out targets.** Universal service obligations are not ideally suited to a multi-operator broadband environment.
- Streamlined authorisation procedures could in principle facilitate cross-border entry, but **authorisation is not a major issue for market players today.**

9.1.3. Comparison to other Regions and Countries

- **Different countries and regions around the world have approached these issues in different ways, and with substantially different outcomes as a result.**
- Europe has a quite huge number of fixed and mobile network operators. Even today, network services tend to be sold primarily as national rather than European products. There is, as has widely been noted, **no truly pan-European network today.**
- By contrast, **the network tends to be more concentrated in many of the regions with which Europe competes.** In the US, for example, the vast majority of customers are served by three fixed operators and four national mobile operators (even though there are huge numbers of tiny fixed operators), and there is substantial overlap between these groups.
- Our comparison countries include the United States, Canada, Australia, New Zealand, Japan, Singapore, Mexico, and India. These countries vary greatly in the nature and effectiveness of their regulatory institutions.

- The character of access regulation is a useful measure of regulatory institutions. The comparator countries have very different arrangements, ranging from structural separation, to unbundled local loops, to laissez faire lack of regulation.
- Call termination arrangements were another useful measure for comparison. Some countries regulate call termination much as Europe does. Others require payment to fixed network operators, but in in effect not among mobile operators. Japan does not regulate mobile-to-mobile termination rates at all.
- Each regulatory system needs to be understood as a whole. Each has strengths and weaknesses. The European Regulatory Framework also has strengths and weaknesses – in the midst of current Single Market concerns, we should not lose sight of the considerable demonstrated strengths of the European Regulatory Framework. **All things considered, we would say that the European Regulatory Framework performs well on a comparative basis.**

9.1.4. Assessment of Costs and Benefits to Europe

- The direct economic impact of many European regulatory interventions can best be understood by assessing their impact on retail prices.
- **Reducing prices to levels approaching those that would exist under perfect competition serves to reduce deadweight loss. This benefits society. The reduction also transfers welfare from producers to consumers, which is in principle neutral to overall societal welfare (but important to consumers).**
- An analysis of the effects of welfare gains due to the regulation of Mobile Termination Rates suggests a gain in societal welfare (due to the reduction of deadweight loss) of from € 2.8 billion (in 2005) to € 11.8 billion (in 2010) per year over the period 2005 through 2010, and a much larger transfer of surplus to consumers. Over the same period, the consumption of voice minutes can be assumed to have increased by 17% (in 2005) to 38% (in 2010) per year as a result, a significant consumer benefit.
- A similar analysis of the effects of welfare gains due to the regulation of prices for International Mobile Roaming suggests an average a gain in societal welfare (due to the reduction of deadweight loss) of € 4.5 billion per year over the period from 2012 through 2014.
- **The regulation of last mile access can be presumed to generate substantial gains in societal welfare as well.**
- A recent study by Analysys Mason for the Commission considers the benefits going forward of policy intervention to support NGA deployment and adoption. They compare a 'do nothing' business as usual scenario to a 'modest intervention' scenario, where governments invest an additional € 5.8 billion, which leads to an additional € 19.2 billion in private investment. This investment supports supply side measures to increase the availability of fixed wireline networks. The intervention drives a modest increase in consumer surplus for the period 2012 to 2020, but a significant increase in macroeconomic benefits from € 181 billion to € 270 billion. The modest intervention also increases the jobs created by NGA deployment from 1.35 to 1.98 million.
- The MTR and roaming examples deal with static economic effects driver by lower prices; while the NGA deployment example deals with dynamic macroeconomic

effects driven by investment. In understanding the overall benefits to society, both are important.

- **The European regulatory system is economically intensive, and thus imposes costs on NRAs and on market players; however, these costs can be presumed to be small in comparison with the gains that European regulation provides.**

9.1.5. The Convergence of Fixed and Mobile Networks

- The evolution of digital mobile network technology has been going on for many years, from GSM (2G) to EDGE (2.5G), UMTS (3G), HSPA (3.5G) and now on to LTE (4G). Each stage of this migration brings an increase in the volume of voice calls and data transfers that the network can handle, together with an increase in the bandwidth (speed) that can be obtained over mobile connections.
- Nominal bandwidth capabilities of mobile technologies are ever more impressive, but they must be interpreted with care. The actual bandwidth that can be obtained in practice is determined by many factors, such as the mobile operator's choices in network dimensioning and radio planning, the data consumption of the other mobile data users active in the particular radio cell in which the user happens to be, and the distance to the serving base station.
- Voice traffic in mobile networks has experienced steady growth over a period of many years. In the past few years, the evolution of traffic growth entered a second phase where data traffic exploded, primarily due to the rapid adoption of smart phones and tablets. **Today, there are indications that we may be entering a third phase of mobile data traffic evolution where the majority of traffic from nominally mobile devices is in fact sent over private Wi-Fi at home or at work. The fixed and mobile networks are increasingly intertwined.**
- **Mobile telephony is increasingly being used as a substitute (rather than a complement) for fixed telephone services, at least for residential consumers. This tendency could have significant implications on market analyses, and on the imposition of remedies aimed at promoting competition in fixed voice telephony.** If mobile voice were considered a full economic substitute for fixed voice, it is likely that the combined market for fixed and mobile voice call origination would be found to be competitive in most if not all Member States.
- The degree of substitutability of fixed for mobile is a complex empirical question. **Businesses appear to be much less able to substitute mobile services for fixed than are residential consumers.** It seems unlikely that mobile will represent a full and comprehensive substitute for fixed broadband in Europe in the medium term.

9.1.6. The Commission's Connected Continent Proposals

- **We agree with the European Commission's implied assessment that the existing EU regulatory framework has failed to achieve effective harmonisation in key areas; however, we fear that solving the problem with a Regulation as proposed is unwieldy and highly likely to result in confusion and overlap with existing measures.**

- Some of the topics addressed in the Commission's proposed Regulation are urgent and directly related to the Single Market. These include:
    - (1) the need for harmonisation of upcoming spectrum allocations;
    - (2) the need for harmonised wholesale inputs for pan-European business communications; and
    - (3) the need for harmonised rules for network neutrality to provide a predictable environment for network operators and online services.

  These urgent topics could (with suitable amendments) be addressed through discrete, targeted legislative measures.
- **The Commission's proposed approach to roaming alliances is unlikely to be effective.** There is no incentive for mobile network operators to form such alliances. Meanwhile, the proposal substantially undermines the viability of the structural solutions to roaming enacted in 2012.
- Proposals to incentivise 'roam like home' packages and to cap retail prices for intra-EU international calls represent a shift away from the existing preference for wholesale regulation towards retail regulation. These measures should also have implications for the way in which termination rates are set, inasmuch as these are key inputs to retail prices. This is a major policy shift that requires careful consideration. **The European institutions should evaluate the feasibility of an integrated approach to cross-border communications that would encompass international mobile roaming, international calls, termination rates, and potentially the European numbering space.**
- Other issues raised (including authorisation, where we find the Commission's proposals unwieldy) may be better suited to an overall review of the electronic communications framework. **Changes to institutional arrangements and the objectives for applying regulation in particular deserve a more thorough and coherent review.**

9.1.7. Overall Assessment

- Europe's telecommunications sector remains fragmented. In some cases (where services are genuinely national such as fixed broadband access), this is not necessarily fatal for the European project. In others such as business communications, operators are struggling to offer effective trans-European services.
- **The EU telecommunications framework has failed to distinguish where harmonisation is essential for the Single Market, but has achieved consistency where it is needed.** It is essential to carefully distinguish and prioritise discrete implementation elements and to conduct a root and branch review of the Framework as a coherent whole. Where harmonisation really matters, we advocate specifying the rules in legislation.
- As regards individual measures, we find many of the topics included in the Commission's draft proposals to be relevant, even if we would suggest amendments to the approaches suggested. **We broadly support the proposed measures on**:
    - **(1) net neutrality**
    - **(2) contractual safeguards for consumers**

  - **(3) harmonised wholesale inputs**
  - **(4) the proposed measures to harmonise spectrum allocation.**

- An important choice must be made between continuing current policies of favouring wholesale regulation to address competitive issues, versus moving to retail regulation that is fully consistent at European level. **A coherent approach would be needed to address not only international roaming calls and intra-EU international calls, but also termination rates and the European numbering space.**
- **Only small surgical (and non-urgent) adjustments are needed to achieve the Commission's aims as regards authorisation.**
- A review of the EU regulatory framework could cover institutional issues and the best approach to achieve consistency alongside other key debates such as the objectives for regulation, the role of SMP regulation vs. other alternatives and a potential phase-out of universal service in favour of alternative regimes.
- **Consolidation is inevitably a part of the discussion of achieving pan-European networks and trans-European services**; however, policymakers look to cross-border mergers, while market players seem to be more interested in in-country mobile mergers. **Cross-border mergers of fixed operators offer few advantages either to market players or to residential consumers.**
- Cross-border mergers could potentially facilitate multi-Member State services, which might benefit business customers even more than residential consumers. Given that MNOs with multi-Member State presence have not offered aggressive packages to business customers to date, there is reason to doubt that consolidation alone would produce trans-European services.
- **A frank discussion at European level of the tensions among European goals, and of the proper balance between static efficiency versus dynamic efficiency (and their respective implications for competition and for retail prices) would now be timely.**

9.2. Recommendations

Recommendations appear at the point in the text at which they are most relevant. The table below provides page numbers for each of them.

Table 18: Recommendations

Recommendation		Page
Regulatory harmonisation and institutional design		
Recommendation 1	Change the Framework to specify regulatory measures in legislation for those aspects of regulation where harmonisation matters	189
Recommendation 2	Streamline the role of the Commission and BEREC to police exceptions than enforce the rule	189
Recommendation 3	Allow a one year extension to the term of the rotating BEREC Chairman. Provide a greater presence for BEREC in Brussels	189
Authorisation		
Recommendation 4	Revise the Directives to simplify authorisation for pan-European operators	190
Broadband deployment		
Recommendation 5	Consider phasing out universal service altogether and relying instead on state aid together with measures to support end-user directly	191
Cross-border communications		
Recommendation 6	Evaluate an integrated approach to capping (1) retail roaming rates, (2) intra-EU call charges, and (3) termination rates	193
Wholesale access remedies		
Recommendation 7	Consider whether certain services would be better regulated through symmetric regulation rather than a full SMP analysis	193
Recommendation 8	Evaluate the implications of joint dominance for SMP regulation	194
Recommendation 9	Mandate conditions and harmonise approach towards market analysis for key wholesale inputs used for pan-European	194

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	business services	
Recommendation 10	Propose standardised conditions for key wholesale inputs used for residential broadband such as virtual unbundled local access	194
Recommendation 11	Limiting sector-specific regulation to areas of market failure should be the stated goal rather than phase-out	195
Net Neutrality		
Recommendation 12	Policymakers should support the network neutrality provisions of the proposed Regulation, and should enact them such that consumers are informed and can switch providers	195
Consumer protection		
Recommendation 13	Amend universal service and consumer rights directive to contractualise service quality standards and improve switching	195
Spectrum management		
Recommendation 14	Enact a Regulation that achieves the key purposes of the Commission's spectrum management proposals	196
Approach to Connected Continent		
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Industry consolidation		
Recommendation 16	European competition policy should remain tolerant of cross-border mergers	205
Recommendation 17	Policymakers should consider the target profitability of network operators, and consider implications for single Member State merger decisions	205

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