COMPETITION POLICY IN THE DIGITAL AGE

A Practical Handbook

About this Handbook

This Handbook is for you if you have an interest in competition policy in the digital communications sector and, in particular, if you are:

- A lawmaker, or in the policy departments of regulators and competition authorities recognising a need to reconsider the current system, in a way that takes into account:
  - the interplay between telecoms regulation and the enforcement of competition law;
  - the traditional tools and categories in market definition and market assessment; and
  - the need to ensure that different operators providing a similar service are treated in the same way in terms of competition policy.
- An enforcer of regulation, with or without concurrent competition law powers, wishing to understand how to regulate the telecoms sector in the digital age, due account being taken of what competition law enforcers can also do.
- An enforcer of competition law wishing to gain a better understanding of the competitive forces that are shaping the digital age.

October 2015

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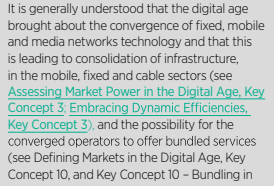

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Foreword

Never before has the role of policymakers in the communications sector been so critical to the success of governments' economic and social policies for the benefit of their citizens – with implications for business, education, health and access to financial and government services.

As the global association for the mobile industry, the GSMA has a unique insight into policy trends and challenges in the communications market. This Handbook is a part of the GSMA's efforts to promote a constructive understanding of the competitive forces that shape the digital age, and the way that growing digitisation challenges existing categories in competition law and regulation. The telecommunications industry welcomes, supports, indeed underpins, the Internet value chain. The digitisation of the economy brings about dynamic change, not just in the communications industry. The focus in this Handbook is to show the move away from traditional telecommunications markets to the reality of closely interacting players in the Internet value chain.

GSMA's ambition in presenting this Handbook is to clarify the issues, with references to precedents and trends and to support the non-discriminatory application of competition law and regulation; the same services should be subject to the same rules (Same Service, Same Rules). This is an application of time-honoured principles of non-discriminatory and technology neutral approaches to regulation. In dynamic, competitive markets, non-discriminatory, technology neutral regulatory treatment ensures that consumers continue to benefit from innovation and investment and limits distortions between providers.

Ultimately, the worst possible outcome for a country would occur if misaligned regulation and competition law enforcement prevented its citizens and industry from being offered the best products. In telecoms markets, the traditional response to market concerns has been to regulate network operators - they are easy to find, and are used to dealing with the regulators. Going forward, consumers' interest will be best served by application of the rules based on clear analysis, addressing the pertinent issues, such as market power. Continued regulation may be the easiest option but, as we discuss in this Handbook, it may be the wrong answer, especially if the aim in policy terms is to achieve continued growth of the Internet and of digital services.

As far as possible, in this Handbook care has been taken to be objective, practical and clear, within a serious and critically assessed framework of reference. It is our hope that lawmakers, regulators and competition authorities will find in this Handbook a valuable compass, and will refer to it regularly in their voyage through the unchartered waters of the digital age.

David Walsh, General Counsel, GSMA
2 October 2015

Summary

In this Handbook, competition policy refers to both government policy and the application of competition law and economic regulation to the communications sector. The fast development of the digital economy challenges existing regulatory and policy frameworks and impacts competition policy.

The analysis presented here takes the existing policy framework as the starting point. The Handbook is constructed around common concepts within this framework. Beginning in the first chapter with an overview of the way in which growing digitisation challenges existing business models (How Growing Digitisation Impacts Competition Policy), the Handbook then provides, in chapter two, an overview of the existing system of competition law and regulation and the relationship between the two (How Competition Policy Works Today). The aim of this second chapter is to clarify issues which are often confused and to help regulators in particular to decide how best to use their powers.

Chapters three, four, five and six are organised around Key Concepts. The first part of every Key Concept explains the traditional, current approach. In the second part (under the heading: "Implications of the Digital Age") the challenges brought about by the digital age are explored. It is the GSMA's intention that each Key Concept be read as a free-standing short piece, with references to the main cases, cross-references to other Key Concepts and backed by evidence in the footnotes. The online version of this Handbook (with cross references in hyperlink) can be found at www.gsma.com/competition-policy-handbook.

Market definition and market assessment are common concepts in competition law and regulation: regulators and competition authorities decide whether, based on the assessment of the market(s) as defined, remedies or commitments must be imposed (and fines). Specifically, in this Handbook:

- Defining Markets in the Digital Age consists of ten Key Concepts, starting from the more general, Market Definition in Practice (Key Concept 1); to more specific concepts, including Key Concepts about the difficulties in applying accepted market definition methodologies, such as the SSNIP test (Key Concept 6) in the digital age; about the way that the characteristics of certain markets require a new approach (as is the case, crucially, with multi-sided markets (Key Concept 7) and with bundling in market definition (Key Concept 10).
- Assessing Market Power in the Digital Age also includes ten Key Concepts, starting from the more general, Market Assessment in Practice (Key Concept 1), to specific Key Concepts on dominance and SMP (Key Concept 2) and merger control (Key Concept 3). The challenges to existing categories for measuring market power, such as market shares and how to measure them is the subject of Key Concept 5. The challenges in assessing leveraging of market power properly in the digital age are considered in Key Concept 9. Bundling in market assessment is examined in Key Concept 10.
- Market assessment must include proper consideration of efficiencies but in traditional, relatively slow moving markets, the treatment of dynamic efficiencies in particular has not been a major concern. Three specific Key Concepts for the assessment of efficiencies are presented in Embracing Dynamic Efficiencies, including efficiencies in merger control (Key Concept 3).

- Growing digitisation forces a re-think of existing bottlenecks and an evaluation of new bottlenecks. At the end of the Handbook, six Key Concepts on the assessment of specific bottlenecks are analysed, in Understanding Bottlenecks in the Digital Age.

Two main conclusions for the application of competition law and the regulation of the telecoms sector can be reached from the analysis presented in this Handbook:

First, is the need for a clear debate by competition policy and law-makers about the application of law and policy to address the new paradigm of the digital age. In reviewing the digital economy, traditional market players (such as the telecommunications operators) should be considered under the same criteria as the new market players. Consumers and industry alike would be poorly served if a new paradigm emerged that were not capable of universal application. This concern goes beyond the telecoms industry, as the Internet of Things develops.

Second, whilst policymakers discuss and develop a new paradigm, competition authorities and regulators need to apply the existing rules, taking into account new considerations brought about by the new market dynamics. The challenge for them is to apply existing concepts to the complex digital value chain, which can change in fundamental ways, even during the time of a single investigation or market review. This task is further complicated by decades of application of the rules to the telecoms operators, in a very different environment.

There is a lot that can be done if the existing rules are applied with more awareness of the new business models in the digital age. Specifically:

- In *competition law*, it is undoubtedly easier to apply traditional categories of assessment and imposition of remedies (and fines) to those (including telecommunications providers) that adopt a traditional business model (e.g. charge for services) but this does not mean that the existing rules cannot be applied to operators with different business models and that different business models are not in competition with each other. For example, some zero-priced services compete with price based services, and provide a formidable competitive constraint on those operators, including the mobile operators, whose business model involves charging a price to the end user (see Assessing Market Power in the Digital Age, Key Concept 5, Measuring Market Power). Consumers of a free service may pay a price in other forms (e.g. giving up privacy, and privacy can also be considered a parameter of non-price competition, see How Growing Digitisation impacts Competition Policy, Control of customer data and content is a significant strategic advantage). Another example: the *equally-efficient-competitor benchmark test* examines whether a competitor with a similar cost structure could compete if it applied the same end-user price as the firm in a dominant position. In multi-sided market, it is often difficult to determine the end-user price. Moreover, digital rivals are unlikely to have similar cost structures (see Assessing Market Power in the Digital Age, Key Concept 8, Exclusionary Abuse, Implications of the digital age). And yet, there are important competition issues to consider.

- The application of existing competition rules needs to be more sensitive to market dynamics in merger control as well. Whilst each case needs to be considered on its merits, generally speaking mergers are traditionally assessed on their short term pricing implications, and efficiencies are only taken into account to a limited extent. In the digital age, this may lead to adverse consequences. For the mobile industry specifically, mobile cycles (e.g. the change from 3G to 4G technology) are relatively short. Increased investment has the potential to expedite the adoption of new technologies which in turn may lead to reduced prices and more availability of services, but such investment cycles are not always considered in traditional competition analysis that uses price as a proxy for consumer interest. (This is analysed in Consolidation in the Mobile Sector).
- In *regulation*, a sector specific regulator can only use the tools it has at its disposal, within the limits of its sector-specific (telecoms) jurisdiction. Yet, in the shorter term, as a new paradigm emerges, the existing framework can be adapted to the digital age. Existing Significant Market Power (SMP) regulation, where it exists, should only be imposed if the market definition and market assessment show that there is a need to regulate operators with market power, and that competition law would not be sufficient to address the issues. Depending on the facts of the case, changing market dynamics may mean that new bottlenecks have emerged and the market power of existing operators is weakened. If so, existing SMP regulation may require a reassessment, potentially leading to the lifting of some regulation. If, instead, new marketplaces are regulated based on past assessments, there is a risk that the playing field will not be level in the digital economy, potentially restricting options for consumers and limiting the multiplier effect that the internet has brought to every aspect of how people and industries operate. (See in particular Understanding Bottlenecks in the Digital Age).

The GSMA is actively seeking comments on this Handbook, and examples relating to the application of the rules from different countries. If you would like to contribute, please send comments to comphandbook@gsma.com.

How Growing Digitisation Impacts Competition Policy

Four key trends are changing the landscape in the communications industry: 1. Communications are converging; 2. Internet apps are breaking down the integration between mobile networks and mobile services; 3. The digital age is data centric; and 4. Control of customer data and content has become a significant strategic advantage. Additional competition by Internet players in the market needs to be properly considered when defining and assessing markets. Competition authorities and regulators need to adapt traditional categories of competition policy assessment to the digital age. Lawmakers need to focus on the future of regulation.

Competition policy can be defined as "the set of policies and laws which ensure that competition in the marketplace is not restricted in such a way as to reduce economic welfare".[1] In this Handbook, the term refers to both government policy and the formulation and application of competition law and economic regulation[2] to the communications sector. Empirical and theoretical analysis indicates that the profit maximising strategy of firms in a position of market power may lead to distortions of market outcomes, to the detriment of consumers. In this Handbook, we explore the contradictions of a system where services in competition with each other are now regulated differently, due to recent momentous market dynamics that should be understood better.

Digitisation has accompanied the advancement of computing over the last 30 years, from PCs to Internet search to smartphones. Digital technologies allow for data to be transferred across networks and on different types of networks: Wi-Fi hotspots, fixed and mobile telecoms networks, satellite technology. The launch of the iPhone (2007) ushered in a new mobile computing era that has brought innovation and disruption to traditional mobile communications services. The resulting entry of disruptive online service providers has seen growth in data erode revenue streams from traditional services such as voice and text messaging.

Digitisation is now moving beyond a computing and web phenomenon and has the potential to impact not only the communications sector, but whole economies, and with it consumers, businesses and policy makers. Its potential scale and transformative effect is such that comparisons are being drawn with the industrial and commercial revolutions of the mid -19th and 20th centuries.[3] Consumers have access to an unprecedented number of services and sources of entertainment and information, making abundance, not scarcity, of information and services the prime issue for consumers.

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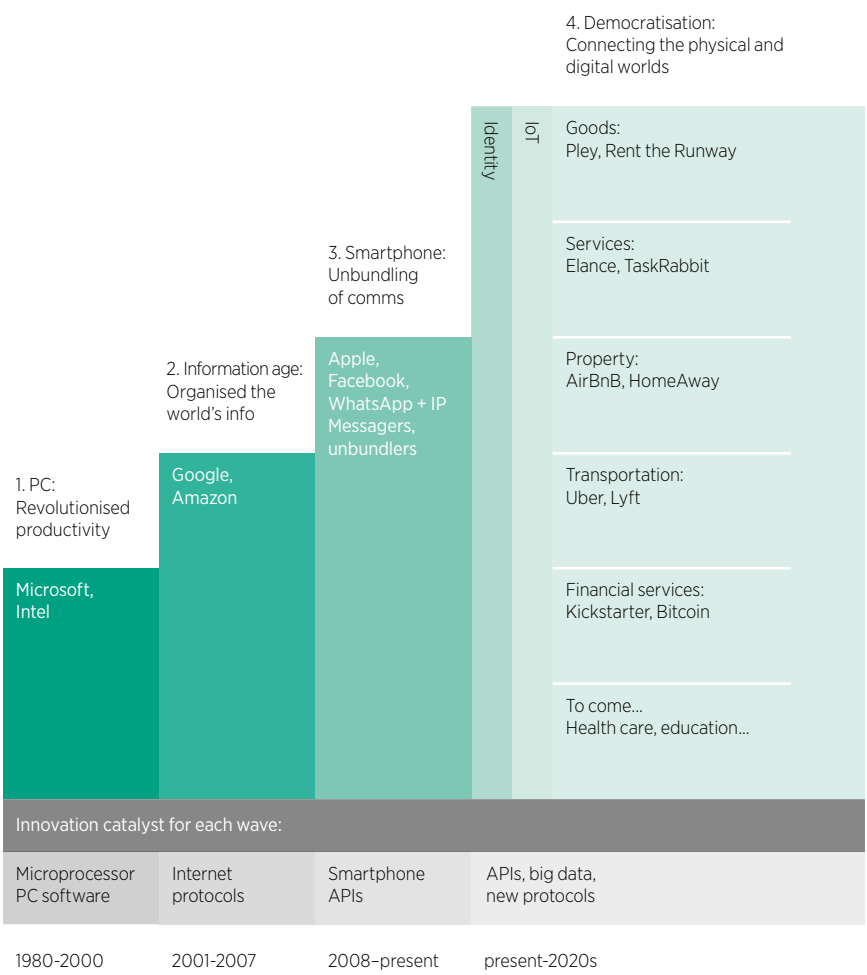
1 Massimo Motta, *Competition Policy – Theory and Practice*, Chapter 2.

2 In this Handbook, the intention is not to focus on regulatory areas such as data protection and consumer protection rules, other than to refer to the fact that telecoms operators are usually subject to more stringent regulation in these areas than other players in the digital age

3 GSMA, *Mobile Industry Radar*, January 2014

Figure 01: Digitisation: From Web Phenomenon to whole sectors of the economy



Source: GSMA, Mobile Industry Radar, January 2015

In tandem with this, a new breed of digital market places have emerged, the main purpose of which is to sell to developers and producers one product, namely the attention of consumers. Many on-line business models depend for their success on competition for an audience: they compete for markets (or aim to create new markets) more than they compete with each other in existing markets.[4]

In Figure 01 we show the development of the digital economy from the early development of the PC in the early 80s to the sharing economy ("Internet of Things") and beyond, leading to disruptions to entire sectors of the economy. It is more and more difficult to distinguish between the digital economy and the physical, traditional sectors of the economy: the repercussions of the digital economy on competition policy which are identified in this Handbook will become of relevance for the application of competition policy in many other sectors.[5]

Four key trends are changing the landscape in the communications industry, namely: the convergence of communications and the consequent rise of bundled communication offerings; the rise of over-the-top (OTT) applications (Internet players); the shift towards data services; and the emergence of customer data as a strategic asset. Law makers, competition authorities and regulators need to assess how these digital trends impact competition policy in the communications sector: additional competition by internet players in the market needs to be properly considered when defining and assessing markets.

1. Communications are converging

It is generally understood that the digital age brought about the convergence of fixed, mobile and media networks technology and that this is leading to consolidation of infrastructure, in the mobile, fixed and cable sectors (see Assessing Market Power in the Digital Age, Key Concept 3; Embracing Dynamic Efficiencies, Key Concept 3), and the possibility for the converged operators to offer bundled services (see Defining Markets in the Digital Age, Key Concept 10, and Key Concept 10 – Bundling in Market Assessment).

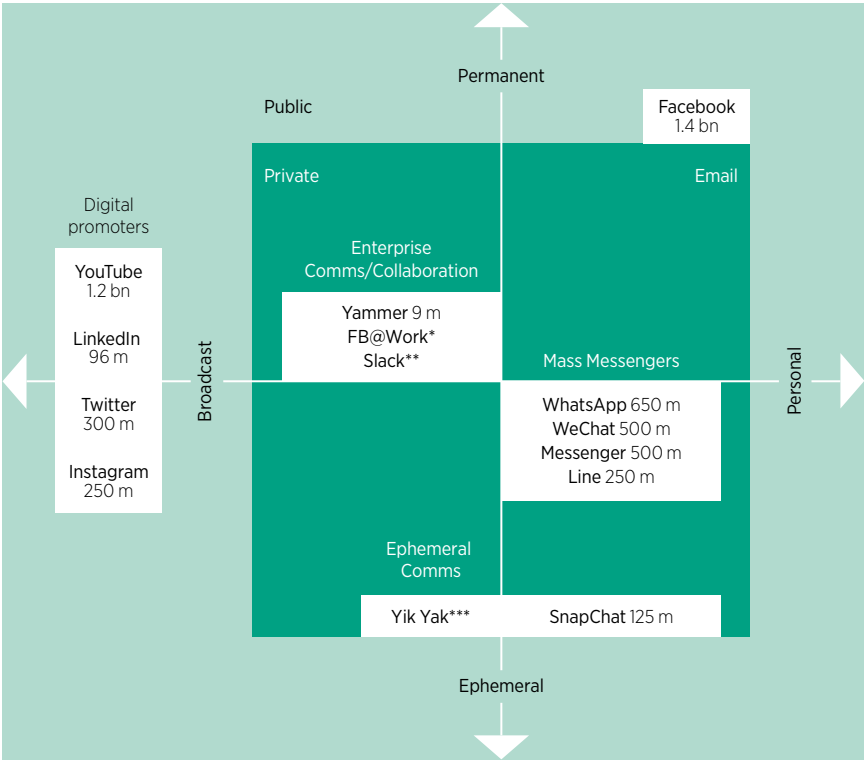
It is perhaps less commonly considered that the digital age can also be analysed as a story of unbundling, followed by re-bundling. In a nutshell, the telecoms operators (mobile and fixed) have traditionally had a presence in infrastructure, customer management and product innovation and have been able to leverage infrastructure to provide services. The advent of the smartphone in 2007 made it possible for new entrants to leverage product innovation capabilities (without the need for an infrastructure) into customer management, leading to the unbundling of the three businesses incorporated in the traditional (mobile) operators.[6] The new communications networks may seem fragmented but closer inspection of the facts reveals that one particular firm, Facebook, has already begun to rebundle services. It now controls four of the top mobile social and communications networks globally both in terms of scale and engagement. Facebook has taken advantage of the opportunity to consolidate user engagement across four of the leading platforms in mobile (Facebook.com; Whatsapp;

[4] European Parliament, Challenges for Competition Policy in a Digitalised Economy, a Study for the ECON Committee,pages 22-23 at: *http://www.europarl.europa.eu/thinktank/en/document.html?reference=IPOL_STU%282015%29542235*.

[5] A point also made in the study European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted.

[6] GSMA, *Mobile Industry Radar,* July 2015, Chapter 3.3, *Unbundling in the mobile computing age.*

Figure 02: Emerging Social Communications Landscape



* FB@Work in trial

** Slack launched in Feb 2014; reached $1.12bn valuation within first year.

*** Yik Yak launched in Nov 2013, reached $300-400m valuation within first year.

Source: GSMA, Mobile Industry Radar, April 2015

Facebook Messenger and Instagram) and has now an unparalleled ability to serve advertisers in targeting users across platforms. Figure 02 shows the position of the Facebook owned platforms in the value chain.

(Facebook also made an offer for Snapchat). To the extent that this consolidation could be considered to pose issues in competition policy, to-date it has not resulted in extra regulation or competition law commitments on Facebook.[7]

[7] The acquisition of Whatsapp by Facebook resulted in the Bureau of Consumer Protection within the FTC writing to the companies to remind them of their privacy obligations, as seen below, *Defining Markets in the Digital Age, Key Concept 1, Market Definition in Practice*.

Figure 03: Operator presence across fixed and mobile networks[8]

Operator	Service	Countries
Airtel	Fixed and mobile	India
	Mobile	Bangladesh, Gabon, Ghana, Rwanda, Niger, Nigeria, Seychelles, Sri Lanka, Uganda, Zambia
America Móvil	Fixed and mobile	Argentina, Austria, Bulgaria, Brazil, Chile, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, El Salvador, Honduras, Guatemala, Macedonia, Mexico, Nicaragua, Peru, Puerto Rico
	Mobile	Belarus, Panamá, Paraguay, Serbia, Slovenia, Uruguay
Batelco	Fixed and mobile	Bahrain, Guernsey, Jersey & Isle of Man, Maldives, Saudi Arabia
	Mobile	Jordan, South Atlantic & Diego Garcia, Yemen
Cable & Wireless	Fixed and mobile	Anguilla, Antigua & Barbuda, Bahamas, Barbados, British Virgin Island, Cayman, Dominica, Grenada, Jamaica, Montserrat, Panama, Seychelles, St. Kitts & Nevis, St. Lucia, St. Vincent, Trinidad & Tobago
Deutsche Telekom	Fixed and mobile	Croatia, Germany, Greece, Hungary, Slovakia, Romania, Montenegro, Macedonia
	Mobile	Albania, Austria, Czech Republic, Netherlands, Poland, UK, United States (Puerto Rico)
Etisalat Group	Fixed and mobile	UAE, Pakistan
	Fixed (only)	Sudan
	Mobile	Saudi Arabia, Egypt, Afghanistan, Sri Lanka, Tanzania, Nigeria
	Satellite	Interest in Thuraya – satellite operator with operations in 140 countries
Maroc Telecom Group	Fixed and mobile	Morocco, Mali, Mauritania, Gabon, Burkina Faso
	Mobile	Cote D'Ivoire, Togo, Benin, Central African Republic

[8] The table does not reflect relative shareholdings in those countries where the operators are in a joint venture with other shareholders. To the best knowledge of the authors, based on published sources, this table is accurate but may not reflect changes that have occurred after the latest published accounts, or may require other changes. Please send all comments to comphandbook@gsma.com.

Operator	Service	Countries
Ooredoo	Fixed and mobile	Oman, Qatar, Tunisia, Indonesia
	Mobile	Kuwait, Iraq, Algeria, Myanmar, Palestine, The Maldives, Singapore, Laos
Orange	Fixed and mobile	France, Ivory Coast, French Caribbean, Mauritius, Poland,Senegal, Spain
	Mobile (fixed offering without fixed local infra-structure)	Belgium, Botswana, Cameroon, DRC, Egypt, Equatorial Guinea, Guinea, Luxembourg, Madagascar, Mali, Moldova, Niger, Romania, Slovakia, Tunisia,
Telecom Italia	Fixed and mobile	Brazil, Italy
Telefonica[9]	Fixed and mobile	Argentina, Brazil, Chile, Colombia, Peru, Germany, Spain, UK[10]
	Mobile	Ecuador, Mexico, Panama, UK, Uruguay, Venezuela
Telenor	Fixed and mobile	Norway, Sweden
	Mobile	Bangladesh, Denmark, Hungary, India, Malaysia, Myanmar, Pakistan, Serbia, Thailand
Vodafone	Fixed and mobile	Czech Republic, Egypt, Germany, Ghana, Greece, Hungary, Ireland, Italy, Malta, Netherlands, New Zealand, Portugal, Qatar, Spain, Turkey, UK
	Mobile	Albania, Australia, DRC, India, Kenya, Lesotho, Mozambique, Romania, South Africa, Uganda

[9] Telefonica is present in Guatemala and El Salvador too, but only as a mobile operator

[10] Currently in the process of sale to Hutchison UK

Other instances of bundling amongst the new players have also not attracted competition law or regulatory scrutiny. For example: some apps may only be made available through an app store. App stores are bundled with an operating system, which is an essential part of any handset. What is the relevant market from a competition perspective? What is the competitive landscape? Does the increase in competition brought about by the Internet players change the position of the tlecom players? Do regulators and competition authorities recognise this? Are there potential new digital bottlenecks? (See Defining Markets and Assessing Markets in the Digital Age, and specifically Understanding Bottlenecks). On the other hand, consolidation of infrastructure, in the mobile, fixed and cable sectors has been subject to heightened scrutiny (see Assessing Market Power in the Digital Age, Key Concept 3; Embracing Dynamic Efficiencies, Key Concept 3). In the digital age, mobile-only operators are seeking to grow by in-country acquisitions, and also to acquire fixed networks (and vice versa, fixed network operators are acquiring mobile networks (see Figure 03).

Consolidation enables operators (on the supply side) to offer bundles of services: converged communications services in a single package which often include broadband, fixed and mobile telephony and more recently broadcasting services, over both fixed and mobile networks. The mergers amongst traditional telecoms operators often are only approved by the competition authorities after the parties have accepted commitments. This is considered further below: see Mobile to Mobile Mergers in the EU, Telecom Italia Analysis.

2. Internet apps are breaking down the integration between mobile networks and mobile services

The new digital value chain is complex, with multiple layers and players (see Figure 04). For this reason, in some studies[11] the term "value web" is preferred, to denote the convergence of previously separate value chains. The value web *"can be described as a complex structure of platforms stacked on each other allowing for multiple routes to reach end users and making it difficult to exclude competitors"*. Content and service providers and handset manufacturers form direct relationships with the consumer but are (mostly) still dependent on the network for their services. This leads to the creation of multisided markets, which are difficult to define (see Defining Markets in the Digital Age, particularly Key Concept 7, Multi-sided Markets) and assess. Revenue growth and rate of returns differ greatly, as shown below. Rate of returns are much lower for the mobile telecoms operators[12] than in the other segments of the value chain. Yet, the "local Telco connectivity" segment is regulated the most. These marketplace platforms are able to take advantage of almost infinitely scalable networks, and position themselves as the chief beneficiaries of industry transformation. Increasingly, communication services (e.g. video, voice or messaging), are no longer autonomous and separate service but are services integrated into a platform (such as social networks, e-commerce, games, or CRM applications). In order to communicate, people increasingly find their respondents through the apps they are using, instead of the traditional way of finding a correspondent through the numbering (or addressing) plan of traditional communication service providers.

[11] Notably European Parliament, Challenges for Competition Policy in a Digitalised Economy, quoted.

[12] The data analysed refer to the mobile operators, and are based on GSMA's research.

Figure 04: Digital value chain (2013)

Low spread and below GDP revenue growth for network manufacturers and connectivity

Concentrations of value across all segments apart from connectivity resulting in 'winner takes all' dynamic while operator's scale is constrained by its global fragmentation

Source: IDC, Gartner, McKinsey strategy analysis, Pyramid, Capital IQ. ©GSMA 2013

Figure 05: Types of Content over the Internet

Services Delivered over the Internet

- **Communication:** Including traditional telephony services and new substitutes. According to the GSMA, 40% of mobile phone users now mainly use internet-based services for messaging, as opposed to 20% who use operator SMS messages. GSMA research has found 69% of smartphone users see Internet apps as a substitute for SMS in all or most circumstances – this figure is 79% in South Korea. For voice, 45% see voice apps as a replacement for 'traditional' voice in all or most situations.[13] Example services include Skype (which accounted for 4.96% of peak period traffic on fixed networks and 1.78% on mobile networks in 2013)[14], Viber and WhatsApp.
- **Entertainment:** Including real-time and on-demand content. Examples include Netflix (2.83% of peak traffic over fixed networks in 2013), YouTube (28.73% downstream peak traffic on fixed networks and 20.62% of peak traffic on mobile in 2013) and Hulu.
- **Marketplaces:** Enabling the discovery, purchase and downloading of digital content and increasingly enabling the sharing economy. Examples include eBay, Uber and Airbnb, Amazon and Apple iTunes store.
- **Social media:** Encompassing social networking sites that enable members to share information. Examples include Facebook (4.94% downstream peak traffic on fixed networks and 11.04% of peak traffic on mobile in 2013) and LinkedIn.
- **Filesharing:** Examples include BitTorrent (48.1% upstream peak traffic on fixed networks and 10.1% of peak traffic on mobile in 2013) and eDonkey.
- **Back-up services:** Enabling consumers to store and back-up data. Examples include Dropbox and iCloud
- **Gaming services:** Encompassing downloads and dedicated games platforms.

Thus, it becomes more and more difficult to split communication services from digital services in general.

Of the Internet services shown in Figure 05, only communication and, in some cases, entertainment are provided by telecoms operators (fixed and mobile), increasingly in competition with new players. When in this Handbook we talk about Internet-based players which provide services in competition with the telecoms operators, we refer to these players, and often specifically to those which provide voice and text messaging services over the Internet. The other services are provided by Internet players using the network. Many Internet players, which inhabit parts of the value chain that require comparatively low capital expenditures (social media, search services and operating systems supporting apps), have

[13] GSMA 2014: Mobile usage, perceptions and preferences

[14] All data in this Figure 05 are from CERRE, *Market Definition, Market Power and Regulatory Interaction in Electronic Communications Markets*, available at http://www.cerre.eu/publications/market-definition-market-power-and-regulatory-interaction-electronic-communications (Page 17).

seen major gains in market value. Infrastructure provision and content production and distribution have not seen the same increase in market value.

3. The Digital Age is data centric

In the digital age, the storage, reproduction and transmission of all kinds of information (sound, video, text, graphics, and data) take place in the form of digits, in binary code over "packet switched networks". Whereas traditional networks are designed for specific applications (the telecoms network for voice and limited data (via fax); the cable network for TV and radio broadcasting), packet-switched networks carry a general-purpose technology, the Internet (specifically, Internet Protocol (IP)), over which any content can be delivered.[15] Consumption can take place "on the go"; at home; at hubs. The use of Wi-Fi hotspots, as opposed to mobile networks, to consume data "on the go" is gaining momentum. Traditional fixed operators are enabling consumers to log on to each other's hotspots. Some companies such as Republic in the US are offering Wi-Fi-only plans for mobile devices, and hybrid plans where Wi-Fi is the main means of transmission and roaming on a mobile network is a back-up system.

Content-hungry consumers require high bandwidth to meet their growing demands for different services as categorised in Figure 06.[16] Overall, according to Ericsson data, Facebook and YouTube together already account for 30% of mobile traffic volume in each of the US, South Korea and Spain.

The traffic generated by video-streaming and IP-based television is set to increase further still and this is a global phenomenon.

Asia is the leading market for Internet applications. Some Asian markets, such as South Korea became dominated by Internet messaging apps as far back as 2011.[17] Carriers in South Korea experienced a substantial (potentially as much as 55 per cent) decline in P2P (person to person) SMS volume in 2011.[18] Messaging service Line, launched in Japan, was reported in 2014 to have over 140 million users globally (now 205 million)[19], and WeChat from China had more than 400 million users around the world at the time (now 549 million).[20] In Western Europe, the volume of Internet messages has increased from less than 100 billion in 2010 to more than 1.2 trillion in 2013, while the volume of Internet calls has increased from nearly 5 billion minutes in 2010 to roughly 65 billion minutes in 2013.[21] Internet messaging accounted for about 67% of overall

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15 Ibid, page 12.

16 Demand for data services does not appear to be slowing down and growth rates being observed are frequently well beyond those being forecasted. For example, in 2011 Ofcom UK estimated that per capita data usage would increase by around 20% over two years when in reality it increased by over 130% over the period: see Ofcom 2013, MCT review 2015-2018 (page 8).

17 From January to September 2011, cumulative downloads of the mobile messaging application Kakao Talk increased almost five-fold – from 5.4 million to 25.4 million (Mckinsey & Company "the future of mobile messaging. Over the top competitors threaten SMS).

18 See http://advanced-television.com/2008/02/20/asia-pacific-will-outpace-europe-in-iptv/.

19 Figure for current number of users based on company published figures in Q2 2015.

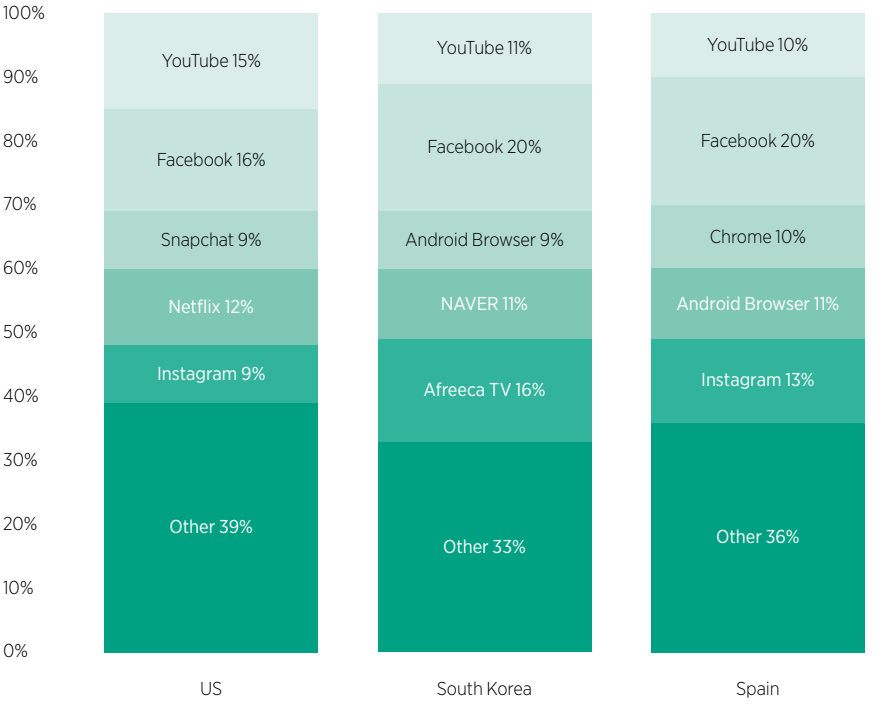
20 WeChat has been one of the fastest growing Internet apps; in 2012, WeChat doubled its user base from 100 million to 20 million and in 2013 it doubled that once again. (See http://www.tyntec.com/fileadmin/tyntec.com/images/market_insights/Executive-Summary_Operator_survey_OTT.pdf). Figure for current number of users based on company published figures in Q2 2015.

21 CERRE, 2014. Market Definition, Market Power and Regulatory Interaction in Electronic Communications Markets.

22 Ibid.

23 GSMA Source: GSMA, Mobile Industry Radar, October 2014.

Figure 06: Top Apps By Mobile Traffic Volume. By Traffic Volume Regionally, 2014



Source: Ericsson, BI Intelligence

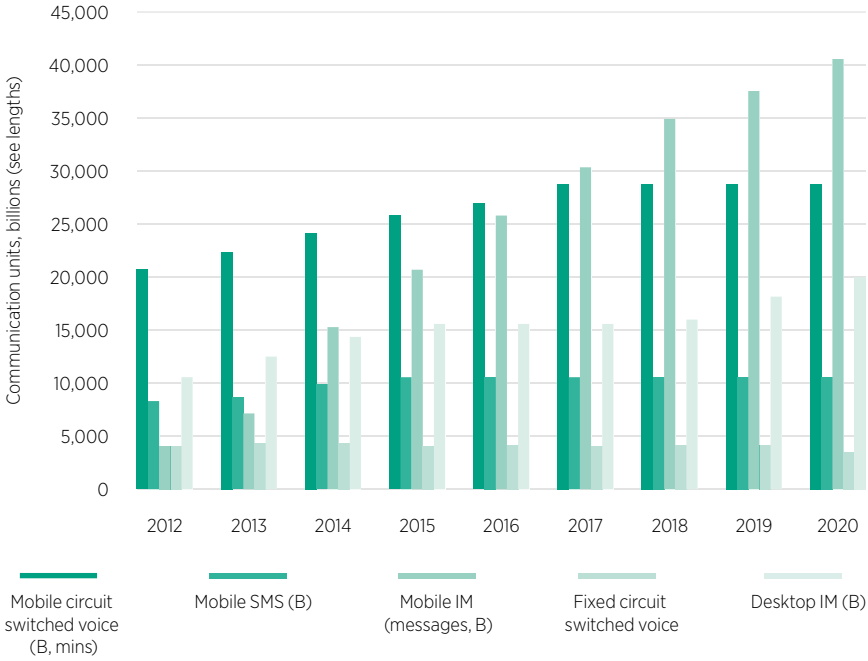
messaging traffic in 2013 in Western Europe, up from 8.31% in 2010.[22] Globally, GSMA forecasts further rise of IP messaging in the period up to 2020.[23] The rise of these new Internet services has important implications for competition policy, in terms of:

- market definition (to assess substitutability of services in competition with each other but traditionally in different markets, see Defining Markets in the Digital Age)
- the assessment of market power (Assessing Markets in the Digital Age): competition at the retail level provides a constraint on wholesale operators and challenges long-held notions of dominance by network owners, particularly in the mobile sector (see Defining Markets in the Digital Age, Key Concept 8; and Understanding Bottlenecks, Key Concept 2)
- the requirement for bandwidth elevates the need for investment and innovation versus the need for low and decreasing consumer prices (Embracing Dynamic Efficiencies, Key Concept 1)

4. Control of customer data and content is a significant strategic advantage

As seen above, the digital age brings the opportunity to consolidate user engagement

Figure 07: Impact of IM on CS and SMS volumes



Source: GSMA, Mobile Industry Radar, October 2014

(to compete for audiences) across platforms and the ability to serve advertisers in targeting users across platforms. The ability to compete for audiences increases if a company has multiple platforms and creates synergies by linking them. Consumers accessing different platforms from one provider (e.g. email, cloud computing, social networking and web searching), allow the provider to develop very detailed user profiles. These are used to optimise the experience of end-users and advertisers. Digital platform operators which make themselves indispensable to end-users and advertisers are in a gatekeeper position.[24]

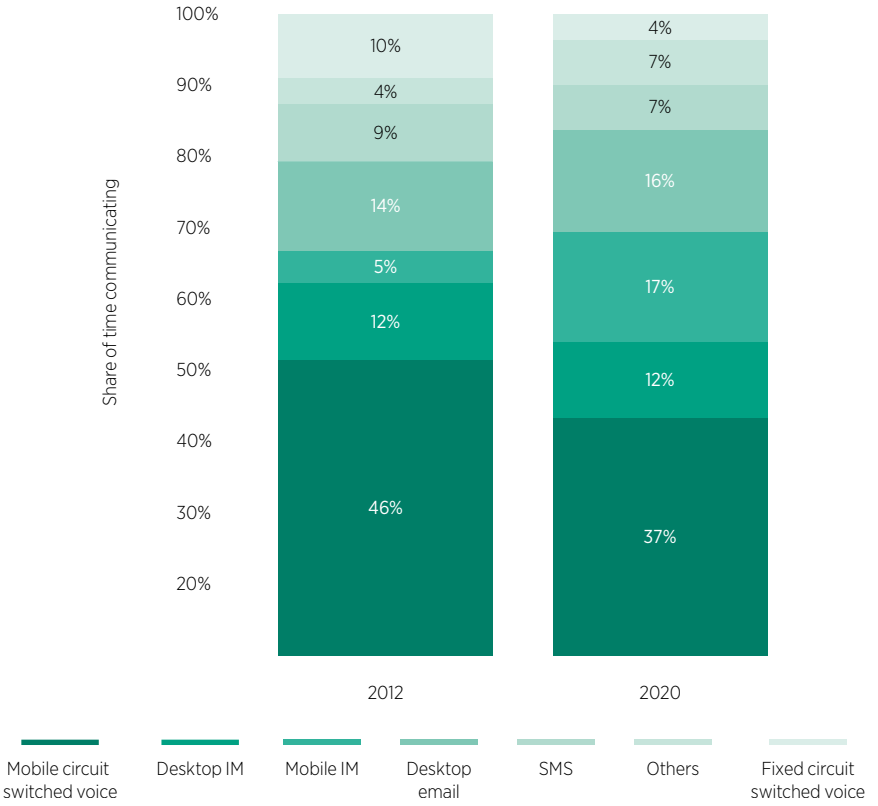
Internet players use these platforms to exploit the often multi-sided nature of digital markets. Services are provided free of charge to consumers, subsidised by revenues from another market – typically by selling customer data or advertising space. Customer data contains valuable insight, facilitating data sharing, and product targeting (see Defining Markets in the Digital Age, particularly Key Concept 7, Multi-sided Markets). The availability of a great amount of data represents an asset which shapes the competition dynamics, possibly leading to market power. It follows that decisions made by firms about consumer privacy can

[24] See European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 24.

lead to a form of non-price competition, so that privacy can itself be considered a parameter of competition.[25] As has been stated, in platform markets *"the prime objective is not to directly extract profits by leveraging monopoly power but to integrate services/platforms in order to develop synergies across those platforms by using end-user data profiles"*.[26]

In theory, a telecoms platform could also be two-sided. Theoretically, a mobile operator could charge suppliers of content services over the Internet infrastructure a different price than it charges the final consumers. At the extreme, the operator could provide services to the end-users for free, and derive revenue from selling capacity to the suppliers

Figure 08: IP messaging rise



Source: GSMA Intelligence, Mobidia. See GSMA, Mobile Industry Radar, April 2015

[25] Deborah Feinstein (director of FTC's Bureau of Competition,) *Big Data in a Competition Environment*, Competition Policy International, 29 May 2015

[26] European Parliament, Challenges for Competition Policy in a Digitalised Economy, quoted, page 25.

of content over Internet. However, in many markets, net neutrality regulation does not allow for telecoms operators to provide Internet apps with a better quality of service in return for a distribution fee (see Assessing Markets in the Digital Age, particularly Key Concept 7, Discriminatory Abuse). Telecoms operators find their traditional sources of revenue impacted[27] by Internet players' ability to give away products ostensibly for free by recovering their costs from the other side of the platform. If telecoms operators want to compete with Whatsapp, for example, they may need to offer messaging services for free. Ironically, existing regulation of the mobile industry reflects the fact that traditionally mobile network operators have had exclusive access to valuable data (e.g. information on which sites are most popular, the frequency with which these sites are visited, the timings of the visits, the duration of the visits and corresponding demographic data). Telecoms operators are consequently subject to stricter data protection and data retention/breach notification requirements than others, including Internet players.
At the time of telecoms liberalisation, regulation was put in place to deal with perceived issues of consumer harm,[28] but Internet apps are a relatively new development, outside traditional regulatory scrutiny. It is an open question to policymakers in particular whether this discrepancy in regulation is still justified or appropriate. This is explored further in How Competition Policy Works Today.

The big data owned by Internet players and mobile operators can be used to increase efficiency and profitability, such as optimising routing and quality of service (by analysing network traffic in real time). Partnerships between various players (such as between mobile operators and Internet apps) present a valuable business opportunity, provided that there is a level playing field between operators and Internet players as regards the commercial utilisation of data.

[27] For instance, India, the Philippines and Vietnam enjoyed average revenue per user (ARPU) of greater than $5 in 2008, while in 2015 this is set to decrease to between $3 and $4. See *http://www.xonapartners.com/wp-content/uploads/2014/01/AsianTelecomMarket2.pdf*.

[28] Such as the risks posed by data on consumers concentrated in the hands of a few players.

How Competition Policy Works Today

The telecoms sector is subject to regulation and the application of competition law. Internet apps and other players are not subject to the same kind of regulation. Regulators and competition authorities need to be aware of the changes in the marketplace, and only regulate if competition law appears to be insufficient, due account being taken of the dynamics in the marketplace, bearing in mind that the application of competition law generally leads to more effective outcomes for consumers than the imposition of regulation.

Regulation (including SMP regulation) and competition law

In this Handbook, we explore the contradictions of a system where services in competition with each other are regulated differently and conclude that the same services should be subject to the same rules. The liberalisation of the telecoms sector in most countries in the past few decades means that telecoms operators are subject to an enhanced system of competition policy[29] and to stricter data protection and data retention/breach notification requirements which, whilst outside the scope of competition policy per se, may generate competitive distortions.

Issues arise beyond competition policy, in areas such as taxation, privacy and security. For example, in many countries, including in all countries belonging to the European Union, sector-specific consumer protection rules are more stringent than the generally applicable consumer protection legislation.[30]

Although a discussion of these issues goes beyond the scope of this Handbook, it is important to note that telecoms operators often have to comply with extra regulation. Mobile operators in particular may be subject to Universal Service Obligations or have to contribute to a Universal Service Fund, providing funding for investment in telecoms infrastructure, for example in rural areas.[31] Mobile operators often have to comply with rules on legal interception of communications and provide emergency calling services, which do not apply to the Internet players in competition with them. Tax rules also disadvantage the traditional players.[32] The economic rationale for treating Internet players offering communications services differently from telecoms operators is unclear but the consequences are that regulation constraints telecoms operators more than Internet players, in a number of areas including privacy, data security, emergency services, universal service and taxation, which are outside competition

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[29] The existence of sector specific regulation facilitates a stricter application of competition laws to telcos, as competition authorities may be tempted to build their cases on the work on market definition and SMP made by regulators, and even though the market dynamics may have changed in the period since the latest SMP review. On the relationship between SMP regulation and competition law, see *How has competition policy been applied in the context of telecommunications?* below.

[30] Mission letter to Gunther Oettinger from the President of the European Commission, Brussels, 1st November 2014. See: https://ec.europa.eu/commission/sites/cwt/files/commissioner_mission_letters/oettinger_en.pdf.

[31] Ibid.

[32] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 39.

policy and are not discussed in this Handbook further.[33]

Specifically as regards competition policy, the telecoms sector is generally subject to a specific system of economic, Significant Market Power (SMP) (ex ante) regulation (and dominant carrier regulation, particularly on access)[34], as well as competition law. Because services offered by Internet players do not fall within the traditional definitions in telecoms regulation, Internet players are outside the scope of SMP regulation. In countries where a generally applicable system of competition law applies, telecoms operators are then also subject to competition law, alongside Internet players. The telecoms industry is therefore subject to both telecom-specific regulation and the traditional application of competition rules whist the competing Internet players are not subject to ex ante regulation and can sometimes escape competition law scrutiny altogether, due to the characteristics of their business model.

A sector specific regulator can only use the tools it has at its disposal, within the limits of its jurisdiction. There is a risk that past assessments by a telecoms regulator will continue to inform the analysis of the new marketplaces. What could be a larger issue in the digital economy may be (wrongly) perceived as a telecoms sector-specific issue leading to extra layers of regulation. This is sometimes referred to as *Maslow's hammer problem: "it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail."*[35]

In competition law, as explored in this Handbook, it is easier to apply traditional categories to telecommunications providers that have been subject to the application of competition law throughout the period leading to the digital age, and have a more traditional business model (e.g. charge a price for services).

Figure 09 provides an overview diagram of the way in which (ex ante) SMP regulation, merger control and the prohibition of abuse of a dominant position generally apply to the telecoms sector. When we refer to "SMP regulation", we refer to a system of regulation enforced by a telecoms-sector regulator with jurisdiction over the telecoms sector only. The term and the concepts of SMP regulation originated in the European Union and are now adopted in a number of jurisdictions. In jurisdictions outside Europe, sometimes reference is made to "dominant carrier regulation" in telecommunications[36] (see Figure 10 for an overview of the situation in different jurisdictions).

The system of SMP Regulation involves periodic market reviews at the end of which certain operators are designated as having Significant Market Power and obligations are imposed on them. SMP in economic regulation and

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[33] The digital age also poses fundamental questions for competition policy as this is sometimes used to address issues caused by limited effectiveness of other policies, such as in taxation, or iintellectual property. Although changing these other policies could be a better solution, sometimes it is difficult for practical and political reasons to do so. The issue is discussed in European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 12. See also an article discussing competition policy intervention and copyright laws: *Copyright reform through competition law? The Commission's statement of objections in the pay TV investigation*, at: http://chillingcompetition.com/2015/07/24/copyright-reform-through-competition-law-the-commissions-statement-of-objections-in-the-pay-tv-investigation/.

[34] In Australia significant market power is a term used in competition law investigations of operators with market power and access regulation depends on the existence of bottlenecks, rather than SMP.

[35] Maslow, *The Psychology of Science*, 1966, quoted in European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, above.

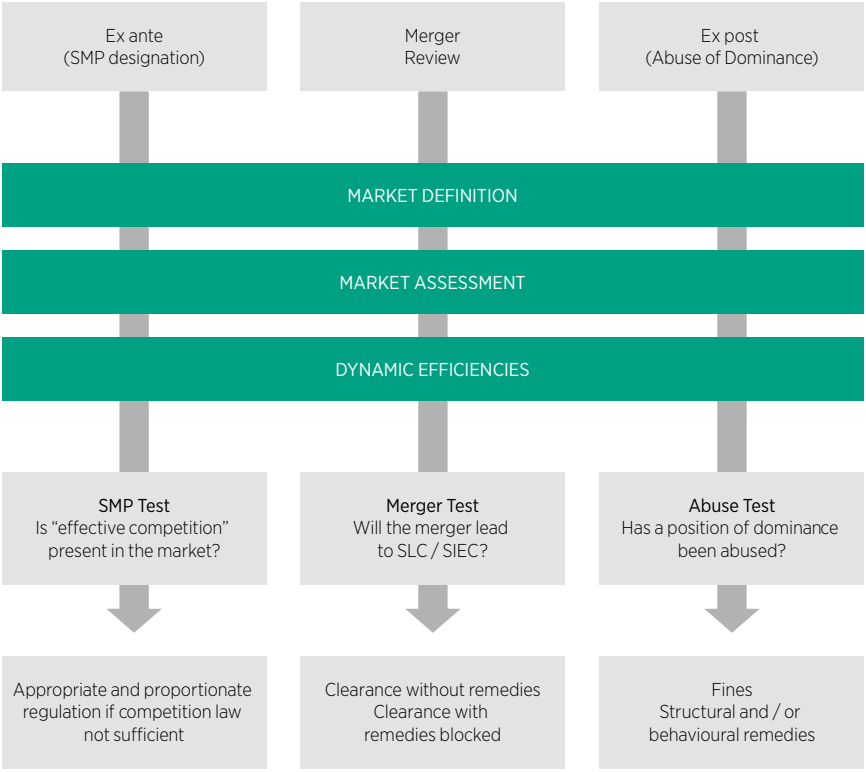
[36] For example Australia does not adopt a system of SMP regulation, but a system of access regulation based on bottlenecks. NBN Co, the government-owned monopoly supplier of national wholesale transmission services to retail service providers, is subject to specific obligations under the access regime set out in Part XI C of the Competition and Consumer Act 2010.

dominance are defined in the same way but they are different concepts. The difference in approach and outcomes in regulation and in competition law must be understood. (See Defining Markets in the Digital Age, Key Concept 1, Market Definition).

Whether considering SMP regulation or merger control or abuse of a dominant position, certain concepts are common. In particular, whatever the system of control, regulators and/or competition authorities will need to define markets and conduct a market assessment. The tools may be the same but conceptually and practically there are differences in competition law and in (ex ante) SMP regulation that must be understood (see How has competition policy been applied in the context of telecommunications?).

In most countries which apply a system of competition law and SMP regulation, regulators and competition authorities are asked to perform a detailed market assessment. This should include an assessment of dynamic efficiencies. Dynamic efficiencies are so crucial to understanding the competitive dynamics in the digital age that in the diagram below

Figure 09: System of economic SMP regulation and competition law that applies to telecoms operators



we have highlighted "dynamic efficiencies" specifically. Dynamic efficiencies are also considered in Embracing Dynamic Efficiencies.

Significant Market Power (SMP) Regulation

In SMP regulation, using economic analysis to assess the extent to which markets are competitive, regulators decide whether regulation should be introduced, removed or used to a lesser or greater extent. In practice, in Europe, for example, the European Commission publishes a Recommendation on Markets suitable for SMP regulation. This is the starting point for the market analysis.[37] The regulator must then analyse the competitiveness of that market and assess whether an operator has SMP within it, or more than one operator have "collective SMP" in the relevant market.

If a regulator concludes that an operator has SMP in a given market, the national regulatory authority must then identify appropriate and proportionate remedies to ensure that effective competition is restored, in the form of regulatory obligations imposed upon that operator, provided that competition law remedies are not sufficient to address the issue. The general premise is that regulation will be imposed only where there is persistent market failure and competition law alone is not effective. In competition policy, the imposition of regulation generally leads to a second best outcome, (i.e. a less efficient outcome), compared to the application of competition law. This is because any direct regulatory intervention in the market, not supported by clear data can distort the incentive structure of firms (for example, by distorting the incentives to invest, or engendering a different pricing behaviour) and harm consumers and typically results in welfare loss.

Competition law comprises:

- Rules prohibiting anticompetitive agreements (including cartels) and abuses of a dominant position
- Rules for the assessment of mergers (merger control)
- Rules allowing for market investigations and inquiries[38]

Anticompetitive agreements

Competition law prohibits horizontal and vertical *anticompetitive agreements*.

Horizontal agreements are those between firms at the same level in the supply chain. Competition law is concerned about the potential for collusion amongst the market players. The most pernicious anticompetitive horizontal agreement is the cartel. The dynamic nature of digital markets makes collusion unlikely. The traditional communications industry is a relatively young industry, characterised by constantly changing conditions of competition in which the players at every level compete fiercely for market share and customers. This may explain the relatively few instances when

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[37] In countries outside Europe which have adopted the EU model, the EU Recommendation on markets is often also the starting point for the analysis, adapted to the local conditions.

[38] In Europe, there is also a system of control of financial support for companies from the public sector (state aid) which is not discussed in this Handbook: for an analysis of State aid in the context of the digital age, see European Parliament, quoted, page 37.

[39] In Europe, in case T-Mobile v NMa, the Dutch competition authority found that the mobile operators in The Netherlands had infringed the prohibition against anticompetitive agreements by holding one single meeting at which they discussed, amongst other things, the reduction of standard dealer remunerations for post-paid subscriptions. On a referral, the European Court held that even a single meeting would be sufficient for a presumption that there was a causal link between the meeting and the subsequent market conduct of the operators (Case C-8/08 *T-Mobile Netherlands BV and Others v. NMa*).

the prohibition against anticompetitive agreements and concerted practices has been invoked in the sector.[39]

Vertical agreements are entered into between companies at different levels of the distribution chain, such as a provider of a service and a reseller. In principle, they are considered to have procompetitive effects as they lead to efficiencies in the supply chain which should result in benefits to be passed on to the consumer. In the telecommunications sector, issues arise in the vertical chain, typically where the network provider is in a position of market power due to its ownership of the network (to which other operators require access). Issues of access to the network have therefore involved consideration of market power, either under the rules dealing with abuse of a dominant position or under regulation.

Abuse of dominance and merger control

This Handbook does not deal further with the application of competition law to anticompetitive agreements. In line with the aim to focus on the interplay between competition law and regulation, and the concepts surrounding the market power of firms, the emphasis is on merger control and abuse of a dominant position.

There is nothing to prevent a player in a marketplace from enjoying a position of *dominance* (or more than one player having together *"joint dominance"*, see Assessing Market Power, Key Concept 4, Collective/ Joint Aspects). Dominant players have a special responsibility not to abuse their dominant position. Competition authorities will first *define a market* and then assess whether any players have dominance in that market and if so whether they have abused their dominant position.

In *merger control* cases (and in those jurisdictions where merger control applies), the competition authorities will have jurisdiction to investigate those mergers that meet certain *jurisdictional tests*. In most countries globally, the thresholds for merger control scrutiny apply a test at least partly based on the turnover (or revenue) of the merging parties, although some also feature a market share or a share of supply element. Consequently, when the business model of the merging parties involves offering products to consumers for free or quasi-free, the revenue thresholds may not be met[40] (see Assessing Market Power in the Digital Age, Key Concept 3, Mergers).

If an authority has the jurisdiction to investigate a merger, it will then seek to determine whether a merger can be expected to lead to a Substantial Lessening of Competition ("SLC") or the broadly equivalent EU test of Significant Impediment to Effective Competition ("SIEC") in a relevant market. The authority must first *define* the relevant market and then *analyse it* to assess whether, postmerger, the new merged entity will be able to act in an anticompetitive manner.[41]

[40] This happened in Brazil, see below, *Assessing Market Power in the Digital Age, Key Concept 3, Mergers*.

[41] Although sometimes the authorities are now skipping the market definition stage, as explained below.

The relationship between SMP regulation (ex ante) and competition law (ex post)

It is often said that SMP regulation applies ex ante (prior to the occurrence of actions that may require intervention), whereas competition law applies ex post (after an infringement, possibly leading to a fine and remedies imposed on the infringers). This is useful as a starting point although it is not entirely accurate. Standard remedies in *SMP regulation* can include price controls and performance requirements. These are imposed ex ante and enforced ex post: telecoms operators can be fined for breaches of SMP obligations,[42] and therefore the effectiveness of the SMP regulatory regime depends on ex post enforcement against breaches.

Competition law applies *ex post* to anti-competitive agreements, including cartels, and abuses of a dominant position. These have usually started in the past and may or may not still occur in the present. If a market player is fined for an anticompetitive agreement and no remedies are imposed, then competition law is applied *ex post*. In situations where an infringement leads to the imposition of "commitments", however, the commitments (imposed in addition to, or instead of, a monetary fine) will affect the market for the future and therefore will have a similar effect to SMP regulation, although they have been brought about by consideration of past behaviours.

Competition law market enquiries, such as the enquiry which led to the creation of Openreach in the UK, are also an instance where competition law applies *ex ante*, in the sense that the relevant authority investigates the features of the marketplace with a view to considering whether these lead to an adverse effect on competition. In the UK, the sectoral regulators, including Ofcom, and the competition authority, also have powers to impose remedies to address any adverse effects on competition (AEC) identified.

Merger control is also forward looking, in the sense that a competition authority considers whether a merger can be expected to lead to anticompetitive effects in the future. This therefore constitutes an "ex ante" analysis, prior to the merger taking place.

How has competition policy been applied in the context of telecommunications?

First, as seen above, in the wider context, beyond competition policy strictly intended, telecoms operators are subject to stricter specific regulation than other players in the value chain in areas such as taxation, data protection[43] and data retention/breach notification requirements[44]. In most countries, there are sector-specific consumer protection rules, more stringent than the generally applicable consumer protection legislation.[45]

Second, in the EU and in countries that have adopted a system based on the EU regime, including in Latin America,[46] the Middle East and elsewhere, only telecoms operators

[42] For example, the Dutch Authority for Consumers and Markets fined KPN Euro 30 million for breach of its non-discrimination obligation in April 2014.

[43] Mission letter to Gunther Oettinger from the President of the European Commission, Brussels, 1st November 2014. See: https://ec.europa.eu/commission/sites/cwt/files/commissioner_mission_letters/oettinger_en.pdf

[44] Ibid.

[45] Ibid.

[46] E.g., Brazil, Colombia.

(but not the new players in the digital economy) are subject to SMP regulation. The GSMA is a global organisation and this Handbook is intended for a global audience. Examples of regulation and the application of competition law from different regions are given throughout.[47]

In the global context, the European framework is a footprint, illustrative of the position in those countries which have adopted a similar system.

The table in Figure 10 provides a summary overview of the way in which in different countries competition law and SMP regulation have been adopted. The interactions between competition law and regulation are complex, and this is of necessity a summary overview, but it illustrates the way in which often even in countries with a generally applicable competition law, the telecoms sector is subject to specific competition law enforcement, as well as SMP regulation. In a number of countries, there is no generally applicable competition law. The goal of the EU (SMP) Regulatory Framework is to address issues that arise in connection with the *transmission* of services. Even though the case-law has extended the definition of Electronic Communications Services in the EU Directives to cover cases where players other than the traditional telecoms operators transmit content (but have no editorial responsibility over it), the application of the rules outside straightforward transmission of telecommunications services is doubtful. SMP regulation is therefore not applied to the communications sector as a whole:[48] Internet players offering access to content produced or edited by them are generally outside SMP regulation. This is not just an EU phenomenon. The example in Figure 11 is from South Africa. In a number of countries, competition law is enforced in the telecoms sector even though no generally applicable competition law exists. This is the case in jurisdictions as diverse as Bahrain[49] and Hong Kong[50]. In Hong Kong, general competition law is expected to enter into force by the end of 2015, but even after the introduction of generally applicable competition law, merger control continues to be limited to companies in the telecommunications sector. The Bahamas has a modern system of regulation where competition law can be applied by the regulator across the communications sector (but not generally in other sectors).[51] In many countries, a Fair Trading Condition is now standard in the licences of telecoms operators globally, meaning that often telecoms regulators without express competition law powers can be called upon to enforce competition law in the telecoms sector

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47 Indeed, the GSMA is actively seeking more examples from the different countries. If you would like to contribute, please see comments to comphandbook@gsma.com. We welcome all contributions.

48 CERRE, Market Definition, Market Power and Regulatory Interaction in Electronic Communications Markets, available at http://www.cerre.eu/publications/market-definition-market-power-and-regulatory-interaction-electronic-communications (Page 48, with specific reference to EU Directive 2009/140).

49 Legislative Decree No. 48 of 2002 (the Telecommunications Law). There is no generally applicable competition law in Bahrain. The Telecommunications Law contains competition provisions that are applied solely to the telecommunications sector. The Telecommunications Regulatory Authority (TRA) is the sole regulatory authority, exercising concurrent competition enforcement functions as set out in the Telecommunications Law.

50 Hong Kong adopted sector specific competition laws for the telecoms sector on liberalisation in 1995 and subsequently amended. Relevant legislation includes: the Telecommunications (Amendment) Ordinance 2000 (Ord. No. 36 of 2000); The Telecommunications (Amendment) Ordinance 2001 (Ord. No. 12 of 2001); the Telecommunications (Amendment) Bill 2001; the Telecommunications and Frequency Licensing Regulations 2005. Generally applicable competition law has been enacted in 2015 prohibiting anticompetitive agreements and abuses of a dominant position only.

51 See the Bahamas Communications Act 2009, published in the Official Gazette on 2 June 2009. The relevant competition provisions are found in 'Part XI – Competition Provisions'. Prior to the Communications Act coming into force, there were general "fair competition" conditions in the operator licences.

Figure 10: SMP Regulation and Competition Law – Country overview[52]

Country	Generally applicable competition law	Telecoms specific competition law / fair trading condition in licences	Ex ante regulation (SMP / dominant carrier regulation)	Comments
Americas				
Bahamas	✗	✓	✓	
Cayman	✗	✓	✓	
Brazil	✓	✓	✓	See Assessing Market Power in the Digital Age, Key Concept 2, Dominance / SMP
Colombia	✓	✓	✓	
Trinidad and Tobago	(✓)	✓	✓	Competition Authority Chair appointed in July 2014.
Asia-Pacific				
Hong-Kong	(✓)	✓ Merger control only in telecoms sector	✓ Regulation of bottlenecks	General competition law In force by end 2015 – Includes "abuse of market power" (lower threshold than dominance) – no generally applicable merger control.
India	✓	✓	✓	
Malaysia	✓	✓	✓	
Pakistan	✓	✓	✓	
Singapore	✓	✓	✓	
Thailand	(✓)	✓	✓	Few reported competition law cases.

[52] This table is intended as a general overview. In each country there are complex interactions between competition law and regulation which cannot be captured in this format. Some countries have dominant carrier access regulation rather than SMP regulation. Please send any comments to comphandbook@gsma.com

Country	Generally applicable competition law	Telecoms specific competition law / fair trading condition in licences	Ex ante regulation (SMP / dominant carrier regulation)	Comments
Africa				
Ghana	✗	✓	✓	
Mozambique	✗	✓	✓	
Senegal	✗	✓	✓	
South Africa	✓	✓	✓	
Europe				
European Union	✓	✗	✓	
Member States (national level)	✓	✗	✓	
Middle East				
Bahrain	✗	✓	✓	Telecoms Act calls SMP and dominance both "dominance".
Saudi Arabia	✗	✓	✓	
UAE	(✓)	✓	✓	General competition law in force but few reported cases. Regulations on merger control not issued.

Figure 11: ICASA review of converged broadcast markets[53]

ICASA: Review of broadcasting regulatory framework hits legal roadblock

In October 2011, the Independent Communications Authority of South Africa (ICASA) began a review of the broadcasting market and the regulatory changes that should be prioritised to support its 2020 policy vision. It stated that the "current regulatory framework needs to be reassessed and updated to remain credible as it is currently not fit or suitable for new digital platforms and consumer technologies".

In undertaking this review, ICASA recognised that the digital era brings with it new products, services and market entrants creating demand and supply side possibilities. One of the questions that ICASA sought to answer was whether IPTV / VOD should be licensed within the regulatory framework, and the extent to which quality and content rules apply to this medium, but it had to recognise that it does not have jurisdiction over programme content over the internet.

by enforcement of licence conditions. Other players in the digital age, such as OTTs, are not subject to the same stringent regulation, are outside the SMP regulatory framework and, depending on the country, may even not be subject to competition law. In countries that do not have generally applicable competition law, including merger control, there is an urgent need for reform of the legal framework. Even in countries where competition law applies across sectors, Internet players have been subject to few investigations under competition law (such as the current EU Commission investigations of Google (see Assessing Market Power in the Digital Age, Key Concept 8: Exclusionary abuse, Implications of the digital age).

If Internet players and other players in the digital age which are not subject to telecoms rules are only subject to competition law (and in some cases no merger control), then competition authorities must be *extra vigilant* to potential cases of abuse of dominance and recognise changes in the market when assessing the conduct of traditional telecoms operators.

[53] ICASA, October 2012, The review of the broadcasting regulatory framework towards a digitally converged environment. A preliminary report and ICASA, 2012 IPTV / VOD position paper.

Competition Law and Regulation in the US Mobile Communications Sector[54]

Jonathan Jacob Nadler (Partner – Telecommunications)
Anthony W. Swisher (Partner – Antitrust/Competition)

Squire Patton Boggs (US) LLP
Washington, DC

The United States has a vibrant mobile market, characterised by significant facilities-based competition and relatively limited government regulation.

1. Overview of US Mobile Communications Market

In the US, the Federal Communications Commission (FCC) has exclusive authority to assign spectrum necessary to provide mobile communications services. However, rather than awarding nationwide spectrum licences, the FCC issues licences covering individual geographic area.[55] Mobile operators have over time aggregated licenses in order to develop a network. Using this approach, the four largest US operators – AT&T, Verizon, Sprint and T-Mobile – has each pieced together nationwide networks that collectively comprise more than 95 percent of the mobile market in the country.[56] There are also several small operators that typically provide service across smaller regions or geographic areas.[57] Mobile Virtual Network Operators (MVNOs), known in the US as resellers, rely on the networks of one or several facilities-based providers to compete in the US mobile market.[58]

Mobile operators generally offer service to their customers on the same prices, terms and conditions throughout their mobile footprint. Retail mobile prices continue

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[54] This paper expresses the views of the authors and does not necessarily reflect the views of GSMA or of any particular mobile operator.

[55] The FCC initially issued licences for Cellular Market Areas (CMAs) (There are 732 separate CMAs. See FCC, *Cellular Market Areas*, 7 FCC Rcd 742 (1992), available at http://transition.fcc.gov/oet/info/maps/areas/names/cmanames.txt.) The agency subsequently issued licences covering larger geographic areas.

[56] FCC, *Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Radio Services*, Seventeenth Report, WT Docket No. 13-135, DA 14-1862, ¶ 30, Table II.C.2 (rel. Dec. 18, 2014) ("FCC Seventeenth Annual Mobile Competition Report"), available at https://apps.fcc.gov/edocs_public/attachmatch/DA-14-1862A1.pdf.

[57] FCC Seventeenth Annual Mobile Competition Report ¶¶ 22, 30, Tables II.B.1, II.C.2.

[58] Id. ¶¶ 15-16, 154, 181, & n.31.

to decrease,[59] while overall revenues – driven largely by greater take-up of data services – have continued to increase.[60] Investment by mobile providers is continuing to grow.[61]

2. Statutory and Institutional Context

Both the Department of Justice (DOJ) and the FCC play a role in overseeing mobile wireless competition.

DOJ. The US antitrust laws are enforced principally by the Antitrust Division of the US Department of Justice.[62] The primary US federal antitrust laws are Sections 1 and 2 of the Sherman Act,[63] and Section 7 of the Clayton Act.[64]

- Section 1 of the Sherman Act proscribes agreements "in restraint of trade", including such practices as horizontal price fixing, horizontal market division and certain group boycotts
- Section 2 of the Sherman Act prohibits "monopolization" and "attempts to monopolize". A firm will not face liability merely because it is a monopolist; the firm also must engage in some form of exclusionary conduct
- Section 7 of the Clayton Act prohibits acquisitions that may "substantially lessen competition" or "tend to create a monopoly"

FCC. The Communications Act of 1934, as amended, gives the FCC authority to regulate international and interstate communications "so as to make available ... to all the people of the United States ... rapid, efficient ... wire and radio communication service with adequate facilities at reasonable charges."[65] The agency has observed that, as it assesses the level of competition and the need for government intervention in the communications market, it is mindful that:

New technologies are challenging existing regulatory structures domestically and internationally, while enabling consumers to have access to more services than ever before. For example, traditional providers of one type of service are increasingly entering new markets by offering voice, video, and broadband data services that compete with incumbent providers of such services.[66]

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[59] Id. ¶ 40

[60] Id. ¶¶ 34-39, Chart II.D.1

[61] Id. ¶¶ 169-72. Investment by AT&T and Verizon has risen steadily, while Sprint and T-Mobile investments have been more prone to annual fluctuation. Id. ¶ 171, Chart VI.A.2.

[62] Section 7 is also enforced by the US Federal Trade Commission, but telecommunications mergers are handled by DOJ.

[63] 15 U.S.C. §§ 1, 2.

[64] Id. § 18.

[65] 47 U.S.C. § 151.

[66] FCC, *Strategic Plan* 2012-16, at 14-16 (rel. Feb. 13, 2012), available at https://apps.fcc.gov/edocs_public/attachmatch/DOC-312420A1.pdf.

3. Competition Law

Merger Review

Mergers involving mobile operators are potentially subject to review by both the US Department of Justice and the Federal Communications Commission. In general, US authorities have placed more reliance on structural remedies, and less reliance on behavioural remedies, than their European counterparts.

DOJ. Pursuant to Section 7 of the Clayton Antitrust Act, DOJ may initiate litigation to block a transaction in any case in which it believes that a proposed merger would be likely "to substantially lessen competition or tend to create a monopoly."[67] The DOJ has adopted Horizontal Merger Guidelines, which it employs in making these assessments.[68] Pursuant to the Guidelines, DOJ typically begins by assessing the structure of the relevant market, specifically the merging parties' market shares, the level of concentration and the change in concentration caused by the merger. In recent years, however, the DOJ has placed relatively more emphasis on the competitive effects that flow from a proposed merger, such as whether the merger would eliminate substantial "head-to-head" competition and whether the merger would eliminate a "maverick" firm (i.e., a firm that plays a disruptive role in the market to the benefit of customers).[69]

FCC. The FCC must approve the transfer of control of spectrum licences in connection with any proposed mobile merger. The applicants must demonstrate that the proposed transaction will "serve the public interest, convenience, and necessity."[70] In conducting its review, the FCC first determines whether the proposed transferee has the legal and financial qualifications to hold the licences. The FCC then assesses any potential public interest harms resulting from the proposed transaction. These include: the likelihood of reduced competition in a combined "mobile telephony / broadband services" product market at both the national and local levels; increased ability to facilitate coordinated anticompetitive conduct among the national wireless carriers; and potential elimination of "disruptive influences or 'mavericks.'"[71] Finally, the FCC considers transaction-specific and verifiable benefits of the proposed transaction. The greater the potential harms, the greater the level of potential benefits must be. Public interest benefits that the FCC has considered in connection with prior mobile transactions include: expanded network coverage; improved quality of service; availability of a wider variety of mobile devices; more rapid

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67 15 U.S.C. § 18.

68 U.S. Department of Justice and the Federal Trade Commission, *Horizontal Merger Guidelines* (Aug. 19, 2010) ("Guidelines").

69 Id. at 3-4. Other issues examined under the Guidelines could include: (a) diminished innovation and (b) coordinated interaction among the remaining firms. Id. at 23-24.

70 FCC, Overview of the FCC's Review of Significant Transactions (Aug. 15, 2014), available at http://www.fcc.gov/guides/review-of-significant-transactions; see also 47 U.S.C. §§ 214(a), 310(d).

71 FCC, Applications of Deutsche Telekom AG, T-Mobile USA, Inc., and MetroPCS Communications, Inc. For Consent To Transfer of Control of Licenses and Authorizations, WT Docket No. 12-301, Memorandum Opinion and Order and Declaratory Ruling, 28 FCC Rcd 2322, ¶ 55 (Wireless Telecom. and Internat'l Burs. 2013).

deployment of advanced technologies; and cost savings from rationalisation of networks into a single network.[72]

The interplay between DOJ and the FCC merger review process was illustrated by AT&T's proposed acquisition of T-Mobile. In March 2011, AT&T announced that it would seek to acquire T-Mobile for US$ 39 billion. AT&T contended that the acquisition would enable it to address capacity constraints it was experiencing because of the significant growth of mobile data services. Six months later, DOJ filed suit to block the merger.[73] In its compliant, DOJ alleged that the proposed merger would harm competition in both the consumer and the business/government markets. Central to DOJ's challenge was its concern that the proposed transaction would eliminate the most "disruptive" participant in the market, T-Mobile, which, DOJ contended, had been both an "aggressive" price cutter and "an innovator in terms of network development and deployment."[74] DOJ also cited significant concerns from a traditional market structure perspective. A combined AT&T/T-Mobile would have been the largest participant in the US mobile market, with more than 130 million wireless connections.[75]Applying the Herfindahl-Hirschman Index (HHI),76 DOJ concluded that, in the nationwide consumer market, the proposed combination would have resulted in an HHI of 3,100, an increase of nearly 700 points. Similarly, in the business/government market, the proposed transaction would have resulted in an HHI of more than 3,400, an increase of more than 300 points.[77] One week after DOJ filed suit, Sprint filed a private law suit seeking to block the merger.[78]

Simultaneously, the FCC Staff conducted its own review of the likely effects of the proposedtransaction. Shortly after the DOJ filed suit to block the merger, the FCC Staff issued a Staff Report that went beyond the market structure and competitive effects considered by the DOJ. For example, the Staff disputed the applicants' claims that the proposed transaction would serve the public interest by: generating significant network "engineering efficiencies"; lowering consumer costs and improving service quality; increasing domestic employment; and enabling deployment of advanced telecommunications services. Based on the Staff Report, the FCC designated the application for a hearing before an administrative law judge, a lengthy process that the FCC had not used since 2002 when it blocked the proposed merger of EchoStar and DirectTV. In the face of these obstacles, AT&T withdrew the application.[79]

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[72] Id. ¶¶ 61, 63, 65, 66 & 71.

[73] See Complaint, United States v. AT&T, Inc., Case No. 1:11-cv-01560 (D.D.C. Aug. 31, 2011) ("DOJ Complaint").

[74] Id. ¶¶ 27-33.

[75] Id. ¶ 2.

[76] The HHI assesses market concentration by summing the square of the market share of each market participant. A market with an HHI of more than 2,500 is considered highly concentrated, and an increase of more than 200 points in such a market is presumed likely to increase market power. Guidelines, at 18-19.

[77] DOJ Complaint ¶¶ 25-26.

[78] See Complaint, *Sprint Nextel Corp. v. AT&T, Inc*., Case No. 1:11-cv-01600 (D.D.C. Sept. 6, 2011)

[79] See *Applications of AT&T Inc. and Deutsche Telekom AG For Consent to Assign or Transfer Control of Licenses and Authorizations*, 26 FCC Rcd 16184 (2011)..

Monopolisation

Two of the US Supreme Court's most significant monopolisation cases have dealt with the telecommunications market. In both cases, the Court's holdings made it more difficult to bring a monopolisation claim. As a result, the Sherman Act prohibition on monopolisation is applied less broadly than its European analogue, the prohibition on abuse of dominant position.

In *Trinko*,[80] the Supreme Court held that the failure of Verizon to comply with Section 251 of the Communication Act, which imposed a duty on some legacy monopoly local wireline carriers to lease "unbundled network elements" to potential new entrants into the local market at cost-based prices, did not constitute a violation of Section 2 of the Sherman Act. This case is sometimes misinterpreted as holding that the antitrust laws do not apply to regulated telecommunications providers. In fact, the case reflects the fact that US competition law only requires a firm to deal with its competitors in very narrow circumstances, and that the existence of a "duty to deal" imposed by sectoral regulation does not expand a firm's obligations under *competition* law.

The Supreme Court similarly took a narrow approach to liability in the *linkLine* case,81 in which it found that engaging in a "price squeeze" does not, in itself, constitute unlawful monopolisation under Section 2 of the Sherman Act.[82] The Court first noted that a price squeeze claim is really an amalgam of two separate antitrust claims: a "refusal to deal" claim at the upstream level (because the vertically integrated firm refuses to sell a required input to a rival firm at the rival's desired price), and a "predatory pricing" claim at the downstream level (because the vertically integrated firm sells its own product at a price that is below the level at which its rivals are able to compete). The Court went on to find that a price squeeze could not violate the antitrust laws if it did not constitute either an unlawful refusal to deal or unlawful predatory pricing. Applying its earlier decision in Trinko, the Court found that AT&T did not have a competition-law-based "duty to deal" in the upstream market. At the same time, and again relying on settled law,[83] the Court found that AT&T had not engaged in below-cost pricing in the downstream market, which is an essential element of a predatory pricing claim.

4. Ex Ante Regulation

The mobile regulatory regime in the US differs from the European approach in several significant respects. First, US regulators place far more emphasis on

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[80] *Verizon Communications v. Law Offices of Curtis V. Trinko*, 540 U.S. 398 (2004).

[81] *Pacific Bell v. linkLine Communications*, 555 U.S. 438 (2009).

[82] A price squeeze (typically referred to in Europe as a "margin squeeze") occurs when a vertically integrated firm sells an "upstream" product required by its "downstream" competitors at a price that effectively precludes competition in the "downstream" market. In *linkLine*, the upstream product was transport services provided by AT&T that downstream firms required to provide digital subscriber line (DSL) service used to provide high-speed Internet access.

[83] See *Brooke Group Ltd. v. Brown & Williams Tobacco Corp.*, 509 U.S. 209, 222-24 (1993).

creating incentives for operators to deploy infrastructure to provide facilities-based competition. Second, the US adopted a "called party pays" regime, in which a mobile customer who receives a call was charged for the airtime. (Today per-call charges for voice services are rare because most carriers are offering unlimited voice service or large buckets of minutes for a flat amount.) Finally, the US does not generally set specific rates in the mobile sector.

These policy differences have a number of practical effects. For example, while the FCC requires mobile operators to offer roaming arrangements to other providers (for both voice and data services) on "reasonable" terms,[84] it does not directly regulate roaming rates. Similarly, because the "called party pays" approach eliminated the ability and incentive for one operator to try to shift termination costs to a competing operator, the FCC did not define mobile termination markets and impose price controls on mobile call termination rates. The FCC also does not have regulations addressing wholesale agreements between facilities-based operators and MVNOs or setting wholesale rates. Rather, MVNOs obtain wholesale access through private commercial negotiations with facilities based mobile providers.[85]

5. Looking Ahead

Looking ahead, DOJ and the FCC are likely to subject any future proposed mobile mergers to careful scrutiny. While each merger will be assessed based on its unique facts, given the emphasis on facilities-based competition, DOJ is likely to be less receptive than their European counterparts to proposals to approve a proposed mobile merger subject to conditions. At the same time, the increasing role of wireless services as a means of accessing the Internet could lead to greater FCC regulation. Indeed, the FCC's recent Open Internet Order for the first time imposes the same "net neutrality" requirements on mobile broadband Internet access service providers that the agency is imposing on wireline network providers.[86]

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[84] See generally FCC, *Reexamination of Roaming Obligations of Commercial Mobile Radio Service Providers and Other Providers of Mobile Data Services*, WT Docket No. 05-265, Second Report & Order, 26 FCC Rcd 5411 (2011), *aff'd sub nom. Cellco Partnership v. FCC*, 700 F.3d 534 (DC Cir. 2012).

[85] FCC Seventeenth Annual Mobile Competition Report ¶ 15.

[86] FCC, *In re Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, FCC 15-24, ¶ 14 (rel. Mar. 12, 2015), available at https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf. For example, mobile operators are not allowed to block users' access to lawful websites or enter into paid prioritisation agreements. The FCC's Order is currently being challenged in the US courts. A decision is expected in early 2016. See United States Telecomms. Ass'n, et al., v. FCC, et al., No. 15-1063 (D.C. Cir.).

Defining Markets in the Digital Age

Market definition is the first step. There has been an increase in the number and importance of multi-sided markets, bundling and retail competition by new operators. Traditional techniques in market definition must be adapted to reflect the new products and services that have emerged within the communications sector.

Background

Market definition is the first step in identifying the competitive constraints acting on the supplier of a given product or service. The market definition provides a framework for undertaking the subsequent market assessment.

Once the market has been defined, the level of competition within the market can be analysed and if necessary remedies can be imposed (see Assessing Market Power in the Digital Age).

The Debate

How should markets be defined in the digital age?

The single most important concept in market definition is substitutability, and demand-side substitutability especially (see Key Concept 4). If customers view Internet players' products as substitutes for traditional telecoms services, this is a good indication that the products are in the same market.

How does increased retail competition in the digital age impact wholesale market definition?

If the market definition analysis shows that retail markets should include more products, this will place additional constraints (indirect constraints) on suppliers of wholesale products. Wider retail market definitions may also result in wider wholesale market definitions. In regulation, depending on circumstances, suppliers of traditional wholesale products may not have Significant Market Power (SMP). (Key Concept 8)

How should multi-sided markets be defined?

Market definition must take into account all sides of the market. In multi-sided markets one side is quite often associated with "free products" and so revenues from all sides should be considered (alongside qualitative evidence). (Key Concept 7)

Does market definition need to take into account quality?

In markets where services of different "quality" (i.e. speed) affect data usage, such as 3G vs. 4G or regular vs. superfast broadband, chain of substitution arguments can suggest that products of different qualities could be in the same market, even if consumers at either end of the 'quality spectrum' do not see them as a direct substitute. (Key Concept 9)

How should product bundles of converged services be captured in the market definition process?

Companies are increasingly competing with bundles of services so that the bundles, rather than the component products alone, could be assessed as the relevant market. The prevalence of bundles complicates the market definition process – particularly as it may not be immediately obvious that services are bundled together. (Key Concept 10)

Figure 12: Key issues associated with market definition in the digital age

	General	Digital Age Issues
Product Market	Comprises all product / services which are interchangeable.	1. Are products / services of different quality in the same market? 2. Are instant messaging services in the same market as mobile SMS / voice services? 3. Are products / services that are free to consumers in competition with substitutable products / services sold for a fee? 4. Are bundles a separate market?
Geographic Market	Areas in which product / services are supplied, in which the conditions of competition are sufficiently homogenous.	1. Services (and networks) can be provided a local level (a city; a separate development). 2. Services are wider than national, offered across regions or even globally.
Demand side /Supply side	1. Do consumers regard the products as interchangeable? (Demand side). 2. Can alternative suppliers start supplying a product / services within a short time and without incurring significant additional costs?	1A. Consumers see OTTs as substitutes for mobile services, and even offering enhanced functionality. 1B. OTTs can also be a complement, driving demand for traditional services. 2. Competition between digital services and traditional telecoms services drives supply side innovations. Traditional operators seek partnerships with OTTs, and vice versa.
Tools for market defiition	1. Typically, quantitative evidence is preferred (SSNP test); price based tests. 2. Qualitative evidence also used.	1. When products or services are offered "for free", there is a need to adapt the SSNP test in a multi-sided platform context. Increased focus on switching costs. 2. Focus on robust qualitative evidence. Need for data from customer surveys, questionnaires to competitors, firms in neighbouring markets; documents of internal commercial strategy of firms.

How can standard competition tools be applied to market definition in the digital age?

Tests that rely on price data (e.g. the SSNIP test), require revision when more 'free' products are on offer and competition is becoming more about functionality than price. There is a need for increased reliance on robust qualitative analysis such as surveys, and to make explicit the cost for consumers of "free" services. (Key Concept 6)

Data availability; what is the impact for market definition?

There is typically no specific formal statutory power for regulators to obtain information from non-regulated Internet players, which also have a global reach, and therefore can be outside national regulation. Regulators should beware of taking decisions based on the information available from their traditional base of regulated telecoms companies. (Key Concept 1)

Key Concepts

Defining markets is a crucial exercise in competition policy. The Key Concepts are:

Key Concept 1
Market Definition in Practice

Key Concept 2
Product Market

Key Concept 3
Geographic Market

Key Concept 4
Demand-side Substitutability

Key Concept 5
Supply-side Substitutability

Key Concept 6
The SSNIP test

Key Concept 7
Multi-sided Markets

Key Concept 8
Indirect Constraints: Wholesale and Retail Markets

Key Concept 9
Chain of Substitution

Key Concept 10
Bundling in market definition

Key Concept 1
Market Definition in Practice

Although this has been questioned in the digital age, the first step in competition analysis is to define the boundaries of the product and geographic markets in which the relevant firms compete. Markets are generally defined using common tools, although in practice market definition differs for SMP regulation and competition law. Crucial in market definition is the concept of substitutability: if consumers see a service as substitutable for another service, then the services are likely to be in the same market.

Market definition is *"the founding stone on which an antitrust case or a regulatory intervention is built"*.[87] In economic models often the relevant market is assumed. For the regulator or the competition authority applying the rules, however, market definition is crucial, as:

[a] mistaken definition of the relevant market might for instance lead an antitrust authority or a court to block a welfare-enhancing merger or to allow a welfare-detrimental one. Similarly, a regulatory decision imposing a set of requirements on an incumbent might be socially inefficient if the incumbent faces sufficient competition. […], in the case of an appeal, the recognition of a wrong market definition is often sufficient for a court to reject the whole analysis and to rule in favour of the appellant irrespective of any other argument brought up by the antitrust authority or the regulator.[88]

Whether a regulator is applying the Significant Market Power (SMP) rules, where they exist, or a competition authority is enforcing the competition laws, market definition is the first step. A merger may lead to the "substantial lessening of competition" / "significant impediment of effective competition" (SLC / SIEC) *in a relevant market*. An operator can only be abusing a dominant position *in a relevant market*. A market player can be determined to have SMP *in a market*. Market definition is therefore an important common concept in regulation and competition law, as illustrated in Figure 13.

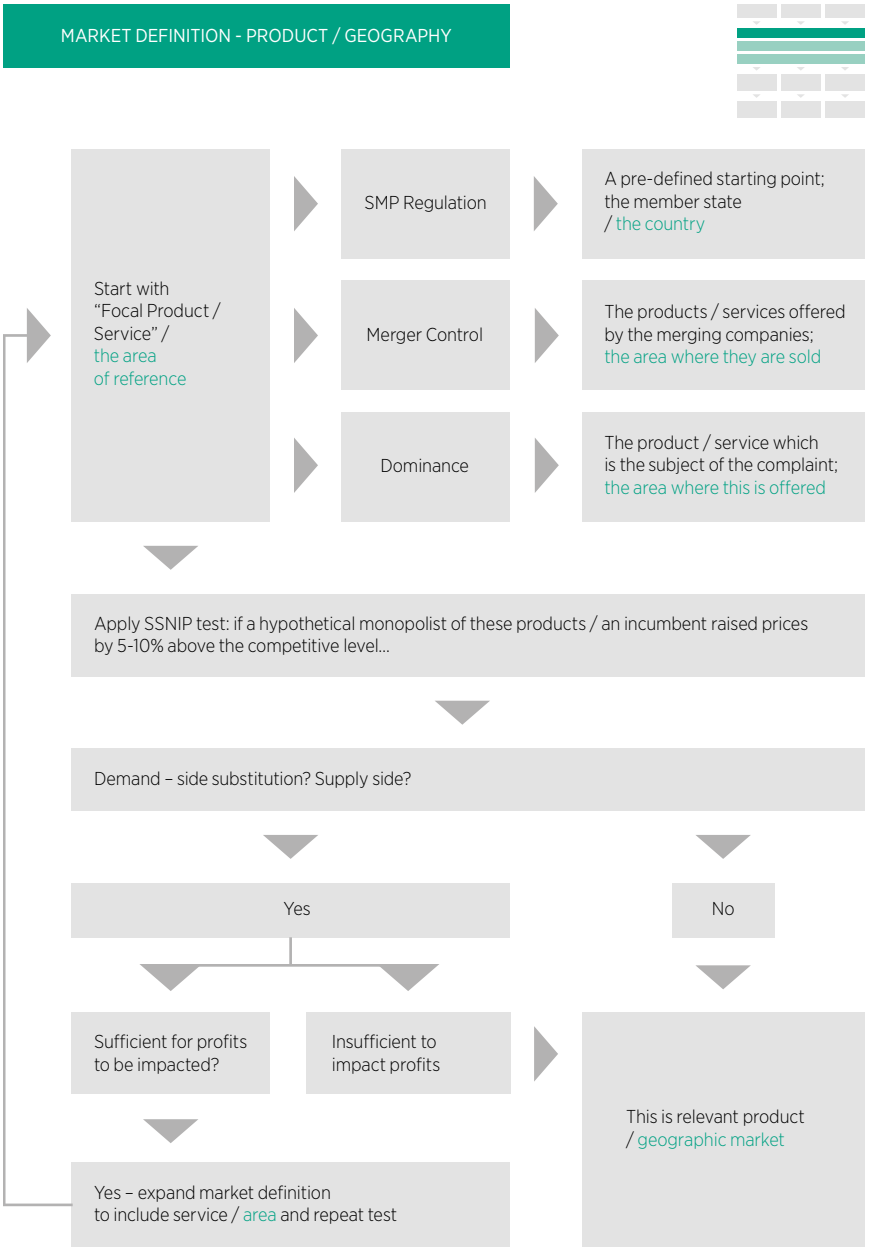
As regards both SMP regulation and competition law (merger control and abuse of dominance) the starting point for the process of market definition is given:

- In SMP regulation, in practice the product market is a given, often defined in, or adapted from the European Commission Recommendation on Markets, as explained in more detailed below. From there, market definition is then a process of deduction, from wide potential product and geographic markets to more narrowly defined relevant markets
- In merger control, the starting point is constituted by the products and / or services offered by the merging companies and the areas in which they are sold
- In abuse of dominance cases, the starting point of the analysis includes the products or services which are the subject of a complaint (or of an own investigation) and the area in which they

[87] L. Filistrucchi, D. Gerardin, E van Damme, P. Affeldt, Market Definition in Two-Sided Markets: Theory and practice, 16 March 2013, =2234608.

[88] Ibid.

Figure 13: Market Definition – Product Market and Geographic Market



are offered. The process of market definition is a process of induction, from a narrow potential market, to a wider economic market.

The tools of market definition are the same for Significant Market Power (SMP) regulation, abuse of dominance and merger control. As shown in Figure 13, market definition consists of determining the product (Key Concept 2) and the geographic boundaries (Key Concept 3) in which products compete. The key criterion for market definition is demand-side analysis (Key Concept 4). Supply-side analysis is a useful complement, particularly for a more forward looking analysis, such as in the case of SMP regulation or merger control (Key Concept 5) and, in both cases, the main standard test applied is the so-called SSNIP test (Key Concept 6).

In *SMP regulation*, regulators tend to use the European Recommendation on Markets to define the product market, although national regulators in Europe may introduce new markets if necessary, depending on local conditions of competition.[89] Even in countries which are outside the EU, the list of products in the EU Recommendation on Markets is often the starting point, adapted to local conditions, and the analysis is performed based on this starting point. In SMP regulation, traditionally the geographic dimension has been national (licensing regimes are national and the underlying network of the incumbent (fixed) operator was national).[90]

As shown in Figure 14, over time the European SMP regulatory framework has evolved towards fewer markets that are suitable for *ex ante* regulation. This underlines the point that, as seen above, in competition policy, the imposition of direct regulatory intervention in the market, not supported by clear data can distort the incentive structure of firms and harm consumers (for example, by distorting the incentives to invest, or engendering a different pricing behaviour) and can result in welfare loss.

The process of market definition in *SMP regulation* consists of checking which products or services should remain in the high level market, a process of deduction, from a wide potential product and geographic market to more narrowly defined relevant markets. The process is described below, Key Concept 2, Product Market and Key Concept 3, Geographic Market. In a nutshell, the regulators apply the SSNIP test to come to a market definition, from the given starting point. As the analysis applies to an actual marketplace, the SSNIP test does not apply to a "hypothetical" monopolist, but to the incumbent operator in that specific market, based on the availability of actual data (see Key Concept 6, The SSNIP Test). The question to be asked is: *"can the incumbent operator in that market profitably raise prices for that particular product by 5-10% over the period of the regulatory review?"* If the answer is "yes",[91] then there are no substitutes available and therefore that product constitutes the relevant product market (and the national dimension constitutes the geographic market). If the answer is "no", then there must be

[89] Commission Recommendation on relevant product and service markets within the electronic communications sector. European Commission, Brussels, September 2014. For more information, see: *https://ec.europa.eu/digital-agenda/en/news/explanatory-note-accompanying-commission-recommendation-relevant-product-and-service-markets*.

[90] There is a trend in Europe toward sub national markets for fixed networks (notably for active access services).

[91] This approach works when the initial situation is competitive. If the initial situation is not competitive, the test may lead to the wrong conclusions. In economic theory, this is known as the so-called "cellophane fallacy": if the monopolist producer of cellophane were to rise prices by 5-10%, customers may well substitute away from cellophane to other means of wrapping food, including brown paper bags, but this does not mean that brown paper bags are in the same marketplace as cellophane. It means that the monopoly producer of cellophane is extracting the monopoly profit

Figure 14: Illustration: The European Regulatory Framework

Evolution of the EU Regulatory Framework

The EU telecommunications regulatory framework has evolved considerably over the last 20 years, as shown by changes in 1998, 2002, 2007 and 2014:

1998: The first regulatory framework had two aims: eliminate specific rights granted to previously state owned telecommunications companies – facilitating the entrance of new players – and to harmonise national ex-ante regulation in the member states. The markets to be regulated were defined in the law itself. The so-called Unbundling Regulation of 2000 was a complement to the 1998 Framework.

2002: The fast pace of technological development meant both that defining markets became more difficult and that multiple criteria had to be applied to identify players with market power. This resulted in a total of 18 markets being identified as suitable for an analysis possibly leading to ex-ante regulation.

2007: The total number of markets identified as suitable for the analysis was reduced to 7; 6 at the wholesale level and only 1 at the retail level.

2014 (Recommendation): The EU Commission proposed to further reduce the number of markets to 4 formal markets and change market definition following recent technological advances. The Commission acknowledges Internet services' potential constraints on traditional players. National Regulatory Authorities (NRAs) must take Internet into account when defining markets and assessing market power.

either demand or supply-side substitutes in that particular high level marketplace and the process is repeated and the marketplace narrowed down.

In *merger control cases*, the focal point is constituted by the products and/ or services offered by the merging companies and the areas in which these are active. The question is "could a hypothetical monopolist offering these products or services, profitably raise prices by 5-10% over the horizon of the merger control process" (typically a short term period, 1-2 years)? If the answer is "yes", then the product or service constitutes an economic market (and the area in question a relevant geographic market). If the answer is "no", the process is repeated taking into account products that consumers will consider as substitutable (demand-side substitutability) or that suppliers will be incentivised to offer (supply-side substitutability) and the constraints on the geographic side. In *dominance cases* the focal point is given by the products or services affected by alleged anticompetitive behaviour, often the subject of a complaint. The test is the same as in merger control. Could a hypothetical monopolist offering these products or services, profitably raise prices by 5-10% over the horizon of the merger control process" (typically a short term period, 1-2 years)? If the answer is "yes", then the product or service constitutes an economic market (and the area in question a relevant geographic market). If the answer is "no", the process is repeated taking into account products that consumers will consider as substitutable (demand-side substitutability) or that suppliers will be incentivised to offer (supply-side substitutability) and the constraints on the geographic side.

This has the following consequences:

First, whilst a finding that an operator has SMP for the purposes of regulation would be a relevant factor in a competition law investigation for abuse of a dominant position, this is not determinative in the EU (and in countries that follow the EU model). It is possible that an operator which is not found to have SMP for the purposes of regulation nonetheless may be found dominant in the (often narrower) market as defined under competition law. The converse is also true. An operator may have SMP in a wider regulated market, but not be dominant in a market defined under competition law. This point is reflected in paragraph 25 of the Commission Guidelines on the assessment of SMP[92] as follows:

The use of the same methodologies ensures that the relevant market defined for the purpose of sector-specific regulation will in most cases correspond to the market definitions that would apply under competition law. In some cases, and for the reasons set out in Section 2 of these guidelines, markets defined by the Commission and competition authorities in competition cases may differ from those identified in the Recommendation and Decision, and/or from markets defined by NRAs under Article 15 (3) of the Framework Directive. Article 15 (1) of the Framework Directive makes clear that the markets to be defined by NRAs for the purpose of ex-ante regulation are without prejudice to those defined by NCAs and by the Commission in the exercise of their respective powers under competition law in specific cases.

Second, it is difficult sometimes for regulators to know when to apply the competition rules. Telecoms regulators without concurrent competition law powers may confuse competition law and regulation, and conclude that they cannot investigate a competition law complaint (under the Fair Trading Licence condition in a licence, for example), unless they have first carried out an SMP market review. This is not correct in the EU regime and in those regimes modelled on it.

Third, in countries where a telecoms regulator has concurrent powers of enforcement of the competition rules, there is a risk is that the categories applied in traditional regulation may be applied and inform the enforcement of competition law. In practice the concepts of dominance and SMP can be confused and competition authorities could take dominance (in competition law) for granted when SMP (in regulation) has been found. More generally, most telecommunications regulators are much more familiar with the deeper network and infrastructure layers of the telecoms sector than the upper network layers of operating systems, applications, content and Internet services. A telecoms regulator could be tempted to define a telecoms market even in the presence of competition from Internet players. As seen above, this is an example of *Maslow's hammer problem: "it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail."* [93]

Finally, markets defined for the purposes of SMP regulation could be wider than telecoms markets defined under competition law. The competitive situation that exists between mobile operators offering voice services to pre-pay customers on a particular route, e.g. calls from Bahrain to Bangladesh,[94] may constitute

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[92] Commission guidelines, available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52002XC0711(02)&from=EN.

[93] Maslow, *The Psychology of Science*, 1966, quoted in European Parliament, Challenges for Competition Policy in a Digitalised Economy, above, footnote 34.

[94] The Bahraini regulator issued infringement notices when investigating a potential abuse of dominance on calls between Bahrain and some Asia destinations: http://m.arabianbusiness.com/batelco-stc-in-hot-water-over-asia-call-charges-419046.html. The investigation was subsequently closed without a finding of infringment.

the relevant market for a competition law investigation brought about by a complaint. It is however unlikely that, in the absence of a complaint, a regulator would define a market as narrow as the market for calls from Bahrain to Bangladesh to pre-pay customers in Bahrain for the purposes of SMP regulation.

Implications of the Digital Age

In the digital age, there have been calls to review the analytical steps of market definition, market assessment and consumer harm, particularly in the context of merger control, where reliance on an analysis of (gross) upward pressure on prices (UPP) has been presented as a way to identify competition concerns without the need for formal market definition (see Assessing Market Power in the Digital Age, Key Concept 3, Mergers: SLC/SIEC). More generally, calls have been made to dispense with a formal market definition stage, and focus on the business case of the firms considered instead, to identify other business models that may "steal away" their profits. This is based on the consideration that there are very strong "feedback effects" in digital markets. Typically performance (high profits) induces entry and therefore alters the structure of the market.[95]

A concern with an approach which dispenses with market definition would be that it introduces an element of difference in market definition between the traditional sectors and the digital market players. Market dynamics must be properly captured at the time of market assessment. This can be done within the traditional analytical structure of market definition and market assessment, which therefore remains valid. Legal precedent also needs to be considered. Regulatory and competition authorities have traditionally defined markets and then assessed them. To alter the approach risks that decisions may be overthrown on appeal, in regulation and competition law.

Two very important issues remain open in market definition in the digital age.

1. Increasing digitisation calls into question the very boundaries of market definition

First, as regards the very boundaries of the product market, issues need to be considered both on the demand side and on the supply side.

On the demand side (Key Concept 4) to the extent that consumers view services and products offered by Internet players and by operators as substitutes, these products should belong to the same market.

Some regulators and authorities have concluded that differences in quality of service[96] between OTTs and traditional channels means that the services are not substitutes and therefore not in the same market. A key question therefore emerges: does quality of service necessarily have to be similar in order for the products to be in the same market? If for example consumers deem the reduced quality of service to be 'compensated' for by a lower price, then consumers would still see them as substitutes. This also depends on the measurement of quality – it might not be noticeable or material to the consumer and therefore have no impact on a product's substitutability.

The recent deal between Facebook and WhatsApp raises issues about the relevant markets identified by the European Commission.

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[95] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 51.

[96] Or indeed, differences in price, meaning that free and paid for services seen as substitutable are sometimes found to be in separate markets or indeed that there is no market for free products. See below, *Key Concept 6, The SSNIP test* and *Key Concept 7, Multi-sided Markets*.

Figure 15: Facebook – WhatsApp merger: how to define a market?

Facebook – WhatsApp merger: How to define a market?

In September 2014 the world's largest social network, Facebook, successfully bid to take over mobile messaging application WhatsApp for $19 billion. The landmark deal is the largest in Facebook's history and gives it a strong foothold in the mobile-messaging market, particularly in Europe, where WhatsApp holds approximately 70% user penetration and represents 43% of total minutes of smartphone use.[97] A recent study conducted by the GSMA also showed that WhatsApp and Facebook are the most commonly used social media and messaging applications across the UK, Germany and Spain, with up to 89% of smartphone users accessing the WhatsApp platform daily.

The deal was approved by competition authorities in the US and Europe. The European Commission considered whether the merger reduced competition in three markets:

1. Communication / messaging market: the Commission decided that consumers were using both platforms for different functionalities, evidenced by the fact that many were using both platforms simultaneously. Indeed the GSMA survey found that 42% of smartphone customers used WhatsApp, Facebook and Facebook Messenger. It was deemed significant that the mode of communication on the two platforms was also different: Facebook required an online user profile while WhatsApp required a telephone number.
2. Social networking market: the Commission decided that the status of WhatsApp as a social network remained unclear. Furthermore, even if an integration of Facebook and WhatsApp as social networks was to happen, it would not significantly increase the number of Facebook members because of the considerable overlap in current members.
3. Online advertising market: though WhatsApp is not currently active in online advertising, the Commission considered the consequences of it becoming active in the future. It found that there were many other suppliers of targeted online advertising and hence competition in the market will not reduce.

The Commission failed to consider that:

1. Facebook and WhatsApp are both part of an emerging market for mobile consumer engagement, a market for the provision of digital services in social and mobile communications. The relevant metric to define market share in this market may be the proportion of total user mobile time allocated to one service. GSMA calculated that the proposed merger gives Facebook a dominant position in this market – it increases Facebook's share of mobile user time from 35% to around 80% in Europe.[98]

[97] GSMA (2014): Facebook acquisition of WhatsApp. Data was gathered from Mobidia. This source captures smartphone usage through its MyDataManager app which has been downloaded and used by millions of customers globally. The dataset is inherently biased towards early adopters and data-users but is useful as a comparative and indexing tool. The data is based on Android smartphone users in Dec 2013.

[98] GSMA (2014): Facebook acquisition of WhatsApp

2. This increase in mobile user time can be directly and indirectly monetised by Facebook – direct monetisation by charging directly the consumers that are locked in to this service and indirect monetisation by collecting large amounts of data for targeted advertising. Indeed, market definition could show that there could be a separate market for advertising on social networks.
3. The marketplace is characterised by multi-sided effects.
4. The ability of the merging parties to control customer access to services and the potential monetisation and network effects of controlling such significant amounts of data.
5. The possibility for Facebook to use Whatsapp data could also give rise to privacy concerns.[99] In the US, whilst the FTC's Bureau of Competition closed the investigation without requiring conditions, the FTC's Bureau of Consumer Protection sent to the companies a notice about their continued obligations.

As in the case of demand-side, debate has emerged surrounding the degree of supply-side substitutability (Key Concept 5) in the digital age. Network effects, especially in closed ecosystems, could potentially limit access to the market for new players, e.g. social networks or messaging applications. There is evidence of new companies entering the market, although often these companies are currently operating in adjacent markets. For example, WhatsApp moved from messaging to video calls[100] and a number of fixed line operators, such as Liberty Global, are now offering customers a choice of Voice over IP ("Internet calls" or "VoIP") services alongside traditional services.

2. The tools of market definition require adjustment in the digital age

Second, the tools for market definition must be reconsidered in the digital age. Data availability can be an issue and quantitative techniques may require adjustment or reconsideration in cases when pricing may not be a feature of the marketplace.

In the digital age, a vast amount of data is required for quantitative market definition analysis, adding further complexity to the exercise.

Issues may arise with data collection where regulators require usage or revenue breakdowns for a specific geographic market, but the companies (in particular Internet players) operate globally. For authorities and regulators to consider the market fully it is necessary for them to have information about all the different players. An issue is that the regulators in particular have limited right to access information on non-regulated market players, an issue currently actively considered in the field of taxation.

A more general issue relates to the fact that traditionally market definition mostly relies on quantitative techniques based on the *prices* of products and services. The evolution of the digital marketplace has brought to the market new services and products that are either totally free for end users, or at least in part free.[101] The main quantitative test used in market

[99] Privacy can be a parameter of (non-price) competition: Deborah Feinstein, quoted, Competition Policy International, 29 May 2015.

[100] http://www.reuters.com/article/2014/02/24/us-mobile-world-whatsapp-idUSBREA1N0PT20140224.

[101] An example of a service free 'in-part' are freemium products, which are free to obtain but offer in-app purchases or add-ons.

Figure 16: Challenges to applying standard economic tools in the digital age

Challenges to applying standard economic tools in the digital age

Standard economic techniques used to define markets typically rely upon analysis which looks at the responsiveness of the market to a change in price or trading conditions. In the digital age:

- Multi sided markets imply that the impact needs to be considered in multiple markets, taking into account the interactions amongst markets.
- When goods and services are provided free of charge, it is not feasible to calculate the impact of a change in price using standard quantitative analysis.
- Data is not available on all the companies operating in this space and particularly on their volumes and revenues.
- There is not a common unit of measurement for many of these good and services, for example VoIP services are not usually measured in terms of minutes and messages.

Faced with these challenges, alternative approaches will need to be considered. These include:

- Requesting information from new digital players who may have traditionally been outside of the monitoring regime.
- Undertaking market surveys to understand the views of both businesses and consumers.
- Reviewing non-monetary measures such as number of subscribers.

definition is the so-called SSNIP test (see Key Concept 6). Other tests, such as critical loss analysis, also use price-based matrices. However, even when services are not priced, demand and supply substitutability do remain the reference for the analysis. The challenges of applying standard economic tools means that authorities need to take a pragmatic approach to their analysis – using standard quantitative techniques but complementing those with qualitative analysis including market research and surveys aimed at understanding customer behaviour. For example the Omani Authority[102] recently relied heavily upon consumer research when defining its list of relevant markets.

[102] Sultanate of Oman, August 2012, A public consultation document on analysis and recommendations for market definition, dominance and related regulation.

Key Concept 2
Product Market

The first step in any competition investigation is to define the product market in which the respective firms compete. This represents the boundaries of the competition investigation and forms the basis for the enquiry. Convergence and data-based services which compete with traditional telecoms offerings challenge the traditional product boundaries.

Key Concept 1 provides an overview of Market Definition in Practice. The process of market definition leads to a finding of the relevant product market (the subject of this Key Concept) and the relevant geographic market (Key Concept 3). A set of products is considered to be in the same product market if, from a demand-side perspective (Key Concept 4), consumers regard the products as substitutable based on their characteristics such as quality, functionality, prices, and intended use. Supply-side considerations are also relevant in market definition (Key Concept 5). In practice, the market is typically defined by assessing whether consumers see a particular set of products as competing alternatives, and by expanding (in the case of abuse of dominance) or reducing (in the case of SMP regulation and depending on the set of products offered by the merging parties, in merger control) an initial estimated market to include the correct set of products. This is explained above (How has competition policy been applied in the context of telecommunications?)

In SMP regulation (based on the EU model), the product markets are typically defined in the EU Recommendation on Relevant Markets. In reaching a decision as to these product markets, the Commission considers the criteria in Art 15 of the Framework Directive,[103] and its guidance under it.[104] As befits a forward-looking analysis, it is important to consider trends in the marketplace. The criteria in the EC Recommendation on Relevant Markets (and in similar regimes) currently are:

- That there should be high and non-transitory entry barriers. As the Commission explains, given the dynamic character and functioning of electronic communications markets, it is important to consider possibilities to overcome barriers to entry within the relevant time horizon, as the analysis is prospective[105]
- Whether the market structure tends towards effective competition within the relevant time horizon, which "involves examining the state of infrastructure-based and other competition behind the barriers to entry"
- That the application of competition law alone would not adequately address the market failure(s) concerned

Implications of the Digital Age

Ongoing digitisation poses several key questions for product market definition.

[103] Directive 2002/21/EC (see: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0021)

[104] Recommendation on Relevant Markets, para. 11.

[105] For a review on the impact this has on existing bottlenecks (e.g. access to mobile networks) and for consideration of new bottlenecks in the Digital Age, see *Understanding Bottlenecks in the Digital Age*.

First, should products of different quality belong in the same market? In particular, a separate market should be defined if consumers do not see the products as substitutes or viable alternatives. For example, the slowest broadband might not be a direct substitute for superfast broadband, but if 'adjacent' intermediate products (in a chain of substitution argument, see Key Concept 9) are substitutes for each other, then a separate market may be inappropriate. In another example, different generation data services (3G and 4G) mean large disparities in network speed – should these be in the same market?

Second, Internet applications provide a viable alternative to operators' SMS and voice services. However, there is substantial debate as to whether Internet apps, which offer the same services as operator SMS and voice, belong in the same market as the traditional products offered by network operators (see Key Concept 4, Demand-Side Substitutability).

Third, the trend of convergence, with an increasing number of players offering both fixed and mobile services, and offering in some cases quad-play bundles, combining broadband internet, television, telephone access (whether mobile or fixed) and wireless service provisions, is blurring the classical product boundaries previously identified in the sector. Given that companies are now competing with bundles of services, could the bundles, rather than the component products, be the relevant market? (Key Concept 10). The key to market definition is whether consumers see converging products as substitutes for one another: see Key Concept 4: Demand Side Substitutability, although in some cases supply side substitutability is a relevant consideration, see Key Concept 5).

As regards the first question, the differentiation of product markets on the basis of speed has been considered on many occasions, with mixed precedents. For example, the Brazilian antitrust authority, the Administrative Council for Economic Defence (CADE) has always defined a single market for 2G, 3G and 4G. In Europe, the European Commission[106] has defined a single market for 2G, 3G, and 4G.

At the national level, Ofcom in the UK concluded: *"It could be appropriate in future to define separate markets based on speed, and noted that this would depend on the emergence of applications that require higher speed services to work effectively."*[107]

As regards the second question, the issue of Internet and other digital products potentially being in the same product market as traditional telecoms services was first raised over 10 years ago. In PTS Sweden (2006)[108] the importance of looking at digital applications when assessing the market was recognised. However, many regulators do not take into account digital products. Both the Omani and Qatari regulatory authorities have recently published a new set of markets defined without consideration of the impact of Internet players.[109] Ofcom in

[106] 'Mergers: Commission clears acquisition of Telefónica Ireland by Hutchison 3G, subject to conditions' European Commission Press Release, Brussels, 28th May 2014.

[107] Ofcom (2010), 2010 WBA Consultation; 2010 WBA Statement.

[108] Post and Telestyrelsen, an analysis of residential customers' substitution of traditional fixed telephony with IP-based and mobile telephony, September 2006.

[109] CRA Qatar, Market Definition, Draft Consultation 25th June 2014 and TRA Oman, Market Definition and Dominance guidelines June 2012.

the UK has also traditionally been reluctant to consider Internet as a product substitute to a voice call on a traditional network due to perceived differences in quality and SLAs, particularly for mobile networks.[110] The fast moving nature of markets in the digital age means that the position should be reassessed periodically. Furthermore, it cannot be concluded in all cases that traditional telephone service would always be considered as having a "better quality" than alternative services provided on best effort IP transport. One of the reasons behind the increasing level of demand-side substitution is that Internet applications could offer enhanced functionality compared to traditional mobile services (as explained in Key Concept 4).

[110] Ofcom, the communications market 2012, Are voice to data substitution and over the top (OTT) services the next step in the use of Communications services.

Key Concept 3
Geographic Market

After the product market has been defined, the next step is to define the geographic boundaries in which the respective firms compete. In telecoms regulation, the starting point for the market definition has been the national market, also due to the boundaries of the regulatory regime. The digital age challenges these assumptions. Markets could well be global if products can be accessed over the internet, whereas the development of local networks can create a local (sub-national) dimension.

The relevant geographic market comprises the area(s) in which the products identified to be in the relevant product market are supplied, and where the conditions of competition are sufficiently homogeneous.

As highlighted in Figure 13, the SSNIP test formally applies to both the process of product and geographic market definition.

Conceptually, the definition of geographic markets involves assessing whether competitive conditions and constraints are different in different geographic areas. In practice, regulators and competition authorities in the telecoms sector have tended to consider that mobile markets are national when coverage is national; and pricing is national.[111] Factors that might be considered in identifying geographic areas with similar competitive conditions include the presence of competitors, the likelihood of entry or the presence of alternative infrastructures.[112] The majority of mobile communications markets are still defined on a national basis.

Implications of the Digital Age

Geographic markets are often defined on a national level. However, the added complexity in defining product markets within the digital age may also add complexity in defining the geographic boundaries in which products compete.

There are many examples of products being provided and marketed outside of traditional geographic boundaries. Markets are becoming wider than national. For example, several African mobile operators offer customers a multi-country package where domestic prices are charged in other select countries and a number of European operators have also introduced similar packages.[113] Furthermore, customers using Voice over IP ("Internet calls" or "VoIP")

[111] Telecoms regulators in particular are also in practice constrained by the geographic limits of their jurisdiction as they are national regulators. In some geographies, competition authorities have a supra-national remit, e.g. COMESA; CARICOM; and the European Commission.

[112] For example in an SMP context, Ofcom in the UK has adopted this approach in defining geographic markets for the review of Wholesale Broadband Access (WBA), arriving at three different geographic markets, namely: (i) the Hull Area; (ii) exchange areas where there are no more than two Principal Operators (POs) present of forecast to be present; and (iii) exchange areas where there are three or more POs present or forecast to be present. Ofcom "Review of the wholesale broadband access market", 2013.

[113] For example, Vodafone allows UK customers to use their inclusive texts and minutes in Europe by paying £3 per day for "Eurotraveller" http://www.vodafone.co.uk/shop/pay-monthly/travelling-abroad/vodafone-eurotraveller/index.htm.

services including Viber and Skype have the same functionality and use the same telephone number regardless of where they are in the world. Customers using these services can avoid paying both incoming and outgoing roaming charges. Some of these services do not depend on mobile or fixed numbers, bypassing traditional number based origination and termination. As the digital age blurs boundaries, authorities and regulators might potentially start to consider even global markets. For instance, in case of a competition enquiry regarding Internet applications providing messaging or calls, there could be an economic case for considering a wider market than a single country. This has prompted calls for more cooperation at the regional level, at least amongst competition authorities.[114]

[114] See European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, a Study for the ECON Committee, quoted.

Key Concept 4
Demand-side Substitutability

Demand side analysis focuses on the characteristics of demand, all the products' substitutes available to the end users. Demand substitutability should be key for market definition in the digital age: when different technologies are used interchangeably, then all providers of these technologies compete in the same market.

As seen in the preceding Key Concepts, the market definition process begins by establishing the products or services which are close substitutes to the product which is the focus of the analysis.

Specifically, products are in the same product market if, on the demand-side, consumers regard the products as interchangeable or substitutable based on their characteristics such as quality, functionality, prices, and their intended use. In practice, the market is typically defined by assessing whether consumers see a particular set of products as competing alternatives, and by expanding/reducing an initial estimated market to include the correct set of products - this form of substitution by consumers is known as *demand side substitution*.

Implications of the Digital Age

The CERRE paper on Market Definition, Market Power and Regulatory Interaction in Electronic Communications Market notes:

*... "when defining markets, **demand substitutability should be the key criterion for market definition**. If multiple technologies can be used for the same purpose, all providers of these different technologies are competing in the same market. This applies also to specific services. For instance, a SSNIP test[115] for mobile voice services must take all relevant substitution possibilities into account. In particular, consumers may switch to Internet services if they experience a price increase for traditional voice services. Also, they may substitute parts of their calls by messages (SMS or substitute services by OTTs such as WhatsApp). Allowing for flexible business models, including two-sided pricing and differential access, implies that an ISP operates as a platform that manages the interaction between content providers and end users.[116] Here, a SSNIP test can still be carried out, but it must include cross-group externalities and associated feedback effects. In particular, an ISP expanding the user base attracts more tailor-made offerings by OTTs. Users consider the level and composition of service offerings as an important determinant for deciding which ISP to join. **Ignoring these interactions would lead to too narrow definitions of markets**".[117]*

The pre-eminence of demand-side substitutability as a criterion for market definition does not preclude that supply-side substitutability would be also crucial in the digital age, providing the backdrop against which all firms in competition with each other compete. See Key Concept 5.

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[115] See *Key Concept 6*.

[116] See *Key Concept 7*.

[117] CERRE, quoted, page 7, emphasis added. (See: *http://www.cerre.eu/sites/cerre/files/141029_CERRE_MktDefMktPwrRegInt_ECMs_Final.pdf*).

There are different methods for consumers to communicate on various types of devices. Many consumers access services (traditional and Internet) through a number of devices.

New platforms and developers are producing applications that act as substitutes to standard mobile operators' products. These new players rely on the operators' network. Moreover, these applications do not directly provide revenue to the operator.

Internet applications can perform the same services for consumers as traditional SMS and voice services. For example, the GSMA notes that 69% of smartphone users see Internet apps as a substitute for SMS in all or most circumstances – this figure is 79% in South Korea.[118] For voice, 45% see voice apps as a replacement for 'traditional' voice in all or most situations.[119] This implies substitution between services, suggesting that, depending on circumstances, a wider market definition might be appropriate.

One of the reasons behind the increasing level of substitution is that Internet applications could offer enhanced functionality compared to traditional mobile services. This shows that it cannot be concluded in all cases that traditional telephone service would always be considered as having a "better quality" than alternative services provided on best effort IP transport. Indeed there is rising demand for 'aggregation' of messaging services: 54-73% of respondents to GSMA survey[120] would like the ability to 'port' between various communications apps (across voice, messaging, and social networks);[121] and 57% stated greater ease of convenience and 49% greater functionality and an ability to reach more contacts respectively, as reasons for using an Internet app. Recently, the European Commission found that apps offer a much richer overall experience than mobile telecoms services.[122] For example, apps allow users to see when their contacts are online, when they are typing or when they last accessed the app.

As a result, although Over the Top providers (OTTs) may provide a substitute to mobile operator services, this may not be true in reverse due to the additional services provided by Internet apps. This is known as one-way (asymmetric) substitution: the extent to which the two products are in the same relevant product market may be different: while the more capable or higher quality network may be in the same market as the less capable, the converse may not be true. This can alter the scope of the particular competition or regulatory inquiry.

One-way (asymmetric) substitution is likely to take place with respect to switching from, broadly, less capable networks and services to more capable ones, but not the other way round. In the presence of non-symmetric substitution, the market definition could be different depending on the focal point for the investigation. If an alleged anticompetitive practice takes place in relation to a product that is (one-way) substitutable for another product, e.g. the less capable network, then the two products (e.g. the less capable and the more capable network) may be in the same market. If the alleged anticompetitive practice takes place in relation to the second

[118] GSMA 2014: Mobile usage, perceptions and preferences. Base: All smartphone users in Germany, Spain, Italy, Sweden, Brazil, Chile, India and South Korea. n= 8,080.

[119] Ibid.

[120] Ibid.

[121] Ibid. Base: All smartphone users in Germany, Spain, Italy, Sweden, Brazil, Chile, India and South Korea. n= 8,080

[122] http://ec.europa.eu/competition/publications/cmb/2015/cmb2015_001_en.pdf Competition merger brief, Issue 1/2015.

product (the more capable network), substitutability would tend to indicate that the market is narrower and should be limited to the better networks which are substitutable (excluding the less capable networks, as consumers would be unlikely to switch to a less capable functionality).

Internet services may also be a complement to traditional services. Telecoms operators are increasingly offering consumers the option of consuming Internet services alongside traditional services and using this to increase demand for traditional services. For example, Globe Telecoms in the Philippines has offered free access to Facebook for the past two years and considers this to be one of the drivers of the 120% increase in mobile data subscribers that it has seen in this period.[123]

Figure 17: Methods of communication by device type

	Mobile phone	Smart phone	Fixed line phone	PC/tablet
Voice Call	●	●	●	
VoIP call		●		●
SMS	●	●	●	
Instant message		●		●
Email		●		●
Social Network		●		●

Figure 18: Internet as a complement to traditional telephony

TeliaSonera – both a complement and competitor to Internet players

TeliaSonera has entered into a number of collaborations with Internet providers, including music streaming service Spotify.

However, the operator also launched an Internet TV service of its own in Finland and Denmark in December 2014, with other markets set to follow. TeliaSonera announced this by saying:

"We've had a pay-TV offer in Sweden, Denmark, Finland, Estonia and Lithuania for quite some time. Originally it has of course been very much linked to our fibre business, and of course it's an attractive offer with 1.5 million subscribers. This is a healthy business for us and an important one, but the way in which consumers consume TV services is changing and Internet TV is definitely accelerating."

Whilst continuing with existing collaborations, TeliaSonera also aims to compete against such service providers as Netflix, by delivering local-language content, along with subscribers being able to have the service under the same account as their mobile subscription.

[123] Manila bulletin, March 26th 2015, Globe extends Facebook offer.

Key Concept 5
Supply-side Substitutability

Supply side analysis takes into account all the current and potential suppliers of the relevant product and their business models. As demand-side substitutability should be the key criterion for the analysis in the digital age, supply substitutability should be assessed, as a complementary tool.

If price rises occur, or if innovation is lagging behind in an industry and quality is not what consumers demand, alternative suppliers might be able to step in and supply that product in the short term (usually defined as within a year) without incurring significant additional costs or risks – this form of substitution is known as supply side substitution.

When supply-side substitutability would only occur through additional significant investments, strategic decisions or lengthy time delays, it is not considered for the market definition.[124] To be taken into account, its effects must be equivalent to those of demand substitution in terms of effectiveness and immediacy. The possibility of additional production coming on the market will have a disciplinary effect on the competitive behaviour of the companies involved, equivalent to the demand substitution effect.

Implications of the Digital Age

Digital firms compete largely on the basis of innovation. The threat of potential competition drives companies in the digital economy to prepare for the unexpected. Supply-side considerations and potential competition are therefore also central to the digital age. As it has been remarked: "*in practice, this means following a cautious approach and relying on self-correcting powers of digital markets that make permanent harm less likely*".[125]

Furthermore, *"even if content or the service is less comparable in the eyes of consumers, as for Facebook and WhatsApp, the companies [...] may still be regarded as each other's competitors. WhatsApp and Facebook, or more general social media, may be perceived by end-users as different services: WhatsApp provides private one-to-one communication services whereas social media provide (often public) one-to-many communication services. However, if Facebook subscribers communicate most of their time one-to-one via WhatsApp rather than one-to-many on Facebook, Facebook loses that audience (and money) for most of the time.*

As such, WhatsApp is stealing away profits of Facebook, even if WhatsApp was barely realising profits itself. Whether or not digital services are each other's competitors can thus not always be determined on the basis of demand side substitutability. What is also very important is whether one company is able to ***steal away profits from the other****".*[126]

A different but related development in the digital age is the phenomenon of cooperation on the supply side. The fact that developers and application programmers are able to produce 'free'

[124] When, such as in the case of SMP regulation or merger control, the analysis is forward looking, supply-side substitutability has a bigger role to play. In SMP regulation, the time horizon of a market review is usually 3 years.

[125] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 11.

[126] Ibid, page 55.

voice and data services, which compete viably with operators who have invested significantly in network infrastructure, has led some operators to seek partnerships with Internet players. This is beneficial for both parties, for Internet apps can gain from the credibility and influence of the network operator, whilst the mobile operator can gain a source of revenue from the Internet.

Figure 19: Examples of Internet tie-ups[127]

Telkom Indonesia and ZTE tie-up

Telkom Indonesia has teamed up with ZTE to establish a research centre focused on IPTV and Internet video technologies. The companies' planned Joint Innovation Center will also seek to build partnerships with other IP-based video technology providers and develop new internet video services.

For Telkom, the tie-up will be a chance to expand the range of video services it offers to its customers, including to subscribers of its IndiHome broadband service.

Singtel, Sony Pictures and Warner Bros JV

SingTel has teamed up with Sony Pictures Television and Warner Bros Entertainment to establish an Internet video service joint venture in Asia.

The venture, HOOQ, will provide a catalog of over 10,000 movies and TV series to countries within SingTel group's Asian mobile footprint - including Indonesia, the Philippines, India and Thailand.

As well as Hollywood films and TV series, the JV will provide a selection of Indian, Chinese, Thai, Filipino, Indonesian, Korean and Japanese movies and shows.

HOOQ will use SingTel's carrier billing capabilities in its operating markets to cater to developed markets where credit card ownership is limited.

"Demand for Internet video has been growing and is poised for higher growth in these markets fuelled by better data networks and the growing supply of affordable devices. This is a more than S$1 billion ($799.8 million) opportunity in our markets," SingTel Group Digital Life CEO Jonathan Auerbach said.

"Video transmission requires significant internet bandwidth, which greatly affects customer experience. With HOOQ, we are bringing together key elements of technology, service and content to deliver the full internet experience to customers."

He said SingTel aims to become the largest Internet video service provider in the APAC region.

[127] ZTE press release, 11th march 2015 and Digitaltv news, January 30th 2015.

Telefonica and Firefox Hello

Telefónica is working with Mozilla to develop Firefox Hello, an innovative new type of Internet service.

Firefox Hello allows users to have Skype-style video conversations, but there is no need to sign up or login, which makes it an open system.

The service works with the user opening a session within the Firefox browser, and sending a link by email to whomsoever they wish to speak to. InternetFirefox Hello will also differentiate from similar services through the content sharing feature, currently in beta phase. The idea is to enable users to share screen content during a call, which Telefónica believes will really make the platform stand out.

According to Telefónica, it is vital for operators to innovate more quickly and become more agile and responsive to customers. Telefónica noted that Internet service providers and application developers "still need us too, and we like to call [them] OTT as in "Over-The-Telco"."

Key Concept 6
The SSNIP Test

The SSNIP test is the main test used to assess substitutability and underpins all substitutability analysis. However, with the emergence of products that are free at the point of use, often provided in multi-platform markets (Key Concept 7), the applicability of the SSNIP test is being called into question.

The so-called "Small but Significant Non-transitory Increase in Price" test (SSNIP test) is the standard analytical (quantitative) tool for market definition. The market is defined as the smallest set of substitute products such that a substantial (usually five or ten percent) and non-transitory (usually one year) price increase by a hypothetical monopolist would be *profitable*.

Evidence on demand-side and supply-side substitutability could be "quantitative" or "qualitative". Quantitative data are anything that can be expressed as a number (quantified). Quantitative data may be represented by ordinal, interval or ratio scales and analysed statistically. Qualitative data cannot be expressed as a number in the same way, but are a valid type of measurement.

Examples of *qualitative data* used in market definition include:

Interviews with customers and rival firms – this is to assess how they would react to a hypothetical change in prices, and who rival firms view as being their competitors within the market

- The commercial strategies of those firms operating in the market
- The extent to which customers incur high switching costs relative to the value of the product
- A review of product characteristics, although, depending on the facts of the case, even products with similar characteristics may not necessarily be substitutes, for example, peak and off-peak telephone calls

Examples of *quantitative techniques* used when considering *demand-side substitution*, include, apart from the SSNIP test, consideration of product price levels over time; own-price elasticities; cross-price elasticities; critical loss analysis and price correlations; and switching costs (the tools of market definition).

When considering *supply-side substitution*, two issues are relevant: how quickly a supplier can enter a market in response to a SSNIP (substantial non transitory increase in price), and whether entry will incur significant sunk costs. Evidence considered includes historic evidence of entry, information from existing and potential suppliers on technical ability to enter; costs of entry and time of entry; and data on the extent of spare capacity, if any.

The SSNIP test is the standard quantitative test in market definition[128] and is described in Figure 20.

[128] Although it should be applied with care, taking into account that the so-called "cellophane fallacy" described in footnote 58 above could lead to the wrong results.

Figure 20: Tests used to define markets

The SSNIP test and Market Definition

The test seeks to establish the smallest product group, and geographic area, in which a hypothetical monopolist could profitably sustain prices that are a small, but significant amount above competitive levels (in practice, this is often between 5-10%). This group of products is defined to be the relevant market: If a hypothetical monopolist can sustain prices profitably, the candidate market is likely to be too narrow and contain too few products, and vice versa.

- If there are close demand-side substitutes or supply side substitutes for the hypothetical monopolist's products, then profitability will fall following the monopolist's increase in prices. If sufficient numbers of customers are likely to switch away from the hypothetical monopolist's more expensive product so as to make the price increase unprofitable, then this hypothetical market should not be considered a relevant market.
- To analyse the supply-side substitutability of a product, the SSNIP test assesses the costs required to enter the market. This determines the extent to which another firm could enter the market and undercut the incumbent. In particular, substitutability is more likely where sunk costs and other entry barriers are low, allowing potential competitors to quickly become established in the market by taking advantage of a monopolist's excessive pricing.
- It is not necessary that both demand and supply-side substitution are feasible for two products to be in the same market. Even if supply-side substitution is not possible, if consumers can easily switch between alternative products or services (demand-side substitution) and vice versa.

A wider and more general definition of the product set is then required, over which a hypothetical monopolist is again presumed to introduce a SSNIP. This process is repeated until an enlarged product set is defined which would permit the hypothetical monopolist to profitably introduce such a price increase. The product set over which the monopolist can profitably increase prices constitutes the relevant market for the purpose of antitrust analysis..

Implications of the Digital Age

In the multisided markets (see Key Concept 7) enabled by digital technologies firms can, absent regulation or other impediments, set prices on the different sides of the market. The question is which price the hypothetical monopolist should be raising. Indeed, because demands on the sides of the market are interrelated, it is difficult to reach a view as to the profitability of a SSNIP. The profit of a hypothetical monopolist who raises the price on one-side of the market is linked to the profit in the other market(s).

Provision of free services may be funded by either cross-subsidisation (e.g. add-ons, chargeable elements of a service), or subsidisation from customers who are more profitable by some measure and / or by advertising, such as in the case of Facebook. The issue of how to use the SSNIP test in digital markets is therefore inextricably linked to the

issue of how to define multi-sided markets (Key Concept 7). Broadly, in the presence of products ostensibly available for free, it would be wrong (though an easy mistake to make) to conclude that there is only one market, the one with paying customers. It would also be wrong to assume that free and paid services should be in separate markets, and that the interrelationships between the two could be ignored. Indeed, expert economists have concluded that some competition authorities *"have failed to recognize the crucial difference between two-sided transaction and non-transaction markets and have been misled by the traditional argument that where there is no price, there is no market".*[129]

The theoretical analysis for the proper consideration of the application of the SSNIP test to multi-sided markets is still evolving. Generally, the logic underlying the traditional test can be extended to a multisided market, but the test needs to be redesigned.[130]

One suggestion[131] is to consider separately two-sided "transaction markets" from two-sided "nontransaction markets". The former category encompasses those platforms where the platform users transact directly (such as payment cards, or operating systems). In these markets, the platform is able to charge a price for joining it and a price for using it. The latter category is characterised by an interaction between users on the two sides, but not a transaction.

In non-transaction markets, in which the two sided could be defined as separate (but crucially, interrelated) markets, the SSNIP test could be applied by considering the profitability of an increase in price first to one side of the market and then on the other side. In two-sided transaction markets, defined as single markets, a modified SSNIP test could be used to check the profitability of an increase in the price level (i.e. the sum of the prices paid for the transaction by the two parties).

In practice, there does not appear to be clear precedent for the application of a specific two-sided market formula to perform the SSNIP test. The application of a modified SSNIP test in a two-sided context would require higher data requirements and higher complexity. As recognised by the UK Competition Commission (now the Competition and Markets Authority) in BskyB/ITV[132] the conceptual framework of the SSNIP test could be used to define the relevant market, "relying as appropriate on a variety of qualitative and quantitative evidence".

In the absence of a clear framework for a redesigned SSNIP test, qualitative evidence acquires a more important role. Competition authorities often undertake surveys of customers and potential competitors to assess market participants' views of alternative products in practice.

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[129] See Lapo Filistrucchi, Damien Geradin, Eric van Damme & Pauline Affeldt, *Market Definition in Two-Sided Markets: Theory and Practice*, Tilburg Law School Legal Studies Research Paper Series No. 09/2013. (http://ssrn.com/abstract=2240850)

[130] Theoretically, a SSNIP test could be based on different parameters: what would happen if a hypothetical monopolist could increase quality, or decrease privacy?

[131] Ibid, pages 40 and 41.

[132] Ibid, pages 33.

Key Concept 7
Multi-sided Markets

Mobile operators' networks and Internet service providers could be considered platforms through which different group of users interact and create economic value. Similarly, Internet services can be multi-sided markets that monetise data to fund "free" applications. If a multi-sided market is erroneously defined as being a single-sided market, often then the market analysis is carried out on the different markets in isolation. When this happens, not all constraints and interactions between the players are captured, impacting the accuracy of the market assessment. Market definition in the case of multi-sided markets is complex, but crucial for a proper market assessment.

Multi-sided markets are characterised by two (or more) groups of users interacting through a common platform. TV is an example of such a two-sided platform. On the one hand, viewers wish to watch the content. On the other hand, the advertisers wish to sell products to an audience. Mobile phone networks have also been described as a platform in a two-sided market. A group of users (those who want to make a call) are able to connect to another group of users (those who want receive a call) through the mobile network.[133] Internet service providers operate in two sided markets. They can, in theory at least, charge prices on the user side and on the side of the content provider. The implications of regulatory measures, such as net neutrality regulation, are considered under Assessing Market Power, Key Concept 7, Discriminatory Abuse.

In today's digital ecosystem, Internet services operate in a multi-sided market whereby they monetise consumers' data a and sell advertising space in order to be able to provide services to consumers which are generally free at the point of use.

Examples of (stylised) three sided markets are provided on the next page. In multi-sided markets, each side represents a constraint on the other. If so, depending on circumstances, these should be included in the market definition; the relevant market includes two, or more sides. When the sides of the market are considered separately, the authority or regulator needs to be aware that there are interrelationships between the separate markets and the constraints need to be properly considered.

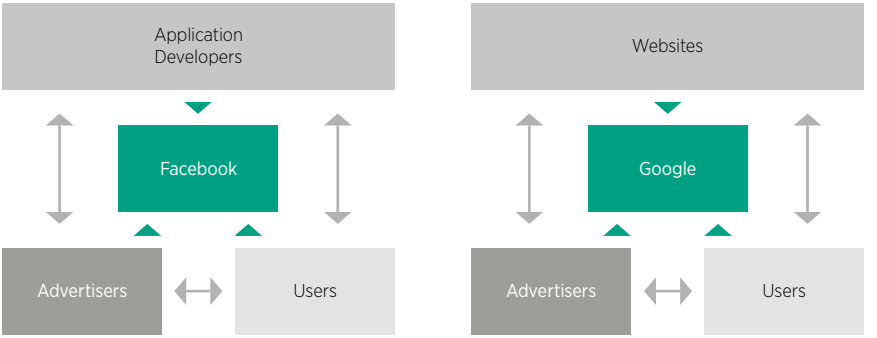
Implications of the Digital Age

Traditional two sided markets are increasingly becoming three or even four sided ("multi-sided"). There still exists the interaction above between users wishing to extend communication and those wishing to receive a call or message, via the telecoms network; however the relationship (demand) between these two is also directly affected by the presence of Internet applications, which provide the same services as those of the mobile operator.

Operating systems also should be considered within this market structure, as they directly

[133] In fact, most customers both call and receive calls so that mobile markets can also be modelled using classical direct network effects.

Figure 21: Facebook and Google search as examples of three-sided markets



affect the other parties present. This is because some applications, for example, FaceTime on iOS, are only available on a particular operating system. The market for voice and messaging services therefore represents an interaction between mobile network operators and end users, together with the interrelationships between these players, Internet apps and operating systems, displayed on the next page.

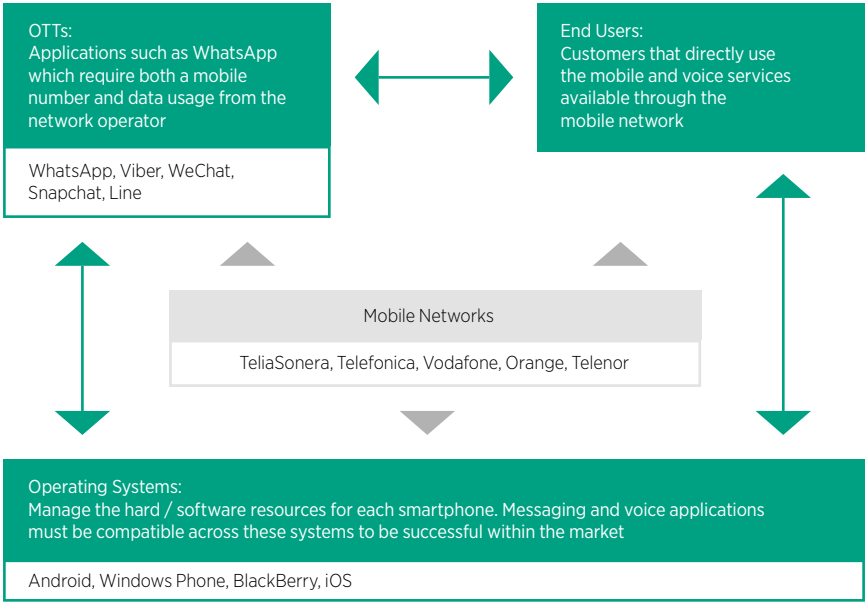
In economics theory, consideration has been given to the best way to define (and assess) multi-sided markets. One suggestion, as already seen above (Key Concept 6, the SSNIP test), is to distinguish "transaction" and "non-transaction" markets. Those platforms, such as operating systems, where users (e.g. the app developer and the user) transact directly and the platform can theoretically charge both for joining the platform and for using it (a per-fee transaction) are "transaction" platforms. Arguably these could be defined as a single market. Those platforms, such as media markets, where the two users do not transact directly, can be considered "non-transaction" platforms. In these cases, the platform does not have perfect control of the relative prices charged to the two sides and separate markets could be defined, provided that the interrelationships between the sides are then properly assessed and understood.[135]

Regulators and competition authorities should therefore be careful to recognise the constraints that each side places upon one another, and the crossed network effects: the more user of a platform, the more advertisers (and vice versa). This has important implications for competition enquiries: failing to consider all sides of a market and all relevant players may lead to incorrect inferences within the investigation. In practice, there are cases involving two-sided non-transaction markets where competition authority failed to define a relevant market on each side, based on the fact that on one side of the market the product is given away for free (and so there is no market on that side).[136] In fact, it is precisely *because* the market is two-sided that one side does not pay: giving away a product for free may be a profit maximising strategy for a firm, even for a monopolist. By giving away a product for free, a platform may recover the loss on

[134] For an in-depth analysis, see Lapo Filistrucchi, Damien Geradin, Eric van Damme & Pauline Affeldt, *Market Definition in Two-Sided Markets: Theory and Practice*, quoted.

[136] For an overview of the case-law, see Ibid., pages 22 and following.

Figure 22 : Example of 2 / 3 sided market in the mobile sector[134]



the other side, making higher profits overall. In fact, exchange of value can take place in the absence of a monetary price: personal information is often exchanged for services.

Competition law guidelines have started to make reference to multisided markets. An early example is New Zealand where the Competition Commission updated its guidelines in 2006 to consider multisided markets. The German *Monopolkommission*, in its 2015 Special Report on Digital Markets,[137] stresses the importance of multi-sided markets and the necessity to include all sides of a platform, as well as direct and indirect network effects, in their analysis. In other countries however, particularly in the Middle East and Africa, the concept has yet to be introduced formally.

In multi-sided markets, each side represents a constraint on the other. It has been noted that price increases are less profitable in two-sided markets due to the presence of indirect network effects. As detailed above (Key Concept 6, the SSNIP test) there is the risk that a 'one-sided' SSNIP test could falsely indicate that a price increase (by a hypothetical monopolist) would be profitable, which could lead to the conclusion of an incorrect (excessively narrow)

[135] In the digital age MNOs are becoming increasingly less central to the provision of services to customers as explained above. See *How Growing Digitisation Impacts Competition Policy*.

[137] Competition policy: The challenge of digital markets. Special Report by the Monopolies Commission pursuant to Section 44(1)(4) of the .Act Against Restraints on Competition. Full original (in German) at: *http://www.monopolkommission.de/images/PDF/SG/SG68/S68_volltext.pdf*. English summary available at: *http://www.monopolkommission.de/images/PDF/SG/SG68/S68_summary.pdf*.

market definition. This issue was recognised in the investigation into the Microsoft / Skype merger,[138] whereby the merging parties' activities overlapped in the narrow market of video messaging and had a high market share, but were found to be non-dominant due to the impact of two sided markets.

Consumers can benefit in multi-sided markets. The price that they are charged on "their" side of the market may be negligible or the product may be free due to cross-funding from the other side of the market. So long as there is full transparency and the consumer is aware of the presence of the second market and the implication for them – for example their data being sold – then the consumer benefits from a lower price.

In Kenya, for example, Safaricom used its considerable buying power in the mobile market, generated from its large customer base, to negotiate a deal with mobile phone supplier Huawei to obtain Android smart phones at a discounted price. This discount was passed onto consumers who were charged $80 per handset. In the first year, 350,000 subscribers took up this offer.

Figure 23 : Market definition in a converged world

Market definition in a converged world

In a converged world, questions of market definition and competitive effects are increasingly hard to assess.

For example, when assessing Microsoft's proposed acquisition of Skype, the European Commission had to review the transaction's effects on consumer and enterprise communications integrating a wide range of functionalities (instant messaging, voice and video calls) across various platforms (PCs, smartphones, tablets) and operating systems. The Commission considered the relevant two-sided markets, after recognising that focusing only on one-sided markets could result in too narrow a market definition.

Within the traditional telecoms sector, the European Commission has recently had to look beyond access bottlenecks and has focused on "maverick theory". That is, ensuring that competitive pressure remain in a consolidating world. For example, in T-Mobile Austria / tele.ring (comp / M.3916) the Commission found that the deal would eliminate a rival firm who placed considerable competitive pressures on T-Mobile and others. The Belgian Competition Authority applied a similar maverick theory when reviewing Belgacom's proposed acquisition of an innovative DSL provider, Scarlet. However, when applying the maverick theory, the authorities looked within the existing telecoms landscape and did not expand the analysis to consider the innovation and competitive pressures that might come from elsewhere within the digital value chain, nor whether in fact the maverick had a sustainable business model.

[138] EU Case No COMP/M.6281 – Microsoft/Skype. Regulation (EC) No 139/2004. October 2011. Decision available at http://ec.europa.eu/competition/mergers/cases/decisions/m6281_20111007_20310_2079398_EN.pdf.

Key Concept 8
Indirect Constraints - Wholesale and Retail Markets

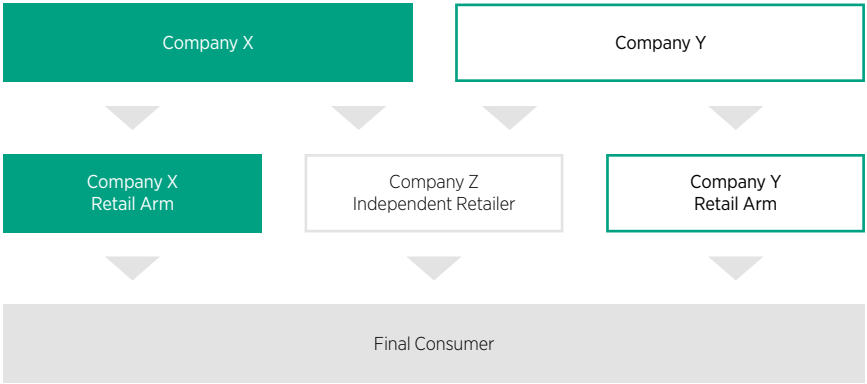
The telecommunications sector comprises a wholesale and a retail segment. At the wholesale level, ownership of the fixed network has traditionally been considered a factor in a finding of market power. This has had a significant impact on the application of regulation and competition law to the sector. In the digital age, competition at the retail level is constraining the ability to exercise market power at the wholesale level, calling for reconsideration of accepted categories in competition policy.

Communications markets feature horizontal and vertical elements and, therefore, both upstream wholesale and downstream retail markets are defined in telecoms:

- At the wholesale level, the market can typically be defined across the products for which network operators offer access to their network
- At the retail level, the relevant product market comprises all those products and/or services which are regarded as substitutable by the consumer by reason of the products' characteristics, their prices and their intended use

In practice, in vertically integrated telecoms markets Significant Market Power (SMP) (or, in some countries such as Australia, access) regulation often applies at the upstream wholesale level, in order to stop upstream operators from influencing the profitability of downstream retail firms. That is, to limit the possibility of a vertically integrated firm leveraging its market power from wholesale into retail markets. This is particularly important in telecommunications, where new entrants and resellers are reliant on the provision of the wholesale input for their own retail product offerings.

Figure 24 : Example of industry with indirect constraints



Consequently, competition authorities and regulators often assess the degree of downstream market powers, before evaluating the level of upstream dominance or SMP. When defining relevant markets in vertically integrated markets, it is important to look at demand and supply substitution at both the retail and wholesale level. This is because wholesale suppliers may be constrained by both direct and indirect constraints.

In Figure 24, Company X is the single supplier of an intermediary wholesale input X that is provided to its own vertically integrated downstream retail arm (XR) and to independent retailers (Z). There is a similar structure around intermediary wholesale input Y. Company X may be constrained in its ability to raise prices for intermediate input X:

- Directly: As Company Z could substitute input X for input Y from Company Y (demand side substitution) (or if firm Y could begin to supply input X (supply side substitution))
- Indirectly: Due to competition between products at the final consumer level, if Company X raises the price for X, this puts upward pressure on the retail prices of firms using input X, limiting their ability to compete with firms using input Y. The effect of a price increase in X would result in a reduction in sales of X and an increase in sale of Y as final consumers switch to products that use Y as an input rather than the more expensive X. This happens even though X and Y may not be directly substitutable, and in particular in cases where the retail and wholesale prices of the vertically integrated operator are constrained by a margin squeeze ban

Even if wholesale customers are unable to substitute between alternative products, sufficient retail consumers might be willing and able to so, rendering any wholesale price increase unprofitable. In other words, the ability to exercise market power in wholesale networks may be constrained by activity at the retail level, which acts as an indirect constraint due to the vertical nature of communications markets. This factor needs to be considered, potentially as part of market definition.[139]

In summary, in addition to supply-and demand-side substitution, the price-setting behaviour of a hypothetical monopolist (or an actual incumbent) is constrained because the wholesale products are linked to each other via the retail market.

Implications of the Digital Age

As retail markets begin to converge, the indirect constraints placed on wholesale products will increase, leading to greater potential for the widening of wholesale market definitions.

As Internet services improve in terms of accessibility and quality of service, there is a growing consensus that they could also be part of the same retail market which may also include, depending on circumstances, providers of broadcasting and audiovisual services. In which case, indirect constraints at the retail level, from Internet apps as well traditional services should be considered when defining wholesale markets.

At the same time, there is an ongoing debate as to whether fixed and mobile calls are in the same market. As quality of service is similar and evidence of customer substitutability emerges, some consider that fixed-to-mobile substitution is sufficiently advanced for fixed and mobile calls to be in a single market. Others consider that fixed and mobile calls should be complements. This is considered further below, Fixed to Mobile: Substitutes or Complement?

[139] Traditionally, in the European system of SMP regulation, indirect constraints are taken into account at the assessment stage

Figure 25 : Indirect constraints and the market definition process

Indirect constraints and the market definition process

Where an upstream firm is effectively constrained in the conditions for supply of the intermediate input by indirect competition downstream, a finding that the firm does not have SMP or dominance should follow. When considering indirect constraints, how should retail substitution be taken into account in defining wholesale markets? There are two possible approaches:

First, include direct and indirect constraints in the market definition: Calculate market shares by reference to the shares of the downstream market that are served by the intermediate input. This approach reflects the economic purpose of market definition, namely to identify all competitive constraints faced by the firm in question. It is also consistent with the SSNIP test for market definition as indirect constraints impact the elasticity of the downstream firm demand for upstream products (Key Concept 6). A concern with this approach is that a degree of artificiality may result from broadening the upstream market horizontally to reflect constraints at the downstream market and then inferring upstream market shares from the downstream market. This approach is analogous to the US approach to supply side substitution in the horizontal merger guidelines.[140] In the US, the market is only defined with regards to demand side substitution. Capacity that could be diverted to the market in response to a SSNIP is factored into the calculations if it occurs within a year.

Second, include only direct constraints in the market definition, but consider indirect constraints in the market power assessment: This approach is theoretically less sound, but is driven by practical considerations such as the relative difficulty of calculating the impact of indirect constraints compared to direct constraints. It may be useful for a high level product screening exercise, but does not provide full details about the competitive conditions of the market. This approach was initially advocated by the EU Commission in a number of comments on market definition under the 2006 regulatory framework for electronic communications. It was also followed in the Schneider case,[141] but it was overruled by the Court of First Instance who required the first approach to be used. The Commission then used the first approach in the GE / Honeywell case.[142]

To avoid some of the artificiality concerns, the Australian merger guidelines[143] adopt a slightly different approach. When close substitution possibilities at the downstream level constrain pricing decisions at upstream, a single functional market is defined for upstream and downstream levels.

[140] US DOJ and FTC "Horizontal merger guidelines" issued 1992 and revised 1997 and "commentary on the horizontal merger guidelines 2006

[141] Schneider EC CFI judgement T-310/01 and GE / Honeywell T-210/01

[142] Case No COMP/M.2220 General Electric / Honeywell.

[143] Australia competition and consumer commission, merger guidelines, June 2006

Figure 26 : Deutsche Telecom Fixed – Mobile Convergence[144]

Deutsche Telecom Fixed – Mobile Convergence

Early in 2006, German carrier Deutsche Telekom introduced a domestic fixed mobile convergence (FMC) service, in the form of T-One, with a phone that could be used with fixed and mobile technology. This was followed by its fixed mobile substitution (FMS) service in 2007, @Home, which proved to be more popular.

In 2014 Deutsche Telekom introduced a different product that drives fixed mobile convergence, its Hybrid router, which combines DSL and LTE. Another important driver for fixed mobile convergence are small indoor base stations, known as femtocells and picocells.

Internet-to-SMS Substitution and Voice over IP ("Internet calls" or "VoIP") Substitution

Another example of indirect constraints is the development of Internet instant message applications, which provide a free alternative to operator SMS, requiring only an internet connection to function. As these applications are typically available free of charge, they place an indirect constraint on wholesale telecoms prices. Consumers are likely to substitute SMS with these free alternative forms of instant messaging, if wholesale SMS prices were to increase.

A similar argument is valid for VoIP services. VoIP applications, such as Whatsapp, Skype or Viber, are used as substitutes to standard calls product.

General concerns that operators may restrict Internet apps' access to customers in all cases are unfounded, as such a strategy would likely be highly unprofitable. Consumers typically choose between operating systems, handsets and applications, not operator services, making it more difficult for operators to exercise any market power. This phenomenon is explained further below under Assessing Market Power, Key Concept 7: Discriminatory Abuse and Understanding Bottlenecks, Key Concept 2. In any event, even if a mobile operator could block access to consumers, a mobile device may be connected to a WiFi network to make a call using an Internet app (Internet, or OTT, bypass).

Regulatory and competition authorities have been reluctant to consider indirect constraints from Internet providers. This is because, in general, constraints need to be in the same retail market as the downstream provider of the integrated entity and the market definition has not expanded to include Internet players and traditional services in the same market. For example, Internet voice services would need to be in the same market as fixed and mobile voice services. Regulators have often cited quality of service differences as the reason for considering the markets separate. However, as the quality of these applications improves (driven in part by the increased data speeds available to mobile devices), the quality of service arguments should become less relevant, and Internet and traditional services could be considered to be in the same retail market. At which time, Internet could be found to place an indirect constraint on upstream telecoms networks.

[144] Telecoms.com. Femtocells drive fixed mobile substitution. June 2007; *http://telecoms.com/6021/femtocells-drive-fixedmobile-substitution/*.

Fixed-to-Mobile: Substitutes or Complements?

The issue whether fixed and mobile voice calls are substitutes or complements is debated and each case should be assessed on its merits. On the one hand, research from some operators[145] seems to indicates that that fixed and mobile access are complements rather than substitutes, for data services. These operators point out that, for as long as mobile data are not sold unlimited, fixed and mobile access cannot be properly substitutable. Indeed, authorities and regulators have generally not found cogent empirical evidence of access substitution,[146] owing to differences in quality of service / data speeds and the fact that mobile is a contested medium.

On the other hand, proponents of a trend towards substitutability point out that some mobile handsets are now capable of switching between a mobile network and pre-programmed Wi-Fi networks seamlessly. With the advent of 4G, a consumer may receive a similar experience on their mobile phone, as on their tablet or PC and may not notice whether they are connected via mobile, cable or fixed line technology. As mobile, cable and fixed line data speeds begin to converge and Wi-Fi as well as mobile networks, are accessible from a range of locations, there may be less differentiation between broadband access markets and a strengthening of indirect constraints.

Figure 27 : Ofcom view on fixed mobile substitution[147]

Ofcom: Fixed and mobile retail substitution

UK regulator Ofcom has reported that fixed voice volumes declined in most countries in the five years from 2004 to 2009. In both the USA and Japan, fixed-line call volumes decreased by 46% over the period, while the UK saw fixed-line call volumes fall by 18%. In Ofcom's 2011 report, it raised for the first time the possibility of fixed mobile access substitution.

Ofcom consumer research found that in the UK, France and Germany most mobile broadband users also have a home fixed broadband connection, with consumers using fixed broadband at home and mobile broadband when out and about. Separate Ofcom research finds that, in the UK, younger people, and those living in rented accommodation, are most likely to use mobile broadband as a substitute for fixed broadband.

However, in some countries (e.g. Australia), most mobile broadband users have it as their only broadband connection, and in Italy, there is high take-up of mobile broadband, both as the only internet connection and as a complement to fixed broadband. High take-up of mobile broadband as the only service may be driven by a number of factors – lack of availability of fixed-line broadband (which historically has been the case in Australia), a high

[145] Notably, Orange

[146] Authorities in the EU identify a trend towards substitutability but there are regulators including many in the Middle East such as the Omani TRA and Qatari CRA that continue to define separate fixed and mobile markets. In *Slovak Telekom*, case COMP/AT.39523, the European Commission did not define a single market for fixed and mobile services.

[147] Ofcom, *The communications market* 2007, 2008, 2011 and 2013.

incidence of mobile-only households (as is the case in the US and Italy), the wide availability of high-speed mobile networks (HSPA services are widely available in Australia and Italy, and in the US alongside LTE services), the relative price of fixed and mobile broadband services, and demographic characteristics (e.g. mobile broadband is more likely to be taken up by young people in rented accommodation, as stated above)."

Figure 28 : BEREC's view on fixed to mobile substitution and indirect constraints[148]

BEREC's view on fixed to mobile substitution

European regulators' body BEREC has produced a report on the impact of fixed-mobile substitution (FMS) on market definition, primarily focussing on retail markets. It concluded that FMS is increasing across Europe, although the degree of FMS depended on country-specific factors.

BEREC found that by 2011, most European national regulators (NRAs) had at least considered whether fixed and mobile services should be in the same market (although at that time only one NRA (RTR-Austria) had concluded they are a single market).

The reasons given by NRAs for continuing to define separate markets included:

- Differences in characteristics: price, bandwidth, mobility, and usage limitations.
- Differences in usage patterns, e.g. fixed broadband customers use the service more intensively and demand higher bandwidths.

BEREC did, however, note, that the impact of FMS on the wholesale market depended on its prevalence at the retail level. It noted that although FMS is more likely to apply at the retail than wholesale level, its existence at the retail level may influence the wholesale market through indirect constraints, which could have an impact on the competition assessment in the wholesale market.

It also noted that even if a single market were not defined then the degree of potential substitutability may still impose a constraint on operators. As such, this should be considered when (i) analysing the three criteria test for imposing ex ante regulation; (ii) in the SMP analysis; and (iii) where NRAs are evaluating the appropriate obligations to impose on the market.

[148] BEREC, Report on the impact of fixed-mobile substitution in market definition. December 2011.

Key Concept 9
Chain of Substitution

Two products can be in the same market if they are not direct substitutes, but each is a substitute for one and the same third product. This means that two products do not have to compete directly in order to be included within the same relevant market.

If two products, A and C, can both be substituted by a product B, they should be included in the samerelevant market, even if A and C are not direct substitutes. EU guidelines on market analysis for electronic communications networks and services note that "chain of substitution" theory is particularly relevant in the telecommunications industry. By this concept, products that may appear to be in different markets may actually fall within the same market.

When considering chain of substitution arguments, it must be noted that the process of defining relevant markets can be further complicated by the existence of asymmetric (one-way) substitution (see Key Concept 4).

Figure 29 : Chain of substitutability in the TV sector

Chain of substitutability in the TV sector

The Dutch telecoms regulator (OPTA) has applied the chain of substitutability argument in a market definition context.

The Dutch market for analogue and digital television is composed of local cable providers based in different regions. Consumers within a certain region can only choose the cable provider in that region. However, one provider is also offering TV services through an antenna that is accessible in any region.

Following the chain of substitutability argument, each cable operator is constrained by the competitive pressure exerted by the antenna operator. Therefore a unique single market, including all the cable operators and the antenna operator, should be defined.

Implications of the Digital Age

Chain of substitution arguments are particularly relevant for defining markets in cases where products are differentiated by 'quality', For example, in the case of mobile networks, even if there are monopoly providers of each generation (for example, a market consisting of one 2G, one 3G and one 4G provider), the constraints that these services place on one another should lead to the definition of a single market. For instance, in the market for mobile voice, the 4G provider may competitively constrain the actions of the 3G provider. Moreover, the pricing of 3G services may constrain the strategy of the 2G provider. Consequently, according to chain of substitution theory, these interrelationships should lead to the definition of a single market for 2G, 3G and 4G voice products.

Chain of substitution arguments can suggest that products of different qualities could be in the same market, even if consumers at either end of the 'quality spectrum' do not see the opposite quality service as a direct substitute.

This occurs when sets of consumers view two or three adjacent products within the 'quality' chain as substitutes and, when these assessments are combined, results in a single market definition.

Figure 30 : Chain of substitution – evolution of arguments in South Africa

Chain of substitution – evolution of arguments in South Africa

Chain of substitution arguments have been used, formally and informally, to assess the various internet mergers that have occurred in South Africa.

- 2004 – Mweb / Tiscali – The Competition Authority defined markets based on consumer groups and not technologies. A "home based market" was defined and this did not differentiate between high speed and dial-up. Had the differentiation been made, it is possible that, the merger may not have been approved as market shares would have appeared far higher in one of the markets. Informally, the Competition Authority used the chain of substitution argument, contending that customers could switch between high speed and dial-up markets following price changes. The Competition Authority did not consider the impact of mobile Internet as it was too early in its development.
- 2006 – Telkom / BCW – The Competition Authority determined that mobile was not a substitute for fixed leased lines. It stated that WiMAX was not a good technical substitute as limited bandwidth was available and a poor commercial substitute, as it did not come with warranties or SLAs. This concurred with EU decisions around this time that quality had a big impact on market definition.

Figure 31: Chain of substitution in H3G / Telefonica Ireland Merger

Relevant market in the H3G / Telefónica Ireland Merger

The European Commission, in its decision related to the case H3G / Telefónica Ireland, has defined a single market for the provision of mobile telecommunications services, without identifying separate markets by technology (e.g. 2G, 3G and 4G).

Key Concept 10
Bundling in Market Definition

Bundling, unbundling and rebundling occur not just in the telecoms sector. The question as to whether the bundles, rather than the component products, should be defined to be the relevant market is very important but in the digital age should not be confined to telecoms services. The market definition has an impact on the market assessment as seen in the next Chapter (Assessing Market Power).

Product bundling is the practice of offering several products together as one combined product.[149] Bundling does not change the underlying principles upon which markets should be defined, namely:

- Is bundle A in the same market as bundle(s) B?
- Is bundle A in the same market as standalone component(s) C?

Answering the first question requires a standard market definition exercise, on a market-by-market basis: there is no conceptual difference between considering two bundles and two single products. The second question requires an assessment of whether the supply of a bundle may be constrained by the supply of an individual component of that bundle. This requires an analysis of the substitutability between bundled and unbundled supply in order to assess whether there is a single market for the supply of the bundle or whether separate markets exist. To put it simply: if the market definition leads to the conclusion that two products are *in different markets*, then the dominant player bundling the original product with another product may be engaged in an anti-competitive practice. If the two products are *in the same market*, the practice would likely not be abusive, see Assessing Market Power, Key Concept 10, Bundling in Market Assessment. For example, in Tetra Pak II,[150] Tetra Pak sought to prove that the equipment for packaging liquids was indivisible from the cartons, and therefore that its practices to exclude independently manufactured cartons from use in Tetra Pak machines could not be abusive. This argument failed.

A detailed analysis of market definition in the presence of mixed bundling is provided in Figure 32. This is quite a technical issue and therefore it pays to spend some time focusing on the way in which this works in practice.

Implications of the Digital Age

Bundling in the communications sector is often seen as a mostly telecoms-related phenomenon, as in many countries, fixed, mobile and broadband services are now supplied on a bundled basis, a phenomenon known as "triple play". With increased convergence, triple play is often supplied alongside pay-TV, and becomes "quad play". Bundled services are provided on the major platforms (e.g. fixed, mobile, terrestrial, cable and satellite) and make use of converged distribution technology.

[149] Economic theory states that there are three main types of bundling, namely: (i) pure bundling: Products are only sold as part of a package of fixed proportions; (ii) Mixed bundling: Products are available as a package or individually, but the package is sold at a discount; and (iii) Tying: A purchaser of one product (the home product) is required to buy another product (the tied product). It is possible to buy the tied product separately.

[150] Case C-333/94 P, [1996] ECR I-5951, discussed below *Assessing Market Power, Key Concept 10, Bundling in Market Assessment*.

Figure 32 : Defining markets in the presence of mixed bundling

Defining markets in the context of mixed bundling

Applying the SSNIP test (Key Concept 6), the relevant question in standard competition analysis is:

Would a monopoly supplier of a bundle A+B be constrained from introducing a small but significant permanent price increase by the threat that customers would switch to buying the individual components separately? It will be valuable to gather evidence as to how many of the purchasers of the individual components also purchase the other.
There are two possible answers:

First, that the hypothetical monopolist would not be constrained, pointing to a separate market for supplying the bundle or this bundle + very similar bundles. This could happen, for example, if the bundle is sold at a significant discount compared to the sum of the component prices, or if there are advantages in quality from buying the products together as a bundle. Or it may be the case where consumers attach a premium to the convenience of buying as a bundle, due to lower transaction costs.

Alternatively, that the hypothetical monopolist of the bundle would be constrained from increasing its price by the threat of substitution to the individual components. In this case, the SSNIP test will be applied sequentially. If the monopolist of the bundle (A+B) is constrained, then:

- Would the hypothetical monopolist supplier of the bundle A+B and of one of the individual components, e.g. product A, be constrained? The answer will depend on the facts. If we assume that A and B are not substitutable, then consumers who wish to buy product A have no choice but to buy from the hypothetical monopolist. The threat of substitution to product B is not credible. Thus a relevant market can be defined for the supply of the bundle A+B and the supply of the individual product A.
- The hypothetical monopolist test will have to be re-applied for each permutation of relevant markets possible. The test could show that there is a relevant market for the supply of the bundle A+B and the supply of B. A practical issue arises when a bundle has a higher number of components. If there is a bundle A+B+C+D, then there could be four relevant markets featuring the bundle.
- The analysis could also show that there is, for example, (i) a relevant market for the supply of the bundle A+B and the supply of A, and (ii) a separate relevant market for the supply of A as a standalone product. Supposing the existence of one single market for the supply of a bundle of pay television and telephony and the supply of telephony, for example. If a substantial number of users of the standalone telephony service have no interest in pay television, the bundle is never likely to be a good substitute for these users. Then it may be the case that a hypothetical monopolist of stand-alone telephony services would not be constrained by the existence of the bundled offering.

However, as seen above (How Digitisation Impacts Competition Policy) when Facebook is able to bundle together offerings across different platforms, and to offer to advertisers the product "consumer engagement" across platforms, Facebook is able to offer a bundled product to advertisers. A proper case-by-case analysis of the implications of this will be required to see whether this should be of concern, given all the circumstances. Bundling occurs across the digital value chain and is not just confined to the widely-discussed triple play and quadplay services.

Bundling takes the form of both mixed and pure bundling and may be achieved in a number of ways, as explained in Figure 33. As the prevalence of bundles grows, it will be necessary to consider whether markets should be defined in terms of bundles as well as, or separate from, standalone products. This will depend on the characteristics of the relevant product and geographic markets and needs to be assessed on a caseby- case basis. At the retail level, a relevant question is whether the customer realised or ought to have realised that they were buying into a bundle. So, a relevant question would be whether, in purchasing a smartphone which uses the Apple iOS operating system, the buyer does so "*in the knowledge that they are buying into*

Figure 33 : Examples of bundling in the digital value chain

Method	Examples
By contract: A contractual requirement of sale, the products are only available together, and there is no discount if only one product is purchased.	Smartphones come pre-loaded with Apps. Premium pay TV contracts come with basic channels. Fixed line broadband typically comes with voice calls. Mobile and fixed line operators are providing complementary Internet services. Internet voice services provide video functionality. A newspaper or magazine subscription with online access.
Technically: The products are integrated technically, and may be difficult or impossible to separate.	An operating system is technically bundled with a smartphone or a tablet computer. App stores can only be accessed through a particular operating system.
Commercially: Where a firm sells a mixed bundle, the discount may be so sharp that the consumer chooses to purchase the products together.	Purchasing a handset on a post-paid contract. Purchasing a set-top television box when purchasing premium television services.
Other means: Such as refusing to honour a warranty on equivalent terms.	Obtaining a handset repair from a non-authorised dealer may invalidate the warranty. "Unlocking" a handset to use it on an alternative network may invalidate its warranty.

Apple's ecosystem",[151] including the device (iPhone, iPod; iPad and relevant hardware), the operating system and the App Store, including Apps created and approved by Apple. If the answer is yes, the bundle may well be the relevant market. If the answer is no, then the markets are separate, with consequences for market assessment of abuse (depending on the facts of the case, increasing consumer costs of switching by denying portability of content may constitute an abuse). This aspect is considered elsewhere in the Handbook: Assessing Market Power, Key Concepts 8 (Exclusionary Abuse), 9 (Leveraging of market power between markets) and 10 (Bundling in Market Assessment). See also Understanding Bottlenecks, Key Concepts 6 (Closed Internet apps), 5 (Operating Systems and App Stores).

If retail markets are defined in terms of bundles, the question then arises as to whether there is also a wholesale market for the upstream inputs of the bundle. This is a question of fact. If the wholesale inputs are procured from different parties, then it is less likely that a market for wholesale bundled inputs exists.

[151] See Neil Brown, *iCompete? An analysis of Apple's App Store within the framework of Art. 102 TFEU*, http://neilzone.co.uk/masters/tel_theme_3_report.pdf, March 2011.

Assessing Market Power in the Digital Age

After market definition, the next step in a regulatory or competition investigation is to assess the market. In this Handbook, we do not consider issues arising in the context of potentially anticompetitive agreements. Market assessment in Significant Market Power (SMP) regulation, merger control and potential abuse of a dominant position requires (i) measuring the extent of market power held by one or more firms in that market; and (ii) assessing whether the existence of market power leads to consumer harm (or the potential for consumer harm, in merger control), to be addressed by regulation or by competition law. If competition law is sufficient to address the issues, then there should not be regulation.

Background

Market power is defined as the ability of a firm to behave independently of its competitors, customers and suppliers and, ultimately, the final consumers. In the digital age, the ability of telecommunications operators to leverage market power may be diminished. The issues are summarised in Figure 34

The Debate

This section identifies key questions for lawmakers and regulators, while serving as an introduction to the key concepts discussed in the next section.

How does growing digitisation impact the factors taken into account for the assessment of market power (SMP and collective SMP; dominance and joint dominance; significant lessening of competition)?

In the digital age, traditional factors for the assessment of market power have to be re-evaluated. Although each case is different and each geographic and product market is at different stages of liberalisation, requiring a case by case approach, generally high market shares in traditional telecoms markets (especially in the mobile sector) may not mean that the players have market power, if market definition takes into account all relevant factors and all substitutable products. In some cases, barriers to entry and to expansion also need to be taken into account. The opportunity for leveraging between wholesale and retail telecoms markets is subject to increased indirect constraints. Access to the network in telecoms (and especially in the mobile sector) does not confer the same degree of market power in the presence of Internet bypass, whereas control of customers by Internet players could be a new bottleneck. (Key Concept 2 Dominance / SMP, Key Concept 3 Mergers SLC / SIEC, Key Concept 4, Collective / Joint Aspects).

Figure 34: Key issues associated with market assessment in the digital age

	General	Digital Age Issues
Market power: Single, collective dominance / SMP; merger tests	Difference between dominance, SMP and lessening of competition. Single versus collective dominance.	Complexity of assessment increases with the complexity of defining markets. Factors for finding of market power are impacted.
Geographic Market	Market share is the starting point for assessing market power. There are a number of other measures which are usually assessed on a supplementary basis – such as barriers to entry and countervailing buyer power.	Market shares based on traditional measures of revenues are difficult to assess in the digital age. Traditional barriers to entry and expansion appear reduced in the digital age. Intellectual property rights are becoming a key source of market power. The potential of traditional bottleneck ownership to be used to harm consumers is reducing.
Abuses of market power	In competition law – it is the abuse of dominance which is prohibited. In SMP regulation, the existence of SMP leads to a remedy.	Some categories of abuse are especially relevant in the digital age. An analysis of precedents from the EU shows that traditional telecommunications operators have been subject to scrutiny for behaviours that have not been investigated in relation to OTTs (such as the use of information obtained for a purpose, but used for another purpose).
Leveraging market power	Market power may be leveraged from one market into a competitive market.	Opportunities to leverage market power in traditional telecoms markets may be reduced as the market power created by traditional bottlenecks is weakening. As firms are increasingly expanding from one market into adjacent markets, there is an opportunity for them to leverage market power.
Bundling	Bundling provides the opportunity for both efficiency gains and consumer harm. Competition authorities are acutely aware of the barriers to entry that can be created by bundling, ref Microsoft bundling cases.	Bundling is gaining prevalence in the digital age, but the bundles are in some cases less easily discerned. Bundling provides opportunity for leveraging market power between markets. Bundling may create a barrier to entry if an essential input is not provided on a standalone basis or at an appropriate price.

To what extent can network owners leverage market power into new digital retail markets?

Although theoretically access could be restricted by operators and operating systems alike, competition is such that this strategy would likely be rendered highly unprofitable. Consumers now choose between operating systems, handsets and applications, not by operator services, making it more difficult for operators to differentiate themselves to compete with new players in the market and to exercise any market power. (Key Concept 5, Measuring Market Power).

Are traditional access SMP remedies still appropriate in the digital age?

Today's downstream retail markets, in particular, tend to have multiple sides, whilst new players also constrain operator behaviour at the wholesale level. Blanket obligations on telecommunications operators in SMP regulation are not likely to capture the nuances of the digital age. As SMP regulation is imposed on telecoms operators only, in the presence of new bottlenecks which cannot be SMP regulated, the imposition of SMP remedies risks distorting the playing field in favour of Internet players.

Is consolidation more of an issue in telecoms than in other sectors in the digital age?

Every merger needs to be assessed on its own facts. Generally speaking, however, it is possible to discern a blueprint of remedies imposed on mobile operators as a condition for a merger. It seems that competition authorities are applying more scrutiny on consolidation in the mobile industry at a time of dynamic change in the marketplace. This aspect is discussed in Key Concept 3: Mergers: SLC / SIEC, Consolidation in the Mobile Sector).

Key Concepts

There are a number of factors to consider within any assessment of market power. The key concepts to understand how authorities approach market power are listed below.

Key Concept 1
Market Assessment in Practice

Key Concept 2
Dominance / SMP

Key Concept 3
Mergers: SLC / SIEC

Key Concept 4
Collective / Joint Aspects

Key Concept 5
Measuring Market Power

Key Concept 6
Exploitative Abuse

Key Concept 7
Discriminatory Abuse

Key Concept 8
Exclusionary Abuse

Key Concept 9
Leveraging of Market Power

Key Concept 10
Bundling in Market Assessment

Key Concept 1
Market Assessment in Practice

Traditional assessment of market power needs to be reconsidered. Each market is different and in some markets there may be a need for continued access / SMP regulation. Generally, however, competition law, in those jurisdictions where it is available, can be applied equally (to all dominant players; to all anticompetitive agreements) – and not just in the communications sector. Depending on circumstances, similar issues may arise in other sectors of the economy, e.g., banking; retail (supermarkets); insurance (motor car; household; medical); utilities; IT and computing; software and Apps. It is important to be able to gain the latest insight from the application of competition law generally, whatever the sector.

Market definition provides the context in which the competitive situation in a market is analysed at the stage of market assessment. The questions to be asked are:

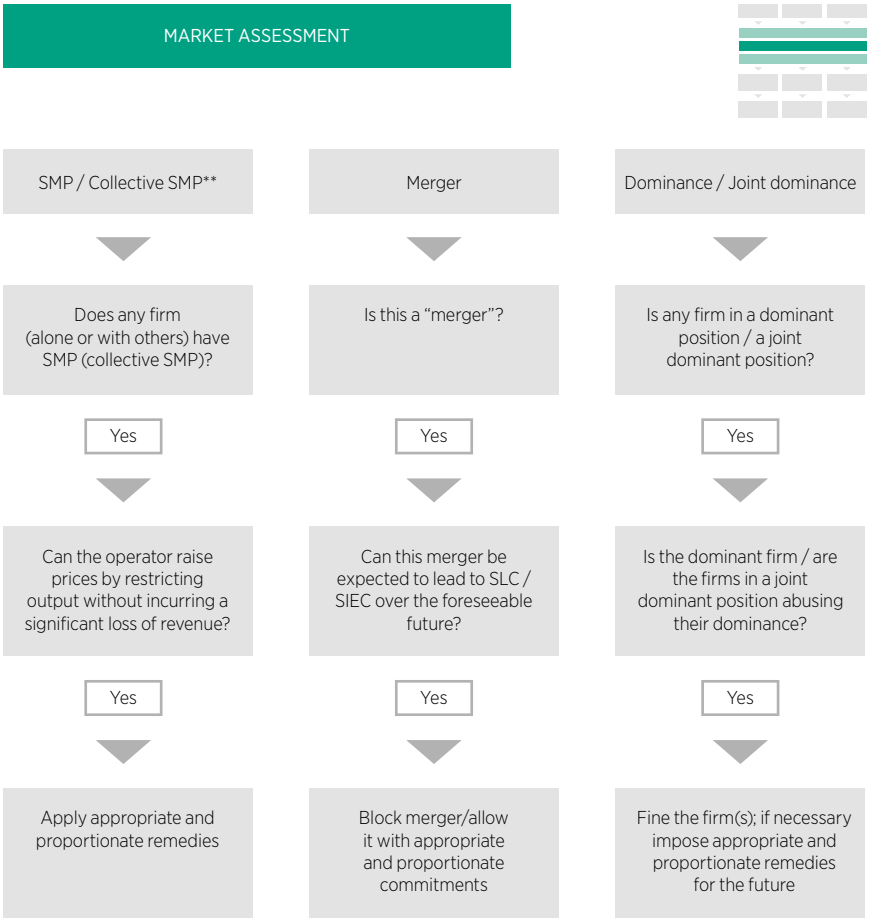
- In regulation, for jurisdictions that consider "SMP", does any market operator have Significant Market Power? Due to the market definition process explained above (Defining Markets in the Digital Age, Key Concept 2, Product Market), an operator should not have SMP if the markets as defined are likely to tend towards effective competition during the time of the review, and if competition law, and in particular the prohibition of abuses of dominance, will not be sufficient to deal with the issues. See Key Concept 2 in this section, Dominance/SMP
- In abuse of dominant position cases, is any player dominant in the relevant (defined) market? If so, is this dominant player abusing its dominant position? What is prohibited is not the fact that a firm, or a number of firms together, are dominant in a market. What is prohibited is the abuse of that dominant position. See Key Concept 2
- In merger control cases, will a substantial lessening of competition (SLC) or a significant impediment of effective competition (SIEC) occur in a relevant (defined) market as a result of the merger? This will happen if consumers can be harmed by a firm acquiring market power (non-coordinate effects), or if the structure of the market post-merger leads to a situation of joint dominance (coordinated effects, see Key Concept 4), or for other reasons, such as if it is likely that the merger will lead to the foreclosure (or exclusion) of competitors. See Key Concept 3 in this section

Figure 35 illustrates the process of market assessment.

At the assessment stage, therefore, the authority or regulator will consider:

- first whether firms have market power or will be likely to acquire it as a result of a merger, and then
- whether they:
  - could abuse such market power (in SMP regulation); or
  - have in fact abused their market power in the past (and may be likely to abuse it in the future unless a remedy is imposed (in abuse of dominance cases); or
  - whether a merger may lead to a substantial lessening of competition

Figure 35: Market assessment in competition policy



** Note that in the EU a market should not be defined as suitable for SMP assessment unless it has been found to have high/non transitory barriers to entry and provided that competition law is insufficient to address the issues.

Efficiencies need to be taken into account for the market assessment. In fast moving dynamic markets it is especially important to consider dynamic efficiencies. This issue is discussed further in Embracing Dynamic Efficiencies.

A comprehensive examination of possible instances of abuses of market power is beyond the scope of this handbook. In competition law it is often said (and this classification is adopted in academic texts and codified in the European Guidelines on exclusionary abuses[152])

[152] See for example the EU Commission Merger Guidelines: http://ec.europa.eu/competition/antitrust/art82/.

that abuses of a dominant position can be:

- *Exploitative* – to exploit an existing dominant position, e.g. by imposing excessive prices (see Key Concept 6)
- *Discriminatory* – discriminating amongst competitors. Traditionally, price discrimination was the main category of discriminatory abuse, although cutting supplies to some categories of customers was also considered as a potential discriminatory abuse. (see Key Concept 7)
- *Exclusionary* – often done in order to gain a position of market power. This is the most problematic category of abuse, and it includes behaviours which, if entered into by a firm which does not have market power are perfectly legitimate, but are potentially illegal if carried out by dominant firms. Examples include predatory pricing and loyalty rebates. (see Key Concept 8)

To some extent these categories overlap. Refusal to supply access to an essential facility can be discriminatory and exclusionary.[153] Leveraging market power could be seen as exploitative and exclusionary abuse. The firm has market power in a market and is therefore able to tie another product to the product in which it has power, thereby excluding competitors from that (secondary) market. Leveraging usually applies in the case of vertical integrated firms (e.g. a firm with wholesale market power attempting to extend this downstream), or firms attempting to extend power into a related market (in merger control cases, these are known as "conglomerate effects").

Specific categories of leveraging include: margin squeeze, a particular feature of competition investigations within the telecommunications sector, especially at the EU level which can be considered discriminatory and exclusionary.[154] (Key Concept 9); and tying and bundling (Key Concept 10).

Implications of the Digital Age

The assessment of market power will depend on market definition. Once the market is defined, the nature of competition in that market can be considered, based on an assessment of the available qualitative and quantitative evidence in the market. Due to the ongoing changes in the communications sector, it is not necessarily the case that ownership of the traditional access infrastructure would confer market power on the owner. Traditional bottlenecks are also changing. Internet apps do not need wholesale input from mobile operators, limiting operators' ability to exercise market power. Although it would technically be possible to refuse access to Internet apps, an operator that restricts Internet services is likely to see large numbers of customers

[153] Telecommunications firms are often SMP regulated for access to their networks although failure to grant access has been considered under abuse of a dominant position in some countries. For example, Vodafone and Orange were fined 3% of their local annual turnover by the Romanian Competition Commission (2011) for failing to allow access to their networks. (See: *http://www.consiliulconcurentei.ro/uploads/docs/items/id7454 mr_cornel_gradinariu_presentation_competition_in_the_telecommunication_sector_ro_experience_and_recent_case_law.pdf*).

[154] Margin squeeze is defined as leveraging market power from upstream to downstream markets. For a finding of margin squeeze the following must be proven: (i) dominance upstream (the input is essential to competitors); and (ii) unprofitable downstream margins, due to excessive wholesale prices for the input or predatory prices at the retail level and the practice is substantive enough to harm competitors.

switch networks onto a provider who allows the Internet app. Therefore, depending on the particular circumstances of the markets and the relevant operators, traditional access SMP regulation may need to be reconsidered and, if the markets are found to be effectively competitive, to be withdrawn.

Where the competitive circumstances allow, in fast moving markets, a case-by-case assessment under the competition rules is more likely to lead to more effective competition and better outcomes for consumers than ex ante regulatory intervention under the SMP rules. This is because any direct regulatory intervention in the market, not supported by clear data can distort the incentive structure of firms (for example, by distorting the incentives to invest, or engendering a different pricing behaviour) and harm consumers and typically results in welfare loss.

At the same time, generally applicable competition rules, when available, should be applicable to all service providers – telcos and others. A proper assessment of the competitive position in the market can show that developers, owners of operating system (through patents) and smartphone makers (especially if vertically integrated – players such as Apple own handsets, operating systems and software) have market power. A company with intellectual property at each stage of the value chain may be able to leverage market power from upstream to downstream due to their position of ownership, highlighting the importance of intellectual property in the digital age. This is explored further in Understanding Bottlenecks.

The application of the competition rules is therefore more likely to lead to a level playing field between operators, ensuring that the same services are subject to the same rules.

Key Concept 2
Dominance / SMP

Dynamic factors need to be taken into account for a designation of SMP or a finding of dominance. Market shares may be lower when markets are properly defined to include all substitutable services; barriers to entry can change, new bottlenecks are replacing the old ones. Regulators should be very careful to conduct a thorough forward-looking case-be case market assessment for the purposes of SMP regulation.

In the EU, Dominance and SMP are defined in equivalent terms as indicated in Figure 36 below. Equivalent definitions are a feature found in a number of other jurisdictions too.[155]

SMP telecoms regulation and abuse of dominance are underpinned by similar principles. Nevertheless, it is important to distinguish between the two regimes. As discussed in Defining Markets in the Digital Age, Key Concept 1, the practice of market definition differs depending on whether there is a focal point for an investigation, such as a complaint or whether, as in the case of SMP regulation, the starting point is a list of high level markets from which the process allows, by elimination, to come to a market which should be subject to regulation. In the first case, the market definition process is more likely to lead to a narrower market than under SMP regulation.

Market assessment is also different.

- In European SMP regulation, the question is "essentially measured by reference to the power of the firm concerned to raise prices by restricting output without incurring a significant loss of sales or revenues".[156] If an SMP designation is made, EU SMP regulation requires that a remedy should be imposed
- In abuse of dominance cases, the question is whether one or more firms have abused their position in the past.[157] A competition authority "*may be faced with a number of different examples of market behaviour each indicative of market power*",[158] unlike a regulator considering whether to apply SMP regulation. If as a result of the investigation, an abuse is found and it is considered necessary to impose remedies other than a fine, then it will be necessary to consider what are the efficiencies and any other mitigating factors

[155] For example, in Brazil: "*A dominant position is assumed when a company or group of companies is able to unilaterally or jointly change market conditions or when it controls 20%, or more of the relevant market, provided that such percentage may be modified by Cade for specific sectors of the economy*" (Art 36, paragraph 2 of Law 12,529/11); for the purpose of SMP regulation: a "*position that enables to significantly influence the conditions of a Relevant Market*" (Art 4, XIII of the General Plan for Competition Goals, enacted by the National Telecommunications Agency (ANATEL)). In Bahrain, the Telecommunications Law calls both situations "dominance", which can be confusing. See Art 52, for a determination that a carrier is in a position of dominance (SMP); and Art 65, for competition law investigations.

[156] EC Guidance on Assessment of SMP, para. 73, 2002/C 156/03

[157] and so considerations of dynamic efficiency, for example may be less relevant than in SMP regulation although if remedies are imposed for the future, dynamic efficiencies also need to be considered. See Below, *Embracing Dynamic Efficiency*

[158] EC Guidance on Assessment of SMP, para. 73, 2002/C 156/03

In considering remedies:

- In EU SMP regulation, remedies must be imposed on SMP operators under both the Access Directive (Art. 8) and the Universal Service Directive (Art. 17(2)). Obligations must be "based on the nature of the problem identified", "proportionate" and "justified in light of the objectives" to be achieved by the regulator as outlined in the Framework Directive. The objectives under the current EU regime are to:
  - Promote competition, inter alia by ensuring the best price, choice and quality for consumers through effective competition, efficient investment in infrastructure (see below, Embracing Dynamic Efficiency, and Key Concept 2, SMP and Dominance, promoting the Efficient Functioning of Markets) and resource management
  - Contribute to the development of the internal market, inter alia by removing obstacles to pan European networks and services and ensuring a consistent regulatory practice across the community
  - Promote the interests of the citizens of the European Union, inter alia by ensuring universal access and protecting the rights of consumers and in particular those with special needs

  As pointed out in the revised ERG (now BEREC) Guidance on the imposition of remedies,[159] "*whereas the Access Directive primarily focuses on promoting competition (from a static as well as from a dynamic point of view by* ***encouraging efficient investment and innovation****), consumer interests and the internal market are at the heart of the Universal Service Directive*".

- Where an abuse of a dominant position has been found, the competition authority orders termination of the abuse (and can impose a fine on the dominant firm, which in most jurisdictions is up to 10% of turnover).[160] In the EU, Art 7 of Regulation 1/2003 empowers the Commission to impose structural and behavioural remedies. These must be "proportionate to the infringement committed and necessary to bring the infringement effectively to an end". In abuse of dominance cases, the Commission can order that the firm perform an act that it previously wrongfully refused to perform (e.g. provide access to an essential facility)

This is also the case in a number of other jurisdictions, where the specifics vary but the dominance and SMP are separate (if equivalently defined) concepts. For example, in Brazil:

- Under SMP Regulation, asymmetric regulatory measures can be imposed on SMP operators under the General Plan for Competition Goals and other specific regulations enacted by the National Telecommunications Agency (ANATEL). Upon establishing such measures, ANATEL must take into consideration, among other factors: (i) the adoption of technical, isonomic (i.e. equal before the law, non-discriminatory) and non-arbitrary criteria; (ii) the imposition of a specific series of obligations in each Relevant Market; (iii) an intervention proportional to the existing risk; (iv) an assessment of the impacts

[159] http://pfs.is/upload/files/erg_06_33_remedies_common_position_june_06.pdf, page 23

[160] In practice, a number of cases are now resolved by using the so-called "commitment procedure", under Art 9 of Regulation 1/2003, which means that commitments are offered and accepted at a preliminary stage in an investigation. In these cases, the firms are not fined and the commitment is in fact regulatory in nature.

Figure 36: Dominance and SMP in the EU

- The definition of dominance under competition law in the EU and in those countries which have adopted a system of competition law based on the EU system is based on the case law of the European Courts and codified in the 2002 EU Glossary of Competition Terms: "A firm is in a dominant position if it has the ability to behave independently of its competitors, customers and suppliers and, ultimately, the final consumer. A dominant firm holding such market power would have the ability to set prices above the competitive level, to sell products of an inferior quality or to reduce its rate of innovation below the level that would exist in a competitive market."
- For the purposes of SMP regulation Art 14 of the Framework Directive defines SMP in equivalent terms, as follows: "an undertaking is deemed to have SMP if either individually or jointly with others, it enjoys a position equivalent to dominance, that is to say a position of economic strength affording it the power to behave to an appreciable extent independently of competitors, customers and ultimately consumers".

generated by the asymmetric measures; (v) the creation of incentives to the investment in new infrastructures; and (vi) an assessment of the costs and benefits arising from the intervention. The purpose is to reduce the likelihood of abuse of market power, as well as to incentivize and to promote free and fair competition

- In abuse of dominance cases, the competition authority (CADE) must find and terminate the abuse (and punish the dominant firm, including with fines up to 20% of the gross turnover registered by the firm, group or conglomerate in the year before the beginning of the formal investigation).[161] Additionally, Art 38 of Law 12,529/11 empowers CADE to impose structural and behavioural sanctions

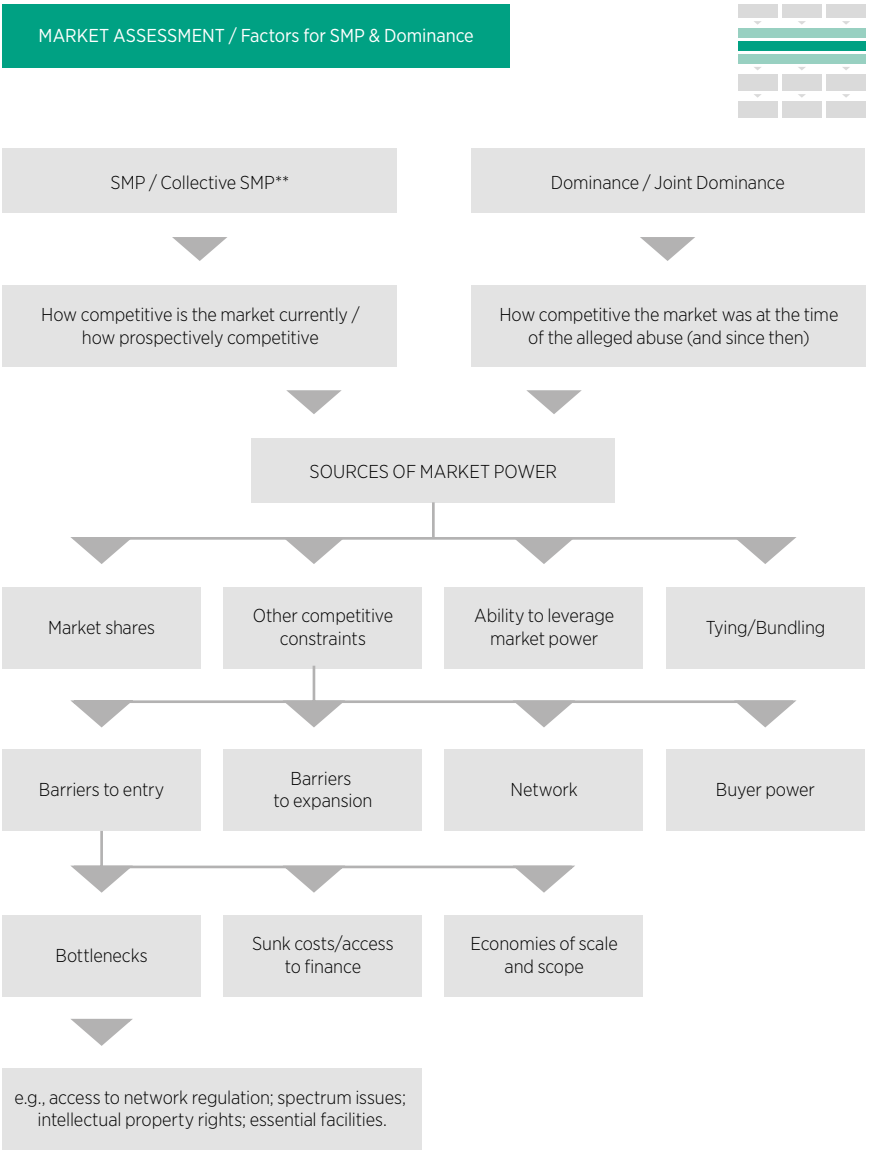
As dominance and SMP are separate concepts, the European Commission says[162]: *"In practice, […] competition authorities may therefore carry out their own market analysis and impose appropriate competition law remedies alongside any sector specific measures applied by NRAs. However, it must be noted that such simultaneous application of remedies by different regulators would address different problems in such markets. Ex-ante obligations imposed by NRAs on undertakings with SMP aim to fulfil the specific objectives set out in the relevant directives, whereas competition law remedies aim to sanction agreements or abusive behaviour which restrict or distort competition in the relevant market".*

The following diagram (Figure 37) illustrates the factors taken into account.

[161] In practice, a number of cases are resolved by entering into Settlement Agreements (*Termo de Compromisso de Cessação de Prática – TCC*), which means that commitments are offered and accepted before a decision is actually rendered. In these cases, firms usually pay a fine, and commit to cease the practice under investigation (in some cases, firms commit to other obligations as well).

[162] EC Guidance on Assessment of SMP, para. 31, 2002/C 156/03

Figure 37: Market Assessment / Factors for SMP & Dominance



Implications of the Digital Age

Dominance and SMP are becoming increasingly dynamic concepts not well suited to the imposition of ex ante SMP regulation. In the digital age, new products and services are constantly emerging, barriers to entry and to expansion are evolving, market shares are volatile, old bottlenecks are replaced by new ones. Consumer tastes and preferences are ever changing.

Applying the framework for the assessment detailed above, a telecoms operator with a significant position in the mobile SMS and voice segments, for example, may not be able to exercise market power due to the emergence and widespread usage of Internet applications. If the relevant market is defined to encompass SMS, voice and equivalent services offered by Internet apps and telecoms operators, that particular operator may no longer have a dominant position or SMP.[163]

In the abstract, a mixture of regulation and competition law could be optimal in minimising the exploitation of market power within the communications sector, but only if regulation is applied equally to players which compete with each other.

[163] In the latest Recommendation on Relevant Markets, classical telephony markets have been withdrawn

Key Concept 3
Mergers: SLC / SIEC
(substantial lessening of competition / significant impediment of effective competition)

Dynamic factors need to be taken into account for a designation of SMP or a finding of dominance. Market shares may be lower when markets are properly defined to include all substitutable services; barriers to entry can change, new bottlenecks are replacing the old ones. Regulators should be very careful to conduct a thorough forward-looking case-be case market assessment for the purposes of SMP regulation.

In merger control, the focus of the analysis is on the structure of a marketplace. The question is what the market will look like post-merger.

Competition authorities apply the Substantial Lessening of Competition (SLC) test or, in the EU, the (equivalent) test of whether the merger will lead to a Substantial Impediment to Effective Competition (SIEC). The formulation of the SIEC test in the EU Merger Regulation considers whether mergers could lead to material harm to consumers even without leading to a position of dominance for the merged firm (so-called gap cases). As more particularly described in the Analysis on Mobile to Mobile Mergers in Europe, in applying the SIEC test the European Commission is able to prohibit mergers which attribute to one single firm, the power to significantly modify the pre-merger competitive equilibrium of the relevant markets (e.g. by raising prices or reducing output) even though the merger may not lead to that firm acquiring a position of dominance.

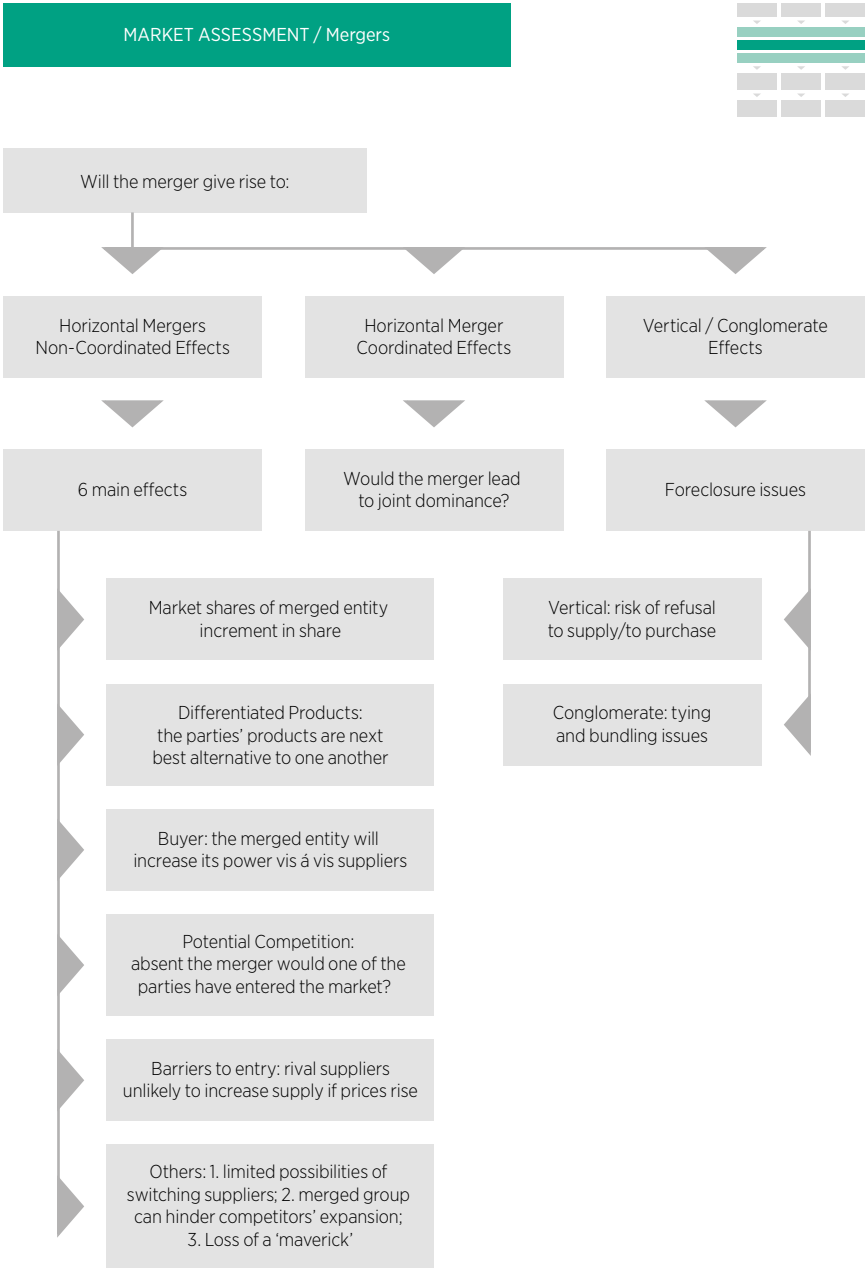
For this reason, we consider SLC / SIEC separately from dominance (or SMP). Figure 38 illustrates the market assessment process in merger control cases.

The factors which are taken into account to determine whether a merger meets the SLC / SIEC test are broadly the same factors which are taken into account to determine whether a firm enjoys a position of SMP or dominance. These include:

- for horizontal mergers, market shares, barriers to entry, buyer power, the effects on potential competition. Some factors reflect the nature of an investigation of a changing market structure: would the merger lead to the creation of a non-coordinated oligopoly? This could happen for example when the merger could lead to the loss of an aggressive competitor in the marketplace (would the merger lead to the loss of a "maverick" competitor?). This aspect is considered further under Key Concept 4, Collective / Joint Aspects
- for vertical mergers, the risk of foreclosure that could arise in relation to consumers or inputs (e.g. refusal to supply) or in mergers between firms in neighbouring markets (so-called conglomerate effects, e.g. the likelihood that the merged entity may be able to leverage market power from one market into another)

The analysis will include an assessment of whether after the merger, and due to the structural changes brought about by the merger, coordinated effects could also arise, i.e. whether the merger will lead to a position of joint dominance (see below, Key Concept 4, Collective / Joint Aspects).

Figure 38: Market assessment in merger control cases



Implications of the Digital Age

The GSMA has been considering aspects of consolidation both in the mobile sector and more widely in the communications sector. Each case of consolidation needs to be considered on its own merits, and the economic impact of a merger will be different in different markets.[164] The following observations can be made in general.

Broadly, in the digital age, the need to invest and innovate is paramount for all players. Indeed, the way in which Internet players are now "rebundling "(see How Growing Digitisation Impacts Competition Policy) points to consolidation in the wider sector. Convergence will reduce the number of telecoms operators (i) in the mobile sector; (ii) in the fixed-mobile sector; and (iii) amongst cable operators (but technical convergence is likely to lead to increased infrastructure-based competition in the broadband market). Mergers between OTTs at different stages in the value chain are also taking place (iv). Consolidation is assessed by the competition authorities under the system of merger control.

Consolidation in the Mobile Sector

Considering the mobile sector first, the trend towards consolidation is global.[165] GSMA considers that drivers towards consolidation include a need to invest, and a decrease in revenue, and increased pressure on margins brought about by the new competitive environment in the digital age. Mobile operators are seeking the benefits from economies of scale and increased global presence. In Europe, these mobile-to-mobile mergers have been approved subject to significant commitments, including commitments to divest spectrum (see the details in Understanding Bottlenecks, Key Concept 3, Licensed Radio Spectrum)[166]. Considering the mobile sector in isolation, these are often referred to as 4-to-3 mergers. Work undertaken for the GSMA[167] found:

- No clear link between market concentration and prices in 3 and 4 player markets
- Spectrum divestment as a remedy can undermine a merger's investment benefits
- The reliance on Gross Upward Pricing Pressure Index (GUPPI) is too simplistic, as it will always predict price increases for a merger, is not a granular measure of levels of competition and is backward looking
- To assess a merger's impact, authorities should look at switching rates to better gauge the nature of competition and consider qualitative market characteristics
- Across 59 emerging markets, there is at least one operator in each market with less than 5% market share. Only 16% of sub-scale operators have increased market share in the past five years, which brings into question their sustainability and ability to invest

In assessing whether these mergers may lead to SLC or SIEC, it is important that:

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[164] At the time of going to print, it was announced that TeliaSonera and Telenor have abandoned their merger plans, as the companies have not been able to agree on a package of commitments to satisfy the concerns expressed by the European Commission. See *http://www.gsma.com/newsroom/press-release/gsma-expresses-disappointment-over-collapse-of-danish-merger-plan/*.

[165] In 2009, there was a 4-to-3 merger in Australia and the FCC blocked the merger between AT&T and T-Mobile. See Assessing the Case for in-country mobile consolidation, A report prepared for the GSMA by Frontier Economics, May 2015.

[166] For a detailed assessment of these mergers, see below, Embracing Dynamic Efficiencies, Analysis, Mobile to Mobile Mergers in Europe

[167] See Assessing the Case for in-country mobile consolidation, A report prepared for the GSMA by Frontier Economics, May 2015. *http://www.gsma.com/publicpolicy/wp-content/uploads/2015/02Assessing-the-case-for-in-country-mobileconsolidation-report.pdf* See also: Emerging Markets Consolidation Report, March 2015.

- All the new players that have recently entered the market are taken into account
- The economic characteristics of the market are properly assessed
- The (positive) impact that the merger can have on efficiencies and investment needs to be considered properly including consideration of dynamic efficiencies in the assessment (see Embracing Dynamic Efficiencies, Key Concept 3, Efficiencies in Merger Control). If in the hypothesis the competition authorities were to start from the premise that a merger has (negative) price implications in the short term and omit to consider the positive effects, then the analysis would be skewed in favour of a finding against the merger

Competition authorities have tended to focus on the short-term pricing implications of mergers, relying on indices such as the GUPPI, explained in Figure 39 below.

Figure 39: Gross upward pricing pressure index[168]

Gross Upward Pricing Pressure Index (GUPPI)

The Gross Upward Pricing Pressure Index (GUPPI) considers the effect of a merger within a differentiated products industry in which two merging firms produce a single product.

Following a merger, the competitive constraint from the merger partner is eliminated, providing the merged firm with the opportunity to raise prices. The GUPPI technique therefore provides a score of the extent to which this may be the case, namely the 'upward price pressure' of the merger.

According to the 2010 Horizontal Merger Guidelines in the US, a GUPPI of less than 5% suggests that the value of diverted sales is proportionately small, hence the proposed merger is unlikely to produce non coordinated anticompetitive effects.

Mergers between cable operators

As regards mergers between cable operators, the Analysis on the aftermath of ComCast/Time Warner below considers the position in the U.S. In some cases, commitments on cable operators have been imposed *in order to help OTTs*. The recent merger between Liberty Global and Ziggo provides an example.

Mobile-Fixed Mergers

Considering mergers between mobile and fixed operators, in Europe, these have been to date cleared unconditionally, as the markets for fixed and mobile services are considered separate and the mergers complementary (e.g. the merger between Vodafone and Cable & Wireless Worldwide in the UK

[168] GUPPI is one of a number of price pressure tests employed by competition authorities, alongside Illustrative Price Rise (IPR) and Upward Pricing Pressure (UPP). For example, mergers involving asymmetric firms should be accounted for by adjusting the price pressure test. Diversion ratios should be designed to truly reflect the closeness of competition between merging parties, and account for price effects from all competitors. Finally, in calculating gross profit margins, care should be taken in choosing the right incremental cost measure. For a high level overview of price pressure tests and other merger screening tools, see: Chapter 20, The Oxford Handbook of International Antitrust Economics edited by Roger D. Blair, D. Daniel Sokol, Oxford University Press, 2015.

Figure 40: Merger between Liberty Global and Ziggo

Case study: Merger between Liberty Global and Ziggo

Following an in-depth investigation, the European Commission approved the proposed acquisition of Dutch cable TV operator Ziggo by Liberty Global with conditions.
The Commission had concerns that the merger, as initially notified, would have hindered competition by removing two close competitors and important competitive forces in the Dutch market for the wholesale of premium Pay TV film channels, and by increasing Liberty Global's buyer power vis-à-vis TV channel broadcasters, allowing it to hinder innovation in the delivery of audio visual content over the Internet (OTT).

To address these concerns, Liberty Global offered to sell Film1, its premium Pay TV film channel. Liberty Global also committed to terminate clauses in channel carriage agreements that limit broadcasters' ability to offer their channels and content over the Internet, and not to include such clauses in future channel carriage agreements for eight years.
These commitments addressed the Commission's concerns.

was cleared unconditionally by the European Commission).[169]

A number of mergers have taken place between fixed operators and cable operators. On 19 May 2015, the European Commission has approved with commitments the merger between Jazztel and Orange in Spain. The conditions are designed to encourage the entry of a new operator in the market and are quite extensive, including a commitment on Orange to sell its FTTH network in several key Spanish cities.

"Rebundling" by Internet players

Finally, as regards the recent trend of "rebundling" by Internet players, as described above (How Competition Policy Works Today), merger control consists of two steps: first, an assessment of whether there is a merger that qualifies for investigation (the merger meets the so-called jurisdictional test for assessment), and second, of whether the merger would lead to a substantial lessening of competition (the assessment phase). In most countries globally, the thresholds for merger control scrutiny apply a test at least partly based on the turnover or revenue of the merging parties. Consequently, when the business model of the merging parties involves offering products to consumers for free or quasi-free, the revenue thresholds may not be met.

Facebook's acquisition of WhatsApp is a case in point. WhatsApp's mobile app is currently offered for free initially and is not monetised through advertising. Although Facebook paid €19 billion for Whatsapp, the European Commission gained the ability to review the transaction because Facebook asked for centralised scrutiny by the Commission rather than multi-jurisdictional analysis in separate countries. At the EU level, this mechanism may be sufficient to ensure that the parties notify the Commission of a merger, to avoid several investigations at the national level. In other countries, this may not happen and such mergers may not meet jurisdictional tests for scrutiny based on revenue, even though the acquisition of Internet players can involve billions of dollars. For example, in Brazil, where

[169] http://europa.eu/rapid/press-release_IP-12-742_en.htm

the thresholds for filing are based on revenue (turnover), the acquisition of Whatsapp by Facebook was not subject to antitrust scrutiny. This has led to calls to consider different jurisdictional thresholds: "*turnover is not a practical metric because some firms may make minimal turnover (like WhatsApp). Given the importance of scale economies and network effects, a better metric would be the number of users together with an estimation of the size of the network effects*".[170]

As regards the assessment of mergers in the digital age, there are calls to focus on the non-price dimensions of competition, including on the potentially anticompetitive effects of mergers between "big data" companies. The analysis of the market definition in *Facebook/ Whatsapp* in Figure 40 above (Defining Markets in the Digital Age, Key Concept 1, Market Definition) illustrates how the European Commission did not consider in that case that the merger would have had an effect on competition in the market for mobile consumer engagement, the market for an audience identified above (How Growing Digitisation Impact Competition Policy). Depending on circumstances, the decisions made by firms on use of data and data privacy, which constitute a non-price dimension of competition, could lead to consumer harm and reduce consumer privacy choices.[171]

One early example of a merger between big data companies was the acquisition of DoubleClick by Google in 2007. DoubleClick was the leading provider of ad-serving technology. This allows publishers and advertisers to manage ads and to measure performance. The merger was analysed both in the U.S. and in Europe and on both sides of the Atlantic it was cleared. The FTC found that the companies were not direct competitors, that entry by Google into the market would not have had a significant impact on competition and that it was unlikely that Google could effectively foreclose competition in the (related) ad intermediation market following the acquisition. Commissioner Pamela Jones Harbour dissented: in her view Google would have competed head-to-head in the market for third-party ad-serving tools, in the absence of the merger.[172]

[170] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted page 60.

[171] D. Feinstein, quoted.

[172] *https://www.ftc.gov/news-events/press-releases/2007/12/federal-trade-commission-closesgoogledoubleclickinvestigation*.

Key Concept 4
Collective / Joint Aspects

Oligopolies are not a monopoly and not necessarily harmful. This is why the bar for a finding of joint dominance is higher than the bar for a finding of single dominance, and why it is more difficult to prove collective SMP than single firm SMP. Recent regulatory initiatives to lower the bar in favour of regulating oligopolies miss the point that oligopolies are not harmful monopolies. The concerns expressed that consolidation may lead to an oligopoly also have to be considered in this context.

A market with a small number of players can be described as an oligopoly. The term "oligopoly" is a neutral term. According to economic theory, competition can be effective in markets with an oligopolistic structure in which no super-normal profit is made. A concern with oligopolies, is that in some cases firms may tacitly coordinate their business strategies, including pricing and policy decisions, leading to firms jointly holding market power.[173]

Oligopolies are the subject of a relevant concept in competition law (joint dominance) and in European SMP regulation (collective SMP). Naturally there are differences between single and joint dominance, between SMP and collective SMP.

In merger control, the competition authorities seek to determine whether, in a merger between parties at the same level in the value chain (horizontal mergers), the merger could give rise to "coordinated effects". Because the focus of the analysis in merger control is on the structure of a market place and on the conditions that exist when a joint dominance position is created, it is not surprising that the factors which may promote joint dominance are most clearly identified in merger control cases. At the EU level, the cases of *Gencor/Lonrho* and *Airtours/First Choice* are particularly relevant.

Broadly, these established the principles that, for a merger to lead to coordinated effects. The parties must be able to (i) reach a tacit agreement; (ii) detect breaches and (iii) punish deviations. The same test applies for a finding of joint dominance in antitrust: joint dominance requires a finding that there is a focal point for the parties to reach agreement, detect breaches and punish deviations. In Figures 41 and 42 the factors taken into account when considering joint dominance are explained. These are broadly equivalent to the factors considered in SMP regulation, bearing in mind the difference in approach highlighted above (Key Concept 1, Market Assessment in Practice).

The bar for a finding of Joint Dominance or Collective SMP is higher than for a finding of single Dominance/SMP. This is because competition can and does take place amongst the members of an oligopoly, whereas a monopoly is by definition not a competitive market. Many of these factors in Figure 41 were considered in the European Commission's decision in France *Télécom/Orange* – see Figure 42.

In summary, regulators should analyse:

- Whether the characteristics of the market makes it conducive to tacit coordination; and

[173] "European competition law, joint dominance, and the wireless oligopoly problem", Ryan.

Figure 41: Joint Dominance in Competition Law

Joint dominance in competition law

Joint dominance occurs when the market structure is such that anti-competitive parallel conduct constitutes an economically more rational strategy than competition. The crucial point to start an analysis is the structure of the market, independent of explicit collusion. Accordingly, the market structure plays the decisive role in those cases where joint dominance is likely to become an issue. Specifically, the following market factors are viewed to facilitate parallel conduct:

- high concentration levels (in terms of market share);
- homogenous products;
- stable and symmetric market shares;
- stagnant demand (incentivises parallel conduct between firms);
- inelastic demand;
- similarity of cost structures within the industry (enables firms to charge higher prices without the threat of competitors significantly undercutting);
- low levels of technological change (reduces the ability of firms to compete with the entities in a position of joint dominance in the form of new technologies, rendering prices above competitive levels unprofitable);
- high barriers to entry (investment requirements, for example, may stop potential competitors entering the market to compete with firms that are able to charge above market prices).

- Whether such form of coordination is sustainable, that is: (i) whether any of the oligopolists have the ability and incentive to deviate from the coordinated outcome, considering the ability and incentives of the non-deviators to retaliate; and (ii) whether buyer/ fringe competitors/potential entrants have the ability and incentive to challenge any anti-competitive coordinated outcome.

Implications of the Digital Age

The typical characteristics of the telecoms market (high investment costs, sunk costs, economies of scale, fast technological progress, and high rate of innovation, network externalities and scarcity of spectrum) mean that they can sustain only a relatively small number of players.

Concentrated markets (or oligopolies) are not harmful per se, and indeed can bring benefits to a market, in terms of incentives for investments and innovation. However, depending on circumstances anticompetitive outcomes can also exist: the risk of slower innovation, higher prices and lower quality, due to coordination, or potential issues of foreclosure. In these cases, the analysis of the factors to be considered for a finding of Joint Dominance or Collective SMP should be the starting point to assess whether competition law remedies or SMP regulation is needed.

Figure 42: Joint Dominance: France Télécom / Orange, Case No COMP / M.2016, 11 August 2000

Joint dominance France Télécom / Orange

In the merger case France Télécom / Orange, the European Commission found that, prior to the entry of Orange into the Belgian mobile market, the two existing players, Proximus and Mobistar, were in a position to exercise joint dominance.

As the Commission noted, for the four years preceding Orange's entry, both operators had almost similar and transparent pricing, their prices following exactly the same trends. In the same decision, the Commission further dismissed claims by third parties as to the risk of a collective dominant position of Vodafone and France Télécom in the market for the provision of pan-European mobile services to internationally mobile customers. Other than significant asymmetries between the market shares of the two operators, the market was considered to be emerging, characterised by an increasing demand and many types of different services on offer and on price.

In the event, the merger was cleared after France Télécom agreed to divest its shareholding in KPN Orange Belgium.

In merger control, depending on the jurisdiction, the market assessment can include both an analysis of whether a merger may lead to co-ordinated effects (a structure of Joint Dominance), and whether it may lead to non-coordinated effects, such that consumer harm may ensue. See Assessing Market Power in the Digital Age, Key Concept 3, Mergers: SLC/SIEC. In merger control, the two situations are described as "coordinated oligopoly" and "non-coordinated oligopoly". In the first situation, due to the existence of a focal point for coordination, the firms may find it easy to coordinate their behaviour without the need of any explicit collusion, by virtue of the structure of the market. This is equivalent to Joint Dominance / Collective SMP. In the second situation, there is no joint dominance but unilaterally the firms may be able to adopt a strategy which leads to non-effective market outcomes. This happens, for example, when the factors listed in Figure 38 above for a finding of non-coordinated effects are found (see Key Concept 3, Mergers: SLC/SIEC).

In June 2015, BEREC published a Draft Report on Oligopoly Analysis and Regulation.[174] In it, BEREC appears to advocate two main conclusions, namely that:

- the conditions for a finding of Collective SMP be clarified; and
- a new regulatory tool be granted to telecoms regulators, allowing these to regulate what BEREC terms a "tight oligopoly", i.e. a non-coordinated oligopoly

One of the main concerns of the regulators that belong to BEREC appears to be that, following the merger of two relatively smaller operators in a telecoms market, the operator previously subject to SMP regulation could face increased competition, potentially leading to the lifting of existing SMP regulation. Given the high

[174] *http://berec.europa.eu/eng/document_register/subject_matter/berec/reports/5042-draft-berec-report-on-oligopoly-analysis-and-regulation.*

threshold for a finding of Collective SMP, BEREC is asking that, in the situation, the NRAs should be allowed to step in and regulate the members of a "tight oligopoly". This would happen when certain factors are met, and outside the relatively harmonized system of SMP regulation, in the 28 member states of the European Union, along national lines. This would happen also after a competition authority has already carried out a merger control analysis, applying when appropriate the SIEC test.

The GSMA has submitted a full reply to the BEREC consultation.[175]

Fundamentally, if the proposals were approved, there would follow further regulation of the telecommunications sector. Due to the nature of BEREC, and the limit to the jurisdiction of the regulators within it, the proposals would lead to regulation imposed on the telecoms operators only. Tight oligopolies in all other sectors of the economy would not be subject to this, with potentially serious implications for investment in the sector. This proposal is also another stark illustration of the reality that the telecoms operators are subject to extra layers of regulation, which in the communications sector leads to a playing field which is tilted in favour of the non-telecoms operators.

This extra regulation would occur at the national level within the EU, further fragmenting the Single Digital Market. It would seem to be directed mostly at the mobile industry (a particular concern for the GSMA). A number of assumptions made in the BEREC Draft Report suggest that the telecoms regulators have not understood the changes to the mobile industry brought about by digitisation (particularly since the introduction of the smartphone, in 2007).

Regulation of tight oligopolies under these proposals would also follow merger approval, in some cases. If the parties to a merger are to face not only the uncertainties of a merger investigation, but also the possibility of being subject to extra regulation following approval of a merger, there would follow very serious implications for the telecoms industry as a whole.

[175] Available at http://www.gsma.com/gsmaeurope/positions-and-publications/gsma-response-to-berec-consultation-on-draft-report-on-oligopoly-analysis-and-regulation/.

Key Concept 5
Measuring Market Power

Market share is usually the starting point for an assessment of the degree of market power. However, high market share is not in and of itself conclusive evidence of market power, in the presence of other factors such as evidence of entry, exit and volatility. Moreover, with the emergence of innovative new products, market power can exist even in the presence of low market shares (e.g. in the case of highly differentiated branded products).

Economic theory defines market power as the ability to raise prices above marginal cost. Market shares and measures of concentration of a market are not determinative of market power, and a variety of factors need to be taken into account, as seen below.

In practice, the starting point for the assessment of market power is often a calculation of market shares held by the firm(s). A firm's market share represents the proportion of the market which can be attributed to the goods or services of a particular market player. This can be measured in a number of ways, for example with reference to the proportion of total market revenues attributable to a firm, or the number of users (total connections in the case of mobile, for example). Whether market shares are calculated by revenues or number of users, for example, is often debatable. The change in market share over time may also be used as a historical indicator of growing market power and competitiveness within the sector.
A finding of SMP or dominance, or a finding that a market share / an incremental increase in market share brought about by a merger can lead to SLC / SIEC will depend on the facts of the case. However, in general:

- A market share of below 25%.[176] is not likely to give rise to concerns
- Single dominance / SMP concerns normally arise in the case of undertakings with market shares of over 40%
- For market shares between 25% and 40% a number of factors will be relevant, including the company's ability to influence the market, its turnover relative to the size of the market, its control of the means of access to end-users, its access to financial resources and its experience in providing products and services in the market
- In practice, a firm can be deemed to have monopoly power with a market share as low as 25%. In UK regulation, for example, 25% is described as the figure above which a firm can begin to exert pricing pressure and other anticompetitive forms of behaviour upon a market.[177] In Brazil,[178] a firm is deemed to have market power with a market share of 20% (a relative assumption that can be changed according to the specific market conditions)

The concentration in a market is one factor considered in assessing the market power

[176] Article 4(3) Interconnection Directive 97/33/EC. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2002:165:0006:0031:EN:PDF.

[177] Ofcom: Identification of Significant Market Power for the purposes of the Interconnection Directive. See: http://www.ofcom.org.uk/static/archive/oftel/publications/1995_98/competition/smpi298.htm.

[178] Law 12, 529/11.

Figure 43: Tools to evaluate market share

Tools to evaluate market share

Concentration Ratio

The concentration ratio is simply the combined market share of the largest firms in the market, typically taken as the 4 firm concentration ratio (CR4). These shares can be calculated by revenue or number of users, for example. The ratio then allows for a direct comparison of how concentrated a market is (between countries, for example). It can also be adjusted to look at the concentration among the top 3, 5 firms etc. as necessary.

Herfindahl-Hirschmann Index (HHI)

The HHI is the sum of squared market shares. It can therefore take any value between 0 (perfect competition, where each firm has an infinitely small market share: 02 + 02... ad infinitum) and 10,000 (pure monopoly: 1002).

This index addresses one key weakness of the concentration ratio. In particular, where the top four or five firms share the market, the concentration index is constant, regardless of how the 100% is shared between the firms. An example of this comparison is shown below:

Concentration Ratio vs HH index

Below is an example of the benefits from the HHI with respect to the concentration index:

1. Take four firms, all with market shares of 25%:

- HHI: $25^2 + 25^2 + 25^2 + 25^2 = 2{,}500$
- Four-firm concentration ratio: 25 + 25 + 25 + 25 = 100%

2. Four firms, with market shares of 70%, 10%, 10%, 10%:

- HHI: $70^2 + 10^2 + 10^2 + 10^2 = 5{,}200$
- Four-firm concentration ratio: 70 + 10 + 10 + 10 = 100%

The HHI therefore recognises the degree of market power held by one firm in scenario 2, as opposed to the four firm concentration ratio, which remains constant.

held by a firm. Two measures frequently used at a high level to assess market power are the concentration ratio and the Herfindahl-Hirschmann Index ('HHI'). The HHI is commonly referred to in traditional competition investigations, as it is a robust measure grounded in economic theory, whereas the number of firms included within a concentration ratio might vary.

The existence of dominance or SMP cannot be established solely based on high market shares or the outcome of an HHI test.[179] Similarly, low market shares do not necessarily indicate that

[179] Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services. (2002/C 165/03). Paras. 75, 78. Accessible at http://ec.europa.eu/competition/sectors/telecommunications/legislation.html

the market is competitive. Therefore, authorities and regulators also need to take into account other factors that could motivate or deter the firm from abusing its dominant position, such as:

- *Barriers to entry*: If other firms are likely to enter (because of low barriers to entry, for example) following an increase in prices, even high market shares may not correspond to market power. The market will have a high degree of contestability. The existence of barriers to entry makes the market not contestable and consequently existing players can exert their market power. Large fixed (sunk) cost investment, e.g. in the form of network infrastructure investment, is a barrier to entry. So is the inability to obtain access to finance or the need to achieve economies of scale and scope or the existence of switching costs. Bottlenecks are a barrier to entry (and are considered in detail in the chapter Understanding Bottlenecks)
  - Intellectual property rights can be a bottleneck, leading to consumer harm and refusal to supply although the existence and ability for firms to obtain a patent or other IPR also provides an incentive to innovate, potentially increasing consumer choice
  - Ownership of an essential facility can result in barriers to entry. The term "essential facility" is a formal competition law concept
  - Access networks and spectrum have traditionally been considered bottlenecks, whereas new bottlenecks emerging in the digital age, such as the existence of closed OTTs and ownership of Operating Systems, Apps and App Stores are emerging as new bottlenecks in the digital age. These are considered in detail in the next chapter
  - Access to adequate sites can prove to be a bottleneck for wireless providers. While providers in some countries may enjoy unimpeded access to the sites necessary to deliver wireless service, wireless carriers in other countries (e.g. in the U.S.) experience bottlenecks in gaining access to necessary siting, which can hinder the delivery of services that compete with cable, fibre and satellite providers
  - Network effects - As the number of people communicating via a messaging or voice service increases, the more functional or convenient it is for users, for they are able to communicate directly with a larger number of their contacts. This phenomenon is known as a 'network effect'. Network effects can create a barrier to entry for potential competitors, if new entrants cannot immediately attain the level of functionality offered by the incumbent. They can also lead to massive consumer benefits (see below, Embracing Dynamic Efficiencies, Key Concept 1, Efficiencies in Competition Policy)
- *Barriers to expansion*: Entry in a market may be achieved in a relatively small scale manner and without experiencing barriers to entry, but the entrant firms may experience barriers to expansion
- *Countervailing buyer power*: Buyer power is the ability of a firm, or a group of consumers, to secure from its supplier prices or other terms in their favour. The ability of a firm to charge high prices depends on the degree of concentration of the buyers. A firm is clearly in a position to exert market power if it faces a large number of disaggregated consumers or buyers than if it faces one or a few influential buyers. A strong buyer can leverage its bargaining power to stimulate competition between sellers, either by threatening to switch orders from one seller to another, or by threatening to start upstream production itself
- *Differentiated products*: If firms compete on quality, high market shares might mean innovation (e.g. a technological breakthrough) and might not imply that a firm has the ability to limit competition

within the market. The converse is also true. In markets containing highly differentiated products, even a low market share may be sufficient for market power

- *Vertical integration*: A firm that is vertically integrated across markets can leverage a position of market power from one market to another. See Key Concept 9
- *Bidding markets*: In bidding markets (such as the market for spectrum), where firms bid for licences, for example, a competitive auction process acquires the greatest importance in a competition context, for this is designed to capture the sector rent gained by the owner, and should deliver efficient market outcomes despite few or only one player ending up with ownership of the resource
- *Regulation*: Even if a firm has large market share, if that firm is regulated, it may be incapable of exercising market power

Implications of the Digital Age

The growth in the digital economy has the following implications for the analysis of market shares:

- Market shares are likely to become more volatile as innovation continues and consumer tastes change. Current market

Figure 44: Market analysis considerations in the EU[180]

Market analysis considerations in the EU

Specifically for an assessment of SMP, under the EU regulatory framework regulators are required to consider:

- Overall size of the undertaking
- Control of infrastructure not easily duplicated
- Technological advantages or superiority
- Absence of or low countervailing buying power
- Easy or privileged access to capital markets / financial resources
- Product / services diversification (e.g. bundled products or services)
- Economies of scale
- Economies of scope
- Vertical integration
- A highly developed distribution and sales network
- Absence of potential competition
- Barriers to expansion

[180] Commission guidelines on market analysis and the assessment of significant market power under the Community regulatory framework for electronic communications networks and services. (2002/C 165/03). Paragraph 78. Available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52002XC0711(02)&from=EN.

share levels are therefore not necessarily a reliable measure of market power now or in the future. The lower informative value of market shares in volatile markets was recently recognised by the General Court in its judgement in *Cisco v. Commission*:

"... the consumer communications sector is a recent and fast-growing sector which is characterised by short innovation cycles in which large market shares may turn out to be ephemeral. In such a dynamic context, high market shares are not necessarily indicative of market power and, therefore, of lasting damage to competition".[181]

- Given the dynamic nature of competition, rather than relying on traditional indicators such as market shares or profit margins, regulatory and competition authorities should focus on "*indicators that inform about contestability, such as the presence of entry barriers, the* ***availability of alternative routes to reach end users (including the presence of measures aimed at locking-in end users)***, and the degree of innovation in unexplored technologies / services"[182]
- The existence of "freemium" applications and free products creates difficulty in calculating market shares based on consumer revenues. For example, many consumers generate zero revenue for Internet applications, as they do not purchase add-ons or upgrades. Moreover, customers use more than one app on a daily and monthly basis. Indeed the European Commission estimates that:[183] 80-90% of EEA users use more than one service per month. This is facilitated by the easy availability and installation, together with features such as 'push notifications' that enable a user to view a message without accessing the application first. Consequently, other metrics such as volume of traffic or share of mobile minutes of use may be more relevant. For example, the total share of mobile minutes of use may be a particularly relevant metric with freemium social networks and instant messaging applications. Nevertheless, this aspect was recently overlooked by the European Commission in the Facebook/ WhatsApp merger (for an analysis of this merger, see above, under Defining Markets in the Digital Age, Key Concept 1, Market Definition in Practice)
- As social networks and messaging markets increasingly converge, the data requirements necessary to calculate standard metrics increase. Availability of data is problematic given data protection regulation, on the one hand, and the multinational nature of the services and the players in the digital age, on the other hand. Data availability is an issue in market definition in the digital age. See Key Concept 1, Market Definition in Practice

In this digital era, authorities and regulators must be even more willing to take into account factors other than market shares, for example the degree of entry, exit, innovation and product development within the industry.

For example:

- *Countervailing buyer power* is becoming increasingly important. Even firms with a high market share may not be price setters as they need to constantly adjust, innovate and reinvent themselves to adjust for changing trends and tastes

[181] Case T-79/12 – Cisco Systems and Messagenet v Commission, judgment of 11 December 2013, n.y.r., paragraph 69.

[182] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 11, emphasis added.

[183] Case No COMP/M.7217 – Facebook/WhatsApp Regulation (EC) No 139/2004, para. 110. October 2014. European Commission, Brussels.

Figure 45: Dynamic market shares – BT / Esat[184]

Consideration of dynamic market shares in competition investigations

In BT / Esat, one of the issues examined by the European Commission was whether market conditions in the Irish market for dial-up Internet access lent themselves to the emergence of a duopoly consisting of the incumbent operator, Eircom, and the merged entity. The Commission concluded that this was not the case for the following reasons. First, market shares were not stable; second, demand was doubling every six months; third, internet access products were not considered homogeneous; and finally, technological developments were one of the main characteristics of the market.

- *Traditional barriers* to entry are reducing, as some bottlenecks are removed. Bottlenecks are considered in detail below, Understanding Bottlenecks. In a nutshell:
  - Opensource software, for example, whereby a copyright holder provides the rights to study, change and distribute the software to anyone and for any purpose, has allowed for collaborative competition in the provision of browsers, content players and other software, enabling innovation and generating savings for consumers
  - Consumers' ability to switch suppliers has been strengthened by the regulatory evolution of the mobile sector, together with the emergence of firms offering rival services to those provided by mobile operators. For example, regulation which is not SMP regulation but applies only to providers of telecoms access services has led to a significant reduction in consumers' switching costs in changing mobile network operator[185]
  - Sunk costs are lowered, for new entrant Internet apps at least. Messaging technology today can be developed by software providers without the significant sunk infrastructure costs and the development of a mobile network that a traditional messaging technology required
- *New barriers to entry are emerging*. These are discussed in more detail in the section, Understanding Bottlenecks, and include:
  - *Customer data*: Internet network effects have enabled a small number of applications to currently become dominant in the freemium messaging market, enabling them to acquire large amounts of customer data. From a competition law perspective, large datasets could provide companies with a competitive advantage, by helping them to improve the product or service in a way that competitors are unable to match. As a result, if these applications were to monetise access to their service in the future, they may be able to maintain a significant number of users, due to the enhanced functionality resulting from network effects and their ownership of customer data
  - *New switching costs*: due to a lack of interoperability. In particular, content provided by non-regulated Internet apps,

[184] Case No COMP/M.1838 -BT / ESAT. Regulation (EEC) No 4064/89. Available at: *http://ec.europa.eu/competition/mergers/cases/decisions/m1838_en.pdf*

[185] Switching costs are those that a consumer incurs as a result of changing suppliers, brands or products. These are usually monetary, although time taken to convert providers, for example, has been shortened by regulation in this case.

Figure 46: Global Internet players in the digital value chain

	Google	Apple	Microsoft	Facebook	Amazon
Mobile Connectivity	Google Loon Project Fi	–	–	Internet.org	–
Apps	iOS and Android	iOS only	iOS, Android, Windows Phone, Cyanogen	Facebook, WhatsApp, Messenger, Instagram	iOS / Android
Hardware	Nexus	iPhone	Lumia	–	Fire Phone
Operating System	Android	iOS	Windows Phone, Cyanogen partnership	–	Fire OS

Source: GSMA, Mobile Industry Radar, July 2015

Figure 47: PCCW Media and VuClip acquisition

PCCW Media and VuClip acquisition

PCCW Media has arranged to acquire a majority stake in mobile video-on-demand service platform provider Vuclip.

Vuclip offers mobile VOD services in six markets - India, Indonesia, Malaysia, Thailand, the UAE and Egypt. The company plans to roll out to other Southeast Asian markets this year, and also has its sights on expansion in Africa and the Middle East.

The combined company plans to develop an Internet platform that provides immediate access to PCCW Media's premium Asian content set (including Korean, Japanese, and Chinese language content) across a much expanded audience base.

PCCW Media said it expects the acquisition to help expedite the company's strategy of expanding its Internet digital video business beyond Hong Kong and into the Asia region.

may not be 'portable' onto a new handset or system, increasing consumer switching costs. The costs of changing operating system, through e.g. loss of content or functionality, may outweigh the benefits

- *Vertical Integration*: Global players operate in a number of segments. For example, Google, Microsoft and Apple all provide content (applications), have developed an operating system to which their own brand app store is linked and provide mobile devices. Google is also interested in using drones, balloons and unlicensed spectrum to provide network accessfurther

increasing their presence in the digital value chain (this is explained in Understanding Bottlenecks, Key Concept 3, Licensed Radio Spectrum)

- *Barriers to expansion* are proving to be difficult to understand in the digital age. On the one hand, although market entry is possible in the digital web and new business models can be created, the chances of success (expansion) are unclear (see Defining Markets in the Digital Age: Key Concept 5, Supply-side Substitutability). On the other hand:
  - Firms that enter one market often use their brand recognition as a basis to move into an adjacent market and to grow market share. For example, Whatsapp, which began as a messaging only application, is moving into providing call services between its subscribers
  - Traditional service providers are moving into other markets in order to play across the digital value chain. For example, Vodafone recently purchased C&W's fixed line business; BT has announced that it intends to acquire EE; PCCW Media has recently acquired a majority stake in video on demand service provider VuClip (see Figure 47) and in the U.S., AT&T (telecoms company and provider of IPTV) purchased DirecTV (satellite TV)

Key Concept 6
Exploitative Abuse

A company in a position of market power may exploit its position. The imposition of excessive prices is the classic case of exploitative abuse. However, other types of exploitative abuse are becoming more relevant, such as the ability of a firm in a dominant position to impose terms on manufacturers and distributors in exchange for a "must have" product.

As seen above (Key Concept 1, Market Assessment in Practice) a useful characterisation of types of abuses is often made by reference to the effects of the conduct in question on others. It is useful to distinguish between "exploitative abuses", "discriminatory abuses" and "exclusionary abuses".

Although, in practice, the categories overlap, an "exploitative abuse" is anticompetitive behaviour by a company with market power, which results in the company being able to exploit its position and harm consumers *directly*, whereas in exclusionary abuse cases consumers are harmed *indirectly*, through the exclusion of a competitor from the marketplace. The classic category of exploitative abuse is excessive pricing by a company. The behaviour does not need to be discriminatory as well as exploitative, although in practice there could be a situation of a dominant player charging excessive and discriminatory prices, such as in discriminatory abuses against consumers and the case against Deutsche Post.[186] (see Key Concept 7, Discriminatory Abuse). Equally, in practice behaviour could be both exploitative and exclusionary, such as in leveraging market power (see Key Concept 9).

Excessive pricing was considered in *ITT Promedia*.[187] The investigation related to Belgacom's practice of charging a fee to competing providers of telephone directories for access subscribers' data. The abuse was deemed to be both exploitative and discriminatory. Belgacom agreed to change its practice and the European Commission closed the case.

In different regions across the world, mobile operators are required by regulation not to charge excessive prices for roaming services. The new EU Roaming Regulation, adopted in 2012.[188] imposes such an obligation in relation to roaming services across EU countries (in comparison with national prices). GCC regulators have adopted coordinated policies to bring roaming prices down in the Gulf countries, first for roaming voice calls (in June 2010) and then for other roaming services (June 2015, to be effective on 1 April 2016).[189] Similar concerns have been expressed in Africa. In August 2015 it was announced that regulators in Botswana, Namibia, Zambia and Zimbabwe will implement a glide path to reduce roaming tariffs.[190]

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[186] COMP/38745 BdKEP, 20 October 2004.

[187] XXVII Report on Competition Policy.

[188] Regulation 531/2012.

[189] http://www.reuters.com/article/2015/06/09/mideast-telecoms-idUSL5N0YV3DN20150609

[190] https://www.telegeography.com/products/commsupdate/articles/2015/08/13/four-southern-african-states-agree-to-cut-international-roaming-costs/. The Southern African Development Community (SADC) also announced action on roaming tariffs.

Exploitative abuse does not need to be excessive pricing. Imposing "unfair trading conditions" of competition can also be an exploitative abuse under Art 102(a) of the Treaty on the Functioning of the European Union. An early example is found in *BRT v SABAM*.[191] A company entrusted with the exploitation of copyright, imposed on their members some obligations that were not absolutely necessary for the attainment of its object and thus encroached 'unfairly' upon the member's freedom to exercise copyright. 'Fairness' concerned balancing the rights and obligations of contract parties. In *Tetra Pak III*,[192] contract clauses going beyond the recognised right of a dominant undertaking to protect its commercial interests were deemed 'unfair'. In that case, such clauses included those giving the absolute right of control over the configuration of equipment prohibiting the buyer from making any modifications, those giving Tetra Pak the exclusive right to maintain and repair the equipment, the exclusive right to supply spare parts, requirements to obtain Tetra Pak's permission for the transfer of ownership or use of equipment, imposition of long lease terms of three years to nine years and penalty clauses for breach of these terms. In the telecoms sector, a requirement to maintain the equipment of the dominant operator to the exclusion of any competitors', imposed on the only manufacturer-approved maintenance operator in a territory, was considered an abuse of a dominant position.[193] The abuse could be considered in this case both exploitative and discriminatory.

Implications of the Digital Age

In cases where many products are offered to the consumer free of charge, excessive pricing may not appear to be a major issue. However, it may still be an issue in the case of multi-sided markets, if in fact the nature of the market as multi-sided is not properly recognised. Then pricing could be considered to be excessive on one side of the market, and perhaps predatory on the other side. For this reason it is very important to define the market appropriately (see Key Concept 7, under Defining Markets in the Digital Age).

In cases where excessive pricing is not an issue, competition authorities may have to look more closely to ascertain consumer harm – such as that which may result in direct consumer harm by the application of unfair trading conditions and exclusivity clauses. Price is not the only (or main) parameter of competition. Exploitation could take different forms, depending on the variables of competition.[194] As the decisions firms make about consumer privacy can lead to a form of non-price competition, privacy can be a non-price dimension of competition. The form of data usage, abusive terms and conditions could also be a form of exploitation in the digital age.

[191] Case 127/73 *Belgische Radio en Televisie v SV SABAM and NV Fonior* [1974] ECR 313, [15].

[192] Case T-83/91 *Tetra Pak International SA v EC Commission* [1994] ECR II-755, [140].

[193] Decision of the French competition authority in *Orange Caraïbe and France Télécom,* Decision 09-D-36 of 9 December 2009.

[194] See D Feinstein, *Big Data in a Competition Environment*, quoted.

Key Concept 7
Discriminatory Abuse

A company in a position of dominance can discriminate amongst customers or different classes of customers. When this leads to a competitive disadvantage for a competitor or to consumer harm, competition authorities can intervene ex post under abuse of dominance provisions. The current cases against Google, for example, allege discriminatory and exclusionary abuse. Although there is no need to regulate ex ante to deal with similar situations, ISPs are confronted with calls for net neutrality regulation.

A company in a position of dominance cannot discriminate unduly. Discriminatory abuse is one of the three main categories of abuse in EU law. Exploitative abuse is considered above (see Key Concept 6), and exclusionary abuse below (see Key Concept 8). This classification is useful as a starting point but there is considerable overlap between categories.

Discriminatory abuse can harm competitors (i.e. the abuse is likely to have both a discriminatory and an exclusionary effect) and it can harm consumers that are not competitors (i.e. the abuse can have both a discriminatory and an exploitative effect).

First, it can harm competitors. For example, a discount structure offered by a dominant supplier to retailers can be both discriminatory (e.g. as against types of retailers who are unduly denied higher rates of discount) and exclusionary (e.g. as against potential competitors, if fidelity-inducing discounts are offered to retailers). Supply to an essential facility on terms which disadvantage competitors in favour of one's own downstream operations, can also be discriminatory and exclusionary (see Key Concept 8, Exclusionary Abuses). Anticompetitive bundling can also be an instance of exclusionary and discriminatory abuse (see Key Concept 10).

In the EU, Art 102(c) of the Treaty on the Functioning of the European Union prohibits "applying dissimilar conditions to equivalent transactions with other parties, thereby placing them at a competitive disadvantage". Therefore, the competitor alleging discriminatory abuse will need to prove that this has an effect on competition, a "competitive disadvantage". The European courts have interpreted this requirement broadly: it is sufficient that the prices "tend" to distort competition. In the communications sector generally, supplying on discriminatory terms is a recognised category of abuse. For example in Télémarketing,[195] RTL, the only channel then offering TV advertising in Belgium, sought to impose on all telemarketing companies a condition that they could not advertise their own telephone number, but this condition was not applied to its own operations. In telecommunications specifically, a line of cases involves the dominant telecommunications provider seeking to prohibit third party competitors (but not its own downstream operations) to connect private leased lines to the public switched network, or imposing extra charges for doing so.[196] Discriminatory abuse against a firm's competitors damages their ability to compete effectively, and in so doing, reduces consumer choice.

[195] Case 311/84.

[196] See for example the Telecoms Access Agreement Notice, points 89-97.

Second, it can harm consumers directly. This is when discrimination may also be an exploitative abuse, particularly when the discrimination results in a market player finding it difficult to compete in any market, regardless of whether the market player is a competitor of the alleged abuser. For example, in a case against Deutsche Post[197] it was found that the practice of discriminating between bulk carriers and commercial providers of letter pre-sorting services placed the latter at a disadvantage even though bulk mailers and commercial senders were arguably not competing in the same market (i.e. the practice was arguably not exclusionary).

Implications of the Digital Age

Traditionally, price discrimination was the main category of discriminatory abuse, although cutting supplies to some categories of customers was also considered as potential discriminatory abuse.

In the digital age, two issues become particularly relevant.

The first is whether some of the practices of Internets can be considered discriminatory and should be investigated as an abuse of a dominant position. This issue arises in particular where Internets operate as a platform (see Key Concept 7, Multisided Markets, under Defining Markets in the Digital Age). Both investigations against Google mentioned in Key Concept 8 below (Exclusionary Abuse) can also be seen as instances of discriminatory abuse: the question is whether search engines discriminate in favour of vertically integrated services (the Search Engine Case, see below); and whether ownership of an operating system allows the owner to discriminate in favour of certain Apps (the Android Case, see below).

The Search Engine case and the Android case are being investigated as possible instances of discriminatory (and exclusionary) abuse under the competition rules. It is possible that in time the investigation would lead to calls for the introduction of regulation, but in fact competition law seems perfectly adequate to assess whether, in the context of a multi-sided market, a dominant operator is abusing its dominant position by foreclosing rivals and discriminating.

The second relates to the debate on net neutrality. This also arises in relation to two-sided platforms, such as the mobile platform (see Key Concept 7, Multisided Markets, under Defining Markets).

The growth in mobile data traffic present mobile operators in particular with new challenges. How to manage this traffic? How to meet the different needs of diverse consumers and businesses? How to generate sufficient revenues to continue to invest in network infrastructure? Some commentators argue that it is necessary to legislate that all Internet traffic carried over a network be treated in the same way, and they call for net neutrality regulation on telecoms operators.

The call for regulation of Internet access should be carefully assessed by policymakers to avid unintentionally hindering innovation and investment in broadband networks and digital services. Policymakers should favour a consultative, principles-based approach over regulatory intervention. The arguments in favour of regulatory intervention include the concern that web traffic management would allow an Internet Service Provider to introduce discriminatory pricing. This could theoretically have repercussions in terms of foreclosure of some content providers, notably the "small" content providers, or could lead to

[197] COMP/38745 BdKEP, 20 October 2004.

incentives for the ISPs to degrade (discriminate) in the quality of service offered to the traffic generated by certain content providers. To the extent that this is a real concern, it should be dealt with by ex post competition law, which deals with specific instances of abuse of a dominant position by an ISP. It can be shown that ex ante regulation is not an attractive policy option.[198]

Unintended consequences could follow if Internet services are being provided using mobile infrastructure, yet Internet players are not making a direct payment to the mobile operator which has provided this infrastructure. In a market where consumers need access to the Internet to use Internet services, the societal value from adding an Internet app cannot be solely attributed to the respective OTT Internet player.[199]

[198] See CERRE, Market Definition, Market Power and Regulatory Interaction in Electronic Communications Markets, October 2014, Economic insights in the net neutrality debate, pages 33-39.

[199] CERRE, market definition, market power and regulatory interaction in electronic communications markets, October 2014.

Key Concept 8
Exclusionary Abuse

Exclusionary abuses lead to a weakening of competition, often by foreclosing competitors from a relevant market. Telecoms operators have been subject to regulatory and competition law scrutiny for their allegedly exclusionary practices. To date, Internet players have not, but the recent cases against Google may herald a change of attitude.

Exclusionary abuses occur when the conduct by a firm in a position of market power is likely to lead to the elimination or weakening of effective competition in the relevant market. This happens when a market player is able to force out or marginalise existing competitors or to raise barriers to entry for new potential competitors. All market players generally aim to increase their market shares by marginalising competitors, but in the EU and in comparable systems, a company in a position of market power is prohibited from doing so when this constitutes an abuse. This makes the analysis and assessment of exclusionary abuses in practice difficult to distinguish from common market practices: with exclusionary abuses, the focus is on the wider economic effect of abuse in the marketplace. Examples include predatory pricing and loyalty rebates by dominant enterprises.

Competition authorities often consider exclusionary abuses that take place in a market which is related to the market in which an enterprise has market power. This happens for example when a firm is able to control competition in a market downstream from the market in which it has market power. Examples of "related markets" exclusionary abuses are considered in depth in Key Concept 9 (Leveraging of Market Power) and Key Concept 10 (Bundling and Tying).

Exclusionary abuses can also be discriminatory or exploitative of consumers. For example, a firm with market power ties another product to the product in which it has power, thereby excluding competitors from that (secondary) market and possibly harming consumers. Refusal to supply access to an essential facility can be discriminatory and exclusionary.[199]

Refusal to supply and practices hindering access have also been considered as a potential abuse of a dominant position in cases where it has exclusionary and or discriminatory and/or exploitative effects, in the absence of an objective justification. In some cases, such as Telekomunikacja Polska,[200] the European Commission imposed a fine of €127 million on the Polish telecommunications incumbent for abusive practices in the market for "broadband internet access". Although competing technologies exist, TP was considered dominant in the market for access using its own wholesale access products, and to have abused its dominant position. Other instances of abuse included a refusal to provide

[199] Telecommunications firms are often SMP regulated for access to their networks although failure to grant access has been considered under abuse of a dominant position in some countries. Vodafone and Orange were fined 3% of their local annual turnover by the Romanian Competition Commission (2011) for failing to allow access to their networks. (See for example: http://www.consiliulconcurentei.ro/uploads/docs/items/id7454/mr_cornel_gradinariu_presentation_competition_in_the_telecommunication_sector_ro_experience_and_recent_case_law.pdf).

[200] COMP/39525, Telekomunicacja Polska.

reliable information; delaying techniques in discussions with potential competitors and proposing unreasonable terms at the beginning of the negotiations.

A special case of "related market abuse" which has been considered against telecommunications operators occurs when the operators use information acquired in the market in which they are dominant or have SMP, to stop customers from migrating to competitors, engaging in "win-back" and save activities. In Italy, an interim injunction was granted against Telecom Italia's practices to use information obtained from number portability requests in order to engage in win-back activities (Fastweb v Telecom Italia).[202] Similarly in France, the competition authority found against France Télécom for its use of information obtained as administrator of the local loop unbundling regime to market to customers who had switched to other providers in the French overseas departments.

Implications of the Digital Age

The telecommunications sector has been subject to significant regulation in the form of access obligations, structural separation and regulatory control of market power, in addition to heightened scrutiny under the competition rules.

By contrast, the new players in the digital age are not subject to SMP regulation and do not seem to be subject to the same level of competition law scrutiny: for example, some fundamental benchmark tests in exclusionary cannot be easily applied to the digital economy. The equally-efficient-competitor benchmark test examines whether a competitor with a similar cost structure could compete if it applied the same end-user price as the firm in a dominant position. In multi-sided market, it is often difficult to determine the end-user price. Moreover, digital rivals are unlikely to have similar cost structures.[203]

At the EU level, the competition law cases against Google may signal a change of attitude. The European Commission will investigate whether Google has abused a dominant position in two cases, also summarised in Figure 65, namely:

- The Search Engine Case: Google handles more than 90% of web searches in Europe.[204] In a classic example of alleged exclusionary "related market" abuse, the Commission will consider whether Google gives prominence to its own comparison shopping services, diverting traffic from potential competitors. In April 2015, the European Commission has sent a Statement of Objections to Google alleging the company has abused its dominant position in the markets for general internet search services in the European Economic Area (EEA) by systematically favouring its own comparison shopping product in its general search results pages. The Commission's preliminary view is that such conduct infringes EU antitrust rules because it stifles competition and harms consumers
- The Android Case (see also Figure 65 below) – to consider whether Google abused its dominance in its Android mobile operating system (80% of smartphones operate on Android).[205] Since 2005, Google has led

[202] Milan Court of Appeal, 16 May 2006.

[203] See European Parliament, Challenges for Competition Policy in a Digitalised Economy, quoted, pages 58-59.

[204] The Economist, 'Europe v Google, Nothing to stand-on', April 18 2015.

[205] V3 Technology news, 'Android on 80 percent of smartphones but Windows Phone growing fast', Jan 31 2014.

development of the Android mobile operating system. Android is an open-source system, meaning that it can be freely used and developed by anyone. The majority of smartphone and tablet manufacturers use the Android operating system in combination with a range of Google's proprietary applications and services. These manufacturers enter into agreements with Google to obtain the right to install Google's applications on their Android devices. The Commission's in-depth investigation will focus on whether Google might have breached EU antitrust rules by hindering the development and market access of rival mobile operating systems, applications and services to the detriment of consumers and developers. Russia's Federal Antimonopoly Service is also reported to be looking into similar complaints

As described in Key Concept 7, Discriminatory Abuse, both the Search Engine Case and the Android Case can be considered instances both of alleged discriminatory and exclusionary abuse.

Key Concept 9
Leveraging of Market Power

Within network industries, a firm with upstream market power can attempt to expand this power into the downstream segment. Leveraging may also occur from a market in which a firm has dominance to a related, but not vertically integrated market. The extent to which traditional operators are able to leverage market power in the digital age may be more limited. At the same time, Internet players' ability to leverage is only just starting to be considered.

The term "leverage" is commonly used in antitrust law to refer to practices of a firm extending its market power in one market, to a related market. Leveraging applies in vertically integrated sectors. A firm with wholesale market power (upstream) can attempt to extend this downstream within an industry, or into a related market. One example is the practice of "margin squeeze", which occurs when a firm raises the price of upstream inputs or lowers the price of downstream products in order to price potential competitors out of the market, leveraging upstream market power into the retail segment.

At the EU level, many of the leading cases on margin squeeze have occurred in the telecoms sector and concerned the supply of wholesale access products. Deutsche Telekom[206] was the first case in the sector and the same analysis was applied to other cases.[207]

In Deutsche Telekom, the EU Commission also found that the prices imposed were abusive under competition law, even though they were separately regulated and approved under the SMP system of regulation. This highlights an important difference between the regime applicable in the telecommunication sector in the US and the EU. In the US, the case of Verizon v Trinko is authority for the proposition that "when there exists a regulatory structure designed to deter and remedy anticompetitive harm, the additional benefit to competition provided by antitrust enforcement will tend to be small, and it will be less plausible that the antitrust laws contemplate such additional scrutiny". In the EU, it has been consistently held that firms in a position of market power have a responsibility not to abuse it and can be fined under the competition rules, even though they are subject to a special regulatory regime.

Regulatory authorities have been particularly aware of the potential for leveraging market power from upstream wholesale to downstream retail markets. As a result, "must supply" and "equivalence" remedies have been imposed on wholesale markets, alongside price controls. Firms have also been required to separate their wholesale and retail functions, to ensure that the two trade on an arms-length basis. For example, in the UK, BT voluntarily accepted commitments to create Openreach (access networks), separate from BT Wholesale, following a (competition law) market investigation inquiry by Ofcom, the regulator with concurrent competition law powers.

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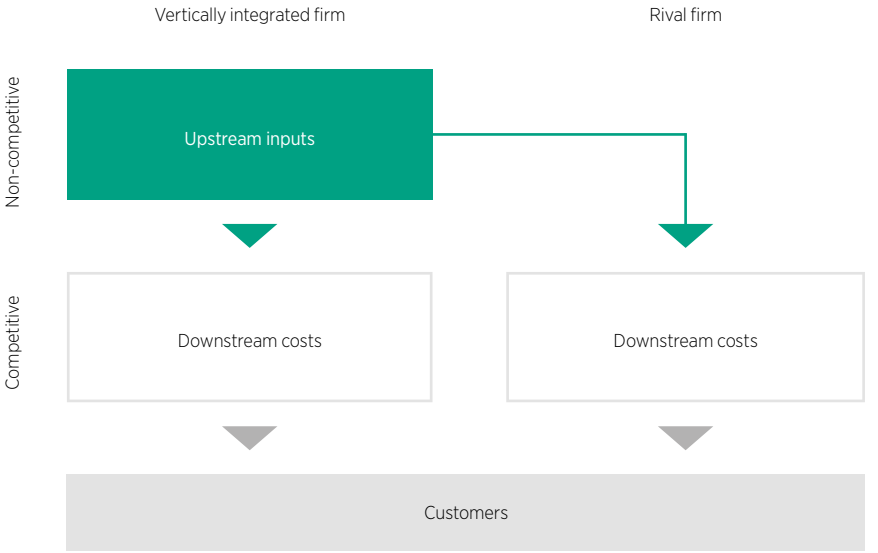
[206] Commission welcomes Court judgement in Deutsche Telekom "margin squeeze" case' http://europa.eu/rapid/press-release_MEMO-10-493_en.htm?locale=en.

[207] Telefonica, COMP/38436: the Commission imposed a fine of €151.8m on Telefonica for margin squeeze in the market for broadband internet access in Spain.

Figure 48: Example of vertically integrated industry



Implications of the Digital Age

As the traditional bottleneck characteristics of telecommunications access networks (particularly in the mobile sector) are reduced, issues of (potential) leveraging of market power into downstream markets correspondingly should raise fewer concerns.

Digitisation is creating new bottlenecks. For example, Apple owns patents regarding handsets, operating systems and software. A company with intellectual property at each stage of the value chain may be able to leverage market power from upstream to downstream due to its position of ownership. As new sources of market power emerge, regulators need to be aware of the opportunities for leveraging of market power and the consumer harm that may arise. (See Understanding Bottlenecks below).

As companies expand into adjacent markets and offer additional products – either on a bundled or standalone basis – there is also the potential for them to leverage their market power. Broadly speaking, leveraging can be defensive or offensive. The decisions against Microsoft analysed in Figures 51 (bundling of Internet Explorer with Windows, to the detriment of alternative web browsers such as Netscape) is an example of defensive leveraging, attempting to defend the primary market position by anticompetitive bundling. Offensive leveraging occurs when additional monopoly rents are sought from a second market and is a concern when one party is able to hinder competition on the merits due to its control over an input, an interface, or a platform, or over essential information. The case against Microsoft analysed in Figure 50 below (tying Media Player) is an example of offensive leveraging. The EU investigations into Google Search mentioned under Key Concept 8 (Exclusionary Abuses) is also an example of (alleged) anti-competitive offensive leveraging.

Key Concept 10
Bundling in Market Assessment

Bundling may lead to efficiencies and gains to consumer welfare. It can also be used as an anti-competitive strategy. It is important to consider the effects of bundling on a case-by-case basis by application of the competition rules, which are applicable to all players in the communications sector, rather than seek to introduce regulation on telecoms operators only.

As described in Key Concept 10, in Defining Markets in the Digital Age, bundling does not change the underlying principles upon which markets should be defined, but potentially increases the range of issues at the market definition stage. The number of products that need to be considered as potential competitive constraints on each other increases, as substitutability must be assessed between different bundles as well as between bundles and individual products within the bundle. If the market definition leads to the conclusion that two products are in different markets, then, depending on the circumstances of the case, the assessment could show that the dominant player bundling the original product with another product may be engaged in an anti-competitive practice (leveraging). If the two products are in the same market, the practice may not be abusive.

Bundling may give rise to significant benefits for consumers in terms of improved product offerings, lower prices and more straightforward customer experience. These factors should be taken into account when assessing their competitive impact.

Impact of product bundling on consumer welfare is ambiguous

The economic characteristics of communications and broadcasting markets make bundling a natural and efficient business strategy. In sectors, such as the cable industry, where costs are mostly fixed and variable costs are low, it makes sense to provide different versions of a product or service (in economic literature, this is called "versioning"). Low demand customers can subscribe to a "basic" service, whereas the high demand customers get a premium bundle.

There are many perfectly legitimate, indeed efficiency enhancing, motivations to bundle products:

- Price discrimination which benefits consumers
- Cost savings (production, distribution, transactions)
- Compatibility cost savings
- Protection of intellectual property
- "Legitimate" low prices
- Creating new products or increasing variety
- Quality assurance

In some circumstances, however, bundling may be an instance of exclusionary abuse. Broadly, there are three main types of consumer harm (theories of harm) that can arise from bundling:

- The elimination of competition (raising rivals' costs; lowering rivals' benefits; leveraging market power from home market; protecting market power in the

home market; committing to bundle to deter entry; denying network effects or scale to a rival; foreclosing by bundling complements (so-called "Cournot effect")

- Obscuring prices
- Consumer-harming price discrimination

In one possible scenario, the implicit price that is being offered to consumers for an element of the bundle is so low in relation to costs that limited-line rivals are foreclosed. Whether foreclosing entrants is likely to be a profitable strategy depends on a number of factors such as the market power of the bundlers, the ability of rivals to differentiate their product offering, and the extent of scale economies and network effects in the tied market.

When a firm or group of firms practices bundling, rivals may have a number of counter-strategies that they can use. They may be able to match the bundling, possibly by teaming or joint ventures. Where they consider that bundling disadvantages them, the customers of the bundling firms may also employ counter-strategies, such as sponsorship of stand-alone rivals or refusing to deal with bundling firms. In the presence of counter strategies, there may be less reason for competition authorities to intervene in the market.

Criteria for intervention

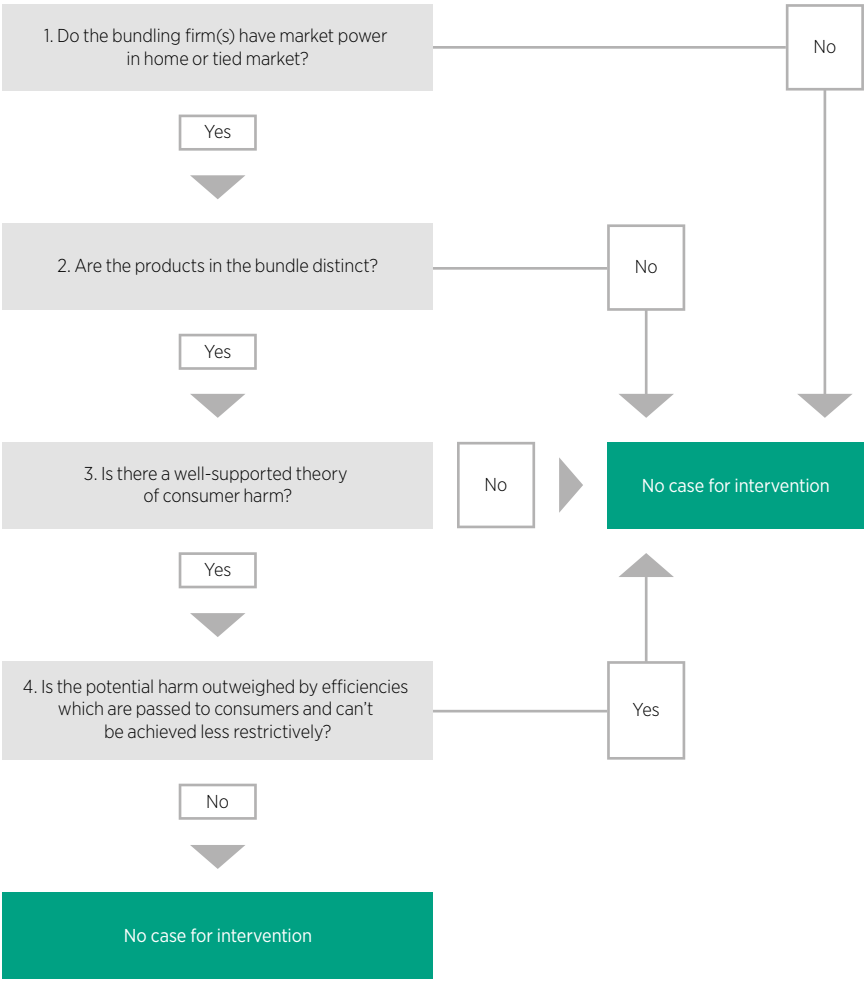
As bundling may be motivated by: (i) a (legitimate) desire to price discriminate, (ii) an anti-competitive strategy, or (iii) the pursuit of efficiency gains, it is necessary to examine the likely effects of bundling on the relevant markets before intervention is contemplated. Weighing these effects may involve a significant element of judgement. The following general principles developed in economic theory are helpful. First, the greater the market power of the bundling firm(s) in the tied and home markets, the greater the danger of consumer harm. Second, a regulatory or competition authority should weigh the empirical evidence of likely economic effects of conduct alongside any other contemporaneous evidence (such as internal strategy documents). The likely impact of bundling on rivals' ability to compete in the tied market depends on the market context and can be assessed using the following evidence:

- Incremental costs of tied product; the incremental price for an element of the bundle is below the incremental cost. This test, although important, is not determinative. It is often the case that the incremental price for an element of the bundle is below the incremental cost. It does not follow that bundling is necessarily anticompetitive. A proper assessment of fact taking into account all the factors to be considered needs to be carried out
- Market position of rivals, and their financial performance: if, for example, the evidence shows that the bundlers' rivals are winning market share throughout the period of bundling, it becomes difficult to maintain that competitors are being excluded. This is particularly the case if the rivals' expansion does not cause them financial losses. Again, however, this piece of evidence is not determinative: where other evidence is sufficiently strong, it may be possible to conclude that the market share of efficient rivals would have grown more, absent the bundling, and that accordingly the bundling was anti-competitive
- Ability of rivals to differentiate in tied product
- Percentage of tied sales (measuring the extensiveness of the bundling practice, and the size and financial importance of the customers available to limited line rivals)

- Whether key customers of actual or potential rivals are tied
- Extent of scale economies/learning curve effects
- Network effects in tied market
- Percentage of tied customers who buy the home good
- Internal documents
- Timing

The criteria for intervention are summarised in Figure 49 below:

Figure 49: Criteria for intervening in bundled markets



Examples – Contractual Tying and Aftermarkets

The European authorities have considered that a dominant player in the market for an original product may not leverage its market dominance in an "aftermarket", e.g. the market for replacement parts, accessories, and equipment for the care or enhancement of an original product, after its sale to the consumer. The two main cases are Hilti[208] and Tetra Pak II.[209]

Hilti was found dominant in the market for nail guns and cartridge strips, where it held patents. It abused dominance by engaging in practices aimed at excluding independent manufacturers of nails from supplying users of the guns, including refusing to supply cartridge strips to customers who may provide the strips to independent manufacturers of nails, refusing to honour the guarantee on the guns if these had been used with non-Hilti nails and insisting that purchases of the cartridges should come with a number of original nails. Tetra Pak was dominant in the market for equipment used in the packaging of liquid in cartons. Tetra Pak sought to tie the sale of the equipment with the sale of the cartons, foreclosing independent carton manufacturers. The EU Commission fined Tetra Pak and Tetra Pak appeals failed. The European Court of Justice found that "any independent producer is quite free, as far as Community competition law is concerned, to manufacture consumables intended for use in equipment manufactured by others."[210]

Examples – the Microsoft Cases

Microsoft was investigated and fined for bundling the Windows operating system with Windows Media Player in the EU and in the US (Figure 50 and Figure 51). In Europe, the case focused on bundling in the presence of interoperability issues. In the US, the focus was more on predatory strategies and barriers to entry arising from product bundling as an anti-competitive strategy.

Implications of the Digital Age

As bundling is a feature of the digital age and has the potential both to enhance consumer welfare and to lead to consumer harm, it is particularly important to examine bundling on a case by case basis, by the application of the (ex post) competition rules. In the absence of a high degree of market power and the evidence mentioned above, the potential for harm is limited.

Ex ante SMP regulation in relation to bundling is particularly harmful as the effects of bundling are so ambiguous. Regulation could limit the potential for product innovation and potentially resulting in consumers missing out on benefits. As such, regulators should consider existing SMP designations and remedies in bundling contexts, weighing up the consumer benefits against any economic harm. They should ensure that, if required at all, remedies are applied consistently to create a level playing field. Companies are becoming more innovative in the way in which they bundle together and charge for services at a discount to the standalone products.

As bundling increases in prevalence, authorities should be aware that it may be occurring in ways that are not immediately obvious to the consumer – for example, the bundling of applications with operating systems and handsets.

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[208] Hilti AG v Commission Case T-30/89, General Court, [1991] ECR II-1439.

[209] Tetra Pak International SA v Commission, Case C-333/94 P, Court of Justice [1996] ECR I-5951.

[210] Para 36, Case C-333/94 P above.

Figure 50: Microsoft bundling of Media Player – EU

Microsoft bundling of Media Player – EU

The European Commission issued an infringement decision against Microsoft for abuse of its dominant position, by bundling Windows Media Player with the Microsoft Windows operating system. Even when the operating system was unbundled, there were interoperability concerns that meant that providers of non-Microsoft media players found that their products could not be used with the Windows operating system. So the abuse of dominance case focussed on interoperability as well as the bundling issue.

The case arose as a complaint from Sun over Microsoft's licensing practices in 1993.

The EU ordered Microsoft to:

- pay a fine of €497 million, the largest fine ever handed out by the EU at the time; and
- offer a version of Windows without Windows Media Player and the information necessary for competing networking software to interact fully with Windows desktops and servers. Microsoft had 120 days to divulge the server information and 90 days to produce a version of Windows without Windows Media Player.

On 12 July 2006, Microsoft was fined an additional €280.5 million and on 27 February 2008 an additional €899 million for failure to comply with the March 2004 antitrust decision (although this was subsequently reduced to €860 million). This represented the largest penalty ever imposed in 50 years of EU competition policy prior to 2009, when the European Commission fined Intel €1.06 billion ($1.45 billion) for anti-competitive behaviour.

The Microsoft case centred on the impact of bundling and interoperability – and whether the potential consumer harm from bundling as an anti-competitive practice to restrict new entry of standalone products outweighed the potential consumer gains from innovation. Despite Microsoft's arguments that revealing its source code would reduce its future incentives to innovate, the Commission ruled that these benefits would be outweighed by the restriction to new entry and hence required the products to be unbundled and source code to be made available.

Figure 51: Microsoft bundling of Internet Explorer – US

Microsoft bundling of Internet Explorer – US

The plaintiffs Sun Mycrosystems alleged that Microsoft abused monopoly power on Intel-based personal computers in its handling of operating system and web browser sales. The issue was whether Microsoft should be allowed to bundle its flagship Internet Explorer (IE) web browser software with its Microsoft Windows operating system.

Bundling was alleged to have aided Microsoft's victory in the so-called "browser wars": every Windows user had a copy of IE. It was further alleged that this restricted the market for competing web browsers (such as Netscape Navigator or Opera) that were slow to download over a modem

or had to be purchased at a store. Underlying these disputes were questions over whether Microsoft altered or manipulated its application programming interfaces (APIs) to favour IE over third party web browsers, Microsoft's conduct in entering into restrictive licensing agreements with original equipment manufacturers (OEMs), and Microsoft's intent in its course of conduct.

Microsoft stated that bundling Microsoft Windows and IE was the result of innovation and competition, that the two were now the same product and were inextricably linked together and that consumers were now getting all the benefits of IE for free.

Those who opposed Microsoft's position countered that the browser was still a distinct and separate product which did not need to be tied to the operating system, since a separate version of IE was available for Mac OS. They also asserted that IE was not really free because its development and marketing costs may have kept the price of Windows higher than it might otherwise have been.

On June 7, 2000, the court ordered a breakup of Microsoft. According to that judgment, Microsoft would have to be broken into two separate units, one to produce the operating system, and one to produce other software components. However, Department of Justice (DOJ) announced that it was no longer seeking to break up Microsoft and would instead seek a lesser antitrust penalty. Microsoft decided to draft a settlement proposal allowing PC manufacturers to adopt non-Microsoft software. On 2 November, 2001, the DOJ reached an agreement with Microsoft to settle the case. The proposed settlement required Microsoft to share its application programming interfaces with third-party companies and to appoint a panel of three people who would have full access to Microsoft's systems, records, and source code for five years in order to ensure compliance. However, the DOJ did not require Microsoft to change any of its code nor prevent Microsoft from tying other software with Windows in the future.

Figure 52: Bundling of applications, operating systems and handsets

Bundling of applications, operating systems and handsets

Those customers who purchase an iPhone are automatically using the iOS operating system – also provided by Apple. Those who choose to download applications onto their iPhone, use the iTunes applications store. These applications are then licensed to the iPhone to which they have been downloaded and cannot be used on a non-Apple device.

There are obvious benefits to the consumer from this, including:

- Convenience
- Ease of use
- Knowledge that there are not interoperability or security issues
- Benefits from innovations undertaken by Apple and application providers who know they have a large potential user base

In the Wake of ComCast-Time Warner Cable: What Does it Mean for Telecoms Mergers in the US? - Analysis[211]

Tim Cornell, Partner, Head of U.S. Antitrust Practice, Clifford Chance

When the proposed merger of Comcast and Time Warner Cable came to a grinding halt recently, many practitioners wondered what this meant for telecommunication mergers going forward. The deal collapsed after the US Federal Communications Commission told the companies that it would challenge the deal as not in the public interest – a somewhat ambiguous standard that includes competition concerns as well as other factors.

At first blush, many initially thought that the competition concerns about the transaction revolved around cable television (the two companies being the largest providers of the product). However, it became readily apparent that US authorities focused on how the transaction affected consumer access to the Internet. The two companies' combined shares in US high-speed wireline broadband access would have been approximately 55-60%.[212] At the end of the day, the US authorities found that no divestiture or conduct commitment could cure their concerns with the transaction. The transaction's review presents some lessons learned for large telecommunications transactions:

First, companies need to prepare for the possibility that the marketplace may change during the pendency of the merger control review. The companies initially pitched their transaction as one in the cable television segment, where there was limited overlap. But, several new services (e.g., the launch of streaming services by Sling, HBO and CBS) that were highly dependent on broadband at the last mile emerged while the proposed Comcast-Time Warner transaction was pending. These new services highlighted the importance of the transaction effect on the provision of broadband access and net neutrality.

The shifting sands of the telecoms marketplace are an important consideration for telecoms engaging in strategic transactions. The telecoms marketplace is evolving. Traditionally, market definitions are being pushed aside as broadband access, video streaming, and ubiquitous connectivity all eclipse voice and data rates as

[211] This paper expresses the views of the author and does not necessarily reflect the views of GSMA or of any particular mobile operator.

[212] "High speed" having been redefined by the FCC during the pendency of the transaction. These market shares were disputed.

principal consumer concerns. Telecoms might consider whether the marketplace is converging on an information dissemination relevant product market rather than traditional voice and data markets and, perhaps in that former category, the market is actually expanding rather than contracting. A larger market definition would be helpful for telecoms in terms of merger control review.

Second, telecoms need to recognize that the FCC has an important role in deciding whether a transaction meets antitrust muster. The "public interest" standard by which a transaction is adjudged by the FCC is arguably easier to meet that the "substantially lessens competition" standard that the DOJ faces under Section 7 of the Clayton Act – yet they both involve the transactions effect on competition. Thus, for telecoms mergers where the FCC has issues, the DOJ can piggyback on that FCC challenge without bringing its own challenge, especially if that challenge might not be successful under Section 7 alone.

Third, while some within the relevant agencies argue that political influence in merger clearance matters does not occur, the large lobbying efforts on both sides of the Comcast and Time Warner cable transaction tells a different story. Comcast had one of the more prominent Washington insiders leading its lobbying effort and several connected lobbyists. While varied in composition, opponents had equal or larger lobbying entourage and included: programmers like the Tennis Channel and Netflix; access providers like Dish Network; media-related associations such as the Writers Guild of America; fan sites like the Harry Potter Alliance; and concerned municipalities such as the town of Moultonborough, N.H. There were more than 300,000 comments filed with FCC concerning the proposed transaction – almost 7 times as many as were filed during the pendency of the AT&T–T-Mobile transaction. While no one can peg an exact metric on political influence, it appears at the end of the day, the opposition's political endeavours paid off.

Fourth, telecoms should be cognizant that price effects may not be the central focus of the government's review. For the Comcast and Time Warner Cable review, the threat that the combined company could favour its own content appears to have been more at the top of the government's list. While in AT&T / T-Mobile and Sprint / T-Mobile the focus of the government's review was pricing of cellular service to consumers, competition between mobile services today appears to have less to do with the price of phone and cellular services, and more to do with Internet and application access. This is likely to continue to evolve as Wi-Fi and other access points erode the convenience and/or necessity of cellular access, especially in urban and suburban areas. Future telecommunications parties considering strategic transactions will need to spend considerable time analysing non-price effects.

On a going forward basis, many of the issues raised above may play out in the review by US authorities.

Embracing Dynamic Efficiencies

Increasing digitisation is generating new efficiencies within the telecommunications sector, driven by innovation and investment and merger synergies arising from market consolidation. However, the competition authorities and the regulators have yet to take into account these factors fully.

Background

The concept of dynamic efficiency relates to the productivity and cost savings of a firm over time. These are often driven by investment in technology and the resulting economies of scale. Competition has typically been seen as the core driver of firm efficiency. Moreover, monopoly structures have been regarded as the least efficient given the lack of incentives to invest and the absence of competitive pressure. It is questionable whether competition authorities and regulators have generally taken an overly-restrictive and formalistic approach to the analysis of efficiencies in light of the dynamic nature of the markets and emerging digital technologies. However, in the Digital Age, new sources of efficiency have also emerged. In the telecoms sector, there is a growing debate over whether increasing the number of competing networks or authorising network consolidation when this leads to a smaller number of more efficient network operators, provides the best incentives for innovation and investment and the extent to which remedies may enhance or dampen these incentives.

The Debate

What impact is greater digitisation having on both efficiency and the efficient functioning of markets?

Digitisation has opened up new ways for firms to be efficient in the mobile ecosystem, yet also placed additional constraints on telecoms operators' pricing and profitability. With digitisation, technology changes at something resembling Moore's law.[213] for electronic components. In this ecosystem, dynamic efficiencies become the main source of consumer benefits. The reorganisation and simplification of business models, alongside a trend of consolidation amongst telecoms network operators, is leading to an increase in productive efficiencies as a result of greater economies of scale. At the same time, a (at least partial) reduction in barriers to entry in the digital age has resulted in new products and services being launched, often as a bundle, which may create supply side efficiencies. Network effects have gained particular prominence with the emergence of Internet and Voice over IP ("Internet calls" or "VoIP") services. Innovators may be able to rapidly achieve efficiencies through the network effects following the introduction of new products and services. (Key Concept 1 - Efficiencies in Competition Policy).

[213] Moore's Law originated around 1970. "The simplified version of this law states that processor speeds, or overall processing power for computers will double every two years." (see *http://www.mooreslaw.org/*).

Figure 53: Key issues associated with efficiency considerations in the digital age

	General	Digital Age Issues
Types of efficiencies	Allocative efficiency occurs when firms produce goods and services to match consumer preferences. Productive efficiency occurs when firms minimise the cost of producing goods and services. Dynamic efficiency occurs when short term and long term incentives, for example with regards to innovation are balanced.	In the digital age, dynamic efficiencies are cumulative. If operators are not able to capture dynamic efficiencies, they will rapidly lose ground. There is evidence of falling costs, driven by investment and consolidation, which is leading to falling retail prices, e.g. cost per megabyte and significant investment leading to greater bandwidth and faster speeds. Competition and falling barriers to entry are driving innovation and R&D, promoting dynamic efficiency.
SMP and dominance	Competitive markets are most likely to deliver an efficient outcome, but where a lack of competition is established there may be a case for regulatory intervention. Policy makers need to balance efficiency gains against potential competitive harm when reviewing potential remedies.	Remedies should be applied following an SMP and dominance assessment that considers all the players and influences in the digital value chain. Remedies should be applied on a non-discriminatory basis to traditional and digital age players to promote a level playing field. As relevant markets expand and more players provide substitutable services, the opportunity to remove regulations and move towards ex-post competition law presents itself.
Efficiencies in merger cases	Efficiencies resulting from the proposed merger should be given weight alongside any evidence of potential competitive harm. Efficiencies have often been overlooked as competition authorities have not been able to definitely attribute them to the merger, ascertain they will occur in the short term and to demonstrate they will be passed through to consumers.	Efficiencies may result from mergers – for example economies of scale and scope, incentives for innovation and investment and efficiencies from bundling of products. Traditionally, competition authorities have only looked at short-term efficiencies. However, more focus may be required on longer term incentives to investment and innovation to promote dynamic efficiencies.

How much are the falling prices observed in the mobile market, and particularly for mobile data, driven by dynamic efficiencies?

Dynamic efficiencies are leading to a reduction in operators' cost base and falling retail prices. A recent GSMA report[214] found that between 2004 and 2014, mobile operators' EBITDA fell by 10% whereas retail prices fell by 63%. This suggests that most of the price fall was due to dynamic efficiencies, largely generated by the shift to 3G from 2G over the period.

Is the current competition policy approach to considering efficiencies, particularly in the context of mergers, still adequate in the digital age?

Competition authorities have typically placed less weight on analysis of efficiencies than on gathering evidence of competitive harm. One reason for this is that customer benefits arising from efficiencies may occur in the longer term, whereas competition authorities typically limit their review period to shorter timescale. Secondly, it may be difficult to disentangle the efficiencies that arise directly from the merger from those that would occur in any case. However, as consumers demand more dataheavy services and this leads to a need for more network capacity, it is essential that operators are incentivised to invest. This requires competition authorities to recognise the efficiencies that will result from network investment and to investigate fully the relationship between mergers, efficiencies and investment (Key Concept 3 - Efficiencies in Merger Control).

When should regulators intervene to best promote the efficient functioning of markets?

It is important to consider the changing dynamics – the substitutability of services, complementarities and network effects and the impact of these on efficiency incentives. These considerations should be given to both traditional and digital players and services, on a technology neutral basis, so that competition can develop on a level playing field (Key Concept 2 - SMP and dominance: Promoting efficient functioning of markets).

[214] Op cit.

Key Concepts

Dynamic efficiencies are crucial to understand the digital economy. The Key Concepts are:

Key Concept 1
Efficiencies in Competition Policy

Key Concept 2
Dominance / SMP: Promoting the Efficient Functioning of Markets

Key Concept 3
Efficiencies in Merger Control

Key Concept 1
Efficiencies in Competition Policy

Competition policy should consider the potential efficiencies and the benefits to consumers from all sources, not just price competition, and the extent to which dynamic efficiency gains are being passed through to consumers. Growing digitisation leads to very fast technical progress. This opens up new ways for firms to be efficient, yet also places additional constraints on operators' pricing and profitability. The benefits of investment can stimulate further investment and product innovation downstream in the value chain and economic growth more widely.

The extent to which efficiencies can or should be taken into account in the assessment of market power varies.

In the EU, efficiencies can be taken into account in the assessment of potentially anticompetitive agreements under the terms of Art 101(3) of the Treaty on the Functioning of the EU (TFEU). Any agreement having an anticompetitive object or effect can be exempted from the prohibition if it *"contributes to improving production or distribution of goods or to promoting technical or economic progress"* provided that the restrictions are indispensable to the attainment of the objectives and competition is not eliminated. Consumers must also have a *"fair share of the resulting benefits"*.

There is no equivalent exemption in Art 102 TFEU for abuse of a dominant position. Nevertheless, it is implicit in the concept of an abuse that conduct which has objective justification, or conduct whose benefits outweigh the anticompetitive effects, should not be an abuse. This line of reasoning is known as the "efficiency defence". However, defence claims are difficult to prove and have commonly been rejected by the Commission and the Courts in the EU. See Key Concept 2, SMP and Dominance, Promoting the efficient functioning of markets.

In merger control, Art. 2(1) of the revised EU Merger Regulation requires that the Commission takes into account certain factors when assessing a merger, including *"the development of technical and economic progress provided that it is to consumers' advantage and does not form an obstacle to competition"*. An assessment of market power needs to consider the efficiencies that can be generated by the particular behaviour or the merger in question. If there are restrictions to competition, are these outweighed by the commercial and economic benefits that can be achieved? In practice, the assessment of efficiency in merger control has proven difficult. See Key Concept 3, Efficiencies in Merger Control.

In SMP regulation, as seen above (under Assessing Market Power in the Digital Age, Key Concept 2, Dominance / SMP), promoting competition is one of the regulatory objectives that a regulator must follow when determining the remedy to be imposed. Especially under the Access Directive, promoting competition must be considered both from a static and a dynamic point of view (by encouraging efficient investment and innovation).

Traditionally competition authorities and regulators have focused their efforts on analysing the likelihood of consumer harm from a particular market position, practice or merger, while giving less weight to the efficiencies that may arise in a particular case. The burden of proving efficiencies is on the firm making a claim for efficiency and, in practical terms, the standard of proof has been very high. In merger control, parties are often under the impression that efficiencies

are only considered in the presence of competition concerns and therefore to mention efficiency is considered risky, also due to the very high burden of proof for efficiencies. (See Key Concept 3, Efficiencies in Merger Control). As such efficiency benefits may be overlooked and remedies be imposed that do not necessarily maximise consumer benefit.

Economic theory defines three main types of efficiency that can be achieved by competing firms:

- *Allocative efficiency*: Firms produce the optimal amount of goods, which represent consumers' preferences. In a perfect model, every good or service is produced up to the point where the last unit produced provides a marginal benefit to consumers equal to the marginal cost of producing. Competition is said to be allocative efficient, whereas monopolies can be allocative inefficient: market power can lead to price increases above the marginal cost of production
- *Productive efficiency*: Firms produce the maximum amount of goods at the lowest cost by the optimal combination of inputs or resources. A slightly different, but similar efficiency is socalled technical efficiency which occurs when costs are minimised not through optimal combination of inputs, but by maximising output from a given input (e.g. a machine, or workers)
- *Dynamic efficiency*: Firms achieve the appropriate incentives to innovate and to invest. Relatively high profit margins may be considered positive and, indeed, necessary to recover investment.[215] This contrasts with the theory of allocative efficiency in which high profit margins can be seen as evidence of consumer exploitation and market power

As a firm becomes more efficient, its cost savings can be passed onto consumers in the form of lower prices. In telecommunications, operators are typically able to benefit from economies of scale, spreading the fixed costs of infrastructure investment over a larger number of users as the number of consumers on their network increases, decreasing costs per unit.[216]

Efficiencies can be achieved on the demand-side and the supply-side.

Demand side efficiencies

Demand side efficiencies occur when a firm is able to reduce costs via interactions with consumers or other end users. Notable knock-on effects include:

- *Network effects*: as the number of people using a product increases, the convenience to other users from using the service increases, incentivising usage of the service. Increased investment in network capacity and new technologies can acquire a larger number of users of a network, reducing costs per unit
- *Enabling effects*: a large user base encourages those in other industries to make use of this base. In particular, as the number of data users rises, supported by improvement in data speed and accessibility, there are wider benefits to the economy. The beneficiaries include not only those in linked industries (e.g. handset manufacturers, apps developers) but also more widely in the economy, e.g. banks, health care providers, educators, governments. These have all sought

[215] The concept was first developed by the Austrian economist Schumpeter and therefore economists sometimes refer to a Schumpeterian framework of assessment.

[216] Usually the need for a new technology is reached when economy of scale are exhausted. When the quantities to be served requires accumulating equipment of current technologies (economy of scales are exhausted), this implies that a market for new equipment of high capacity is emerging. The emergence of a new generation of equipment leads to a new cycle of volume growth benefitting from economy of scale.

to launch new products and services over the Internet platform, further boosting productivity and long-term economic growth

- *Pricing effects*: changes in the price of a good or service can attract a larger number of users, reducing costs per unit
- *Quality effects*: an increased user basis can provide incentives to extend coverage or to compete on quality of service and other non-price factors
- *One-stop shopping effects*: bundling services (e.g. telephony, media and broadband) allows consumers to reduce search costs and acquire multiple individual products in a single purchase, increasing efficiency for vendors
- *Citizenship effects* – similar to network effects, once a sufficiently large number of users are connected via social media or similar, they may be able to exert an influence on companies or their government and hold them to account more easily and more effectively for their actions

Supply side efficiencies

Supply side efficiencies relate to unit cost reductions that can be achieved through the interaction with suppliers. These may include:

- *Cost reductions*: As operators invest in new technologies, there may exist a learning curve, whereby 'learning by doing' allows for cost reductions at both the upstream and downstream level over time. Furthermore, new technologies may allow the same or an improved service to be provided more cheaply
- *Double marginalisation*: Double marginalisation occurs when an upstream and downstream firm have monopoly power in their respective market, and each firm reduces output from the competitive level to the monopoly level, at the expense of consumers. Following a merger, the vertically integrated firm can reset output to competitive levels at both stages of the supply chain, achieving economies of scale and lower costs for consumers[217]

Implications of the Digital Age

Investments undertaken by telecoms operators have benefited consumers directly, as well as providing indirect benefits to others in the digital value chain which rely on underlying telecoms networks for their services. These benefits have been realised in terms of both capacity and service quality. For example:

- Cost per Megabyte significantly decreased across different technology cycles by a factor of five or more[218]
- Faster speeds have supported the exponential development of content and applications

A recent GSMA report[219] found that between 2004 and 2014, mobile operators' EBITDA fell by 10% whereas their retail prices fell by 63%. This suggests that most of the price fall was due to innovation in the sector (dynamic efficiencies), primarily from the shift to 3G from 2G over the period. These efficiencies are likely to continue as operators continue to innovate and invest in new technologies, such as 5G and femtocells, which will further improve coverage, provide faster data speeds and reduce overall costs. The challenge for policy maker is to

[217] It should also be noted that the investment of the operators represents the turnover of network equipment manufacturers. *Thus, network investment provides the resources and incentives for manufacturers to develop successive generations of network equipment.*

[218] GSMA (2014),"European mobile network operator mergers. A regulatory assessment".

[219] Op cit.

understand that by trying to slightly reduce price through reducing EBITDA margin, the incentives to invest may also be reduced and limit the speed of greater unit price reduction resulting from investment in improving technologies.

Greater digitisation is also prompting firms to re-organise their structure and attracting new entrants to service the value chain – specialising in particular segments, such as apps or handsets, where they may have a particular relative advantage. This reorganisation and simplification of business models is also leading to an increase in productive efficiencies.

Moreover, barriers to entry are now significantly reduced. In the digital age, the entire value chain is enlarged, new services and products are available to the customers and therefore new business opportunities arise. Moreover, companies have started to provide differentiated services.

Finally, consolidation is occurring amongst telecoms network operators, generating economies of scale, both from an enhanced customer base and opportunities for investment. Merged firms can benefit from an enhanced customer base by combining assets, for example spectrum infrastructure, and consequently may be able to pass any scale economies on to consumers. Enhanced operator revenues may also enable greater capital expenditure and investment in new technologies (dynamic efficiency), benefiting consumers. Consolidating firms can launch quad-play and triple play offers. These provide new opportunities for efficiency, reducing the cost of acquiring customers, whilst innovation can allow for greater opportunities to reposition products and achieve economies of scope. The constant development and innovation within the sector may also mean that efficiency gains follow a learning-curve type process. The efficiencies associated with consolidation and mergers are discussed further under Key Concept 3.

Despite the efficiencies occurring in the digital value chain, however, operators may be unable to attain further economies of scale due to the reduced profitability of data network expansion following the emergence of Internet and VoIP applications. Moreover, the rise of "freemium" messaging and voice applications has also placed a heavy requirement on operators to minimise costs per unit, maximising efficiency in order to remain profitable and competitive. Unless operators can find a way to better monetise their contribution to the digital value chain, further investment could be at risk.

Competition policy should actively consider the potential efficiencies and the benefits to consumers from all sources, not just short term price competition, and the extent to which dynamic efficiency gains are being passed through. The authorities need to consider both the short term and long term. For example, in the short-term Internet applications have provided consumers with reduced costs and greater choice. However, in the longer term operators may be unwilling to expand network infrastructure as the revenues generated by additional data usage may not exceed the cost of the additional network equipment. This may result in limited coverage in the longer term, curbing operators' ability to achieve increased efficiency through economies of scale, and incorporation of technical progress. The trade-off between lower prices in the short-term and the longer term[220] goal of providing investment incentives needs to be properly considered.

[220] "longer" term does not mean "long term". Reduction of EBITDA have an immediate impact on investment levels. Reduced investment levels can have an immediate impact on the availability of improved services (e.g. 4G).

Key Concept 2
Dominance / SMP: Promoting the Efficient Functioning of Markets

Investment in new technologies and network infrastructure is vital to further the development of the sector and achieve the positive knock-on benefits. Regulation should only be considered after a finding of SMP / dominance and with a view to promoting investment and associated consumer benefits. Policy makers must be careful not to reduce incentives for investment and innovation and to inadvertently reign in the rapid advances in digital services.

In imposing remedies on firms found to have SMP or to have abused a dominant position, regulators and competition authorities have to follow certain principles. (see Assessment of Market Power in the Digital Age, Key Concept 2, Dominance / SMP).

Regulators need to impose remedies that will ensure the promotion of competition, taking into account static and dynamic efficiency. Obligations must be "based on the nature of the problem identified", "proportionate" and "justified in light of the objectives".

In competition law at the EU level and in other jurisdictions which have adopted a system of SMP regulation, remedies imposed must be "proportionate to the infringement committed and necessary to bring the infringement effectively to an end". If there is no infringement, there is obviously no requirement for a remedy and it is implicit in the concept of an abuse that conduct which has objective justification, or conduct whose benefits outweigh the anticompetitive effects, should not be an abuse ("efficiency defence", see Key Concept 1, Efficiencies in Competition Policy). When a remedy or a commitment will apply in the future, the impact of the remedy needs to be assessed. Market testing has become a reality of many antitrust cases, as well as merger control cases.

Defence claims in abuse of dominance cases are practically difficult to prove and, as a matter of practice, have commonly been rejected by the Commission and the Courts in the EU.

In the EU, current SMP regulation requires that intervention must follow a number of principles:

- Regulatory interventions should deliver outcomes in the least distortionary and burdensome manner. Remedies should only be imposed where necessary, considering alternatives to regulation. A cost benefit analysis should be undertaken to ensure that remedies are leading to better consumer outcomes than the status quo
- Second order implications of remedies should be considered. Regulators must be aware of the risk of unintended consequences and negative knock-on impacts in other markets
- Remedies should maintain a level playing field and be applied on a non-discriminatory basis to all market participants on a technology and service neutral basis
- Regulatory intervention should be adaptive, reflecting the changing operating environment and recognising that remedies may warrant removal more quickly in fast changing markets. As relevant markets expand and more players are providing substitutable services, there are opportunities to remove regulations

and move towards the enforcement of competition law (ex-post).

Finally, an efficient market requires transparent market information and decision-making. This requires regulatory authorities to exercise their functions as transparently as possible, providing appropriate information on regulatory decisions and on relevant market information and opportunities for consultation.

Implications of the Digital Age

Regulatory certainty is of vital importance in the digital age in order to provide the correct incentives for efficient investment and competition within the telecommunications industry. Network expansion represents a significant investment, and operators consequently require regulatory certainty to invest.

Remedies should be considered in the context of the technology lifecycle: mobile technologies have a relatively short life cycle – typically about 6 to 8 years before the "next generation" of technology emerges.[221] This means that network operators must be confident that they can recover the cost of developing and operating the technology within this short lifetime in order to commit funds for investment. Competition authorities therefore need to strike a balance between preventing competitive harm and imposing remedies that could hinder investment and the positive economic benefits associated with network investment and take-up. This has been recognised by a number of authorities, for example, in connection with remedies imposed on virtual unbundled local access. The EU, for instance, has encouraged regulatory authorities in the member states to take a "light touch" approach, so as not to dissuade investment.[222]

Regulators and competition authorities should be cautious of imposing remedies that may create perverse incentives – for example, by increasing costs or limiting the cost reduction potential, reducing innovation or investment or stifling increased choice or price declines.

Furthermore, it is important that remedies are applied on a fair and transparent basis across all market participants, on a service and technology neutrality basis recognising that market power and bottlenecks have evolved from the time when remedies were first imposed on network operators. The market environment is continuing to evolve rapidly, so regulatory and competition authorities should take a flexible and adaptive approach. To the extent that mobile operators may no longer be dominant in a number of markets, due to wider market definitions and increasing substitutability, then remedies should be removed to ensure that operators can compete on an equal basis and that efficiencies from competition can be realised.

[221] And much shorter "sub cycles". Within 3G, for example, there have been three sub-cycles. It is expected that a number of versions of 4G will be developed before 5G. These sub-cycles occur ever 2-3 years.

[222] See, for example: 'Broadband: Commission sets out common EU approach on ultra-fast broadband networks', 2010. Available at: http://europa.eu/rapid/press-release_MEMO-10-424_en.htm?locale=en.

Key Concept 3
Efficiencies in Merger Control

Market consolidation is occurring globally. In Europe, mergers that lower the number of players in the mobile market from four to three have been cleared, albeit with remedies. In the U.S., there have been informal blockings. Competition authorities are applying their standard economic toolkit to assess the impact of these mergers – but are finding it increasingly difficult to generate timely and meaningful analysis.

In merger control, Art. 2(1) of the revised EU Merger Regulation requires that the Commission takes into account certain factors when assessing a merger, including *"the development of technical and economic progress provided that it is to consumers' advantage and does not form an obstacle to competition"* (Key Concept 1 above). Recital 29 EUMR states: *"In order to determine the impact of a concentration on competition in the common market, it is appropriate to take account of any substantiated and likely efficiencies put forward by the undertakings concerned. It is possible that the efficiencies brought about by the concentration counteract the effects on competition, and in particular the potential harm to consumers, that it might otherwise have and that, as a consequence, the concentration would not significantly impede effective competition"*.

In the Commission Guidelines on the Assessment of Horizontal Mergers, the Commission states that it will consider, amongst others, whether *"the efficiencies generated by the merger are likely to enhance the ability and incentives of the merged entity to act pro-competitively for the benefits of consumers, thereby counteracting the adverse effects on competition that the merger would otherwise have"*.[223]

In merger cases, competition authorities seek to analyse whether the competitive harm in a merger, often in the form of higher prices or reduced consumer choice, outweighs the benefits. Efficiencies are usually present in the form of economies of scale and related impacts that can be passed onto consumers in the form of lower prices and increased innovation by the merged firm. Proof of immediate efficiency benefits, often within a year, are a key factor in determining whether a merger case is cleared by competition authorities.

Implications of the Digital Age

Procedurally, the burden of demonstrating the potential existence of efficiencies falls on the merging entities rather than the competition authority. However, notwithstanding the pronouncements by the authorities, merging parties are often under the impression that, when assessing the impact of a merger, the potential negative effects are, in a sense, almost presumed, and any potential efficiency needs to be proven by the parties in a very detailed and robust way. This is contrary to the scheme of existing legislation in a number of countries including Art 2(1) of the EU Merger Regulation reproduced above: it would be

[223] Paragraph 77 of the Notice on Horizontal Mergers. In a speech in 2007, Philip Lowe, then Director General of DG Competition, put the point eloquently: *we apply an integrated approach. That means that we do not artificially distinguish between efficiencies on the one hand and other effects of the merger on the other. We rather weight all positive effects against all negative effects in one integrated step and assess whether the outcome is, on balance, positive for consumers"*.

important to analyse the potential positive and negative effects together, to see whether the outcome is, on balance, positive for consumers. Only if the outcome is, on balance, negative for consumers, should the parties be asked to provide evidence of any efficiencies which may counteract such negative effects.

This perception means that often the merging parties are hesitant to bring evidence of efficiencies to the attention of the authorities because to do so may imply that the merger would lead to competition concerns. In addition, proof of efficiencies involves a large amount of work, which may not be warranted given the lack of success in having efficiencies fully considered. As market consolidation increases and merger decisions become more finally balanced, it is important for competition authorities to focus on both efficiency gains and competitive harm to ensure merger clearance and remedy decisions are optimal.

This will require greater quantification and analysis of potential efficiencies:

- First, in the assessment of efficiencies and synergies, one issue often considered is whether the efficiencies go towards fixed or variable costs. In traditional sectors of the economy, it is often said that efficiencies in variable costs are more likely to result in consumer benefits. The telecoms sector is however characterised by significant sunk costs as well as fixed and common costs. The concept of variable cost and marginal cost is therefore not useful. The marginal cost is generally close to (or equal to) zero until a network reaches capacity, at which point the marginal cost of serving an additional customer (or of providing another minute of voice or another bit of data) is extremely high. For this reason, telecoms regulators use the Long Run Incremental Cost (or LRIC) concept rather than marginal cost. Indeed, the European Commission, DG COMP, the competition authority in Europe, uses LRIC in its assessment of certain categories of alleged abuse of dominance, such as margin squeeze. Furthermore, due to the presence of fixed and common costs and in order to recover investments that are sunk, it is necessary for operators to charge prices above LRIC for a number of services[224]
- Second, operator convergence allows greater economies of scale, improving efficiency for the merged firm compared to the two individual firms before. The merged firms to combine assets, creating investment opportunities, for example in spectrum infrastructure. This may bring significant benefits for consumers, reducing the cost of mobile ownership and usage, whilst also improving network coverage
- Third, merged firms may be able to deliver a higher level of investment in new technologies and network expansion than the individual entities, enabling the spread of innovation and further efficiency gains. As demand for data-intensive services grows and there is a requirement for more network capacity and at higher speeds, it is essential that operators are incentivised to continue to invest. The relationship between mergers and investment is not properly understood
- Fourth, mergers may lead to efficiencies by allowing the operators to take advantage of new sources of efficiency, such as the provision of individual services as a bundled product

However, in many cases, authorities have considered that the efficiencies could be achieved by other means (point 1 above), such as infrastructure sharing, rather than a full merger. In fact, network sharing could result in

[224] Therefore, in the telecommunications sector, prices for certain products have to be above LRIC in order for firms to recover their efficiently incurred costs.

fewer efficiencies, since retail costs and some network costs will be duplicated. Network sharing agreements also need to be monitored closely for on-going compliance with the competition rules. Governance issues are also often problematic for the parties of such agreements. Another difficulty arises because the claimed efficiencies in mobile-to-mobile mergers are likely to occur beyond the period considered. Mobile services require significant investment in infrastructure and development in order to deliver the benefits to consumers. The processes of deciding to invest, acquiring finance, site selection (often an extensive process) and deploying infrastructure that is ready to provide services to end-users may be a multi-year process, hence these benefits may only be delivered a number of years after the proposed merger. As a result, unless the time period considerations change, future mergers may be unfairly rejected based on a lack of immediate benefits.

Traditional price assessment tests, such as GUPPI,[225] may ignore capacity constraints, efficiency improvements and supply side positioning.

Finally, the available evidence suggests that consolidation does not result in reduced network investment (or indeed higher prices); competition authorities need to assess each case on its merits.

First, the potential for price increases after a mobile merger reducing the number of operators from 4 to 3 is not proven in practice. In the 2015 Consolidation Report, prepared for the GSMA, Frontier Economics analysed how prices for voice services changed in the past 14 years across markets with three and four operators.[226] The empirical analysis shows no evidence that prices are higher with three operators rather than with four. There is not an optimal number of operators that guarantees competition in the market and lower prices for customers; a case-by-case analysis is needed.

Even if there were such potential for a price increase, however, the benefits of mobile mergers, particularly in multi-sided markets, are likely to be measured in terms of innovation, quality and choice as much as lower prices, where access to services is already free to consumers. Firms compete for consumers on a non-price basis, such as through quality and choice. Incentives to bolster the quality of existing products and services, such as coverage and capacity, as well as greater innovation and partnerships which create new products and services, such as video on demand, online banking, health and education applications, are as important as traditional efficiency measures of lower cost base and the potential for lower retail prices (e.g. reduced price per megabyte).

Moreover, the reduction in number of operators from 4 to 3 in a market does not result in lower network investment. The GSMA's Consolidation Report included analysis looking at the link between competition and investment in EU countries during the previous 14 years and found no clear evidence that investment is lower in markets with three players rather than four. Mergers may increase investment for the reasons discussed earlier in this section.

[225] See above, footnote 168.

[226] Assessing the case for in-country mobile consolidation, A report prepared for the GSMA, May 2015.

Telecom Italia
Mobile to Mobile Mergers in the EU - Analysis[227]

Rosario Baratta, Head of Antitrust and Media Policy, Telecom Italia

In the last decade, competitive dynamics based on strong price competition have dramatically reduced mobile operators' revenues thus reducing their ability to invest in new technologies across Europe. European player are therefore increasingly looking at consolidation as a means to get more resources to invest and compete in a market which is more and more global.

Mergers fall under the competence of either the National Competition Authorities or the European Commission, according to specific revenue thresholds (see Assessing Market Power in the Digital Age, Key Concept 3, Mergers). Given the dimension of the telecoms players, the European Commission has been often in charge of assessing mergers in this specific market. As we will see, the Commission's approach to merger cases in the mobile market has been based in most cases on the identification of competition concerns mainly related to the so called unilateral effects that the concentrations might trigger (e.g. as a result of the merger, the remaining MNOs would be inclined to increase prices without necessarily coordinating their behaviour). In particular, the Commission's assessment is based on economic analyses which highlight the risk of short-term price implications, without giving proper consideration to the post-merger increase in the incentives for investment.

This approach is particularly harmful when considering that, in the last decade, competitive dynamics based on strong price competition have dramatically reduced operators average ARPU thus decreasing their ability to invest in Next Generation Mobile Networks across Europe. The European TLC sector has therefore not been in the position to keep up with the current fast broadband standards available in the United States and in Asia.

Merger control in Mobile Markets - the Application of the SIEC test

Until 2004, the test for EU merger control introduced in 1989 prohibited mergers creating or strengthening a dominant position. The European Merger Regulation

[227] The author acknowledges the contribution of Simona Girolamo (Telecom Italia). The views expressed are those of the author and do not necessarily represent the official position of Telecom Italia, GSMA, or any particular mobile operator.

139/2004 introduced the new "Significant Impediment of Effective Competition" (SIEC) test. The new "SIEC" test, allows the Commission to prohibit also those acquisitions which attribute to one single undertaking, not in a dominant position, the power to modify significantly the pre-merger competitive equilibrium of the relevant markets (e.g. by raising prices or reducing output).

The new test, therefore, introduced a major change in EU Merger Control. The previous regime was indeed aimed at preventing structural changes in the market (i.e. creating or strengthening a dominant position); the new regime is aimed at preventing specific anticompetitive effects, regardless of the fact that these are or are not consequences of a structural and non-reversible change in the market.

The main impact of the SIEC test regards, therefore, those concentrated markets (mainly oligopolistic ones) where market shares and structure make the creation of a dominant position difficult but might allow individual operators to alter competition by means of unilateral conducts.

According to the European Commission, this is the case for mergers in mobile markets that reduce the number of MNOs from 4 to 3. As a consequence, a new economic test has been introduced. The test includes the use of Gross Upward Pricing Pressure Index (GUPPI) which normally identifies potential price increases. The GUPPI formula is, indeed, based on the assumption that all mergers produce an increase in prices. As a consequence, recent 4 to 3 mergers have always been negatively evaluated by the Commission and approved with remedies.

The new SIEC test is therefore stricter than the previous one. According to the legislator the more restrictive test should have been mitigated by giving more importance to efficiencies (in particular dynamic ones) produced by the concentrations in terms, for instance, of increased investments.

However, recent case law of the Commission demonstrates that this has not been the case. Dynamic efficiencies have never been given adequate consideration in the Commission's assessment of mergers in mobile markets and are not included in the GUPPI model.

In most cases the Commission stated that these efficiencies were: a) not demonstrated; b) not merger specific; c) could have been equally achieved by other means (e.g. network sharing), preserving the number of competitors in a market.

However, the Commission's approach towards dynamic efficiencies is much stricter than that applied to potential price increases. Moreover, dynamic efficiencies are not directly included in the GUPPI model. As some economist suggest, in fact, efficiencies could and should be used to mitigate the overall assessment of negative effects on prices. [228]

[228] Caffarra C. (2013), The Competition/Investment Trade-Off Revisited? Lessons from Hutchison 3G / Orange Austria, in CRA Competition Memo.

On network sharing, several studies [229] show that mergers typically lead to much greater cost savings and efficiency benefits than the most advanced network sharing agreements. The Commission's reluctance to acknowledge and give necessary relevance to the efficiencies produced by the mergers is at odds with the current market situation as well as with the specific characteristics of the sector.

Indeed, the Telecoms sector is investment and innovation-intensive. Increased concentration usually generates improved incentive for investment and thus leads to faster networks and better quality and breadth of services.

Moreover, a thorough analysis of the last 15 years' market evolution shows that changes in relevant technologies have a clearer and more substantial impact on prices than the number of MNOs present in national markets. Indeed, average prices in Europe have constantly been reducing over this period. Despite the fact that the number of MNOs in national markets has constantly changed in both directions.

Precedents in Merger Control in Mobile Markets

The Commission's analysis of mergers in telecommunication markets has been focused on ensuring the survival of "mavericks" and has led the Commission to clear most important mergers only under commitments aimed at resolving the alleged anti-competitive effects of the deals. Although so far the Commission has not prohibited the proposed mergers, the imposition of far reaching commitments de facto reduces the potential for investment.

These deals usually obtain conditional EU approval only by proposing remedies aimed at reestablishing "competitive pressure" with at least one new competitor. The rationale behind these decisions is that unilateral effects could arise when the Commission finds that the merging parties are close competitors at the retail level, and that by removing important competitive forces from the market the merger would change the remaining operators' incentive to compete.

A first important case in this respect is Hutchison3G Austria/Orange Austria (2012), where for the first time the Commission applied a GUPPI analysis as a tool to estimate the risk of a merger bringing unilateral effects in terms of future increase of prices.

The Commission concluded that Orange Austria and H3G Austria were close competitors and H3G's strategy was to price aggressively in order to attract customers. The Commission argued that H3G played a key role in the Austrian market and, after the merger, it would have lost its incentive to compete in such a way; by consequence there would have been a price increase for Austrian consumers.

Thus, to address price concerns, Hutchison offered the following remedies: i) it committed to make spectrum available, which is a necessary condition for a new

[229] Frontier Economics for GSMA (2014), European Mobile Network Operator Mergers – A Regulatory Assessment.

mobile network operator to enter Austria's telecoms market ii) it committed to make wholesale access available to up to 16 virtual operators for ten years; and iii) it committed not to complete the acquisition of Orange before the conclusion of a wholesale access agreement with one virtual operator.

The Austrian merger is often quoted as an example where prices increased post-merger. However, analysts have pointed out that prices in Austria were already unsustainably low. Moreover, the operators had still to recover from a very expensive spectrum auction. Arguably, when all the factors are taken into account, it is not possible to conclude that the merger was the cause of any increase in prices. Furthermore, prices cannot be considered in isolation. Other elements such as: increased usage, better quality and innovation are also very relevant and the effects of a merger should be evaluated in the longer term.

A similar case is the Hutchison 3G UK/Telefonica Ireland merger (2014), in which the concentration led to a 4 to 3 market structure for MNOs present on the Irish retail mobile and wholesale markets. Eircom and Vodafone would have been the residual players in Ireland.

Also in this case, the Commission concluded that the merger would have produced unilateral anticompetitive effects. By eliminating H3G as an independent competitive force, the merger would have changed its incentives to compete aggressively on price and service innovation, hence relieving the pressure on the remaining competitors.

Moreover, the Commission was concerned that the merger would have jeopardized the network sharing agreement between O2 and the residual player Eircom, reducing the latter's ability to compete.

The Commission also investigated the efficiencies claimed by the merging parties, in terms of network coverage, speed and quality. Nevertheless, by comparing the situation before and after the merger, the Commission found that the merger in itself would not have brought significant additional benefits. The evidence collected showed that both parties were likely to achieve the same coverage and quality as the merged entity on a stand-alone basis.

However, as we have mentioned in the previous paragraph, the Commission's evaluation of postmerger efficiencies is very rigid and would require data on future investments which are almost impossible to provide in a fast-moving market like the mobile telecoms'. As a consequence, efficiency gains claimed by the parties are often considered speculative and difficult to quantify and are then not properly looked at.

For all these reasons, the Commission cleared the deal with remedies and without recognition of the efficiencies. In particular, H3G committed to sell up to 30% of the merged company's network capacity to two Mobile Virtual Network Operators (MVNOs) in Ireland which, on a fixed payments, would have obtained a dedicated "pipe" from the merged entity's network. This new model of network access is

aimed at increasing the incentives for MVNOs to use the capacity by offering services at attractive condition. The merging parties also committed to conclude two agreements and at least one was to be approved by the Commission before the conclusion of the transaction.

Similar concerns have been expressed when the Commission analysed the merger between Telefonica Deutschland and E-Plus (2014), the third and the fourth largest mobile network operators in Germany.

Even though the merged entity would have had approximately the same size of the retail market as the other German operators (Deutsche Telekom and Vodafone), the Commission considered that the deal would have removed two important and close competitors (Eplus in particular played a very important role in the German market); moreover, the Commission's investigation showed that the competitive pressure by MVNOs would have been limited, due to their dependency on access to the MNOs.

The Commission therefore concluded that, by eliminating two important competitive forces at the wholesale level, the deal would have led to deteriorated conditions for MVNOs access to mobile networks.

Furthermore, the Commission once again stressed the absence of evidence of substantial dynamic efficiencies (i.e. that, in an inertial scenario, Telefónica and E-Plus would not have been able to invest in networks quality sufficiently).

Telefonica's remedies to address the Commission's concerns reflect the structure of Hutchison's commitments in the Irish case. The Commission's approval of Telefonica's acquisition was conditional on the selling of up to 30% of the network capacity of the merged entity to MVNOs on the basis of the same fixed-payment model designed for the H3G/O2 merger. Moreover, like Hutchison, Telefonica committed to divest spectrum to new entrants. In addition, Telefónica committed to extend existing wholesale agreements with existing Telefónica, and E-Plus' partners and to offer wholesale access to all interested players in the future.

Conclusions

From a numerical point of view, the number of prohibition decisions in the Telecoms sector is low. Nevertheless, the Commission's approach in this sector is particularly interesting for the analyses applied and for the remedies imposed which have the potential to strongly impact the merging parties' ability to invest and compete.

In this sector, more than in others, Commission's decisions have been aimed at safeguarding the price competition that would have allegedly decreased after a 4 to 3 merger. The Commission, however, has repeatedly clarified that the number of MNOs in a market is not a problem in itself ("there is no magic number", is the Commission's mantra) and that each analysis is very much case specific. According to the Commission's explanation of its case law, in fact, elements like: i) quantity

and quality of MVNOs and, ii) whether or not the merging parties are close competitors and iii) dynamic, merger specific efficiencies, are more important in its assessment than the simple number of MNOs post-merger.

On the other hand, by analysing the mentioned precedents it is possible to identify the need for improvement, such as in the way that potential competition and dynamic efficiencies are assessed and in the role of GUPPI models.

Last but not least, it is important to stress that this very same approach is now likely to be applied also to concentrations in the fixed sector. The recent approval by the Commission (with far reaching commitments) of the Orange/Jazztel deal in Spain is an important precedent in that respect. In this case, the Commission's assessment is that the 4 to 3 deal is likely to eliminate an important competitive forces, thus creating the premises for unilateral anticompetitive conducts by the remaining three network operators. The type of commitments offered by the parties (i.e. remedies aimed at substituting the exiting competitive force with a new, similar one) tend to replicate the same mechanism already applied in mobile markets.

Understanding Bottlenecks in the Digital Age

New entrants and new business models have led to changes in bottlenecks. Depending on the market assessment in each case, traditional network access bottlenecks may be weakened and new bottlenecks created. These require appropriate monitoring under the competition rules.

Background

Figure 54: Key issues associated with bottlenecks in the digital age

	General	Digital Age Issues
Mobile and fixed access networks	What constitutes a bottleneck?	Has Internet bypass weakened (mobile) bottlenecks? Have substitution and indirect constraints widened the bottlenecks? Are mobile and fixed access networks still bottlenecks? To the extent bottlenecks still exist, are they being treated equivalently with new bottlenecks?
Spectrum	Spectrum is a bottleneck due to its scarcity. Spectrum is in high demand as due to increases in data use. Regulators should seek to promote efficient use of spectrum.	Spectrum refarming and trading freed up spectrum and increase efficiency. Mobile operators should be able to use spectrum from the digital dividend. Unlicensed use of spectrum is devaluing existing spectrum and reducing quality of service to customers.
Closed OTTs	Demand for closed OTTs is increasing.	OTTs introduce greater competition to voice and messaging services. Network effects may lead to closed OTTs being a bottleneck. Closed OTTs gather customer data and this provides a commercial advantage.

	General	Digital Age Issues
Application stores and operating systems	Operating systems are an essential component of a smartphone. Application stores are specific to a particular operating system.	Application developers need permission to place an app on an app store. The operating system may be a new type of bottleneck, despite the "open source" characteristics of Android (currently being investigated by the EU). Bundling an app store with the operating system may allow leveraging of market power from the app store to the operating system and device market. Lack of interoperability between apps, app stores and operating systems may create a barrier to switching and entry.
IP Interconnection	IP interconnection is required to connect customers with content and applications. There are five parties in the IP value chain – content and application providers (CAPs), IP transit providers, Internet traffic exchange providers, content delivery networks (CDNs) and ISPs.	CAPs and ISPs are vertically integrating, disintermediating pure Internet connectivity providers. Consolidation is occurring between CAPs and wholesale carriers, increasing their bargaining power. CDNs have emerged as a major player in the value chain. Many large software companies, such as Microsoft, have developed their own CDNs. CDNs may create a new bottleneck (as those wishing to obtain faster network speeds and offer better end user experience require this technology). CDNs also question long-held assumptions about traditional access bottlenecks in mobile markets.

The Debate

Are traditional telecommunications network access bottlenecks still relevant in the Digital Age?

New innovations and technologies are reducing traditional bottlenecks, such as the potential ability of mobile network operators to exploit monopoly power within their own network. In particular, Internet and VoIP applications reduce the likelihood of access networks causing consumer harm by increasing choice within the instant messaging and voice market. Moreover, with the emergence of fixed, data and voice networks as substitutes, even if a mobile network operator were to block access to a consumer then the mobile device may be connected to a Wi-Fi network and a call made over Internet (Internet bypass). As OTT bypass increases, there may be a case for access networks SMP deregulation, particularly if the new digital age bottlenecks are outside SMP regulation.

What new bottlenecks are emerging?

New potential bottlenecks include operating systems, app stores, and elements of the IP interconnection value chain. Applications, such as WhatsApp, have achieved considerable

network effects, and hence have access to customer data, notably increasing the functionality of their products compared to new entrants. As seen above (How Growing Digitisation Impacts Competition Policy), Facebook has started to bundle, and now owns the most prominent services (including WhatsApp). Facebook has created the largest bait and switch in recent times: mobile advertisers are now forced to pay to access communities which they paid to build up in the first place. Customer data represents a significant competitive advantage for firms as they reveal patterns of information that enable companies to understand user behaviour and preferences and improve (or target) their products and services (and prices) accordingly.

From a competition law perspective, a possible theory of harm is that in merger cases, combining the merging parties' datasets could provide companies with a competitive advantage, by helping them to improve the merged entity's product or service post-merger in a way that competitors are unable to match. Ownership of data may confer a position of market power on the owner. (See Key Concept 6 - Closed Internet Apps and Key Concept 5 - Operating Systems and App Stores).

Are statutory legal powers sufficient to deal with these old and new bottlenecks consistently? Is it sufficient to rely on ex-post intervention to address market failures resulting from new bottlenecks?

A fundamental issue arises when considering traditional bottlenecks and new bottlenecks.

Whereas there exists a regime of SMP regulation (or access regulation) that is designed to capture issues relating to the transmission of data over traditional telecoms networks, the new bottlenecks are outside such regulation. An important open question is whether it is still appropriate to have a special form of regulation and enforcement only applicable to the telecoms sector, in the light of the market dynamics explored in this Handbook. It is important to look beyond the traditional communications bottlenecks to the new bottlenecks and use the existing competition law framework as much as possible.

How do you ensure that remedies are imposed on bottlenecks in a fair and non-discriminatory manner that facilitates a level playing field between traditional and digital age services?

For the time being, as regulators are bound by the existing SMP regime, in applying SMP obligations, they should ensure that same services should be subject to the same rules. Two aspects are particularly important:

- In the digital age, traditional concepts of telecoms bottleneck regulation need to be reconsidered, due consideration being given to the appropriate market definition and market analysis
- If the application of the regulatory regime risks distorting the competitive situation in the marketplace in favour of the OTTs (as owners of the new bottlenecks) forbearance in SMP regulation should be the answer

Key Concepts

Bottlenecks are a vital part of the competitive landscape within the telecommunications industry, for they potentially allow market players to leverage monopoly power to the detriment of consumers. The following potential bottlenecks are considered in this section of the handbook.

Key Concept 1
Bottlenecks in the Digital Age

Key Concept 2
Mobile and Fixed Access Networks

Key Concept 3
Licensed Radio Spectrum

Key Concept 4
IP Interconnection; CDNs

Key Concept 5
Operating Systems and App Stores

Key Concept 6
Closed Internet Apps

Key Concept 1
Bottlenecks in the Digital Age

The market power conferred by ownership of traditional fixed and mobile networks may be weakening and new bottlenecks are emerging through ownership of customers and content. This shift must be recognised in competition policy.

A bottleneck exists when it is not technically or economically feasible to duplicate infrastructure elements.[230] Bottlenecks are present in most network industries, arising from the high sunk infrastructure investment costs to enter the market and the incumbency advantage that results. Ownership of a bottleneck provides the owner with market power, particularly as the bottleneck owner may seek to exclude others that need to use the facility.

Historically, bottlenecks in communications have been associated with fixed and mobile network operators. Competition enquiries typically start from the viewpoint that both mobile and fixed operators enjoy advantages from their own access networks and that, absent intervention, such ownership may be used to adversely affect competition.

The identification of bottlenecks is an important part of market analysis in the telecommunications sector, since the owner of a bottleneck is by implication afforded a degree of market power. This, of course, does not mean that they will abuse this power or that it will necessarily result in consumer harm. However, the potential for such harm may exist and as such regulatory authorities have typically either regulated these bottlenecks for access or at the very least kept them under review. When a proper market assessment shows that in fact there are bottlenecks and that ownership of the network and abuse either are occurring or the potential is there, it is important to intervene to protect or promote competition, by way of competition law enforcement or SMP regulation. Intervention needs to be backed by enforcement powers.[231]

There are two types of regulatory intervention in networks.

Behavioural regulation: Interventions in the various decisions of a bottleneck monopoly, including entry, exit, price, investment and even technical standards. Examples include access price controls.

Structural regulation: Specific terms for a firm to enter and exit a market, and design of the market structure itself. Examples include network unbundling and operational or structural separation.

Implications of the Digital Age

The ability of owners of traditional communications networks to exercise market power is being weakened by greater substitution possibilities. Services provided over the fixed or the mobile network increasingly constrain the other network (as consumers see them as substitutes and therefore due to indirect constraints at the wholesale level)

[230] Lee, I. (2009) Handbook of telecommunications Planning and Management for Business

[231] It is a concern that in some instances a regulator or a competition authority recognises the potential for consumer harm in some situations and even issues a decision but then this results in weak enforcement.

and Internet apps, provide the opportunity to bypass a mobile network entirely, when delivered through Wi-Fi.

To the extent that telecoms access networks (especially fixed networks) still represent a bottleneck, there is an emerging class of downstream competitors for which this is not relevant and, thus, less potential for operators to leverage their position in fixed networks in the downstream markets (see Key Concept 2). Operators may be constrained by the buyer power of others in the value chain and consumers are using services from a range of providers, such as Microsoft, Facebook, Google and Apple, whose services are not dependent on the wholesale offerings of network owners.

The availability of licensed spectrum has also traditionally been considered a bottleneck, but new ways to connect "on the go" are increasingly available, weakening the potential of the owner of licensed spectrum to gain market power (see Key Concept 2 below).

In fact, new digital bottlenecks are emerging that result from ownership of (i) the consumer; (ii) the content that consumer value; and (iii) consumer data usage. As has been noted, *"digital platform operators aim at making themselves indispensable for both end-users as well as advertisers and place themselves in a gatekeeper position"*. [232] For example:

- Intellectual property rights can be a bottleneck. Copyright geographical restrictions may prevent access to content, leading to geo-blocking. In the EU, this is not only a competition concern but also an internal market issue, preventing parallel imports. The abolition of geoblocking was identified as one of the actions in the EU Digital Single Market Strategy.[233] Patents grant control over access to technology and standards and, for example, play a prominent role in the battle for leadership in operating systems (see Key Concept 4). On the other hand, the ability for firms to obtain a patent or other IPR also provides an incentive to innovate, potentially increasing consumer choice. (see INTEL, Role of IPRs in Competition Policy – Analysis)
- Social networks, closed Internet apps that hold large amounts of consumer data, create large network effects and are expanding into related markets, such messaging or enterprise services (see Key Concept 6)
- App stores lock customers into particular operating systems and/or handsets and may be used to block access to particular applications or content (see Key Concept 6). Both app stores and operating systems raise issues about the possible existence of new bottlenecks

IP interconnection has also been considered a new bottleneck in the digital age, although for the reasons explained below (Key Concept 4) the sector is characterised by falling prices and innovation, through the emergence of Content Delivery Networks (CDNs).

Competition policy must recognise the emergence of new bottlenecks and the weakening of others. If there is a need to intervene, intervention should occur across the spectrum. Under the current regime, when considering who holds market power for both SMP assessments and competition investigations, both traditional network operators and newer entrants in the digital value chain should be considered in assessing all competitive constraints in the marketplace. If the assessment under the current rules, taking

[232] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted, page 24.

[233] Vice-President Ansip, Digital Single Market speech of 26 November 2014, http://europa.eu/rapid/press-release_SPEECH-14-2182_en.htm.

into account all competitive constraints, leads a regulator to believe that SMP regulation on existing telecommunications providers (e.g. in access to fixed networks) is necessary, then regulation should be imposed and strongly enforced. However, this must follow a proper market assessment.

Major antitrust investigations into Microsoft, Google and others, and the large fines that have resulted show that these digital companies have the potential to distort competition as consumers increasingly rely on smartphones, PCs and tablets in all aspects of their lives.

Key Concept 2
Mobile and Fixed Access Networks

Access networks have long been regulated as a form of bottleneck. Innovations in the digital age raise questions about the strength of traditional bottlenecks held by mobile and fixed operators.

Access networks are the part of the telecommunications network that connects subscribers to the core network. Fixed access networks have monopoly characteristics due to their high sunk investments and economies of scale and hence have traditionally been considered to represent a bottleneck to reaching the subscriber.

Traditionally, authorities and regulators have defined fixed and mobile access, at both the wholesale and retail level, to be in different markets. Fixed networks have typically been regulated for both origination and termination services, whereas, due to the larger number of competing mobile operators, mobile networks typically have been regulated for call termination services only.

Implications of the Digital Age

Competition in mobile access, enabling consumers to substitute between network providers, has reduced the ability of any given operator to charge consumers above competitive levels. Even on mobile termination, multi-homing and Internet bypass mean mobile networks often no longer have a monopoly for termination of calls on their own networks.

While there remain significant differences between fixed and mobile markets from a demand-side perspective, convergence is narrowing the gap between the two. [234]

(see Defining Markets, Key Concept 8, Indirect Constraints):

- Operators launch 3G and 4G services with comparable quality, in many cases, to fixed networks
- Smartphones are connected to Wi-Fi and hotspots, alongside mobile networks, as customers switch between networks based on availability and cost[235]
- Operators offer triple play and quad play, so consumers receive a single service and a single bill and are less aware of who is providing the service (see Assessing Market Power, Key Concept 10, Bundling in Market Assessment)

Increased substitution at the retail level places an indirect constraint on the wholesale network as described in Defining Market Power, Key Concept 8, Indirect Constraints.

Many of the Internet players are multinational companies, able to exert their own market power and to use this alongside their buyer power, to restrict the ability of telecommunications operators to leverage any access network power they may have into other areas of the value chain. Consumers more closely identify with many of these companies than the underlying telecoms network provider, and it may be these companies that can now be considered to "own" the customer and, increasingly importantly, their data.

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[234] For a discussion as to whether mobile and fixed networks should be considered "complements" or "substitutes" see above, *Fixed to Mobile: Substitutes or Complements?*

[235] This trend will inevitably accelerate as availability and quality of Wi-Fi improve. See GSMA Mobile Radar, April 2015.

Key Concept 3
Licensed Radio Spectrum

In a number of countries, licensed radio spectrum has historically been considered an important bottleneck asset providing mobile network operators with market power. But this bottleneck has been eroded as a range of alternative access technologies, such as Wi-Fi, allows users to bypass the traditional networks. Re-farming of satellite spectrum for terrestrial use is adding more competition in some markets.

Television and radio broadcasting, mobile communications networks, emergency services, radar and many other services and applications all depend on access to radio spectrum. Access to large parts of the radio spectrum is strictly controlled by national governments. Different parts of the spectrum are allocated to specific services and use of spectrum is managed through authorisation and licensing.

Signals carried on low frequencies travel farther and are better able to penetrate buildings. However, they are not suitable to carry large amounts of data. Conversely, higher frequencies carry much more data but over a significantly reduced range and ability to provide in-building coverage. Most mobile network operators aim to make use of a mix of low frequency (700-900MHz) and high frequency (1800MHz to 2600MHz) spectrum to provide a good balance between coverage and capacity.

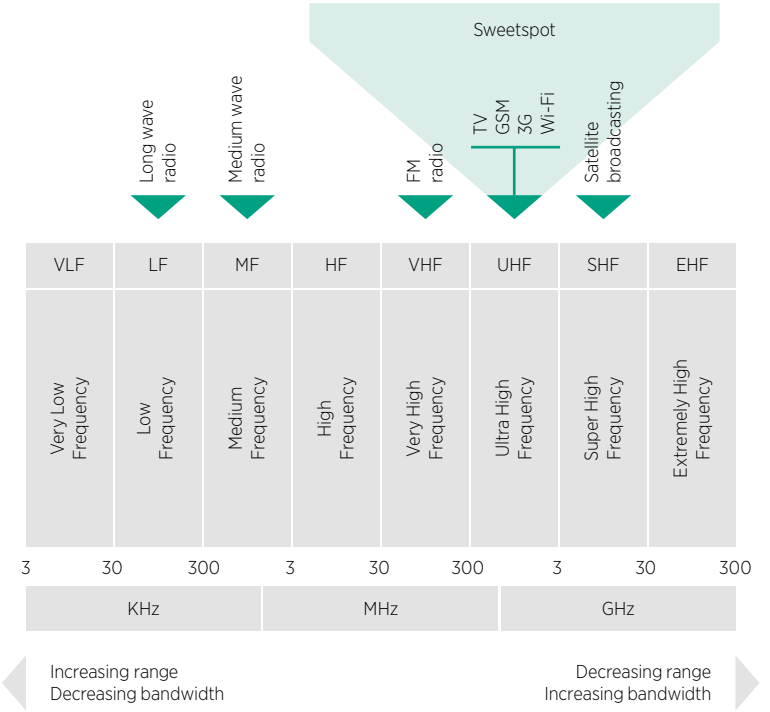
The amount of spectrum allocated to the mobile communications industry has been steadily increasing, allowing more operators to enter the market, support larger numbers of customers and provide a wider range of services. As an example, in Europe original analogue mobile networks operated at the 450MHz frequency digital (2G) mobile services were made possible through the use of 900MHz and then 1800MHz spectrum. Faster data services were enabled by the allocation of 2100MHz spectrum for 3G, and most recently 4G services have been made possible by the allocation of spectrum at 700-800MHz and 2600MHz. Some of this spectrum, in particular in the 700-800MHz range has been re-allocated away from other users, such as radio and TV broadcasters.

As the consumption of mobile data traffic continues to rise, demand for even more spectrum to be allocated to the mobile communications industry is increasing.

Radio spectrum has historically been considered as a bottleneck asset because there is only a finite amount of spectrum available. This means there is a limit to the number of mobile network operators that can be supported in a given market. Even though additional spectrum is being allocated to the mobile communications industry, this is required by existing operators to meet growing demand for data traffic.

The perceived strategic importance of spectrum can be seen through the remedies required by competition authorities to permit in-market mergers between mobile network operators. There are numerous recent examples, both in Europe and other regions, where merging operators have been required to divest certain parts of their combined spectrum portfolio to help avoid a potential strengthening or creation of market power.

Figure 55: Radio spectrum frequencies and usage



Implications of the Digital Age

Digitisation is both encouraging new entrants (through consumer demand for data traffic) and enabling them (through technology developments) to find ways to bypass traditional mobile networks and as a result reducing the potential for licensed spectrum to be considered a bottleneck asset.

Examples include

- *The popularity and widespread availability of Wi-Fi access networks.* Close to 50% of data traffic consumption (source: Cisco Visual Networking Index) on mobile devices is carried over Wi-Fi rather than traditional cellular networks. To date, this consumption has primarily been for Internet-based data services, but increasingly involves communications services (voice and messaging). Wi-Fi is also enabling a range of new hybrid operators to enter the traditional mobile market. These operators are combining their fixed broadband access networks with public Wi-Fi hotspots to create low cost wide area networks. These are often supplemented with a traditional mobile overlay achieved through either an MVNO deal or investment in a small amount of mobile spectrum. This technology strategy has enabled disruptive players to enter a number of mobile markets, (e.g. Iliad in France)

Figure 56: Examples of mobile mergers requiring spectrum divestment

Country	Merging Parties	Spectrum Divestment Requirement
Austria	Three Austria and Orange	Divest radio spectrum and additional rights to an interested new entrant
Ireland	Three Ireland and O2 Ireland	Five blocks of spectrum in the 900MHz, 1800MHz and 2100MHz frequency bands
Germany	E-Plus and O2 Germany	Divest radio spectrum and additional assets to a new entrant or MVNO
Argentina	Movistar and BellSouth	35Mhz
Chile	Movistar and BellSouth	25MHz of spectrum in the 800MHz band
US	Verizon and SpectrumCo	Various spectrum in the 700MHz frequency band
UK	T-Mobile and Orange	2x15MHz of spectrum in the 1800MHz frequency band

- *Spectrum re-purposing.*[236] In some markets, satellite operators use their spectrum to create mobile networks. In the US, for example, satellite operator DISH has successfully lobbied for a change of use in certain spectrum it owns. This spectrum was originally granted for use as satellite uplink and downlink, but can now be used for terrestrial mobile network services. In combination with additional spectrum acquired through auctions, DISH now has sufficient spectrum assets to consider the creation of a new mobile network infrastructure across the US market. Such spectrum repurposing offers the potential for additional competition. The proposal to use white spaces in the spectrum allocated to other usages would have a similar effect

[236] Spectrum repurposing should not be confused with spectrum refarming, see glossary

Figure 57: Importance of Wi-Fi off-load for Telenet's hybrid cellular offering

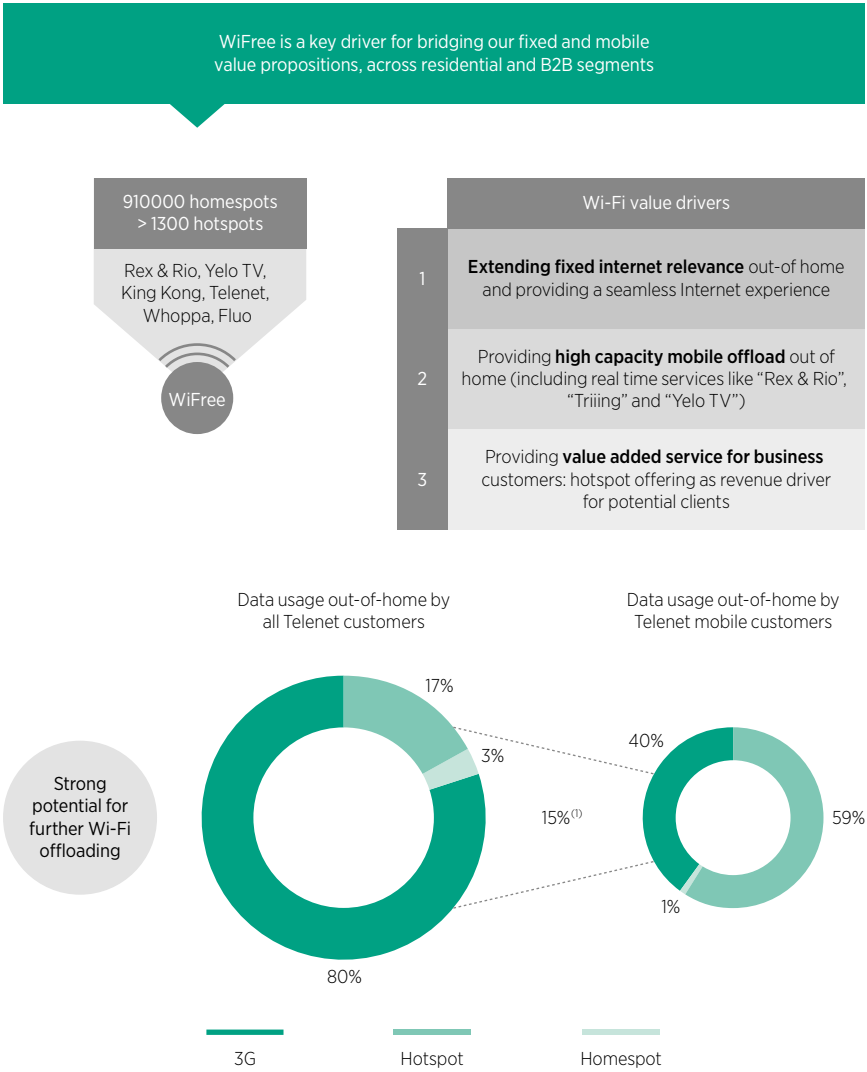
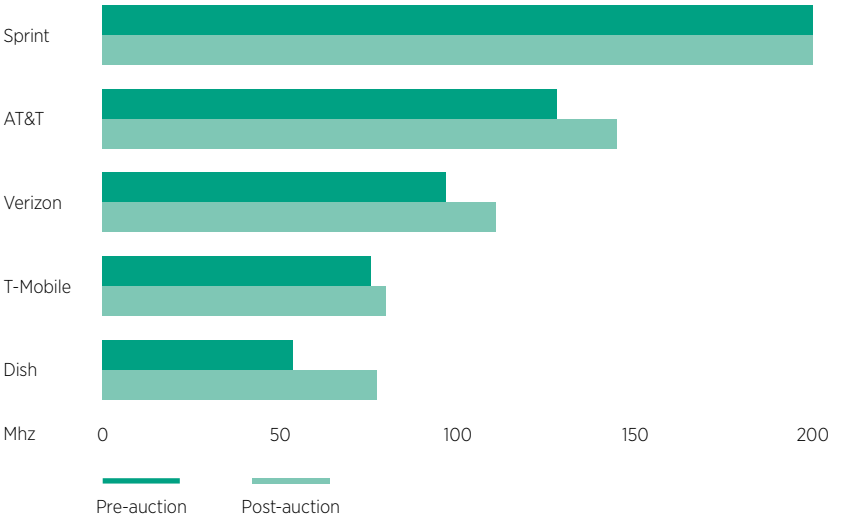


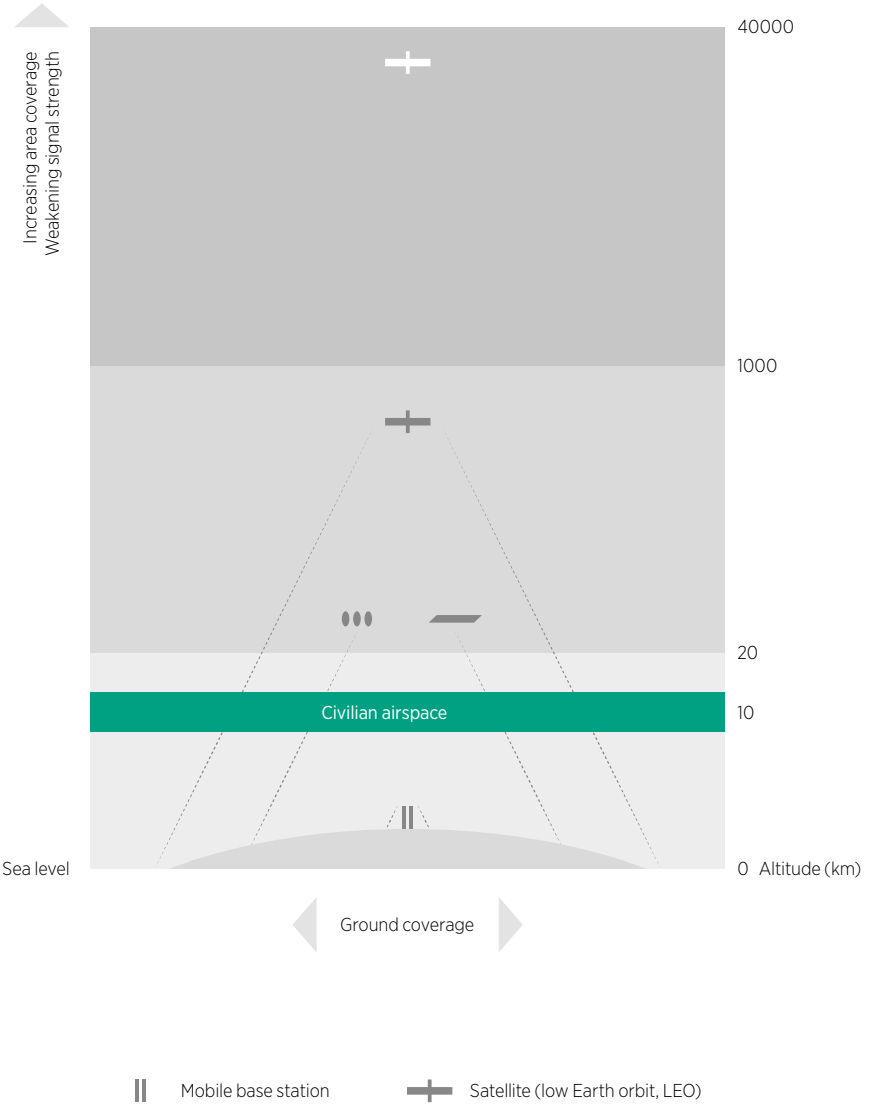
Figure 58: Dish spectrum ownership post AWS-3 auction



- *Balloons and drones.* A number of companies, including Google and Facebook, are running high profile trials of alternative access technologies. Most of these trials are using unlicensed high frequency spectrum to create new types of access network with high altitude balloons or low altitude drones acting as base stations in the sky. Currently most of these trials are focused on rural connectivity, but some of the trial backers have signalled ambitions to cover the whole world. If the technologies being tested provide encouraging results, they could be a new source of competition for traditional mobile operators in the mid to long term

It is also important for policy makers to properly evaluate the role that other spectrum-using industries are playing in the creation of spectrum bottlenecks. Broadcasters, in particular, currently have access to significant amounts of low frequency radio spectrum that could be more effectively used by the mobile industry to expand the coverage of networks and increase capacity. The move to digital transmission means that broadcast industries require less spectrum is required to deliver their services, and the Internet increasingly provides an alternative distribution platform for this content. By re-allocating more spectrum to the mobile industry, policy makers can support strong economic growth and social inclusion by enabling connectivity to a wider population.

Figure 59: Aerial networks



Source: GSMA Intelligence

Key Concept 4
IP Interconnection; CDNs

IP interconnection models need to evolve to accommodate the amount of Internet traffic generated by new forms of content. Although the imbalances have led to fewer settlement-free peering arrangements, the IP interconnection sector shows signs of healthy competition, with falling prices and development of new products, such as content delivery networks (CDNs).

IP interconnection is a business-to-business arrangement that is essential for the quality and functionality of the Internet. Content and application providers, such as Google, YouTube, Amazon and Netflix, generate large volumes of traffic at the IP interconnection level.

There is a need for increased investment and innovation in IP Interconnection arrangements: the development of future applications, particularly those with high data requirements and quality of service standards, require the evolution of IP interconnection models. However, refusing to provide IP interconnection is not a likely strategy – telecoms networks are reliant on content in order to attract and retain their retail customers. Content and application providers, such as Google, YouTube, Amazon and Netflix, can connect to the Internet through an ISP, CDN or IP transit provider. They are in a position to negotiate reduced prices in return for large volumes at the IP interconnection level, and can leverage their premium content and applications to steer end users' decisions regarding the selection of an Internet service provider.

Indeed, the question whether major European telecoms operators could have violated competition law in their Internet peering and transit practices has been considered recently both in France and by the European Commission, and the allegations rejected. In France, in 2012 Cogent alleged before the French competition authority that France Télécom had abused its dominant position by requiring payment in exchange for increasing direct peering capacity. The French competition authority dismissed the claim and the Paris Court of Appeal upheld this decision on appeal.[237] The Court confirmed (amongst others) that:

- direct peering and indirect access via transit are substitutable. Direct peering is one alternative to gain access to France Télécom subscribers, but not the only one
- unpaid peering is based on traffic balances, between parties in a roughly equivalent position. When traffic is not balanced, asking for payment as a condition to increase peering capacity is not in itself a discriminatory practice (provided that the same applies to other partners in a similar position)

In July 2013, the European Commission carried out dawn raids against Internet operators on similar allegations but in October 2014 closed the investigation, having found "no evidence of behaviour aimed at foreclosing transit services from the market or at providing an unfair advantage to the telecoms operators' own proprietary content services".[238]

[237] 19 December 2013, http://www.hlmediacomms.com/files/2014/01/Cogent-France-Telecom-Dec-19-2013.pdf.

[238] http://www.telecompaper.com/news/ec-stops-peering-probe-into-telefonica-orange-telekom--1040998.

In fact, two main factors point to a competitive IP interconnection sector, namely falling prices and innovation.

Falling Prices

Concerns have been expressed in relation to the replacement of settlement-free Internet peering arrangements amongst IPs, with IP transit agreements in which a carrier provides connectivity to all global IP destinations, and transit is priced per capacity.[239] This is a function of traffic volumes becoming increasingly imbalanced, as consumers require large amounts of bandwidth to consume some services, such as video-on-demand.

A recent report suggests that IP transit prices have fallen below €1 for high volumes, with peering prices generally at or slightly above this level.[240] This indicates that IP transit and peering could be considered substitutes. If networks were to choose not to enter into peering arrangements because the traffic imbalance makes this commercially unviable, there are niche providers of IP transit services who will offer connectivity services at a similar level to peering arrangements.

Innovation –the development of CDNs

The development of content delivery networks ("CDNs") addresses the issues posed by the escalating rise in network traffic, the global consumer uptake of online video, and the growing popularity of Internet services.

Traditionally, Internet users entering a website are redirected via a web host server, namely a computer system that hosts or "stores" websites, based in a central location. Every website user accesses this single server to view the website. With a high volume of traffic, this can overload the single server, causing slow loading or even a website crash. There is a measurable amount of latency (waiting time) for a website user visiting a page that is hosted thousands of miles away. Storing files on several servers across a geographical area can ensure the user is loading files that are not significantly far away.

When a website employs a CDN, web content is stored on a network of servers, which can be spread throughout the world. A large CDN can have thousands of servers around the globe, making it possible for the provider to send the same content to many devices efficiently and reliably, even when bandwidth is limited or there are sudden spikes in demand. CDNs are especially well suited for delivering streaming audio, video, and Internet television (IPTV) programming. In the event of an Internet attack or malfunction at one junction, content that is hosted on a CDN server will remain available to other users.

CDN technology can enable mobile network operators to achieve up to an estimated 30% faster mobile content delivery, as well as up to a 20% reduction in mobile data traffic.[241] In addition, CDNs traditionally lease bandwidth (i.e. storage space) from the mobile operators. CDNs now serve a large fraction of the content on the Internet, with the market projected to be worth over USD 12 billion by 2019.

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[239] Under an Internet peering arrangement, customers can also be required to commit to a minimum bandwidth.

[240] The future of the internet, innovation and investment in IP interconnection. Arthur D Little, May 2014.

[241] CDNetworks: Content Acceleration Brochure, *http://www.cdnetworks.com*.

Figure 60: CDN compared to traditional server hosting

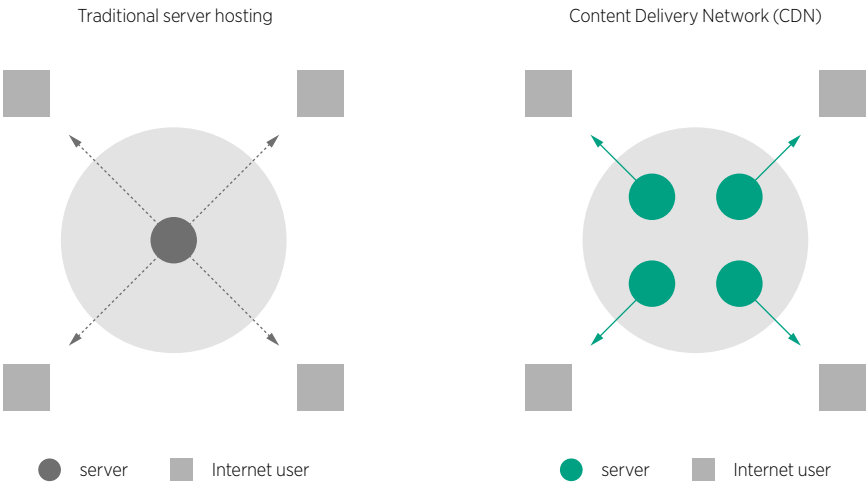

Figure 61: Ericsson deploys Rostelecom CDN

Case Study: Ericsson deploys world's largest operator CDN for Rostelecom

In 2013, the Russian operator and broadband provider Rostelecom deployed the world's largest operator CDN using Ericsson's Media Delivery Network solution. This enables Rostelecom to optimise content delivery across Russia though the strategic distribution of multi-service edge servers, which bring content closer to the end user. The solution enables the operator to forge new, more sustainable business models with content providers and to leverage more fully the value of its network in the expanding media world. With a unique single-platform approach to policy control, routing and caching of all content types, the CDN also allows operators greater network efficiency and saves bandwidth, footprint, and operational costs.

The CDN has content servers located in 30 major cities across all federal districts of Russia. In addition, the network has a capacity of more than 1 terabit per second serving Rostelecom's 9.5 million broadband customers, from a total base of 28 million subscribers. With competition between content providers at an all-time high, quality and speed of delivery to consumers has become a critical differentiator, and guaranteed quality of experience is especially important to content providers.

Key Concept 5
Operating Systems and App Stores

All smartphone systems run an operating system (OS) and apps must be downloaded from an "app store" that is compatible with that OS. This has implications for the ability of developers to develop apps that would be compatible with the OS, and for customers who find themselves locked in, due to the difficulty of porting content from one OS to another.

The interplay between operating systems and smartphones, operating systems and apps and app stores gives rise to issues for competition policy in the digital age. Nothing exemplifies the difficulties in this area better than the announcement at the beginning of July 2015 that Microsoft will be scaling down operations in its struggling phone division, having found it difficult to make inroads with its Windows Phone, against the main operating systems, Android and iOS.[242]

Operating Systems - An OS is software that manages a computer's hardware and software resources and provides a common platform for applications. Smartphones require an OS to function. Only a small number of large OS providers exist. These include Android, BSD, iOS, Linux and Microsoft Windows. Android and iOS (the operating system for Apple) are the two most commonly used systems in smartphones. In Q4 2013, Google's Android mobile operating system had a 78% share of all users globally.[243] Apple's iOS had 18%. GSMA data shows that at the end of 2014, Apple's iOS had 20% and Android 76% of users globally.

Whilst the Android system is "open source", iOS is not open to third party handset developers. As handset makers must source an OS, the lack of availability of iOS potentially creates a bottleneck to the development of smartphones. Content providers have to design their content to fit particular OSs, while application developers must develop apps for the different operating systems.

Apps and App Stores - Application stores, commonly referred to as "app stores", are a distribution platform for mobile applications, or "apps", online stores where users can browse applications before downloading them to their device. These apps are designed to run on specific devices and are developed for a particular OS. For instance, each OS has its own application store, from where users can download mobile apps that run on that OS (Android phones have the Play Store while Apple phones have an app store or iTunes store).

Content Production for App Stores - The apps available from most app stores are only compatible with a single operating system. Many app stores require that submissions of prospective apps go through an approval process: apps are inspected for compliance with certain guidelines and in some cases can be excluded at the discretion of the OS's owner.

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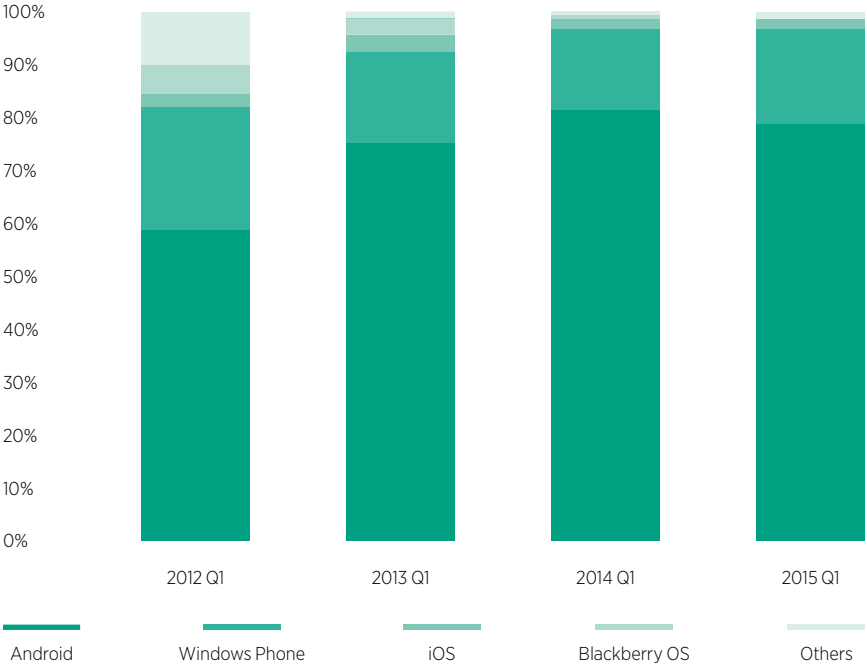
[242] http://www.fastcompany.com/3048370/fast-feed/microsoft-to-eliminate-up-to-7800-jobs.

[243] International Data Corporation: http://www.idc.com/prodserv/smartphone-os-market-share.jsp.

Figure 62: Share of different mobile operating systems globally.[244]



In the case of some app stores, notably Apple's App Store, there is no "App Store Bypass", which has the following consequences:

- Developers of apps have to adapt their products to different platforms and go through the take-on process for each app store; which can may take a number of weeks and delay the launch of new applications
- Generally, content providers have to design their content to fit particular OSs
- Application stores usually take a percentage of the purchase price for paid apps – typically around 30%

Are some apps "must have" apps? One specific open question relates to whether certain apps may be crucial to the success of a new entrant OS. If the market assessment shows that an app is a "must have", in the sense that consumers would not purchase a device which does not support that particular app, conceivably there could be a debate on whether some access obligation could be imposed on the app developers, so that, if they do not wish to develop the app for a different OS, others could.

Consumer lock-in – Generally, the integration of multiple platforms through user data creates a better experience for both users and

[244] International Data Corporation: http://www.idc.com/prodserv/smartphone-os-market-share.jsp.

Figure 63: The evolution of app stores

Case study: The evolution of app stores

In 2007, Apple Computer launched the iPhone, the company's first ever smartphone. When the device launched, it did not provide any support for third-party software, as Apple believed that web apps available over the Internet could provide adequate functionality for most users. However, soon after its release, developers began coding third-party apps for the device.

With the release of iPhone OS 2.0 in July 2008, Apple launched the App Store officially introducing third-party app development and distribution to the platform. The service allows users to purchase and download new apps for their device through either the App Store on the device, or through the iTunes Store on the iTunes desktop software.

All apps are subject to a technological and content review by Apple staff. Additionally, Apple takes a 30% commission on revenues for paid apps sold through the store. The App Store has been a success for Apple: reaching over 40 billion app downloads in 2013, with a library of over 800,000 apps available.[245] According to GSMA data, currently the App Store has over 100bn downloads and over 1 million apps.

The popularity of Apple's App Store led to the introduction of equivalent marketplaces by competing mobile operating systems: Android Market launched at the same time that the first Android smartphone (the HTC Dream) was released in September 2008, and BlackBerry's App World launched in April 2009. In January 2011, Apple also launched the Mac App Store, a similar distribution platform for OS X software on Macintosh computers. Developers can still distribute apps for Macs via traditional methods, but the Mac App Store features similar certification requirements to its iOS counterpart for security and reliability.

advertisers. When users experience a better functioning service due to the use of personal data profile in a multiplatform environment, they may be less willing to switch. As has been said: *"in a way, consumers lock themselves in by providing their personal data"* (and in most cases do not understand it).[246] Once a consumer has purchased a particular handset / OS, they are not always able to keep the same content when they switch between different types of devices or seek to upgrade their devices. The consumer does not control their digital content and, for example, when users switch from Apple to another platform it may not be possible to take their iTunes content and apps with them. This can create both a barrier to entry for new app developers and potentially for the developers of new OS, and a barrier to switching for consumers. In Figure 64, this point is illustrated by reference to the new improved features of the Apple iO8 OS.

Could these practices (relating to OSs and app stores) be anticompetitive? – Applying the framework developed in this Handbook, the first step is market definition (see Key

[245] Source: *http://www.statista.com/statistics/263794/number-of-downloads-from-the-apple-app-store*

[246] European Parliament, *Challenges for Competition Policy in a Digitalised Economy*, quoted page 33

Figure 64: iO8 operating system update

Case study: Apple iO8 OS launch

Apple launched the Apple iO8 operating system in summer 2014. It provided:

- Improved interoperability between apps, so, for example, health-related apps can "talk" to each other, sharing data.
- Extended voice command for digital content purchases via Siri and extension of TouchID fingerprint authentication system to third party developers.
- "Spotlight" app store functionality, which suggests apps and app bundles to end-users. These can be video marketed on the app store.

This OS update extended the functionality of the App Store and the apps being purchased from the store. However, it is also likely to increase the amount of consumer data that is being generated and being shared between applications and will increase network effects. It has the potential to further lock customers into a particular app store, operating system and handset, raising barriers to entry and barriers to switching. It also raises the possibility of the leveraging of market power from app stores into other related markets – including that for apps. However, as app developers benefit from many of these innovations in terms of ease of marketing apps, this could be a trade-off that they are willing to accept.

Concept 1, Market Definition in Practice). If, for example, the focal point for an investigation is a complaint by a developer that they are not able to obtain approval from the owner of an App Store for an app, what is the relevant market? The particular app store itself, or the market for all mobile apps distribution platforms? On the demand side, if consumers are likely to switch in response to an increase in price by a hypothetical monopolist in that app store, to another store, then the market may be wider than the specific app store and the developer could be expected to develop its app for a substitutable platform.

If the answer is no, then the app store itself may be the relevant market. In that case, the owner of the particular app store has no competitors in that market place, i.e. it has 100% share, it is a monopolist.

Then practices aimed at excluding a third party developer of apps from that store, in the absence of objective justification, could be abusive (as described above, Assessing Market Power Key Concept 8, Exclusionary Abuse and Key Concept 10), much as it was held that it was abusive for Tetra Pak to seek to exclude third-party manufacturers of cartons from use with its equipment; or for Hilti to seek to exclude third party manufacturers of nails (Assessing Market Power, Key Concept 10).

Figure 65 provides details of the Android investigation of Google.

Figure 65: EU investigation into Android

Case study: EU investigation into Android

In April 2015, the EU announced a proposed investigation into Android. Android is the global leader in smartphone operating system – ranging from 50% market share in the UK to almost 90% in Spain (source Kantar World Panel). The EU investigation is seeking to answer three specific questions:

1. Has Google hindered the development of rival apps by "requiring or incentivising" companies, such as Samsung, HTC and LG, to pre-install Google's own suite of apps and services such as Google Maps, Gmail and the Google Play store?
2. Has Google hindered the development of versions of Android known as "forks" by preventing the companies developing these pieces of software from installing the Google's market-leading apps?
3. Has Google illegally hindered the development of rival apps by tying or bundling certain Google apps and services with other Google as or programming interfaces of Android?

Google has responded by stating that Android is an open source OS and that apps that compete directly with Google apps are freely available on Android and many are also pre-loaded alongside Google apps. However, others have argued that Android is not truly open source, as the open source version comes without key Google apps and to get these, developers need certification from Google.

Key Concept 6
Closed Internet Apps

In order to communicate over some Internet players' platforms, users must be registered with the platforms. If the services are free, users have an incentive to register and use these platforms, increasing network effects and the amount of data available to the Internet players. Consumers can be harmed particularly if they are unaware (or not sufficiently aware) that data about their usage is monetised, and especially in the absence of a possibility to opt out of unilateral conditions of use.

OTT systems are typically "closed": in the absence of interoperability users cannot communicate with those on other Internet apps. So, in order to reach a user on WhatsApp, it is necessary that both the sender and the receiver of the message should be registered with WhatsApp. The same goes for Skype or indeed Facebook. iPhones have iMessage and FaceTime, via which one iPhone user can have a live chat with another. Blackberries have BBM (Blackberry Messenger).

Closed Internet apps exhibit strong network effects once they reach a certain size. Furthermore, existing customers are reluctant to switch to competing applications as they will no longer be able to connect with their contacts on their legacy network (customers may also be reluctant to switch if they cannot port their content to a different device, see Key Concept 5, OS and App Stores). This, in turn, means that Internet applications and networks have gathered considerable customer data,[247] allowing them to target services better to customers and gather strategic insights.

Network effects and the insights gained from customer data may allow incumbent players to foreclose other players' access to direct revenues (such as by other messaging, voice calling or social networking systems) and indirect revenues from these users (for example, user information can be monetised via online advertising), which could restrict competition within the sector.

There is potential for consumer harm: it is unclear whether users of these products understand the full extent by which their data can be a revenue source for the OTTs and how these are used. Even if they do, the need to be included in a highly successful platform may overrule legitimate misgivings at signing up to the conditions of use of such platforms. There is no alternative for the user who wishes to be part of a closed Internet, but to sign up to the unilateral terms on offer. The current investigations by different competition authorities on trading conditions online may shed more light on the users' experience of closed OTTs, amongst others.

[247] Data concentration could be by itself a competition issue, as described in this Handbook (see D. Feinstein, quoted).

Intel
Role of IPRs in Competition Policy in the Digital Age - Analysis[248]

Preserving the Benefits of Standards by Enforcing FRAND Commitments

The benefits of standards are immeasurable. Standards enable products from different manufacturers to work together and communicate with each other seamlessly. This compatibility enabled by standards simplifies product development, reduces transaction costs, encourages investment and innovation that builds on the broadly adopted technologies, and increases competition.[249]

Today's information economy, built on an array of digital devices, depends heavily on standards. They are pervasive in the computing, communications, networking, and electronics sectors. For example, the USB specification enables smartphones, cameras, printers and countless other devices to exchange data with computers through a standard connector regardless of the manufacturer's identity of the USB circuitry.

Interoperability standards are generally developed cooperatively by various industry stakeholders, often competitors, under the auspices of standard setting organizations (SSOs). The standard-setting system as a whole greatly benefits innovation, competition and consumers. However, this system is vulnerable to abuse due to the unique power that it gives patent holders whose patents are incorporated into standards. That power is created because, as the European Commission has noted, "[t]he very purpose of choosing a standard is that the industry coordinates on a specific technological solution at the expense of alternative technologies."[250] As discussed in this section of the Handbook, competition policy has a unique role in preserving the benefits of standards by preventing the abuse of standard essential patents (SEPs).

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[248] This paper expresses the views of the authors and does not necessarily reflect the views of GSMA or of any particular mobile operator.

[249] See generally EU Submission to OECD Competition Committee, Standard Setting DAF/COMP (2010) 33, 8 March 2011, at 197; Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements (2011/C 11/01) § 308 ("Article 101 Guidelines").

[250] Case No. COMP/M.6381 - Google/Motorola Mobility, 13 February 2012, §§ 53, 54 ("Google/Motorola Mobility").

FRAND commitments restrain SEP holders' market power

Once a standard is finalized, the bargaining power of those who hold SEPs "surges because a prospective licensee has no alternative to licensing the patent; he is at the patentee's mercy."[251] Inevitably, this creates the potential for abuse as described by the European Commission:

"Once a standard has been agreed and industry players have invested heavily in standard-compliant products, the market is de facto locked into both the standard and the relevant SEPs. This gives companies the potential to behave in anti-competitive ways, for example by "holding up" users after the adoption of the standard by excluding competitors from the market, extracting excessive royalty fees, setting cross-licence terms which the licensee would not otherwise agree to, or forcing the licensee to give up their invalidity or non-infringement claims against SEPs."[252]

SSOs have a responsibility to develop sound intellectual property policies that provide a fair return on the investment made by SEP holders while curbing potential patent abuses. Thus, SSOs typically require participants in standard setting activities to license their SEPs on Fair, Reasonable, and Non-Discriminatory ("FRAND") terms to every company that makes, uses, or sells standard-compliant products. SSOs require FRAND commitments to avoid conferring upon SEP holders unearned market power. Otherwise, according to the European Commission, such market power could be abused by "refusing to license or by requesting unfair or unreasonable fees (in other words excessive fees) after the industry has been locked-in to the standard...."[253] The FRAND commitment thus restrains market power and gives standard implementers (particularly manufacturers) confidence they will receive a license to SEPs on reasonable terms.

The essence of the FRAND commitment is a voluntary agreement by the SEP holder to forgo the right to (i) exclude others from practicing the patented technology, and (ii) charge a royalty that reflects the absence of competitive alternatives to the SEP after a standard is adopted. In exchange for constraints on the exploitation of patents for which a commercial market might not have existed absent the standard, SEP holders that make FRAND commitments gain the ability to obtain reasonable royalties from a large number of standard implementers.[254]

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[251] Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 2012); see also Google/Motorola Mobility, § 53 ("A company wishing to produce goods complying with a certain standard cannot do so without either a licence to the technology incorporated in that standard or by infringing the patents covering that technology.")

[252] European Commission Competition Policy Brief, Issue 8 (June 2014).

[253] European Commission, Article 101 Guidelines, § 287.

[254] Wi-Fi SEP holders, for example, can collect reasonable royalties on billions of Wi-Fi chips used in many products, including notebook PCs, smartphones, printers, cameras, TVs, medical devices, and home appliances.

Judicial and competition authorities play a critical role in defining FRAND and ensuring consistent enforcement of FRAND commitments

Unfortunately, ambiguities in the meaning of FRAND in SSO IPR policies have contributed to the recent and ongoing wave of SEP related litigation. Officials from the U.S. Department of Justice (DOJ) have provided guidance on how SSOs might revise their patent policies to "benefit competition by decreasing opportunities to exploit the ambiguities of a FRAND licensing commitment."[255] Some SSOs have amended their IPR policies accordingly while other SSOs are unable to do so. Their membership includes SEP holders that want to charge as high a royalty as possible for FRAND-encumbered SEPs because patent licensing revenue represents a core part of their business model. For instance, some SEP holders continue to criticise and even block clarifications to SSO IP policies.[256] Thus, assistance from judicial authorities and competition regulators remains critical in both continuing to clarify the meaning of FRAND and in consistently enforcing FRAND commitments. The following key principles can be derived from case law and guidance provided by competition regulators:

1. Holders of FRAND-encumbered SEPs may not seek or enforce injunctions or Exclusion Orders except in special circumstances

Some SEP holders use the threat of an injunction and exclusion from the market as a way to impose unreasonable licensing demands. As the European Commission has explained, *"the threat of injunction, the seeking of an injunction or indeed the actual enforcement of an injunction granted against a good faith potential licensee, may … force the potential licensee into agreeing to potentially onerous licensing terms which it would otherwise not have agreed to"* including, *"for example, a higher royalty."*[257] Similarly, European, U.S., Chinese and Japanese courts have expressed concern that the threat of an injunction puts prospective licensees under pressure to agree during license negotiations to license conditions that are not FRAND.[258]

The use of injunctions is especially pernicious where SEPs are implemented at the component level of a complex high tech product; in those cases, "even a

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[255] See, e.g., Renata Hess, Deputy Assistant Attorney General, Six 'Small' Proposals for SSOs Before Lunch, Prepared for the ITU-T Patent Roundtable (October 10, 2012), p. 9.

[256] E.g., Bill Merritt (InterDigital), "Why We Disagree with the IEEE's Patent Policy," eeTimes (March 27, 2015).

[257] Google/Motorola Mobility, § 107.

[258] See, e.g., Samsung v. Apple, Nos. 400367 / HA ZA 11-2212, 400376 / HA ZA 11-2213, 400385 / HA ZA 11-2215 (Dis. Ct., The Hague, ND) (14 Mar. 2012), at § 4.31; Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 22 June 2012), rev'd in part, 757 F.3d 1286 (Fed. Cir. 25 Apr. 2014); Form 10-K, InterDigital, Inc., at 23 (26 Feb. 2013), available at http://files.shareholder.com/downloads/IDCC/2438652851x0xS1405495-13-10/1405495/filing.pdf;"Decision of the Tokyo District Court in the FRAND Defense Case" (7 Oct. 2013), available at http://www.nakapat.gr.jp/english/legal/2013/10/decision_of_the_tokyo_district_1.html.

very weak patent could command a high royalty in settlement."[259] Injunctions also create major problems for small standard implementers that often conclude paying an unreasonable royalty is less risky than costly SEP litigation.[260]

Competition authorities have determined that the threat of injunctive relief or its use against willing licensees is anti-competitive and fundamentally incompatible with the FRAND promise. According to the European Commission, a FRAND commitment is a willingness to license, which "allows for adequate remuneration of the SEP-holder so that seeking or enforcing injunctions is no longer justified."[261] Given that injunctions are designed to provide a remedy where monetary compensation cannot, injunctions should be allowed only when a standard implementer is either unwilling or unable to pay a judicially-determined FRAND royalty, or is outside the court's jurisdiction, so that monetary relief could not be enforced.

2. A FRAND commitment is a promise to license all willing standard implementers

Another way SEP owners can extract unreasonable royalties is to refuse to license companies which manufacture components that implement the standard, and only license the end product manufacturers. Their selective refusals enable them to potentially impose a higher royalty on chipmakers' customers that make the final and more expensive product, instead of the much cheaper component that practices the inventions claimed by the SEPs. Such a strategy might be prevented if the chipmakers were licensed.[262] This conduct could be seen as a breach of the FRAND commitment to license on both reasonable and non-discriminatory grounds.

European Community law requires SEP owners, pursuant to applicable SSO policies, to commit "in writing to offer to license their essential IPR to all third parties" that are willing and able to enter into a FRAND-compliant license.[263] To this end, leading SSOs, such as the IEEE and the International Telecommunications Union (ITU), require SEP owners to "grant a license to

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[259] See, e.g., Colleen V. Chien & Mark A. Lemley, Patent Holdup, The ITC, And The Public Interest, 98 CORNELL L. REV. 1, 8 (2012).

[260] Fiona Scott Morton and Carl Shapiro, Strategic Patent Acquisitions at 5-6 (2013), available at http://faculty.haas.berkeley.edu/shapiro/pae.pdf (concluding that a rational standard implementer would be willing to settle for more than three times the royalty level that the court deemed reasonable in Microsoft Corp. v. Motorola, Inc., 2013 WL 2111217 (W.D. Wash., 25 Apr. 2013) in order to avoid a mere 1.2% chance of losing in court).

[261] European Commission, "Commission sends Statement of Objections to Motorola Mobility on potential misuse of mobile phone standard-essential patents - Questions and Answers" at 1, 6 May 2013, available at http://europa.eu/rapid/press-release_MEMO-13-403_en.htm.

[262] Under a longstanding patent law doctrine known as patent exhaustion, the first sale of a product embodying an owned or licensed patented invention exhausts the patent holder's rights under the patent and thus precludes it from obtaining royalties from downstream customers of the product. See European Commission, Guidelines on the application of Article 81 of the EC Treaty to technology transfer agreements, at § 6.

[263] Article 101 guidelines, § 285; see also Case No. COMP/M.6381 – Google/Motorola Mobility, 13 February 2012, § 55 (FRAND "oblige[s] SEP owners: [] to make the patent in question available to all interested third parties").

an unrestricted number of applicants"[264] that wish to implement their standards. As a United States Court of Appeals has held, this language "admits of no limitations as to who or how many applicants could receive a license" to the SEPs.[265] Other major SSOs also require that any applicant that implements a standard must be entitled to obtain a license.[266]

3. Holders of FRAND-encumbered SEPs may not require prospective licensees to take licenses to patents that are not SEPs

Some SEP holders attempt to extract excessive royalties from standard implementers by requiring potential licensees to agree to a "package license" that includes non-SEPs. Tying SEPs and patents that are not SEPs is a mechanism for evading the price control on SEPs that is created by the FRAND obligation. It is too easy to demand an unreasonable US $0.50 royalty on a US$1 product by tying some non-SEPs to the FRAND-encumbered SEPs, even though the non-SEPs might have little or no value to the licensee and are included in the package license principally to disguise excessive royalty demands for the SEPs.

Tying to evade price controls and extract unearned royalties is anti-competitive.[267] Courts in several jurisdictions, including the U.S. and China, have ruled that requiring package licenses that include non-SEPs is a violation of FRAND.[268]

4. SEP holders should be prevented from taxing product features or components that are not covered by their patents

Litigated royalty demands in cases involving FRAND-encumbered Wi-Fi SEPs indicate that some SEP holders seek to exploit locked-in standard implementers by breaching their FRAND commitments (to request only reasonable royalties).

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[264] IEEE-SA Standards Board Bylaws § 6.2(b), available at http://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf; ITU, General Patent Statement and Licensing Declaration Form, available at http://www.itu.int/oth/T0404000002/en.

[265] Microsoft Corp. v. Motorola, Inc., 696 F.3d 872, 874 (9th Cir. 2012).

[266] See, e.g., ETSI, Intellectual Property Rights Policy § 6.1 (30 Nov. 2011), available at http://www.etsi.org/WebSite/document/Legal/ETSI%20IPR%20Policy%20November%202011.pdf (capitalization omitted).

[267] See generally U.S. Dep't Of Justice & Federal Trade Comm'n, Antitrust Guidelines For The Licensing Of Intellectual Property § 5.3 & n.34 (1995), available at http://www.usdoj.gov/atr/public/guidelines/; Guidance on the European Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings [now Article 102 of the Treaty on the Functioning of the European Union], 2009/C 45102, at § 57.

[268] For example, the Shenzhen Intermediate People's Court in China held that InterDigital had violated the Chinese Anti-Monopoly Law by, among other things, tying the licensing of SEPs to the licensing of non-SEPs. Accordingly, the court ordered InterDigital to cease its improper bundling of InterDigital's Chinese SEPs and non-SEPs. See Form 10-K, InterDigital, Inc., at 23 (26 Feb. 2013), available at http://files.shareholder.com/downloads/IDCC/2438652851x0xS1405495-13-10/1405495/filing.pdf. See also Apple, Inc. v. Motorola Mobility, Inc., 2011 U.S. Dist. LEXIS 72745 at *32-*33 (W.D. Wisc. 7 June 2011) (denying motion to dismiss breach of contract claim based in part on assertion that Motorola "sought to include cross-licenses to certain of Apple's nonessential patents as a condition of a licensing agreement and sued Apple when Apple refused to accede to Motorola's demands" because such "allegations are sufficient to imply that Motorola has not honored its promise to license on fair, reasonable and non-discriminatory terms").

For example:

- In April 2013, Motorola was awarded ~1/2000th of the original $4 billion in royalties it sought from Microsoft on IEEE and ITU standards. The court determined that Motorola was entitled to $0.03471 per Microsoft Xbox console, a tiny fraction of the $6 to $8 per unit that Motorola had demanded while threatening Microsoft with an injunction[269]

- The same year, Innovatio IP Ventures, LLC, sued hundreds of small businesses, such as coffee shops and hotel franchisees, seeking thousands of dollars from each based on their provision of Wi-Fi to their customers. Innovatio's demand amounted to several times the $1-2 price of many Wi-Fi chips in return for a license to less than 1% of all Wi-Fi SEPs. After some companies had been forced to settle, the court ultimately awarded Innovatio the reasonable royalty of $0.0956 per unit, a tiny fraction of the royalty it demanded[270]

- In yet another case LSI Logic, the holder of only two FRAND-encumbered Wi-Fi SEPs, demanded that a Wi-Fi chipmaker pay "a royalty that exceeds the selling price of [the chipmaker's] products."[271] The court awarded plaintiff a royalty of US$0.0019 to US$0.0033 per chip,[272] a small fraction of the royalty initially sought by LSI which exceeded the estimated US$1.00-1.75 price of the chips at issue.

Following these and other U.S. cases that have analysed the proper royalty base for patent cases, it appears that there may be an emerging consensus on the following principles:

- First, with respect to all patents whether or not subject to FRAND commitments, royalties must compensate SEP holders only for the contribution of their patented feature(s) to the overall product. This means that the royalty must be determined by reference to the selling price of the smallest saleable component that practices the patented feature, and must be further apportioned to account for that feature's contribution to the smallest saleable unit (such as where that unit is a system on a chip that incorporates multiple functionalities). The only exception to this "smallest saleable unit" principle is if the patented feature alone drives demand for the entire product[273]

- Second, with respect to FRAND-encumbered SEPs, the royalty must reflect only the contribution of the patented feature to the standard and the contribution

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[269] See Microsoft Corp. v. Motorola, Inc., 2013 WL 2111217 (W.D. Wash. 25 Apr. 2013) (the award of $-1.8 million divided by the original ask of $8 billion equals .045% or 1/2222th of the asking price).

[270] In re Innovatio IP Ventures, LLC Patent Litig., 2013 WL 5593609 9 (N.D. Ill. Oct. 3, 2013)

[271] Realtek Semiconductor Corp. v. LSI Corp., 2012 WL 4845628 at *2 (N.D. Cal. 20 May 2013).

[272] Jury Verdict Form, Realtek Semiconductor Corp. v. LSI Corp., Case No. C-12-3451-RMW, Docket No. 324 (Feb. 26, 2014).

[273] See Ericsson Inc. v. D-Link Systems, Inc., 773 F.3d 1201, 1227 (Fed. Cir. 2014); LaserDynamics v. Quanta Computer, Inc., 694 F.3d 51, 67, 69 (Fed. Cir. 2012); VirnetX, Inc. v. Cisco Systems, Inc., 767 F.3d 1308, 1326, 1327 (Fed. Cir. 2014) (quotation omitted).

of the standard to the product. The royalty must (i) take into account the value of the patent as compared to other patents that read on the same product; and (ii) not reward the SEP holder with any additional value that the patent gains from being included in a standard[274]

While courts in most jurisdictions outside of the U.S. have yet to publish opinions addressing the determination of FRAND royalties,[275] the principles established by the U.S. cases discussed above should apply consistently throughout different jurisdictions because of their persuasive reasoning. They are especially critical with FRAND-encumbered SEPs involving information technology and communications products, any one of which may be subject to tens of thousands of patents[276] and standards.[277] If these royalty base principles are not consistently enforced, the recent wave of abuses of FRAND commitments will continue to pose a significant risk to consumer welfare, and to innovation and competition in the digital economy.

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[274] See, e.g., Apple, Inc. v. Motorola, Inc., 869 F. Supp. 2d 901, 913 (N.D. Ill. 2013), rev'd in part on other grounds, 757 F.3d 1286 (Fed. Cir. 2014); Microsoft Corp. v. Motorola, Inc., 2013 WL 2111217, at *10, *11, & *20 (W.D. Wash. 25 Apr. 2013), affirmed, 2015 WL 4568613 (9th Cir. Jul. 30, 2015); In re Innovatio IP Ventures, LLC Patent Litig., 2013 WL 5593609, at *6, *9 & *13 (N.D. Ill. Oct. 3, 2013); D-Link, 773 F.3d at 1226, 1232.

[275] One exception is a lawsuit between Interdigital and Huawei that occurred in China. The Shenzhen Intermediate People's Court found that Interdigital's royalty demands did not comply with FRAND and accordingly ruled (with little explanation) that the royalties to be paid by Huawei for InterDigital's 2G, 3G and 4G essential Chinese patents should not exceed 0.019% of the actual sales price of each Huawei product. See Form 10-K, InterDigital, Inc., at 23 (26 Feb. 2013), available at http://files.shareholder.com/downloads/IDCC/2438652851x0xS1405495-13-10/1405495/filing.pdf.

[276] One widely cited estimate indicates that a smartphone uses more than 250,000 patents. See RPX Corporation, Amendment No. 3 to Form S-1, Apr. 11, 2011, at 59, available at http://www.sec.gov/Archives/edgar/data/1509432/000119312511101007/ds1a.htm.

[277] According to one study, at least 251 interoperability standards are practiced by an average laptop computer. http://www.standardslaw.org/How_Many_Standards.pdf.

Glossary of Terms

BEREC: The Body of European Regulators of Electronic Communications.

Content Delivery Network: A system of distributed servers that deliver webpages and other web content to a user based on the geographic locations of the user, the origin of the webpage and the server delivering the content. See Understanding Bottlenecks in the Digital Age, Key Concept 5.

Economies of scale: The ability of a firm to decrease costs per unit as the quantity produced increases. This is because as production increases, the fixed costs of entry are spread over a larger number of units.

European Commission: Represents the interests of the EU as a whole, independent of national governments. It is: (i) the initiator of action within the Union and drafts proposals for new European laws, which it presents to the European Parliament and the Council; (ii) the Union's watchdog (the guardian of the Treaties), bringing an end to infringements of the law by Member States; and (iii) the executive of the Union, providing detailed implementation of the policy decisions taken by the Council and the Parliament and enforcing its own powers of decision (e.g. in competition law). The Commission has also an external role, for example in negotiating trade policies.

Ex ante: In other words, "before the event". Economic regulation and dominant carrier regulation are often said to apply "ex ante", when a regulator detects a possible market failure – there is no need to show that there has been an abuse of a dominant position or that the parties have entered into an anticompetitive agreement unlike in competition law, which is said to apply ex post. This is helpful to characterise and distinguish the two but in practice, there are nuances. See How Competition Policy Works Today.

Ex post: "After the event". Competition law is said to apply "ex post", after an abuse of a dominant position or an anticompetitive agreement. This is helpful to characterise and distinguish the two but in practice, there are nuances. See How Competition Policy Works Today.

Femto Cell: A small, low-power cellular base station, typically designed for use in a home or small business.

FON: FON started as a peer-to-peer approach to Wi-Fi: members share their wireless access and in return can freely use Wi-Fi when they find another Fon's Access Point. The concept has been adopted by telecoms operators who offer to their customers who agree to share their access point, the possibility to access other customers' Wi-Fi for free.

Freemium: Freemium applications are available to download or obtain free of charge, but often offer priced add-ons or upgrades within the application.

Glossary of Terms

Geo-blocking: The practice of preventing users from accessing content based on location.

GUPPI: Gross Upward Pricing Pressure Index, a method for determining the upward price pressure that would occur as a result of a merger and evaluating the merger's potential for unilateral competitive effects.

Interoperability: The extent to which systems and devices are capable of working together. For example, in the simplest case, mobile phones are able to call any other device, regardless of manufacturer. Interoperability is low between platforms owned by different Internet players. Lack of interoperability raises entry barriers resulting from network and lock-in effects.

IPTV: Internet Television Programming System through which television services are delivered using the Internet, instead of being delivered through traditional terrestrial, satellite signal and cable television formats.

MNO: Mobile network operator. A provider of wireless communication services that controls all of the elements necessary to deliver services to an end user, including radio spectrum allocation, wireless network infrastructure, billing, customer care, provisioning computer systems and marketing and repair organizations.

MVNO: A mobile virtual network operator is a wireless communications services provider that does not own the wireless network infrastructure. Alternatively, it enters into a business agreement with a mobile network operator to obtain bulk access to network services at wholesale rates, then sets retail prices independently. An MVNO may use its own customer service, billing support systems, marketing and sales personnel.

Multi-homing: Means that consumers can be reached through the same medium, e.g. Facebook or Whatsapp on multiple devices such as PCs or smartphones.

Network Effects: Exists in industries where the benefits of consumption depend on the total number of consumers who purchase compatible products. In a physical network, such as a communication network, increases in the number of consumers on the same network raises the consumption benefits for everyone on the network (direct network effects). In a "hardware/software" system, the consumption benefits of the hardware good increase depending on the availability of compatible software (virtual (or indirect) network effects). Increases in the number of hardware users increases the demand for compatible software, and hence the supply of software. Platform based business models are all based on exploiting network effects, both as direct network effects (a platform becomes more attractive to consumers if the total number of consumers grows) and indirect network effects (a platform becomes more attractive to consumers as the number of service and content providers increases, and viceversa, it becomes more attractive to service and content providers as the number of consumers increases.

Network industry: Industries such as telecommunications and energy require significant investment in infrastructure to provide services across a region. These are known as network industries.

Operating system: Software that manages a computer's hardware and software resources and provides a common platform for all computer programs.

OTT: Over-the-top. In this Handbook, the term refers to the fact that services via the Internet are delivered without control over the underlying network and they are therefore referred to as OTT services. Most types of digital services are OTT.

OTT Bypass: The phenomenon by which retail customers in the digital age can (and do) circumvent mobile networks – by using an alternative to a mobile phone and/or connecting their smartphone directly to the internet through Wi-Fi.

Patent: A patent is a set of exclusive rights granted by a state to an inventor or assignee for a limited period of time in exchange for detailed public disclosure of an invention.

SIEC – Significant Impediment to Effective Competition: A concept broadly equivalent to SLC.

SLC – Substantial Lessening of Competition: See Assessing Market Power in the Digital Age, Key Concept 3 – Mergers: SLC / SIEC.

SMP - Significant Market Power: A term used in regulation in Europe and in a number of other jurisdictions. SMP designation is necessary before the imposition of regulatory remedies on an operator. Although SMP and dominance are defined in equivalent terms, there are important differences in concept and enforcement. See How Competition Policy Works Today. In Australia, significant market power is a term used in competition law investigations of operators with market power.

SMS - Short Messaging Service: Text messaging service for mobile communications.

SSNIP – Small but Significant Non-transitory Increase in Price: See Defining Markets in the Digital Age, Key Concept 6, the SSNIP Test.

Switching costs: Costs incurred by a consumer when changing from one product to another. These are usually monetary, although other costs such as time, or ease of use, may also be considered.

VoIP: Voice over internet protocol. A group of technologies that deliver voice communications over the internet. These have developed in the form of mobile applications such as Skype and Viber.

WBA: Wholesale broadband access.

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