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TECHNICAL REPORT

Assessing Indirect Impacts of the EC Proposals for Video Regulation

Chris Marsden, Jonathan Cave, Edward Nason, Andrew Parkinson, Colin Blackman, Jason Rutter

Prepared for the United Kingdom Office of Communications

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1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
1200 South Hayes Street, Arlington, VA 22202-5050
4570 Fifth Avenue, Suite 600, Pittsburgh, PA 15213-2612
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Executive Summary

The European Commission published proposals for a new Audiovisual Media Services Directive (AVMS)[1] on 13 December 2005. RAND Europe input (RAND, 2006)[2] in October 2005 to the European Commission's Impact Assessment based on the Issues Papers of 11 July 2005[3] found empirical support for the liberalisation of the rules on traditional broadcasters. It cautioned that evidence for impacts on the developing sectors for non-linear delivery was lacking: "In the absence of empirical evidence in order to assess the cost–benefit, we do not consider that definitive answers are possible."[4] The AVMS proposes to regulate two types of video providers: linear and non-linear. Linear providers will be regulated according to a revised broadcast regime, and will encompass both traditional broadcasters and providers of Internet Protocol TV (IPTV). This regime will apply whether the viewer watches the programme in real-time or records (using, for instance, a Personal Video Recorder; PVR) for later playback. Where the viewer actively requests the individual video file on demand, this is considered a non-linear use of video. This latter type of service would be regulated according to minimal standards, lighter than linear 'broadcasting' regulation, but still encompassing a wide range of prohibitions against particular types and durations of advertising, other commercial communications, different types of expression, and so on. The definitions do not exclude video blogs, interactive computer games or delivery of video over mobile telephone networks.

The AVMS as drafted does not yet ensure consistent application of a 'light touch' approach using self-regulation wherever possible to offers market actors greater flexibility in achieving the goals of the AVMS rather than traditional command-and-control regulation. The cost of complying with regulation has several components including: (1) opportunity costs arising from not creating content that is popular but not permitted by

[1] Formally COM(2005)646 final, proposing revisions to Directive 89/552/EC as amended in Directive 97/36/EC, with proposals for further revisions, at: http://europa.eu.int/information_society/newsroom/cf/itemlongdetail.cfm?item_id=2343 (henceforth, European Commission, 2006).

[2] Horlings, E., Marsden, C., Van Oranje, C. and Botterman, M. (2006) Contribution to Impact Assessment of the revision of the Television without Frontiers Directive, TR-334-EC DG, submitted 1 November 2005, published February 2006, at: http://www.europa.eu.int/comm/dgs/information_society/evaluation/studies/ (henceforth RAND, 2006).

[3] See http://ec.europa.eu/comm/avpolicy/reg/tvwf/modernisation/consultation_2005/index_en.htm

[4] RAND (2006), at p. vii.

regulation (and provided by other sources outside the EU); (2) the direct costs of policing content that is created; and (3) the risk of litigation. RAND 2006 stated that:

> "Regulation can only be effective with flanking self-regulation and technological and other instruments to protect viewers."[5]

Further, the AVMS proposals as currently drafted do not offer firms, particularly the small and medium-sized enterprises (SMEs)[6] who can be expected to play a major role in driving new media innovation, with sufficient regulatory certainty to encourage investment in European Union (EU) multimedia sectors. This is essential: the forerunner of the AVMS (the 'Television without Frontiers' Directive) affects only licensed broadcasters directly. The AVMS as proposed will affect a very broad range of stakeholders who formerly were unregulated or regulated by generic regulation such as the E-Commerce Directive[7]. The impacts of the proposal should be assessed for these 'indirectly affected' (in actuality, newly-affected) parties.

This study analyses these potential effects in detail. The Executive Summary describes the conclusions in five phases:

1. analysis of the proposed Directive's definitions as applied to multimedia content;
2. the Directive's broader macroeconomic impact via broadband and information and communication technology (ICT), including the innovations which have been termed 'Web2.0'[8];
3. the effect of the regulation on multimedia value chains;
4. the specific effects of regulation in three case studies: Internet Protocol TV (IPTV), online games and mobile multimedia; and
5. concluding comments on the impacts of regulation on development of the sector in terms of portraits of future broadband service development.

We caution that the sectors under examination have changed considerably from experimental innovation to deployment. Governments recognise a need to improve measurement of digital content, as lagging or incomplete statistical indicators mask the economic potential and implications of emerging industries and trends, affecting the agenda and priorities for government policymaking, if not the evolution of the sector itself.

This study does not attempt to describe material changes or improvements which could be made to the draft Directive to ameliorate the regulatory impacts identified, but the study

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[5] RAND (2006), at p. vi.

[6] The definition of SMEs: "Companies classified as small and medium-sized enterprises (SMEs) are officially defined by the EU [European Union] as having fewer than 250 employees. In addition, they can have an annual turnover of up to 50 million euros, or a balance sheet total of no more than 43 million euros… In reality, 99% of businesses in the European Union are SMEs", see: http://ec.europa.eu/enterprise/entrepreneurship/docs/facts_en.pdf

[7] Directive 2000/31/EC on Certain Legal Aspects of Information Society Services, in Particular Electronic Commerce, in the Internal Market.

[8] See O'Reilly, T. (2005) 'What Is Web2.0?', at: http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html

does point to the need for greater regulatory certainty as to the scope of the regulation of new services and the need for clear commitment to 'light touch' regulatory techniques.

AVMS and Definitions of Multimedia Content

A first legal problem is the application of the AVMS to new multimedia services. The definition of "audiovisual media service" is based on the six elements in Article 1(a) of the proposed AVMS:

> "A service as defined by Articles 49 and 50 of the Treaty [of the European Union], the principal purpose of which is the delivery of moving images with or without sound, in order to inform, entertain or educate, to the general public by electronic communications networks."

Article 1(b) defines "media service provider" as those who hold editorial responsibility. Both scheduled linear programming and video-on-demand (VOD) services (non-linear content) are to be subject to a set of prohibitions or restrictions on offensive content (inappropriate for children, racist or xenophobic) and forbidden commercial content (including certain types of advertising and sponsorship).

The E-Commerce Directive[9] and Annex to the 1998 Recommendation on the Protection of Minors and Human Dignity[10] already apply to non-broadcast services. The AVMS supplants this suggested self-regulation by a co-regulatory or regulatory approach. The Commission states:

> "This definition is intended to regulate as a function of the centre of gravity of the service sector concerned, not as a function of borderline cases. It is binding as to the result to be achieved but leaves to the national authorities the choice of form and methods."[11]

This latter point is critical: the definition does not specify exclusions or how 'light touch' regulation should be applied, so national implementation can vary significantly. In particular, the relative regulatory compliance cost burdens faced by linear and non-linear service providers can be expected to vary significantly.

The Impact of Broadband and ICT on the Economy

The macroeconomic impacts of the AVMS arise from its effect on the development of core elements of the 'New Economy' – especially broadband and the 'creative content' sectors[12]. The Organization for Economic Cooperation and Development (OECD) states:

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[9] Directive 2000/31/EC, as implemented in national laws in 2002, already gives consumers clarity about where a company is regulated, and where to pursue any complaints.

[10] See Council Recommendation 98/560/EC of 24 September 1998 on the Development of the Competitiveness of the European Audiovisual and Information Services Industry by Promoting National Frameworks Aimed at Achieving a Comparable and Effective Level of Protection of Minors and Human Dignity, at: http://europa.eu.int/eur-lex/lex/LexUriServ/LexUriServ.do?uri=CELEX:31998H0560:EN:NOT

[11] European Commission (2006) February 'non-paper', mimeo.

[12] See Richards, E. (2006) 'Next Generation Networks: Investment and Innovation', presentation at London Business School, 29 June, at: http://www.london.edu/assets/documents/PDF/Ed_Richards.pdf

> "Broadband content applications and services are expected to encourage the uptake and effective use of ICT, to drive broadband development. Furthermore, digital content is expected to provide a new impetus for the digital economy, encouraging innovation, raising the level of skills, triggering dynamic developments and innovations in existing industries and creating new markets."[13]

Therefore, the digital content industries are viewed as particularly important for employment and international competitiveness. Figure 1 shows that employment in industries such as advertising and film shrank between 2001 and 2004, but employment in software for computer games and electronic publishing (elements in multimedia) grew by 5% over the same period.

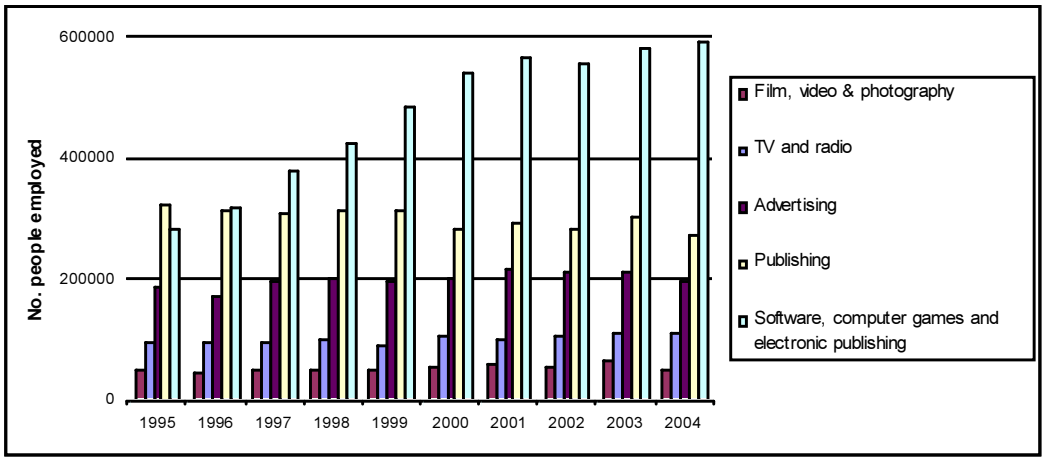

Figure 1: Employment in Creative Industries in the UK 1995–2004

Source: Office for National Statistics

Figure 2 shows that the software sector also dominates creative economy exports.

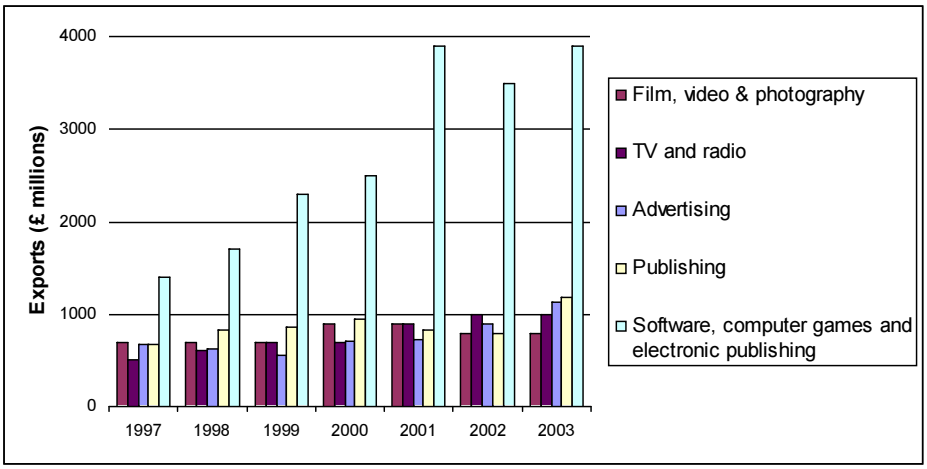

Figure 2: UK Exports for Selected Creative Industries 1997–2003

Source: Office for National Statistics

[13] Wunsch-Vincent, S. and Vickery, G. (2006b) 'Digital Broadband Content – Digital Content Strategies and Policies', OECD DSTI/ICCP/IE(2005)3/FINAL, 19 May. Paris: OECD, at p. 6.

The European Information Technology Observatory (EITO) stated that:

> "Entertainment and mobility in particular will account for most of the positive developments within the telecommunications market, further supported by new data and Internet services, mainly in the fixed area. Broadband access continues to boom in the EU."[14]

Beyond this direct contribution to competitiveness, broadband and ICTs are 'enabling technologies' that facilitate broad productivity gains. Broadband Internet use is necessary for many future ICT applications and services, and policymakers consider it important that current and future workers are ICT-literate, which increasingly means multimedia literate.

User-generated Content: Web2.0

A further element in broadband's contribution to overall productivity is the potential development of innovation by end-users enabled by ICTs. The next generation of distributed applications and services on the Internet is crucial to development of the broadband economy, increasing the utility and power of networked computing, especially the Internet. This is described as Web2.0, and makes user-generated and distributed content central to consumers' Internet experiences. In Europe, a notable national example is Estonia, which has significant expertise in Web2.0 and peer-to-peer (P2P) technologies, notably in producing the Voice over Internet Protocol (VoIP) software Skype and the P2P client Kazaa. Web2.0 is likely to facilitate significant innovation and consumer adoption in the years to 2011. In turn, user experience with digital games and multimedia suggests that they are likely to drive innovation and adoption of Web2.0 and P2P services and markets.

Value Chain Analysis

We now examine the sectors in more detail. There are limitations to the use of standard quantitative techniques in determining the costs and benefits of the AVMS in new multimedia sectors[15]. We consider the medium-term, to 2011 where possible, but caution that the only certainty in such an analysis is that the quantitative assessment will be incorrect. Therefore, we rely largely on qualitative analysis. We examine the literature for evidence of the evolution of value chains, before turning to specific case studies and the value chain in each.

The value chain is a simple tool to evaluate systematically the full range of activities required to bring a product or service from conception through production to final consumer delivery. Porter's classic 1985 analysis[16] studies value creation at company level,

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[14] EITO (2006) 'Online Visual Media Content', market data provided by the EITO Task Force in cooperation with IDC (Inbternational Data Corporation), Institut de l'Audiovisuel et des Télécommunications en Europe (IDATE) and Growth from Knowledge (GfK), at: http://www.egovmonitor.com/node/4796/print

[15] In any nascent sector that is predicted to grow fast, the 'median' statistical prediction is most likely to be inaccurate: consumer adoption of technologies either develops faster or slower than expected, as we discuss in Chapter 2. For a quantitative assessment, see Indepen/Ovum/Fathom (2005) 'Extension of the Television without Frontiers Directive: An Impact Assessment', see: http://www.ofcom.org.uk/research/tv/twf/twfreport/

[16] Porter, M.E. (1985) Competitive Advantage – Creating and Sustaining Superior Performance. New York: Free Press.

identifying and categorising the company's activities, and studying the value added at each point. Support activities, which exert their effect on value creation via the primary activities, can also directly affect value creation. The normal value chain diagram connects different entities (generally firms) and the arrows between them indicate functions. These value chains can incorporate also the more complex interlinkages between the various actors (processes) within the value chain. For example, the design of a product not only influences the production process and marketing, but is influenced also by the constraints in these downstream areas. In addition, value chain analysis has been extended to analysis at an industry level, encompassing links between firms in a similar manner to links within the firm[17].

Scholars have argued that the emergence of new technologies will have – and has had – fundamental impacts on the value chain of affected industries[18]. In particular, disruptive technologies[19] have the potential to overturn an existing dominant technology or product, and in so doing, introduce new value-creating processes, reconfiguring the value chain. In some cases, the emergence of new technologies has led to the creation of a 'value web'[20], where the traditional linear or hierarchical relationships between suppliers and producers have evolved to encompass more complex, network-like, relationship forms. Value web networks are footloose (can globally relocate easily) and responsive to consumer market, investment and regulatory conditions. This is not to say that bottlenecks and legal constraints do not constrain these new types of enterprise, but their responses are not as uniform, smooth or predictable (in relative terms) as in the traditionally linear, vertically-integrated or controlled environments which broadcast and telecoms regulators have analysed[21], and on which formal analysis has concentrated[22]. Furthermore, the ruthless competition in these markets results in highly volatile and 'snowballing' investment decisions: for states seeking to attract such investment, there is more of a 'winner-takes-all'

[17] Kaplinsky, R. and Morris, M. (2001) A Handbook for Value Chain Research, at: http://www.ids.ac.uk/ids/global/pdfs/VchNov01.pdf; mGain (2003) Mobile Entertainment Industry and Culture Deliverable D5.2.1, at: http://www.knowledge.hut.fi/projects/mgain/mgain-wp5-d521-delivered.pdf

[18] See for example Wirtz, B.W. (2001) 'Reconfiguration of Value Chains in Converging Media and Communications Markets', Long Range Planning 34: 489–506.

[19] Christensen, C.M. (1997) The Innovator's Dilemma. Boston, MA: Harvard Business School Press.

[20] Note that this is not a direct reference to the Internet or to Web2.0 technologies. Cartwright, S.D. and Oliver, R.W. (2000) 'Untangling the Value Web', Journal of Business Strategy 21(1): 22–7; Tapscott, D., Ticoll, D. and Lowy, D. (2000) Digital Capital – Harnessing the Power of Business Webs. Boston, MA: Harvard Business School Press.

[21] See Chapter 1 in Marsden, C. and Ariño, M. (2004) 'From Analogue to Digital', in A. Brown and R. Picard (eds) Digital Television in Europe. Mahwah, NJ: Lawrence Erlbaum.

[22] Examples include: PriceWaterhouseCoopers (2004) 'Economic Analysis of the TV Advertising Market', report commissioned by Ofcom; PriceWaterhouseCoopers (2006) Global Entertainment and Media Outlook 2006–2010. London: PriceWaterhouseCoopers.

pay-off from the entrepreneurial investment climate provided. There is a tendency in networked sectors to reactions swinging from excess inertia to volatility[23].

Conventional simplified value chains do not reflect fully the ability of international or globalised investment, production and distribution to relocate away in response to changes in the regulatory and/or market environment. This study tests whether AVMS could have a measurable impact on particularly 'footloose' sectors of the overall value 'mesh'. Previous studies show that the value chain in emerging multimedia services (as with Web2.0) is less hierarchical and less linear than traditional mass media markets[24]. The 'fitness' of one business model over another will be determined by its ability to adapt to technological, regulatory and other changes and to articulate and attract finance for suitable business cases.

Competing business models differ in the power of the operator within the value chain, and the feasibility of vertically-integrated 'walled gardens'. This fluid relation between power and upstream and downstream integration is characteristic of multimedia value webs, where transaction costs are large enough to promote internalisation by integration rather than reallocation through market-based relationships. Network operators may expand up the value chain into content provision, and content providers may expand down the value chain into service provision and content aggregation. This has two implications. First, the internalisation of functions previously available in a competitive market may increase entry barriers and thus market power. Second, integration may change the amount of regulatory pressure brought to bear (this will be anticipated in integration decisions).

The single point of control assumed in most broadcasting and telecoms regulation has given way increasingly to clustering, hybridisation and agglomeration of skills within virtual organisations[25], in ways that have not been reflected fully in regulatory impact analyses[26].

Therefore, the AVMS Directive will be applied to an industry whose structure is both more complex and more dynamic than the traditional industries of broadcasting or telecoms, and one in which the effects of regulation may have significant impact on the eventual industry structure that emerges. In some cases, the natural response by the market to heavy regulatory burdens and/or increased regulatory risk may be to increase this rate of integration, and hence to make the market structure less competitive and open than would have been the case otherwise[27].

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[23] See Katz, M. and Shapiro, C. (1986) 'Technology Adoption in the Presence of Network Externalities', Journal of Political Economy 94(4): 822–41.

[24] Horlings, L., Lundin, P., Simmons, K. and Kahan, J. (2005) 'Input for the Extended Impact Assessment of i2010', report for the European Commission, DG Information Society, March. Santa Monica, CA: RAND.

[25] See Botterman, M., Van Oranje, C., Horlings, E. and Cave, J. (2005) 'Preparing for Tomorrow's Global, Networked Knowledge Society', report for the Netherlands Ministry of Economic Affairs, Directorate-General Telecommunication and Post, February.

[26] European Commission (2005) Impact Assessment Guidelines, SEC 791, 15 June.

[27] Perhaps the classic article in this field is Stigler, G.J. (1971) 'The Theory of Economic Regulation', RAND Journal of Economics 2(1): 3–21.

Case Studies

This section lays out conclusions from the detailed case studies. Note that the concluding remarks differentiate 'walled gardens'[28] from an open/interoperable access 'commons'[29]. It is also important to note the influence of the AVMS on the value chains for each case study and, in particular, the effect of content compliance costs on large content providers and SMEs, offshoring by providers and network operators' pricing and regulatory compliance strategies.

IPTV

IPTV is at a mature stage of commercial deployment only in Hong Kong, and to a lesser extent, France and Italy. IPTV is a substitute for existing TV channels, and can be largely substituted by VOD services. It is delivered primarily as a 'walled garden' product bundled with broadband access and telephone calls at present, typically by major telecoms and cable operators. The sustainability of this business model in the medium term is not clear and turns in part on whether network operators are able (and permitted by regulation) to impose charges or other forms of control for such content in the face of 'free-riding' global P2P distribution of video content.

Regulatory risks: A light-touch regulatory regime based on industry self-regulation or co-regulation appears feasible in relation to these 'walled garden' offerings. Conversely, the risks of multinational offshoring and SME business failure appear quite high, particularly in more global sectors such as P2P-distributed VOD and niche content channels. The market is too immature to model peering costs and alternative distribution models with any certainty. We therefore recommend more intensive and focused research into the costs of local IPTV versus VOD and multicast distribution costs. If such costs differ substantially, it may be that the regulatory costs are very much secondary to the distribution costs in the operators' choice of where to site their networks.

It is possible that this market will trend away from 'walled garden' linear services to open-access non-linear distribution for all but essential 'live' events. Such a development would much reduce the scope to apply practicable EU-level regulation, unless this was mirrored in the level of control applied in Third Countries. In the absence of detailed modelling, it is difficult to be certain whether the cost of regulatory compliance with the new AVMS Directive could itself be a contributory cause of the migration of economic activity towards this 'open-access' model, but clearly, the heavier and less practicable the EU regime, the more likely it is that distributors will favour alternate means to address consumers.

Open versus closed models: The distribution cost question may depend on the ability of IPTV 'walled garden' networks to retain customers in the face of possible 'free-riding'

[28] A 'walled garden' is a type of IP content service offered without access to the wider Internet: most mobile telephone networks provided walled gardens to their subscribers.

[29] By 'commons', we refer to an open space, with interoperable and publicly available standards, of which the World Wide Web is the archetype.

global P2P distribution of video. This has wider regulatory implications, particularly involving the development of 'gatekeepers' rather than open access models[30].

Mobile Multimedia

Mobile users inhabit a much more personal and pervasive environment than personal computer (PC) users[31]. Compared to fixed line Internet access there are additional constraints on full openness. The mobile industry has developed hitherto on the basis that operators control the use of their networks and the devices which connect to them. For that reason, the initial content offerings of mobile providers have tended to be provided in a 'walled garden', in which the customer experience is 'guaranteed' by the operator and regulatory compliance can be imposed on third-party content providers through their contracts with the mobile operator.

Regulatory risks: As with 'walled garden' IPTV offerings, compliance with a light-touch regulatory regime appears feasible, and in fact would build on existing self-regulatory regimes in a number of Member States. Mobile operators are probably less vulnerable than fixed networks in relation to the 'free-riding' P2P problem because of the greater control that they already exert over the end-to-end delivery of traffic on their network. Nonetheless, care would need to be taken to ensure that the costs of compliance with a regulatory regime for content did not become so great in relation to 'open-access' distribution that mobile operators themselves would choose to evade the costs of the former by artificially restructuring their business activities (for instance, mobile companies requiring or facilitating the setting up of content services outside of the EU so as to avoid EU rules).

Open versus closed models: The obverse of the above analysis is that the Directive will tend to reinforce the tendency towards a high level of end-to-end control by network operators of mobile content services. If it were considered that a more open mobile environment was desirable and would spur creativity and generate more jobs, then part of the policy response could be to avoid new regulatory burdens.

Online Games

It has been argued that 'online games are the future of the interactive entertainment industry'[32]. In this relatively young sector, a highly-skilled labour force gives Europe significant presence in the global market. Digital games development is more global than either IPTV or mobile content sectors. Developers increasingly use specialised labour around the world and around the clock. Global labour supply and the networked basis of the games themselves make offshoring elements of the industry relatively straightforward.

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[30] Continuing the analogy with commons and walled gardens, one can imagine that a walled garden can be protected and entry or exit charges imposed. By contrast a commons is open access, with no controls. The walled garden gatekeeper is likely to be the owner of the garden – the operator.

[31] As a hypothesis chosen in Chapter 3, we did not consider that – in the medium term – mesh networks would achieve critical commercial mass such that they would affect the regulatory decisions to 2011. This may be inaccurate, but certainly to date such networks have been isolated.

[32] Sharp, C. (2003) 'Business Integration for Games: An Introduction to Online Games and e-Business Infrastructure', IBM, at: http://www-03.ibm.com/industries/media/doc/content/resource/thought/1500737111.html

By 2011, most games will involve access to online content, multiplay or community resources, irrespective of the platform. This will eliminate any demarcation between offline and online gaming, as data flow will become increasingly seamless.

Regulatory risks: Applying rules drawn directly from TV to games may not suit the profound differences in the way that the media are used. Implementation of the AVMS, where games are classified as linear or non-linear regulated video, would make online gaming subject to new regulation based on whether the user is connected to the network, not the context of the game or its content. Neither legislators nor users would be clear on the point at which gaming services become covered by the AVMS or why elements of play are regulated differently. The gaming currently considered appropriate for industry self-regulation and play by minors (when used on a stand-alone machine or wired network) would become subject to AVMS regulation when played online.

With high local development costs, compliance costs falling on EU developers may bar them from the global market. While large publishers could mitigate costs by integrating administration with existing quality management, developing and hobbyist SME developers would face disproportionately high impacts. However, precisely these small players constitute Europe's comparative advantage in the global market.

Innovation and Web2.0: The regulation of online 'persistent world' games is still primarily through PCs. In Eastern Europe the PC – rather than the specialised games console – is the primary games platform. Any regulation that disproportionately affects online PC games will have asymmetric impact, especially on European states with lower average wage levels. The digital games industry is at the vanguard for exploiting the use of network technologies for user engagement, user creativity and community building and it may seem premature to legislate for the developing industry. Moreover, this impact of regulation on platform development and convergence is particularly tricky in terms of new games consoles driving innovations in graphics, storage, communications and computing power. The 'media centre' bundling of functions in these consoles creates a further challenge for 'technology-neutral' AVMS implementation.

Overall Value Chain Conclusions

The most footloose and immature elements of the value chain also combine high potential for disruptive growth and responsiveness to regulatory sunk costs and uncertainties. The resulting flight of capital or skills to other sectors or countries may be greatest in gaming, but also includes globally P2P distributed IPTV (as opposed to local) companies and some elements in the otherwise tightly vertically integrated and localised mobile value chain. We expect these businesses to have a high sensitivity to regulatory proposals. As business models develop, so does the possibility of quantifying and analysing their response to regulation in more detail and with more certainty. Regulation includes changes to current regulated pricing and classification of content, so the interplay between content regulation and content pricing is, in our view, an essential area for future research[33].

[33] The interviewees in this project have indicated that Quality of Service on the Internet is a complex issue and that net neutrality needs greater analysis in order to ascertain the real investment

The potential of regulation to affect the value net appears most profound in the business model choice between a 'walled garden' and an open-interoperable content model (although we acknowledge that these are ideal types of business model). The latter tends towards Web2.0-type 'public good' value and innovation concentrated in end-users rather than network operators and associated clusters of developers. At least at the margin, the choices made now about the regulation of these sectors can have an impact on this business model choice. By and large, the greater the levels of regulation and problems of uncertainty, the more likely the market is to develop towards more closed and concentrated structures, for three reasons:

1. larger companies are able to bear the direct costs of regulation much more easily than SMEs;
2. larger companies have the resources and lobbying power to seek to influence regulation in a positive direction; and
3. larger firms in a concentrated market can offload compliance costs upstream onto content providers and developers, or downstream onto consumers.

The case study sectors' development is interdependent. They are both cooperative and in competition with each other, being substitutes and complements in both demand (consumer substitution and churn) and supply (the degree to which content can be reformatted and/or made interoperable across platforms for IPTV, mobile and games).

The linear/non-linear distinction is vital in deciding on regulatory strategy. Non-linear enforcement is a critical issue. User-generated and user-hosted content create their own problems[34]. There are tens of thousands of potential commercial video podcasters, but no regulatory body in the sector can register such a body of AVMS suppliers. *The only feasible way to enforce the Directive is via the intermediary, content host or service provider as a proxy for the content editor.* This may result in substantial changes to the type of common carriage regime that is currently in place, and described in Chapter 2.

For incumbent linear operators, the nominal burden of regulation will not change. *Hence, incumbents and regulated actors have incentives to drive up regulatory costs in other parts of the value chain.* Should they choose not to do so, they must hope to leverage their position in the emerging value chain in order to compete successfully with entrants from outside the industry.

New linear operators (e.g. new channel providers) will face relatively heavy regulatory burdens under all scenarios. They are likely to licence over to incumbents or otherwise consolidate. *Therefore*, *regulation reinforces concentration*. In fact, it is difficult to imagine new entry succeeding in any but niche channels, because sunk costs make entry uncompetitive in 'established' new media channels.

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options that can drive content and network investment in Web2.0 and next-generation network futures.

[34] These are not always non-linear. For linear niche content, the extreme cost of enforcement on users may create a 'safe haven' in the shadow of the regulation. Users and others below the regulatory radar could populate the linear market niche as suppliers, and as users of other users' linear content, if the regulation inhibits the incumbents who currently dominate the linear sector.

For both old and new linear operators, the 'referred liability' which makes them police content is controlled via the fact that they commission content from providers (including advertisers) under contract. *Therefore, linear actors can pass on regulatory risk via co-regulatory and self-regulatory arrangements enforced by contract*. Where costs cannot be passed on except to end-consumers, linear offers may lose out to non-linear services.

Impacts of Case Studies on the Broadband Market

Having considered the effect of regulation in the three case studies and their potential interactions, we now attempt to aggregate from the sectoral to the broader content level, to gauge the impact of content regulation on the broadband network market and ICT in three areas: universal broadband penetration, faster broadband, and the effect of user-generated and distributed content.

Universal broadband penetration: Currently, approximately 40% of UK households do not subscribe to a fixed-line broadband service. It is necessary to separate the consumers who are likely to do so by 2011, those who have (or will) obtain mobile and other wireless connections, those who access the Internet only at work or school, and those who will not adopt. We can anticipate that a proportion will choose to adopt a lower speed and more filtered Internet via digital TV (with final UK regional analogue switch-off in 2012), or substitute mobile for fixed line networks. Further evidence and analysis is needed to assess the extent of any serious or sustained lag in broadband penetration or correlation between population density and broadband penetration. OECD figures for the end of 2005 indicate that several early-adopter European countries are now approaching universal broadband saturation (with the exception of rural areas, disabled users and a clear lag in penetration among over-55s)[35].

Faster broadband: Most existing UK home Internet connections are already at broadband speed. The migration path to 2011 is to higher bandwidth (speed, capacity, reliability) services. The higher cost of fibre combined with consumer service demand uncertainties mean that it cannot be assumed that fibre will achieve a penetration rate approximating to current broadband penetration by 2011, but the rate of adoption of fibre and fibre-like (50Mb/s and upwards) connections is an essential element in the assessment of the AVMS. As Figure 3 shows, there may be a developing supply–demand 'arms race', as connection speed and application bandwidth continually drive each other higher (at least in urban high-density locations). This is obviously only one of several different potential outcomes.

[35] See generally, OECD (2006a) 'Broadband Statistics December 2005', 11 April, at http://www.oecd.org/document/39/0,2340,en_2649_34223_36459431_1_1_1_1,00.html#Graph2

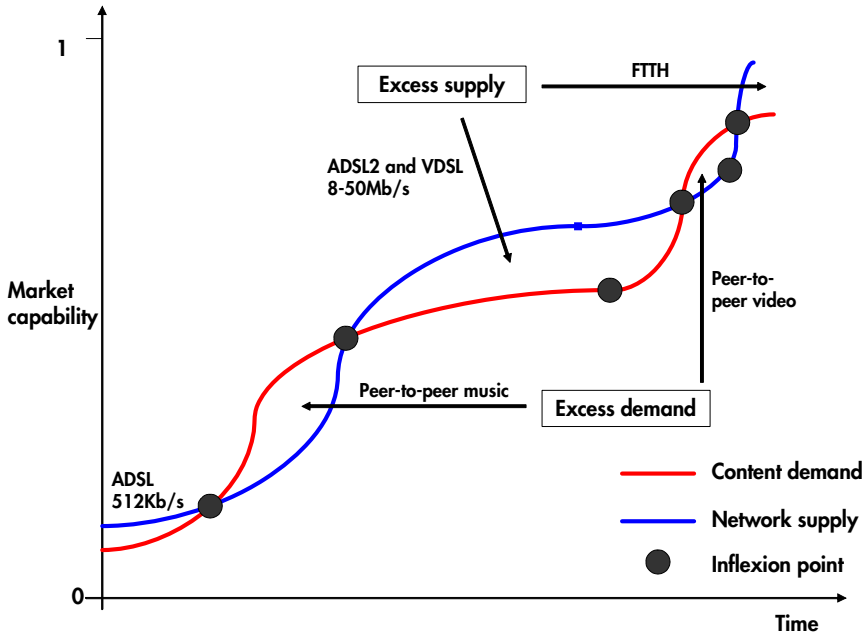

Figure 3: Possible Development of the Supply–Demand Curves for Broadband

User-generated and distributed content: If networks and content providers cannot monetise their respective parts of the value chain, network effects can reverse into a 'vicious circle', in which neither content nor network can secure investment to provide service. Instead, the inflexion points at which investment in the lagging element is needed to prime the next phase of disruptive growth can become crisis points (described below in the 'midband malaise' or 'user-controlled commons' portraits). At this point, investments may be constrained and a 'virtuous circle' of investment replaced by a vicious circle of under-investment.

Qualitative Projections Based on Portraits

It is difficult to model changes in AVMS regulation against broadband Internet use with any certainty. Quantitative forecasts for the size of new multimedia markets are unreliable, as outcomes in an immature disruptive technology environment tend to fall at either extreme of the ranges anticipated. For the same reason, it is not possible to quantify accurately the broader economic impact of the AVMS. Instead, we offer preliminary qualitative 'portraits' of potential broadband development based on a previous scenario-based methodology[36]. Figure 4 below illustrates the portraits via current projections of broadband penetration and European Internet advertising and access growth against the European venture capital available for communications investment. We note that both of the current projections would be significantly interdependent with the scenarios we portray for the future: the higher the scenario projection of investment, the higher the rate of

[36] See Horlings, E., Botterman, M., Cave, J., Ligtvoet, A. and de Vries, G. (2002) 'Accelerated Broadband Roll-out for the Netherlands: A Review of Economic Benefits', MR-1654-NDGTP, September, at: http://www.rand.org/pubs/monograph_reports/MR1579/

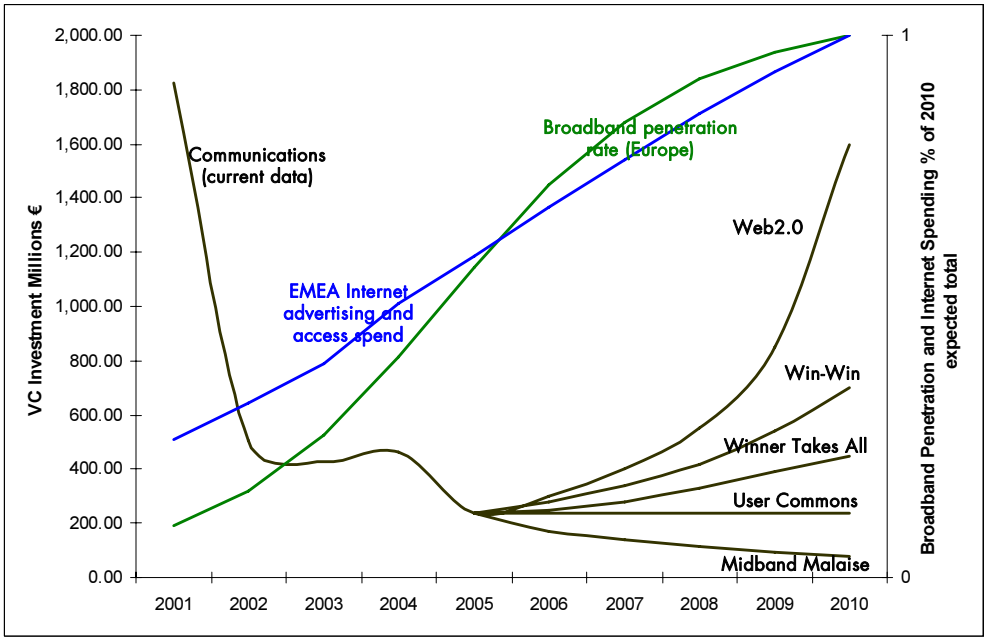

Figure 4: Potential Future Outcomes for Investment in European Communications, 2006–2010

Sources: RAND analysis from OECD, PriceWaterhouseCoopers, European Venture Capital Association

deployment of services and hence some further presumptive increase in the rates of broadband adoption and access/advertising growth.

The portraits are:

1. 'midband malaise' – where content owners and network operators cannot monetise content;
2. 'user-controlled commons' – where P2P distribution becomes highly popular and widespread, displacing streamed live content on the Internet and traditional business models[37];
3. 'winner-takes-all' – one type of content wins the bulk of consumer revenues, taking advantage of the contagion and tipping effects of digital networked content;
4. 'win–win' – all content sectors grow their markets and create a virtuous circle of bandwidth upgrades and industry growth.

Figure 4 adds a fifth 'Web2.0' portrait whose potential success has many key dependencies, of which the most important are motivated and risk-taking innovators and the venture capital to support those risks. New innovation encouraged by venture capital – which we take as a quantifiable proxy for other investment sources – may be diverted by 'heavy touch' regulation of market entrants. Strong regulatory signals can invite (or alternatively, dissuade) such investment.

[37] We note that in this scenario, the prevalence of usage of non-commercial sites will lead to flattening growth for Internet advertising and access, unless there are new compelling applications for P2P sharing that include advertising and late adopter use. Otherwise, it may only be a commons for non-commercial early adopters.

Regulatory Conclusions

In a 'walled garden' world, vertical integration and/or networks of contractual relations can allow participants some competitive breathing space to find and implement suitable allocations of regulatory costs and compliance activities. Something similar could happen in self-regulation or co-regulation forums. Dominant and entrenched market actors in regulated 'bottlenecks' play games with regulators in order to increase the sunk costs of market entry for other actors, and pass through costs to consumers and innovators. Very high cost co-regulation and self-regulation can be as effective in curbing market entry as direct content regulation. Also, if vigorous regulation makes it difficult to recoup compliance costs or shift them towards those entities best placed to bear them, the consequence would be consolidation and concentration of market power[38]. Either approach would help the European sectors touched by the AVMS to 'survive' the onset of regulation, but long-run efficiency requires either that competition hardens, or that ultimately, regulatory burdens must increase. The former approach (bargaining to reallocate compliance typical of a light-touch/co-regulation approach) seems likely to provide fewer long-term threats to competitive health. The cost, investor signalling and market reputational effects of a non-regulation regime can be very damaging, leading to 'surprise' court cases and broad national legal differences. It leads to wide divergences between market actors' compliance and between 'walled gardens' and open access, causing consumer confusion (as well as choice for the particularly well-educated minority of consumers).

Therefore, based on the incomplete evidence thus far – for which reason we include the research topics below – we cautiously suggest that a form of Internet video self-regulation in which market actors and self-regulatory bodies maintain a constant dialogue with regulators and consumers is a preferable light-touch regime to those of government-funded regulation and non-regulation of selected European Internet content. A light-touch stable regime provides investors with a reasonable level of business certainty. Investors require some certainty that regulation will not cause unwelcome 'surprises' that distort their business case. Proposals that user-generated Web2.0 video and computer games be regulated under the AVMS can be included in such 'surprises'.

In sum, these conclusions support a light-touch regulatory regime involving self-regulation and market-based, low-cost solutions.

Nine Areas for Further Research and Analysis

The conclusions we make are based on hypotheses designed to isolate the effects of content regulation within the many other parameters in the development of broadband services. The report details the various areas of development that invite further research, and we here highlight the most pertinent and relevant areas that we have identified, throughout

[38] The claim is that if regulation falls on the new content providers, who have no regulatory expertise or even function (except a lawyer as a generalist), then it will be more painful and create real economic hardship for some players. By contrast, if regulation is enforced in a flexible way that allows those best placed to comply to do so in the most cost-effective way, there will be less economic hardship and potentially more competition.

which there runs the ever-present research topic of the search for cost-effective pricing of content and of Digital Rights Management (DRM). These research areas can inform ongoing assessment of indirect impacts of the effects of content regulation on the Internet.

1. *Internet peering and distribution costs*: We recommend more intensive and focused research into the costs of local IPTV, VOD and multicast distribution. It can be postulated, for instance, that European 'Long Tail' sites need US 'hits' in order to prosper: further research into the use of these sites is needed to confirm this initial hypothesis. Further research on an ongoing basis is needed into user-generated content creation and self-regulation.
2. *Price discrimination and content regulation*: Regulation includes changes to current regulated pricing and classification of content, so the interplay between content regulation and content pricing is in our view an essential area for future research. 'Net neutrality'[39] needs greater analysis in order to ascertain the investment options that can drive content and network investment in Web2.0 and next-generation network[40] futures.
3. *Converging Quality of Service and next-generation networks*: On the Internet, 'Quality of Service' is a complex issue. Data, voice and other applications have different 'legacy' Quality of Service standards – at least implicitly in their technologies and consumer preference. In converged domains, the necessary evolution will affect entry and profitability. The economics of these interactions require further clarification, as the current empirical base reflects 'impulse' effects not market development.
4. *Venture capital flow analysis*: In order to explore the fluctuations in venture capital more accurately it would be necessary to research the individual funding agreements. This helps in real option analysis of the choices made by venture capital investors.
5. *Switching costs, regulation and innovation*: The impact of regulation on churn and the 'turbulent' impact of churn on market growth need to be considered. For instance, regulation may encourage price/feature competition or reduce firm survival. Churn – or even vigorous cost competition – may reduce the scope for product innovation on the supply side and innovative (user-generated) activity on the demand side.
6. *Drivers for broadband penetration*: Differences in broadband penetration and capacity utilization appear to be largely explicable by speed of deployment and pricing differences. This observation for early adopters in richer OECD countries may not adequately describe late adopter incentives, and may not hold for the

[39] The legality of the attempts by network owners to charge multimedia content producers for carrying their content.

[40] See European Commission (2006) 'Staff Working Document', 28 June, at: http://ec.europa.eu/comm/avpolicy/reg/tvwf/modernisation/consultation_2005/index_en.htm, which discusses in depth the issues arising from next-generation networks and provides definitions.

Eastern European EU Member States. Further research is necessary in this area, with stated preference as a potentially useful methodology.

7. *Stated preference analysis*: User demand for access and services is not driven wholly by current offerings, but reflects as well a 'real option' decision based on potential future goods, services and types of interaction (especially with regard to user-generated content). This has powerful implications both for uptake and utilisation. Because these options are framed by existing uses and service offerings, revealed preference data cannot shed light on underlying preferences or on the structure of the underlying decision (e.g. the extent to which content drives broadband adoption or vice versa). Discrete choice modelling with stated preference data would make the values ascribed to internet service provider (ISP) choice by users more robust and give deeper insight into the possible future evolution of the sector under different regulatory regimes.
8. *Quantitative assessment of harmonisation and enforcement*: We note that the medium-term effects of regulation are largely differentiated between Member States according to their enforcement decisions, and that these will have impacts on both investment and competition in the sectors. We caution that further research is needed to model these more fully in quantitative rather than qualitative terms, and to shed light on the possible future shape and consequences (e.g. regulatory cost, effectiveness and 'flight') of regulatory competition both within the EU and between the EU and other global regimes.
9. *Game theory and regulatory impact assessment*: Our analysis has highlighted the importance of different models for the discharge of regulatory liabilities (blind vs. sighted ISPs, as analysed in Appendix A) and for consumer interaction (open access vs. 'walled gardens'). Since these partially align with the Internet versus next-generation network split and since they are already visible, it would be helpful to have a better understanding of this 'competition of organisational forms'. Our analysis shows that the supposed 'unanticipated consequences' of regulation of Internet video can be estimated, and that regulators can become more aware of these consequences by using regulatory games to simulate real market behaviour.