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## Report of the LSE Network Economy Conference 2013: policies and strategies for a revival of the European Telecom and Internet Sector

Blog Editor

The [LSE Tech](#) group held a [Network Economy conference](#) on 13 May on the theme “The need for a revival of the European Telecom and Internet Sector: Policies and Business Strategy”. Among the 75 participants we had regulators, telecom operators, internet application firms, financial analysts, and academic researchers. The day was structured on a number of central themes that extended and drew from three [previous workshops](#) on: infrastructure investments, service innovation, and regulatory economics. Here, you will find a summary of the main themes and current key debates about telecommunications and internet policy research in Europe.

### Opening remarks: The key to today’s policy must be further stimulation of ICT markets

Alex Blower from Nominet opened the conference with a broad ranging critique of the structure and policies for European telecoms. Alex had been head of the international division at [Ofcom](#) and his perspective spanned Europe and contrasted private sector engagement with state policies. He reminded us that Thatcher’s legacy to the telecom and ICT markets from 1991 are still relevant today. He further pointed out how the economic crisis is shaping our view of policy and networks. Alex also asked whether we really want to see a trend of increasing industrial policy and interventionism. It is instead important, he continued, to create good conditions (and trust) rather than one-off interventions that will harm the investment climate, and these comments shaped one of the persistent themes of the conference. Europe has competitive advantages in developing networks and economies of scale, so it is disappointing that the European market is still characterised by poor growth and performance. The key to today’s policy must be further stimulations of these ICT markets. However, he believes that net neutrality will continue to be an issue for some time as industries from different regulatory starting points blends together. Alex finished on a note of warning that political grandstanding rather than innovation economics could set the agenda in Europe’s policy landscape the coming years.

Picking up on this somewhat gloomy outlook Michele Bellevisita from ETNO and Telecom Italia reflected on recent events in Brussels pointing out that the European telecommunications industry is facing unprecedented challenges. Total revenue in the sector shrank 8% between 2007 and 2011, a period in which other regions, most notably East Asia and North America, saw sustained growth. Mr Bellevisita also pointed out that with current investment rates the [Digital Agenda target](#) will not be met: [According to the European Commission](#), only 12% of fixed broadband lines are at least 30 mbps, and just 2.5% are 100 mbps or more. The fragmentation in the market needs to be address according to him: In the U.S., four operators control 86% of the market, which has around 330 million subscribers. In Europe, which has a total of 645 million subscribers, it takes the top 15 operators to reach the same combined market share.

### Infrastructure theme: Next generation research on changing internet infrastructures

#### What does a revival of the European telecom industry means?

Richard Feasey of Vodafone continued by introducing the first research session on infrastructure policy. He asked the audience to consider how we define success when addressing “a revival” of the European telecom industry. He suggested that a lack of clarity or consensus on defining these goals contribute to the incoherency of the European policy debate. Here academic research help to understand industry characteristics and could provide lessons from other markets. At least three metrics are needed: outputs, innovation, and investment. Success could be measured in terms of expansion of total output, higher investments, an increasing number of larger firms in existing sectors, or new firms in new sectors, increased rate of innovation, more employment, higher returns to share holder, and increased consumer benefits. Richard means that the debate on investment is moving in the right direction to focus on what really affects returns: market structure and competitive interactions between firms. Cost reduction in itself does not improve investment levels if surplus is immediately competed away. However, simplistic comparisons between Europe and US on price and average revenue per user are not very informative in this sense. The main issue is about expected returns on incremental investments, i.e. ability to use capital to differentiate, and for differentiating firms to capitalise by sustaining a pricing premium (or drive market share). Richard asked the rhetorical question “Does European policy then encourage shareholders to support differentiation strategies?” Not quite, was his answer: Network access models of competition tend to dilute returns from incremental network investments because any source of differentiation has to be shared with resellers (hence the ‘regulatory holiday’ debate in fixed telecom, and the MVNO challenge in mobile – especially for LTE investments). ‘Symmetric’ market models, where policymakers are seeking to narrow gaps between firms, also tend to weaken the ability (and hence incentive) of European firms to differentiate. He also stated that efforts to close gaps between ‘laggards’ and ‘leaders’ (e.g. spectrum caps, MTRs, national roaming) dampen the

investments (at least in the short term). Dr. Feasey finished by proposing that policy makers perhaps need to be more Darwinian in their approach to competition in Europe. The risk is otherwise that we reach a situation where the investment gap becomes unbridgeable, which the case in Australia informs us about.

### **The need for better internet metrics**

[Jonathan Liebenau](#) and [Silvia Elaluf-Calderwood](#) provided an overview of the LSE Tech research activities, stressing recent outputs and the themes that hold together a varied portfolio of projects. They picked up on some of the themes addressed by Richard Feasey, including the need for better metrics. A starting point has been to seek a robust answer to the straightforward question of how to quantify the internet. A clear trend is that [the internet is neither flat nor global](#), and it is increasingly mobile. One hitherto poorly integrated feature is the changing role and significance of internet exchanges and [recent quantifications](#) of that reveal that around one third of European internet traffic passes through exchanges that consequently hold great significance for the structure, dynamics and pricing of network services. Other themes on the research agenda described include sustainability of mobile internet business models and APIs, [NFC and privacy](#), definition and metrics of [cloud computing markets](#), and how big data will affect financial markets.

### **The Commissioner and the price of copper**

[Martin Cave](#) described how the debate over copper access prices for broadband services has devined and what policy options are at hand. Incumbents claim that raising the price of copper (and broadband) would encourage fibre investment and make fixed telecoms more profitable. Alternative services providers argue that lowering the price of copper would encourage fibre investment (and make ADSL easier to sell). Neither is (or both are) right according to Martin. The price of copper has an opportunity cost effect: A high price means that switching to fibre entails a substantial loss of revenue and a business migration effect, but a high copper price could affect the price of retail broadband to make fibre investment more attractive. The outcome depends on the balance of these effects. As always, access pricing rules depend on the policy maker's objective: is it roll-out of high speed broadband (HSB), or take-up of HSB, or competition, or low broadband prices? The available options depend on how many instruments are available: i) controls only on the copper price, because fibre investment has to break even; ii) controls on both the price of copper and the price of fibre (which can be reduced by public subsidy); iii) leave fibre prices alone but tax copper (as proposed by Lord Carter in 2009); iv) the copper price can be made conditional on fibre investment (an operator which invests in fibre can raise the price of copper). From these options three strategies for a policy maker emerges: Strategy 1: a backward-looking 'monopoly utility' approach to allow efficient cost recovery of copper investments. However, this could generate almost any result. Strategy 2: the traditional 'efficient competitive process' approach to charge copper at the long run incremental cost and wait and see. Strategy 3: the teleological approach: choose the price of copper to achieve a desired end state – the European digital agenda! This may entail short/medium term sacrifice of welfare from current generation broadband. Martin Cave concluded that the EU Commission appears to use the language of strategy 2 while pursuing strategy 3. Is this really welfare-enhancing, he asked. He concluded that it appears to hinge on the (as yet unknown) spill-over effects of HSB, and on how indispensable fibre is to HSB.

### **Regional innovation and employment**

Sven Otto Littorin, former minister of employment in Sweden, gave a practical account of regional efforts to boost industry and academic collaboration for ICT innovation. "Mobile Heights" is a regional coordination hub among industry, academia and regional government. They have made an effort to coordinate responses to opportunities and setbacks such as the 650 lay-offs recently at Sony Mobile when its hardware engineering was relocated Tokyo. Mobile Heights is an effort to bridge the gap of research between industry and academia applying the successful spin-out/spin-in process of SAAB Defence & Security. A key driver for this process is to let industry and commercial needs direct the research agenda. Through Mobile Heights a new Mobile and Pervasive Computing Institute at Lund University has been established where commercial goals will be connected to research budgets.

### ***Service Delivery theme: investments and economics of new internet architectures***

#### **The mobile industry will shift**

The growth of mobile phone access worldwide has attracted much enthusiasm in part because of its potential to generate new social and economic benefits. [Mark Selby](#) started his talk by stressing the need for new mental frames where we look at things differently since the mobile industry is shifting. He questioned whether the economic and social benefits can continue to accrue. Most countries have a limited number of mobile network operators due to local regulatory and licensing policies. Unlicensed spectrum and WPAN open the door to new entrants, unhindered by the cost and regulatory constraints of current mobile operator incumbents. A more acute market concentration has developed in the mobile device industry. Canaccord Genuity estimated that in Q4 2012, Apple took 72% and Samsung took 29% of total profits in the mobile phone market. Other suppliers, including Nokia, RIM, LG and HTC either broke even or lost money. Such financial strength gives the two companies an extraordinary opportunity to control the market, cause further havoc amongst their competitors and contribute to the major shift by taking the industry in a fundamentally new direction. Conversely, the control of the few has historically enabled new entrants to create fundamentally different innovations, unhindered by historic ways of working or cognitive frames. Significant innovation, economic and social value will be created but it is not clear who the losers are going to be. Those at risk are incumbent market players following inappropriate, rear-view mirror strategies, seeking regulatory protection from new entrants.

#### **Internet-based innovation and the importance of getting the policy context right**

[Johannes Bauer](#) highlighted two aspects of the emerging socio-economic system: (1) its unique, malleable technological basis and its implications for competition, and (2) the implications for services innovation. A critically important role of policy is to get

the environment right. Digital environments amplify the nature of innovation as an experimental learning process. Because of the malleability of information and communications technology, multiple innovation processes with different economic characteristics coexist in the internet. Economic attributes of digital technology could be described in plasticity and acceleration representing the multiplexity and diversity of innovation processes. Digital technology allows flexible substitution and multiple configurations (e.g. best-effort, P2P, CDN for internet video) with very different cost characteristics. Alternative configurations will be least-cost, profit maximizing solutions for varying output levels or uses, often with complex patterns of technology switching. Plasticity is multiple technological solutions and perpetual transformation of factor combinations which enhances innovation opportunities. Johannes claimed that innovation also can be understood as an experimental process combining and re-combining knowledge, contributing to what we can call acceleration. Assembly of incremental innovations can contribute to fundamental systemic transformations. Digital technology changes the process of innovation (referring to work of Brynjolfsson); rapid sharing of success and failure; quick imitation and replication of successful projects; these forces accelerate innovation and create turbulent competitive conditions. A critically important role of policy is to get the context right so that players optimize fitness relative to their environment.

### **Competition in the cloud**

From this framing of service innovation, [Annabelle Gawer](#) presented recent work on cloud computing, its enablement by platforms, and the role of law and economics to get the “environment” right. Annabelle set out by saying that innovation in the cloud is challenging Europe’s telecoms industry and its regulatory system. The shift from ‘desktop to data centre’ and the provision of computing in the form of a service means that cloud offerings are increasingly dependent on the quality of the underlying communications infrastructure. Critical parts of the infrastructure are regulated, and the role that regulation plays may limit services innovation and in turn may mean that communications infrastructure could become the ‘weakest link’ in a cloud offering. According to Annabelle Gawer it is important to get this environment right in particular when it comes to service platforms. As platforms are tools for coordination, incentives to coordinate are crucial to platform innovation. She used lego pieces as a metaphor for those building the blocks behind platforms. In this sense she pointed to the difference between modular versus systemic innovation that needs more attention and further empirical tests. European policy goals, the Lisbon Treaty and regulatory actions all interact, and she proposes a change in the EU regulatory regime to reflect a duty to promote innovation as a stated goal. This change would encourage new business models to emerge, allowing the incumbent EU telecom network providers the opportunity to contribute to innovation in the cloud.

### **Policies of the apps economy should support high mobility and decreasing switching costs**

Continuing on the theme of platforms, LSE Tech [Patrik Karrberg](#) spoke on policies for the emerging mobile applications market. A research project at LSE Tech has identified the structure and size of the apps economy in the US, UK, Italy, and Germany. In this way employment effects among IT workers in firms developing and distributing mobile apps can be estimated. The US dominates the app economy in real numbers, amongst others due to its dominance in providing very large cloud data centres and related skillsets. Direct and indirect employment resulting from cloud-related tasks among IT staff is estimated to be ten times as high in the US as in the UK. By modelling service delivery platforms used for distributing mobile apps we can also identify the underlying assets, or architectural components to study technology innovation in services. We note that such platforms have evolved from telco-controlled supply-chain platforms in the early 2000s to industry platforms (such as iOS, Android, etc.) connecting multi-sided markets of gaming, music, TV, and event ticketing, to mention a few. Suggestions for policies focusing on the apps economy in Europe should support high mobility and decreasing switching costs in the single market for these platform components and the related IT staff. The policies should also strive to support high complementarity (increasing value when the right components are combined) among platform architectures by addressing IPR, data protection and cross-industry regulatory silos.

### **Regulatory economics theme: Future scenarios**

#### **Next generation broadband investments needs more attention**

Harald Gruber of the [European Investment Bank](#) [EIB] explained the status of financing next generation broadband build-out in Europe. Up to 70-80% of FTTH build-out cost is generated by civil works contributing to local employment, according to EIB estimates. Even though the perceived benefits of FTTH are significant, customers’ willingness to pay is seemingly not high enough partly due to the absence of high speed broadband services. There is also a limited ability of investors in NGA infrastructure to appropriate benefits related to structure of market and the regulatory environment. The build-out of 4G mobile networks has a very different cost profile to FTTH (lower capex per capita and mainly network equipment rather than civil works for FTTH). The high cost of deployment (EUR 220bn, estimates by EIB) with most of it in rural areas, contributes to operators reluctance in an environment where governments are scaling back planned subsidies. Harald also believes that operators are cautious to invest since the regulations for FTTH remain under development and are to a large extent untested. The wish-list for long-term NGA investors could be assumed to be the following: clearly identified and mitigated risks; regulatory certainty and time consistency of regulatory propositions; dealing with bypass infrastructure (legacy infrastructure, competing networks); agreement of rate of return and how to deal with up-/downsides. Harald Gruber concluded that investment requirements has questionable financial profitability, especially in non-urban areas and he considered the role of new financial instruments, in particular joint activities with the Commission such as project bonds, PPP and equity instruments. Hence he thought it a pity that the European Council has cut broadband budget from EUR 9.2bn to EUR 1 bn over the period 2014-20.

Jonathan Dann of Barclays presented a view that contrasted somewhat with Harald Gruber in that he expressed concern about the overall appetite of the market for upgraded infrastructure in the near future. He stressed the conditions in which pay-off periods might occur and the relative willingness of investors to move into telecoms in a larger way than before.

#### **The European policy landscape from a policymaker’s viewpoint**

Andrea Coscelli of [Ofcom](#) gave an account of current challenges for telecom regulation in Europe seen from a policy maker's viewpoint. Andrea summarised the main challenges in the following: convergence of TV, broadband and telephony in the consumer retail space (and in some countries mobile); getting the investment incentives versus regulated access to bottleneck facilities right; the pricing of regulated access prices to main bottlenecks; and the interplay of EU regulations and national implementation. Most core telecom regulation according to Andrea is essentially about pricing of one-way access to upstream regulated facilities (e.g., WLR, LLU, wholesale call origination, leased lines) and pricing of fixed and mobile termination. However there is less of a debate about mandated access per se in this area but an increasingly litigious approach to pricing of access or termination rates that has led to increased complexity of the models used to determine prices. The interplay of national regulation and EU policy plays out in how the EC has veto power over market definition and SMP but not over remedies. Existing regulation focussed on individual wholesale inputs (e.g., LLU, WLR, wholesale call origination, VULA) to allow every efficient retail players to compete. Andrea concluded that it is increasingly difficult to apply the existing framework to this increasingly converged world.

### **And a response from the industry**

Alan Sewell from Sky discussed the proposed "extension" of regulation into the pay TV space. He questioned the need for more regulation in an area where traditional cable operators are challenged by the likes of internet movie providers with limited employment or their otherwise contribution to the UK digital economy. His comments crystalized the problem of how far legacy regulatory approaches rooted in telecoms might go, and in what manner, towards other digital economy realms.

### **Regulators should require more transparent pricing**

[James Alleman](#) from the Columbia Institute for Tele-Information followed up on the core issue of pricing by presenting how nonlinear pricing and [self-selecting tariffs](#) could benefit user welfare. James set out by pointing to the fact that users have a plethora of different plans of cellular phone packages, broadband services, and mobile wireless device "hot spots." Users do not have perfect information about what broadband plans suit their DSL needs, how many minutes for cellular service they use, and what level of use for wireless data that would be optimal to their needs. However, with the push for "competition" and deregulation, the ICT oligopolies have not been subject to price controls according to James. Indeed, pricing regulation of these firms has been neglected. James Alleman explored the relationship between these various areas and suggests how regulators should insert their influence in pricing policy making. Specifically, regulators should require ICT firms to be more transparent regarding their optional pricing packages. Indeed he proposes that ICT firms should be required to bill their consumers the "best" price structure for their usage *ex post*, and not require consumers to select a package *ex ante*. The result of such a [pricing policy](#) would allow society to reap savings and welfare benefits from nonlinear pricing.

### **Cyber law theme and its impact for Business Models on the future Internet**

[Andrew Murray](#) from the LSE Department of Law started the session by providing an overview of legal risk associated with digital communications and cyberlaw. He commented on how extradition charges and the choice of location for international disputes has a significant impact on the outcome, which poses a risk to individual users. Resourceful organisations benefit from this situation as they can juggle which jurisdictions to apply in order to increase the chance of a, from their point of view, successful outcome.

[Barbara Cherry](#) from Indiana University described what she calls the rise of "shadow common carriage". "Shadow activities" refers to those actions that meet the definition of the "activity" but fail to be recognized or regulated by the public or government as such. Shadow activities develop according to Barbara for the following reasons: as a matter of law when dismantling of prior regulation or prohibiting regulation of new activities takes place; through avoidance of regulatory rules, either legally or illegally; or as unintended consequences of deregulatory policies. Shadow common carriage has evolved by overt deregulatory action in the U.S. However, it is not the case in Canada although both share the same common law history and similar dual-jurisdictional and federal statutory regimes. Moreover, in the U.S., the misattribution of "monopoly theory" to common carriage regulation has contributed to both the evolution of shadow common carriage, and the tendency to dismiss the likely consequences of its development. Results of policy divergence between the U.S. and Canada include: Loss versus retention of providers' traditional obligations, such as an obligation to serve; loss versus retention of stand-alone wireline access lines for customers; loss versus retention of wholesale interconnection obligations; and as loss versus retention of judicial remedies for customers. Barbara Cherry also suggested that lessons from the US in how federal versus state law regulates telecom services could be applicable to the European debate on how to progress with creating a single telecom market.

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In a field long dominated by partisan positions, the LSE Network Economy Forum takes the lead in disseminating quality research and fostering serious debate about telecommunications and internet policy research in Europe. Our intention has been to raise the level of sophistication and careful use of high quality studies by all parties involved in the network economy. The chairman of the NEF is [Dr Jonathan Liebenau](#), Reader in Technology Management, Department of Management, LSE. NEF Programme director is [Dr Patrik Karrberg](#). The NEF counts with the support of LSE Tech Research Fellows [Dr Silvia Elaluf-Calderwood](#) and [Dr Carla Bonina](#), and project manager Louise Newton-Clare.

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