inter media
www.iicom.org
July 2011 Volume 39 Issue 3

by Brian Williamson

Convergence policy and outcomes: a transatlantic divide?

Comparing Europe and the USA

Europe and the US have followed different paths in terms of policy, regulation and market outcomes in relation to the telecommunications sector. In important respects they have diverged, and that divergence now appears to have resulted in path dependence. We explore aspects of this divergence and path dependence in this paper.

The US and Europe have diverged in relation to policy targets, with the US focussing on goals in relation to universal broadband that are closer to what the market is likely to deliver compared to Europe (4 Mbps rather than 30 Mbps and a greater focus on the mobile Internet); whilst also adopting targets in relation to spectrum reallocation, an area where there is necessarily a role for policy either in reallocation or designing market mechanisms to achieve reallocation.

Analysis of the US versus Europe illustrates how different aspects of policy can interact, potentially in unanticipated ways. Further, these interactions can result in path dependence or hysteresis, whereby the policy-business strategy game can shift, sustaining divergence rather than convergence of outcomes. This implies a need to give more weight to strategic and political economy considerations in evaluating policy options, recognising that action today that appears optimal may result in incentives to pursue sub-optimal policies in future.

The US removed mandated cost oriented network access requirements and published principles in relation to open access to Internet based applications in 2005. This combination may have resulted in a relatively more welcoming attitude of network owners to growth in Internet based applications and in traffic growth, indeed it is viewed as a profit opportunity as it creates demand for network capacity and speed.

In contrast, in Europe where *ex ante* price controls have been maintained and extended, some network operators have called for data termination charges and view traffic growth as a concern. The creation of an industry built on regulated access to the loop has also led to pressure to preserve the status quo reflected both in minimum notice requirements for copper retirement and pressure to lower the price of copper.

In relation to outcomes we find that comparisons are made more difficult as a result of convergence, in particular in relation to price comparisons over time and between countries/regions. Quantity measures, particularly in relation to take-up and use, are likely to be more robust and meaningful as they reflect service quality, willingness to pay and price. In general a greater focus on outcomes rather than outputs (for example, fibre availability) and inputs (such as capital expenditure) is warranted.

Policy targets

The US and Europe have recently adopted divergent policy targets in relation to next generation access. The US FCC National Broadband Plan submitted to Congress in March 2010 proposed a broadband target of 4Mbps for all by 2020,[1] whilst Europe adopted the Digital Agenda target of 30Mbps for all by 2020 in July 2010.[2] The cost implications and technology mix required to meet these targets are likely to be very different.

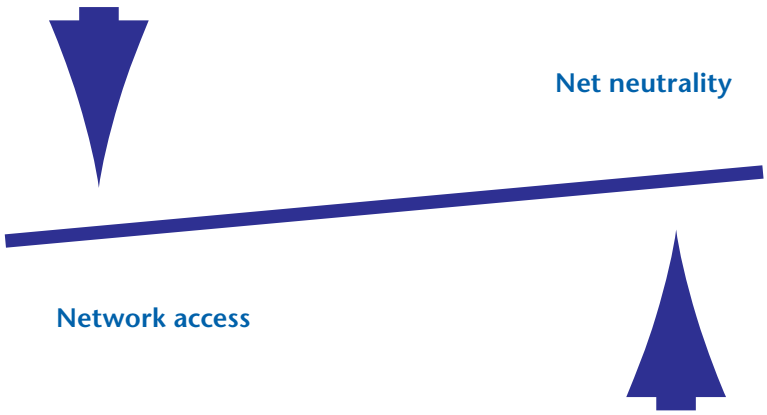
In addition, the US has focussed relatively more on wireless reflected both in the target (which wireless can more readily deliver) and emphasis in terms of statements regarding the role of the mobile Internet in relation to innovation and growth. In particular, the President's State of the Union address in January 2011 mentioned high-speed Internet as essential to America's economic growth and global competitiveness, and set a goal for wireless but not for fixed or fibre:[3]

"Within the next five years, we'll make it possible for businesses to deploy the next generation of high-speed wireless coverage to 98% of all Americans."

1 FCC. March 2010. "National Broadband Plan". http://www.broadband.gov/plan/
2 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF
3 Remarks by the President in State of Union Address. January 2011. http://www.whitehouse.gov/the-press-office/2011/01/25/remarks-president-state-union-address

The US has also adopted a target for spectrum reallocation for mobile broadband. The FCC National broadband plan of March 2010 proposed that the FCC should make 500MHz newly available for broadband use within 10 years of which 300MHz between 225MHz and 3.7GHz should be made available within five years for mobile use.[4] In June 2010 a Presidential memorandum directing a programme of work to achieve the objective was issued.[5] In Europe national targets have been adopted in Denmark, the UK and Sweden and a European target of making available a total of 1200 MHz for mobile use by 2015 has been proposed.[6]

Figure 1 Shift in regulatory policy in 2005



Policy and regulation

US and European telecommunications regulation deviated significantly in 2005 when the FCC removed mandated network access requirements in relation to fibre and limited unbundling options in relation to copper.[7] Europe has maintained such requirements and explicitly restated them in relation to next generation access in September 2010.[8] However, at the national level different approaches have been followed with the UK, for example, applying non-discrimination "equivalence" requirements in relation to next generation access but not an *ex ante* price control. Rather, the coexistence of regulated copper DSL alongside next generation access is expected to constrain any pricing power (so called "anchor product" regulation[9]).

In relation to radio spectrum the US completed nationwide analogue TV switch-off in June 2009 with spectrum reallocation for mobile broadband use in the 700MHz band. Further, operators are also free to use available spectrum on a technology neutral basis. However, the US has less spectrum for mobile compared to Europe.

Across Europe there is wide divergence in timing of TV analogue switch-off and an aim of clearing spectrum across member states for mobile broadband by January 2013, with possible derogations until the end of 2015. Further, until liberalisation this year, the GSM Directive prevented the use of 900 MHz frequencies for 3G and LTE (the Directive facilitated early spectrum reallocation and harmonised market development, but arguably outlived its usefulness).

Alongside liberalisation of wireline access the US also adopted net neutrality principles in August 2005,[10] in effect replacing mandated third party access to networks with a principle of open end user access to lawful content and applications provided over the Internet. More recently, the FCC has sought to turn these principles into rules. The rebalancing implied by the two measures considered together is illustrated above (Figure 1).

There has been a view in Europe that the "net neutrality" issue is particular to the US precisely because the US removed mandated network access and therefore regulatory support for competing access resellers.[11] However, Europe has nevertheless seen instances of discrimination against Internet based applications, a number of European network operators have been vocal in arguing that traffic generated by consumers using applications such as *YouTube* threatens to overwhelm their networks and in proposing data termination charges,[12] net neutrality

4 FCC. March 2010. National Broadband Plan. http://www.broadband.gov/plan/
5 http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution
6 http://www.europarl.europa.eu/meetdocs/2009_2014/documents/itre/pr/852/852716/852716en.pdf
7 Bauer. March 2005. "Unbundling policy in the united states - players, outcomes and effects." http://papers.ssrn.com/sol3/papers.cfm?abstract_id=976885
8 "Commission Recommendation of 20 September 2010 on regulated access to Next Generation Access Networks (NGA)." http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:251:0035:0048:EN:PDF

9 Williamson. 2009. "The regulation of next generation access networks and the draft Commission Recommendation." http://www.plumconsulting.co.uk/pdfs/Plum_Sept09_Regulation_of_NGA.pdf

10 FCC. August 2005. http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf
11 Neelie Kroes. April 2010. "Net neutrality in Europe." http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/10/153&format=HTML&aged=0&language=EN&guiLanguage=en
12 FT. 26 April 2011. "Europe telecom groups target Google."

principles are now under active discussion in Europe[13] and have been adopted in some member states.[14]

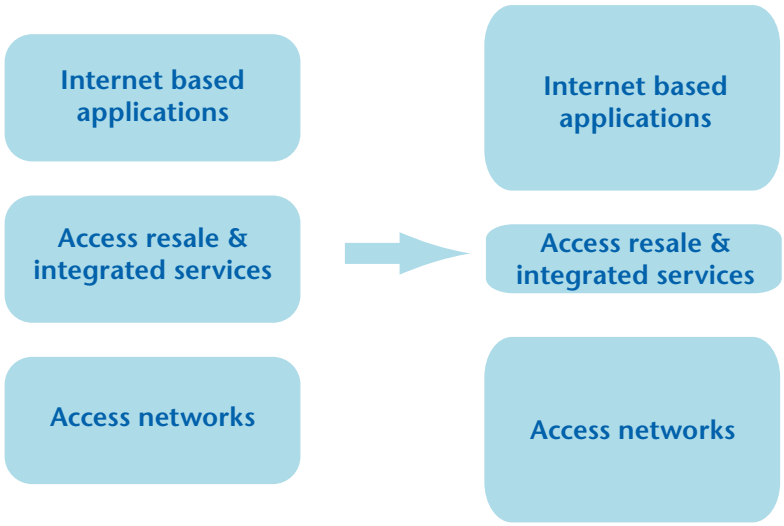
Net neutrality would appear to be anything but a uniquely North American issue, and, arguably, tension around the issue may prove more pronounced in Europe given the apparent divide between network owners and Internet based application providers in Europe compared to the US, as illustrated by the following:

> *"I love what Google is doing to the extent that they generate more use of broadband."*
> Seidenberg, CEO, Verizon, 2006[15]

> *[Google and Yahoo!] "use Telefonica's networks for free, which is good news for them and a tragedy for us."*
> Cesar Alierta, CEO, Telefónica, 2010[16]

It is unclear precisely what is driving the difference in attitudes of network owners in the US versus Europe, but greater regulation of access networks in Europe may be a factor. Regulation including unbundling requirements and price controls in relation to copper loops and regulated prices for mobile call termination limit opportunities for network operators to monetise their core business, namely access, directly via end user charges.

Figure 2 The relative rise of access and Internet-based applications



Other possible explanations may include differences in perceived exposure to losses of voice revenues as use of third party VoIP applications grows (perhaps flowing from calling party versus receiving party pays and the structure of mobile tariffs) and differences in political economy of policy in Europe versus the US reflecting the relative lack of high profile Internet based enterprise success stories in Europe.

Europe has also seen ongoing debate about the merits of network-service separation whereas the US has not.[17] Arguably over the top network independent applications, such as Skype, are now achieving a significant degree of separation independent of any policy initiative. This trend is likely to accelerate as people adopt smart personal devices which can run third party apps.

Over time the contribution of such applications to innovation, competition and value added can be expected to increase. Value added in the access layer can also be expected to increase (with next generation access) whilst value added related to access resellers (so called "ISPs") and network integrated services can be expected to decrease, as illustrated in the above figure (Figure 2).

Provided end users have open and non-discriminatory access to Internet based applications, one might expect this trend to continue and therefore for forced separation of services from networks as a policy issue to become largely irrelevant.

Regulation of access in Europe also has indirect and perhaps unanticipated consequences. In particular, the creation of an influential access reseller layer in the market has focussed attention on their interests rather than the interests of

13 http://www.coe.int/t/dghl/standardsetting/media-dataprotection/conf-Internet-freedom/Internet%20Governance%20Principles.pdf
14 23 June 2011. http://www.bbc.co.uk/news/technology-13886440
15 This followed earlier comments by the Verizon Senior Vice President that mirror those in Europe today, namely "The network builders are spending a fortune constructing and maintaining the networks that Google intends to ride on with nothing but cheap servers." http://www.forbes.com/2006/02/09/verizon-google-0209markets06.html
16 http://www.bloomberg.com/news/2010-12-07/apple-google-asked-to-pay-up-as-european-operators-inundated-by-data.html

17 In the UK functional separation (the creation of *Openreach*) was a mechanism for ensuring equivalence rather than an initiative to achieve separation *per se*. This approach has allowed the boundaries of the *Openreach* business to be flexed in response to technological and market developments.

consumers. This has implications for the transition from current to next generation access.

Even where there is consumer willing to pay for more advanced broadband, access resellers may perceive little benefit from transition since gains are likely to be competed away at the retail level and to be shared between consumers and network investors. Access resellers may then seek to impede transition since it would disrupt their existing business model based on unbundled local loops (unless there is sufficient platform based competition to make the status quo option unattractive and therefore to motivate transition).

Evidence for access reseller capture of policy is illustrated by the requirement in the September 2010 European Commission recommendation that "In the absence of such agreement [between the SMP operator and operators currently enjoying access], NRAs should ensure that alternative operators are informed no less than 5 years, where appropriate taking into account national circumstances, before any de-commissioning of points of interconnection such as the local loop exchange." This requirement does not have direct regard to customer or infrastructure investor interests; rather it gives primacy to the interests of access resellers.

In contrast to Europe, in the US copper retirement is permitted.[18] Five years after Verizon began offering fibre to the home to customers Verizon gave notice in April 2011 of the first proposed retirement of copper at an exchange in Texas on or after August 2011.[19]

The European focus on call termination and roaming is not mirrored in the US given adoption of bill and keep and the fact that the US is a single market within which roaming charges are not an issue. However, the FCC has proposed a national mobile data roaming requirement.[20]

More recent policy discussion in the US and Europe has focussed on if, who and how to regulate cloud based applications. One question, if and where it is appropriate to apply equivalent regulation to Internet based applications and integrated applications, is whether regulation should be levelled up or down. However, it does not follow that regulation should in principle be the same for Internet based and non-Internet based applications. For example, a linear TV viewing time "watershed" does not translate to on-demand Internet based services (for which users make consumption choices and may apply filtering or protection for some content themselves).

Another issue under consideration in the US and Europe is how universal service policy should be adapted given the development of mobile and during the transition to next generation access. For example, aspects of universal service policy adopted in relation to fixed telephony may no longer be appropriate given widespread adoption of mobile.

A discussion peculiar to Europe is how cost orientation should be interpreted in relation to next generation access, and whether to change the approach in relation to calculating the cost of copper access during transition. A report commissioned by the European Competitive Telecommunications Association (ECTA) proposes lowering, or threatening to lower, the price of copper loops substantially.[21] However, lowering the price of copper loops would discourage customers from switching to next generation access and/or result in a lower price for fibre, and would send a signal that cost recovery in relation to future "sunk" assets might also be denied.[22]

We note that lowering the wholesale price of copper would not be expected to increase the profitability of access resellers since, in a competitive retail market, wholesale price reductions would be passed on to end users. Lowering the price of copper would, however, help protect access resellers from competition from rival cable and wireless platforms. This may explain the motivation of access resellers in advocating lower copper prices.

Outcomes

With convergence, measurement of prices and usage of specific services is either meaningless or is complicated by growth in network independent services, zero priced services and connectivity and service bundles. In addition, service quality is no longer homogeneous, with growing choice and variations in service quality emerging. This makes comparisons of prices across time and between countries problematic. Further, lower prices do not necessarily imply that consumers are better off as consumers might rather pay more for better service quality (for example, a smart phone rather than a basic phone or

18 There was an unsuccessful effort to reverse this policy. See Verizon response: http://fjallfoss.fcc.gov/ecfs/document/view?id=7020393147

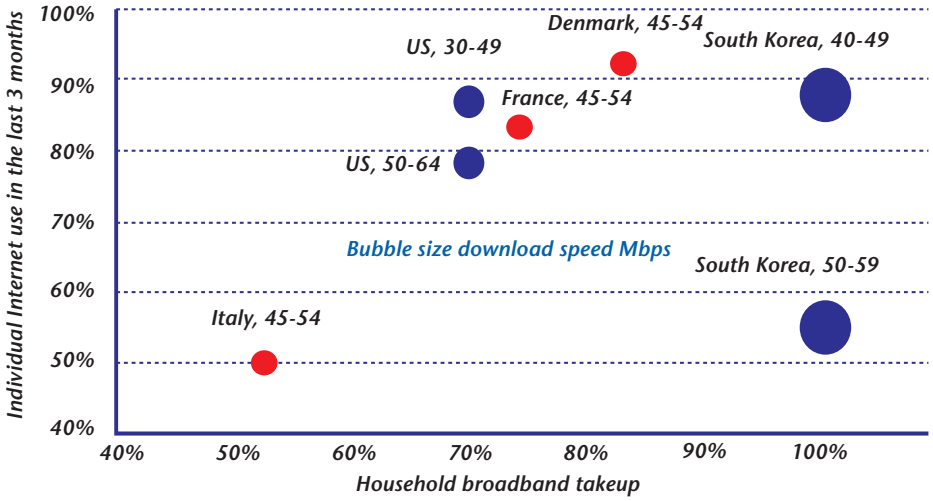
19 Verizon. April 2011. http://www22.verizon.com/regulatory/pdf/Bartonville-TX.pdf

20 http://www.fcc.gov/rulemaking/05-265

21 WIK-Consult. April 2011. "Wholesale pricing, NGA take-up and competition." http://www.ectaportal.com/en/REPORTS/WIK-Studies/WIK-Study-Apr-2011/

22 Brian Williamson and David Black. March 2011. "Costing methodology and the transition to next generation access." http://www.plumconsulting.co.uk/pdfs/Plum_Costing_methodology_and_the_transition_to_next_generation_access_March_2011_Final.pdf

Figure 3 Internet use versus household broadband takeup
(Source: Plum Consulting, EU Implementation Report, OECD, Akamai, Pew Internet, KISA ISIS)



faster broadband rather than basic broadband).

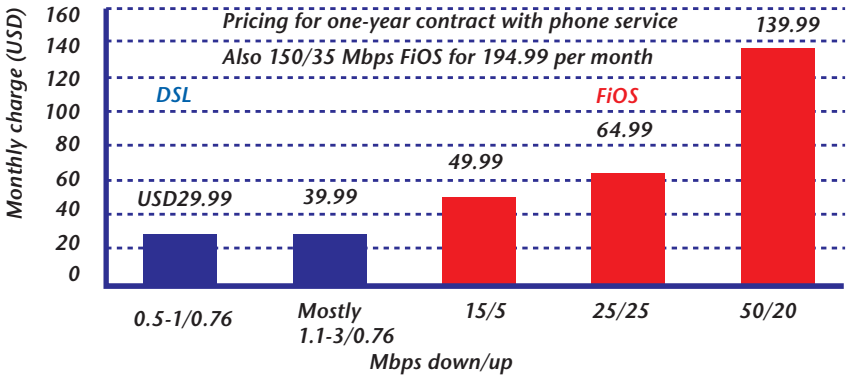
We therefore focus on quantity measures in terms of availability, take-up and use of services rather than prices. Quantity measures, particularly in relation to take-up and use, reflect both quality and price and are likely to provide a better proxy for economic welfare gains than prices. We do however consider pricing structures which can be compared in qualitative terms.

We find that outcomes differ between the US and Europe, in part reflecting policy and regulatory differences over the past decade, but also reflecting differences in market norms and history, for example receiving party pays in the US versus calling party pays in Europe.

The US is also seeing a rapid and comprehensive rollout of LTE with, for example, Verizon introducing LTE on 5 December 2010, covering more than 110 million Americans by June 2011 and with plans to deliver LTE to its entire 3G wireless footprint by the end of 2013.[23] The more rapid comprehensive deployment of LTE may reflect nationwide spectrum availability below 1GHz and the opportunity to utilise this on a technology neutral basis.

The US also has a higher level of fibre to the home deployment and take-up – a difference that is even more pronounced if one focuses on commercial deployment. This may reflect more extensive cable competition and deregulation of access in 2005. However, we note that average connection speeds

Figure 4 Verizon broadband DSL and FiOS pricing (Source: Plum Consulting)



are similar in the US and Europe at around 5Mbps.[24]

The figure above (Figure 3) shows Internet use for middle aged cohorts versus fixed line residential broadband adoption for a selection of countries in 2010. The area of the bubbles represents average connection speed.

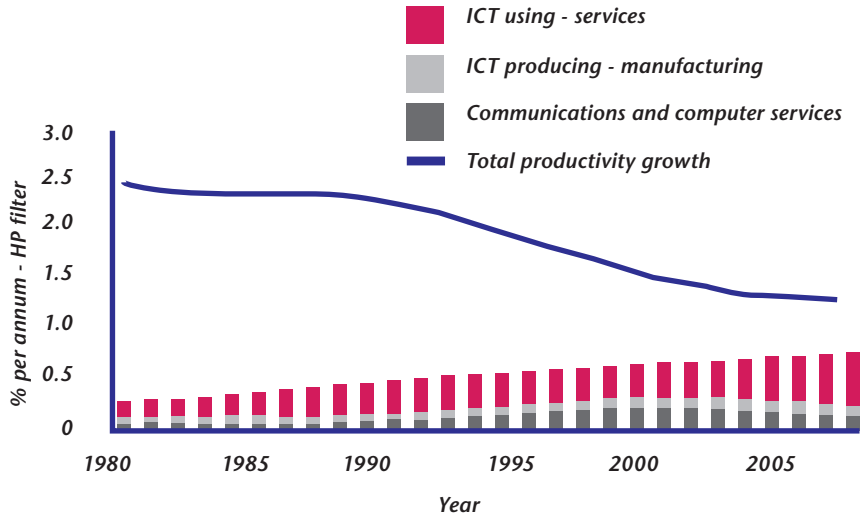
Countries which historically had relatively low incomes per capita (Italy and Korea) and have had higher economic growth over the past several decades tend to have relatively low Internet use amongst middle aged and older people. Neither broadband availability and take-up, nor high average connection speed (around 14Mbps based on Akamai data), appears sufficient to offset other barriers for the over 50s in the case of Korea.

Mobile data traffic for the US and Western Europe on a per capita basis is similar, as is the growth

23 http://news.vzw.com/news/2011/06/pr2011-06-13.html

24 Akamai. The State of the Internet. 4th quarter 2010. See also http://www.measurementlab.net/

Figure 5 ICT contribution to productivity growth EU15 compared to overall productivity growth (Source: Plum Consulting, EU KLEMS)



rate.[25] Average mobile call minutes per capita are, however, far higher in the US than Europe at 736 minutes versus 215 minutes per month.[26]

In terms of pricing structures for mobile, both US and European operators have moved away from unlimited mobile data packages to tiered pricing. In relation to fixed broadband, US operators are able to sustain differentiated pricing structures for next generation access (Verizon, for example, have the pricing structure across copper and fibre services shown in Figure 4).

In Europe, where passive infrastructure unbundling is implemented, price differentiation of this kind is unlikely to be sustained as all retail operators have access to the same undifferentiated wholesale product and any operator who tried to charge more for higher bandwidth would be undercut, thereby also preventing lower charges for lower bandwidth. This may harm both incentives to invest and digital inclusion.

Economic outcomes

Evidence of a linkage between developments in the communications sector and the economy as a whole is necessarily weak (some overly simplistic econometric regressions have been conducted in the past which purport to show a strong linkage). However, there is good evidence for a strong linkage between ICT and productivity (and GDP) growth in some countries but not others; and the evidence base in relation to the role of the communications sector within this is improving.

In some countries, but not others, a linkage between ICT and productivity growth has been identified post 1995 i.e. pre-dating the development of residential broadband. This led to a divergence in productivity growth globally.[27] In the US ICT has made a strong contribution to productivity growth[28] whist in Europe (focussing on the EU-15) the contribution of ICT to overall productivity growth has risen principally because overall productivity growth has fallen (Figure 5).

In relation to the contribution of the communications sector, research by Corrado (2010) implies there has been a strong contribution as take-up of more advanced fixed broadband and, more recently mobile broadband, has contributed to productivity growth and spillover effects.[29]

It is notable that this outcome has been achieved during a period when the rate of growth in real communications equipment investment has been low by long run historical standards and during which capital expenditure per wireless connection has been declining.[30] More generally this rising contribution alongside a reduction in capital inputs suggests there may be considerable merit in a clearer focus on outcomes rather than inputs.

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25 Cisco. June 2011. "Cisco Visual Networking Index: Forecast and Methodology, 2010–2015." http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360.pdf
26 Bank of America Merrill Lynch. 2010. Global wireless matrix 3Q10.

27 Vu. 2005. "Measuring the Impact of ICT Investments on Economic Growth." http://www.hks.harvard.edu/m-rcbg/ptep/khuong-vu/Key%20paper.pdf

28 Jorgenson, Ho and Samuels. November 2010. "Information technology and US productivity growth: evidence from a prototype industry production account." http://www.economics.harvard.edu/faculty/jorgenson/files/02_jorgenson_ho_samuels%2B19nov20101_2.pdf
29 Corrado. May 2010. "Communication capital, Metcalfe's law and US productivity growth." http://www.crei.cat/conferences/cornucopia/confpapers/CREI%20paper_Corrado_15May10_V2.pdf
30 Table 4 and Figure 5 in Corrado 2010.