

Annex

Response to ETI, Lemay-Yates, and Towerhouse Reports

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Executive Summary

I have been asked by TELUS Communications Company (“TELUS”) to respond to certain analyses and assertions contained in three reports filed by MTS Allstream Inc. (“MTS Allstream”) in support of its Petition to the Governor in Council to review and vary certain determinations in Telecom Decision 2008-118 and Telecom Regulatory Policy CRTC 2009-34. These reports conclude that extensive network unbundling is pro-competitive without having a deleterious effect on network investment. One of these reports by ETI concludes that U.S. deregulation was responsible for the failure of entrants and a decline in network investment beginning in 2001.

I find that the three reports reach erroneous conclusions on these issues of network unbundling, competition, and investment. Specifically, I show that:

- None of the reports cites any of the rapidly-growing economic literature which shows that network unbundling has an adverse effect on network investment and no lasting effect on output (broadband subscriptions).
- The ETI Report misleadingly argues that U.S. “deregulation” of network unbundling began in 2001, creating a downturn in network investment, despite the fact that there was no such deregulation until after the Federal Communications Commission was reversed by the Federal courts in 2004 for the third time. The decline in network investment in 2001—in the United States and throughout the world –was caused by the bursting of the telecom stock bubble, not by any alleged deregulation.
- The collapse of the U.S. local entrants began in 2000-01, not because of any U.S. “deregulation,” but because investors began to understand at that time that these entrants did not have sound business plans.
- The sanguine descriptions of European Union network unbundling policies found in the Lemay-Yates and Towerhouse Reports contain no empirical support. In fact, there is no evidence that these unbundling policies have had a favorable effect on broadband penetration. However, there is ample evidence that investment in telecommunications is much lower in the European Union than in the United States and Canada. In

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2006, the EU telecom investment was only 101 euros per capita while North American telecom investment was 167 euros per capita.

- The Lemay-Yates and Towerhouse Reports also contain a favorable view of the United Kingdom regulator's (Ofcom's) aggressive policy of requiring unbundling and functional separation of British Telecom. Neither Report provides empirical substantiation for such views. In fact, since Ofcom's new policy was launched in 2005, the United Kingdom has suffered a much greater slowdown in broadband growth than have the rest of the EU-15. Moreover, although British Telecom has been investing somewhat more aggressively in its fixed-wire operations than has the average EU-15 incumbent, it invests far less than the four major North American incumbents, TELUS, Bell Canada, AT&T, and Verizon.

These reports submitted by MTS Allstream provide no support for the proposition that an aggressive network unbundling policy promotes competition and, therefore, greater broadband penetration. Nor do they contradict the findings in the economics literature that such unbundling reduces investment incentives. For these reasons, these reports' conclusions about the effects of aggressive network unbundling policies should be ignored.

I. Introduction

I have been asked by TELUS Communications Company (“TELUS”) to respond to certain analyses and assertions contained in three reports filed by MTS Allstream Inc. (“MTS Allstream”). These reports were filed in support of MTS Allstream’s Petition to the Governor in Council to review and vary certain determinations in Telecom Decision CRTC 2008-118, *MTS Allstream Inc. – Application to review and vary certain determinations in Telecom Decision 2008-17 regarding the classification of wholesale Ethernet services* and Telecom Regulatory Policy CRTC 2009-34, *Request to Review and Vary Directives in Telecom Decision 2008-10 related to the Provision of Central-Office based Wholesale ADSL Access Service and Aggregated ADSL Access Service*. The reports are as follows:

Economics and Technology, Inc., *The Role of Regulation in a Competitive Telecom Environment: How Smart Regulation of Essential Wholesale Facilities Stimulates Investment and Promotes Competition*

Lemay-Yates Associates, Inc., *Next Generation Network Access: A Canadian and international perspective on why wholesale services should be regulated as essential facilities*

Towerhouse Consulting LLP, *Ethernet and Other Next Generation Access: Lessons from the UK Example*

Each of these reports addresses the international experience with network unbundling, competition, and investment in a variety of ways. In particular, one or more of these reports concludes that:

1. Extensive mandated unbundling, even of new fiber-optic facilities, promotes competition without reducing the incentives for carrier investment;
2. The United States Federal Communications Commission’s (“FCC’s”) decisions to deregulate wholesale network access to incumbents’ networks after 2000 severely damaged nascent U.S. competitors and contributed to a decline in U.S. network investment;
3. European countries have successfully pursued extensive network unbundling and are now poised to require unbundling of new fiber-optic connections that is unlikely to have an adverse effect on network investment; and
4. The aggressive unbundling and functional separation policies pursued by the United Kingdom’s regulator, Ofcom, have succeeded in increasing competition without any adverse effect on investment.

In this report, I focus primarily on # 2-4 of the above conclusions, showing that the reports’ authors have failed to muster evidence in support of these propositions. Indeed, I will show that the evidence supports a contrary position: network unbundling has not

promoted competition, but it has been associated with much lower investment levels. I begin, however, with a brief discussion of the accumulating scholarly evidence on #1.

II. Is There Evidence that Network Unbundling Promotes Competition without Reducing Investment Incentives?

Network unbundling began in 1995 in Hong Kong and in 1996 in the United States. Thus, there has been sufficient time for economists to study its effects. A mounting body of empirical evidence provides a verdict that is overwhelmingly negative. For instance, virtually every study of the impact unbundling on competition has concluded that unbundling has no lasting effect on the downstream output of telecommunications services – particularly broadband subscriptions. Most of the research has focused on the effect of local-loop unbundling on broadband penetration. Papers by Aron and Burnstein (2003), Denni and Gruber (2005), Distaso, *et. al.* (2006), and Wallsten (2006) have shown that unbundling has no permanent effect on broadband subscriptions. Many of these papers show that *platform* competition, not the competition that derives from entrants’ use of unbundled incumbents’ facilities, is important to the expansion of broadband.

Similarly, empirical investigations have shown that aggressive unbundling requirements lead to a reduction in network investment. Crandall, Ingraham, and Singer (2004) demonstrate that the availability of low-priced unbundled loops reduces investment by competitive carriers in their own facilities. Waverman, *et.al.*, (2007) provide econometric evidence that that low loop prices reduce investment in competitive platforms in Europe. They estimate that a ten percent reduction in the price of an unbundled loop translates into lost investment of 10 billion Euros in the long run. Wallsten and Hausladen (2009), using a different econometric methodology, confirm the Waverman, *et.al.*, findings that European unbundling policies have reduced investment in competitive cable platforms, but they also find that unbundling reduces incumbents’ and entrants’ investment in fiber-optics connections.

This growing literature demonstrating the ineffectiveness of unbundling in promoting broadband diffusion and the negative effect of unbundling on network investment is not refuted by the above three reports submitted by MTS Allstream. This literature is not even addressed or acknowledged in these reports.

III. Did “Deregulation” Injure Competition and Reduce Network Investment in the United States?

The Economics and Technology Inc. (ETI) report by Lee Selwyn and associates makes the startling argument that “deregulation” of wholesale access to incumbents’ network facilities ended a golden period of competition, investment, and innovation in U.S. telecommunications:

“The assured availability of competitor access to unbundled ILEC “last mile” services at regulated, cost-based wholesale rates as mandated by the US *Telecommunications Act of 1996* stimulated massive innovation and investment by entrants and incumbents alike....”²

“When the process of eliminating mandated, cost-based competitor access to unbundled incumbent last-mile facilities was begun starting in 2001, competitive and incumbent carriers alike scaled back their investment programs and competition dwindled.”³

Both statements are simply not supported by the evidence. The rapid increase in investment during the 1998-2000 telecom stock-market bubble reflected overoptimistic predictions of the growth of the demand for telecommunications capacity, particularly from the growth of the Internet. The liberal unbundling policies surely contributed to investment by new entrants, but most of this investment was simply wasted on business models that focused disproportionately on traditional mass-market and small-business services. These investments contributed little if anything to innovation in telecommunications. Moreover, the entrants failed in large numbers before the United States began its modest roll-back of unbundling much later than 2001.

A. Innovation and Entry into U.S. Local Exchange Markets

There is very little evidence of any innovation by the entrants invited into U.S. local exchange markets by the FCC’s liberal unbundling rules established to implement the 1996 Act. Some of the entrants’ attempts to introduce fixed wireless largely failed. Most of the entrants’ effort was devoted to marketing virtually the same services as those offered by the incumbents, generally offered over the incumbents’ platforms, at small price discounts. The only detailed econometric study of the effects of this entry of which I am aware [Economides, *et.al.* (2008)] finds that consumers realized benefits of \$1.13 and \$2.77 per month from entry by MCI and AT&T, respectively, but a large share of these benefits appear to come simply from changing the name on the customer’s bill from Verizon (Bell Atlantic) to MCI or AT&T. This is hardly “massive innovation.”

Significantly, the U.S. Bureau of Labor Statistics reports that labor productivity growth in U.S. fixed-wire telecommunications declined substantially in 1996-2002 relative to the rate attained in the previous decade while labor productivity accelerated rapidly in the wireless sector. As I show in Crandall (2005), this deterioration in fixed-wire productivity growth can be attributed to the fact that the new local entrants employed a substantial number of people but added little to U.S. industry output.⁴ The ETI Report does not cite this result, the Economides, *et.al.*, paper, or any other study of

² Economics and Technology, Inc., *The Role of Regulation in a Competitive Telecom Environment: How Smart Regulation of Essential Wholesale Facilities Stimulates Investment and Promotes Competition*, 2009, p. 17. (Hereafter, “ETI Report”)

³ ETI Report, p. 18.

⁴ See, in particular, Crandall (2005), Figures 3.6 and 4.8.

“innovation” that derived from entry in this period. It simply asserts, without any empirical support, that the rapid entry of firms with faulty business plans created an environment of massive “innovation.” There is no evidence that such innovation occurred.

B. “Deregulation” and the Collapse of the U.S. Entrants

The ETI Report asserts that “the process of eliminating mandated, cost-based competitor access to unbundled incumbent last-mile facilities” by the Bush Administration ended this supposedly golden age of U.S. telecommunications created by entry of new competitors. This assertion is clearly wrong; the entrants began to collapse in 2000 when the financial markets realized that few of them had any hopes of eventually becoming profitable. In Appendix A, I list 38 national entrants whose stock was publicly traded at some time between 1996 and the present. The stock market value (“market capitalization”) of these firms began to decline precipitously in 2000 and then virtually collapsed in 2001. At the end of 1999, these companies had a market capitalization of more than \$90 billion. By the end of 2000, their combined market cap had declined to \$28 billion, and one year later they had a combined market cap of just over \$5 billion. These firms reported capital expenditures of more than \$36 billion between 1996 and 2006, most of which occurred in 1999-2001.⁵ Clearly, these investments were not productive.

There was no deregulation of access to unbundled network facilities in the early period of the entrants’ collapse. The FCC persisted in requiring the incumbents to offer the *entire network platform* (the “UNE-P”) at forward-looking costs under its network unbundling policy through 2005. Despite this fact, the ETI Report asserts that “...the process of eliminating mandated, cost-based competitor access to unbundled incumbent last-mile facilities was begun starting in 2001...” But the number of lines leased to entrants at cost-based regulated rates more than trebled between the end of 2000 and the end of 2004, rising from 5.5 million to 19.0 million. By the end of 2004, these unbundled lines amounted to nearly 11 percent of U.S. access lines.⁶ If the “process of eliminating ... access” was begun in 2001, it surely failed in its objective.

Moreover, the FCC did not specifically exempt new fiber-optic facilities from its unbundling regime until 2003, an exemption that was upheld by the Federal Court of Appeals in March 2004. However, the Court of Appeals overturned the FCC unbundling rules for the third time in this same 2004 decision, forcing the FCC to roll back its unbundling policy by eliminating switching from the list of unbundled elements. Nevertheless, the UNE-P was still available to entrants through 2005 and even beyond, but by then all but a few of the entrants had fallen into bankruptcy, subsequently disappearing or being purchased for pennies on the dollar. (See Appendix A)

⁵ All data obtained from published financial reports of the companies.

⁶ These data may be found in the Federal Communications Commission’s semi-annual *Local Telephone Competition Reports*, available at <http://www.fcc.gov/wcb/iatd/comp.html>.

Nor is it possible to attribute the 2000-01 collapse of the entrants to the partial deregulation of “special access” (private lines), as the ETI Report implies. The incumbent local exchange carriers were granted pricing flexibility for these services by the FCC beginning in July 2001, but this “deregulation” was gradual and was only granted when the incumbent Bell companies could demonstrate that competitive alternatives existed in a given geographic market. The effects of this grant of pricing flexibility have been hotly debated before the FCC. Verizon has supplied data to the FCC showing that special access rates declined substantially after 2001.⁷ Whatever the effect of this change in FCC policy on special access rates, no one could possibly suggest that any change in special access rates in a few markets in late 2001 contributed to the collapse of the local entrants, which was a *fait accompli* by then.

C. Investment and “Deregulation”

The ETI Report claims that the investment boom created by the 1996 Telecom Act was abruptly ended by the “deregulation” that began with the new Bush administration in 2001, in particular the scaling back of the FCC’s unbundling policy. But there was no general telecom deregulation or, as I showed above, deregulation of network unbundling in the United States in 2001. The degree of network unbundling was not reduced until 2005-06, and even then the FCC only acted when required to do so by a third federal court reversal of its liberal unbundling rules. Indeed, AT&T and MCI continued to enroll new local subscribers through the use of the UNE-P until 2005. Moreover, network unbundling of local loops and many other network facilities continues to this day. And pricing flexibility for special access services began gradually in the second half of 2001.

In short, the choice of 2001 by ETI as the turning point in U.S. telecommunications regulation is simply inaccurate. U.S. network investment in telecom did not turn down in 2001 because of regulatory changes. Rather, it began to decline then because the high-technology and telecom stock market bubble burst in 2000, leading to an economic recession. Between March 2000 and March 2001, the NASDAQ Composite Index declined by 60 percent and the S&P 500 Index declined by 23 percent. Both indexes continued to decline until late 2002 (NASDAQ) or early 2003 (S&P 500). Obviously, network investment in telecommunications fell after 2000 as the economy weakened and the stock market plunged. Similar declines in capital spending occurred throughout the world telecommunications sector; it was not confined to the United States. To attribute this world-wide decline in investment to “deregulation” in the U.S., which had not even begun in 2000, is fallacious.

U.S. telecom capital spending did not rebound with the stock market in 2002-03 probably because of the continued and futile FCC unbundling policies. Data from the U.S. Census Bureau, reported in Table 1, show that U.S. fixed-wire telecom capital spending

⁷ See Declaration of William E. Taylor on Behalf of Verizon, In the Matter of Special Access Rates for Price Cap Local Exchange Carriers and AT&T Corp. Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services, June 9, 2005; Supplemental Declaration of William E. Taylor, August 8, 2007. (WC Docket No. 05-25, RM No. 10593)

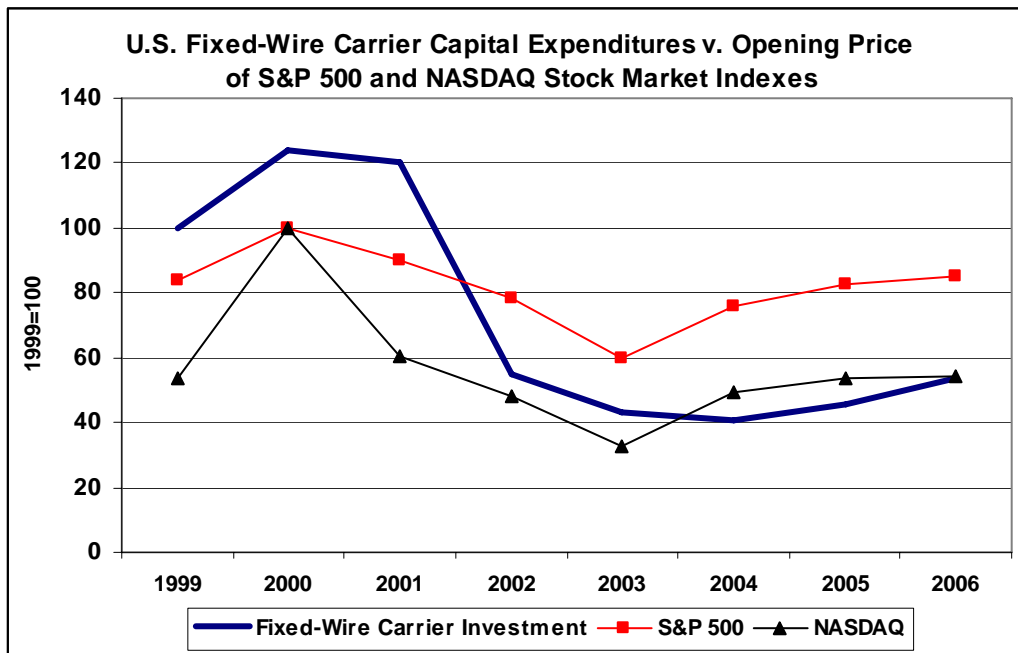
declined sharply after the stock-market downturn in 2000. See Figure 1. Capital spending only began to rebound in 2005, *after* the 2004 federal court decision that upheld the FCC’s decision not to require unbundling of new fiber-optic access lines and the court’s instruction to the FCC to scale back its unbundling regime. It was at this time that Verizon and AT&T (the “new” AT&T) began to deploy fiber to the premises (or to the curb, in AT&T’s case). This suggests that “deregulation” in the United States led to a *rise* in capital spending, not to a reduction as the ETI Report claims.

Table 1
Capital Expenditures in U.S. Fixed Wire Telecommunications

Year	Fixed-Wire Capital Expenditures (Billion \$)
1998	50.6
1999	59.8
2000	74.2
2001	72.0
2002	34.7
2003	25.7
2004	24.5
2005	27.1
2006	32.1
2007	35.2 (e)

(e) – Author’s estimate based on BEA data.
 Source: U.S. Bureau of the Census

Figure 1



Sources: U.S. Bureau of the Census; <http://finance.yahoo.com>

IV. European Unbundling Policy

The Lemay-Yates and Towerhouse reports provide a generally favorable review of the aggressive network unbundling policies instituted in the European Union. Moreover, they report favorably on remarks made by the European Commissioner, Viviane Reding, on the prospect of requiring incumbent telcos to provide access to any new fiber-optics or other “Next Generation Network” (NGN) facilities. However, neither report provides empirical support for these positions.

The Lemay-Yates report provides a summary of EU policies towards network unbundling and the recent deliberations over extending such unbundling to new, fiber-based NGNs. It favorably quotes Ms Reding, including the following excerpt from a 2008 speech:

“Regulation has a role to play here. I see it as entirely appropriate for regulators to allow infrastructure providers to make a reliable return on next generation access investments in return for testable guarantees of non-discrimination and an agreed plan for infrastructural investment that will lead to an open, high speed infrastructure. By the way, one of the potential attractions of functionally separating access networks is to make this incentive structure clearer and more operational.”⁸

Moreover, the Lemay-Yates report suggests that the European Commission views its policies as successful, but it offers no empirical evidence by which the reader could judge this “success.” For example, it does not mention that the EU-15 remain behind the United States and Canada in broadband penetration despite these policies.⁹ Nor does it provide comparisons between Europe and the rest of the world on the rate at which fiber is being deployed to subscriber premises by its regulated national incumbent carriers. Japan, Korea, and the United States are the leaders in this effort; no major incumbent carrier in Europe has begun widespread deployment of fiber to the premises.

Turning to the effects of EU regulation on investment, the Lemay-Yates Report declares:

“The EU has been recording sustained increases in overall industry investment since it has been implementing its regulatory framework for electronic communications starting in 2002.”¹⁰

It then quotes Ms Reding as proudly proclaiming that:

⁸ Lemay-Yates Report, pp. 56-7.

⁹ See the most recent OECD data on broadband per capita at www.oecd.org.

¹⁰ Lemay-Yates Report, p. 70.

“The European model is empirically proven to promote not just choice, competition and innovation but also investment: in 2006, investment in the EU telecom sector reached another peak of over €47 billion, 5% up on 2005. This was the fourth year on year increase since 2003. By the way, European investment is at least at the same level as other major regions (Asia Pacific: €44.3 billion and North America: €43.7 billion).”¹¹

Surely Lemay-Yates and Ms. Reding must know that 2002 was very close to the trough in network investment throughout the world after the bursting of the telecom stock market bubble in 2000-01. Moreover, if true, it is surely not surprising that 2006 EU-25 investment might be “at least the same as” North American telecom investment, given that the EU-25 population was 463.5 million and North American (U.S. and Canada) population was 330 million in 2006. However, Ms. Reding’s estimate of North American telecom investment is too low. The CRTC reports that 2006 Canadian telecom capital expenditures were \$6.9 billion (Cdn.),¹² and the U.S. Bureau of the Census reports that U.S. telecom capital investment in 2006 was \$63.1 billion.¹³ At the average exchange rates for 2006, U.S. plus Canadian telecom capital expenditures were therefore \$55.1 billion euros. Thus, North American telecom companies spent 167 euros per capita in 2006 while their EU-25 counterparts spent 101 euros per capita. North American companies invested nearly two-thirds more than the EU-25 telecom companies per capita, strongly contradicting Ms. Reding’s notion that EU investment was “at least the same as” North American investment.

Unfortunately, Ms Reding does not provide sources for her estimate of capital expenditures. When the European Commission’s Information Society commissioned London Economics to conduct a study of its regulatory policies, London Economics was forced to assemble investment data from company reports and a survey of EU-15 companies in order to estimate total EU-15 capital spending in 2001-04.¹⁴ London Economics estimated that EU-15 capital expenditures were 32 billion euros in 2004, or about \$40 billion at the average 2004 exchange rate. In 2004, U.S. capital spending in telecommunications was \$51.2 billion and Canadian capital expenditures were \$5.7 billion (Cdn.), or \$4.4 billion (U.S.). Thus, in 2004 North American capital expenditures were nearly 40 percent greater than EU-15 expenditures despite the fact that the EU-15’s total population is about 13 percent greater than that of the U.S and Canada. Given the surge in U.S. telecom capital spending since 2004, this gap has widened. Ms Reding’s confidence in the EU environment for telecom investment is therefore not substantiated by the evidence. The evidence suggests that the EU lags behind North America rather badly in telecom capital spending.

The comparisons between the EU and North America in the previous paragraphs include both wireless and fixed-wire capital spending, but the policies at issue in this proceeding are limited to the fixed-wire telecom sector. Before turning to the specifics of recent policies in the United Kingdom, it is useful therefore to compare the capital spending

¹¹ *Id.*, p. 71.

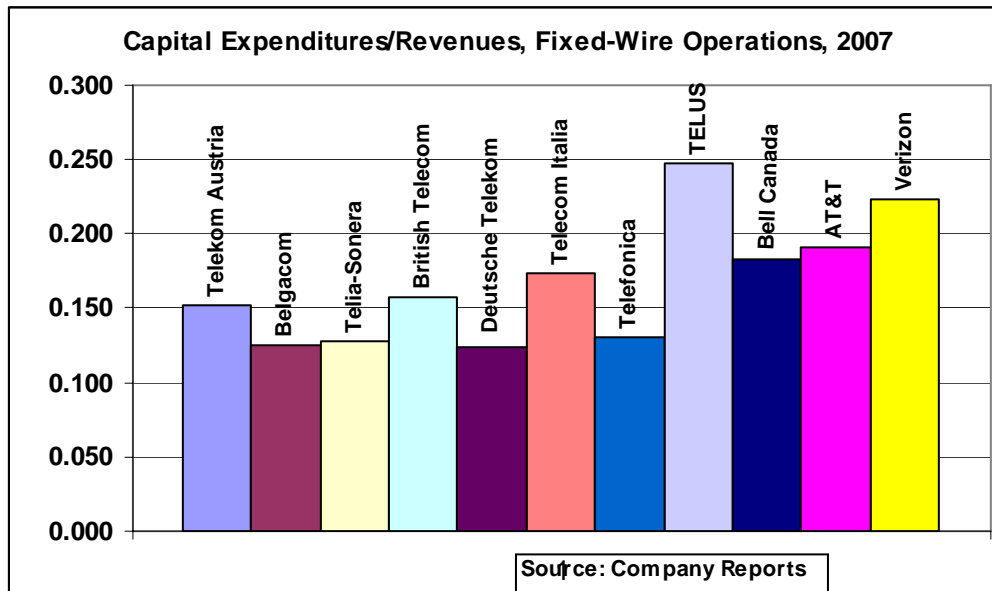
¹² CRTC, 2008 *Communications Monitoring Report*, Section 5.1, Table 5.1.5, available at <http://www.crtc.gc.ca/eng/publications/reports/policymonitoring/2008/cmr2008.htm>.

¹³ U.S. Bureau of the Census, *Capital Expenditure Survey 2006*, available at <http://www.census.gov/csd/ace/xls/2006/>.

¹⁴ London Economics, *An Assessment of the Regulatory Framework for Electronic Communications – Growth and Investment in the EU e-Communications Sector*, Final Report To The European Commission DG Information Society and Media, 2006.

of the major incumbent carriers in North America and Europe on their fixed-wire networks. Not all major EU carriers report their financial results for fixed-wire and wireless operations separately. Several break out “consumer” from “business” operations instead. I have collected the fixed-wire capital spending estimates for a number of European and North American carriers who report such data. In Figure 2, I show the 2007 ratio of capital spending to revenues for the carriers for which I have been able to assemble such data.¹⁵

Figure 2



Note that all four of the major North American carriers have higher capital expenditure intensities than any of the EU-15 carriers for which fixed-wire data are available. TELUS and Verizon, in particular, have much higher capital spending intensity than even Telecom Italia, the carrier with the most capital spending per unit revenue among EU-15 carriers that report separate data for fixed-wire operations. Whatever the reason, Figure 2 surely casts further doubt on Lemay-Yates’ – and thus Ms Reding’s – sanguine view of the EU regulatory environment’s effect on capital spending.

V. The Example of the United Kingdom

The Lemay-Yates and Towerhouse reports cite the United Kingdom as an example of pro-competitive wholesale regulation that has achieved its goals without providing adverse incentives for capital formation. Once again, neither report provides any empirical support for this assessment. Indeed, it is unlikely that they could.

¹⁵ The data for British Telecom are for the fiscal year ending March 31, 2008. BT has not yet reported its results for fiscal year 2008-09.

A. UK Broadband Growth after the Change in Regulatory Policy

The United Kingdom's telecommunications policy changed substantially when a new regulatory agency, Ofcom, replaced the old regulatory regime in 2002. Ofcom became much more aggressive in forcing the incumbent carrier, British Telecom, to pursue a non-discriminatory wholesale access policy, even requiring BT to undertake a functional separation of its wholesale and retail operations. Ofcom pursued these policies because it concluded that there was little likelihood of meaningful broadband competition from the UK cable sector. The cable television companies had lagged badly in deploying network facilities and accounted for only about one-quarter of broadband connections by late 2005. Obviously, the broadband market is very different in Canada; virtually ubiquitous cable television facilities are responsible for more than half of Canada's broadband connections.

The new UK policy mandates were implemented by BT in the third quarter of 2005. BT established a functionally separate wholesale division, Open Reach, greatly reducing any prospect of wholesale-market discrimination against its broadband rivals, according to Ofcom. If broadband had been languishing in the UK before the change in policy because of a lack of competition from resellers or other DSL providers using BT loops, one might expect the change in policy in the 3rd quarter of 2005 to correct this deficiency. As entrants took advantage of the availability of BT's new wholesale offerings and BT's mandated non-discrimination against competitors, entrant-supplied broadband lines should have increased, thereby expanding broadband penetration, according to the Ofcom theory, perhaps dramatically. But no such result occurred.

Between 3Q 2005 and 3Q 2008, according to ECTA data, UK broadband lines have increased from 8.9 million to 16.9 million, an annual rate of increase of 21 percent. However, broadband lines had been increasing by more than 50 percent per year before 3Q 2005.¹⁶ Thus, the new Ofcom policy has resulted in a deceleration of the growth of broadband in the United Kingdom.

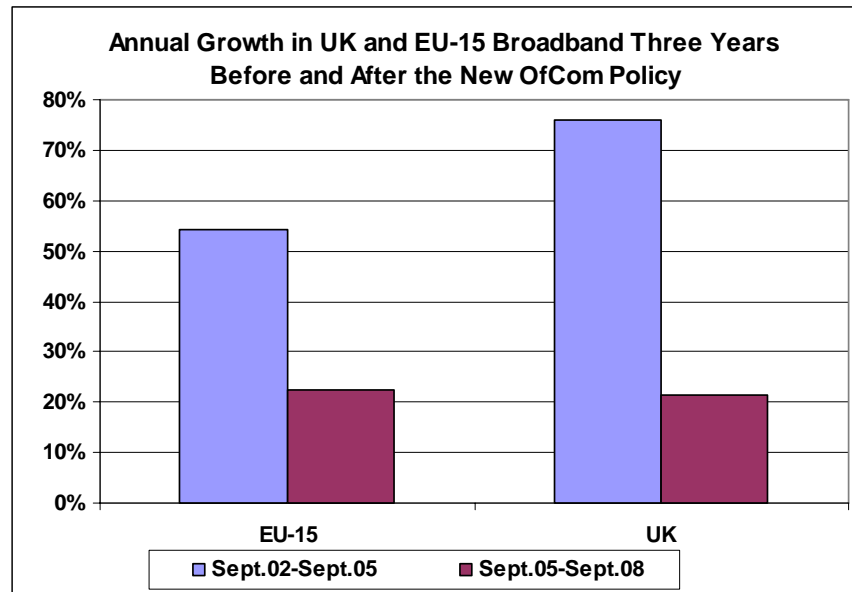
A comparison of UK broadband growth with analogous growth in the EU-15 provides a similarly bleak conclusion about the effects of functional separation. According to ECTA data, between 3rd Quarter of 2002 and the 3rd Quarter of 2005 when the new Ofcom policy went into effect, UK broadband lines increased at an annual rate of 76 percent while EU-15 broadband lines rose at a rate of 54 percent. Thus, prior to the change in policy, the rate of increase in UK broadband lines was 22 percentage points above the rate of increase in the EU-15. In the three years following the implementation of the new Ofcom policy, UK broadband line growth fell to 21 percent, and EU-15 broadband line growth fell to 23 percent.¹⁷ (See Figure 3.) Thus, the new policy has been associated with a severe decline in UK growth relative to the growth in the EU-15. Indeed, the UK broadband growth rate is now less than the average rate for the entire EU-15, and broadband penetration in the UK has fallen relative to EU-15 penetration in the three years that the UK's new policy has been in place.

¹⁶ ECTA data obtained from www.ectaportal.com.

¹⁷ The most recent ECTA data are for the third quarter of 2008..

The new Ofcom policy was driven in large part by the view that platform competition from cable television companies was anemic because the cable companies did not offer service to large numbers of UK households and because the cable companies were not aggressively rolling out new services. But the new Ofcom policy appears to have further weakened platform competition by slowing the growth in cable modem subscribers even more than the reduction in DSL subscribers, as Figure 4 shows.

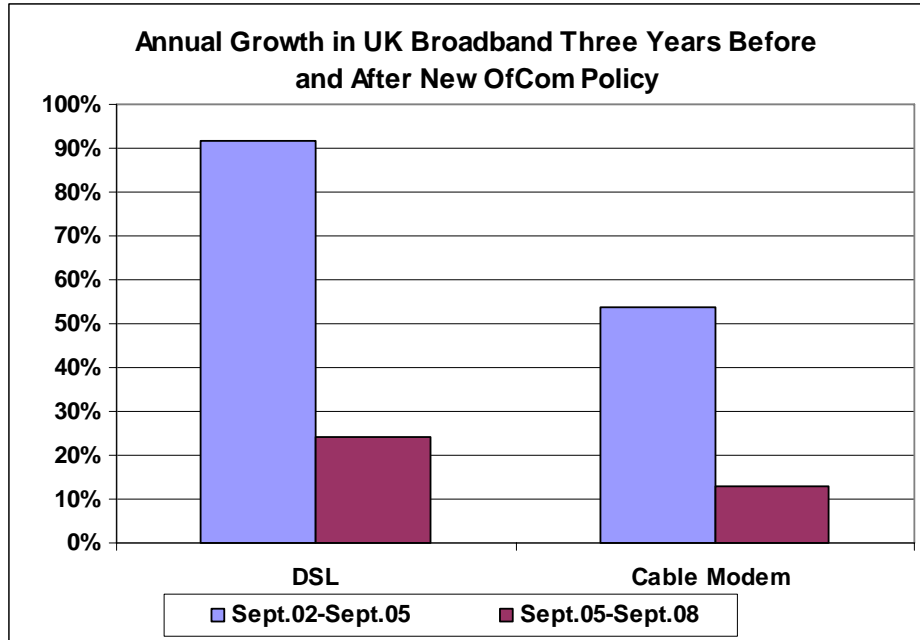
Figure 3



Source: ECTA (www.ectaportal.com)

In part, this slowdown in cable modem growth is due to the cable companies' (now one company, Virgin Media) decision to use BT's facilities to provide DSL service rather than building out their own facilities to serve these customers. This is precisely the effect that Waverman, *et.al.* (2007) identify in their recent study of the effects of network unbundling in the EU.

Figure 4



Source: ECTA (www.ectaportal.com)

B. Capital Spending under the New UK Policy

In public presentations, Ofcom officials often claim that capital spending by British Telecom is greater than that of all other EU-15 incumbent telephone companies, thereby suggesting that Ofcom's policy has actually encouraged capital spending by BT. While this assertion is not quite correct, it is indeed true that BT has capital expenditures per line or per unit of revenue are among the highest in the EU-15, perhaps because of the very poor condition of the BT network. The Lemay-Yates report shows that BT's capital expenditures have remained at about 16 percent of revenues for several fiscal years,¹⁸ but it fails to mention that this is far less than the capital spending by the major U.S. and Canadian carriers. As Figure 2 shows, BT lags substantially behind the two large U.S. incumbent carriers and the two major Canadian carriers.¹⁹ Neither Canada nor the U.S. requires functional separation, and the United States has explicitly rejected mandated unbundling of new fiber networks a policy that Ms. Reding and Ofcom have openly suggested.²⁰

The scope of network unbundling differs very little across the EU-15 countries, and Ms. Reding's recent proclamations suggest that she will pressure the national regulators to consider unbundling of incumbent carriers' new fiber-optic subscriber

¹⁸ Lemay-Yates Report, p. 74.

¹⁹ All data are from the companies' annual financial reports. It is necessary to eliminate Verizon's and AT&T's wireless spending in order to compare their spending with BT's capital expenditures. BT spun off its wireless operations several years ago.

²⁰ In recent weeks, Ofcom has apparently been moving away from this aggressive stance towards the regulation of new fiber networks and is now beginning to favor more platform competition. Any such changes could not yet have had an impact on BT's recorded capital expenditures.

connections if these companies choose to deploy such facilities in such a hostile regulatory environment.

Given these policies, it should be noted that none of the EU-15 countries' incumbent carriers is deploying fiber optics to the subscriber (FTTH) in the manner of Verizon, NTT, and Korea Telecom. According to ECTA data, of the EU-15 countries, only Sweden has more than 1 percent of total fixed-wire broadband connections in the form of FTTH, and the overwhelming share of Swedish connections are provided by municipalities, not the incumbent carrier.²¹ The UK is thus not appreciably different from other European countries in being slow to deploy advanced networks undoubtedly because the European Commission is promoting an aggressive wholesale unbundling policy throughout the EU and is openly suggesting that other countries follow the UK lead in mandating functional separation or, even worse, structural separation.

VI. Conclusions

My review of these three reports leads me to reject their conclusions on the efficacy of network unbundling and the effects of aggressive unbundling policies on network investment. I conclude that:

1. None of the reports cites any of the rapidly-growing economic literature which shows that network unbundling has an adverse effect on network investment and no lasting effect on output (broadband subscriptions).
2. The ETI Report misleadingly argues that U.S. “deregulation” of network unbundling began in 2001, creating a downturn in network investment despite the fact that there was no such deregulation until after the Federal Communications Commission was reversed by the Federal courts in 2004 for the third time. The decline in network investment in 2001—in the United States and throughout the world –was caused by the bursting of the telecom stock bubble, not by any alleged deregulation.
3. The collapse of the U.S. local entrants began in 2000-01, not because of any U.S. “deregulation,” but because investors began to understand at that time that these entrants did not have sound business plans.
4. The sanguine descriptions of European Union network unbundling policies found in the Lemay-Yates and Towerhouse Reports contain no empirical support. In fact, there is no evidence that these unbundling policies have had a favorable effect on broadband penetration. However, there is ample evidence that investment in telecommunications is much lower in the European Union than in the United States and Canada. In

²¹ See the periodic “broadband scorecards” available at www.ectportal.com.

2006, North American telecommunications companies invested 65 percent more per capita than their EU-25 counterparts.

5. The Lemay-Yates and Towerhouse Reports also contain a favorable view of the United Kingdom regulator's (Ofcom's) aggressive policy of requiring unbundling and functional separation of British Telecom. Neither Report provides empirical substantiation for such views. In fact, since Ofcom's new policy was launched in 2005, the United Kingdom has suffered a much greater slowdown in broadband growth than have the rest of the EU-15.
6. Moreover, although British Telecom has been investing somewhat more aggressively in its fixed-wire operations than has the average EU-15 incumbent, it invests far less than the four major North American incumbents, TELUS, Bell Canada, AT&T, and Verizon. Surely, aggressive unbundling regulation that may extend even to new fiber connections is at least partly responsible for this difference.

These reports provide no support for the proposition that an aggressive network unbundling policy promotes competition and, therefore, greater broadband penetration. Nor do they contradict the findings in the economics literature that such unbundling reduces investment incentives. For these reasons, these reports' conclusions about the effects of aggressive network unbundling policies should be ignored.

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Appendix A
The Failure of US Competitive Local Exchange Carriers, 1996-Present

Company	Evolution	Sale Price or Market Value 12/31/06 (million)	Capital Expenditures, 1996- 2006 (million)
Adelphia Business Solutions	Chapter 11 Bankruptcy, 3/02	Acquired 5/06 for \$1,240	\$2,315
Allegiance Telecom	Chapter 11 Bankruptcy, 5/03	Acquired 6/04 for \$322	\$1,372
Advanced Radio	Chapter 11 Bankruptcy, 3/01	Closed	\$76
US LEC	Acquired	Acquired 8/06 for \$450 million	\$402
Choice One	Chapter 11 Bankruptcy, 10/04	Taken private 11/04	\$323
Cogent	Operating	\$895	\$272
Concentric Network	Acquired	Acquired 6/00 for \$3,600	\$70
CoreComm	Chapter 11 Bankruptcy, 1/04	Taken private in 2004	\$114
Convergent Communications	Chapter 11 Bankruptcy, 4/01	Closed	\$83
Covad Communications	Chapter 11 Bankruptcy, 8/01	\$619	\$800
CTC Communications	Chapter 11 Bankruptcy, 10/02	Combined with Choice One, taken private in 2004	\$588
CapRock	Acquired	Acquired in 12/00 by McLeod which entered Ch. 11 in 2005	\$604
Cypress	Acquired	Acquired in 2002; acquirer sold for \$12 million in 2005	\$161
DSLNet	Acquired	Acquired in 10/06	\$101
Elec Communications	Operating	Sold CLEC operations, 6/07	\$3
Electric Lightwave	Acquired	Acquired in 5/02 for \$3	\$704
eSpire	Chapter 11 Bankruptcy, 3/01	Sold assets for \$68 million, 5/02	\$921
Focal Communications	Chapter 11 Bankruptcy, 12/02	Acquired for \$210 million in 9/04	\$674
GST Telecommunications	Chapter 11 Bankruptcy, 5/00	Assets sold for \$689 million in 1/01	\$912
ICG Telecommunications	Chapter 11 Bankruptcy, 11/00	Assets sold for \$6 million in 7/04	\$2,725
Intermedia Communications	Acquired	Acquired in 10/00; acquirer filed for Ch. 11 in 7/02.	\$2,085
ITC DeltaCom	Chapter 11 Bankruptcy, 6/02	\$387	\$1,036
McLeodUSA	Chapter 11 Bankruptcy, 1/02 and 10/05	Taken private in 1/06	\$3,910
MPower	Chapter 11 Bankruptcy, 4/02	Acquired for \$204 million in 8/04	\$654
Network Access Solutions	Chapter 11 Bankruptcy, 6/02	Assets sold in 1/03	\$87
Network Plus	Chapter 11 Bankruptcy,	Acquired for \$16 million	\$367

	2/02	3/02	
Northpoint Communications	Chapter 11 Bankruptcy, 3/01	Assets sold for \$135 million in 2001	\$517
Net 2000	Chapter 11 Bankruptcy, 11/01	Assets acquired for \$25 million in 1/02	\$204
Nextlink (XO Communications)	Chapter 11 Bankruptcy, 6/02	\$1,078	\$4,628
Pointe Communications	Acquired	Acquired by private company in 7/99.	\$25
RCN	Chapter 11 Bankruptcy, 5/04	\$1,004	\$3,252
Rhythms Net Connections	Chapter 11 Bankruptcy, 8/01	Assets sold for \$28 million in 12/01	\$374
Talk America	Acquired	Acquired for \$251 million in 12/06	\$98
Teligent	Chapter 11 Bankruptcy, 5/01	Acquired for \$99 million in 1/05	\$739
Telocity	Acquired	Acquired for \$180 million in 12/00	\$46
Time Warner Telecommunications	Operating	\$3,290	\$2,096
Winstar	Chapter 11 Bankruptcy, 5/01	Acquired for \$43 million in 12/01	\$2,596
ZTel (Trinsic)	Chapter 11 Bankruptcy, 2/07	\$5	\$123

Sources: Author's calculations from published financial reports and www.finance.yahoo.com.

Appendix B

Curriculum Vitae

ROBERT W. CRANDALL

CURRENT POSITION:

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FIELDS OF SPECIALIZATION:

Industrial Organization, Antitrust Policy, Regulation

PREVIOUS POSITIONS:

Adjunct Professor, School of Public Affairs, University of Maryland, 1987 - 1993

Deputy Director, Council on Wage and Price Stability, 1977 - 1978

Acting Director, Council on Wage and Price Stability, 1977

Adjunct Associate Professor of Economics, George Washington University, 1975 - 1977

Assistant Director, Council on Wage and Price Stability, 1975 - 1977

Associate Professor of Economics, M.I.T., 1972 - 1974

Assistant Professor of Economics, M.I.T., 1966 - 1972

Johnson Research Fellow, The Brookings Institution, 1965 - 1966

Instructor, Northwestern University, 1964 - 1965

Consultant to Environmental Protection Agency, Antitrust Division Federal Trade Commission, Treasury Department, various years

EDUCATION:

Ph.D., Economics, Northwestern University, 1968

M.A., Economics, Northwestern University, 1965

A.B., Economics, University of Cincinnati, 1962

HONORS and AWARDS:

Phi Beta Kappa

MEMBERSHIPS:

American Economic Association
Board of Directors, Baltimore Life Insurance Company

PUBLICATIONS:

Books:

Competition and Chaos: U.S. Telecommunications since the 1996 Act. Washington, DC: The Brookings Institution, 2005.

Broadband: Should We Regulate High-Speed Internet Access? (edited with James Alleman), AEI Brookings Joint Center for Regulatory Studies, 2002.

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RECENT CONSULTANCIES:

Bahamas Public Utilities Commission (2008) – Testimony in law suit involving the privatization of Bahamas Telephone Company

TELUS (2007-08) –Testimony before the Canadian Radio-Television and Telecommunications Commission on various regulatory issues

Telmex (2007-08) –Meetings with government officials on various telecom regulatory issues

Gulf States Recovery Group (2008) – Testimony in private antitrust suit involving steel industry

Schmoltz and Bickenback AG (2007-08) – Testimony before the International Trade Commission on stainless steel imports

Puerto Rico Telephone Company (2007) –Testimony before Puerto Rico Telecommunications Regulatory Board