

Analysis of functional separation and the impact on investment in the telecommunications sector of Poland[♦]

A report for Telekomunikacja Polska S.A. (TPSA)

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Executive Summary

In this report I address the impact of functional separation on TPSA on investment in the electronic communications sector in Poland.

My analysis leads me to conclude that functional separation in Poland would have a detrimental impact on investment and would therefore be bad for end-users.

This is because functional separation:

- Requires considerable financial resources; and
- Is a lengthy process which would amplify regulatory uncertainty and distract management resources away from innovative activities.

What is needed urgently in Poland is regulatory stability and policies focussed on stimulating facilities-based competition rather than bureaucratic functional separation. Given the numerous cable TV networks, broadband wireless networks and extensive cellular networks, as well as utility companies with 'duct' access to many end-users, there is every prospect of sustainable effective competition in Poland.

Promoting facilities-based competition would translate into higher tele-density and more broadband users, ultimately benefitting the Polish economy.

My report is structured as follows. In chapter 1 I set out the general themes in the report and provide the context for the report.

In chapter 2 I discuss the structure of the broadband market in Poland and the regulatory environment. I also discuss the opinions of the European Commission on Poland's regulation in the electronic communications sector.

In chapter 3 I turn my attention to the ladder of investment concept and vertical separation. The ladder of investment hypothesis has been used by European policy makers, most notably the European Commission, to justify various access regulations. A brief discussion of investment incentive effects is also presented.

Chapter 4 probes into functional separation and looks at the case of Openreach in the UK in brief and focuses on the impact on investment.

In chapter 5 I address the potential impact of functional separation on investment in Poland and argue that it would heighten regulatory uncertainty and be detrimental.

Chapter 6 presents a conclusion arguing that functional separation of TPSA would be damaging for investment in the electronic communications sector in Poland. .

Conclusions and findings in the report

- **Functional separation is bureaucratic – it requires an elaborate regulatory monitoring and compliance apparatus able to make effective Chinese walls and non-discriminatory procedures**
- **There is every reason to suspect that functional separation costs in Poland would be large and comparable to the costs in the UK**
- **It would seem more prudent to channel the resources needed to implement functional separation in Poland into more productive investments in the electronic communications sector**
- **On the basis of evidence presented by other researchers, access regulations in Europe appear to undermine investment incentives of alternative providers**
- **In Poland investment in electronic communications would be enhanced if there were**
 - **More regulatory clarity**
 - **Improved design and effective application of existing regulatory powers – under both telecommunications and competition laws**
 - **Greater encouragement and support for alternative platform investors to act as the spur to sustainable competition**
- **The consensus emerging in the research about European telecommunications markets suggests regulatory regimes that place an emphasis on facilities-based competition and less emphasis on detailed regulatory rules are likely to deliver better outcomes over the long-term**
- **Functional separation in Poland would burden TPSA and UKE and undermine the investment incentives of alternative providers**
- **The regulator in Poland should take heed of the above and focus efforts instead on measures aimed at stimulating sustainable inter-platform competition**

1. Introduction

The regulator of electronic communications in Poland (UKE) is considering the merits of applying functional separation to Telekomunikacja Polska S.A. (TPSA).¹ Functional separation also forms a part of the proposed amended Access Directive currently being debated by EU institutions as part of the co-decision procedure. To date only one incumbent telecommunications operator has been subject to functional separation in the EU. This was BT in the UK which offered the regulator Ofcom legally binding undertakings to separate functionally commencing in late 2005. These undertakings were accepted and have been in force for nearly three years. The Swedish regulator PTS² is also considering applying functional separation on Telia Sonera and the Italian regulator Agcom has indicated in the recent past a preference for this measure.

It is interesting to ask why functional separation is happening now and what it is. I shall start with the latter. Functional separation is a regulatory measure that requires a SMP operator to separate in operational terms the management of key inputs (typically fixed wholesale access inputs) which are not available on and unlikely to be available on competitive markets in the near future. It imposes a requirement for a SMP operator to erect internal procedures to ensure that non-discrimination is adhered to and that equivalence of inputs is achieved – meaning that all purchasers (internal and external) of wholesale access inputs are treated equivalently in equivalent circumstances. Functional separation does not require full structural or ownership separation; though this would be the logical next step in the event of functional separation failing to achieve non-discrimination.

Why is functional separation on the regulatory agenda in electronic communications now? It has arisen partly because of the application by Ofcom in the UK, and partly because a number of commentators and actors in the market have argued that existing SMP obligations are not robust enough to deter anti-competitive discriminatory practices by incumbents in fast growing broadband markets. For example, the European Regulators Group (ERG) has expressed support for functional separation:³

“ERG believes it is appropriate to propose changes to the Framework based on the experiences of NRAs to date. In its response to the review of the regulatory framework ERG proposed not only Functional Separation but a strengthening of the text on Non-discrimination. Specifically, ERG asked that non-discrimination reinforces the concept of equivalence in the provision of wholesale regulated products to third parties. This is particularly important considering the incentives for vertically integrated operators to engage in non-price discriminator behaviour.”

¹ Functional separation is an established part of the armoury available to economic regulators for dealing with problems of discrimination in vertical industries. See for example Kahn, A.E. (1988).

² See PTS (2007).

³ ERG (2007) page 6.

Although functional separation is novel to the electronic communications sector, it has been applied in other regulated network industries, most notably in the energy sector. Functional separation has been applied in US gas markets⁴ since 1988 and in US electricity markets⁵ since 1996.⁶ It has also been applied in the EU energy sector where legislation requires that network operations be legally and functionally separated from supply and generation or production activities.⁷ The European Commission has proposed that existing rules in the energy sector be strengthened to make separation more effective – and its preferred model is ownership separation.⁸

This report examines functional separation and other separation remedies that could be applied and/or have been applied in the electronic communications sector. In particular I inquire into the effect functional separation, if it were applied on TPSA by UKE, might have on investment in the Polish electronic communications sector. Due to the novelty of its application in the electronic communications sector, there is little empirical evidence to draw on to assess with confidence the implications for investment of functional separation – but it is possible to draw on research which has examined the impact of access obligations that have a similar intent.

The debate on the effects of functional separation has become intense in Europe following the functional separation of BT in the United Kingdom in 2005 and the proposal by the European Commission to include functional separation as an exceptional measure within an amended Access Directive.⁹ Proponents of functional separation have argued that by removing (or greatly diminishing) the incentives for anti-competitive discrimination, competition is likely to be more effective and this ought to benefit end users.¹⁰ Opponents and those sceptical of functional separation have stated that it is a costly measure which appears to have little or no empirical basis and is damaging for investment over the longer term and not in the interest of end users.¹¹

It should be emphasised that functional separation on its own is not a measure that should necessarily influence firms' investment decisions. Though the cost of

⁴ US Federal Energy Regulatory Commission, Order No. 497, *Inquiry into alleged anticompetitive practices related to marketing affiliates of interstate pipelines*, 1 June 1988. The term functional separation is not used in the Order, but the theme throughout is consistent with a contemporary interpretation of functional separation.

⁵ US Federal Energy Regulatory Commission, Order No. 888, *Promoting wholesale competition through open access non-discriminatory transmission services by public utilities*, 24 April 1996. The term *functional unbundling* is used in the Order, having in effect the same meaning as functional separation.

⁶ On 21 March 2008 FERC issued a Notice of Proposed Rulemaking revising the previous orders and seeking greater functional unbundling clarity, Docket No. RM07-1-000, *Standards of Conduct for Transmission Providers*. This measure is intended to replace an earlier measure that attempted to impose rules beyond functional separation. Following legal challenge, FERC is seeking to revert to its position of functional separation.

⁷ Under the 2003 energy directives 2003/54/EC (electricity) and 2003/55/EC (gas).

⁸ One of the reasons that the European Commission is seeking more effective vertical separation in electricity markets is the perceived problem of under-investment on the part of vertically integrated entities. See for example EC (2007a) page 4.

⁹ EC proposal for a Directive amending directives 2002/21/EC, 2002/19/EC and 2002/20/EC, COM(2007) 697 Final, 13 November 2007, see EC (2007b).

¹⁰ See for example Grant Forsyth of BT and Ed Richards, CEO, Ofcom in Arcep (2007) and Richards (2008).

¹¹ See for example Jacques Champeaux of France Telecom in ARCEP (2007) and IDATE (2008).

implementing functional separation is not trivial and could deprive TPSA of valuable working capital. It has also been observed in the UK, as noted below, that functional separation can stifle innovation.

Nevertheless, firms ought and would normally choose investments that earn returns at or above their cost of capital. Owners of upstream access facilities ought not to care therefore about the identity of purchasers downstream, internal or external, and sell to those who generate the greatest returns. This situation is further strengthened by the fact that monopoly elements are generally regulated in the electronic communications sector, so a firm will not be able to leverage market power due to regulation. But as the terms of access offered to third parties by incumbent SMP operators are also regulated, it is this feature in particular that will have a significant impact on investment incentives.

For example, a regulated firm subject to access regulations may not be able to recover the full cost of services supplied to external purchasers – because access charges are set too low by a regulator, i.e. below the economic cost of supplied services. This situation is allegedly what happened in the US under the mandatory unbundling applied for a period following the 1996 Telecommunications Act.¹² The investment decisions of entrants are also affected by regulated access terms. If access terms are too low then entrants may invest less in their own infrastructure and rely on leasing incumbent facilities, something that has occurred in the EU according to Friederiszick *et al.* (2008).

Thus when examining the potential impact functional separation might have on investment it is important to focus on the terms of access for the separated wholesale access products. It is also important to look into the future and at developments affecting the way in which services are managed within the networks.

1.1. Next generation networks and next generation access

A further complication arises with regard to the debate surrounding functional separation, as telecommunications technologies are shifting to an all IP-based setting paving the way for so-called next generation networks (NGNs) and next generation access networks (NGANs). NGNs and NGANs involve the deployment of all-IP systems within the core out to local exchanges and the installation of soft-switches for voice applications. In a NGN setting there is a more defined separation between the transport layer and the services – in short services and applications will become independent of transport and access layers. The attraction of all IP-based systems to telecommunications companies are cost savings, a wider range of services and enhanced quality of service.¹³

The introduction of a NGN involves retiring legacy networks (rather than overlaying current networks, NGNs are built independently with a view to replace), as well as building new systems on Greenfield sites. The architecture of NGNs and NGANs differs from existing circuit switched architectures, and significantly the basis for local

¹² See Crandall, Ingraham and Singer (2004).

¹³ See Salina and Salina (2007).

loop unbundling – the MDF (main distribution frame) – is replaced by the MSAN (Multi Service Access Node). Fundamentally the introduction of NGN technologies necessitates substantial new investments.

Where functional separation has been applied (e.g. on BT), the emphasis has been on legacy products and services (notably local loop unbundling and collocating DSLAMs) and less on dealing with NGN issues. That is not to say NGN issues have been ignored, rather uncertainty surrounding NGN developments and how best to accommodate NGNs and NGANs within the regulatory framework is an evolving and changing subject.

Nevertheless, all telecommunications operators are finding it strategically in their interest to move to an all IP-based setting. TPSA is no exception in this regard.¹⁴ However, TPSA has made it clear that major investments leading to an all IP-based network require changes in “legal and regulatory surrounding”¹⁵. As part of the debate on the legal and regulatory rules surrounding TPSA, functional separation is a key issue.

1.2. Functional separation: a remedy unsuited for the Polish market?

The Polish market is behind markets in the western part of the EU, as liberalisation has occurred more recently, incomes are lower and regulation has been problematic. Thus the full impact of facilities-based competition has yet to develop. A policy of functional separation in Poland is unlikely to yield net benefits. Of much greater importance is the need for a regulatory climate favourable for investment, so that tele-density increases and broadband penetration improves.

While functional separation has been applied in the UK, it is noteworthy that Ed Richards, CEO Ofcom has stated:

*“We certainly don’t believe that all regulators would need to follow the UK approach to achieve effective competition – **this depends on national market circumstances.**”¹⁶ (emphasis added)*

It is highly doubtful whether functional separation would confer net benefits in the Polish market starting in 2010 (the latter being the earliest date at which functional separation would likely be applicable in Poland).

There are striking differences between the UK and Polish telecommunications markets:

- BT was privatised starting in 1984 and concluding in 1993, whereas TPSA was privatised between 1998-2001 and the State still holds nearly 4%

¹⁴ Representatives of TPSA (Jacek Olejnik and Janusz Pieczerak) made a presentation “NGN implementation aspects on the developing market in Poland” in July 2002 at an IP/Optical Workshop held in Chitose.

¹⁵ TP Group 2007 preface available at <http://biuroprasowe.tp.pl/PressOffice/Pressrelease.92642.po?rss=true>

¹⁶ Ed Richards, page 8 in Arcep (2007).

- Market fully liberalised in the UK in 1991, in Poland 2003
- Liberalisation started in the UK in 1981, in Poland 1992
- GDP per capita in US dollars PPP adjusted for 2007 in the UK was \$35,100 and in Poland was \$16,300 – per capita income in the UK is more than twice as high as that in Poland
- Fixed teledensity is over 50% in the UK in 2007, whereas it is around 30% in Poland
- BT retail had a market share of fixed telecommunications services of 66% in 2007, TPSA share was nearly 80%
- Number of broadband subscribers in the UK was over 15 million (density of 25%) in 2007 and BT retail's share was 26.5%, in Poland there were 3.4 million (density of 8.8%) and TPSA's share was about 66%
- In the first quarter of 2008 the number of unbundled local loops was over 4 million in the UK, in Poland there were less than 150
- In October 2007 the price of an unbundled local loop in Poland and the UK was above the EU27 average, with that in the UK slightly higher (though relative to income, the UK is much cheaper)
- Population density in Poland is 116 per square km and in the UK it is 252 per square km
- The UK has a substantial legal and financial services sector with a strong tradition in auditing, Poland's legal and financial services sector is much smaller and less experienced

The above points inform us that the UK market is considerable larger than the market in Poland, and that the role of local loop unbundling is much further progressed. However, one of the main drivers behind functional separation was the poor performance on local loop unbundling in the UK up to 2005.

The growth in unbundled local loops in the UK is shown in Figure 1.1. It can be seen that post-functional separation there has been a dramatic surge in the number of unbundled local loops. However, it would be far too simplistic to infer that functional separation alone is the key causal factor. Over this period there have also been other key changes in the market – the regulated price of unbundled loops was lowered, broadband demand increased due to greater customer awareness and facilities based competition from cable TV intensified. Therefore, it is difficult to predict what the pattern of growth would have resembled absent functional separation.

A notable factor of relevance to the debate on functional separation when comparing the UK with Poland is the issue of resources needed to supervise and ensure its

success. These resources reside in auditing functions resident in the legal and financial services communities. The UK has a strong and long tradition in this regard, whereas Poland's communities are much more recent and relatively inexperienced. This calls into question whether a sophisticated and complex obligation such as functional separation could be successfully applied in Poland now or in the near future.

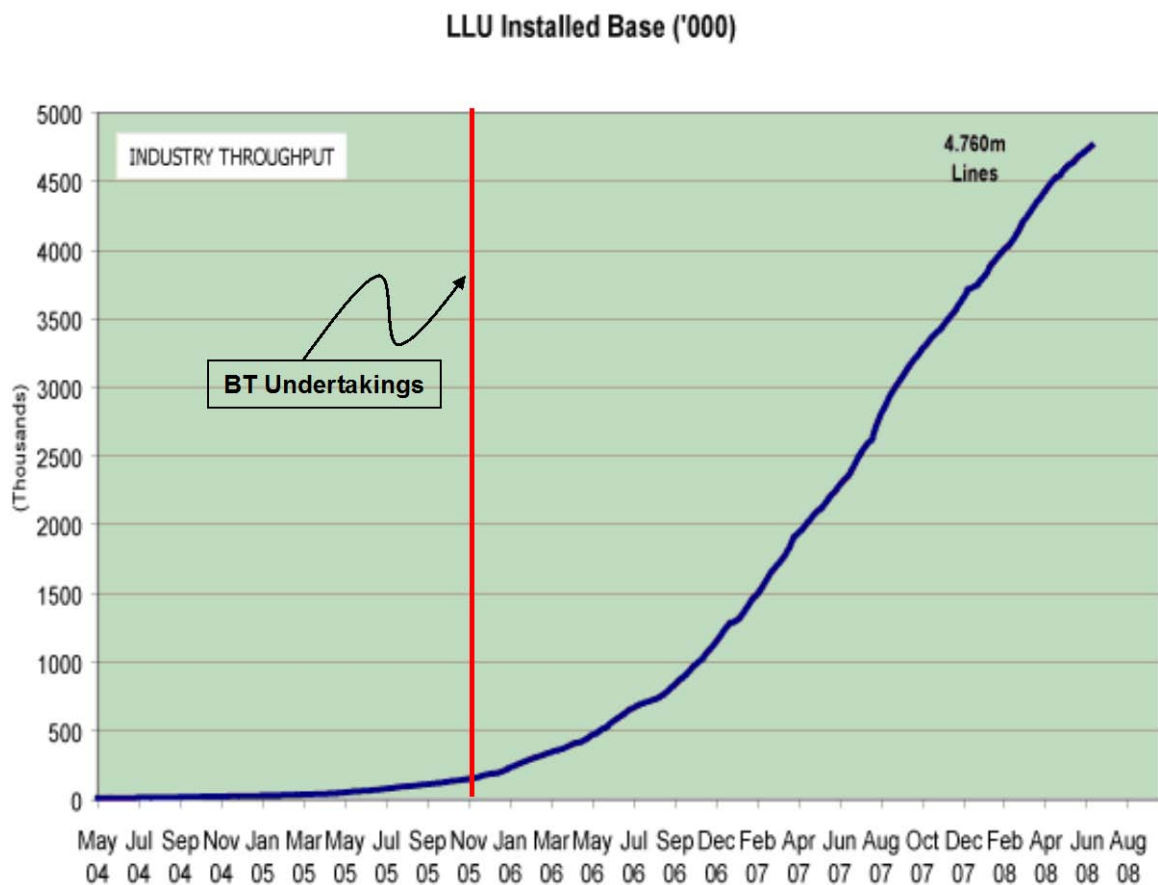


Figure 1.1 Number of unbundled local loops in the UK¹⁷

1.3. Overview

This report is structured as follows. In chapter 2 I discuss the structure of the broadband market in Poland and the Polish regulatory environment. I also discuss the opinions of the European Commission on Poland's regulation in the electronic communications sector. In this chapter I highlight concerns about Poland's lack of regulatory certainty and the potential adverse impact this is likely to have on investment in the electronic communications sector.

¹⁷ Source: Office of the Telecommunications Adjudicator www.offta.org.uk

In chapter 3 I turn my attention to the ladder of investment concept and the degrees of vertical separation available as regulatory remedies. The ladder of investment hypothesis has been used by European policy makers, most notably the European Commission, to justify various access regulations. I show the intuitive appeal of the concept but point out that there is an absence of empirical support for the proposition. The discussion on vertical separation highlights the three main forms of separation: structural, functional and accounting. I also discuss these modes of separation within both legacy network and next generation network contexts.

Chapter 4 probes into functional separation and looks at the case of Openreach in the UK and in particular examines the impact functional separation might have had upon investment incentives in the UK.

In chapter 5 I address the potential impact of functional separation on investment in Poland and argue that it would likely heighten regulatory uncertainty and therefore be detrimental for investment and end users.

Chapter 6 presents my conclusions and suggestions for regulatory policy in Poland.

2. The broadband market in Poland

In this chapter I outline in brief the structure of the Polish telecommunications market and focus in particular on entities involved in supply of broadband and related services.¹⁸ The electronic communications market in Poland is the largest in the accession member states of the EU and the revenue generated in 2006 amounted to around 3.75% of GDP, which is slightly above the EU average and slightly above that in the UK. Investment in the sector in 2006 was around 0.5% of GDP. In 2007 TPSA spent 3.7 billion PLN on development projects alone.

2.1. Regulation

Operators in the Polish market are governed by applicable competition law¹⁹ (Competition Act 2000) and the Telecommunications Law 2004, enforced by the Office of Electronic Communications (UKE). National laws are consistent with EU legislation, though enforcement in telecommunications has relied on transitional arrangements that have been criticised by the European Commission.

In July 2006 the Council of Ministers in Poland approved 'Regulation Strategy 2006-2007' which placed an emphasis on speeding up the development of the Polish telecommunications market. On 1 February 2008 the UKE President published 'Regulatory Strategy for 2008-2010' in which it confirmed positive developments have taken place in the market including:²⁰

- Increased revenues and subscription volumes;
- Falling prices in all market segments;
- Quality of service improvements; and
- Increasing competition in most segments.

The UKE also emphasised that there is a need:

¹⁸ Information in this chapter relies in part on EC (2008c), OECD (2008) and UKE (2008).

¹⁹ The Competition Act 2000 enforced by the Office of Competition and Consumer Protection (OCCP). In December 2007 the OCCP issued a decision imposing a fine of PLN 75 million (approximately EUR 20 million) on Telekomunikacja Polska S.A. (TPSA) for abusing its dominant position on the national market of providing access to Internet end-users connected to public telecommunication networks. The fine is the largest in the history of the OCCP. The abuse concerned discriminative degradation of the Internet Protocol (IP) traffic coming from domestic operators' networks to TPSA's network via foreign operators' networks, by TPSA reducing the quality of or preventing data transmission to the Internet end-users. The OCCP concluded that the practice at issue amounted to a margin squeeze. TPSA disagreed with the OCCP's decision and has appealed against it to the Court of Competition and Consumer Protection. TPSA believes that the fine is disproportionate to the type, scope and effects of the violation in question.

²⁰ UKE (2008).

“to increase the physical availability of services by stimulating investment in telecommunications infrastructure... The level of investment in telecommunications infrastructure is much lower than the EU average... the President of the UKE will also strive to create favourable conditions for investors”

In achieving some of the above, the UKE is also considering the applicability of functional separation for TPSA.

2.2. Fixed telephony and internet access

The largest operator in Poland is TPSA. In 2007 its share of revenue in the fixed markets was estimated at 77.8% and it had over 10 million fixed line subscribers, of which approaching 2 million were broadband internet subscribers. Other operators in the market include Netia S.A., Telefonía Dialog S.A. and Tele2 Polska Sp. z o.o.

The total number of fixed lines in 2007 was around 12 million (making for a teledensity of around 30%), of which TPSA held 87%. The next largest operator in terms of subscribers was Netia, having 3.8% of subscribers. Prices for fixed line services appear relatively high, as illustrated in Figure 2.1, yet are below those in Finland and Japan.

In 2007 up to 12.7 million persons were using internet access services (dial-up, cable TV, DSL and high-speed mobile), of which 3.4 million were broadband (which includes mobile broadband access – making the broadband penetration around 8%²¹). Seven operators dominate the provision of fixed line broadband services, three from fixed telephony headed by TPSA (with over 2 million subscribers or around 60% of the market in 2007) and the four largest cable TV operators (UPC Polska having 9% and Netia 5% of the market in 2007). There are very few unbundled loops, less than 200 were reported unbundled in early 2008. There is in place a reference bitstream offer from TPSA. Broadband penetration at 8.8% was the second lowest in the EU-27 and substantially below the EU average of 20.0%.

As can be seen in Figure 2.2²², broadband penetration at the end of 2007 in Poland was among the lowest in the OECD countries, and fourth lowest overall. Penetration was estimated by the OECD at 8.8%, though GDP per capita in Poland is the third lowest among the OECD member states. According to a report published by IDATE (2007), Poland’s broadband penetration was a little below the average in Eastern Europe, and substantially below that in Western Europe.

²¹ The population of Poland is a little over 38 million.

²² Source: EC (2008c) Figure 54.

**Average monthly expenditure (composite basket)
Residential users**

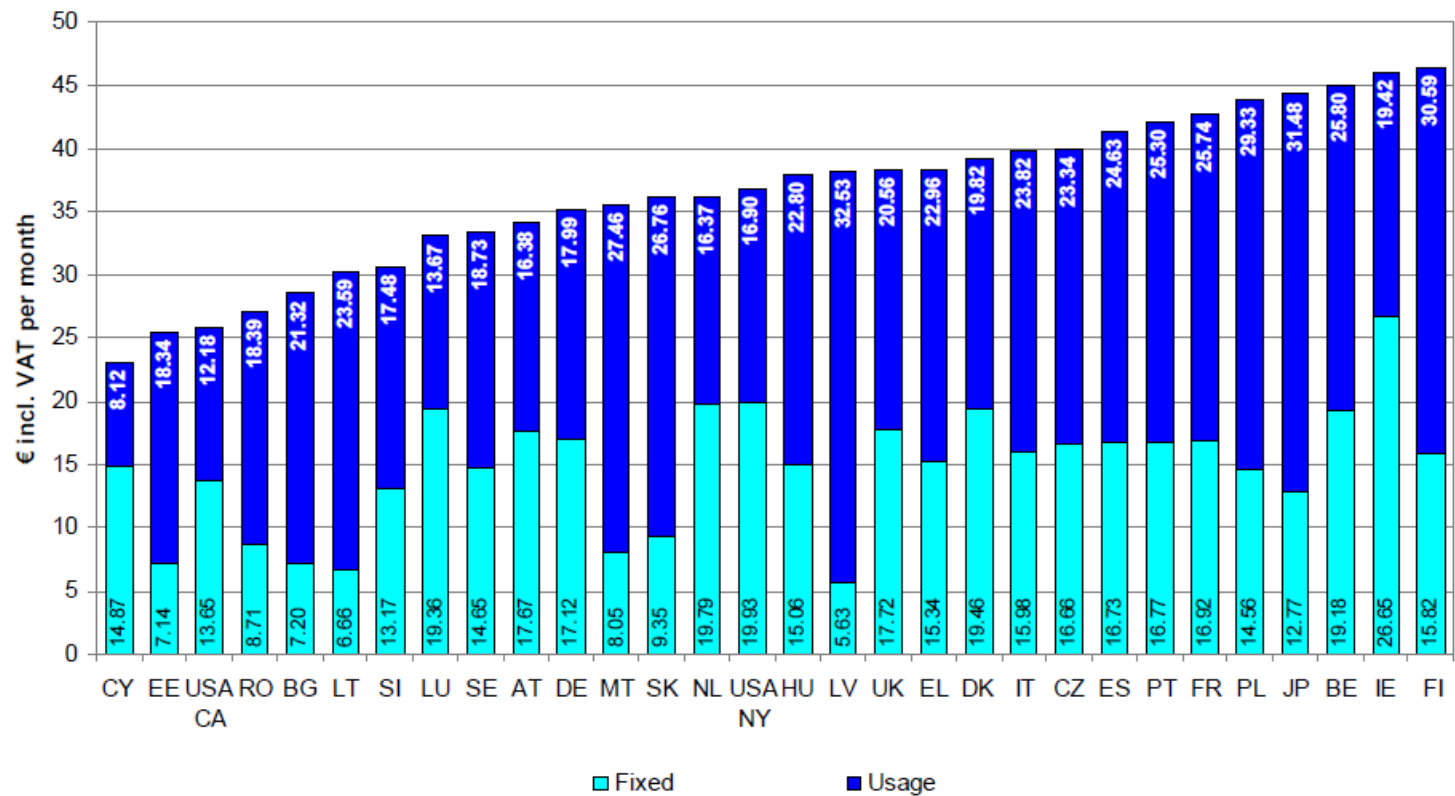


Figure 2.1 Ranking of costs for a basket of services for EU countries, Japan and two US benchmarks

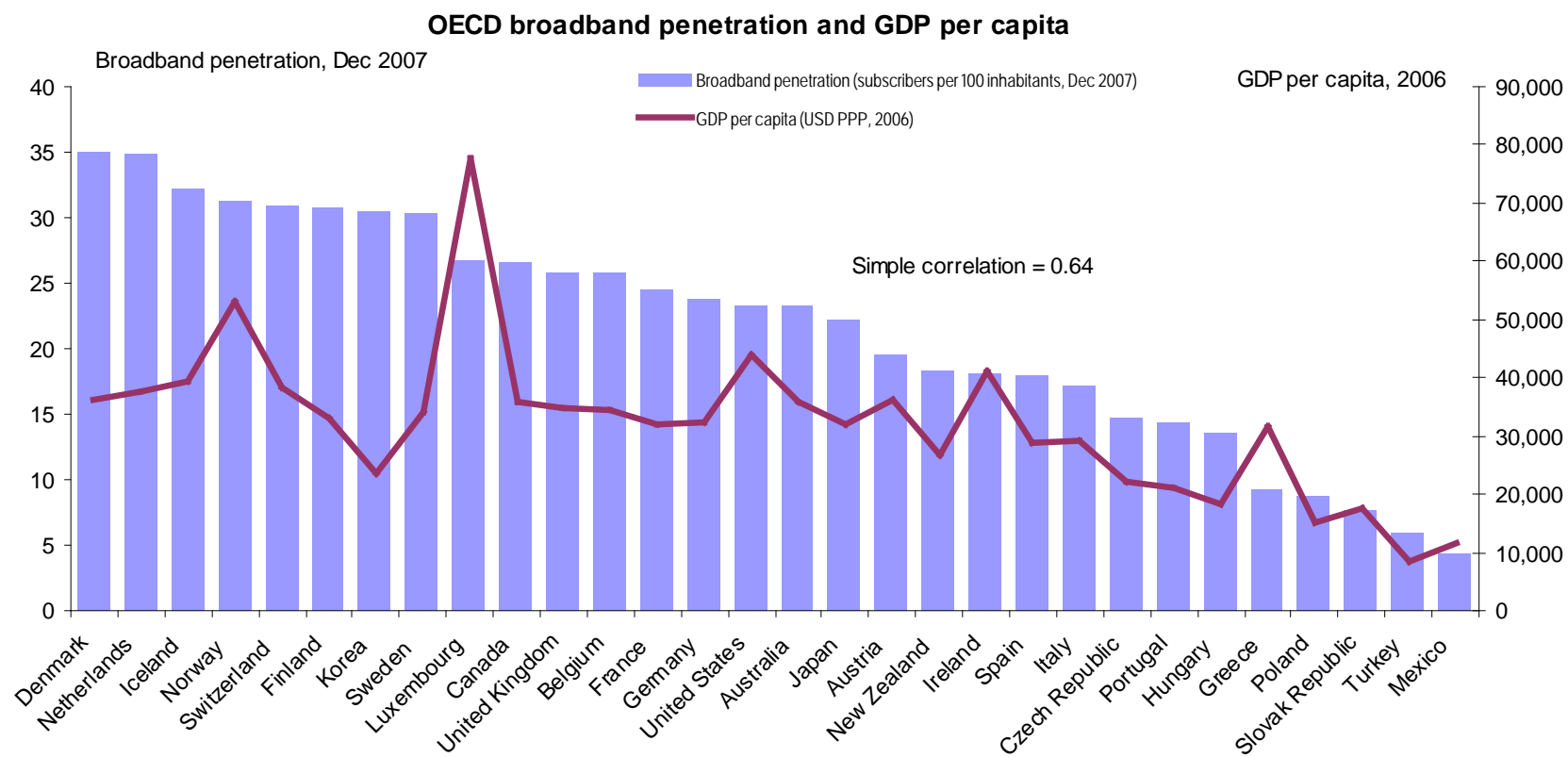


Figure 2.2 OECD Broadband subscribers per 100 inhabitants, by technology, December 2007.
<http://www.oecd.org/sti/ict/broadband>

2.3. Local loop unbundling and wholesale broadband access

One of the key regulatory obligations that can be applied to help facilitate broadband rollout is the requirement on the part of incumbent SMP operators to make public reference offers for local loop access (shared or full access). The UKE has applied considerable regulatory pressure in this regard in a decision dating from April 2007. By the end of 2007 TPSA had concluded nine agreements with other operators with regard to local loop unbundling. However, during 2007 TPSA received only a small number of unbundling requests and unbundled 77 local loops and sub-loops. By February 2008 there were 130 loops and sub-loops unbundled.

TPSA has blamed the slow take-up of LLU on over-advantageously priced bitstream access, which takes away the incentive to invest on the part of alternative operators.²³ The price of an unbundled loop in 2007 in Poland was slightly above the EU average (see Figure 2.3²⁴), but below that in the UK.

The UKE has also been active in bringing about wholesale broadband reference offers (in the form of bitstream reference offers). By the end of 2007 some 18 agreements were signed involving wholesale broadband service provision. TPSA provided over 132,000 bitstream lines to other providers by the end of 2007.

Table 2.1 illustrates the number of unbundling and bitstream access agreements in place for the countries in the EU.²⁵ In its strategic outlook the UKE is forecasting that by 2010 some 7-10% of TPSA lines should be unbundled and around 10-13% of lines supporting bitstream services purchased by alternative operators. UKE also forecasts broadband penetration to grow to around 20%.

²³ As noted in EC (2008b) page 250.

²⁴ Source Figure 109, EC(2008c).

²⁵ Source Table 90 on EC (2008c).

Monthly average total cost per full unbundled loop
 EU average Oct. 2007: 11,28 €

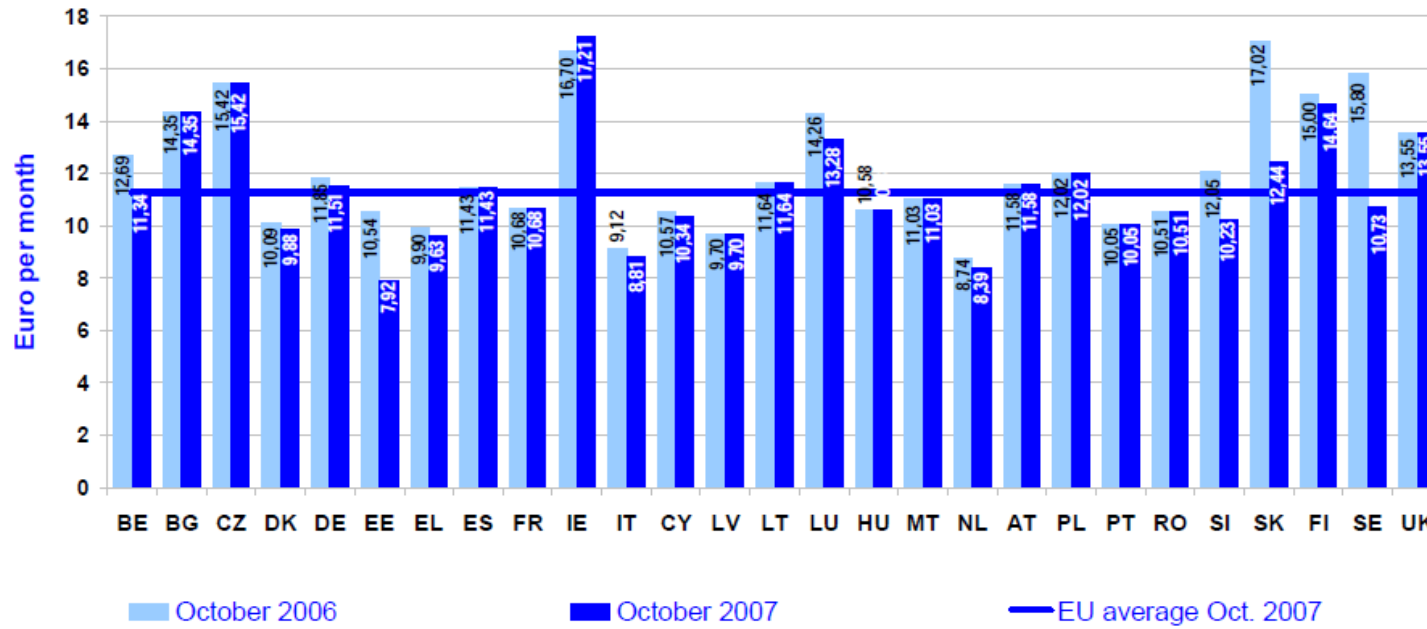


Figure 2.3 Monthly average total cost of a fully unbundled loop

	N. of agreements on fully unbundled lines			N. of agreements on shared lines			N. of agreements on Bitstream access			N. agreements on resale lines		
	JAN 06	JAN 07	JAN 08	JAN 06	JAN 07	JAN 08	JAN 06	JAN 07	JAN 08	JAN 06	JAN 07	JAN 08
BE	8	9	9	8	9	9	11	13	13	18	18	18
BG			3		3	3			1		3	2
CZ	4	6	6	4	6	6		22	21	19		
DK	21	21	25	7	8	8	11	14	18	11	11	14
DE	100	103	109	18	18	20	3				27	31
EE		7	7									
EL	12	14	19	2	7	7	10	15	16			
ES	13	17	21	10	13	13	30	25	23		2	2
FR	21			21			5			20		
IE	3	5	7	4	5	7	9	11	14			
IT	25	27	31	6	9	13	239	248	162			
CY		2	3		2	3						
LV	2	2	2	2	2	2	11	11	10			
LT		1	2				12	9	10			
LU	4	4	5	4	4	5			7	6	7	7
HU	6	7	9	4	7	9	20	20	25			
MT									11	19	11	
NL	10	10	9	10	10	9	5	5	5			
AT	29	36	37	29	3	3			46			
PL			8			8		6	19			
PT	3	5	5	2	1	1	8	7	8			
RO		17	17		17	17						
SI	3	3	3		3	3	12	12	6		4	3
SK											12	16
FI												
SE	131			131			26					
UK	53	55	57	29	31	33	24	30	38	619	582	541
EU	448	351	394	291	158	179	436	448	453	712	677	634

Table 2.1 Unbundling and bitstream agreements in the EU

2.4. European Commission observations of regulation in Poland

In the 13th Implementation Report published by the European Commission²⁶, a serious concern regarding the independence of UKE is raised:

*“NRA independence is a prerequisite for regulatory certainty. ... However, concerns persist in Bulgaria and Luxembourg, and **in particular in Poland** in relation to the rules for the removal of the head of the NRA.”²⁷ (emphasis added)*

The issue of regulatory certainty is regarded by many as crucial for stimulating investment and effective competition in the sector. The EC has also noted that a number of players in the Polish market have complained about legal uncertainty:²⁸

“This has not prevented the regulator actively promoting the goal of lowering prices paid by end-users via other routes, although according to market players it has caused legal uncertainty. Seven infringement proceedings were pending against Poland, of which one, concerning retail broadband regulation without prior market analysis, was launched in 2007.”

The EC has also identified a number of other regulatory shortcomings that are likely to be causal factors explaining the relatively poor performance of broadband in Poland:²⁹

“In Poland there is a perceived lack of powers for the NRA to ensure adequate access and interconnection, while the legal challenge to the appointment of the President of the NRA has contributed to uncertainty in the sector.”

*“Lack of available resources for the NRAs (whether in terms of the recruitment and retention of staff or finances generally) continue to be a concern in a number of Member States, such as Bulgaria, Greece, Luxembourg, **Poland** and Slovakia.” (emphasis added)*

“In Poland also there is a perceived lack of powers for the NRA to encourage, and where appropriate, ensure adequate access and interconnection.”

“In other cases the relevant reference offers for specific products (e.g. wholesale line rental, bitstream access or local loop unbundling) exist, but on pricing conditions that do not provide an incentive for alternative operators to take up those offers. Such a situation has been reported for example in Lithuania, Luxembourg, Slovakia, Malta, Poland and Sweden.”

Despite these regulatory shortcomings, it has been observed by the EC that:³⁰

²⁶ EC (2008a,b,c).

²⁷ Page 10 EC(2008a).

²⁸ Page 246 EC(2008b).

²⁹ Pages 42, 43 and 46 EC(2008b).

³⁰ Page 37 EC(2008b)

“The President of the UKE is currently considering whether to introduce functional separation of the fixed incumbent.”

2.5. Concluding remarks

The markets in Poland for wholesale broadband access and local loop unbundling are in their infancy and it will take time for regulations to bed down and for procedures to evolve. Unsurprisingly during the early phase complaints surface, as imperfections in both regulation and procedures materialise.

The regulatory environment in Poland appears to suffer from a number of deficiencies that have been commented upon critically by the EC. This undoubtedly raises the degree of regulatory uncertainty and as a result will be detrimental for all players in the market and ultimately for end users.

Of particular concern is the observation that against a background of regulatory uncertainty, regulatory infancy and arguably inexperience, the UKE is considering the application of functional separation. I shall return to the implications of this aspiration in chapter 5 below.

Before doing this I turn to the idea of the ladder of investment and the application of separation remedies in general.

3. The 'ladder of investment' and degrees of separation

Incumbent providers of electronic communications services are usually vertically integrated – operating access networks, core transport networks and supplying end users with retail services. In this respect TPSA is no exception. Vertical integration allows synergies across different parts of the value chain to be exploited – which in competitive markets leads to lower end user prices. An important component of these synergies is the coordination benefits between downstream demand and upstream investments. In other regulated sectors, most notably the energy sector, there has been a breakdown in the coordination of supply (generating capacity) and demand.³¹

In liberalised electronic communications markets entrants are unlikely to be able to enter on such a scale to supply an entire market (of course this depends on the nature of specific markets, and in some small markets entry may be ubiquitous). Much of the impetus for regulatory intervention in the EU's electronic communications sector is predicated on the need to assist, or at least to ensure that, efficient entrants are given a fair chance of being able to compete in the market. There is a presumption that operators with SMP would act unfairly against entrants absent regulatory obligations.

Regulation is designed, however, to encourage facilities-based competition where possible. Thus regulations which are aimed at levelling the competitive playing field may ultimately be withdrawn as entry becomes deeper and more firmly entrenched. It is against this vision that the concept of the 'ladder of investment' has taken hold in influencing EU policy in electronic communications.

3.1. The ladder of investment

The ladder of investment³² is an intuitive concept that suggests entry assistance over a finite period can be utilised to promote facilities-based entry and subsequent competition in electronic communications markets. The concept originated in the debate surrounding mandatory unbundling in the United States, where it was referred to as the 'stepping-stone' hypothesis.³³

The ladder of investment is appealing because of its metaphorical power – it suggests that entrants into the telecommunications market seek to climb upwards from initially reselling incumbent services through to developing their own services using their own facilities.

³¹ Joskow (2006).

³² For a discussion on the ladder of investment see Cave (2004, 2006).

³³ See Rosston and Noll (2002) and Hausman and Sidak (2005).

The ladder comprises a number of rungs, which using legacy networks comprise from the bottom upwards:

- Resale
- Naked bitstream
- Shared access and/or full local loop unbundling
- Own infrastructure (access and backhauling).³⁴

Regulators in Europe have been attracted to the ladder of investment concept and have used it to justify the application of some SMP obligations, particularly access and price control obligations. The ladder of investment suggests that by providing favourable access and wholesale prices initially, entrants will be able to climb onto the lower rungs of the ladder and move upwards over time. Presumably the reason entrants do not invest significantly in infrastructure at the initial point of entry is due to their imperfect knowledge of the market and/or difficulty in attracting capital funds. Once established in the market with a critical mass of customers, knowledge of the market improves and funds may be more easily obtained – particularly where an entrant is proven to be successful.

This ‘theory’ has not been tested rigorously – and while intuitively appealing, recent empirical analysis would appear to cast doubts to its validity. Friederiszick *et al.* (2008) claim that entrant investment in infrastructure has in fact been adversely affected by access terms designed to facilitate entry. Earlier less formal empirical research also cast doubt on the validity of the ladder of investment proposition; see Hausman and Sidak (2005).

3.2. Degrees of separation

Vertically integrated incumbent operators competing in downstream markets against non-vertically integrated rivals’ have been viewed by regulators to pose a threat to the development of effective competition in electronic communications markets. A vertically integrated firm may be able to leverage market power to squeeze the (profit) margin available to competitors by setting wholesale charges above cost and/or engaging in cross-subsidy to set retail rates below costs. A combination of the two would make it difficult for competitors to achieve market share and earn a normal return. Competitors who may be more efficient than the incumbent in the downstream elements of the market would be foreclosed and consumers would be denied benefits.

It may appear straightforward to remedy the problem of margin squeeze via price regulation. Through a combination of a price ceiling on wholesale charges and a price

³⁴ The rungs in a next generation network setting are likely to involve resale, bitstream, sub local loop unbundling (i.e. collocation at the street cabinet) and own infrastructure. The elimination of current MDF platforms would appear to raise the bar or widen the gap between the rungs bitstream and unbundling. Conceivably this could open a gap too far for many entrants, making facilities-based competition much less likely.

floor on retail rates, a regulator should be able to safeguard consumers and hence competitors. Nevertheless, it is challenging to acquire all the relevant accounting data to ensure that price regulation is effective in these circumstances. At the very least the regulator needs the incumbent to present detailed separated financial accounts that are subject to appropriate external and independent audit. It is also essential that the regulator is able to trace all the transactions within the integrated firm to ensure that internal terms accord with regulated external rates.

Accounting separation has been part of the regulatory armoury for dealing with margin squeeze problems for many years, but on its own it may fail to deliver effective competition. While suitably designed accounting separation may deal adequately with anti-competitive *price* discrimination – the setting of different prices by an incumbent favouring its own affiliates – the problem of using other variables to exercise discrimination, notably through lowering quality of service, non-price discrimination, presents a more formidable challenge. Much of the UK case in favour of the functional separation of BT rested on the proposition that the company was practising non-price discrimination and was likely to persist in doing so (Cave, Correa and Crocioni (2006)).

3.3. Separation remedies and vertical competition problems

The persistence of market power held by vertical integrated incumbent telecoms operators has resulted in the application by regulators of separation obligations that seek to deter the application of anti-competitive discriminatory practices. Accounting separation is widely applied on incumbent operators having market power in one or more wholesale markets and/or retail markets. However, as discussed above, the complexity of accounting data and the fast changing nature of the market have compromised the efficacy of accounting separation.

As a result, more robust forms of vertical separation, such as functional separation, have been applied by regulators (for example by Ofcom in the UK and by the Ministry of Economic Development in New Zealand) to promote effective competition in markets where persistent bottlenecks may be used by dominant operators to leverage market power through discriminatory conduct (see EC (2007b) and MED (2007a,b)).

3.4. Forms of vertical separation

Table 3.1, based in part on Cave (2006b), contains a specification of the vertical separation options available to regulators. At the bottom of the regulatory options lies accounting separation and at the top is full ownership or structural separation.

Table 3.1 Forms of vertical separation

6	Ownership separation (in whole or part)	Full structural separation – may involve club ownership of bottleneck
5	Legal separation (separate legal entities under common ownership)	Legal separation (which may or may not embody elements of functional separation)
4	Functional separation with localised incentives and/or separate governance arrangements	Variants on functional separation
3	Functional separation	
2	Virtual separation	Variants on accounting separation
1	Creation of a wholesale division	
	Accounting separation	

Accounting separation entails the compilation of separate profit and loss statements and balance sheets for the separate entities within an organisation. This can be accompanied by the creation of a special wholesale (or otherwise named) unit, with a dedicated management (1 in Table 3.1). This will be responsible at a managerial level for the production and supply of the relevant products, but with no guarantee, at this degree of separation, of non-discrimination between affiliated and competitive access seekers. Such accounting separation has been a regulatory obligation on most EU telecommunications incumbents since the 1998 ONP framework.

Under this regime, the regulator can make attempts to ensure some loose equivalence between services to affiliated units and to competitors. However, these efforts are hampered by two factors in particular:

- The absence of a precise target level of equivalence – an ambiguity which leads to opportunities for the incumbent to continue to discriminate;
- The fact that the incumbent's network, IT systems and business processes were broadly designed within the context of a fully integrated firm supplying end-users directly, but not supplying access services to third parties; the historic situation was thus “discriminatory” at that time of market liberalisation, when access products were grafted onto the network through the adoption of special procedures and technological fixes; commercial motives then perpetuated discrimination, whether intentional or unintentional.

Virtual separation (2) is the *modus operandi* of many European telecommunications incumbents at present, given the obligations for non-discrimination imposed on them since 1998 and 2003. Companies typically establish retail, access, and wholesale divisions and service level agreements are intended to ensure that discrimination does not occur. The key issue here is the actual and perceived feasibility of achieving full equivalence of treatment of affiliated and unaffiliated downstream or upstream organisations in such circumstances.

Functional separation (3) of a telecoms company requires the reworking of underlying business practices and not just changes at the transaction boundary, as with virtual separation. The aim is to segregate particular assets and other inputs within a separate unit, which then trade using *identical processes* with both internal and external customers in ways that can be verified. Key functions are identified and assigned to specific divisions and where necessary information exchanged between the different divisions is anonymous to deter discriminatory practices. In practice functional separation will necessitate new training for the workforce, to enable employees to appreciate the importance of respecting newly erected Chinese walls.

A higher level of functional separation (4) involves incentives for senior managers in the separated entity, and/or separate governance arrangements. A further escalation of measures in a similar vein would require the creation of a divisional board with non-executive directors independent of the group, or of a special scrutiny regime to enforce separation. This could take the further form of legal separation (5), a regime in which a separate board is created and separate statutory accounts are filed – all designed to emphasise and support the independence of the separated entity.

The final option (6) requires separate ownership of the separated assets. This could be incomplete, in the sense that the group might exercise partial ownership.

An assessment of the pros and cons of functional versus structural separation as presented in OECD (2001) is shown in Table 3.2 below.

Table 3.2 The pros and cons of functional and structural separation

Policy	Advantages	Disadvantages
Ownership Separation	Eliminates incentives for discrimination; allows for lighter-handed regulation of downstream entities	Potential loss of economies of scope; may require costly and arbitrary separation
Functional Separation	May facilitate control of discrimination and anti-competitive behaviour	Possible lack of profit motive reduces incentive to provide innovative and dynamic services

Source: OECD (2001)

It should also be noted that functional separation has the additional disadvantage of maintaining the conflict of interest with respect to key strategic investments at the group

level. Ideally a functionally separated entity should have as much operational discretion as possible, but full independence is clearly impossible because of the need to retain shareholder accountability.

In addition to determining the best form of separation to achieve competition goals, an important closely related issue is the position of the boundary of separation. This matter is taken up in the next section.

3.5. Where to separate – the debate applied to legacy networks

In a complex business like telecommunications there is enormous scope for choosing different points of separation, not least because the number of different activities involved is very large. Separation may be chosen voluntarily, in which case the decision rests largely with the firm in question. Under mandatory separation, the regulator may have the last word, though in practice negotiation will typically be involved.

In either case, the decisions are likely to reflect economic considerations addressing benefits and costs, see de Bijl (2005). For example, the greater the degree of separation the higher the threat might be to the co-ordination of investment and according to some (e.g. Crandall and Sidak (2002)) this could present a considerable cost. On the other hand, the more robust is separation the more likely would discriminatory practices be eliminated and effective competition promoted.

It is concerns about discrimination and market foreclosure that are used by policy makers to justify some form of mandatory separation. The boundary of separation should occur between markets where an incumbent exercises persistent market power (and hence is able to discriminate with anti-competitive effect) and markets which are potentially competitive – as proposed by de Bijl (2005). It follows from this that the appropriate division depends upon current and predicted market developments. These will vary with the size of the economy which the telecommunications sector is serving.

Until recently the regulatory debate surrounding separation focussed on current generation access networks – notably copper loops providing DSL services. The last few years has seen the momentum shift towards making more effective the application of non-discrimination obligations. This has resulted in a number of regulators seeking to apply what is known as functional separation.

In public policy discussions on separation within the context of legacy networks, the two principal candidates for making a single split were to do so between retail and wholesale (the “NetCo” model) and between access or the local loop and all non-access services including retail (the “LoopCo” model). Underlying this are competing two-way and three-way classifications, as shown in Table 3.3. The transport layer in the core network is omitted from this table, but this is presumed to be ‘largely’ effectively competitive.

While the NetCo model has been applied in other utilities (such as electricity), it has not been attempted in its purest form in telecommunications. Typically regulators have

addressed economic bottlenecks by focussing on the local loop. This has been the case in both New Zealand and the UK.

Table 3.3 Functional separation applied to a legacy network

Segment	Services	Division
1. Retail	Marketing and selling services to end-users and managing the end-user relationship	Retail services
2. Network (non-access)	Core network services Call origination, call termination, transit, etc. Trunk segments of leased lines Some backhaul	Wholesale
3. Network (access)	Copper loops Fibre to the node/cabinet or to the home Ducts Wholesale line rental Some backhaul Tail segments of leased lines	Access

3.6. Separation and the NGN

In the evolution to NGNs the location of separation also falls into two- and three-way categories, but is different in flavour to that associated with legacy networks. Table 3.4 below illustrates the framework that applies in a NGN and NGA setting.

Table 3.4 Two and three-way classifications in a NGN and NGA setting

	Services	2-way separation model	3-way separation Model
1. Retail	Marketing and selling services to end-users and managing the end-user relationship	Retail	Retail
2. Network (Active Line access ³⁵)	Wholesale bitstream products, MSANs, optical line terminals	WholesaleCo	OpCo
3. Network (Passive line access ^{36, 37})	Copper lines, optical fibres, ducts		NetCo

3.7. Functional separation and investment incentives

The separation of vertical integrated entities can impact significantly on investment incentives. Several factors can weaken the incentives for investment:

- The boundary of separation may be defined incorrectly (or alternatively may vary over time) and this would make investment more costly
- The costs of monitoring and compliance could divert valuable resources away from investment projects
- The temptation for the regulator to price so-called monopoly elements at low prices would result in wholesale losses and dent incentives to invest
- The fear on the part of management that it would be punished by the regulator (in the form of further separation and lowered access charges) if TPSA's share of the market were to increase post-separation would lead to investment being directed towards non-regulated areas of business

The above would all be pertinent in the case of Poland, as they are in the UK. Therefore the application of functional separation would be worrying for investment in the Polish telecommunications sector.

³⁵ Active line access refers to wholesale products based on both the active electronics and the physical elements of the access network. Bitstream products are an example.

³⁶ Passive line access refers to wholesale products based on direct access to physical elements of the access network, excluding any form of electronics.

³⁷ Ofcom (2007) has articulated opinion on the regulatory treatment of NGA suggesting that the most likely regulatory remedies will comprise (i) sub-loop unbundling (or what is termed *passive line access*) and (ii) *active line access*.

3.8. Concluding remarks

The ladder of investment is a concept that has a strong metaphorical appeal and has been used by policy makers and regulators to justify the application of access obligations in the EU. However, there appears to be little empirical support for the proposition.

In this chapter I have also discussed the degrees of vertical separation available to regulators, ranging from accounting separation – which is the status quo – through functional to full ownership separation. In the electronic communications sector the debate has shifted onto the merits of functional separation.

Functional separation has only been applied in one EU member state to date – on BT in the UK. I have raised some issues about investment incentives and suggest that the application of functional separation in Poland would be damaged by functional separation.

4. Functional separation

Functional separation involves the judicious compartmentalisation of company assets so that a business operates on a non-discriminatory basis and applies full equivalence (parity between the vertically integrated incumbent and downstream competitors) while retaining common ownership and a single legal entity. It builds on the foundation of accounting separation but requires substantial changes to the internal operations of a firm so as to ensure that non-discrimination occurs in practice leading to Equivalence of Inputs (EoI). Functional separation involves considerable set-up costs and imposes a substantial regulatory burden onto the affected operator and on competing communications providers.

There are six key components of functional separation which are shown in Table 4.1.

Table 4.1 Six key components of functional separation

1	Separation of functions
2	Separation of brand
3	Separation of employees
4	Separation of information
5	Financial separation
6	Transparency requirements and compliance

Separation of functions (1), which leads to the name functional separation, is only one part of functional separation. This involves the creation of a separate business unit responsible for the supply of products in question. This can be likened to the formation of a new wholesale division, as illustrated in Table 3.1 above. This new business unit would be obliged to supply all customers (its own affiliate and other operators) on equal terms (i.e. equivalence). Crucial to enabling non-discrimination is that the Operational Support Systems (OSS) must also be separated in accordance with the new business unit.³⁸ The latter is likely to be non-trivial and involve considerable resources.

The new business unit should be seen by other operators as a distinct brand – in the UK, which is discussed more fully below, BT established Openreach as a BT Group business dealing with access network services distinct from BT Retail and BT Wholesale.

Separation of employees (3) can take a number of forms but essentially involves the creation of a separate management board for the new business unit. Importantly this board should be independent of the management elsewhere in the group but understandably will report to the group CEO to comply with stakeholder accountability requirements. Employees in the new business unit should not be allowed to work at

³⁸ The OSS are computer systems that deal with the telecom network itself and support processes such as maintaining network integrity, provisioning services, configuring network components, and managing faults.

the same time for other units in the group. The need to separate employees will also necessitate the physical separation of offices and places of work to minimise the prospects for information to pass hands and be used in a discriminatory manner. Incentive schemes should be designed to reflect the performance of the new business unit and not the group. Employees should sign up to a code of conduct that emphasises confidentiality of information.

Separation of information (4) will require a structure to be put into being that limits information flow between the new unit and other parts of the group, through the establishment of firewalls and Chinese walls. Management information systems will need to be separated.

Financial separation (5) will strengthen existing accounting separation obligations and ensure that the new business unit compiles its own profit and loss accounts and balance sheet data. Financial budgets should be separated and as much financial autonomy granted as possible. Given the magnitude of some investments, however, it is likely that group wide investment decisions will need to be taken. Note, as discussed in the Introduction, this is always likely to handicap functional separation compared to structural separation.

Finally functional separation features transparency requirements (6). These are intended to ensure that (1)-(5) operate satisfactorily and involve a system for monitoring compliance with obligations and performance targets. There needs to be a system in place for reporting breaches of compliance and an independent committee that oversees the compliance regime. Performance and compliance reports should be published.

In the next section I look in some detail at BT Openreach, which is the only case to date of functional separation in the EU electronic communications sector.

4.1. BT Openreach

The functional separation of BT led to the creation of a division known as Openreach, comprising BT's local access network (or the first mile as it is sometimes known). Openreach is responsible for maintaining the wires, fibres and connections linking end-users to communications providers' networks (usually at the local exchange but sometimes via backhaul extension from the local exchange to the network of a communications provider).³⁹ The main products offered by Openreach are wholesale line rental (WLR), local loop unbundling (LLU), extension services (ES) and wholesale leased lines (WLL). Effectively the UK has applied a LoopCo model, addressing competition concerns in a legacy model that arose in around 2003.

³⁹ Openreach manage the connections between the Main Distribution Frame (MDF) and the BT Wholesale/Local Loop Unbundling (LLU) termination points located in the exchange, often referred to as jumper connections.

The separation of the local access network emerged from undertakings offered by BT to the regulator Ofcom at the end of a 'Telecoms Strategic Review' (TSR) undertaken during 2004-05 using powers under UK competition legislation, the Enterprise Act 2002, rather than its sector-specific regulatory powers.⁴⁰

The Enterprise Act 2002 enables competition authorities (which includes Ofcom) to make a reference to the Competition Commission⁴¹ to investigate a market where it has reasonable grounds to suspect that features of a market, prevent, restrict or distort competition. A market investigation which leads to the finding that there are adverse effects on competition requires the Competition Commission to take such action as it considers to be reasonable and practicable to remedy, mitigate or prevent the adverse effects. A remedy openly considered by Ofcom during its strategic review was structural separation, and this would have been one option considered by the Competition Commission under a referral if the investigation had found adverse effects.

Delivering Eol to meet the expectations and standards required by Ofcom involved creation of new service ordering and management gateways to be used by all customers (including BT) and separating out the operations and information systems which previously held data and functionality for many unrelated services. This systems separation is potentially very costly and time consuming, especially for older fully integrated systems designed for BT's previous company structure.

The EMP is the system designed to handle the majority of transactions for Eol products. The EMP was established in June 2006 and is the largest IT capability of its kind in the UK telecommunications industry. It is designed to deliver service with a greater degree of automation, processing up to 100,000 orders a day and with the capacity to carry out up to 60,000 line checks an hour. However, testing, implementation and deployment of the EMP "has been a major cause for industry concern reported to the EAB with recurring problems leading to system downtime".⁴²

According to BT in 2007 capital expenditure on property, plant and equipment and computer software was £1,108 million, an increase of 7% in the 2007 financial year. BT argued that this reflected significant investment in new systems to ensure compliance with the Undertakings and increased spend to meet LLU demand.⁴³ Additionally BT claims that over 2006 and 2007 the cost of establishing Openreach was £100 million.⁴⁴ Other communications providers have reported to the EAB that "the introduction of newly-equivalent products by BT can require costly and time consuming systems changes in order to use those products".⁴⁵

⁴⁰ Ofcom (2005b).

⁴¹ The Competition Commission is an independent public body operating under provisions in the Competition Act 1998 and the Enterprise Act 2002. The Commission undertakes market investigations in accordance with powers under the Enterprise Act 2002. A market investigation may only be initiated following a referral from the Office of Fair Trading (OFT) or another legal body holding concurrent powers, such as Ofcom.

⁴² EAB Annual Report 2007 page 9.

⁴³ BT Annual Report and Form 20-F 2007 page 37.

⁴⁴ BT Annual Report and Form 20-F 2007 page 40.

⁴⁵ EAB Annual Report 2007 page 3.

4.2. Openreach, investment and innovation

One of the major challenges encountered when establishing the functional separation regime in the UK was the treatment of investment by Openreach. In the Undertakings the following sections deal specifically with investment:⁴⁶

5.12 AS shall control and operate the assets contained within the Physical Layer of BT's Access Network and the Physical Layer of BT's Backhaul Network including such items needed to support these assets, such as line testing and remote diagnostics. It shall determine which products these assets must support, and also determine any appropriate enhancements in the functionality of these assets, having full responsibility for any investment decisions relating to these assets and made within the annual operating plan to be created in accordance with section 5.28. It shall have full responsibility for building, maintaining and repairing these assets.

This section is intended to provide Openreach with operational independence.

5.13.2 any investment decisions required in consequence of the product roadmaps and volume forecasts referred to in section 5.13.1 shall be considered solely on their own merits, and shall not take into consideration the potential impact on other products offered by BT's businesses downstream of AS other than in as much as they affect aggregate demand forecasts;

This section is very important and is intended to eliminate the incentive for managers in the access division from taking account of group-wide ramifications of their decisions. In short, the managers of Openreach are supposed to behave as if they were maximising the profits of Openreach alone.

5.28 With effect from the BT financial year 2006/2007, AS shall establish an annual operating plan which shall be submitted to the BT Group plc Board for approval. Once approved, execution of that plan shall be the responsibility of the AS CEO and the AS Management Board. The plan will establish the budget, including capital and operating expenditure, for AS. The plan shall include plans and targets for implementing and applying those sections of these Undertakings applicable to AS for the relevant year. Following each year of operation of AS such plan shall include a commentary on the previous year's implementation and application of these Undertakings as they apply to AS. The annual operating plan and commentary shall be shared with the EAB.

This section provides for independence of implementation of approved plans. However, note that the group is involved directly in approving key plans.

⁴⁶ AS is the Access Services division now known as Openreach.

5.29 The AS CEO shall have delegated authority from the BT Group plc Board to authorise capital expenditure of up to £75 million within the annual operating plan referred to in section 5.28. This limit may be varied from time to time at the discretion of the BT Group plc Board. Ofcom and the EAB shall be notified of such variation within five working days.

This section gives discretionary power ex post to the management of Openreach.

10.12 The EAB shall be responsible for monitoring and reviewing the product roadmaps and volume forecasts as referred to in section 5.13.1, as well as the associated investment decisions as referred to in section 5.13.2, as they relate to AS and SMP Products.

This section grants powers to the oversight body the EAB.

Overall strategic investment decisions are still taken at the group level. Recently BT as a group announced that it wished to increase investment in NGAN technologies:

“BT today announced on 15 July 2008 plans to roll out fibre-based, “super-fast broadband” to as many as 10 million homes by 2012. The £1.5 billion programme will deliver a range of services with top speeds of up to 100 Mb/s with the potential for speeds of more than 1,000 Mb/s in the future. The investment forms part of BT’s wider strategy of delivering next generation broadband services nationwide.

“A supportive and enduring regulatory environment is essential if this investment is to take place. Given this, BT will be discussing with Ofcom the conditions that would be necessary to enable this programme to progress. These include removing current barriers to investment and making sure that anyone who chooses to invest in fibre can earn a fair rate of return for their shareholders.

“BT plans to invest around £1.5 billion in total on the programme, of which around £1 billion is incremental to BT’s existing expenditure plans for fibre deployment. BT expects its initial investment in the programme will result in around £100 million of incremental capital expenditure in each of the 2008/09 and 2009/10 financial years, taking the total expected capital expenditure in those years to around £3.2 billion and £3.1 billion, respectively. The remaining incremental spend of £800 million will be spread over the following three financial years.”⁴⁷

In June 2007, Openreach completed an initial consultation with communications providers about the deployment of high capacity fibre optic cable to premises and the delivery of wholesale services over these networks to greenfield sites. From August 2008, as part of an initial trial, Openreach will deploy fibre optic cable, instead of

⁴⁷ See BT press release at: http://miranda.hemscott.com/servlet/HsPublic?context=ir.access&ir_option=RNS_NEWS&item=65554085838890&ir_client_id=1281.

copper, to homes on a new 1,000 acre site at Ebbsfleet Valley in Kent. Around 10,000 homes will be built on the site, incorporated in 1.5 million square metres of retail, leisure and community facilities. At this site, Openreach will offer the communications industry a wholesale fibre-based broadband product, facilitating competition at a retail level. The service will be capable of supporting speeds of up to 100Mbps – the fastest headline speed available to residential customers in the UK. This will make possible a range of applications from HDTV gaming to near instant music downloads.

Ofcom has also been engaged in a consultation on next generation networks at Greenfield sites.⁴⁸ As part of the consultation it is investigating the possibility of mandating duct access.

More recently Ofcom has launched a consultation on a new pricing framework for Openreach.⁴⁹ The consultation is being undertaken in part as a result of requests from BT to increase the price of local loop unbundling relative to wholesale line rental products. BT has argued that based on current cost accounting principles the return it has obtained on Openreach has been 7.7%, significantly below the 10% cost of capital that was applied by Ofcom. However, Ofcom has countered with the suggestion that Openreach enjoys returns of around 13%.

In terms of innovation Ofcom (2007a) noted concerns:

“Openreach’s product development process has caused concerned. To date its focus has been on meeting the requirements of the Undertakings and feedback from communications providers suggests that this has limited the development of a proactive and innovative approach to product development”.⁵⁰

4.3. Conclusion

In this chapter I have discussed functional separation and the case of Openreach.

⁴⁸ Ofcom (2008a).

⁴⁹ Ofcom (2008b).

⁵⁰ Ofcom (2007a) page 13 para. 2.57.

5. Predicted impact on investment in Poland

The primary drivers influencing investment in telecommunications are demand factors (prices, income, network externality effects, population density) and supply-side factors (principally the cost of technologies). In addition, structural characteristics of the market are important – for example Burnstein and Aron (2003) found that intermodal competition between cable companies and telecommunications companies in US markets was positively correlated with broadband penetration during the early phase of broadband rollout. Wallsten (2005) also found facilities based competition to be favourable for broadband penetration in the US.

The role played by regulation in affecting investment is also critical. Waverman and Dasgupta (2007) have stated:⁵¹

“The link between regulation and investment is not a precise quantitative one, and regulators should be wary of analyses that attempt to draw such a link. However, we think that regulators should use economic logic to gauge whether or not their regulatory regimes are appropriate and promote the outcomes that are best for society and economic efficiency”.

This is a view shared by the author. A recent study by Friederszick *et al.* (2008) suggests that entry regulation of the kind based on the concept of the ladder of investment may have actually undermined incentives for investment in infrastructure by entrants. The authors conclude that:⁵²

“Promoting market entry by means of regulated access might have the desired short-term effect of lower prices and more consumer surplus, but at the same time undermines the incentives of entrants to invest in their own infrastructure and thereby compromising on the long-term goal to establish facilities-based competition.”

5.1. Is functional separation entry-based regulation?

On the basis of recent regulatory experience in Poland it is likely that functional separation would take up to two years to agree and initiate. Therefore the implementation of functional separation would likely start at the earliest in mid-2010. The full process of functional separation would likely take up to 5 years or so – allowing for the complete migration of existing TPSA customers into the new systems of an operationally independent access service provider (i.e. the equivalent of Openreach in the UK).

⁵¹ Waverman and Dasgupta (2007).

⁵² Page 36, Friederszick *et al* (2008).

It seems reasonable to assume that functional separation may be completely implemented by 2015.

TPSA would be concerned, particularly over the next two years, about the terms and procedures needed to satisfy compliance with functional separation. This would raise uncertainty and consequently act as a deterrent to investment. On the other hand, it could be argued that investment might be bolstered in an attempt by TPSA to acquire more of the market before any separation takes full effect.

The impact on investment over the next 5-10 years of functional separation should be compared against the next best alternative. Instead of embarking on a programme of functional separation the UKE could provide greater regulatory clarity with regard to existing wholesale market products, and align relative prices to provide better incentives for alternative operators to purchase wholesale inputs and invest in infrastructure.

The existence of cable TV infrastructure in over 115 cities in Poland indicates that infrastructure-based competition is a potential reality in urban markets. An alternative approach to functional separation is to rely on greater clarity with regard to terms and conditions, and a coherent and robust application of existing competition provisions under the Competition Act 2000. By doing this the UKE would save:

- Consultation costs associated with functional separation
- The set up costs associated with functional separation; and
- Diminish uncertainty in the near future.

In short, the UKE should seek to apply powers already available in a better and clearer manner to facilitate competition in Polish broadband markets. As Viviane Reding, Member of the European Commission responsible for Information Society and Media, stated recently:⁵³

*“It is very important that the conditions to invest exist and **regulatory certainty** is one of those conditions.” (emphasis added)*

Regulatory certainty is something that has been lacking in Poland and a debate over functional separation would likely exacerbate this uncertainty to the detriment of end users. With events such as Euro 2012 looming, functional separation carries with it risks that would be better avoided through prudent application of existing powers.

⁵³ Reding (2008).

6. Conclusion

Functional separation is bureaucratic – it requires an elaborate regulatory monitoring and compliance apparatus able to make effective Chinese walls and non-discriminatory procedures.⁵⁴

The task of monitoring activities is considerable and compliance checks need to be extremely thorough if they are to succeed in achieving a level playing field. In the UK BT has reported that the cost of implementing functional separation has been at least £100 million.⁵⁵ BT has reported higher capital expenditure at its retail division (BT Retail) because of functional separation:

“Capital expenditure for the 2007 financial year was 8% higher at £166 million due to extra expenditure on implementation of the systems development required under the Undertakings”⁵⁶

Similarly BT Wholesale has increased its expenditure as a result of functional separation:

“Capital expenditure on property, plant and equipment and computer software at £1,017 million increased by 4% in the 2007 financial year. This reflects increased capital expenditure to prepare for the 21CN [BT’s next generation core network] and investment in new systems to ensure compliance with the Undertakings”⁵⁷

Last but not least, Openreach, the access services division functionally separated from the rest of BT, has also incurred substantial expenditures as a result of the functional separation undertakings:

“Capital expenditure on property, plant, and equipment and computer software was £1,108 million, an increase of 7% in the 2007 financial year. This reflects significant new investment in new systems to ensure compliance with the Undertakings and increased spend to meet LLU demand.”⁵⁸

⁵⁴ See for example the discussion in Ofcom (2007a) and EAB (2008).

⁵⁵ See Azimuth report ‘Operational Separation: Establishment of a separate Access Network Services Unit,’ February 2007. for TCNZ, (available at: <http://www.med.govt.nz/upload/45608/azimuth-ans-unit.pdf>).

⁵⁶ BT Annual Report 2007, p36.

⁵⁷ BT Annual Report 2007, p37.

⁵⁸ BT Annual Report 2007, p37.

There is every reason to suspect that functional separation costs in Poland would be large and comparable to the costs in the UK.

This is because functional separation involves a substantial one-off cost largely invariant to the scale of day-to-day operations. It is possible that per subscriber costs would be higher in Poland than in the UK, given the substantial fixed costs associated with functional separation.

It would seem more prudent to channel the resources needed to implement functional separation in Poland into more productive investments in the electronic communications sector.

For example, the regulator and government should encourage investment in enhanced cable TV networks so that they can offer the equivalent of VDSL and facilitate investments in new broadband wireless systems such as higher speed WiMAX. This could be achieved in part by offering tax allowances – which might cost in total less than the cost associated with functional separation.

On the basis of evidence presented by other researchers, access regulations in Europe appear to undermine the investment incentives of alternative providers.⁵⁹

The regulator in Poland should be seeking to promote innovation rather than applying complex regulatory tools unsuited to the Polish market. It should be noted that the *Connectivity Scorecard* places Poland at the bottom of 16 innovation driven economies – scoring 2.33 out of 10.⁶⁰ By contrast the United States is top with a score of 6.97. There is much scope for improvement in Poland and the regulatory regime governing electronic communications will play a key role.

Proposals to apply additional regulatory obligations such as functional separation at this time, given the circumstances in Poland are likely, on balance, to do more harm than good, and would only serve to emphasise the poor standing of Poland's connectivity score.

⁵⁹ For example, see Waverman et al. (2007).

⁶⁰ See www.nokiasiemensnetworks.com/global/IndustryThemes/ConnectivityScorecard/ConnectiveScorecard.htm The scorecard has been developed by Len Waverman and associated at LECG.

In Poland investment in electronic communications would be enhanced if there were:

- **More regulatory clarity;**
- **Improved design and effective application of existing regulatory powers – under both telecommunications and competition laws; and**
- **Greater encouragement and support for alternative platform investors to act as the spur to sustainable competition.**

As Gruber (2007) notes:

“In order to restore incentives for investment in the view of expanding broadband access, a review of certain access regulation provisions seem to be necessary, possibly by providing greater incentives to facility based entry via platform competition.”

The consensus emerging in the research about European telecommunications markets suggests regulatory regimes that place an emphasis on facilities-based competition and less emphasis on detailed regulatory rules are likely to deliver better outcomes over the long-term.

Functional separation in Poland would burden TPSA and UKE and undermine the investment incentives of alternative providers.

The regulator in Poland should take heed of the above and focus efforts instead on measures aimed at stimulating sustainable inter-platform competition.

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