



Structural Separation for a National Broadband Network

A report for SingTel Optus

May 2008

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1. Introduction

1.1. Background

SingTel Optus has asked CEG-Asia Pacific to provide a high-level report on the economic costs and benefits of structural separation in the specific context of the deployment of a national broadband network (NBN). In particular we have been asked to consider the economic consequences of a model of separation in which the owner of the NBN, including the local loops, digital subscriber line (DSL) and backhaul equipment is separated from other network and retail activities. An important context to this report is the recent Request for Proposals for the deployment of a high-speed broadband network issued by the Federal Government.

1.2. Summary of main conclusions

The key findings of this report are:

- Without structural separation, Telstra¹ will have very powerful incentives to damage competition in downstream markets that rely on access services provided by the NBN. In fact, regulation of access prices without structural separation may increase the incentives to damage competition in downstream markets.
- These incentives are unchanged by accounting or operational separation regimes.
- Operational separation is likely to reduce the benefits of vertical integration without significantly deterring anti-competitive conduct. Effective operational separation is likely to mean that regulation will creep from the monopoly part of the network to potentially competitive areas.
- International surveys suggest that operational separation has not worked as some had hoped. There are international precedents for structural separation in the telecommunications industry in the context of an NBN.

The basic question facing policy makers is whether monopoly networks should be vertically separated² from activities that are open to competition. The key advantage of vertical separation is that it removes the incentives for the owner of the network to act anti-competitively toward its rivals where they face competition.

Structural separation greatly reduces the job of regulating the monopoly network because the regulator no longer has to deal with the efforts of the network owner to 'get around' the access regulation and transfer its monopoly to the competitive part of the market. Of course, regulation of the monopoly activity is still needed, but it no longer

¹ These incentives would apply to any other vertically integrated owner of the NBN.

² We use the terms vertical separation and structural separation to mean full legal separation of the monopoly network and downstream activities. Alternatives to legal separation, including operational separation are considered in a later section of this report.

needs to include the difficult task of monitoring the vertically integrated network owner's efforts to favour its downstream affiliate.

The task of monitoring this activity should not be underestimated. As we discuss, the range of options available to the vertically integrated network owner to either lower the quality of their rival's competitive offers and/or raise their rival's costs is significant, and the assignment for the regulator to sift through 'good' and 'bad' discrimination is arduous and, inevitably, can be only be done imperfectly. .

Vertical separation may result in the loss of other potential efficiencies - the greater the economies of scope between the network and competitive activity, the greater the cost of separation. In the context of the NBN and the separation model discussed in this report these do not appear to be significant and certainly not as significant as they are sometimes portrayed.

1.3. Structure of this report

The remainder of this report is structured as follows:

- Section 2 provides the background to the NBN and provides some theoretical context to the debate regarding structural separation.
- Section 3 outlines the extent of behavioural regulation designed to address vertical foreclosure in the telecommunications industry.
- Section 4 examines the case for structural separation of the NBN.

2. What are the issues?

On 11 April 2008 the Federal Government issued a Request for Proposals for the deployment of a high-speed broadband network to 98 percent of the Australian population. The Request for Proposals specifies a minimum bandwidth of 12Mbps. We understand that such a minimum speed cannot be delivered under the traditional copper local loop architecture and therefore proponents will likely need to deploy more equipment into the local access network.

Regulators have maintained the potential of next generation access networks to promote competition in telecommunication markets. For example Vivian Reding has said that:³

“For traditional telecom operators full IP networks represent a serious hazard, because it means that services can be platform neutral: we can expect the IP business model of flat rate charging to become increasingly important in traditional telephony as well as added value market.

In short: while the decline in revenue from fixed line users has been so far been somewhat offset by the rise of broadband subscriptions, operators are now faced with the VoIP business model that will expose them to a new frontier of competition on their core voice revenues. This might explain some of their reluctance to invest.”

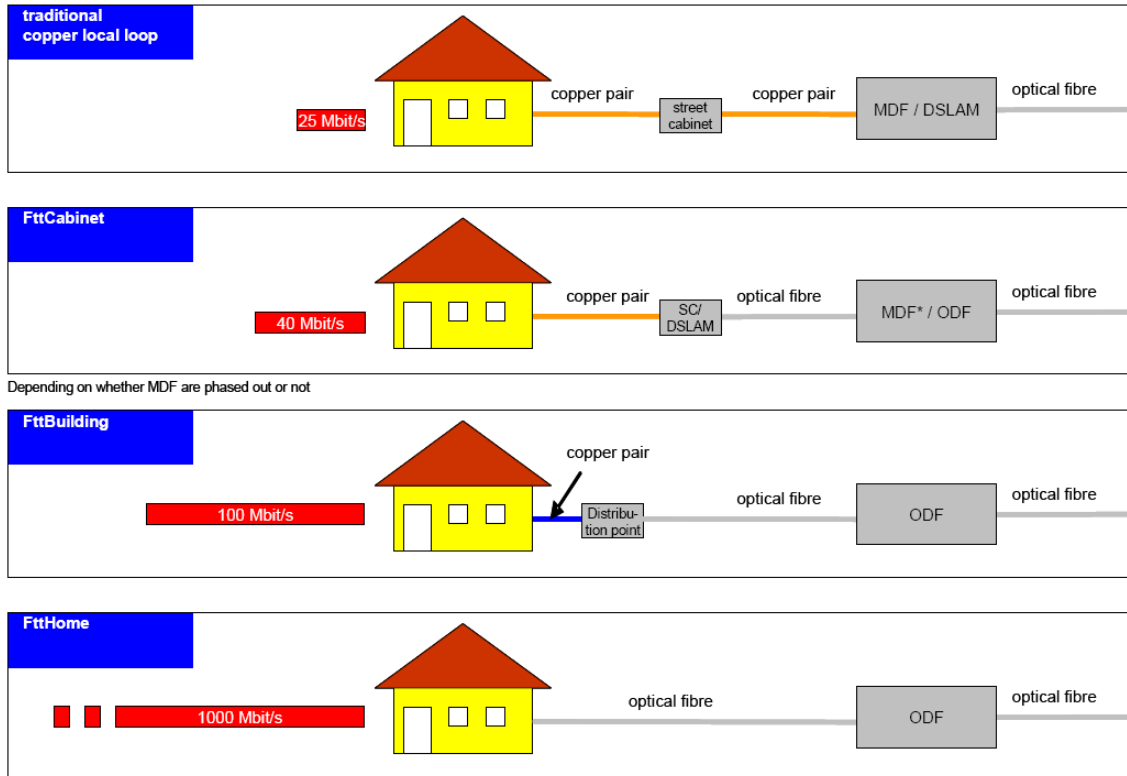
We have discussed the potential reasons for delays in investing in an NBN in a separate report.⁴ We note that as the owner of the local loop, Telstra has an incentive to ‘hold-up’ investment in next generation networks in order to secure regulated terms of access which are above cost.

We understand there is a range of technical solutions that offer so-called next generation capabilities, such as a minimum 12Mbps. These include combinations of fibre and copper with xDSL equipment, or fibre and wireless. We understand that the likely transition path for many areas served currently by copper from exchanges involves replacing some of the copper with fibre optic cable. The resulting increase in broadband capability depends on how close the fibre optic cable gets to the home or business.

³ Viviane Reding, Member of the European Commission responsible for Information Society and Media Connecting up the Global Village: a European View on Telecommunications Policy Conference of the International Telecommunications Union (ITU): “Telecom World 2006” Hong Kong, China, 4 December 2006.

⁴ CEG (2007), *Economic analysis of sub-loop access*, Report for the G9 Consortium, 5 September.

Figure 1: Options for rollout of fibre



Source: ERG

The Request for Proposals from the Government requires that services provided by the network be subject to an ‘open access’ model. Various options for physical unbundling (access) of NBNs have been canvassed by regulators⁵. Most involve competitors locating facilities in street side cabinets in order to offer equivalent services to the vertically integrated network owner. In order to do this, competitors would require access to the sub-loop of copper between the street cabinet (or node) and the home. There is a general consensus that the economics of competing deployments at this level of the network will be significantly worse than what exists today with unbundling at the exchange, given the smaller number of customers off a node compared to an exchange. That is, relying on unbundling of the copper loop at the street cabinet (node) will make partial facilities based competition (via accessing the unbundled local loop service) more costly and less attractive than it is today.

If the economics of sub-loop unbundling fails to materialise, competitors currently engaging in partial facilities based competition (via unbundling at the exchange) will need to migrate to service based competition in which they acquire some form of access product – a bitstream service – from the network owner.⁶

2.1. Economics of the local loop and next generation broadband networks

⁵ Ofcom (2007), Future broadband: Policy approach to next generation access, 26 September.

⁶ We understand that it is conceivable that competitors could continue to provide services using equipment located in exchanges if this is permitted by with the vertically integrated operator. This possibility is not considered in this report.

Vertical integration of the monopoly infrastructure owner and a downstream service provider gives the monopolist a potential incentive to discriminate against (foreclose) its downstream competitors.

In the case of the local loop, a potential constraint on the vertically integrated owner's ability to damage competition is the ability of competitors to bypass (duplicate) the local loop. If a small but significant increase in price above cost by the network owner causes competitors to duplicate the network then the owner will not have the ability to damage downstream competition. That is, the network owner will not have market power because competitors can economically avoid paying monopoly prices or unfair non-price terms by simply duplicating the network.

The economics of duplicating the local loop depends heavily on the density of customers but also on their demand characteristics. Less dense areas increase the average cost of deploying local loops because the bulk of the costs of the local loop is in upfront investments in network infrastructure. Greater demand for high value services, such as subscription television, increase the average revenues available to operators. Replication of the local loops by facilities based competitors has been fairly limited in Australia. The main exceptions being the cable deployed by Optus, Transact and others in some densely populated metropolitan areas.

The courts have noted that facilities based competitors do not provide effective competitive constraint on Telstra's behaviour in most telecommunications markets.⁷ Perhaps for these reasons regulation has most recently focused on unbundling the local (copper) loop.

The deployment of an NBN will change the economics of local loop networks. For example the ERG has noted:⁸

"[next generation access network] investments are likely to reinforce the importance of scale and scope economies, thereby reducing the degree of replicability, potentially leading to an enduring economic bottleneck. The degree to which this is the case will vary depending on the specific technology deployed, but may mean that effective competition will increasingly require significant scale in order to compete with incumbents' deployments of NGA, even though for the time being it is uncertain what the minimum scale exactly is.

It may be the case that, to some degree and in certain locations, these scale economics mean that there is a natural monopoly in certain areas of the electronic communications value chain."

2.2. Vertical integration

Structural separation, by definition, would result in the loss of any benefits that come from vertical integration. As such, it is important to understand what these might be.

The boundary of the firm has been extensively explored in the economic literature, indeed the existence of the firm and its boundaries is in many ways the foundation of

⁷ Telstra Corporation Ltd (No 3) [2007] ACompT 3 (17 May 2007) at [79] and [80].

⁸ European Regulators Group *Opinion on Regulatory Principles of NGA*, ERG (07) 16rev2.

the *Industrial Organisation* literature. In deciding to integrate an activity the business owner takes a decision to bypass the market mechanism and to no longer rely on the information inherent in the market price for that activity. In the words of Coase:⁹

“Outside the firm, price movements direct production, which is coordinated through a series of exchange transactions on the market. Within a firm, these markets transactions are eliminated and in place of the complicated market structure with exchange transactions is substituted the entrepreneur co-ordinator, who directs production.”

By vertically integrating a service or activity, the firm avoids the cost of transacting with the market for that service. These transaction costs come in the form of searching and identifying trading partners and writing contracts, but also in the costs of being unable to fully specify a contract and the adverse consequences if this is the case. The savings made by vertically integrating are offset by the loss of efficiency from using the market mechanism (i.e., prices) to signal resource use within the firm’s production processes.

Absent the existence of significant market power and the likelihood of vertical foreclosure, policy makers need not be particularly concerned whether the economy is better off from a particular firm integrating an activity or alternatively separating the activity and buying services at arm’s length. The efficient answer to the question of what activity should be integrated in the firm will likely come from experimentation in a competitive market by entrepreneurs.¹⁰

2.3. Vertical foreclosure

There may be a number of reasons why a vertically integrated network owner may favour its downstream affiliate and not make the same cost structure (marginal cost-based prices) available to downstream rivals.¹¹ This contrasts with the case of a structurally separate network owner who would have strong incentives to make price discrimination available to all downstream operators. This is because by making efficient price structures available to all downstream operators they are more likely to be reflected in retail prices (therefore stimulating sales as intended) and will not distort downstream competition, reducing the potential for double marginalisation.

For the vertically integrated operator, discriminating against its rivals may involve some short term costs in the form of foregone sales because the downstream affiliate does not supply the entire downstream market and may not be as efficient as its rivals. However, under most plausible forms of competition the operator will have an incentive to discriminate against its rivals. For example, economies of scale in downstream markets may give incentives to increase share in that market and scope economies between the downstream market and other markets may give the vertically integrated

⁹ Coase, R. 1937, 'The Nature of the Firm', *Econometrica*, 4.

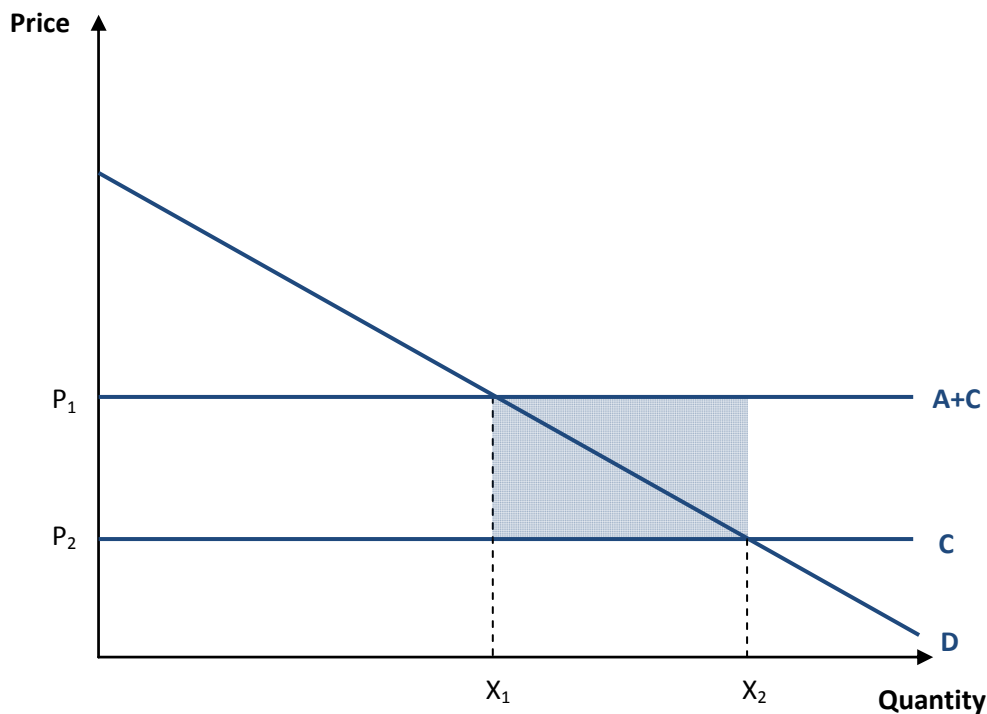
¹⁰ Famously, Hayek has advised policy makers that “If we can agree that the economic problem of society is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating *all* knowledge, issues its orders. We must solve it by some form of decentralization.” In “The Use of Knowledge in Society”, by Friedrich A. Hayek. *American Economic Review*, XXXV, No. 4; September, 1945.

¹¹ Noll (1995) “The Role of Antitrust in Telecommunications”, *Antitrust Bulletin*, Fall edition.

firm the ability to leverage the ownership of the essential facility into other (unregulated) markets.

In addition, the high fixed costs for the vertically integrated monopolist will give it an incentive to implicitly 'price discriminate' through its downstream affiliate rather than for all access seekers. This makes it less likely that other access seekers can compete on an equal footing. This can be seen in the following simple diagram. In this diagram all consumers are assumed to be identical. The marginal cost of producing the access service is assumed to be zero, whilst the average cost (A) is equal to the access charge. The cost of converting the access service to a retail service (C) is constant and assumed to be the same for all operators. The non-affiliated access seekers have a constant unit cost of $P_1 = A + C$. By setting a variable usage charge of P_1 the access seeker can compete profitably with the downstream affiliate of the vertically integrated operator but only if that operator also charges a price equal to P_1 .

Figure 2: Asymmetric price discrimination



If, however, the vertically integrated downstream affiliate offers a two-part tariff in the downstream market with a fixed charge of $(P_1 - P_2) * X_1$ and a variable price of $P_2 = C$, then the access seeker can no longer profitably compete for customers. This is profitable for the vertically integrated firm because, for it, the marginal cost of access is not the access price (A) but the true marginal cost (zero) so their total marginal cost is $C = P_2$. If the access seeker were to match the two-part tariff then it would make a loss of $(P_2 - P_1) * (X_2 - X_1)$. This is because, for the access seeker, their total marginal cost is $A + C = P_1$. Thus, by selling the additional units $(X_2 - X_1)$ at a price P_2 they make a loss of $(P_2 - P_1) * (X_2 - X_1)$.

Whilst in this case, with the integrated operator's profits held constant, welfare is increased in the short run, competition is foreclosed. This foreclosure of competition allows the vertically integrated downstream affiliate to raise prices and profits in the long run – effectively transferring its monopoly power to the (unregulated) downstream market.

A clearly superior solution to this problem is to have an access charge that is the same for all access seekers (i.e., a fixed charge for all access seekers). With structural separation the monopolist has a strong incentive to do just this in order to maximise total sales. However, this incentive is dampened or reversed in the presence of a downstream affiliate through whom both price discrimination and foreclosure can be given effect.

Regulation, in the form of imputation tests, can potentially be used to limit such conduct. As discussed in the next section, this necessarily involves limits on the pricing behaviour of the vertically integrated downstream affiliate. However, this effectively involves the creep of regulation from the monopoly services (access) to the competitive services in the downstream market. Structural separation offers the potential to make redundant this layer of regulation in the competitive market segment.

We also note that in more complicated demand scenarios (i.e., where all consumers are not identical) the optimal access pricing structure will be considerably more complicated than a single flat charge, involving a mixture of different quality of service and price combinations. The only way that the optimal pricing structure can be determined is if the access provider has an incentive and free reign to find it (a regulator cannot hope to accurately determine this pricing structure as it will never be close enough to customer demand patterns). However, a regulator cannot afford to give a vertically integrated monopoly free reign to set access price structures as it will always have an incentive to do so in a manner that damages its downstream rivals (e.g., increasing prices for quality standards used by rivals disproportionately more and *vice versa*).

Regulations have even more difficulty in addressing 'non-price' discrimination. This is because in the absence of true arm's length transactions and (in the case of a vertical integrated operator) the likely lack of motivation to design efficient ways of serving downstream rivals, reasonable non-price terms are difficult to define. In the context of service design, the potential for non-price discrimination appears higher under an NBN compared to local loop unbundling. This is because under the NBN the technical characteristics of the access product (or service) define the scope for competition, whereas in local loop unbundling the access seekers xDSL equipment and backhaul defined the potential of its service. The unbundled copper loop is after all simply a piece of copper, whilst the bitstream service offered by the NBN operator has, we understand, various layers of internet protocol attached to it which effect the capability of downstream services supplied by access seekers.

Mandy and Sappington identify two broad forms of non-price sabotage:^{12,13}

¹² Mandy & Sappington, (2007). "Incentives for sabotage in vertically related industries," *Journal of Regulatory Economics*, vol. 31(3).

¹³ Mandy and Sappington find that depending on the nature of competition in downstream markets, the vertically integrated operator may favour one or the other form of sabotage. If competition does not give parties price setting power in the downstream market, the operator may favour strategies to increase the cost of their rivals supplying the market - by increasing their rivals' cost, the vertically integrated operator gives itself pricing freedom in the downstream market. If this is not the case, and operators' quantity choices in downstream markets affect price (e.g., Cournot style competition), then the vertically integrated operator may have a greater incentive to reduce the attractiveness of its downstream competitor's service.

“Although some forms of sabotage (e.g., engaging in protracted litigation and imposing standards that are particularly costly for rival producers to adopt) may increase rivals’ operating costs, other forms of sabotage (e.g., degrading the relative quality of competitors’ products and limiting the ability of competitors to test new products and deliver them to customers) may primarily reduce the demand for rivals’ products.”

Each of these forms of sabotage is considered in the context of the NBN in the following sections.

3. Is Operational Separation the answer?

In the case of a vertically integrated owner of an essential facility, many of the benefits of access can be lost if measures are not put in place to control potential anti-competitive leverage into downstream and related markets. Access regimes which have left the vertically integrated operator competing with access seekers in downstream markets have often been accompanied by behavioural rules on price and non-price discrimination.

These rules are often supported by accounting separation to calculate the transfer prices used by the vertically integrated network owner. These accounts have also been used to test for margin squeezes. Rules to prevent non-price discrimination are increasingly being adopted. These price and non-price rules are sometimes packaged up and described as 'operational separation'. Falling short of structural separation, operational separation may nevertheless involve extensive rules that go to the heart of a network owner's activities.

It must be recognised that operational separation regulations may impose significant transaction costs on the vertically integrated network owner. Operational separation typically involves restrictions on interactions between staff and managers of the business divisions, reporting and monitoring by regulatory officials and the imposition of systems and process that would not otherwise be needed.¹⁴

The effort to promote competition (such as by unbundling of the local loop) has required more regulation than would be warranted if there was structural separation of the local loop. As access price regulation removes profits from supplying access to essential infrastructure, the monopolist has increased incentives to recapture the profits from its monopoly (lost by access regulation) by distorting competition in the downstream market - perhaps by damaging downstream rivals using non-price means. As Mandy and Sappington note:¹⁵

"Although input prices above marginal cost can induce inefficient consumption patterns, they also can increase the integrated firm's opportunity cost of engaging in sabotage that reduces the demand for the firm's upstream product."

The cost of behavioural remedies is particularly high if there are significant vertical externalities between the parts of the business being separated. That is, an effective operational separation regime will obstruct the efficiency enhancing co-ordination between the activities and investments of the retail business and the access network activities. This criticism of operational separation is also the customary objection to structural separation.

Notwithstanding the extent of operational separation and behavioural rules, the effectiveness of behavioural regulation in limiting anti-competitive incentives is generally regarded as limited.¹⁶

¹⁴ See Section 3.2 for a brief discussion of the scope of operational separation in the UK.

¹⁵ Mandy & Sappington, (2007). "Incentives for sabotage in vertically related industries," *Journal of Regulatory Economics*, vol. 31(3).

¹⁶ Laffont and Tirole (2000), *Competition in Telecommunications*, MIT Press.

For example, pricing rules are unlikely to prevent anti-competitive price discrimination. They are inevitably cumbersome and involve all the well understood pitfalls associated with regulating against ‘predatory pricing’.¹⁷ That is, the regulator must understand the dynamics in the competitive sector and must decide when low prices are ‘pro-competitive’ or ‘anti-competitive’. The regulator will often not have the information to be able to determine this accurately, nor the ability to take action in a timely fashion through the courts or other processes.

This is exacerbated by the fact, as discussed above, that access prices are typically based on long run average costs, which in high fixed cost networks (such as the NBN) are significantly greater than marginal costs. This means that whilst an access seeker will base its downstream pricing decisions on the calculated access price, the downstream division of the vertically integrated network owner will have a strong commercial incentive to base its decisions on the true economic cost of the service even if there are detailed operational rules to set transfer prices. As observed above, only the downstream firm will face the true cost of additional services on the network which will allow it to engage in retail level price discrimination that is unprofitable for access seekers.

3.1. Behavioural separation rules in Australia

In the case of the local loop in telecommunications, the interaction between the local loop and other aspects of the vertically integrated operator’s activities are potentially intricate. Policing anti-competitive conduct in these circumstances is difficult. As a result in many jurisdictions, including Australia, the regulations to control the potential for anti-competitive behaviour have been multifaceted.

Since competition was introduced in Australia, telecommunications operators including Telstra have been subject to specific rules regarding their commercial behaviour. These include a specific anti-competitive conduct regime (Part XIB) and record keeping rules which have required accounting separation for some retail and wholesale activities and reporting of imputation tests. The Telecommunications Legislation Amendment (Competition and Consumer Issues) Act 2005 requires operational separation of Telstra. It requires that Telstra maintain separate divisions for retail, wholesale and network services. The purpose of the legislation is “to provide transparency that Telstra is not favouring its own retail activities over the activities of its wholesale customers, while allowing Telstra to obtain legitimate benefits from vertical integration”.¹⁸ The Telstra operational separation plan, required under the Act, specifies various and optically significant organisational and operational rules.¹⁹

Despite the significant extent of behavioural regulation in Australia, competitors and the competition authorities continue to accuse Telstra of anti-competitive discrimination against its downstream rivals. For example:

¹⁷ Edwards, G (2002) “The Perennial Problem of Predatory Pricing” Australian Business Law Review, Vol. 30, June.

¹⁸ The Parliament of the Commonwealth of Australia, Senate, Telecommunications Legislation Amendment (Competition and Consumer Issues) Bill 2005, Explanatory Memorandum.

¹⁹ <http://www.telstrawholesale.com/dobusiness/customer-commitment/operational-separation.htm>

- On 12 April 2006, the ACCC issued Telstra with a Competition Notice alleging anti-competitive conduct because Telstra i) increased the price of its unbundled wholesale line rental product; ii) increased the price of its unbundled retail line rental product; and iii) kept the price of its bundled retail line rental products constant. The ACCC Notice alleges that the effect of Telstra's conduct is to raise the cost of its rivals as well as hinder competitors competing for a particular class of customer termed "low spend" customers.

It is interesting to note that the final allegation is consistent with the conduct discussed above in section 3.2. That is, Telstra as a vertically integrated operator has the ability to discriminate at retail, profitably serving customers that are unprofitable for access seekers to serve because Telstra does not offer the same level of price discrimination at retail that it does at wholesale. In other words, it only offers the efficient pricing structures to its downstream affiliate, not to its downstream rivals.

- On 18 November 2005, Optus lodged an access dispute in relation to the unbundled local loop service alleging a lack of equivalence in the price and non-price terms of access to the service. The ACCC is yet to publish its determination in relation to this dispute. The ACCC has, however, published its determination of a dispute between Optus and Telstra on access to the local loop service in multi-dwelling units, albeit more than 12 months after the dispute was lodged. These lengthy periods, likely following long periods of negotiations, demonstrate the difficulties in sifting through legitimate and illegitimate non-price terms and addressing concerns regarding non-price discrimination.

To the extent that these disputes relate to non-price terms such as the equivalence of ordering and provision of the unbundled local loop services, then they relate specifically to questions regarding whether Telstra can degrade the quality of their rival's competitive offer. We would suspect that the time taken to order a new service, say when a person is moving house, is an important potential quality differentiator between the vertically integrated operator, Telstra, and its rivals.

- As at 6 May 2008, it has been reported that Telstra has around 47 matters before various courts including the Full Federal Court (1)²⁰, the Federal Court (13)²¹, Administrative Appeals Tribunal (33)²² and Access Disputes (18)²³. Protracted litigation is likely to increase the cost of rivals. Telstra has itself been vocal regarding the cost of regulation²⁴, but anecdotally it appears recently to have increased its use of the courts to resolve regulatory issues.

Whilst it is clearly not within the scope of this report to comment on the merits of each action described above, it appears obvious that within the scope of the existing

²⁰ Graeme Samuel's speech 13 March 2008

²¹ 12 ADJR actions in the Federal Court on ULLS and LSS arbitration determinations, 1 Federal Court ADJR action regarding administration of retail price controls –Graeme Samuel's speech 13 March 2008

²² 33 applications to the Administrative Appeals Tribunal for review of the ACCC decisions on Freedom of Information requests –Graeme Samuel's speech 13 March 2008.

²³ ACCC website.

²⁴ <http://www.nowweareretalking.com.au/features/telstra-on-regulation>

regulations and the examples described above that there is plenty of potential for the vertically integrated operator, Telstra, to engage in actions that both raise its rivals' costs and degrade the quality of its rival's service.

Critically, if a similar regime were adopted for the NBN then we see no reason for such actions to cease. In fact, these problems may get worse to the extent:

- The additional complexity of the quality dimensions for access of the NBN network make non-price discrimination easier/more effective; and
- The higher fixed costs and greater variety of services to be supplied over the NBN increased importance of price discrimination in the downstream market.

3.2. Operational separation in the UK

Ofcom's Strategic Review of Telecoms concluded that behavioural and organisational changes by BT leading to "real equality of access" for its competitors were necessary to support the growth of greater competition, innovation and investment certainty in the UK telecommunications sector.²⁵

Faced with an implied threat of structural separation if it did not make the changes required by Ofcom,²⁶ BT proposed a legally binding undertaking to form an operationally separate unit called Openreach to manage its access and backhaul networks and the establishment of an Equality of Access Board (EAB) to oversee its implementation. BT also undertook to create two separate divisions within its wholesale division to be responsible for the management of products in which it had significant market power (BTWS) and other products of significance to other operators (BTS) respectively. BT agreed to apply "Equality of Inputs" on certain products, requiring that all customers of its upstream units, including BT Retail, be provided with the same product or service on the same timescales, terms and conditions by means of the same systems and processes with the same commercial information about such products, services, systems and processes.

In order to ensure the equality of access sought by Ofcom, BT made commitments to the behavioural separation of Openreach, BT Wholesale and BT Retail, and between BTWS and BTS within BT Wholesale. The extent of this separation includes staff, management team premises, objectives, performance measurement, incentive remuneration, financial results and operational support and management information systems.

In terms of non-price discrimination, Ofcom's survey of BT wholesale customers in 2006 revealed optimism amongst some about the restructuring but also highlighted concerns about the operation of Openreach.²⁷ These included:

- Problems with restructuring and delays in service delivery;

²⁵ Ofcom (2004), Strategy Review of Telecommunications Phase 2 Proposals, News Release 18 November.

²⁶ Specifically, Ofcom said "should [operational separation] not deliver real equality of access, a reference under the Enterprise Act, which would no doubt lead to the issue of structural separation being actively considered, might be the only viable option". Page 14.

²⁷ Ofcom (2006), Survey of BT's wholesale customers, April.

- Fear of compliance issues ‘paralysing’ some Openreach staff, particularly at the junior levels; and
- Ensuring that equality of inputs does not result in “equally poor instead of equally good” services for all and that Openreach would be able to provide differentiated products to those who wished to purchase these.

Customers rated BT as a “below average” supplier and had not observed any improvements in service quality in the months since Openreach was created.

In terms of BT’s pricing in the retail market, we are unaware of any evidence to the effect that the institution of Openreach has had any effect.

4. What is the case for Structural Separation?

Implementing structural separation requires that particular assets and activities of the vertically integrated operator are divested. Whilst horizontal separation has been implemented in some jurisdictions²⁸ the focus of regulatory debates today is largely around vertical separation between the access network and other network assets and activities. In an NBN environment this might involve separation of the access network including the local loop, deployed fibre, xDSL equipment in nodes and interconnection equipment.²⁹ Under this model, the majority of network assets and activities will remain in one network operating company.

As discussed above, structural separation needs to be based on a presumption that the network will continue to be an economic bottleneck with enduring monopoly characteristics. As noted by Bijl:³⁰

“... structural separation makes sense only if local access is a bottleneck or an essential facility, that is, if it is essential to provide services to end-users, and it cannot be economically reproduced because of substantial sunk costs. Since technological change may eliminate the bottleneck nature of certain network elements, one should add the condition that bottlenecks will remain persistent, or at least are expected to do so with a large likelihood.”

In the context of access to an essential (monopoly) network, structural separation has two clear advantages over allowing the network owner to operate in downstream markets. Structural separation:

- Removes the incentive to engage in price or non-price sabotage against particular access seekers and allows all downstream operators to compete on an equal footing; and
- Provides a strong incentive to engage in efficient pricing at the wholesale level such that all access seekers face the same access prices and importantly, face prices that reflect the true economic cost of using the services of the network.

4.1. Assessing separation of the NBN

If competition is foreclosed due to anti-competitive behaviour then the benefits of competition will be lost. Structural separation will protect the benefits of competition. The benefits from structural separation therefore are essentially the benefits of competition that would otherwise be foreclosed. However, there are potential costs of

²⁸ In the US, the Bell system was broken up into a long distance provider (AT&T) and seven regional bell operating companies with exclusive franchises over local access markets but prohibited from offering long distance services. The relevance of the success of this form of separation is questionable for case of vertical separation between network and retail functions, because of the absence of retail complementarities in the latter case.

²⁹ This contrasts with proposals for structural separation of the local loops only.

³⁰ Bijl, P. (2005), Structural Separation and Access in Telecommunications Markets, Cesifo Working Paper No. 1554 Category 9: Industrial Organisation, September.

structural separation and proposing structural separation requires a careful consideration of the costs and benefits.³¹

Structural separation will tend to be most desirable where:

- Structural separation does not result in a reduction in efficient price discrimination to end users as a result of poorly implemented regulation or if information available to the separated access provider is reduced as a result of separation;
- The greater the importance of the downstream industry segment (and, hence, the greater the benefits of vibrant competition in that sector); and
- The greater the ability to use contracts to effectively co-ordinate activity between the network and downstream market participants.

4.1.1. Price discrimination vital for the NBN to succeed

The costs of the NBN are largely fixed investment costs made at the time the network is deployed. Price discrimination to end users of services on the network is likely to be vital in order to make the investment financeable and to ensure utilisation of the infrastructure is maximised. Offering different quality products at different prices is widely recognised as the most efficient means to ensure that fixed costs are recovered.

Price discrimination is also needed to ensure that end users with low valuations are not 'priced out the market'. For example, if only a single 'maximum speed' product is offered the price that has to be charged to recover fixed costs may need to be so high that some customers, with low valuations of internet usage, may find it unattractive. In this scenario, it will be welfare enhancing to also provide a lower priced 'slower speed' product.

As described in section 2.3, a vertically integrated network owner (and access provider) will have an incentive to engage in price discrimination to end users through its downstream affiliate. This can have positive efficiency effects to the extent that it promotes usage of the network. However, the vertically integrated network owner will have an incentive to deny access products to its rivals that support the same pricing structures for end users. The end result is that price discrimination occurs through the integrated affiliate and rivals are foreclosed.

However, if vertical separation will result in the elimination of price discrimination to end users then this will involve a cost that must be offset against the benefit associated with avoiding foreclosure of rivals. Potential reasons why a structurally separated access provider will not provide price discriminated access prices are:

- Regulation may explicitly deny it that opportunity or it may give it little financial incentive to do so; and

³¹ OECD, (2001), Recommendation of the Council concerning structural separation in regulated industries, Paris.

- The separation of the access provider from the end customer may result in the access provider having insufficient information to accurately determine efficient price discrimination strategies.

In our view, these considerations are of limited concern in the current context. So long as regulation of the structurally separated network owner provides it the incentive to increase usage (sales) and sufficient flexibility in pricing then the network owner will have both the ability and incentive to engage in efficient price discrimination. In the Special Access Undertaking offered by FANOC such a pricing model has been proposed – a weighted average price cap. Under this pricing model, FANOC will derive a financial benefit if it can increase utilisation of the network. Moreover, if the objective of equivalence of access to the bitstream service offered by the NBN is to be achieved then quality differentials will need to occur at the wholesale level rather than at the retail level.

In terms of gathering information on end users demand, the network owner will be able to determine this directly as variations in demand at the end user level will impact on demand for its own access products. In any event, the structurally separated network owner and access seekers will have an incentive to share information to seek efficient prices. For example, if any access seeker believes that a particular price/quality combination would be popular they can request that the structurally separated network owner provide that combination.

Structural separation may also provide more certainty for access seekers to invest in service innovation, simply because they face less risk of being discriminated against by a rival who may seek to strand that investment by, for example, modernising the network in such a way as to make the investment obsolete or at least less commercial. A consequence of the next generation of networks appears to be a greater independence between services and the technology of the access lines. This may be in part because of the move from circuit-switched communication to completely or partly IP-based.

4.1.2. Potential for innovation on the NBN

The more important the downstream industry segment in which competition occurs, the greater are the potential gains from competition. Competition drives productive and investment efficiencies that will be larger with more facilities based competition. As observed above, the likely access model in the NBN involves limited facilities based competition because of the difficulties of unbundling the network elements and hence a return to service based competition. However, it is commonly reported that service based competition in the NBN environment will be rich in applications, service platforms and content (e.g., television). If this is borne out then the cost of access will not be as significant a component of the overall charge for services delivered on the network, implying there are potentially significant gains from separation at the service layer. In fact, if this were not the case then it would be optimal not to provide access at all – and simply regulate the retail prices of a vertically integrated monopolist directly.

The greater the potential for innovation in the downstream market the more valuable to society is vibrant competition in that market. We understand, as discussed above, that there is substantial scope for innovation in the retailing of NBN products. Consequently, a key benefit of structural separation would be promotion of that innovation (by removing the threat of vertical foreclosure).

4.1.3. Contracts in a structurally separated environment

A potential cost of structural separation exists if vertical integration allows the network owner's business divisions to avoid costly contract negotiations – where the costs include not just legal fees but also any limitations to the sophistication with which contracts between separated parties can be written. For example, a firm where IT is critical to their business might prefer to employ its IT team in-house rather than outsourcing due to the difficulty of specifying a contract that ensured they had access to the quantity and quality of IT professionals when they needed them. That is, the difficulty of fully specifying a contract might make vertical integration with IT preferable to outsourcing IT.

Opponents of structural separation are typically pessimistic of the ability of contracts to co-ordinate activity.³²

However, this sort of consideration does not appear to be as relevant for the NBN. The type of services provided will, we understand, be able to be clearly specified in contracts. Indeed, even under vertically integrated operations it is envisaged that such contracts will be used by the non-affiliated retailers (the so-called open access model). In addition, and as noted previously, separation of the local access network in an NBN environment at a point above the xDSL and transmission equipment limits the extent of scope economies between the retail and operational functions because control of most network assets is under the control of one entity. This fact makes co-ordination between activities at the service provider level more easily dealt with by contracts and limits the likelihood of hold-up.

The potential for contracts to address objections to structural separation has been summarised by Cave and Doyle as:³³

“There are thus numerous examples, some of them discussed above, others summarised in literature reviews and collections, of how flexible and sophisticated contract design can overcome problems of opportunism. Examples of such methods are long-term contracts, take or pay arrangements, demand projections made by disinterested third parties, and customer engagement. These methods do not solve all the problems which result from regulation in conditions of asymmetric information, but they can solve or mitigate problems associated with separation, and allow consumers to benefit from the advantages of separated structures.”

It is difficult to know with certainty what model would prevail in the industry absent the incentive created for the owner of the (regulated) monopoly network to be vertically integrated. However, it is evident from the analysis in the report that in the context of the NBN the vertical externalities in the operation of the NBN and downstream service provision appear more limited, certainly more limited than in the case for separating the local loop. As noted below, the threat of strict controls on anti-competitive vertical activity may create incentives to voluntarily separate activities and the example of eircom should be noted as a case where this theory appears to be reflected in practice. In other words, absent the ability to implement vertical foreclosure strategies it appears eircom is itself pursuing vertical separation. A strategy which suggests that that absent

³² Ergas (2007) Vertical Integration, Vertical Separation and the Efficiency Consequences of the G9 SAU, 6 August.

³³ Cave, M. & Doyle, C (2007), *Contracting across Separated Networks in Telecommunications - Lessons from Theory and Practice*.

the anti-competitive aspects of a vertical relationship the vertical externalities are not as significant as they are portrayed.

4.2. Experience with structural separation

Structural separation has been the default form of regulation in the electricity and gas industry in Australia and in many jurisdictions. Structural separation has also been implemented in a number of other industries including water and rail. The success of structural separation, particularly in rail, has been criticised. Compared to other industries such as railways, telecommunications appears to be favoured in the literature as a more natural candidate for separation.³⁴

In telecommunications, voluntary separation has been proposed by both Telecom in New Zealand and by eircom in Ireland. We understand that in New Zealand, Telecom is now proposing a form of operational separation but eircom appears to be continuing to pursue voluntary structural separation. The motives for voluntary separation appear to be two-fold, i) the risks for investors in particular assets would be more clearly defined and ii) an increase in regulatory certainty.

We understand that mandatory separation is unlikely to be legal in many European countries³⁵ (with an important exception being the UK) and hence the European Commission does not have structural separation as a “remedy” but it does have the capacity to approve functional separation models imposed by regulatory authorities in the EU.³⁶ In the UK, Ofcom canvassed structural separation of BT but in the end accepted operational separation. Ofcom specifically considered recommending an investigation into structural separation by the Competition Commission. It noted:

“Such an investigation would be wide-ranging. The Competition Commission would be able to impose structural remedies. It could, for instance, examine whether the only solution to the problem of inequality of access would be the separation of BT’s wholesale network operations and its retail service provision. In our view structural separation of the network infrastructure would be a complex and difficult task, nor would it eliminate the need for regulation. It would represent a seismic change to the UK industry structure, but it may unlock value and improve customer service, innovation and competition in the mid to long term.”

Arguably because of the capacity of Ofcom to threaten structural separation, it maintains greater control over BT’s conduct as a vertically integrated operator.³⁷

³⁴ See Gomez-Ibanez J (2003) *Regulating Infrastructure: Monopoly, Contracts and Discretion*, Harvard University Press.

³⁵ Cave, M. & Doyle, C (2008), *Separation and Investment in Telecommunications Networks: A Review of Recent Practice*.

³⁶ European Commission (2007) Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directives 2002/21/EC on a common regulatory framework for electronic communications networks and services, 2002/19/EC on access to, and interconnection of, electronic communications networks and services, and 2002/20/EC on the authorisation of electronic communications networks and services, COM(2007) 697 final.

³⁷ Bijl, P. (2005), *Structural Separation and Access in Telecommunications Markets*, Cesifo Working Paper No. 1554 Category 9: Industrial Organisation, September.

Structural separation has been mandated by regulators and competition authorities, in merger cases, in a number of jurisdictions. Cave and Doyle (2008) survey various cases of structural separation in the US, Germany, Mongolia and Portugal.³⁸

Closest to home and in the context of a tender for an NBN deployment, the regulator in Singapore is including structural separation of the network company (the owner of the passive fibre and ducts) as a requirement of proponents responding to its request for proposals. The regulator has said that:³⁹

“It is also critical for the Next Gen NBN to provide effective open access to downstream operators. This will create a more vibrant and competitive broadband market. As a policy, we have therefore decided to adopt separation between the different levels of the Next Gen NBN to achieve effective open access. The RFP to construct the network will therefore provide for structural separation of the passive network operator from the downstream operators.”

The regulator has, however, only imposed operational separation between the operational company, the company that owns the switches and transmission infrastructure, from any of its downstream retail affiliates. It is worth noting in this regard that in Singapore there are a number of operators with local fibre loops.

³⁸ Cave, M. & Doyle, C (2008), *Separation and Investment in Telecommunications Networks: A Review of Recent Practice*.

³⁹ Media Release, Singapore's Ultra-high Speed Digital Highway Ready by 2015, Singapore, 11 December 2007.