Vertical Integration, Vertical Separation and the Efficiency Consequences of the G9 SAU

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ABBREVIATIONS

FANOC	Fibre Access Network Operating Company
SAU	Special Access Undertaking
HFTP	Hybrid Fibre Twisted Pair Network
CAV	Capital Asset Value

1. EXECUTIVE SUMMARY

1 This report considers the economic efficiency implications of the FANOC's Special Access Undertaking of 30 May 2007 ("the G9 proposal"), drawing on both well-accepted economic theory and practical experience in telecommunications and other network industries.

2 I am the author. My qualifications are attached to the report. In relation to Appendix A to this report Serge Moresi undertook the analysis and produced the Appendix A report under my direction. Serge Moresi's qualifications are attached to this report. All assumptions made in this reports are set out in the report as they relevantly arise.

3 I have made all the inquiries that I believe are desirable and appropriate and I am satisfied that no matters of significance that I regard as relevant have, to my knowledge, been withheld.

4 I attach a letter dated 3 August 2007 setting out the issues that I was requested to address by Telstra

5 The key elements of the FANOC proposal are that:

- In areas where FANOC is granted a licence to be the FTTN-based high speed network operator, it will provide wholesale network services using both hybrid-fibre assets and Telstra's copper wire. This upstream company will not be permitted to compete at the retail layer.

- Further, the undertaking requires that, in these areas, all of the Telstra-owned copper lines in a given 'node' (regardless of the retail provider) be migrated onto the upstream fibre network. Telstra will be, in effect, reduced to: (a) being a 'sub-loop' company providing inputs to FANOC; and (b) an access seeker for the purpose of providing services to its customers on the sub-loops. In short, it will cease to be fully vertically integrated.

- The ongoing capital and operational expenditure of FANOC will be reviewed by a management company (the BAS Manager or 'Speedreach') controlled by access seekers. In the event of a dispute with FANOC, Speedreach can refer the matter to the Commission or an independent arbitrator. Speedreach will also have a role in determining the non-price terms of access for each product offered by FANOC.

- The investments made by FANOC will be protected by a legislative regime preventing network overbuild for an as yet undetermined 'limited time' (5 years is suggested).

6 These features of the undertaking amount to vertical separation of the telecommunications network into two basic wholesale layers (network provision through FANOC and Telstra's copper, and network management through Speedreach), and retailing (through the individual carriers). Some carriers will own a share of FANOC, and all carriers with ongoing operations will have voting rights in Speedreach. A wholesaling voice layer could also emerge, since FANOC will not be providing wholesale voice services other than Basic Telephone Access.

7 The economic literature indicates that vertical separation can be inefficient. This is borne out by practical experience in the telecommunications, energy and transport industries. Particularly important in this respect are the inefficiencies that arise out of "vertical externalities": that is, situations where each firm in a vertical chain takes decisions which, viewed separately, are profit-maximising, but which are collectively suboptimal for the vertical chain because they do not take account of the interdependencies between the vertical layers.

8 This report covers, in detail, four of the most relevant contexts in which vertical externalities can arise:

- In pricing, 'double marginalisation' can occur where non-integrated vertically-related firms each set a mark-up over marginal cost, resulting in an aggregate mark-up that exceeds the mark-up of a profit-maximising vertically integrated firm.

- The incentives to improve product quality and innovate may be reduced in a vertically dis-integrated structure relative to an integrated one. An important reason for this is that without vertical integration, a substantial part of the benefits of investments by the upstream provider to promote higher quality in the upstream provider's products will not be captured by the provider (given they have to be shared with downstream rivals in the form of higher demand for the products). (The reverse is also possible. That is, a downstream provider's incentives to fund network development for a new service would be inefficiently undermined if it would bear the costs of a failed product launch, while sharing the benefits of a successful launch with copying downstream suppliers.) Such incentives are critical in the present case, as it makes it all the more unlikely FANOC will rollout an FTTN that could facilitate entirely new, and in some cases, presently unimagined, services.

- The incentives to invest more broadly can be impeded by 'hold-up' effects as investments which require coordination between upstream and downstream firms are delayed and undermined by strategic bargaining between the parties. Here too, the greater the extent to which the benefits of investments in one layer flow to others, the more severe will be the misalignment in investment incentives.

- Finally, the scope for an industry to adapt to rapid change is compromised by vertical separation where close coordination between network, service and application levels is required for adjustment to occur. These difficulties are aggravated where decision-making structures make adjustment conditional on costly bargaining processes.

9 There is good reason to believe that telecommunications is even more subject to these externalities than are other infrastructure industries. There is substantial interdependence between network layers in terms of efficient design, investment and ongoing operation. Optimising those interdependencies requires specialised investment in each layer and coordination of the timing of that investment. Moreover, the boundaries between vertical layers in telecommunications are dynamic, shifting over time as technological change alters the optimal location of network functionalities. There is a contrast here to the conventional public utilities, where frontiers between vertical layers are relatively clear (i.e. rail to port, generation to transmission) and have been stable over periods of decades.

10 The extent of the vertical externalities that characterise telecommunications makes it all the more important to ensure that in any assessment of the G9 proposal, the coordination difficulties vertical separation can lead to have been fully taken into account.

11 In practice, the G9 proposal offers few safeguards, if any, against distortions arising from vertical externalities, and is therefore likely to suffer from the inefficiencies highlighted above.

12 Relevantly, FANOC will face weak incentives for cost reduction and service improvement relative to an integrated firm. This is because an integrated firm such as Telstra will have stronger incentives for cost reduction and for quality enhancement than would the G9, as cost reduction and quality enhancement would yield incremental profits for that integrated entity in both the upstream and downstream markets. More specifically, the G9 structure means that:

- Telstra would have weaker incentives to maintain and upgrade its copper assets, as its ability to do so would be compromised by the G9 architecture, while its return on those assets would be effectively eroded by their dependence on the FANOC assets and the Speedreach's decisions.

- Downstream firms would face prices based essentially on averaged costs and in taking their pricing and output decisions would not take account of incremental profits accruing upstream. This in itself will distort pricing and output decisions downstream.

- Those distortions are worsened by the fact that the Undertaking imposes a revenue cap (rather than a price cap), on FANOC: it constrains in the Second and Third Periods the aggregate revenue FANOC can earn to recover costs. It is well known that such revenue caps reduce the incentives for efficient operation and pricing.

- FANOC's only incentive to reduce costs is the transient benefit offered by the lags between the periodic resets of the revenue cap. Information asymmetry means that Speedreach will not have adequate knowledge of those costs to reduce them in an efficient way. Moreover, individual members of Speedreach will have less incentive than would a vertically integrated entity to apply pressure on those costs, as the benefits of cost reductions will be delayed in their effects (by the lag between resets) and in any event, common to all access seekers.

- FANOC has few incentives, if any, to improve service quality: as it offers only weak commitments in terms of service quality, it could increase its profits under the revenue cap by "skimping" on the quality it provides.

13 These incentive problems are compounded by the management of network assets by the Speedreach committee. While the Undertaking does not discuss this issue, it is apparent that decision-making in Speedreach will be inefficient in one of two ways:

- If participants are able to make 'side payments' to each other (so that they can attain the outcome that is profit-maximising for the participants as a group), then Speedreach will operate as a cartel, with all the inefficiencies that entails.

- Alternatively, if participants are prohibited from making such payments, then there is simply no reason for expecting the committee structure to lead to efficient decisions. Rather, decisions would be taken in the interest of the pivotal voter, who is unlikely to have interests that are aligned with those of consumers overall in terms of service quality, costs and network upgrading.

14 In addition, the management structure is, in any case, complicated and indeed opaque and consequently is likely to make timely and efficient decision making impossible. It involves at least three layers (FANOC, Speedreach, members of which can also be part of FANOC, and an independent arbitrator) and has a complex and indeed confusing assignment of powers and of voting rights.

15 The vertically separated structure not only fails to deliver investment incentives, but also offers no additional benefit to downstream competition. In this regard, the G9's key claim is that vertical separation will mean that FANOC will have no incentive to discriminate as between downstream rivals in an anticompetitive manner. This claim is inconsistent with the findings of the Australian Competition Tribunal, which has found that the mere fact of vertical separation does not preclude conduct that is so discriminatory as to materially affect downstream competition[1]. Moreover, despite NERA's claims to the contrary, the Undertaking does make provision for differential terms of access as between different access seekers. In this regard, the G9 Undertaking gives FANOC the scope to price discriminate without also being subject to existing legal and regulatory safeguards.

16 The concerns expressed in this report about the efficiency of the G9 Undertaking are supported by a review of the international experience with vertical separation in telecommunications markets. In the two major jurisdictions where vertical separation has been implemented, the evidence indicates that it has produced poor market outcomes:

1 See *Virgin Blue Airlines Pty Limited* [2005] ACompT 5.

- in the UK, the incumbent is functionally separated into wholesale and retail businesses. Over the past 22 months, considerable costs have been incurred in implementing the operational separation model and initial indications are that benefits to date have been small, and investment incentives have been compromised as a result of separation;

- In the US, the incumbent was broken into seven local operating companies and also forced to separate its operations vertically. The break-up of the Bell system reduced the relative efficiency of the industry, functional/structural separation proved to be very difficult for regulators to implement in practice, and the industry is now embarked on a path, sanctioned by legislation and regulation, of re-consolidation to regain scale and scope efficiencies.

17 Likewise, vertical separation in other infrastructure industries – particularly those which require close coordination between different vertical layers – has proved to be a problematic and costly exercise notwithstanding the fact that the boundaries between vertical layers in these industries are more stable, facilitating an easier 'carve-up'. For example:

- The difficulties involved in coordinating the supply, transport and export of coal from Dalrymple Bay in Queensland have been highly publicised. Two years after a regulatory ruling that was supposed to provide investment certainty there is an inability to export all coal demanded through the port. Similar outcomes have been experienced at Port Waratah, where bottlenecks arising from failures in vertical coordination have led to persistent capacity constraints. There is a stark contrast between outcomes at these, vertically separated, facilities and outcomes in the vertically integrated mine/rail/port systems in the Pilbara, where investment and capacity expansion have proceeded smoothly and efficiently;

- The structural separation of British Railways led to chronic maintenance problems and underinvestment in the track network, culminating in rail accidents at Southall, Ladbroke Grove and Hatfield rail crashes. The track operator, Railtrack, entered administration in 2001 and is now run as a not-for-profit;

- Disputes between airlines and the now privatised airports over the price paid by the airlines for airport upgrades, under a scheme not dissimilar to that proposed by the G9, led to the scrapping of the regulatory regime. Even this has not yet ended investment delays.

18 In the body of this report, I set out numerous other examples of vertical inefficiencies causing significant detriment to investment outcomes. In the telecommunications market, given its complexity, these costs are likely to be greater than in other utilities sectors.

19 The impediments the G9 structure would create to efficient investment are of particular concern. In effect, the G9 commit to no more, by way of service quality and range than is currently available – indeed, I understand that there are a range of current services that the network proposed by the G9 would not support. But while the G9 commit to little, they would, were their proposal to proceed, have an effective monopoly on upgrading the network to genuinely high speed services. As a result, the ability of end-users to access those services would depend on whether the G9 structure is capable of delivering upgrading investment in a manner that is timely and efficient. Both economic theory and extensive practical experience suggest it would not.

2. THE G9 FTTN PROPOSAL

20 This section briefly outlines the background to this report by describing some of the key aspects of FANOC's Special Access Undertaking of 30 May 2007 ("the G9 proposal"). It considers in turn:

- The key characteristics of the proposed network, and how these relate to amendments to Part XIC of the TPA sought by FANOC;
- The proposed separation of FANOC and the key roles of the BAS Manager/SpeedReach; and
- The proposed pricing principles for the broadband services provided by the combination of Telstra and FANOC infrastructure.

21 These arrangements imply the structural separation of access services with retail and wholesale access services, in combination with the separation of decision-making processes in respect of local network access investment. However, as set out in the following sections of this report, these arrangements are likely to create substantial productive and dynamic inefficiencies.

2.1. KEY NETWORK CHARACTERISTICS

22 FANOC is proposing to build a hybrid fibre twisted pair (HFTP) network ('the network'). The HFTP network is defined as one which 'supplies carriage services over a hybrid fibre twisted pair network using a copper (or aluminium) wire from an end-user to a node co-located with the copper access pillar and the use of fibre optic cable between the node and the point of interconnection'.[2] Thus the network encompasses everything on the customer side of the POI (including the copper sub-loop).

23 Under the current legislative framework, Telstra is not required to provide access to the copper wire from the customer premises to the node. Hence, FANOC is seeking two key amendments to Part XIC of the TPA:

1. The creation of an access regime **allowing for pillar migration**; and

2 'Statutory amendments to facilitate competitive proposals for the construction of an Australian next generation broadband network', *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p. 16. The FANOC proposal is, despite the use of the phrase "competing HFTP network", for a geographic monopoly protected by the regulatory regime.

2. The creation of a regime **preventing HFTP network overbuild** for a 'limited period' (5 years is suggested).

24 FANOC describes pillar migration thus:

> *…for a competing HFTP network to proceed the Telstra pillar would need to be connected to the competitor's node, such that all of the ULL lines from that particular pillar would be connected across to the competitor's node at one time.*[3]

25 It is argued that pillar migration is simply a natural extension of the existing access regime for ULLS except that in the case of the HFTP network, migration needs to be on a node by node basis. That is, all customers served by a node are migrated at the same time, rather than migration occurring on an individual customer basis as it does for ULLS.

26 FANOC also indicates that a competing fibre to the node network would not be possible:

> *In an HFTP Network environment, the most efficient way to configure the nodes and pillars is to take all of the copper wires currently coming into the pillar on the exchange side, and connect them to a single node located near that pillar… Under this network structure it is not technically or economically feasible for competitors to build a separate node and fibre connection back to the exchange and interconnect at the pillar.*[4]

27 FANOC indicates that the initial HFTP network would cover approximately 4 million homes in 5 capital cities at a cost of around $3.6 billion. Initially it would be capable of ADSL2+ speeds of *up to* 24Mbps but could be upgraded to have VDSL capabilities (*up to* 50Mbps) if there is sufficient demand. The initial services contemplated by FANOC's undertaking are:

- A basic telephone access service; and
- Standard broadband services offering speeds of 1.5Mbps and up to 6Mbps, 12Mbps and 24Mbps.

3 *Ibid*, p. 3.

4 *FANOC Pty Ltd, Special Access Undertaking to the Australian Competition and Consumer Commission Under Division 5 of Part XIC of The Trade Practices Act 1974 (Cth) in respect of the Broadband Access Service*, 30 May 2007, p. 3, Clauses 2.1-2.2.

28 However, the actual service levels FANOC commits to are well below these capabilities (amounting to transport at 1.5 Mbit/s), and even these commitments appear to be on a "best efforts" basis. Moreover, FANOC does not discuss whether or how it would support a wide range of services that are provided in the current network (such as Frame Relay and special services), which would be compromised were its network architecture implemented. Overall, FANOC does not commit to service levels that exceed those currently widely available, and – because it could not support the current service range – effectively proposes to reduce the range of services available.

2.2. SEPARATION OF FANOC AND THE BAS MANAGER/SPEEDREACH

29 FANOC has developed a number of 'Management Principles', which it believes will provide the right incentives for delivery of high quality and cost effective access services. The fundamental assumption underpinning these principles is that operational decisions (such as budgeting for capital expenditure and determining product offerings) and the day-to-day running of the network are vested in separate entities. FANOC's wholesale customers will own a separate entity known as the Broadband Access Service (BAS) Manager or 'SpeedReach'. SpeedReach will play a central role in making operational decisions, while day-to-day operations will be carried out by FANOC. The functions of FANOC and SpeedReach are discussed in more detail below, but in essence the role of SpeedReach is to oversee FANOC's major operational decisions.

30 FANOC's key Management Principles include the following:[5]

- FANOC will only serve wholesale customers, and will not provide any retail telecommunications services;
- No carrier (or group of carriers acting in concert) can be in a position to control FANOC prices;
- FANOC may not discriminate against an access seeker on the basis of whether the access seeker is an investor in FANOC;
- No carrier (or a group of carriers that have an incentive to favour FANOC) may control SpeedReach;
- Any of FANOC's wholesale customers (including Telstra) can be members of SpeedReach, with voting rights measured against the volume of services acquired, but capped at a maximum percentage; and

5 *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p. 4.

- FANOC and SpeedReach will enter into a Management Agreement under which SpeedReach is allocated key operational functions in respect of the FTTN Network.

2.2.1. FANOC

31 In its Special Access Undertaking (SAU), FANOC says little about its current ownership structure except that:[6]

> *The shareholders and board of FANOC will be re-constituted at the financing phase of the project when a range of third party debt and equity investors are expected to invest in the Network as a stand alone financial investment.*

32 In relation to its management structure, FANOC states that it will not be controlled by any one access seeker, nor by any group of access seekers if they are able to control the determination of material terms for BAS products.[7]

2.2.2. The BAS Manager (SpeedReach)

33 FANOC intends to appoint a separate management company, known as the BAS Manager or SpeedReach, with responsibility for the operational management of the Network and to represent the interests of access seekers (to the extent that they do not coincide with the interests of FANOC). According to FANOC, the primary purpose of the BAS Manager is:[8]

- To facilitate a degree of separation between the funding and ownership of the HFTP Network and its day to day operations; and
- To provide access seekers with a degree of oversight of the costs incurred by the access provider.

6 *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p. 3.

7 *FANOC Pty Ltd, Special Access Undertaking to the Australian Competition and Consumer Commission Under Division 5 of Part XIC of The Trade Practices Act 1974 (Cth) in respect of the Broadband Access Service*, 30 May 2007, Clause 4.1.

8 *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p.18.

34 The BAS Manager will have two key roles:

- **Determination of BAS products:**[9] The BAS Manager will develop the non-price terms of access for each BAS Product and confer with FANOC in relation to the technical characteristics and parameters of all products. Before introducing withdrawing or varying a BAS product, FANOC must consult with the BAS Manager and notify access seekers. FANOC will request that the BAS Manager develops, in consultation with FANOC and access seekers, proposed reference non-price terms. FANOC states that it will not withhold approval for non-price terms if, in FANOC's 'reasonable opinion' it is commercially prudent, required expenditure is approved and it would not adversely affect the technical/operational quality of the network and BAS products or the interests of access seekers in using BAS products.

- **Approving the budget and deployment:**[10] FANOC must prepare and submit to the BAS Manager initial budgets, budget updates and significant budget increases (increases of more than 5 per cent in the first period and more than 7.5 per cent in subsequent periods). The BAS Manager may notify FANOC if it considers, in good faith, any expenditure or deployment in the budget (or increase) not to be 'commercially prudent' (making it a 'reviewable component').[11] If, after a period of 15 days, FANOC and the BAS Manager are unable to agree on the reviewable component, the issue may be submitted to the ACCC or an Independent Reviewer for determination – this determination is final and binding on FANOC.[12]

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9 *FANOC Pty Ltd, Special Access Undertaking to the Australian Competition and Consumer Commission Under Division 5 of Part XIC of The Trade Practices Act 1974 (Cth) in respect of the Broadband Access Service*, 30 May 2007, Clauses 6.3, 6.5, 6.6.

10 *FANOC Pty Ltd, Special Access Undertaking to the Australian Competition and Consumer Commission Under Division 5 of Part XIC of The Trade Practices Act 1974 (Cth) in respect of the Broadband Access Service*, 30 May 2007, Clause 5.

11 Commercial prudence is defined by FANOC to mean that an activity would be undertaken by a prudent Telecommunications Network owner (Clause 5.2 (d):

(i) acting in a cost effective manner consistent with good industry practice; and

(ii) having regard to existing and forecast demand and capacity and the ability to maintain technical and operational quality of services.

12 Independent Reviewers cannot be employees, material shareholders, professional advisors, material suppliers or material customers of FANOC or the BAS Manager. FANOC may propose an Independent Reviewer and the ACCC may object to the proposal if they believe the person does not meet the criteria to be an Independent Reviewer.

2.3. PRICING

35 Pricing for broadband services is made up of two components:[13]

- A Pass Through Component, which passes on Telstra's charges for the sub-loop at cost; and
- A FANOC Component which represents charges for new infrastructure built by FANOC.

36 The pricing model for the FANOC Component will have two key inputs:

- Calculated costs, which include a return on capital (at the regulated WACC), a return of capital (depreciation), as well as operating and capital expenditures; and
- Demand forecasts.

13 *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p. 5.

37 Prices will be set so that FANOC's Target Revenue (which is based on its calculated costs) is met assuming that demand forecasts are realised.[14] The exception to this rule is in the first three-year period, when FANOC cannot make reliable demand forecasts. For this period, prices have been set based on long term forecasts of expenditures and demand. These are shown in Table 1 below. FANOC may also seek permission from the Commission to vary its prices in the case of unanticipated events, or to exclude from the price control arrangements products for which, for example, demand is difficult to forecast.[15]

Table 1: Prices for certain basic access products in the first period

Service	***Pass Through Component ($/month)***	***FANOC Component ($/month)***		***Total ($/month)***
	Sub-loop	*Basic service charge*	*Broadband component*	
Basic telephone	5-15	10	-	15-25
Standard broadband (1.5Mbps)	5-15	10	4.23	19-29
Standard broadband (6Mbps)	5-15	10	8.46	23-33
Standard broadband (12Mbps)	5-15	10	16.92	32-42
Standard broadband (24Mbps)	5-15	10	25.38	40-50

Source: FANOC Special Access Undertaking, Submission to the ACCC, 30 May 2007, p.6.

2.4. CONCLUSIONS

38 The structure and organisational arrangements proposed for FANOC by the G9 requires three fundamental changes to the current structure and operations of the Australian telecommunications industry:

- Telstra becoming a "subloop" company, which supplies FANOC with the necessary input (most notably copper loops from the FANOC node to the end customer) for the provision of local access;

14 This formula is only applied to broadband prices. Since they are subject to social obligations, prices for the basic telephone services will only be subject to CPI increases.

15 *FANOC Special Access Undertaking, Submission to the Australian Competition and Consumer Commission*, 30 May 2007, p. 16.

- The introduction of structural separation of local access services from the provision of downstream services, with the local access services supplied by a joint venture of the G9 and outside investors; and

- The introduction of vertically separated decision making processes at the local access level, which will result in decisions on investment by FANOC being made to a large extent by access seekers.

39 These changes make it important to examine how vertical separation is likely to affect efficiency, both with respect to current operations and with respect to future investment. This issue is of crucial significance to the assessment of the proposed SAU for two reasons.

40 First, it is a central feature of the G9's proposed pricing mechanism that it essentially "flows through" expected and ultimately actual cost increases. (Costs are only adjusted to an actual cost basis with a lag). As a result, to the extent to which there are cost inefficiencies, those inefficiencies, if anticipated, will be directly charged to end-users; if unanticipated, they will flow through with a lag.

41 Second, the proposed SAU only commits to service quality levels for DSL service that are not superior to those currently available. If, however, end-users are to be assured genuinely high speed fixed network access (such as access at 20 or more megabits per second), then the HFTP network would need to be upgraded to VDSL. This would require large-scale additional investment, as the nodes in the network would need to be moved substantially closer to end-user premises. For that to occur, significant changes would need to be made, presumably in a closely coordinated way, in the Telstra copper pair network, the FANOC traffic concentration, management and transmission assets and in the networks of access seekers. The extent to which a vertically separated structure can ensure that such substantial investment is made in a timely and efficient manner is therefore also a matter of crucial concern.

42 This report examines these issues from two perspectives.

43 First, it reviews the economics of vertical integration, highlighting the features of the situations in which economic analysis suggests vertical integration is likely to facilitate efficient investment and operation – and in which, by inference, vertical separation is likely to impose significant costs.

44 Given that analytical discussion, the report then takes a second perspective on the impacts of vertical separation by examining those cases where it has been implemented. Those case studies, drawn both from Australia and from overseas, come partly from telecommunications and partly from other industries (including energy, rail, ports and airports).

3. EFFICIENCY OF THE G9 APPROACH – ANALYTICAL PERSPECTIVES

45 NERA claims that the introduction of structural separation and decision-making through the SpeedReach vehicle will result in a range of benefits:[16]

> *1. FANOC will have no incentive to engage in price or non-price sabotage against particular Access Seekers (as no single Access Seeker, or group of Access Seekers, will control FANOC);*
>
> *2. FANOC will have to engage in efficient pricing at the wholesale level rather than at the retail level (as FANOC will not have any retail operations). This ensures that all Access Seekers face the same true economic wholesale prices;*
>
> *3. FANOC will be required to provide all Access Seekers with equal access to information important to their planning processes;*
>
> *4. FANOC will be able to engage in a HFTP specific capital raising - allowing the true cost of capital for the HFTP to be transparently revealed in financial markets;*
>
> *5. All Access Seekers' are able to have input into FANOC's budget priorities through the SpeedReach vehicle - rather than those priorities being determined primarily to suit the vertically integrated arm of the infrastructure owner. This includes ensuring that the build of the HFTP makes the maximum use of existing infrastructure owned by all Access Seekers.*

46 The efficiency benefits claimed by NERA rely on the dual features of structural separation and the decision-making arrangements vested in the BAS Manager/SpeedReach. In considering these claims, I proceed as follows:

- I begin by summarising some key findings of the economic literature on vertical integration; that literature suggests that vertical integration is likely to be efficient when markets have specific characteristics – those characteristics being of considerable relevance both to telecommunications and to other network industries.
- I then examine specific claims that NERA makes as to the efficiency of the proposed G9 structure, again from the perspective of first principles.

16 NERA, *Economic Properties of the FANOC SAU*, 30 May 2007, p. 19. Claims 1, 2 and 5 are also directly addressed in the accompanying Technical Report, at pages 30-34.

3.1. VERTICAL INTEGRATION AND EFFICIENCY

47 There are many respects in which integrating activities within a single firm is costly. For instance, vertical integration increases the organisational burden placed on the firm, and may undermine its ability to adequately motivate and reward employees. As this happens, the incentives employees have to perform their duties or the incentives to undertake certain types of investment may be weakened, reducing the firm's overall performance. However, while these costs exist, vertical integration is common in many parts of the economy (indeed, all firms are instances of at least some vertical integration), and has been virtually universal in many infrastructure industries (unless precluded by regulation), raising the question of why this occurs.

48 The simple-minded answer to this question is to say that vertical integration reflects the search for market power. However, it is clear that this answer is inadequate, as many instances of extensive integration occur in highly competitive markets. Rather than market power, economic theory identifies the "transactions costs" of organising economic activity between independent firms or agents as central to the advantages of firm integration.[17] These are the costs of finding and qualifying trading partners, establishing specifications and prices, negotiating and drafting contracts, and of enforcing such contracts.[18] In short, in the presence of transactions costs, firms integrate when managing complex transactions within the firm is a less costly way of doing business than undertaking transactions at arm's length in the market place.

49 The economic literature identifies a range of circumstances when transactions costs may be sufficiently material to make integration an efficient organisational structure. Such costs arise in the context of market "imperfections".

50 Particularly important in this respect are the inefficiencies that arise out of "vertical externalities": that is, situations where each firm in a vertically separated, but functionally interdependent, chain would take decisions which, viewed separately, are profit-maximising, but which are collectively suboptimal for the vertical chain because they do not take account of the interdependencies between the firms. These "vertical externalities" can arise in at least four contexts:

- Pricing;
- Service quality;

17 Coase, R. 1937, 'The Nature of the Firm', *Econometrica,* 4, p. 386.

18 Roberts, J. 2004, *The Modern Firm : Organizational Design for Performance and Growth*, Oxford University Press, p. 90.

- Investment;
- On-going adaptation to change.

51 I consider each of these in turn.

Vertical externalities in pricing

52 In understanding the "vertical externalities" that can arise in pricing, it is important to start by noting that typically[19], each non-integrated firm within a vertical chain of production has at least *some* influence on the market price for its product. In other words, each firm faces an individual demand curve that is downward sloping, which implies that setting a lower price for the product will increase sales or that increasing production will decrease the price its customers will be willing to pay.

53 Where non-integrated vertically-related firms individually face downward sloping demand curves, an inefficiency referred to as "double marginalisation" can arise. The inefficiency arises because profit maximisation will lead each of the vertically related firms to impose a mark-up over its own marginal costs. As the marking-up cascades through the vertical chain, the resulting aggregate mark-up will exceed that which would be profit maximising for the upstream supplier and indeed for the firms taken as a whole. For example, when an upstream monopolist is dealing with two downstream firms that each themselves face downward sloping demand curves, the downstream price will typically exceed the price that an integrated monopolist would charge, because it includes the mark-ups both of the upstream monopolist and of the downstream competitors.[20]

54 Double marginalisation can at times be avoided in whole or in part. For example, the upstream supplier may be able to use non-linear prices, in which the combination of a fixed fee and a variable charge induces the downstream firm to set the final price at the efficient level. Alternatively, contractual arrangements between the upstream supplier and its downstream users (such as an agreement on maximum resale prices) may better align incentives in the vertical chain than would be the case if the firms acted wholly independently.

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19 The only situation where this does not occur is where a firm's production has no impact on the market price. In this case the market for the product that the firm produces would be perfectly competitive and the firm would charge a price equal to its marginal costs. The conditions under which perfect competition prevails are extremely restrictive, and it is widely accepted that perfect competition is not a sensible benchmark for the assessment of 'real world' markets.

20 The double-marginalisation problem is illustrated, for example, in Tirole, J. 1988, *The Theory of Industrial Organization*, MIT Press, pp. 174-175.

55 However, these options often encounter substantial practical problems. For example, to be fully effective in preventing double marginalisation, non-linear prices for the upstream input need to be set on the basis of a more detailed knowledge of cost and demand conditions downstream than is likely to be available to a vertically separated upstream firm. Additionally, if the upstream input can be resold, then the non-linear prices may come unstuck (or have their efficiency compromised), as the fixed fee can only be collected once. Similar difficulties also affect the attempt to overcome double marginalisation through contractual arrangements.[21] That being said, the G9 proposal involves no such restrictions on double marginalisation, which (as discussed below) affects its efficiency.

56 In contrast, vertical integration will allow the inefficiencies associated with "vertical externalities", including double marginalisation, to be overcome or substantially reduced. As regards double marginalisation, for example, the vertically integrated firm, in maximising its profits, will set the internal input price at marginal cost (though in determining that marginal cost, it will take account of any contribution margins it might obtain on the sale of the input to downstream competitors). This both avoids the 'double mark-up' problem and removes distortions to the choice of input mix. As a result, the integrated firm will be more efficient than its un-integrated rivals.

57 That enhanced efficiency is pro-competitive. To begin with, as the integrated firm has lower costs, including lower short and long run marginal costs (because it avoids the mark-up on the input and chooses input proportions efficiently), it will have a unilateral incentive to expand output, which translates into greater competitive pressure in the market as a whole.[22] Additionally, the difference in the cost structure and level of the integrated firm, compared to non-integrated rivals, can undermine any tacit coordination between firms in the market, and hence make concerted conduct less likely and less durable.

Vertical externalities in product quality

58 A second type of "vertical externality" arises from interdependencies in product quality and promotion between the vertical layers.

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21 For a discussion of the competitive effects of vertical contracts see, for example, Motta, M. 2004, *Competition Policy: Theory and Practice*, Cambridge University Press, chapter 6 or Tirole, J. 1988, *The Theory of Industrial Organization*, MIT Press, chapter 4.

22 It is sometimes said that a firm that has unilateral market power will lack the incentive to pass-through a cost reduction. This is incorrect; a profit-maximising firm facing a downward sloping demand curve has an incentive to pass-through a significant proportion of any cost reductions (see, for example, Yde, P. and M. Vita, 2006, 'Merger Efficiencies : The "Passing on" Fallacy', *Antitrust*, 30(3), pp. 59-65, at p. 59).

59 Efforts that a downstream firm undertakes to promote the upstream product (such as facilitating investment in the upstream product with the effect of reducing capacity constraints and improving end-to-end service levels) may “spill-over” to the benefit of other downstream competitors. As well as directly advantaging rivals, the increased demand for the downstream product would increase total sales incorporating the input provided by the upstream supplier. The higher demand would, in turn, allow the upstream supplier to increase the price that it charges for the input, thereby appropriating for itself the benefits of the promotional effort. Hence, due to this spill-over effect, a non-integrated downstream firm is unlikely to capture the full benefits of its effort and therefore may have sub-optimal incentives to engage in these efforts.

60 This is of particular concern with respect to the proposed G9 network. In the proposed undertaking, FANOC make only very modest commitments with respect to the range and quality of services their network would support; and substantial upgrading would be needed for that network to provide significantly higher speeds and greater functionalities than are currently available. However, whether that upgrading would be made obviously depends on whether retail services would be supplied which would make use of that higher speed and greater functionality. However, development and rollout of such retail services is highly risky and for some types of services, requires close cooperation with the underlying network provider. This raises exactly the problems just outlined.

61 In particular, it is difficult for a downstream provider to take the risks of investing in building a market without adequate assurance that the network owner will supply the relevant infrastructure. Yet equally, the network owner, and indeed other downstream operators, would also wish to be insured against failure of the proposed new services. At this point, the circle closes. If the downstream innovator were to provide such a guarantee, then it effectively bears the risks, without claiming the full benefits, of its innovations. Once the investments are made and the market is proven, and indeed developed (benefits that cannot be isolated to the innovator), the network provider has strong incentives to increase network use by selling similar services to other downstream firms. At the same time, those downstream firms have strong incentives to enter the new market.

62 Moreover, it is difficult to write contracts that avoid this problem, since the incentives of the innovator’s downstream rivals are to free ride. They can claim they do not think the proposed services would be profitable. If they are not, they will have lost nothing (and perhaps increased their capacity to call for network developments that suit their own business plans). If, however, the innovation turns out to be profitable, the downstream firm can profitably enter that market, developed at great risk by the innovating rival. The G9 structure, in which the BAS Manager – that is, a committee of access seekers – must approve the development of new services, makes it all the more difficult for any individual access seeker to gain an advantage by taking the risks of network and service innovation. Faced with the “chicken and egg” problem outlined above, the risk (discussed further below) is that of paralysis.

63 These spill-over issues may also arise with respect to efforts to improve service quality by the upstream entity. If the upstream entity cannot fully capture the benefits of those efforts, say because it cannot implement fully efficient non-linear pricing, then it will invest less in those efforts than would be desirable.

64 Similarly to internalising some of the externalities of pricing decisions within the vertical chain, vertical integration would address the problem by 'internalising' in the integrated entity the costs and benefits of promotional investments that either of the parties undertakes. This too will be pro-competitive, as it provides incentives for the merged entity to expand its output, benefiting consumers and competition.

Vertical externalities in investment

65 Similar "vertical externality" issues can arise for any effort or investment the benefit of which, absent integration, cannot be fully appropriated by the party that bears its costs. An oft-cited example of this occurs where investments returns are susceptible to opportunistic behaviour.

66 Many vertical production relationships require at least one party to make investments that are relationship-specific in the sense that their value is reduced outside a particular vertical relationship. For example, the owner of an electricity generator serving an isolated mine has incurred a relationship-specific investment when the electricity generation plant has no other existing and potential customers. In a telecommunications context, relationship-specific investments arise from the need to coordinate interdependencies between networks and services, as when enabling high speed service requires complementary sunk investments in the various parts of the network, the services layer and the development and promotion of applications.

67 Once an investor incurs an investment that is tailored to the needs of another party, then that other party may have an incentive to behave opportunistically based on the fact that the investor has limited possibilities to utilise the investment for alternative purposes. The problem this creates is often referred to as "hold-up". Predicting opportunistic behaviour, the potential investor would be likely to invest to a lesser extent than would be optimal from the point of view of maximising the overall gains from a the vertical relationship, or invest in assets that are less efficient, but also less specific and therefore less susceptible to hold-up.[23]

23 The underinvestment effect of hold-up is set out, for example, in Tirole, J, 1988, *The Theory of Industrial Organization*, MIT Press, p. 25.

68 In principle, contracts between the parties could prevent them from expropriating each other's investment returns. However, in most situations it is not possible to foresee or specify all potentially relevant contingencies at reasonable costs in a contract (or provide for the low cost determination of which potentially relevant contingency has eventuated), so that such contractual means are often an incomplete remedy to the hold-up problem.

69 In this instance, vertical integration between the party that would potentially invest in relationship-specific assets on the one hand, and the party that the investment is tailored to on the other, would 'internalise' the gains from the investment and remove the incentive for opportunism between the parties. By stimulating efficient investment, this would reduce the entity's costs, including potentially its long run and short run marginal costs, providing it with incentives to expand output and thus increasing competitive pressures in the market.

Vertical externalities in adaptation to change

70 A fourth and final factor that can make for efficient integration is the need for "adaptive, sequential decision-making" where uncertainty associated with changing circumstances is resolved over time.[24] When future events are uncertain and two separate firms must cooperate and adapt to changing circumstances in a close trading relationship, it may again be difficult or impossible to completely specify the terms of the trade before future (uncertain) outcomes have materialised. Even if it were possible to write such a contract, any arrangement that is eventually reached may be too inflexible. This loss in flexibility can be overcome by vertical integration because a single firm could adapt the relationship between the two parties to reflect new information as it is observed.

71 More specifically, where close and ongoing coordination between processes is required, in an environment that is subject to dynamic change, it may simply be too costly to secure that coordination through continuing bargaining between separate entities, each pursuing its own interests. Such bargaining may be too slow to allow the requisite timeliness of action; additionally, it may be prone to frictions that prevent good decisions from being taken, and even to bargaining breakdowns that undermine the viability of the integrated process. By bringing these processes within the administrative structure of the firm, these costs and risks can be reduced or even avoided.

24 Williamson, Oliver E., 1975, *Markets and Hierarchies, Analysis and Antitrust Implications*, The Free Press, p. 20ff.

72 The difficulties associated with responding to change in a vertically separated structure are compounded when successful ongoing cooperation requires investment in key assets, for instance rail and port facilities, to be undertaken in a coordinated manner. Complementarities between component processes that determine the overall capability of the system are an important example of such interdependencies. That is, while it may be possible to invest independently in each of the assets that make up the entire process, the overall effect on performance of undertaking investment in a coordinated manner exceeds the sum of the individual effects.[25] Explicit coordination within a firm is then more likely to result in the choice of the value maximising pattern of investment, and highly complementary assets are most efficiently employed under common ownership.[26]

73 As well as arising in the context of strategic decisions such as investment in new assets, the need to efficiently manage complementarities may be of crucial importance to the efficiency with which existing assets can be used. For example, random shocks (such as an unexpected increase in demand for a particular Quality-of-Service within a telecommunications network) may require a balancing response in many parts of the system. If the key assets involved are under common, end-to-end, ownership and control, these adaptations can be made without potentially costly negotiations with third parties. As a result, it is common to observe interdependent processes that require such ongoing adaptation or balancing being integrated within a single firm.

Conclusions

74 Overall, there are a range of circumstances in which a vertically integrated structure is likely to yield efficiency gains relative to one based on vertical separation. The central issue in this respect is whether there are interdependences in the vertical chain – in terms of pricing, service quality, investment and ongoing adaptation – that are most readily dealt with within the firm rather than through contracting between separate entities.

75 There are good reasons to believe that telecommunications, even more so than other infrastructure industries, displays such interdependencies.

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25 Roberts, J. 2004, *The Modern Firm: Organizational Design for Performance and Growth*, Oxford University Press, p. 37. As Roberts puts it: "*..When complementarities and non-concavities abound, decentralized local experimentation is not enough. Search and change must be coordinated.*" Roberts, J. at 60. Close integration and ongoing communication within the firm provide the means by which the opportunities and risks associated with complementarities can be effectively managed.

26 See Hart, O. 1997, *Firms, Contracts and Financial Structure*, Oxford University Press, p. 46.

76 Thus, telecommunications networks have high fixed costs and low marginal costs. Moreover, downstream service providers, especially for broadband services, are differentiated in terms of the range and quality of service they provide. Combined, these factors make double marginalisation an issue in price setting;

77 Telecommunications networks and services also have substantial interdependences between vertical layers in terms of efficient design, investment and ongoing operation. Optimising those interdependencies requires specialised investment in each layer and coordination of the timing of that investment. This is especially so within the different components of the network layer (for instance, in terms of jointly optimising the design of transport medium in the local network with the location and features of the network's nodal points), but also applies in a more commercial sense to the interdependence between the development of new network capabilities and the development of applications that make those capabilities attractive to users.

78 Finally, it is worth noting that compared to a number of other infrastructure industries, the boundaries between vertical layers in telecommunications are more dynamic. In electricity, for example, the demarcation points between generation, transmission and distribution are clear and stable; the same applies to natural gas and to rail. However, in telecommunications, technological change sees continuous shifts in the efficient location of functionalities as between the fringe of the network (typically, the customer premise equipment), the core network and overlay or special purpose networks. As a result, one important element in ensuring the efficient design, operation and upgrading of telecommunications networks is the ability to optimise the manner in which, and the location at which, functionalities are provided.

79 Efficient management of these interdependencies is all the more important given the demand and supply uncertainties that bear on contemporary telecommunications. It is uncertain how quickly demand will evolve for very high speed applications, and what types of services (with what required functionalities) will be involved. It is also uncertain how the technology used in the network will evolve, for instance, in terms of its ability to manage continuously time-varying grades of service. As a result, the ability to respond in a timely manner to developments by upgrading or modifying the underlying network will be of key importance to efficiency going forward.

3.2. THE G9'S CLAIMS

80 The G9 in their Submission and NERA's in its Report ignore the issues associated with these vertical interdependencies. They assume that any difficulties associated with vertical interdependence can be managed either by the decision-making process associated with the BAS Manager/Speedreach or by a third party adjudicator; and on that basis state that the G9 structure will display stronger incentives for efficiency and better promote competition than would the relevant counterfactual.

81 Viewed as a matter of economics, these claims are weak. In effect, it can be shown that an integrated structure managed and owned by Telstra – as would occur either in the status quo or in a Telstra FTTN counterfactual – would, on plausible assumptions, have superior efficiency properties to the complex and fragmented arrangements proposed by the G9. Here I consider specifically:

- The incentives for cost reduction and service improvement; and
- The impact on competition in downstream markets.

82 In considering these issues, I also draw on the findings set out in an accompanying Technical Report (appended to this Report), which on the basis of a theoretical analysis compares the incentives for efficiency in two situations:

- The proposed G9 SAU, with its vertically separated ownership and management structures; and
- A potential Telstra FTTN, in which those ownership and management would be vested in an integrated entity.

83 While the relevant issue in the assessment of the SAU is the comparison between the world with that SAU and the status quo (as there is no Telstra FTTN SAU before the Commission), this comparison is relevant for two reasons:

1. From the strictly analytical perspective adopted in the Technical Report, the issue of the efficiency or otherwise of structural separation is not affected by the technological content of the situations being compared; and
2. An important feature of the status quo is that it preserves the option of Telstra developing and implementing an FTTN on a vertically integrated basis, an option which the G9 SAU would effectively extinguish (without itself providing end-users with guaranteed access to any services that are not available in the status quo).

3.2.1. Incentives for cost reduction and service improvement

84 An integrated structure would have stronger incentives for cost reduction and for quality enhancement than would the G9, as cost reduction and quality enhancement would yield incremental profits for that integrated entity in both the upstream and downstream markets.[27] This contrasts with the G9 structure, in which the upstream entity derives only limited benefit from any expansion in the downstream market.

85 As shown formally in the accompanying Technical Report, these effects are merely an instance of the "vertical externality" issues discussed above. More specifically, in the G9 structure:

- Telstra itself would have weaker incentives to maintain and upgrade its copper assets, as its ability to do so would be compromised by the G9 architecture, while its return on those assets would be effectively eroded by their dependence on the FANOC assets and on the decisions taken by the BAS Manager;[28]
- FANOC's returns would be capped overall, and in any event, FANOC would not obtain returns from earnings in the downstream market;
- Downstream firms would face prices based essentially on averaged costs and in taking their pricing and output decisions would not take account of incremental profits accruing upstream. This would result in double marginalisation and in reduced downstream competition.

86 In its Report, NERA suggests that the charging constraints imposed on FANOC would provide the needed incentives for efficiency.

87 It is worth noting, as a preliminary matter, an important error of fact in NERA's Report. More specifically, NERA says that the charging constraint proposed by the G9 amounts to an optimal price cap, of the kind developed by Tirole and Laffont, and that it will consequently provide incentives for an efficient structure of upstream charges.

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27 Of course, under current arrangements, those incentives are at risk of being blunted by inappropriate regulation. However, that is an argument for changing the regulatory arrangements, rather than for accepting the inefficiencies of the G9's approach.

28 The Telstra copper assets would become effectively simply an input into the FANOC network, which would determine service quality as perceived by the user.

88 This claim is factually incorrect. In effect, the proposed charging arrangement is not a price cap but a revenue cap: the cap constrains, in the Second and Third Periods, the aggregate revenue FANOC can earn. It is well-known that such revenue caps do not provide incentives for efficient pricing: indeed, NERA itself has stated this with some force in other contexts. For example, in a recent report for the Ministerial Council on Energy, NERA stated that:

> *Under a revenue cap form of price control, firms have little or no incentive to ensure that their prices are calibrated so as to reflect marginal cost or to avoid distorting customers' usage decisions.*[29]

89 As a result, the form of the charging constraint proposed by the G9 will not address the issues raised above with respect to inefficient pricing.

90 Turning to the impacts of the charging controls on cost efficiency, the proposed revenue cap is reset periodically, and adjusted for agreed expenses. As a result, the arrangement converges to a "cost plus" form of regulation, albeit with a lag (essentially exactly as in the much criticised US telecommunications rate-of-return regulation of decades past). This in itself erodes FANOC's incentive to cut costs.[30] Additionally, as FANOC is not allowed to have any interest in the downstream market, it has no particular incentive to reduce those expenses, other than for the sake of the transient benefit allowed by the cap.

91 This means that the extent of the cost disciplines bearing on FANOC will importantly depend on the degree to which users can credibly monitor and control FANOC's costs. However, it is clear that that ability would be limited by information asymmetry issues, with the extent of those asymmetries being greater, the greater the degree of effective ownership separation between the FANOC assets and the downstream market. Additionally, each individual member of the BAS management committee will have only weak incentives to invest in reducing these upstream costs, for were any individual member to spend time and resources in "getting on top of" those costs, the benefits would be shared among all access seekers.

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29 See http://www.mce.gov.au/assets/documents/mceinternet/NERA_Distribution_Pricing_Rule_Framework20070410090317.pdf

30 Cost plus regulation has two well-known negative efficiency consequences. First and foremost, it reduces the firm's incentives to innovate, whether in cost-reduction, pricing innovations, and product development, including quality variety. If the firm invests in innovation for any of these reasons, it gains the same rate-of-return as it would have if it did nothing. Second, it can, but need not, distort the incentives firms face in favour of overuse of capital and under-use of other inputs (the Averch Johnson effect).

92 This "free rider" problem is aggravated by the fact that the Undertaking caps the voting shares allocated to larger downstream users, reducing the ability of those users to affect outcomes on the committee. Moreover, the SAU does not permit a third party arbiter (say the ACCC) to optimise FANOC's costs once incurred, further eroding the disciplines that bear on cost levels.[31]

93 In contrast, under current vertical integration, Telstra has both upstream and downstream involvement and its downstream prices are regulated under a price cap. This gives it both an increased ability to monitor and control costs and a stronger overall incentive to do so.[32] Indeed, unit costs at Telstra have decreased very significantly over the years.

94 Similar issues arise with respect to service quality. Thus, given separation between the upstream and downstream layers, FANOC will have weaker incentives to set efficient levels of service quality than would an integrated structure (as service quality increases would yield the "vertical externality" effects discussed above). Further distortions to incentives in respect of service quality will arise from the proposed revenue cap – as again has been emphasised by NERA itself in other contexts. For example, in a report for the New South Wales regulator IPART, NERA argued that:

> *Incentive regulation provides a financial incentive for businesses to reduce costs, with any cost savings being initially kept by the businesses and then, over time, passed onto customers in the form of lower prices. If there is no regulation of the quality of service supplied to customers, then such a regime can create inappropriate financial incentives for businesses to reduce costs at the expense of the quality of service provided. (..)* ***Regulation that focuses purely on costs implicitly provides an incentive to reduce the quality of service through lower investment and maintenance expenditure, since this will reduce costs and thereby increase profits.*** *This provides a strong rationale for measures of quality to be explicitly incorporated into the regulation of energy distribution businesses.*[33]

31 This is not to suggest that such optimisation is desirable – it usually is not. However, it is striking that NERA and the G9, which have strongly advocated this form of optimisation in respect of Telstra's assets, propose to exclude it in respect of assets in which they would have an interest and where the case for it seems stronger than it usually is.

32 Again, these incentives can be distorted by inefficient forms of regulation associated with Part XIC – for example, forms of wholesale price setting that deprive Telstra of the benefit of efficiencies obtained from its cost-reducing efforts. However, the efficient solution to those distortions is for changes to occur in the manner in which Part XIC is implemented, rather than for the G9's SAU to be accepted.

33 NERA 2002, *Review of Energy Licensing Regimes in NSW: Minimum Service Standards*, Report for the Independent Pricing and Regulatory Tribunal, January.

95 In its proposed SAU, the service standards FANOC commits to are very low indeed – they do not, for example, include continuity of service for a wide range of services that are currently available. As a result, there are few safeguards in respect of service quality, so that the risk of these perverse incentives leading to inefficiencies must be material.

96 In contrast, under the current arrangements, Telstra's combined presence in vertically-related markets gives it greater control over service quality and an incentive to maintain that service quality, to the extent to which doing so allows Telstra to maximise the combined value of its assets. Moreover, there are extensive regulations bearing on service quality, both at the wholesale and retail layers. It is unclear how those regulations could be implemented (or implemented efficiently) in the vertically separated FANOC structure, where control over service quality would be spread among three distinct sets of asset owners.

97 Additionally, under the current arrangements, Telstra faces competition from access seekers who can use ULLS to provide genuinely differentiated services to those Telstra supplies. Telstra has no ability to prevent those access seekers from providing any service they choose, subject to that service not causing undue interference with other uses of the network. To the extent to which Telstra lags in supplying the quality of service desired by end-users, that competition will provide some degree of discipline.

98 In contrast, under the G9 proposal, the scope for downstream product differentiation would be constrained both by characteristics of the upstream service (where the Quality-of-Service commitments extend only to 1.5 Mbit/s service) and by the fact that the BAS Manager must approve changes to that service. This means that innovative approaches by one access seeker, which would provide it with a competitive advantage over its rivals, could be blocked or "socialised" in the management committee.

99 This highlights the more general problem that what the G9 propose is management of a complex network asset by a committee of its users – users who are then supposed to compete in downstream markets. This raises issues both in terms of competition and in terms of the efficiency with which costs are managed and service quality determined.

100 While neither NERA nor the G9 address this question, there are broadly two possibilities in terms of the operation of the management committee:

- Either participants will be allowed to do "side deals", or where disallowed, will engage in concealed side deals, in which parties "bribe" or are "bribed" through income transfers into agreeing to outcomes; or alternatively,
- Such "side deals" will be prohibited and concealed side deals can be prevented.

101 Now, it is apparent that:

- If such "side deals" are permitted, the BAS manager will maximise profits for the group as a whole. It will, in other words, operate as a cartel, with all the inefficiencies that entails – inefficiencies that are so great that the ACCC has strongly and consistently supported not only a *per se* prohibition on such arrangements, but also criminal penalties for those individuals involved (the issue of the risk of collusion that is inherent in the G9 model is discussed in greater detail below); or alternatively,

- If such "side deals" are not permitted, then there is no reason to expect the committee structure to lead to efficient decisions: rather, decisions would be taken in the interest of the pivotal voter, who is unlikely to have interests that are aligned with those of consumers overall in terms of service quality, costs and network upgrading. This is all the more the case given that voting rights on that committee will be constrained, in ways that tend to "over-weight" relatively small players (who being smaller, "vote" for fewer consumers).

102 The proposed organizational structure is also highly complex, and hence unlikely to lead to a timely and efficient decision making process. It allows for three interacting decision bodies: the FANOC, Speedreach, and the Commission (or an independent reviewer).[34] Of those, membership of FANOC and Speedreach can overlap subject to "cross-ownership" constraints[35] that could require annual changes (due to the complex structure of Speedreach).

103 Voting rights in Speedreach vary from year-to-year, depending on past year market shares. There is also a cap: no two members of Speedreach can have more than 40 percent of the voting rights,[36] a matter FANOC is required to enforce.[37] Yet, quite how FANOC would respond when such enforcement was required is not laid out.

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34 *FANOC Pty Ltd, Special Access Undertaking to the Australian Competition and Consumer Commission Under Division 5 of Part XIC of The Trade Practices Act 1974 (Cth) in respect of the Broadband Access Service*, 30 May 2007, Clause 4.1.

35 *Id*. Some of these constraints are vague, For example, no two members of Speedreach that also are FANOC owners can have a controlling interest in Speedreach if "that is reasonably likely to result in the decisions of [Speedreach] being made in the interests of [FANOC]" (*ibid*, Clause 4.1(e)(ii)).

36 *Id*.

37 I*bid*, Clause 4.3.

104 Indeed, the issue of how the cap would be enforced is exceptionally non-transparent and seems to provide FANOC with enormous discretionary power. Consider, for example, the case where Telstra's past market share would entitle it to 36% of the votes and two other Speedreach members each with 12% of the votes, and four other parties each with 10% of the votes. At one extreme, FANOC could ensure compliance with Clause 4.1 by granting Telstra 28% of the votes; at another, it could reduce the voting share of all other parties except Telstra to 4%. An infinite number of options lie between these extremes.

105 As well as highlighting the obvious deficiencies in the drafting of the SAU, the vesting of such power in FANOC is, of course, dangerous in of itself. For example, FANOC could use its capacity to allocate voting rights to reinforce the votes of conforming cartel members while weakening defectors (and subsequent votes would allow more effective reward and punishments for the purpose of maintaining the cartel). No less dangerously, FANOC could use its control over the allocation of voting rights to "punish" any large access seeker that had been especially diligent in seeking cost and quality controls over the services FANOC provides.

106 The structure also grants the different bodies power over different, but deeply interrelated matters, at different junctures:

- FANOC essentially sets budgets (that is, investments) subject to review by Speedreach, where the Commission or an Independent Arbitrator resolves disputes (on which more below).[38]
- FANOC can introduce, vary or withdraw products subject to reasonable notice to access seekers and consultation with Speedreach.[39]
- FANOC determines price terms subject to a revenue cap, where the parameters determining the cap are set either by Speedreach, or by the Commission.[40]
- Speedreach sets non-price terms subject to FANOC's reasonable opinion in certain respects (though it is not clear how an opinion from FANOC is deemed to be reasonable, or what happens if it is not).[41]

38 *ibid*, Clause 4.1.

39 *Ibid*, Clauses 6.1-6.3.

40 *Ibid*, Clause 7.

41 *Ibid*, Clauses 4.1, 6.4-6.7.

107 It is, needless to say, difficult to specify the full scope for gaming between all the various parties (owners of FANOC and members of Speedreach) in such a complex system; what is clear is that there would be many opportunities for such gaming to occur. Some of these are fleshed out in the accompanying Technical Report (see Part 1, of Section II pages 4-6), and others are considered in the discussion of externalities in paragraphs 45 *ff* above). Consequently, it is highly unlikely that the result would be a timely and effective, let alone efficient, decision process. In fact, the opposite seems far more likely, especially in light of the case studies considered below.

108 The G9 Submission and the NERA Report suggest that any difficulties that arise from this process, in terms of controls over cost or decisions with respect to investment, could be dealt with by an independent expert decision-maker or by the ACCC. However, it is difficult to place much weight on this proposition. It is not part of the capabilities of the ACCC to take complex operating and investment decisions; moreover, the ACCC would not be financially accountable for those decisions, were it to take them. The only case with which I am familiar that involves a regulator in effectively taking major investment decisions – the "regulatory test" under the electricity transmission arrangements – is a significantly more "hands off" role, in an industry where the technology is substantially more stable and demand more predictable; yet (as discussed below) even that more limited role has not been widely viewed as operating successfully.

109 Moreover, the G9 structure only invokes the regulator where agreement between the BAS Manager and FANOC cannot be reached; it does not provide for the review of inefficient, but otherwise agreed, decisions. As a result, there is no reason why NERA's claims with respect to incentives for cost reduction, price relativities, quality enhancement and non-price terms and conditions would be correct.

3.3. PROMOTION OF COMPETITION

110 The promotion of competition is a central limb in the assessment of the Long Term Interests of End-Users. Reflecting this, the G9 Submission and NERA claim that the arrangements they propose would promote competition. There appear to be two basic elements to this claim.

111 The first is that in the G9 structure all downstream firms will face the wholesale access price, while in the status quo, Telstra, according to the G9, only faces the marginal cost of access. This argument is confused, as when Telstra "sells" access to itself, it foregoes the revenue it obtains from supplying access to third parties. As a result, the opportunity cost that Telstra faces is not marginal cost, but rather the sum of marginal cost and the foregone contribution from sales of access services. That said, even were it the case that Telstra faced marginal cost, while access seekers faced the wholesale price:

- If, in the G9 structure, downstream users retain a financial interest in FANOC, then those users with such an interest will themselves face wholesale usage costs that differ from "headline" wholesale changes (as the payments they make to FANOC in part accrue to them), with the extent of that difference depending on the extent of their ownership stake;

- In contrast, if – as the G9 suggest – downstream users do not have a financial interest in the upstream assets, then that means that there will be more extensive "double marginalisation" than occurs in the status quo: that is, as demonstrated in the accompanying Technical Report, wholesale prices will be further marked up in the downstream stage, in a way that reduces consumer welfare and competition.

112 The second element in the G9's alleged promotion of competition is a claim that the structure it proposes would avoid the risks of price and quality discrimination as between access providers and access seekers. However, while NERA says that the Undertaking requires equal treatment of access seekers, there does not appear to be any commitment to non-discriminatory price terms and conditions in the FANOC Undertaking. On the contrary, the FANOC Undertaking states that FANOC may set different charges for different access seekers:

> *"FANOC may set the charges for BAS products for each Access Seeker at lower charges than those set out in the Reference Price List and at different charges for different Access Seekers"*[42]*.*

113 Moreover, even if FANOC were to commit to set prices available to all access seekers, it could still set them in a manner that inefficiently discriminated against different types of access seekers. For example, FANOC could reduce efficient competition from large purchasers of access services, to the extent that such large purchasers impose lower average costs on FANOC, by setting flat rate charges for access.[43] Similarly, Speedreach could use its power to determine non-price terms and conditions in such a way as to bias service usage against particular competitors (for example, making it impossible for an innovator to obtain a particular Quality-of-Service necessary for its product line).

42 See clause 7.6 of the FANOC Undertaking.

43 The use of a formally non-discriminatory pricing mechanism by an unintegrated monopolist to reduce competition was of course central to the Australian Competition Tribunal's findings in *Virgin Blue Airlines Pty Limited* [2005] ACompT 5.

114 Additionally, quite contrary to the G9's claim, the Australian Competition Tribunal has found that the mere fact of vertical separation does not preclude conduct that is so discriminatory as to materially affect downstream competition. [44] Moreover, in the status quo, there are far-reaching regulatory safeguards against price and quality discrimination; the G9 proposal multiplies the problems across numerous players while not imposing the solutions that have been used to address them.[45]

115 In short, the arguments the G9 advance for claiming that the G9 proposals will promote competition lack economic substance. However, even were it the case that those arguments had some merit, they would be more than outweighed by the risks to competition that are inherent in the G9 proposal.

116 The risks of collusion arise from governance structure proposed by the G9. That structure amounts to a Joint Venture between competitors, with the BAS Manager being the primary mechanism through which that Joint Venture operates. The BAS Manager would exercise its functions, including that of approving budgets and the proposed development of new services, on the basis of the decisions of its members. Those members would have voting rights that depend on their usage of the wholesale service, subject to caps that limit the share of overall voting rights that can be controlled by larger users. Section IV of the accompanying Technical Report first provides a range of means by which FANOC's governance structure would facilitate collusion. It then demonstrates that, under the G9 proposal, the incentives facing the relevant parties to engage in collusion are much greater than they would be under a Telstra FTTN (with the same factors applying in a continuation of the *status quo*).

117 Competition regulators internationally, including the ACCC, have highlighted the dangers involved in coordination between competitors. Central among these is the scope such collaboration offers for arrangements that amount to or facilitate collusion. [46] The G9 proposal, provides ample such scope as:

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44 See *Virgin Blue Airlines Pty Limited* [2005] ACompT 5

45 It is worth noting that while NERA asserts as if it were obvious that Telstra, as a vertically integrated entity, has an incentive to discriminate against access seekers, such an assertion is by no means self-evident as a matter of economics, and its mere assertion does not amount to demonstrating its credibility. In effect, discriminating against rivals incurs costs (in the form of foregone sales to rivals) and benefits (in the form of enhanced revenues to the firm engaged in the discrimination). The balance between these depends on the specific form of competition and on the values of a number of key parameters, including the ease of bypass by those rivals. Showing that the benefits outweigh the costs is an empirical exercise. See for example, D. Sibley and M. Doane, 2002, 'Raising the Costs of Unintegrated Rivals', in *Measuring Market Power*, D.J. Slottje, ed., Elsevier, Amsterdam, which applies this methodology to the proposed merger of Barnes & Noble, Inc. and Ingram Book Company.

46 See for example 'Collaborative Commerce', speech by Professor Alan Fels to *Melbourne Business – A day with the leaders*, 20 August 2001 and ACCC, *E-commerce and Competition Issues under the Trade Practices Act*, Discussion Paper, October 2001.

- Information exchange between competitors would seem to be central to the functioning of the BAS Manager;
- That information exchange would occur without the stringent safeguards that currently restrict retail decision-makers' to wholesale information;
- The proposed BAS Manager structure creates opportunities for vote trading and vetoing, which permits a "tit for tat" approach in which aggressive competitors would find their proposals being vetoed; and
- The BAS Manager is vested with the ability to hinder new services from being provided that would disproportionately benefit innovative and aggressive users, and in any event, to require such users to disclose the substance of such innovative services to their competitors.

118 I am unaware of any parallels to the approach proposed by the G9. Specifically, I have not been able to find instances in North America or Europe where a competition regulator has approved so far-reaching an arrangement that allows downstream competitors to jointly take capacity, output and innovation decisions while explicitly constraining the scope of those competitors to opt-out of the arrangement. The fact that there will be no credible alternative to FANOC – including because of the proposed restrictions on Telstra's ability to by-pass the FANOC structure – makes the risks of collusion all the more acute.

119 The G9 proposal is also likely to harm competition, even assuming collusion does not occur. This is because, as demonstrated part 2 of in Section IV of the accompanying Technical Report, firms can be expected to compete more vigorously in price under the Telstra, as compared with the G9, proposal. The same factors identified in the Technical Report as making for greater competition in a counterfactual Telstra FTTN would also apply to a comparison between the *status quo* and the Undertaking proposed by the G9.

3.4. CONCLUSIONS

120 Economic analysis, while recognising that vertical integration involves costs, suggests that there are circumstances in which it plays a key role in permitting efficiency. These circumstances appear of substantial relevance to telecommunications, so that the vertical separation which forms an integral part of the proposed G9 SAU is likely to cause inefficiencies.

121 It is difficult to quantify, in any satisfactory *ex ante* way, the likely extent of those inefficiencies. However, there is compelling evidence from case studies that they are material. Those cases, to which I now turn, show that, especially in complex network industries:

- Structural separation creates productive and dynamic inefficiencies, and in particular reduced incentives for efficient innovation and investment; and

- Fragmented decision-making arrangements – similar to those proposed by G9 – can be highly inefficient and result in strategic behaviour from affected parties, which further hinders efficient operation and investment.

4. STRUCTURAL AND FUNCTIONAL SEPARATION: TELECOMMUNICATIONS PRECEDENTS

122 The G9 approach is unique in telecommunications in that there is no precedent for the combination of:

- Structural or functional separation of assets between the customer premises and the local exchange;
- The formation of a separate joint venture upstream monopoly firm utilising a mix of incumbent and access seeker assets; and
- The formal and extensive involvement of a committee of downstream competitors in network investment and service upgrading decisions.

123 Furthermore, even where less profound industry intervention has occurred, there is existing and newly emerging evidence that these types of arrangements are inefficient in the short run and create a risk of investment failure in the longer term. It is for these reasons that a number of regulators have distanced themselves from attempts to vertically separate components of their respective telecommunications industries.

124 The remainder of this section considers the available experience in three relatively distinct cases:

- The US where there is over 30 years of experience of the costs and benefits of structural separation;
- The UK market, where there is already some evidence associated with the benefits and costs from the recent functional separation of BT; and
- Other markets where decisions on industry functions and structures have recently been taken.

4.1. STRUCTURAL SEPARATION IN THE US

125 The US pioneered structural separation in telecommunications, beginning over thirty years ago. Since then, the policy of structural separation has been almost entirely abandoned, and very substantial reintegration has occurred. The US experience therefore provides some guidance to the likely effects of similar policies elsewhere.

4.1.1. Structural separation of enhanced services

126 The most discussed case of structural separation in the US is the 1984 separation of the Bell system (see below). However, mandatory structural separation was introduced for 'enhanced services' in 1971 through the *Computer I* decision. In this decision the Federal Communications Commission (FCC) attempted to separate computers which were involved in the means of communication from computers which performed data processing services.[47] The FCC believed there was a potential thriving competitive market in data processing services that could be thwarted by the incumbent telecommunications provider. In turn, the FCC ruled that incumbents could only offer data processing services through a separate subsidiary.

127 However, this regulatory experiment produced smaller benefits and greater costs than the FCC had expected, and the agency accordingly scrapped structural separation in 1986.[48] The FCC found that there were significant direct costs and costs in relation to the discouragement of innovation:[49]

> *Structural separation imposes opportunity costs by discouraging the BOCs from designing innovative enhanced services that utilize the resources of the public switched network. Such innovation losses, resulting from the physical, technical, and organizational constraints imposed by the structural separation requirements, directly harm the public, which does not realize the benefits of new offerings.*
>
> *….*
>
> *direct costs on the BOCs from the duplication of facilities and personnel, the limitations on joint marketing, and the inability to take advantage of scope economies . . . . are indications of more fundamental costs of structural separation—namely, that the BOCs are unable to organize their operations in the manner best suited to the markets and customers they serve.*

128 The FCC ultimately abandoned its requirement for structural separation with a simpler system of non-structural safeguards in 1986.

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47 Cannon, R, 'What is the 'Enhanced Service Provider' Status of Internet Service Providers?', *FCBA News,* February 1997.

48 Crandall, R. W, and J. G. Sidak 2002, 'Is Structural Separation of Incumbent Local Exchange Carriers Necessary for Competition?', *Yale Journal on Regulation,* 19(2), pp. 386-387.

49 FCC quoted in Crandall, R.W, J. G. Sidak 2002, 'Is Structural Separation of Incumbent Local Exchange Carriers Necessary for Competition?', *Yale Journal on Regulation,* 19(2), pp. 386-387.

4.1.2. Structural separation of Bell System

129 In 1984, the Bell System, a vertically integrated telecommunications entity, that operated as a monopolist in most local service markets, was broken up following legal and regulatory complaints from competitive long-distance interexchange carriers (IXCs), notably MCI, which claimed they could not purchase originating and terminating access on reasonable terms from the Bell companies. These complaints had culminated in a lawsuit which was filed in 1974 and finally settled through a divestiture agreement in 1982. Under the resulting divestiture, the Bell System was broken up into AT&T and seven Regional Bell Operating Companies (RBOCs). Each of these RBOCs was assigned exclusive operation territories, called Local Access and Transport Areas (LATAs).

130 Each LATA was typically smaller than the State in which it operated and the RBOCs all served many different LATAs. RBOCs were permitted to provide local exchange services and intra-LATA toll services to end-users (calls that both originate and terminate within the same LATA, but cover a greater distance than a local call) but they were prohibited from providing inter-LATA toll services (calls that originate in one LATA and terminate in another), or to enter other downstream markets such as information services. By contrast, AT&T (the entity which acquired the long-distance and enhanced services network previously operated as a component of the Bell system) was not permitted to provide local exchange services, but was permitted to provide inter-LATA (interstate as well as intrastate) toll services, information services, and, in some states, intra-LATA toll services. In effect there was both horizontal separation of the Bell system (i.e. the RBOCs) and vertical separation (i.e. breaking off the long distance supplier AT&T).

Effect on industry efficiency

131 Many studies of the effects of the Bell divestiture have focused on the performance of AT&T as against various indicators compared to the previous Bell monopoly. Many have discovered adverse impacts on the performance of AT&T relative to its integrated predecessor.

132 Kwoka studied total factor productivity growth of AT&T from 1948 to 1987 and decomposed the components of that growth.[50] He found that divestiture had a strongly negative effect on productivity which fell by 4.2 per cent from 1984 to 1987, compared to a TFP increase of 42.7 per cent between 1977 and 1987. The study also found that the single most important causal factor behind TFP increases was improved realisation of economies of scale from output growth. As well as highlighting the extent of the once-off costs from separation, this in itself suggests that the reduced TFP performance post-divestiture was in part due to foregone scale economies.

50 Kwoka, J. 1993, 'The Effects of Divestiture, Privatisation and Competition on Productivity in US and UK Telecommunications, *Review of Industrial Organisation,* 8, pp. 49-61.

133 In a 2006 study which drew on a sample of 67 countries that privatized their former state-owned monopoly in the period from 1984 to 2003, Viani tested whether monopoly and vertical separation had any impact on the provision of basic telephone service.[51] He found that there was a highly significant and negative effect of vertical separation on outgoing international minutes per person (a proxy for output of long distance phone services). Based on his regression model, an additional year of vertical separation reduced the amount of international telephony usage by 10.8 per cent compared to a reduction of 5.8 per cent for one additional year of monopoly. In other words, vertical separation leads to a greater deadweight loss in terms of reduced output than even a monopoly. He also found a significant negative effect of vertical separation on fixed lines in service per person. However, a similarly significant correlation could not be found between vertical separation and the price of local residential telephony.

134 In addition to these studies, Crandall and Sidak documented one US State regulator's experience with structural separation, which suggests that structural separation is not a generally effective solution to facilitating competition:[52]

- In September 1999, the Pennsylvania Utilities Commission (PUC) issued a 'Global Order' instructing Verizon to structurally separate its wholesale operations from its retail operations as a means of promoting local service competition. In October 2000, Pennsylvania's Commonwealth Court upheld all aspects of the order.

- Despite the affirmation of its order by the Court, by March 2001, the PUC acknowledged in a new Opinion and Order that either full or functional separation would require substantial implementation costs and complementary behavioral remedies without any substantial reduction in regulatory oversight.

- The PUC then proceeded to devise a two-pronged form of separation ('functional/structural separation'), involving:

    - Mandating 'functional separation' of wholesale and retail units in a way that 'provides for non-discriminatory access to its wholesale division';

    - Directing Verizon to create an advanced-services affiliate, separate from the retail division of its business. Ten additional behavioral requirements were then imposed on Verizon.

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51 Kwoka, J. 1993, 'The Effects of Divestiture, Privatisation and Competition on Productivity in US and UK Telecommunications, *Review of Industrial Organisation,* 8, pp. 49-61.

52 Crandall, R. W. and J. G. Sidak 2002, 'Is Structural Separation of Incumbent Local Exchange Carriers Necessary for Competition?', *Yale Journal on Regulation,* 19(2), pp. 386-387.

- Despite this effort, by November 2001 the PUC rescinded its directive for full functional separation and relied instead on its code of conduct to promote competition. In December 2001, PUC Commissioner Terrance Fitzpatrick called functional separation an 'intrusive remedy designed to fix a problem that has not been shown to exist.'

Recent industry consolidation

135 The efficiency of the Bell divesture can also be evaluated with reference to industry consolidation subsequent to the restructure of the industry.[53] The US telecommunications market is strongly competitive and in this context, the industry structure that emerges is likely to be that which maximises efficiency.[54]

136 In the 1990s, AT&T, which was rapidly losing market share to MCI, Sprint and other long-distance firms, petitioned the FCC for regulatory relief. In 1995, the FCC found AT&T non-dominant and it was largely deregulated.[55] In addition, the US Congress enacted the *Telecommunications Act of 1996* with the express purpose of opening the local telecommunications services markets to competitive entry. The significance of this Act was that it also implemented a consistent system of access regulation, removing the need for forced structural separation and creating a pathway by which the RBOCs could re-enter the long-distance market. Under the *1996 Act*, the RBOCs were permitted to provide long-distance services after meeting specific non-discrimination and accounting requirements, assisting in the development of integrated carriers.

137 The post 1996 experience suggests strong pressures to merge to recapture efficiencies that were lost during the breaking up of the Bell System. The acquisitions described below have been approved by the US Department of Justice, by the FCC, and by State regulators and have been motivated by efficiency considerations, in particular by the efficiencies associated with end-to-end network integration:

53 An overview of the subsequent structural changes in the industry is set out in Appendix A.

54 This is the "survivor principle" developed by Nobel Laureate George Stigler. See George J. Stigler 1958, 'The Economies of Scale', *Journal of Law and Economics*, 1, pp. 54-71.

55 FCC 95-427. In the Matter of Motion of AT&T Corp. to be Reclassified as a Non-Dominant Carrier. ORDER. Released: October 23, 1995.

- Since 1997, the original seven regional Bell operating companies created by the break-up of AT&T have merged into four companies (SBC, Verizon, Bell South and Qwest) in order to attain sufficient scope and size to enter the long-distance and international markets, as well as to upgrade their networks to provide extensive broadband services.[56]

- One example was the merger of Bell Atlantic and Nynex in 1997, which provided the newly merged company (Atlantic Bell) with 'a wire into every home and business in the region' and a huge base of local call subscribers. It could then use this large market to compete in the long-distance and international market (for example, by offering attractive bundling options to customers of MCI and AT&T) and to upgrade it service offerings to broadband.[57] This strategy was also an important factor behind SBC's merger with Ameritech.[58] In the case of both these mergers, the RBOCs also identified significant 'synergies' or economies of scale and scope, which would significantly reduce costs.[59]

56 In 1997, Bell Atlantic merged with Nynex (Bell Atlantic, Annual Report 1997, http://investor.verizon.com/financial/quarterly/pdf/97BEL_AR.pdf). In 2000, Bell Atlantic merged with GTE (another ILEC, though not a RBOC) and changed its name to Verizon. In 1997, South-western Bell (SBC) acquired Pacific Telesis (CNET News, 'SBC, Pac Tel merger a done deal' April 1997, http://news.com.com/SBC,+Pac+Tel+merger+a+done+deal/2100-1001_3-278461.html). In 2000, SBC acquired Ameritech (FCC News Release 'FCC Approves SBC-Ameritech Merger' October 1999, http://www.fcc.gov/Bureaus/Common_Carrier/News_Releases/1999/nrcc9077.html). All web-sites listed in this footnote viewed 14 March 2005.

57 BusinessWeek Online, 'For Whom the Baby Bells Toll' May 1996 http://www.businessweek.com/archives/1996/b3474050.arc.htm, (accessed 18 April). BusinessWeek Online, 'Telecom: What Happens When the Walls Falls?' January 1996, http://www.businessweek.com/archives/1996/b3457157.arc.htm, (accessed 18 April).

58 SBC News Release, 'SBC-Ameritech Merger Will Jumpstart Competition' October 1998, http://www.sbc.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=2715, (accessed 18 April),

59 Bell Atlantic Annual Report 1997 (http://investor.verizon.com/financial/quarterly/pdf/97BEL_AR.pdf).

- In January 2006, the formerly largest RBOC, Verizon, reached a proposed acquisition agreement with MCI, the second largest Interexchange carrier (IXC) in the US, under which MCI will become a wholly-owned subsidiary of Verizon.[60] Similarly, what was the second largest RBOC, SBC reached an acquisition agreement with AT&T, the largest IXC, under which AT&T will become a wholly owned subsidiary of SBC.[61]

- Integration which suggests efficiencies in coordinating interdependent investments have also emerged in newer 'value-added' areas. In particular, the RBOCs have made acquisitions in the wireless area while extending their services into broadband and video on demand. For instance, Cingular Wireless, a joint venture between SBC and BellSouth, bought AT&T wireless in 2004 while Sprint recombined with Sprint PCS and then merged with Nextel Communications in 2005.

138 Commentators have emphasised the extent to which these changes reflect the importance of economies of scope and hence their significance for consumer benefits. Thus, Professor Alfred Kahn, one of the founders of NERA and a Senior Consultant to NERA, in reviewing the history of US telecommunications regulation, has concluded that:

> *.. Experience with the benefits of vertical reintegration – including the internalisation of the benefits of expanded sales of complementary services – makes one sceptical about the wisdom of the FCC's systematic insistence in recent years that ventures by the ILECs outside the traditional boundaries of voice service – notably in broadband – be confined to subsidiaries operating at arm's length. The twenty year experience with AT&T's dissolution should have increased our respect for the potentially large economies of scope in telecommunications.*[62]

139 Although these lessons do not seem to have been appreciated by the authors of the NERA Report, they should clearly be of considerable importance to the ACCC in assessing whether that SAU is in the Long Term Interest of End-Users.

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60 The top six ILECs ranked by local loop supply are (local loop share in December 2002 in parentheses): Verizon (32.17**%**); SBC (32.17**%**); Bellsouth (13.15**%**); Qwest (9.02**%**); Sprint (4.36**%**); and ALLTEL (1.62**%**). Jointly they supply 91.26% percent of America's local loops. FCC 2004, *Trends in Telephone Service*, Washington DC, Federal Communications Commission, Table 7.3, http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend504.pdf.

61 The top five IXCs by revenue are (revenue share in December 2002 in parentheses): AT&T (32.9%), MCI (listed as Worldcom) (21.1%), Sprint (8.5%), Qwest, through its subsidiaries (4.0%), and Global Crossing (2.51%). Jointly they earn 69% of America's long-distance revenues. FCC 2004, *Trends in Telephone Service*, Washington DC, Federal Communications Commission, Tables 9.1, http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/trend504.pdf.

62 Kahn, A. 2004, *Lessons from Deregulation: Telecommunications and Airlines after the Crunch*, AEI-Brookings Joint Centre for Regulatory Studies, at page 24. See also Kahn, A. *Whom the Gods Would Destroy, or How Not to Deregulate*, AEI-Brookings Joint Centre for Regulatory Studies, for example, at pages 19, 26 and 29.

140 In summary, the US experiment with structural separation in the telecommunications industry – the separation of enhanced services and subsequent break-up of the Bell System – is likely to have proved costly in terms of foregone productive efficiencies, and has been largely abandoned by regulators. Moreover, the subsequent experience with industry consolidation highlights the strength of the pressures to recapture these efficiencies, which obviously attests to their materiality.

4.2. FUNCTIONAL SEPARATION OF BT

141 The UK experience involves regulatory restructuring that is far more limited in its scale and complexity than that proposed by the G9. Nonetheless, it too involves a change in vertical industry structure and hence can cast some light on the more far-reaching G9 proposal.

142 In September 2005 Ofcom accepted Undertakings from BT Group plc ('BT') to set up a new and operationally separate business unit, Openreach, to be responsible for BT's local access and backhaul network. The Undertakings were aimed at delivering equality of access to BT's enduring economic bottlenecks (i.e. equivalence of inputs[63]) in order to provide a platform for effective and sustainable deep level infrastructure competition, and thereby to deliver the benefits of competition and innovation to UK consumers and businesses. Openreach commenced operation in January 2006.

143 There are a number of distinct differences between the Openreach model and that proposed by the G9. First, Openreach is not proposing to deploy FTTN or FTTH. Instead, Openreach plans on using its existing customer access network to provide high speed broadband and is currently deploying ADSL2+ at its exchanges. Second, Openreach's Next Generation Network (NGN) upgrade, called '21CN', is focussed only on its core network.[64] Moreover, Openreach does not involve a change in ownership arrangements and has no equivalent to the BAS Manager in terms of decision-making complexity or risks of collusion.

144 Although the BT functional separation model differs in substantial respects from the G9 model and, importantly, proposes a far weaker form of structural and functional separation than the G9 model, a number of significant difficulties and costs have become apparent.

63 Equivalence of inputs is the concept established by the Undertakings in which BT provides, in respect of a particular product or service, the same product or service to all communications providers (including BT) on the same timescales, terms and conditions (including price and service levels) by means of the same systems and processes, and includes the provision to all communications providers (including BT) of the same commercial information about such products, services, systems and processes.

64 The approach proposed by Openreach is also very different to many other EU telecommunications providers, a number of whom appear to support use of VDSL2+ to provide very high bandwidth.

145 First, there is evidence that the UK access regime could be at least in part responsible for the lack of next-generation access network ('NGAN') deployment. For example, BT has stated that regulation is an issue in the decision not to upgrade the access network:[65]

> *Beal added that BT has been trialling technologies for FTTH and fibre-to-the-kerb deployments since 2004. But he said in other countries where incumbents are planning FTTH or fibre-to-the-cabinet, the operators are being told they would not have to unbundle exchanges.*
>
> *'We are not being given those assurances,' said Beal. 'If you have fibre, the unanswered question is how to allow LLU operators to continue. The unresolved question is LLU.'*

146 Any possible harmful effects of functional separation on innovation and investment (through the lack of this investment) that may have been observed in the UK are unlikely to be as significant as those that would arise in Australia where:

- Access network upgrades are required in the immediate future; and
- There are fewer bypass opportunities by technologies such as cable than in the UK.

147 Second, the creation of Openreach and BT Wholesale has resulted in a range of significant direct costs.

148 Openreach and BT Wholesale have incurred significant additional capital expenditure on their systems to enable compliance with the Undertakings:

- Openreach has reported a £70m increase in capital expenditure in 2006-07 to reflect 'significant investment in new systems to ensure compliance with the Undertakings and increased spend to meet LLU demand'; while
- BT Wholesale reported a £32m increase in 2005-06 and a £39m increase in 2006-07 to reflect 'increased capital expenditure to prepare for the 21st Century Network and to invest in new systems to ensure compliance with the Undertakings agreed with Ofcom.'

149 It seems likely that further systems costs will be incurred in future, given that logical separation of systems is required by the end of 2007 and physical separation by 2010.

150 Even if only 50 per cent of the increase in capital expenditure by Openreach and 20 per cent of increase in capital expenditure by BT Wholesale were related to implementing the Undertakings, and if capital expenditure continues on current trends, by 2010 the cumulative costs of implementing the Undertakings will be well in excess of £100m (AU$250m) for these two entities (excluding any additional cost accruing to BT Retail).

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65 Anne Morris, 'BT to complete 21CN in 2011/12, rules out FTTH', *Total Telecom*, 13 April 2007.

151 Additional operating costs have also arisen through a need for increased staffing levels at Openreach. The 2007 BT Annual Report notes:[66]

> *In the 2007 financial year, operating costs, excluding leaver costs, were 4% higher at £3,289 million. Activity levels in the network, driven by broadband and LLU volumes, have increased in 2007 along with the investment in improving service levels. There have also been new ongoing infrastructure costs of supporting Openreach and the Equivalent Management Platform (EMP) which enables Openreach to manage all communication providers' orders, both external and from other BT lines of business, on an equivalent basis. These increases have been partially offset by cost efficiencies made within the business. The investment in service and equivalence has resulted in the headcount increasing by around 2,000 in the year to 33,265.*

152 These costs will obviously need to be recovered from end-users; and while the costs of BT's restructure are becoming clear, there is, as of yet, no evidence of any corresponding improvement in market outcomes.

4.3. APPROACHES TO FUNCTIONAL SEPARATION IN OTHER JURISDICTIONS

153 While European Union regulators do not currently have the power to impose functional or structural separation on vertically integrated incumbents, a number of jurisdictions have carefully examined this option and concluded that the costs associated with functional or structural separation are too significant to merit imposing such far-reaching changes.

4.3.1. France

154 In France, neither functional nor operational separation has been imposed on France Telecom. Instead, current regulation with respect to non-discrimination involves such measures as accounting separation in regard to local loop access and 'regular monitoring of France Telecom's operational processes and of various quality of service indicators for its LLU services'.[67]

66 BT Group Plc, *Annual Report and Form 20-F*, 2007, Page 37.

67 *La lettre de l'authorite de regulation des communications electroniques et des postes,* March/April 2007 (English version), available at http://www.arcep.fr/uploads/tx_gspublication/lettre55-eng.pdf

155 The French regulator, ARCEP, has considered the pros and cons of imposing separation requirements on France Telecom.[68] However, it concludes that the costs of functional separation – including the direct costs to France Telecom and ARCEP as well as the potential reductions in investment and overall quality of service – are high, while the benefits are mixed and uncertain. ARCEP suggests that on balance the costs are likely to outweigh the benefits of transparency and non-discrimination. ARCEP states:[69]

> *The apparent appeal of such a solution must not be allowed to mask the difficulties involved… Generally speaking, the implementation of functional separation entails costs which are well in excess of those involved, for instance, in the implementation of accounting separation.*

156 ARCEP also suggests that imposing functional separation 'runs the risk that the incumbent will then make less effort with respect to the overall quality of the services'. Moreover, it is argued that investment incentives may be affected by functional separation 'since such decisions are not made in isolation from the strategies of the players on the retail markets'. Finally, ARCEP indicates that:[70]

> *…segmentation can be difficult to define in practice and on a stable basis over time… because telecommunications networks are constantly undergoing rapid technological change*

4.3.2. Netherlands

157 In the Netherlands, OPTA published a statement on the UK approach to functional separation of BT.[71] While OPTA indicated it could be receptive to a voluntary separation by KPN, it considered that mandating functional separation would be a disproportionate remedy:[72]

> *in this respect [in relation to functional separation] the Commission has adopted the provisional position – based on the findings of the market analyses completed in 2005 – that an obligation which compels KPN to introduce a functional separation appears to be disproportionate for the time being, and it could produce undesirable effects with a view to the primacy of infrastructure competition.*

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68 *La lettre de l'authorite de regulation des communications electroniques et des postes* March/April 2007 (English version), available at http://www.arcep.fr/uploads/tx_gspublication/lettre55-eng.pdf

69 Ibid, pp. 3-4.

70 Ibid, p. 5.

71 See letter from D.I. Bos to Market Parties, 'All-IP: Policy Rules and Separation of Functions', 2 March 2007, available at http://www.opta.nl/download/200309+ALL%2DIP+letter%2Epdf

72 Ibid, p. 5.

4.3.3. Spain/Germany

158 Neither Spain nor Germany are contemplating any move towards functional or structural separation. Regulators rely instead on non-discrimination provision in the respective legislation.

159 Furthermore, the German Government is relying exclusively on the vertically integrated incumbent, Deutsche Telekom, for investment in its fast broadband infrastructure. To ensure appropriate incentives for investment, the German Government has made amendments to paragraph 9a of the Telecommunications Act that exempt 'new markets' from regulation. The effect of this legislation will be to create a 'regulatory holiday' for Deutsche Telekom's VDSL network investment.[73]

4.3.4. Sweden

160 In Sweden the regulator, PTS is supportive of a move towards a BT-style functional separation of TeliaSonera. The principal concern of PTS relates to the 'equal treatment' of different partners.[74] As it currently does not have powers to mandate functional separation, PTS is requesting that TeliaSonera undertake this on a voluntary basis.

4.3.5. Ireland

161 Although there is no regulatory pressure to structurally separate, the new owners of Eircom (Babcock & Brown) are considering implementation of a structural separation model. The Babcock & Brown business model has involved investment in stable network industries, and this initiative may reflect this established strategy. Babcock & Brown has also noted that any move towards structural separation would require regulatory safeguards to ensure investment in future network:[75]

> *Although not anticipating structural separation, BCMIH has indicated that it would consider any such request from the relevant authorities in Ireland, provided an appropriate complementary regulatory regime is implemented and the interests of other stakeholders, including employees, are safeguarded.*
>
> *BCMIH acknowledges that such a separation might allow the network business to more easily raise capital to finance the broadband, next-generation network and IPTV rollout.*

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73 Note that the EU has referred this legislation to the European Court of Justice.

74 PTS, *Proposal for Swedish Broadband Strategy*, February 2007, at p. 142.

75 http://www.babcockbrowncapital.com/media/65117/offer%20announcement%20final.pdf

4.3.6. New Zealand

162 Telecom New Zealand has recently proposed a structural separation model that involves separating out local access services. While this model has similarities with the G9 proposal, a key driver of the proposal is a desire to avoid the Commerce Commission's proposed functional separation model, which Telecom has claimed is unworkable:[76]

> *The company acknowledges that this is late in the day to be introducing such a fundamentally new proposal. However in the course of working through the details with officials it has become clear that the very rigid and complex operational separation being proposed for Telecom is practically unworkable, and will not meet the majority of the Government's objectives to improve competition and investment in the telecommunications sector.*

163 In addition, Telecom's proposal relies on obtaining agreement with the Government over the regulation that will be applied to the separate network company. In this sense there are similarities with Eircom's proposal in that the two companies are seeking regulatory certainty in return for some measure of separation.

4.4. CONCLUSIONS

164 In summary, a review of structural and functional separation in telecommunications industries internationally provides no evidence to support the claims made by NERA that functional or structural separation will enhance investment or otherwise improve efficiency.

165 There are no international precedents for structural separation along the lines proposed by the G9. Telecom New Zealand's proposal for voluntary structural separation is effectively a response to a 'practically unworkable' model proposed by the regulator, and would not involve the complex investment decision-making processes contemplated in the G9 model.

166 Difficult problems have emerged in the two precedents considered in detail here – the UK and the US:

- In the UK, considerable costs have been incurred in implementing the operational separation model and initial indications are that investment incentives have been compromised as a result of separation;
- In the US, the break-up of System Bell reduced the relative efficiency of the industry, functional/structural separation proved to be very difficult for regulators to implement in practice, and the industry is now embarked on a path of re-consolidation to regain scale and scope efficiencies.

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76 Telecom 2007, *Submission of Telecom New Zealand Limited in response to MED Consultation Document: Development of Requirements for the Operational Separation of Telecom*, 27 April 2007, p. 2.

167 In many other markets, regulators have ruled out enforced functional or structural separation after considering the significant costs and uncertain benefits of such a policy. Furthermore, while there are examples where incumbents have proposed structural separation, these examples, rather like BT's experience, do not suggest that structural or even functional separation are economically efficient: they merely suggest that incumbents may prefer (economically costly) forms of separation to (even more harmful, and likely inefficient) forms of ongoing regulation. There is, in this respect, a clear contrast to experience in the United States, where choices now being made in a competitive marketplace highlight the efficiencies vertical integration and end-to-end network control entail.

5. STRUCTURAL/FUNCTIONAL SEPARATION AND MULTI-PARTY DECISION-MAKING: EXPERIENCE IN OTHER INDUSTRIES

168 Section 4 showed that experience in telecommunications does not support the proposition that structural separation is economically efficient, either in the short or in the longer term. However, as described in this section, an even greater body of precedent on functional and structural separation is available for other network industries. The case studies summarised in the following sections represent examples of decision-making structures similar to those proposed under the G9's BAS Manager arrangements, and highlight their corresponding pitfalls. This is despite the fact that the characteristics of the industries reviewed below are such that the risks of vertical separation are far less for these industries than in telecommunications.

169 In Australia, structural separation has been imposed on many areas of the energy and transport sectors. Although pursued in differing forms and to varying extents across the different States and Territories, most jurisdictions have disaggregated previously vertically integrated utilities into separate entities for each functional layer. For example, formerly integrated electricity entities were split into separate firms supplying generation, high voltage transmission and local distribution respectively. Similarly, in gas, the ownership and operation of pipelines was separated from that of local gas distribution networks, and both of these were separated from the activity of gas retailing. In rail, although many jurisdictions still have common ownership of rail track and rolling stock, there are a number of important cases in which the sector forms part of a larger production, transport and logistics chain in which there is separate ownership of components such as mining, land transport and export (ports). The relationship between airports and airlines also provides an example of a sector where decision-making is separated across functional layers.

170 While the experience in these industries can provide valuable insights, it must be recognised that it is far simpler to structurally separate network industries in the energy and transport sectors than it is in telecommunications.

171 Structural separation along functional lines refers to a prohibition on supplying specified activities through an integrated corporate structure. It follows that a central element of a policy of structural separation lies in specifying the boundary that divides the services that can be provided within a given corporate entity from those that cannot.

172 In networks such as those used for the supply of gas, electricity and rail such a boundary can be more or less readily defined.[77] In gas networks, the point at which transmission pipelines are connected to the lower pressure systems used for local distribution forms a natural boundary, which can serve to guide structural separation requirements. In electricity, there is a demarcation between the high voltage grid, which forms the transmission infrastructure, and generation at one end and low voltage distribution at the other. In rail, ports and airports, the distinction between goods-producing activities (such as mining), haulage and export is conceptually relatively clear.

173 Furthermore, in all of these industries, functional boundaries have been relatively stable over time, so that the interfaces of the major component parts of a network have not changed substantially over the years. The implementation of new technologies on either side of these boundaries has then been reasonably readily accommodated by revising the technical standards governing the interface. In short, technologically stable boundaries between different network functions have sustained the separation of functions on either side of the boundary. Moreover, technical standards can evolve incrementally over long periods of time, allowing each party to take its own technical decisions independently.

174 Finally, these are industries that are generally relatively mature, which facilitates demand forecasting and capacity planning.

175 These conditions – a clearly identifiable, stable and effectively separating boundary between functional layers, along with a reasonable degree of industry maturity – simply do not apply to modern telecommunications networks. Indeed, the technical differences between the G9 and Telstra FTTN proposals – which differ not only in the bandwidth they provide but also in the location within the network of key functions – highlight the degree to which the optimal network architecture, and hence the delineation between functional layers, remains contentious. At the same time, there is far-reaching uncertainty about future demand conditions and about the best arrangements for financing the applications that are needed to make very high speed broadband commercially viable.[78]

77 This is not to say that these boundaries are always unambiguous. In electricity, for instance, the distinction between what constitutes transmission and distribution assets is sometimes not well defined, while transmission and generation services are sometimes effectively substitutes.

78 Historically, the development of new telecommunications applications has almost invariably relied on significant direct or indirect subsidies from the network side to the application at issue, allowing the application to obtain the critical mass and internalise network externalities. Structural separation of course undermines this pattern of funding.

176 The following sections explore the implications of vertical separation in the relatively simple operating environments of electricity, gas, rail, ports, and airports. Even in these major network industries, where there is a clear and stable boundary point between functional activities, the evidence suggests that structural separation had not helped secure greater efficiency and better consumer outcomes – rather, it has resulted in persistent inefficiencies, especially in respect of investment. Furthermore, the ability to ensure efficient investment has been further compromised where complex investment decision-making arrangements (including of the type proposed by the G9 in its BAS Manager arrangements) have been superimposed on a structurally separated industry.

5.1. ENERGY

177 The electricity and gas industries have relatively clear functional layers, consisting of generation (or production in the case of gas), transmission, distribution, and retailing respectively. Both industries have been vertically separated in many countries, and both are characterised by relatively low rates of technological change. However, experience from both the gas and electricity industries suggests difficulties in ensuring appropriate incentives for efficient investment, particularly where decision-making involves parties from different layers of the supply chain.

178 As set out below, the examples in electricity transmission of the Australian regulatory test and investor coalitions in Argentina, and of the Dampier to Bunbury Natural Gas Pipeline (DBNGP) in gas transmission, demonstrate the practical difficulties that arise when uncertain regulation is combined with divergent incentives of major stakeholders. A consistent feature of these outcomes has been protracted (and costly) consultation and disputation processes, and corresponding delays in investment. Issues of this nature are likely to be especially problematic in relation to the G9 proposal, given the range of stakeholder views that will exist about the merits of alternative investment proposals.

5.1.1. Electricity

179 In electricity, there are a number of areas where operational and investment decisions must be made jointly by different parties in the supply chain in order to be efficient. However, the most apparent difficulties have arisen in relation to interdependencies at the ‘wholesale’ level of the industry between generation and transmission, and in implementing effective transmission investment policies.

180 Transmission investments involve extensive externalities and are additionally characterised by scale economies. Creating incentives for transmission system investment and innovation is a central issue in electricity industry restructuring that has not been satisfactorily solved to date.[79] The two case studies below briefly illustrate the outcomes of separate approaches to transmission investment:

- The reliance on formal public investment evaluation processes, when such investment may run counter to the commercial interests of interested parties who may be affected by the investment, as applied in Australia; and
- The reliance on coalitions of interested users to agree to and finance investment, as applied in Argentina.

Australian Regulatory Test

181 Following the restructuring of the Australian electricity industry, the Australian regulatory test was originally developed in order to define the circumstances under which transmission between 'regions' in the National Electricity Market (NEM) should take place. Transmission network service providers (TNSPs) would identify worthwhile investment projects and assess their merit using a cost-benefit framework. If the project was found to be a least-cost alternative of meeting an investment objective, it would be commissioned.

182 In practice, however, the effective application of the Regulatory Test was undermined by the ability of NEM participants with differing commercial incentives to challenge and postpone regulatory test processes. The result has been that since the inception of the NEM, no inter-regional investment has been commissioned under the regulatory test.

183 The difficulties of reaching regulatory approval through the application of the regulatory test are illustrated by the deliberations in relation to a proposed interconnector between South Australia and New South Wales (SANI):

- In December 1997, the proponents of the SANI interconnector between New South Wales and South Australia, Transgrid (NSW) and ETSA Transmission Corporation (SA), applied for an assessment of the SANI project under the then applicable regulatory test. Following extensive lobbying by opponents of the investment (Murraylink, see below), the National Electricity Market Management Company (NEMMCO), which undertook the economic evaluation, concluded that, as formulated, the test was not robust and requested a review of the regulatory test.

79 See e.g. Joskow, Paul L., 'Patterns Of Transmission Investment', MIT, available at http://econ-www.mit.edu/faculty/download_pdf.php?id=1133.

- In October 1998, Transgrid submitted a new application for a New South Wales-South Australia, referred to as 'SNI'. In April 1999, a rival investment project to SNI – Murraylink, was announced. Murraylink would operate over a similar (but shorter) route to SNI, but delivered a far reduced public benefit than SNI, despite that as a privately financed project, Murraylink did not have to pass a regulatory test. In April 2001 Murraylink commenced construction.

- By November 2001 various NEM regulatory bodies had concluded that SNI satisfied the regulatory test (which Murraylink did not) and maximised the public benefit, and could therefore begin construction. Murraylink applied to the National Electricity Tribunal for a review of this decision, which was upheld in October 2002, and subsequently for judicial review of the Tribunal's decision in the Victorian Supreme Court. In July 2003 the Supreme Court held in favour of the Tribunal on most grounds but in favour of Murraylink's appeal on two grounds. It remitted the decision back to the Tribunal for reconsideration.

184 In the event, these regulatory and judicial issues became moot. The application to commission SNI was withdrawn by its proponents, and SNI was never commissioned. Murraylink had been commissioned, and the value of the SNI investment had been significantly undermined by the commissioning of Murraylink. Murraylink entered commercial operation in October 2002, but was not financially viable and applied for (and subsequently received) regulatory status – and therefore ratepayer funding - by October 2003.

185 The regulatory test for transmission investment has now been revised on a number of occasions.[80] In its most recent review, the AEMC highlighted the problems associated with gaming when there is a wide divergence in benefits to participants associated with a particular investment:[81]

80 On 21 December 2000, the then regulator NECA submitted code changes to the ACCC for approval, focusing on the process for network planning and augmentation. Another review of the Regulatory Test began in May 2002, which was in turn followed by a renewed policy initiative by the Ministerial Council on Energy (MCE) in 2003 and 2005, driven by the complete lack of inter-regional transmission investment in the NEM. The most recent review of the Regulatory Test was undertaken by the AEMC in 2006.

81 Australian Energy Market Commission, 'Final Rule Determination, National Electricity Amendment (Reform of the Regulatory Test Principles) Rule 2006', November 2006, p. 58.

> ***Potential for gaming***. *Poor definition of alternative options can lead to gaming of the Test. The fact that transmission investment results in winners and losers provides strong incentives for parties that will be disadvantaged to abuse the process. This issue can be seen in two ways – first, opponents of a project may 'game' the Test by proposing unrealistic alternatives, or second, the Test may be 'gamed' by a TNSP taking too narrow an interpretation of the requirements of the Test, meaning that alternatives or scenarios that should have been considered are not considered.*

186 However, despite significant public benefit from inter-regional transmission (and benefit occurring on both sides of the interconnector), there has still to be any inter-regional investment commissioned through this process. This example suggests that where private interests differ, and there is scope for gaming, these interests can adversely affect the process of ensuring sufficient investment. The greater the scope for gaming the decision-making process, the more likely it is that gaming will occur and impede efficient investment. Additionally and importantly, the experience of inter-regional transmission highlights the limited value of relying on regulatory decision-making to break the "log-jams" associated with vertically separated investment processes.

Investor coalitions (Argentina)

187 The regulatory arrangements introduced in Argentina to plan for and finance electricity transmission investment are also relevant to an assessment of the likely efficiency of the G9's proposed approach to investment. As noted above, under the G9 proposal, upstream investment in the broadband network will essentially be determined by a committee of users. A similar approach was originally adopted in the Argentine electricity transmission industry, where a 'committee of users' approach was adopted as the basis for determining investment levels.

188 The electricity deregulation framework for the Argentine electricity industry provided for a mechanism to encourage transmission investment by groups of interested parties.[82] The regulatory framework envisaged the emergence of 'coalitions' of customers that would jointly fund a portion of investment from which they benefited for a period of 15 years.[83] As part of the decision-making process, a voting mechanism was introduced that was intended to emulate some features of the Wicksell-Lindahl modified unanimity rule, which makes the decision to engage spending and raise taxes conditional on super-majority voting with blocking minorities.

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82 To our knowledge, this model is currently under review to enable a 'regulatory backstop' if necessary investment does not materialise.

83 A proportion of the surplus derived from congestion rents and marginal losses (referred to as the 'SALEX fund') would be deducted from the cost charged to users.

189 However, a number of factors, including free-rider effects (and the corresponding existence of negative externalities in electricity networks) undermined this model, and no transmission investments in the shared network were undertaken as a result of it:[84]

- It proved difficult to identify suitable coalitions, because benefits could not be clearly attributed to particular groups, and indeed, end customers were not formally represented in the bargaining framework.
- Forming coalitions that were stable was beset with problems, since it was always in a member's interest to 'jump ship' to avoid paying their share of the investment.
- Finally, the model was susceptible to blocking coalitions, including by generators benefiting from high revenues during network congestion and other customers to whom separate charges would be attributed as a result of an investment.

190 The model is different to the G9 in that investment costs will flow through to access prices generally, rather than a particular set of customers (though under the proposed SAU, FANOC has the scope to charge differing amounts to different access seekers). However, the dynamics are similar in important respects given that particular sub-groups will obtain disproportionate benefit from particular investments (relative to costs incurred) and there will be the potential for groups of access seekers to block proposed investments.

191 To date, no practical approach has been devised that – given heterogeneous preferences – allows efficient committee decision-making without creating risks of cartelisation. The Argentinean approach, which relied on the concept of Wicksell-Lindahl efficiency, stands out for its sophistication; yet it too failed to generate investments that would be in the public interest.

5.1.2. Gas

192 As in electricity, in gas there are many decisions that need to be made jointly by different parties in the supply chain in order to be efficient. One critical decision in the gas sector has been to ensure that capacity expansion occurs on a timely basis and at the dimension necessary to best meet end-user needs.

84 Chisari, Omar O., Pedro Dal-Bó, Carlos A. Romero 2001, 'High-Tension Electricity Network Expansions in Argentina: Decision Mechanisms and Willingness-to-pay Revelation', *Energy Economics,* 23, pp. 697-715. See also Gomez-Ibanez, J. 2003, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, Harvard University Press.

193 However, there have been difficulties in securing agreement on necessary capacity expansion in a structurally separated gas industry. One such case was the delay in commissioning new capacity on the Dampier to Bunbury natural gas pipeline (DBNGP) in the early part of this century when the pipeline was owned and operated by Epic Energy. This case has parallels to the G9 proposal in that there was:

- A clear need for increased capital expenditure on the main network asset;
- Participants with divergent commercial interests; and
- An overlay of complex regulatory arrangements (though materially less complex than those proposed by the G9).

194 Epic Energy purchased the DBNGP following its privatisation. As part of the terms of the acquisition, Epic Energy agreed to invest up to $870 million in expanding the capacity of the pipeline. By 2000 it had spent approximately $120 million.[85] However, no further investment in the pipeline was made by Epic Energy.

195 Epic Energy had paid $2.407 billion for the pipeline in 1998. However, a draft decision by the Independent Gas Pipelines Access Regulator (the Regulator) in Western Australia in 2001 valued the pipeline at $1.234 billion, undermining Epic's ability to undertake capital expenditure. Regulatory resolution of this case was time consuming, and included an appeal to the Supreme Court of Western Australia. The Regulator subsequently issued a revised decision in May 2003 that set the asset value at $1,550 million, which was just sufficient for Epic to meet obligations to debt holders.

196 At the same time, major downstream users, including Alcoa and Alinta, disputed tariffs introduced by Epic Energy. Furthermore, when Epic was subsequently looking to sell the DBNGP, Alinta and Alcoa would not sign contracts with Epic Energy to assure the asset's viability. This in effect forced DBNGP into receivership. The outcome was that the network owner, Epic Energy, exited the market and the sector partially reintegrated – the asset was subsequently bought by a consortium of DUET and downstream providers, Alinta and Alcoa in 2004. This transaction can be seen as representing partial vertical re-integration of the pipeline. Since that reintegration, further delays – largely arising from opportunities for gaming afforded by the regulatory process – occurred; but investment on capacity expansion is now underway, with a Stage 4 expansion of $430 million implemented by the end of 2006 and a further Stage 5 expansion proposed to commence in 2007.

85 Epic Energy, *Dampier to Bunbury Natural Gas Pipeline: Proposed Access Arrangement under the National Access Code, Additional Paper 4: Regulatory Compact*, 8 September 2000, p. 4.

5.2. RAIL AND PORTS

197 The recent experience with structural separation of rail and port services also suggests that structurally separated arrangements have resulted in substantial losses in operational efficiencies and investment shortfalls from the loss of coordination (scope) efficiencies.

198 The structural separation of the British Rail system involved both horizontal and vertical separation and produced an industry structure not dissimilar to that proposed by the G9. It created a range of access seekers (or train operating companies) and structurally separated entities across the supply chain (Railtrack the network operator, and Rolling Stock Operating Companies). The British model was beset with problems from the start, particularly over coordination of investment and maintenance as well as disputes between parties in the supply chain – all features that are likely to be equally difficult to manage in the G9 model.

199 There are also strong parallels to the model set out in the G9 proposal in the ports sector for Dalrymple Bay Coal Services (DBCS) and Port Waratah Coal Services (PWCS) where:

- The port management and ownership operates separately from other functional components of the industry; and
- Investment in port facilities benefiting multiple users is determined by a regulator with industry input or jointly by industry participants.

200 The outcomes for DBCT and PWCS are illustrative of the difficulties involved in coordinating interdependent investments of a vertically separated 'system' (the coal distribution chain) for the joint benefit of its users (mine operators wanting to export their coal):

- Upgrade plans of key port facilities have been undermined by disagreements among industry participants with conflicting commercial interests about the merits and cost allocation of investments; and
- Even where in principle agreement has been reached to invest in identified bottlenecks, industry participants have no guarantee that new bottlenecks will not emerge elsewhere in the supply chain.

201 Poor investment outcomes in fragmented rail and port industries contrast with those in the highly integrated privately owned Pilbara rail systems. The integrated mining, rail and port infrastructure operations of BHPBIO and Rio Tinto have facilitated constantly expanding capacity growth over more than 30 years, as well as greater responsiveness to changing commodity demands than has been observed for the coal supply chains.

5.2.1. British Railways

202 The experience of structural separation of the British rail system highlights the problems inherent in ensuring efficient and timely investment in network upgrades in a structurally separated industry.

203 In the early 1990s, the British government structurally separated and then privatised British Rail.[86] The reforms were encapsulated by the UK *Railway Act* 1993 which divided the national railway into over seventy different companies. Management of the rail track infrastructure was separated from rail operation and made the exclusive responsibility of Railtrack, which was charged with owning, maintaining and developing the network.

204 Service operation was handed over to 25 train operating companies ('TOCs'), each of which bid for a franchise area and then paid for access to the network while leasing stations and depots from Railtrack. The Act also created Rolling Stock Operating Companies ('ROSCOs') from whom the TOCs leased trains and carriages. ROSCOs were also responsible for heavy maintenance of fleet.[87]

205 By the end of the 1990's the performance of the British railways had deteriorated. The degradation in performance was largely due to the coordination problems created by vertical unbundling. In particular, the schedule of access charges encouraged train operators to congest the tracks with additional trains, reducing reliability and making track maintenance harder, while it became extraordinarily difficult to reach agreement about network enhancements to reduce congestion.

206 The problems associated with investment were a direct consequence of the structural separation model. A central flaw of structural separation was that larger investments covering multiple franchise areas were nearly impossible to negotiate as they always involved multiple train operating companies (TOCs) with competing interests who were unable to reach agreement.

86 For a more detailed study of British Rail privatisation see: Wolmar, C. 2001, *Broken Rails: How Privatisation Wrecked Britain's Railways*, London, Aurum Press. See also Gomez-Ibanez, J. 2003, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, Harvard University Press and Gomez-Ibanez, J. 2006, Chapter 1 in *Competition in the Railway Industry: An International Comparative Analysis*, Edward Elgar Publishing, Inc.

87 In addition to the coordination problems between Railtrack and the TOCs, vertical unbundling brought a host of problems to the TOC and ROSCO relationship. On this, see: Yvrande, A. 2000, 'The New British Railways Structure : a Transaction Cost Economics Analysis', DRUID Working Paper No 00-5.

207 One pertinent example was the West Coast Main Line. The West Coast Main Line is a major route connecting London, Birmingham, Manchester, Liverpool, Glasgow and Edinburgh. The route had not been improved since the 1970s and was losing traffic to the East Main Coast Line, which was recently modernised. However, negotiations to modernise the West Coast Main Line lasted the better half of the 1990s, without agreement being reached. The cost of negotiation and regulation had apparently discouraged Railtrack and the TOCs from making many modern improvements that might have been quickly undertaken by a vertically integrated firm.[88] The regulator ultimately forced through an incomplete agreement, which then contributed to enormous cost overruns on the project, suggesting that the intervention even of an independent third party could not salvage an already complicated and imperfect bargaining process between owners of different components of the network.

208 Investment in rolling stock was also beset with problems. ROSCOs were reluctant to invest in rolling stock with the likely operating life of 30 years for TOC which own a franchise of at most 15 years duration. This is because the ROSCOs did not have the assurance that the clients they were building new rolling stock for would be able to renew their franchises or that new operators who won the franchise upon expiry of existing contracts would lease the resulting trains at the same prices as those agreed to by the previous franchise holders. This manifested itself in a decline in investment in rolling stock.[89] Ultimately this problem was addressed via a degree of re-integration as some TOCs agreed to jointly finance new rolling stock with ROSCOs.

88 Gomez-Ibanez, J. 2003, *Regulating Infrastructure: Monopoly, Contracts and Discretion*, Harvard University Press.

89 This reduction in investment incentives was exacerbated by the fact that rolling stock is not standard as some vehicles are designed for specific purposes. The rail infrastructure imposes additional substitutability constraints as there are restrictions on part of the rail network on which types of rolling stock can operate. Therefore TOCs were dependent on ROSCO-supplied vehicles which specific to the particular routes they operate. Symmetrically, the ROSCOs which supply particular TOCs did not have many potential alternative clients and were dependent on the TOCs leasing their specific rolling stock for continued custom and revenues.

209 The disintegrated structure also made it difficult to determine liabilities when problems arose, for example in the event of vehicle breakdowns. When a train breaks down it may, depending on the causes of the breakdown, result in one or more than one of the various parties in the rail system being liable. For instance, if the breakdown is due to a design fault then the ROSCO would be liable, if it is due to bad light maintenance, the TOC would be liable, if a mixture of these factors, then weights must be assigned for each party and so on. Compared to the past integrated structure, the vertically separated structure invited this sort of dispute, while creating evidentiary difficulties in proving liability and therefore increasing the costs of contract enforcement. This in turn reduced the incentives for the various parties to take due care in fulfilling their contracts and meeting service quality obligations. The system designers anticipated these problems to some extent by setting up conflict procedures in the various contracts but nonetheless the effectiveness of these procedures proved highly dependent on the availability of relevant information and on the extent of goodwill among industry participants.

210 The blunted incentives for safety and maintenance due to structural separation were noted by the UK's Office of the Rail Regulator in a 2000 report[90]:

> *While wheel irregularities are known to lead to track damage … there is less evidence that they adversely affect the vehicle structure…. Thus in a railway system where vehicle owners and maintainers are insulated from direct track damage costs (such as the situation that now exists in Britain), there is less pressure on the mechanical side to maintain wheels in good condition.*

211 Due to the problems on the West Coast Main Line and a number of crashes that resulted in penalty payments by Railtrack to TOCs,[91] Railtrack entered administration in late 2001. Railtrack was eventually restructured as a not-for-profit firm, called Network Rail.

212 Testament to the inefficiency of the structural separation was that the system was eventually forced to re-integrate itself to a substantial degree in order to recreate aspects of the internal control hierarchy that were lost with vertical separation:

90 Pittman, R. 2005, 'Structural Separation to Create Competition? The Case of Freight Railways', *Review of Network Economics,* 4(3), pp. 181-196.

91 Three significant incidents were the Southall, Ladbroke Grove and Hatfield rail crashes. The Hatfield crash in particular led to a large increase in expenditure on maintenance and renewals and compensation to the TOCs for the network speed and capacity reductions.

- Some TOCs have agreed to joint financing of new rolling stock. Therefore, contrary to the intention of the 1993 reforms, the ownership of rolling stock under these new arrangements has effectively not been separated from the operation of particular routes. TOCs which were intended to specialise in servicing particular routes became part owners of the trains they operated. In one case there was outright vertical re-integration as the ROSCO Porterbrook was purchased by the TOC Stagecoach.

- TOCs have also effectively reintegrated into the provision of heavy maintenance services. Several TOCs found it more efficient to do so because TOCs already employ staff for light maintenance who are equally skilled to do heavy maintenance. There were therefore potentially substantial savings in transaction cost, including savings from not having to make agreements with subcontractors and savings from not incurring transferring and parking expenditures by doing the heavy maintenance themselves.

- Some TOC franchises were effectively lengthened in return for commitments to obtain new or refurbished rolling stock;

- Site specificity problems were addressed through increased standardisation of rolling stock. For instance, more standard trains have been designed that are adapted to the whole network in order to reduce the bilateral dependency between TOCs and ROSCOs

Comparison between British and Swedish experience

213 It is worth briefly contrasting the British experience with functional and structural separation in rail with that implemented in Sweden.

214 The first key difference was that the approach to structural separation in Sweden has been a more incremental one. The Swedish national railway was first split up into a public service enterprise responsible for railway transport, SJ, and a Government agency responsible for the infrastructure, the Swedish National Rail Administration (Banverket) in 1988, but freight rail traffic was not opened to competition until 1996. The incumbent SJ was not split into several limited liability companies, including one for operating passenger traffic, and the other for freight, until 2001.

215 The second key difference is that the Swedish rail sector is a beneficiary of substantial, explicit and well defined levels of government subsidy relative to the UK rail sector where problems in the lack of transparency of the subsidy regime and the overlapping roles between regulators and subsidy providers may have led to some accountability problem and fostered an uncertain climate for investment[92]. Total annual subsidies to the rail sector are roughly around SEK 10 billion a year. Most of this is for track maintenance and investments in new tracks, reducing the need to rely on negotiations between the separated entities to agree on levels of investment.[93] If anything the Swedish public sector's total financial support to railway traffic has increased substantially compared to the 1980s. In 2003, the state-owned train operator SJ AB received nearly SEK 2 billion from the government to avoid bankruptcy.

216 In other words, to the extent to which structural separation has proved resilient in Sweden this is very largely because the need to finance investment has been very largely removed from the rail system – with public funding being relied on for all significant network investments. This has allowed the system to avoid a key issue in any structural separated system – ensuring timely and efficient investment – but at the cost of potentially serious technical inefficiency.[94]

Other evidence of effect of structural separation on industry efficiency

217 The experience in the UK and to some extent in Sweden has prompted a number of studies that have sought to examine, through more formal methods, the extent of the economies of scope that risk being foregone through structural separation of the rail sector.

92 See the discussion in Bartle, C. 'Britain's railway crisis: A review of the arguments in comparative perspective' Centre for the Study of Regulated Industries', Occasional Paper No.20 particularly pp.44-48.

93 In 2003, subsidies amounted to SEK 9 billion compared to track fees of SEK 450 million, and the cost for the Rail Administration's operation and maintenance of the tracks which were approximately SEK 3 billion.

94 Public subsidies create "moral hazard" problems, as they blunt the need for firms to operate efficiently.

218 Ivaldi and McCullough estimated for US freight railways that there would be a 20-40 percent loss of technical efficiency if railroad freight operations were separated from infrastructure and an additional 70 percent loss of operational efficiency if on-rail operations were separated.[95] Economies of scale in train operations also manifest themselves in the form of so-called economies of density, since costs increase less than proportionately to the volume of services provided over a given infrastructure (in part because it is usually possible to add additional carriages to existing trains rather than to operate new trains).[96] A high degree of economies of density has been estimated for non-bulk freight train traffic.[97]

219 Furthermore Friebel et al investigated to what extent third-party access, independent regulation and the separation of infrastructure from operations affect railway performance.[98] They were unable to find any evidence that full separation of infrastructure from operations is a necessary condition for increasing railroad efficiency.

220 The OECD, which has been a strong proponent of structural separation in rail, has also acknowledged that structural separation may lead to inefficiencies due to coordination difficulties (that is, lost scope economies). In particular, the OECD's comments suggest that there are a number of respects in which vertically integrated rail systems may be superior to structurally separated ones. These include:[99]

95 Ivaldi, Marc and Gerard J. McCullough, 2004 'Subadditivity Tests for Network Separation with an Application to US Railroads', available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=528542.

96 OECD 2005, *Structural Reform in the Rail Industry*, Competition Policy Roundtables, available at http://www.oecd.org/dataoecd/7/14/35911008.pdf

97 BTRE (Bureau of Transport and Regional Economics), 2003, *Rail Infrastructure Pricing: Principles and Practice,*, Report 109, BTRE, Canberra, ACT, available at http://www.btre.gov.au/docs/reports/r109/r109.aspx

98 Friebel, G., M. Ivaldi and C. Vibes, 2003, *Railway (de)regulation: a European Efficiency Comparison*, IDEI report no. 3 on passenger rail transport, Université de Toulouse.

99 OECD 2005, *Structural Reform in the Rail Industry*, Competition Policy Roundtables, available at http://www.oecd.org/dataoecd/7/14/35911008.pdf

- **Efficient and timely investment** - it can be more difficult to ensure efficient and timely investment in upgrades to the infrastructure when the rail infrastructure is structurally separated.[100] This is because upgrades to the rail infrastructure impose both costs and benefits on train operators – that is, they involve "vertical externalities". But different train operators will incur different shares of the total costs and benefits. Therefore particularly (but not necessarily only) for a major investment project, some operators may benefit strongly while others may be made significantly worse off and obtaining agreement to a major network augmentation will therefore require either prolonged and costly negotiations or, to avoid that, decision making must be vested in a regulatory authority at arms-length from the rail industry.

- **Controlling external costs** - it may be harder to properly control the external costs which trains may impose costs on other train operators, or on the infrastructure owner under a structurally separated mode. Furthermore, a fault on one train can have significant follow-on consequences in the form of delays on other train services; and

- **Incentives to maintain the network** - under structural separation it may be more difficult for the regulator to ensure adequate incentives to maintain the quality of the infrastructure. Given that the quality of the infrastructure can directly affect the ability of the train operators to deliver their services, this problem ultimately goes to the effectiveness of the infrastructure.

Conclusions on rail

221 Rail is a relatively mature industry, with a technology base that is stable and with reasonably stable demand. Rail networks are also characterised by clear demarcation points at which functional boundaries can be drawn. However, the experience with structural separation in rail is characterised by:

- Inefficiencies in network operation and maintenance, relative to the better performing vertically integrated systems; and

100 See also Kessides, Ioannis and Robert Willig, 1998, *Restructuring Regulation of the Rail Industry for the Public Interest*, OECD , Paris, p. 147:

"The provision of many innovative and market-responsive rail services may require specific investment in infrastructure, such as maintenance or upgrading of way and structure facilities, construction of loading and transhipment fa-cilities and building of spurs of track to reach a shipper's location. It may be difficult and ineffi-cient for any [train] operator to coordinate, as necessary with the infrastructure monopoly en-tity, especially if their incentives with respect to investment behaviour are not in harmony."

- Persistent difficulties in ensuring needed investments, with the result either of eventual collapse, reliance on greatly expanded public subsidies (as in Sweden), or both (as occurred in the UK).

5.2.2. Ports

222 Australian mineral export-oriented ports form part of a wider logistics chain that goes from mine to ship, and includes logistics-related investments at the mine, on the rail link to the port and at the port itself. The Australian experience provides a natural experiment for assessing the impact of structural separation in such a chain as there are major ports that are vertically separated from their users (namely Dalrymple Bay and Port Waratah) and major ports – the iron ore exporting ports in the Pilbara – that are not. Moreover, all of these ports have experienced a major demand side shock, with the very strong growth of demand from China and more recently India. The differing ability of the ports to respond to these shocks is a case study in the costs and complexities of vertical separation.

Dalrymple Bay

223 Dalrymple Bay Coal Terminal (DBCT) is a port facility located in Queensland, Australia. Its customers comprise mines owned by some of the world's largest mining companies. It is linked to the Bowen Basin by a rail network owned by Queensland Rail (QR) and currently services all coal from the 13 mines in the Basin.

224 The case of DBCT is particularly relevant to a discussion of the G9 proposal, since it encompasses both structural separation of multiple functional industry components, and where the operations and investment of one functional component – the port – in effect constitutes a joint venture of industry participants.[101] The case of DBCT also suggests that where demand is uncertain (as it is for FTTN), coordination mechanisms are likely to prove inadequate in the face of capacity shortfalls and associated productivity losses.

101 A further complexity in the G9 structure is that the copper loops would remain owned and operated by Telstra. As a result, there would be four layers in the G9 model – the upstream copper, FANOC, the BAS manager and then the retail service providers – as against merely two in Dalrymple Bay.

225 The DBCT terminal itself consists of purpose-built rail in-loading facilities, on-shore stockpile yards and off-shore wharves. Jetty supported conveyor systems service the off-shore wharves, which extend 3.8km out to sea allowing for deep water loading. The DBCT therefore is an integral part of the coal supply chain as it provides unloading, stockpiling, coal blending, cargo assembly and out-loading services to mines using the terminal. The DBCT also plays a coordination role by helping to ensure that the delivery of coal by rail meets the demands of customers in terms of scheduled ship arrivals. The major functions performed by DBCTPL have been summarised by the ACCC as follows:[102]

- Coordinating the railing of coal from the mine sites to the Terminal (in conjunction with QR);
- Managing and operating train unloading, stockpiling and shiploading activities within the Terminal;
- Preparing shipping documentation on behalf of the mines shipping the coal; and
- Maintenance and minor engineering functions.

226 As such, the coal handling service performed by the DBCT as part of the overall coal supply chain requires careful coordination with upstream mining and rail networks, including coordinated investments to address the interfaces between the various networks. In practice, however, the processes to reach agreement on what investment should be undertaken and the corresponding prices that should be charged to users have been complex and adversarial. In combination with regulatory delays, the need to reach agreement has prevented investment from being undertaken within the timeframe required to respond to very high world coal prices. The following sequence of events illustrates the difficulties:

- In September 2001 Babcock & Brown was granted a 50-year lease over DBCT with an option to extend the lease a further 49 years. As lessee of DBCT, Babcock & Brown (then known as Prime) was required to submit an Access Undertaking (i.e., a proposal of terms and conditions of third party access to the facility for new contracts) to the Queensland Competition Authority (QCA).[103] The Undertaking, submitted in June 2003, proposed to charge facility users $2.77 per tonne, compared to the $2.08 per tonne that it was charging at the time.

102 ACCC Determination, *Applications for authorization lodged by Dalrymple Bay Coal Terminal Pty Ltd*, 15 December 2005.

103 An approved access undertaking does not of itself affect the terms and conditions of any pre-existing access agreements which are governed by the terms and conditions in those agreements. Rather the access undertaking will only apply to access negotiations occurring after the approval date of the undertaking.

- A long and protracted process followed as stark disagreements between Babcock & Brown in its capacity as DBCT Management, and the DBCT Users' Group arose. The differences between the parties were summarised in the QCA's final decision on the Undertaking as follows:[104]

  - While Babcock & Brown proposed a price of $2.77 per tonne, the DBCT Users' Group thought that a price of less than $1.00/tonne was appropriate.

  - Babcock & Brown submitted a valuation of $1.1 billion for the terminal, while the DBCT User Group submitted an independent valuation of under $500 million.

  - Babcock & Brown sought a weighted average cost of capital (WACC) of 11.04 per cent, while DBCT User Group proposed a WACC of 7.64 per cent.

- In October 2004 the QCA released a draft decision that coal handling charges should be cut from $2.08 per tonne to $1.53 per tonne (based on a WACC of 8.2 per cent). Babcock & Brown strongly protested against this decision. As the QCA deliberated its decision, an unanticipated surge in worldwide demand for coal arose,[105] and several coal companies lodged formal requests for increased port allocation at Dalrymple Bay. All spare coal loading capacity at DBCT was allocated and the facility became a serious bottleneck in the coal supply chain. By early 2005, there were reports of more than 50 ships queuing to access the facility to load coal.

- While Babcock & Brown responded by releasing plans to expand capacity by approximately one third, it emphasised that the planned expansion would only go ahead if the coal-handling fee it received was enough to make the investment worthwhile.

227 In April 2005, nearly two years after Prime Infrastructure submitted its draft access undertaking to the QCA, the regulator handed down its final decision on the access undertaking. The final decision provided for a $1.72 per tonne coal handling charge, a 12 per cent increase on the draft decision. Immediately after the final decision, Babcock & Brown announced its decision to proceed with its planned expansion of DBCT.

228 However, since the QCA decision, the coal logistics chain feeding DBCT has continued to be beset by problems, in particular over the coordination of capacity expansion.

104 http://www.qca.org.au/files/DBCT_DAU_FINAL_plus_Part_B.pdf

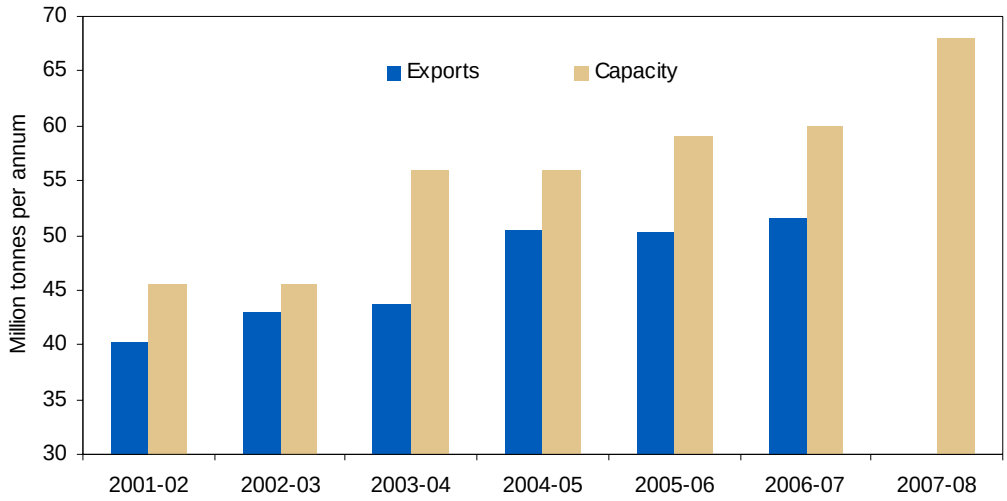
105 http://www.qca.org.au/files/DBCT_DAU_FINAL_plus_Part_B.pdf

229 Babcock & Brown has undertaken only a minor expansion in capacity from 56.8Mtpa to 59Mtpa at DBCT since the QCA decision. Although Babcock & Brown is embarking on a two-stage project to increase capacity to 85Mtpa by the end of 2008,[106] Babcock & Brown announced that DBCT has operated with spare capacity throughout the 2006-07 Financial Year:[107]

> *In each and every month of the current financial year (i.e. since 1 July 2006), the terminal has not received sufficient coal to enable DBCT to function at its full operating capacity. That is, DBCT has spare operating capacity to blend, load and ship more coal if it can be delivered to the DBCT site.*

230 The gap between coal exports and capacity at DBCT is illustrated in Figure 1.

Figure 1: Exports and Capacity, DBCT, FY2001-02 to FY2007-08



Notes: Coal Exports for 2006-07 obtained from BBI, 'DBCT Site Tour' (ASX Announcement, 18 May 2007). DBCT capacity for 2001-02 was assumed to be the same as for 2002-03. Source: Export data provided by Queensland Government, Natural Resources and Water (available at: http://www.nrw.qld.gov.au/mines/statistics/coal_stats.html). DBCT capacity information is contained in BBI Annual Reports, 03-04 (p.5) and 05-06 (p.10).

106 The program involves expansion of capacity to 68 Mtpa by the end of 2007 and expansion to 85 Mtpa by the end of 2008. Source: Babcock & Brown Infrastructure, ASX Release, 'DBCT Asset Analyst Tour – Presentation', 17 May 2007.

107 Babcock & Brown International, 'DBCT – Goonyella Coal Supply Chain', ASX Release, 31 May 2007.

231 Since the QCA decision at the end of 2004-05 the gap between exports and port capacity has remained relatively constant despite very strong demand for coal. By mid-2007 there were reported queues of up to 50 vessels off the coast near Mackay.[108] The evidence of excess capacity at the port highlights the difficulties associated with expanding volume given that any expansion in volume requires:

- Effective coordination between the expansion of capacity at DBCT and expansion of the QR below-rail network; and
- Effective coordination between the mines and QR's above-rail operations.

232 At both of these levels there have been reports of disputes, in particular between QR and coal producers.[109] In response to these disputes, the Queensland Government commissioned an independent review of the Goonyella coal network serving DBCT. The review recommended that "a central coordination role be created to oversee and if necessary coordinate all activities which span the whole of the supply chain"[110]

233 The cost of delay associated with coordinating capacity expansion is estimated to be significant. The independent review of the Goonyella coal network estimated that current supply bottlenecks at DBCT are costing the Australian economy $1 billion a year.[111] Furthermore:

- Xstrata Coal has stated that a major factor in whether it develops a 20 million tonnes-a-year coal mine near Wandoan, Queensland will be "whether Australia can get its congested ports in order"[112]

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108 Thomas, H. 'The Smart State's Disgrace', *The Australian*, 30 May 2007.

109 For example, the Australian reports that "In a formal letter to the acting chief executive of QR, Stephen Cantwell, coal industry leaders said that the Goonyella Coal Chain was in crisis and had the potential to lose the Queensland Coal Industry more than $1 billion in revenue and additional costs: 'Editorial: First rule of business: Shoot the messenger', *The Australian*, 30 May 2007. In a response to this article Queensland Rail CEO Stephen Cantwell stated, "Most haulage contracts were written by mining companies and prior to the unprecedented surge in demand….QR was not contracted to supply any additional capacity to cater for supply chain variation…While we would like to be providing more capacity sooner and have a major investment program underway, we are operating within the contractual framework on the Goonyella system: Cantwell, S. 'Queensland Rail doesn't have a monopoly on freight', *The Australian* ,Letters Blog, 1 June 2007.

110 Letter from Stephen O'Donnell to Mr Michael Roche, Chief Executive Queensland Resources Council and Mr Bruce Wilson, Director General Queensland Transport, 'RE Goonyella Coal Chain Capacity Review', 29 July 2007.

111 O'Donnell, S, *Goonyella Coal Supply Chain Review :* Supporting Documentation", 30 July 2007.

112 'Port congestion worries Xstrata', Townsville Bulletin, 26 June 2007.

- South Korean steelmaking company Posco, which spends more than $US1 billion ($A1.22 billion) a year on Queensland coal, has said it is developing coal contracts in other countries due to costly delays and unreliable deliveries by Queensland Rail. Posco first threatened not to buy anymore Australian coal because of these delays in May 2007.[113]

Port Waratah

234 Port Waratah Coal Services ('PWCS') handles coal for around 30 Hunter Valley coal mines. PWCS is the largest coal port in the world with a nameplate capacity of 89 million tonnes per annum. Essentially, PWCS' role in the coal supply chain is similar to DBCT's; that is, it interfaces with the major above-track (rolling stock) operators using the Hunter Valley rail track to transport coal to port on behalf of the mines and for subsequent export.

235 PWCS is owned by a number of industry participants, both directly and through Newcastle Coal Shippers Pty Limited (itself owned by industry participants), which has a 36.9 per cent shareholding. The other major shareholders are Rio Tinto (through its subsidiary Coal & Allied) and Xstrata. PWCS leases the land on which the port is situated from the NSW Government under an agreement which requires the port to be maintained as a 'common user facility'. This provision requires the port to accommodate all new users, irrespective of whether they are shareholders in the port or not.

236 Like the DBCT, PWCS is relevant to a discussion of the G9 proposal, since it encompasses both structural separation of multiple functional industry components and a fragmented decision-making structure for investment. Developments at PWCS further highlight the difficulties that arise in a vertically separated system where there is a need for careful coordination of interdependent investments at different functional layers of the industry to maximise system efficiency.

237 Difficulties at PWCS arose due to the capacity to handle coal not keeping up with that demanded by exporters. As of 2004, demand for haulage services exceeded PWCS' capacity (around 89mtpa), resulting in substantial vessel queues off the Port of Newcastle. In turn, coal producers incurred correspondingly increasing vessel demurrage charges, estimated at their peak to amount to $1 million a day. As a result of the increased demand for coal in 2003 and 2004, the queue of vessels waiting to load coal at the Port of Newcastle increased from an average of 17 in January 2003 to around 40 in the early part of 2004.

113 'DJ Posco Threatens To Stop Buying Australia Coal', *Dow Jones*, 30 May 2007.

238 To address these queues, PWCS applied for authorisation for its proposed Capacity Distribution System (CDS) on 5 February 2004 – a capacity rationing system under which a System Administrator set coal producer loading allocations. Re-authorisations of evolving (and increasingly complex) versions of the CDS were then sought and re-granted in April 2005, and May 2007. As a simple quantity (rather than price) rationing system, there is no reason to believe that the capacity allocations are efficient, in the sense of allocating capacity to those exporters who place the highest valuation on the exports. Indeed it has been suggested that producers with limited scope to expand their mines and increase exports have blocked investment proposals.

239 Furthermore, while the successive CDSs that have been applied in recent years appear to have limited shipping queues off the Port of Newcastle, their application has been problematic in other respects:

- The fact that coal handling allocations under the medium term CDS apply for only one year (and are reset annually to reflect new applications) has limited the ability of exporters to enter into long-term coal supply contracts with customers;[114] and
- Since exporters had set their production plans to reflect their handling allocations, they have generally not been in a position to expand output at short notice to offset other producers' production shortfalls.[115]

240 To date, actual throughput for PWCS' facilities has consistently been lower than its nominal declared capacity. Furthermore, there are a number of uncertainties:

- PWCS's planned expansion plans beyond 105mtpa are 'planned' or 'under evaluation', rather than firm.
- Even were PWCS to expand, the ability of train operators to deliver committed infrastructure augmentations is uncertain. Queensland Rail, which also delivers coal to a Dalrymple Bay port in Queensland, for instance, has been criticised for an expected reduction in the volume of coal shipped by Queensland railways in 2007 by 15 per cent on 2006 levels.[116]

114 Wisenthal, S. , 'Port, Rail Bottlenecks Threaten Revenue', *Australian Financial Review*, 21 April. 2007. Under the short term CDS allocations had been determined quarterly. Also, while the CBS has been reinstated for 2007, the ACCC authorisation does not allow for a CBS in 2008.

115 Main, Andrew, 'Flaws in the system', *Australian Financial Review*, 17 June 2005.

116 'The Need for Investment in Infrastructure is Urgent', The Australian, 28 May 2007.

- Additionally, to the extent that the rail infrastructure businesses are state-government owned (Queensland Rail) or otherwise rely on government funding (ARTC and RIC), they must compete with other government businesses for investment financing.

241 The difficulties that have been experienced at PWCS highlight the fact that potential limitations to coal exports can arise from any or a combination of limitations in port, track and train infrastructure. While work on capacity expansion projects has begun, the status of many is uncertain, as is their degree of overall coordination, reducing the ability of industry participants to plan their corresponding operations and investments longer-term.

The Pilbara iron ore supply chain

242 It is worth contrasting the outcomes in vertically disaggregated rail and port industries with those for the integrated Pilbara iron ore supply chain system in Western Australia where the iron ore railways have always been privately owned by the mining businesses whose ore they ship since their origins in the 1960s.[117] In spite of the substantial and unexpected world demand for iron ore – similar in scale to the boom in coal demand – the integrated Pilbara mine to port systems have never suffered durable and significant capacity constraints. Indeed, capacity of the system as a whole has been increased over last 30 years and continues to increase steadily.[118] Moreover, capacity has been increased through a mix of mine, rail and port expansions, coordinated in their timing and optimised so as to minimise system costs.

243 For instance, in 2006 Rio Tinto announced an investment of $940 million in stage 2 of its Dampier port expansion to increase export capacity by 24 million tonnes by the end of 2007, and stage 2 of its Cape Lambert port upgrade of $302 million to increase capacity by 19 million tonnes.

244 Equally, BHPBIO has two separate rail, port and mine upgrades under construction expected to cost $783 million and $2.08 billion respectively.[119] Reflecting steady capacity expansion, BHPBIO's output (measured in million wet tonnes OFR) has increased steadily from around 65 million tonnes in 2000 to around 105 million tonnes this year, with further increases to over 155 million tonnes planned. Despite very sharp demand increases and output growth, there have been no unscheduled increases in queuing times for loading or other indicators of system dysfunction.

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117 Evans and Peck 2004, *Pilbara Iron Ore Rail Access Public Interest Study,* for the Department of Industry and Resources.

118 Evans and Peck 2004, *Pilbara Iron Ore Rail Access Public Interest Study,* for the Department of Industry and Resources.

119 ABARE 2006, *Australian Commodities June Quarter 2006*, pp. 326-327.

245 Corresponding export earnings provide an indication of the benefits of unified control of investment, in terms of the ability of businesses to rapidly respond to commercial opportunities. The Centre for International Economics estimated in a recent study that the Pilbara iron ore industry generates $15 billion annually in export earnings, amounting to 1.5 per cent of GDP. By the same token, the magnitude of these figures provides an indication of the potential losses foregone in terms of coal export earnings as a result of a failure to invest in and optimise the ongoing control of the relevant supply chain.

246 In contrast, the poor record of investment in the vertically separated coal mine/port/rail facilities may have had a crucial dampening effect on the ability of coal mines to benefit from the resources boom.The Centre for International Economics also found that between 1990 to 2006, iron ore exports were about two to three times more responsive to changes in market conditions than coal, with this responsiveness particularly marked in recent years. For instance, while iron-ore exports have increased by 55 per cent since 2002, coal exports have increased by only 18 per cent (or 4 per cent a year — little more than the growth in GDP) despite experiencing similar pricing and demand trends.[120]

247 A comparison of the performance of one of the integrated Pilbara rail systems – the Mt Newman line – with that of the structurally separated Hunter Valley coal chain (encompassing Port Waratah) further illustrates the gap in efficiency resulting from different investment and operational incentives.

248 BHP Billiton Iron Ore Pty Ltd ('BHPBIO') undertakes mining, blending and other processing of various types of iron ore in the Pilbara region of Western Australia. Ore is then transported from the mine to BHPBIO's port facilities the Mt Newman line, as well as the Goldsworthy line, from where it is exported. BHPBIO has developed a number of systems to ensure the seamless operation of interdependent components of the iron ore chain, including the application of one of the heaviest haul railway technologies in the world requiring a specially strengthened track structure, along with proprietary wheel profiles and rail grinding technologies.

249 The Hunter Valley coal chain is also a bulk mineral export system of nationally significant scale that exports approximately similar volumes of coal to BHPBIO's iron ore. While average haul distances are shorter in the Hunter Valley, the data from public sources indicates that:[121]

120 Centre for International Economics 2006, *National Competition Policy Access Regimes and the National Interest: The case study of iron ore.*

121 See CRA International, *FMG Application to Access Mt Newman Railway Line under Part IIIA: A report for BHP Billiton Iron Ore*, June 2005, pp. 86-88, available at: http://www.ncc.gov.au/pdf/DERaFoSu-015.pdf.

- The intensity of track usage, indicated by the number of millions of gross tonnes kilometres per track kilometre, is more than twice as high on the Mount Newman line in the Pilbara as in the Hunter Valley;

- An approximately equal number of tonnes of product requires nearly five times as many train trips in the Hunter as in the Pilbara;

- BHPBIO's locomotives work more than twice as hard, in terms of millions of gross tonne kilometres per locomotive per annum, and their wagons are significantly more intensely utilised than those in the Hunter system.

250 If asset utilisation rates comparable to those in the vertically separated Hunter Valley system were imposed on the Mount Newman system, then the equivalent of an additional 593 track kilometres of rail infrastructure would be required merely to haul existing output. Even at the relatively conservative rate of $2m per track kilometre, the additional capital cost would be over $1 billion—more than doubling the necessary investment in rail track. Approximately twice as many locomotives at a capital cost of $4m per locomotive would be required, costing approximately $250m in additional capital expenditure. In addition to those costs, up to twice as many wagons would be required. At the conservative rate of $100,000 per wagon, the additional capital cost would be $220m. In total, the additional capital costs inflicted by complete vertical separation of mines, port, rail infrastructure and train operations would be in the order of $1.5billion **for no additional iron ore output**. This figure represents an approximate doubling of the capital cost to replace the existing railway assets.

5.3. AIRPORTS

251 The experience with airports is of relevance for two reasons.

252 First, Section 44(1) of the Airports Act 1996 prevents airlines from owning airports. As a result, airports have no ownership interest in aviation. However, contrary to the claims made in the NERA Report, vertical separation has not prevented anti-competitive discrimination. Rather, in *Virgin Blue Airlines Pty Limited*,[122] the Australian Competition Tribunal found that Sydney Airport Corporation Ltd ("SACL") had chosen a pricing arrangement for aeronautical services which was inefficient but which favoured one of its larger customers because it gave that customer a competitive advantage over its main domestic rival and in doing so "misused its monopoly power".[123]

122 *Virgin Blue Airlines Pty Limited* [2005] ACompT 5

123 At paragraph 218.

253 Second, experience under the Necessary New Investment (NNI) processes put in place for Australian airports is illustrative of the difficulties that arise in coordinating investment in a vertically separated structure that, while similar to the G9 proposal, is much simpler in both technological and commercial terms. In common with the G9 proposal, the NNI regime required agreement with access seekers as a precondition for new investment.

254 However, as set out below, even in industries where, viewed overall, separate functional layers appear to work well, obtaining agreement when there are multiple access seekers with differing incentives can be very problematic. The fact that the NNI scheme was abolished is to a large part due to the incentives for 'gaming' that it created, to the point where it became unworkable. Moreover, the fact that investment delays have still occurred even after abolition of the NNI regime highlights that difficulties can be expected even with a simpler decision-making process than that proposed by the G9.

5.3.1. Design and outcomes of NNI processes

255 Prior to the deregulation of Australian airports in 2002, the price cap arrangements that airport operators were subject to required them to seek ACCC approval for charges in excess of the price cap, to recoup costs associated with Necessary New Investment (NNI). NNI provisions were intended to allow for increases in expenditure above the price cap for investments where the airport operator could demonstrate that 'users with a significant interest in the new investment supported the investment, including the associated charges'.[124] The ACCC then assessed the proposals against the guidelines in the Prices Surveillance Act. These required the ACCC to assess any investment proposal against:[125]

> *(a) the operator's plans for new investment or service innovation and the associated costs;*
>
> *(b) the relationship between the proposed increases in aeronautical charges and the costs (including the level of the rate of return) of the new investment or service;*
>
> *(c) support from airport users with a significant interest in the investment for the operator's proposals, including in relation to charging changes;*
>
> *(d) contribution of the new investment/service to productivity improvements at the airport;*
>
> *(e) overall efficiency of the airport's operation;*

124 Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, p.52.

125 *Prices Surveillance Act 1983* (Cth), Direction No 13.

> *(f) the particular demand management characteristics of individual airports, including any demand management schemes in place, capacity constraints and any under utilisation of the airport infrastructure;*
>
> *(g) airport performance against quality of service measures, including services under the control of the airport operator;*
>
> *(h) airport performance vis a vis other Australian airports and any comparable international airports; and*
>
> *(i) the extent to which the proposed investment will facilitate the operations of new entrants to domestic or international aviation.*

256 However, despite the NNI provisions being designed in some ways to mimic commercial negotiations, there were numerous examples of difficulties, including delays with the resurfacing of a runway at Perth airport, and indefinite deferment of investments by Northern Territories Airport, including some that had been approved under the NNI scheme.[126]

257 A key highlighted problem with the arrangements was the significant opportunities created for gaming between airlines and airports. In its 2002 Inquiry into the Price Regulation of Airport Services, the Productivity Commission (PC) noted its concern with gaming by airlines:[127]

> *However, there are several reasons why airlines, particularly incumbent airlines, might have incentives that conflict with efficient provision and pricing of new investment. If an investment in increasing aeronautical capacity provides benefits to new entrants, existing airlines will have an incentive to delay that investment. Even if the existing airlines expect to receive net benefits in a direct sense from such an investment, the total impact on them may be negative because of the facilitation of increased competition. The significant reductions in airfares that have occurred on routes with new entrants indicate the size of these potential costs for incumbent operators.*

258 The PC also noted concerns associated with strategic behaviour of tenants of shared services:[128]

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126 Northern Territories Airport indicated that it had deferred the implementation of projects approved for price increases by the ACCC but for which costs (and hence the necessary price increase) had risen during the extended regulatory process. See Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, p. 241.

127 Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, pp. 234-235.

128 Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, p. 235.

> *The ACCC (sub. 36, appendix D) pointed out that the shared nature of airport terminals has encouraged strategic behaviour by potential tenants trying to minimise their share of the terminal costs. Such behaviour has been observed in negotiations regarding the new terminals at Melbourne and Adelaide airports. It is difficult for a regulator (or an airport) to disentangle the genuine from the strategic aspects of such claims. Different airlines do have different requirements for terminal and other facilities, but they are likely to exaggerate these when negotiating airport charges — even in the absence of a regulator.*

259 In its findings, the PC concluded that the NNI scheme had fundamental problems and that it had failed to promote the desired commercially negotiated outcomes:[129]

> *The necessary new investment provisions have not promoted the commercially negotiated outcomes that were envisaged by the architects of the regime. This has been partly due to the need to develop criteria and procedures for necessary new investment after purchase and for participants to adapt to the very different business environment following airport privatisation.*
>
> *However, the observed difficulties also point to some fundamental problems. In particular:*
>
> *the lack of transparency regarding what investment was considered to be included in the base aeronautical prices and what was to be covered by necessary new investment, with resultant effects on incentives to invest;*
>
> *the incentives for some participants to approach the regulator rather than achieve commercially-negotiated solutions;*
>
> *the high costs of complying with the regime; and*
>
> *the regulatory risk due to the uncertainty and delays introduced by the need to have every investment-related price increase vetted by the regulator.*

260 The PC also recommended that the process for approving investment needed to be explicitly set out in a clear manner where multiple parties were involved in the decision-making process:[130]

> *Where price caps are implemented, the approach adopted for investment should be spelled out clearly and transparently to all relevant parties from the outset, in order to reduce the risk of inefficient outcomes and excessive gaming. (part of finding 10.1)*

129 Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, p. 245.

130 Productivity Commission 2002, *Price Regulation of Airport Services*, Report no. 19, AusInfo, Canberra, p. 308.

5.3.2. Recent investment outcomes

261 Although the NNI provisions have now been removed and replaced by a relatively light-handed price monitoring scheme, coordinating airport investment remains difficult. There have been disputes between airlines and airports over prices to be paid for airline facilities that have been upgraded since expiry of the NNI regime, including, for example, those required to accommodate the A380 Airbus. This example is instructive, since access seekers' incentives were not aligned as not all airlines had ordered the new aircraft.

262 In a submission to the PC inquiry, the Board of Airline Representatives (BARA) highlights general difficulties it has had in negotiating with SACL, including its very limited ability to verify SACL's claimed costs or how these should be allocated between members:[131]

> *BARA and airline representatives devoted considerable time to reviewing the pricing information provided by SACL. The analysis undertaken by BARA and airline representatives indicated that the current base aeronautical charge over-compensates SACL for its capital and operating costs and for its reasonable rate of return. It is estimated that this over-compensation is at least $1.00 per arriving and departing passenger and may be as high as $2.20.*
>
> *However, BARA is unable to accurately quantify the extent of over-compensation to SACL because SACL has not justified the prices sought by providing fully transparent cost information. SACL has recently notified airlines that it intends to increase aeronautical charges as from 1 July 2006. In the absence of the necessary supporting information, BARA cannot determine the efficient overall price that should apply at Sydney Airport. Consequently, BARA has formed the view that there is no justification for SACL to increase aeronautical charges as proposed in the recent notification. To the best of BARA's knowledge, the current aeronautical charge already over-compensates SACL for its aeronautical costs by a greater amount than the proposed price increase.*

263 For its part, SACL argued that airlines were unwilling to negotiate new agreements due the limited ability for SACL to deny access to Sydney airport and the potential for re-introduction of regulation that in effect provided an option value to waiting, would provide a one-way bet to access seekers:[132]

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131 Board of Airline Representatives of Australia (BARA), *Submission to the Productivity Commission's inquiry into price regulation of airport services,* June 2006, p.16.

132 Sydney Airport Corporation Limited, *Submission to the Productivity Commission Inquiry into price regulation at airport services*, July 2006, p. 25.

In addition, the prevailing nature of the regulatory environment in which these negotiations have been progressing has itself provided an inducement for airlines, quite rationally, not to conclude final agreements. This is because, in so doing, they may deprive themselves of further advantage that they perceive might otherwise arise through either the Virgin Part IIIA proceedings or this scheduled Productivity Commission review.

Thus, the fact that these new-style agreements have not been finally concluded does not in any way indicate that mutually acceptable commercial agreements cannot be reached between airports and airlines (or, even more particularly, between SACL and airlines), or that greater regulatory intervention is warranted.

Rather, if anything, it demonstrates the desirability of clarifying the ambiguity of the current regulatory arrangements and leaving airports and airlines to get on with the task of achieving enhanced commercial arrangements against a background in which, as in other industries, Parts IIIA, IV and VIIA of the TPA provide sufficient protection against unjustifiable conduct.

5.4. CONCLUSIONS

264 The case studies reviewed in this section show that difficulties in coordinating efficient investment have occurred in all major infrastructure sectors, even in industries where structural reform has generally been considered to be successful. In other words, the mere fact that it may be relatively straightforward to delineate the various functions in an industry to give effect to structural separation is a necessary, but by no means sufficient, condition for concluding that structural separation will be beneficial.

265 Overall, the case studies suggest that structural separation even in mature network industries with stable functional boundaries can give rise to the following inefficiencies:

- The difficulties in coordinating major investment projects that affect or require the involvement of different functional layers in the energy, rail, ports, and airports sectors indicate that significant additional costs can be incurred through structural separation. These costs will be magnified under the G9 proposal, as network upgrading under that proposal not only requires coordination between Telstra's copper network and the G9's proposed FTTN network, but also requires collective decision making by all access seekers (with divergent commercial interests) over FTTN investment.

- Vertical integration internalises problems associated with the need to successively adapt contractual relationships in situations where parties operate over long time periods in an uncertain environment. Vertical separation eliminates that internalisation and hence plays the burden of securing coordination on formal agreements, which are costly to secure, often difficult to enforce and even more difficult to update. The DBCS and PWCS case studies highlight particularly well the difficulties that arise in coordinating investment in a fragmented industry as the investment environment changes. The structure proposed by the G9 is especially vulnerable in this respect, given the likely divergent commercial interests of its members and the fact that the relative bargaining power of access seekers will change over time.

- Investment outcomes in many of the case studies reviewed here have suffered from the incentives created for industry participants to engage in opportunistic behaviour reflecting their specific commercial interests. The role provided to access seekers in investment decisions of FANOC creates a significant risk of similar outcomes.

266 Structural separation in telecommunications raises far greater complexities and difficulties than those encountered in gas, electricity, rail, ports and airports. These complexities and difficulties arise from the technically dynamic nature of the telecommunications industry, which make it difficult to determine the appropriate functional 'boundaries', and from the substantial uncertainty that characterises demand and supply conditions going forward. In essence, securing the gains from the continued rapid development of telecommunications technology requires an integrated operation that spans networks and services, fixed and mobile, conduit and content. Placing artificial barriers to such integrated operation is likely to be deeply counterproductive. Not only will this cause costs to rise but even more importantly, it is likely to mean that consumers do not get the full benefit of new products and services.

5.5. POSTSCRIPT: ASSESSMENT OF NERA'S CLAIM THAT THERE ARE CLOSE ANALOGIES BETWEEN THE SPEEDREACH/FANOC MODEL AND OUTSOURCING IN THE ENERGY INDUSTRY

267 While the NERA Report generally makes claims without providing substantiating evidence, it does advance the specific claim that the proposed outsourcing arrangements between FANOC and BAS Manager (SpeedReach) are consistent with arrangements in the energy sector:

> *The economic effect of the SAU is that SpeedReach effectively outsources the provision of network services to the FANOC. The SAU creates a similar relationship between the parties as do other long term outsourcing contracts - such as those that are common in the electricity and gas industries.*

268 Outsourcing arrangements for capital expenditure and operating expenditure are not uncommon. NERA notes an arrangement between Envestra and OAEM of this nature:

> *We note that such arrangements are commonplace in negotiated commercial arrangements. For example, Envestra, a gas distribution company, outsources most of its operating and capital expenditure under a contract to OEAM, a division of Origin Energy. Envestra discloses aspects of that contract on its website including that Envestra must approve the appointment of OEAM's General Manager, and each year, Envestra must approve OEAM's Budget as well as its proposed operating activities and key performance indicators. Envestra notes that this gives it the means to 'ensure that OEAM performs to acceptable standards'*

269 Although Origin Energy owns 17 per cent of Envestra, the proposed arrangements between FANOC and BAS Manager are entirely different to outsourcing arrangements in the energy sector:

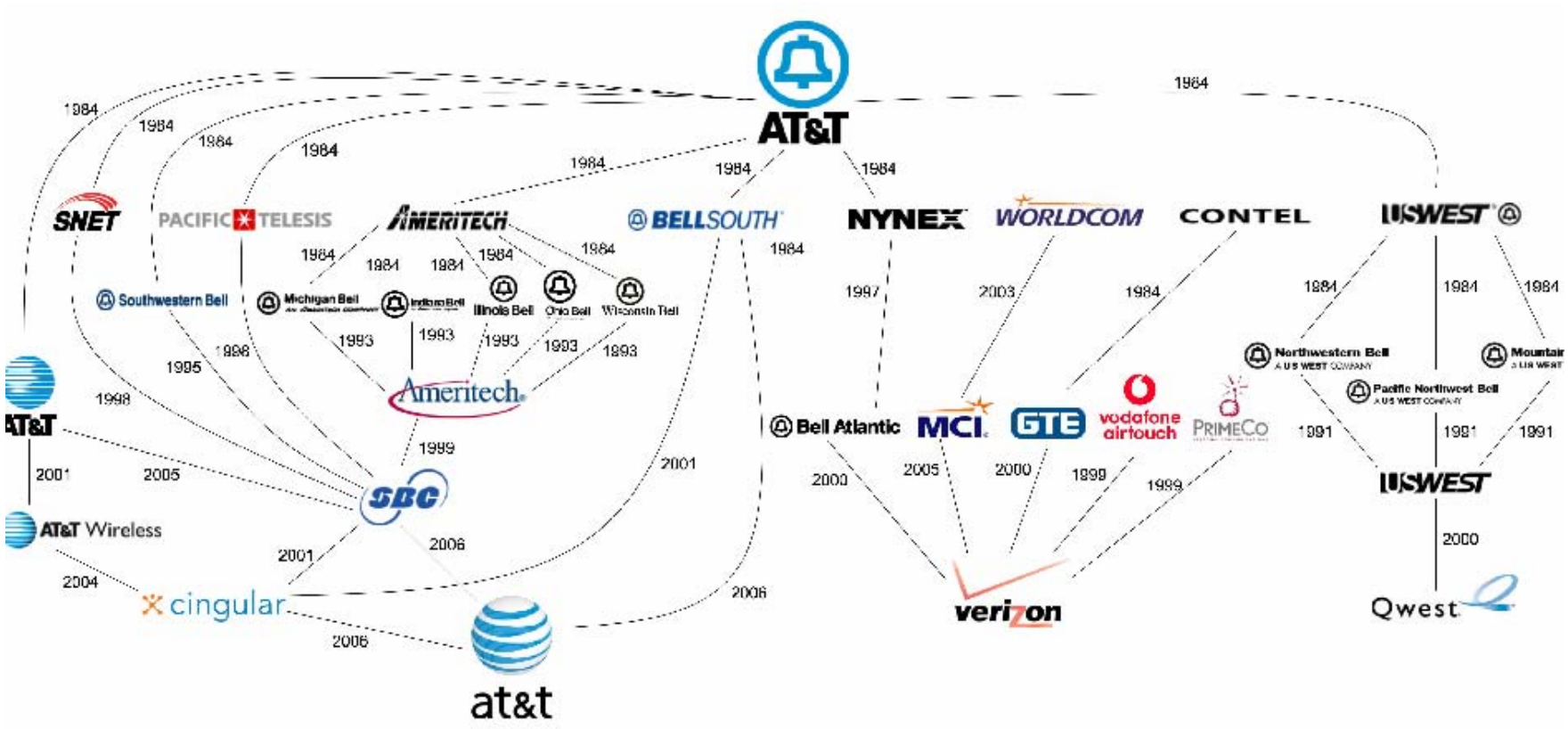
- The purpose of outsourcing arrangements as undertaken by Envestra is to obtain efficiencies in the **implementation** of an agreed capital and operating program; while
- The G9 arrangements involve the vesting of actual **decision making** powers associated with the capital and operating expenditure of FANOC in an outside body.

270 Origin Energy is not a controlling shareholder in Envestra.[133] Therefore, it does not have a decision-making role in Envestra along the lines that SpeedReach will have with FANOC. This means that Envestra remains largely in control of its capital and operating expenditure at all times. This control over its expenditure is enhanced through its ability to influence appointments to OEAM. Furthermore, there is nothing to stop Envestra from outsourcing its capital and operating expenditure functions to a different entity (other than OEAM) over time or bring these functions in-house. To this extent the arrangement are closely akin to a sub-contracting arrangement, which has little or nothing in common with the arrangement proposed by G9.

133 Furthermore, Origin Energy is not a coalition of users and therefore the analogy drawn by NERA is also invalid in this respect.

271 As long as the market for outsourced services facing Envestra is competitive, then the risk of inefficient investment is low. Additionally, should that risk arise, or should complexities and delays arise in the relation between Envestra and OEAM, Envestra retains the option of reintegrating the construction and operation function. This is in obvious contrast to the structure set out in the G9 proposal.

APPENDIX A: OVERVIEW OF STRUCTURAL CHANGES IN THE US TELECOMMUNICATIONS SECTOR



Source : http://www.freepress.net/ownership/att_history.jpg

APPENDIX A - CV

HENRY ERGAS

M.Ec.Stud. (High Distinction)
University of Queensland

B.A. (Econ) First-Class Honours
Sussex University

Henry Ergas spent a decade as a micro economist at the OECD in the 1980's, focusing on the analysis of issues affecting efficient resource allocation. At the OECD, he headed the Secretary-General's Task Force on Structural Adjustment, which concentrated on improving the efficiency of government policies in a wide range of areas. As part of this work, and subsequently, he has examined the design of systems for allocating scarce resources over a range of issues from the allocation of R&D funds through to the design of congestion charging. His work on innovation policies, originally carried out at the OECD, has been influential in the design of R&D policies in a wide range of countries.

Since leaving the OECD, Henry's work has focused on competition policy and regulatory economics. He has been closely involved in dealing with regulatory issues in a range of industries, including telecommunications, electricity, aviation, surface transport, and financial services.

Prior to joining CRA International, he was the founder and Managing Director of the Network Economics Consulting Group (NECG) Pty Ltd, which became part of CRA in November 2004.

EXTERNAL APPOINTMENTS

2006 *Member,* Defence Industry Consultative Group reporting to the Australian Minister for Defence

2005 *Member*, Prime Minister's Taskforce on Exports and Infrastructure

2004 *Adjunct Professor*, School of Economics, National University of Singapore

2004 *Member*, Australian Centre of Regulatory Economics (ACORE) Advisory Board

2004 *Member,* French Ordre Nationale du Merite

2002 *Editorial Board*, *The Review of Network Economics* at www.rnejournal.com

2001 *Lay Member, New Zealand High Court* in cases involving appeals from decisions of the Commerce Commission and other matters under the Commerce Act

1999-2000 *Chairman*, Intellectual Property and Competition Review Committee, Attorney-General's Department, Australia

1998-2004 *Member*, Commissione Scientifica, Telecom Italia, Rome, Italy

1997 *Member*, Advisory Panel on Telecommunications Reform to the Minister for Communications and the Arts, Australia

EMPLOYMENT HISTORY

Present *Vice President and Regional Head, Asia Pacific,* CRA International

1996–2004 *Managing Director*, Network Economics Consulting Group (NECG), Australia

1995–1997 *BellSouth NZ Visiting Professor of Network Economics and Communications*, The University of Auckland, New Zealand

1994–95 *Visiting Professor*, Kennedy School of Government, Harvard University

1*993–1997 Advisor, Trade Practices Commission, Canberra, Australia*

1991–1993 Counsellor for Structural Policy, Economics Department, OECD, Paris

*19*87–1991 *Professor*, Graduate School of Management, Monash University, Melbourne

1978–1987 Administrator, Principal Administrator, and subsequently Counsellor, OECD, Paris

ACADEMIC

Henry Ergas has held teaching positions at a number of leading institutions. He has taught at the Kennedy School of Government at Harvard University and been a consultant to the RAND Corporation in Santa Monica, California; an adviser to the Australian Trade Practices Commission (now the ACCC); and a visiting professor at the Centre for Research in Network Economics and Communications at the University of Auckland. He was a Professor in the Graduate School of Management at Monash University and taught at the Ecole Nationale de la Statistique et de l'Administration Economique in Paris. Currently, Mr Ergas is an Adjunct Professor of Economics at the National University of Singapore.

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