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**FINAL REPORT - PUBLIC**

**Prepared For:**

Mallesons Stephen Jaques

Governor Phillip Tower

Sydney, NSW

Expert Report by  
Dr Paul Paterson of CRA  
International for Mallesons  
Stephen Jaques on the ACCC  
Discussion Paper 'Telstra's  
domestic PSTN originating  
access service exemption  
applications' August 2007

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## 1. BACKGROUND

My name is Paul Paterson. I am a Vice President with CRA International. My curriculum vitae, including qualifications, experience and publications, is included in Appendix C.

In October 2007, the Australian Competition and Consumer Commission ('the Commission') released a discussion paper ('Discussion Paper') on Telstra's domestic PSTN originating access ('PSTN OA') exemption applications.<sup>1</sup> I have been asked by Telstra, through the offices of Mallesons Stephens Jaques ('MSJ'), to provide an expert report on specific issues raised by the Commission in the Discussion Paper. My instructions from MSJ are reproduced in Appendix D. I note that I have prepared for MSJ an earlier expert report on Telstra's PSTN OA exemption application ('original report').<sup>2</sup>

This report has been prepared with regard to the Federal Court's 'Guidelines for Expert Witnesses and Proceedings in the Federal Court of Australia', which are included in my instructions from MSJ. I note that I have benefited from helpful drafting, comments and suggestions from my colleague at CRA, Senior Consultant Eric Ralph, but the views expressed in this report are entirely my own.

The remainder of this report is structured as follows:

- In Section 2, I consider questions raised by the Commission relating to issues of market definition;
- In Section 3, I consider competition in the relevant markets;
- In Section 4, I consider questions relating to whether exemption will promote the efficient use of and investment in infrastructure.
- In Appendix A, I present revised modelling of the viability of serving voice-only customers using ULLS, based on updated and more detailed data provided to me since completing my original report;
- In Appendix B, I present the results of minimum efficient scale sensitivity analysis conducted by Telstra.

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<sup>1</sup> ACCC, "Telstra's domestic PSTN originating access service exemption applications", Discussion Paper, October 2007 ('Discussion Paper').

<sup>2</sup> Telstra, "Statement by Dr Paul Paterson of CRA International for Mallesons Stephen Jaques on the Economic Considerations for a PSTN Originating Access Exemption", Annexure A to "Telstra's PSTN Originating Access Exemption Application – Supporting Submission", October 2007.

## 2. MARKET DEFINITION

The Commission asks:

*What are the relevant markets that would be affected by the granting of an exemption? How should these markets be defined? What evidence of demand and supply-side substitutability supports that market definition?*

The Commission, in its Fixed Services Review, emphasises the importance of a purposive approach to market definition for declaration (and by inference, exemption) inquiries.<sup>3</sup> I agree with the Commission's view. With this in mind, I set out the dimensions of the relevant markets below which in my view are most useful for the current competition analysis, namely whether PSTN OA exemption is likely to promote competition in the relevant downstream markets and more generally be in the long-term interests of end-users (LTIE). The market dimensions I outline here are consistent with those proposed in my original report.

### 2.1. THE DOWNSTREAM MARKET

It is conventional to divide telecommunications supply functionally into upstream (wholesale) and downstream (end-user or retail) markets. For the purposes of this discussion (and without prejudice), I accept that distinction.<sup>4</sup> Given that, it is helpful to first focus on downstream markets as all upstream demand is derived from end-user demand, and it is outcomes in downstream markets that impact most directly on the LTIE.

As explained in detail in my original report, in my view the relevant retail product market can, for the purpose of discussing this exemption, be defined as the cluster market for the full bundle of fixed voice services.<sup>5</sup> The market potentially also includes broadband services.

Geographically, the relevant markets are most straightforwardly defined by ESA boundaries. I see this as the relevant market as:

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<sup>3</sup> See ACCC, 'Fixed Services Review', April 2007, pp32-33

<sup>4</sup> I do this with some caution as it is possible, and even likely, that supply-side substitution is sufficient that any hypothetical monopolist over all retail operations would be unable to engage in a SSNIP due to immediate retail entry from wholesale suppliers. That is, consideration of the competitive characteristics of the retail market is not independent of the situation in the wholesale market.

<sup>5</sup> These services are basic access and local, national long distance, international and fixed-to-mobile calls. I note that while a broader product market may apply, this would not change the essence of the conclusions I come to in this report.

- a narrower market definition would present analytical challenges and not accord with commercial reality; and
- if a broader market definition is called for, it is likely this can be obtained without loss by simply aggregating ESAs.

I now expand on these points.

### 2.1.1. Product dimensions

Although PSTN OA is primarily used for the supply of retail long distance, international and fixed-to-mobile services, both demand-side and supply-side factors point to a retail product market which encompasses all fixed voice services and not these call services alone. These factors are discussed below. Arguably, the product market extends beyond fixed voice services to include broadband and mobile voice services.

#### *Demand side factors*

Relevant demand characteristics also point to a market definition that is broad in its product dimension, in particular the prevalence of bundling.

Increasingly consumers are purchasing bundled fixed voice services. As I noted in my original report, the share of Telstra retail customers taking Home Line Part or Business Line Part (the products allowing use of another carrier for long distance calls) has fallen from [c-i-c] to [c-i-c] in the last 3 years.<sup>6</sup> This implies that [c-i-c] of Telstra's 7.78 million retail fixed line customers are now bundling basic access with local and long distance voice services.<sup>7</sup> This evidence of consumer preferences in favour of bundled voice offerings further supports my view that the relevant product market extends beyond individual voice services and includes the full bundle of fixed voice services. If a hypothetical monopolist offering just one voice product were to impose a price increase, there would be scope for consumers to switch to bundled offerings, thus rendering the increase unsustainable.

#### *Supply side factors*

Defining a retail market for the full bundle of retail fixed voice services is further warranted on the basis of scope for supply side substitution. Once a retailer has made the investments in retailing functions necessary to supply a particular subset of retail fixed voice products, that same retailing function can in general be readily used to supply an additional retail fixed voice service.

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<sup>6</sup> [c-i-c]

<sup>7</sup> Telstra reported 7.78 million retail fixed line customers in June 2007. See: Telstra, 'Results and operations review, year ended 30 June 2007'

Similarly, substantial network costs are incurred to supply any customer any type of calling (or broadband) service, and these are shared over many customers (for example, the DSLAM in an exchange) or over the customer (for example, the cost of obtaining access). Consequently, any additional costs associated with moving to supply an additional fixed voice service are likely to be low.<sup>8</sup>

### *Competition from new technologies*

As I also note in my original report, there is strong market evidence of substitution away from PSTN-based fixed voice services. In recent years, such substitution has chiefly been towards mobile services.<sup>9</sup> However increasingly, traditional PSTN-based voice services are also being substituted for by VoIP.<sup>10</sup>

Whilst VoIP technology development and deployment is still in its infancy relative to PSTN services, I note that a number of operators have begun offering VoIP to end-users on a significant scale and are seeing strong growth in their subscriber numbers.<sup>11</sup> This indicates that even if VoIP is not viewed as a fully substitutable service at present, it is likely to become so in the near future.

It could be argued that negative consumer perceptions of VoIP call quality are a barrier to this occurring. However, if this is the case I do not see this as an enduring barrier, for two reasons:

- First, most end-users will not be aware of the technology being used to provide voice services by carriers. As a result these negative consumer perceptions, if they exist, will not limit substitution occurring.

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<sup>8</sup> A DSLAM-based entrant can provide the full suite of voice services by either using standard PSTN technology, POTS emulation (these first two options require ULLS) or carrier grade VoIP. [c-i-c].

<sup>9</sup> For example between 2003-04 and 2005-06, the ACCC reported a 6.4% decrease in fixed basic access lines in operation and a 23.3% increase in the uptake of mobile services. See: ACCC, 'Telecommunications market indicator report 2005-06', August 2007.

<sup>10</sup> I note that increasingly this is VoDSL (including "carrier grade" VoIP) and VoBB more generally (including voice services provided on HFC networks).

<sup>11</sup> For example iiNet has recently started offering naked DSL and includes a free broadband phone plan with every naked DSL plan (see [www.gonaked.com.au](http://www.gonaked.com.au)). iiNet reported 35,000 VoIP subscribers in June 2007, a 50% increase on a year earlier. Similarly, Engin reports that it now has over 60,000 VoIP subscribers, a threefold increase on its subscriber numbers of January 2006 (see <http://www.engin.com.au/about/about.aspx>).

- Second, these perceptions do not accord with the technical realities of carrier grade VoIP and accordingly are likely to change over time. Whilst public internet-based VoIP (e.g. the original Skype-type services) can be of inferior quality due to the “best endeavours’, take it as you find it’ nature of the World Wide Web, carrier-grade VoIP (now universally used in core network transmission of voice services) is typically indistinguishable from, and in fact can be superior to, traditional PSTN-based voice services.<sup>12</sup> Hence insofar as consumer perceptions are relevant, as consumer understanding of this distinction develops, any legacy resistance to VoIP is likely to fall away and ready substitution between traditional and IP-based voice services will occur.

The increasing availability and uptake of VoIP services raises the possibility that such services place some competitive constraint on traditional fixed line operators. Indeed the Commission has acknowledged this potential constraint since mid-2006:<sup>13</sup>

*VoIP service offerings (through low cost or zero cost calls and value-added data services) have the potential to provide a competitive alternative to traditional fixed-line (circuit-switched) voice and data services and more access-based competition because they can be provided over existing broadband services without duplicating extensive access infrastructure networks. [...]*

This has two key implications in the context of the exemption application: first, it implies that not only ULLS-based providers, but also LSS-based providers offering VoIP, are likely to increasingly constrain Telstra’s behaviour in the retail market for voice services;<sup>14</sup> and second, it means that where LSS-based providers are currently providing VoIP in addition to broadband, barriers to them switching to ULLS-based supply are particularly low.

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<sup>12</sup> [c-i-c]

<sup>13</sup> ACCC, ‘Declaration inquiry for the ULLS, PSTN OTA and CLLS: Final Determination’, July 2006 pp34-35

<sup>14</sup> An LSS requires that the end customer purchase a basic access service provided over the same access line as LSS. At present this can be done by purchasing the basic access service from Telstra (the Home Line Part product comprises just basic access and local calls, while other Home Line products include domestic long distance, international and fixed-to-mobile calls), or from an entrant that acquires WLR and LCS from Telstra and on-sells these services to end customers. If LCS and WLR are exempted and Telstra chooses not to supply LCS/WLR then the use of LSS would require the end user to purchase basic access from Telstra. Telstra would not be able to refuse supply due to its universal service obligation, and is constrained in the price it can charge for this service by retail price cap requirements. Under its Universal Service Obligation, Telstra must provide basic access to a standard telephone service to all people in Australia on an equitable basis (see Part 2 of the *Telecommunications (Consumer Protection and Service Standards) Act 1999* (Cth)) and under the retail price controls, the price of Telstra’s basic line rental products can only increase (at most) by the rate of inflation (see [http://archive.dcita.gov.au/2007/11/connect\\_australia/new\\_telstra\\_retail\\_price\\_controls](http://archive.dcita.gov.au/2007/11/connect_australia/new_telstra_retail_price_controls)). I have argued in this and my original report that ULLS-based entry would constrain Telstra’s retail prices. This would, of course, also mean Telstra could not gain wholesale or retail profit through exploitation of customers supplied using Home Line Part or WLR (even in the absence of Telstra universal service obligation and retail price constraints). However, the point being made here is that even in the absence of ULLS, since these constraints prevent Telstra from claiming profits from customers that rely on wholesale or retail line rental, LSS providers place an independent competitive constraint on Telstra.



### 2.1.2. Geographic dimensions

As I indicate in my original report, for the purpose of this exemption I consider the relevant market to be geographically confined by the boundaries of the ESA. This view is based on supply-side considerations and market reality. A strict application of demand-side substitution tests in determining the geographic dimension of the relevant markets may lead to an unworkably narrow definition, such as the customer premise. In my view, a more practical geographic delineation in the context of the exemption application, and one that conforms to considerations of supply-side substitutability, is the ESA.

In geographic terms, supply side considerations suggest that the ESA provides a natural geographic boundary to the relevant market since the greatest scope for supply-side substitution is generally within that geographic unit.<sup>15</sup> Whilst I maintain that this geographic delineation is the most logical one in the context of this exemption, I acknowledge that geographic markets could arguably be defined more broadly.

The relevant market could, for example, encompass a number of ESAs with similar competitive characteristics. It is possible that a hypothetical monopolist in one ESA could be constrained by the threat of entry from a DSLAM-based provider currently located in a nearby ESA with similar competitive characteristics. For example, such a rival could simply use their current local support arrangements to deploy DSLAMs in neighbouring ESAs with conditions similarly conducive to competition. However, I consider the scope for such supply-side substitution more limited than it is within the ESA.

For these reasons in my view retail markets cannot be defined at a national level, as has previously been suggested by the Commission. I agree with the Commission's recent suggestion that the uneven emergence of facilities based competition means that national markets are becoming less relevant:<sup>16</sup>

*The uneven roll-out of competing infrastructure, and the uneven development of full-facilities and quasi-infrastructure competition in parts of Australia, raises the possibility that the competitive dynamics differ in discrete geographic regions... If competitive dynamics are substantially different in different geographic areas the case for maintaining a 'national' market scope for relevant markets is open to question.*

As Telstra argues in its exemption application, the rollout of competitive infrastructure in the proposed exemption area is indicative of materially different competitive conditions in this geographic area. For this reason, I believe that the exemption area should not be viewed as part of a broader national market.

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15 Telstra, "Statement by Dr Paul Paterson of CRA International for Mallesons Stephen Jaques on the Economic Considerations for a PSTN Originating Access Exemption", Annexure A to "Telstra's PSTN Originating Access Exemption Application – Supporting Submission", October 2007. This is not true where facility-based supply crosses ESA boundaries.

16 ACCC, 'Fixed services review: a second position paper', April 2007, pp34-35

In any case, my approach of defining the market at the level of the ESA will ensure appropriate geographic application of an exemption, since the factors that apply to a broad market definition of similar exchanges would also apply to the individual exchanges that make up that broader market.

## 2.2. THE UPSTREAM MARKET

The other relevant market is the upstream market in which PSTN OA is supplied, or in other words the set of wholesale services that are a close substitute for PSTN OA. For the purposes of this inquiry into Telstra's PSTN OA exemption application it is sufficient to make note of two important points:

- First, concerning the product dimension, in my view this market includes ULLS – that is, given the relevant downstream market, ULLS is a close substitute for PSTN OA since it allows entrants to provide the same retail services as PSTN OA (as well as many more). In my original report I have shown barriers to ULLS entry (including migration from LSS-based operations) to be low in the exemption area. I have also shown that ULLS is a viable alternative not only for servicing customers taking a full bundle of voice and data services, but additionally for the majority voice-only customers.<sup>17</sup> Furthermore, with the increasing substitutability of VoIP, LSS may also be, or soon become, a substitute for PSTN OA.
- Second, regarding the geographical dimension, I indicate in my original report that, for the purpose of this inquiry, I share the general Commission view the relevant geographic level is Telstra's ESAs.<sup>18</sup>

The Commission has asked whether PSTN OA would continue to be supplied, and what alternative suppliers of PSTN OA exist. In my view such an inquiry is ill-conceived since it places undue importance on the state of a segment of the *wholesale* market – that for originating access – and ignores the role of self-supply of services akin to origination by DSLAM-based operators and those using alternative networks. In addition, questions as to whether PSTN OA supply will continue assume that such supply is properly required for competition (and by implication, is efficient). In my view this should not be assumed, particularly in the case of wholesale products that have been created through regulation as a stepping stone to deeper competition.

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<sup>17</sup> Telstra, "Statement by Dr Paul Paterson of CRA International for Mallesons Stephen Jaques on the Economic Considerations for a PSTN Originating Access Exemption", Annexure A to "Telstra's PSTN Originating Access Exemption Application – Supporting Submission", October 2007. This analysis of voice-only customer viability is revised in Appendix A of this report, based on updated and more detailed information that has been provided to me.

<sup>18</sup> ACCC, 'Fixed services review: a second position paper', April 2007

Accordingly I do not have, nor consider it necessary to have, a firm view as to whether originating access will be supplied as a stand-alone wholesale product. Rather, I am of the opinion that such supply will occur to the extent that is efficient. If the supply of wholesale origination is efficient, then Telstra and its competitors will face incentives to supply. I note that in the US, the FCC has taken this view in forbearing from regulation some elements of Qwest's network where there is competition from the cable operator, Cox. The Commission has stated:<sup>19</sup>

*...given Cox's ability to absorb customers without any reliance on Qwest's local exchange facilities, Qwest will be subject to very strong market incentives to ensure that its network is used to optimal capacity – irrespective of any legal mandate that it do so. Faced with aggressive "off-net" competition from Cox, we predict that Qwest will endeavor to maximize use of its existing local exchange network, providing service at retail **and at wholesale**, in order to minimize revenue losses resulting from customer defections to Cox's service. In short, Qwest will prefer that a customer be served by a wireline competitor using Qwest's facilities at wholesale rates above that customer's use of Cox's network, which offers Qwest no revenue whatsoever but only a miniscule reduction in its costs [emphasis added].*

On the other hand if vertical integration is the efficient model, wholesale origination may not be actively traded, with competition in downstream markets occurring through vertically integrated operators self-supplying the operational equivalent of PSTN OA. In this situation competition will not be hampered in the retail market for fixed voice services. Rather, competition would be enhanced since increased vertical integration is likely to mean stronger competition on both price and non-price dimensions (see section 3.2 below).

Ultimately, the Commission's primary consideration in promoting the LTIE should be competition in the retail market for fixed voice services and efficient investment in and use of infrastructure. As I address later in this report, I am of the view that competition in this retail market will not be harmed and will in fact be deepened (section 3). Furthermore, exemption will remove some of the distorting effects of regulation and therefore promote efficient investment in infrastructure (section 4). Once this has been shown, in my view no further inquiry is necessary and in particular, inquiry into the future supply of PSTN OA is not relevant.

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<sup>19</sup> FCC memorandum opinion and order in the matter of 'Petition of Qwest Corporation for Forbearance Pursuant to 47 U.S.C. § 160(c) in the Omaha Metropolitan Statistical Area', FCC 05-170, September 16 2005.

### 3. COMPETITION IN THE RELEVANT MARKETS

#### 3.1. THE COMPETITIVE THRESHOLD

Telstra's exemption application (and my original report) proposes that the presence of one competitor DSLAM be used as the threshold for determining whether competitive conditions in a particular ESA are sufficiently favourable to warrant exemption. In relation to this proposed competitive threshold, the Commission asks if there is any significant difference in competitive conditions between an ESA with one competitive DSLAM and an ESA with two or more competitive DSLAMs.

My view, based on both economic analysis and available market evidence, is that there is no material difference in competitive conditions between an ESA with one DSLAM and an ESA with two or more DSLAMs.

In my original report I present the reasoning and evidence that suggests to me there are not material barriers to ULLS-based entry, either by *de novo* entrants or current LSS-based operators. Furthermore, the presence of one DSLAM in my view supports this conclusion as it signals, through what has actually happened, favourable conditions for and low barriers to (further) DSLAM-based entry.

Recent history of DSLAM deployment confirms that the presence of one DSLAM is likely to be followed by the entry in that ESA of another DSLAM operator. For example, in the two months between June and August 2007, 44% of one-DSLAM ESAs in Band 2 became two- or three-DSLAM ESAs (see Figure 1).<sup>20</sup> Similarly, 45% of two-DSLAM ESAs and 43% of three-DSLAM ESAs saw increases in DSLAM deployment in this brief period.

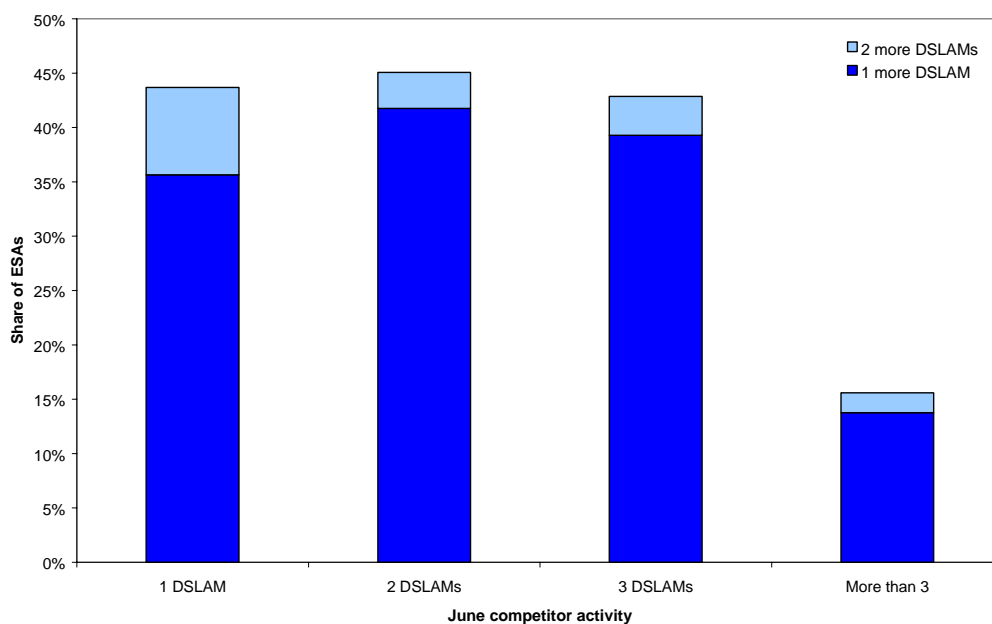
Furthermore, I would expect that the rate of this follow-on deepening of DSLAM deployment for individual ESAs would be even greater if PSTN OA was exempted in the exemption area and Telstra attempted to extract monopoly rents in downstream markets.

In short, the DSLAM deployment data implies that initial entry is a strong indicator of underlying competitive conditions and unobserved factors contributing to the competitive environment such as consumer preferences and cost structures.

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<sup>20</sup> [c-i-c]

**Figure 1: Increase in DSLAM-based competitor activity between June and August 2007**



Source: [c-i-c]

The Commission asks two further questions in relation to the competitive threshold and the capabilities of currently deployed DSLAMs. These revolve around the degree to which currently deployed DSLAMs can be used to provide PSTN services and the share of these DSLAMs that are currently being used for ULLS.

In my view this is the wrong perspective for an inquiry into competitive constraint, for three reasons. First, it focuses on static rather than dynamic considerations. The Commission should be considering whether current competitive conditions provide scope for DSLAM-based entry and competition. Second, the barriers to moving from LSS-based supply to ULLS-based supply are not material. Third, any DSLAM capable of providing broadband can also provide PSTN-equivalent calling services.

As discussed above, the focus of the one-DSLAM decision rule is on competitive conditions rather than present competition. Once this perspective is taken, the distinction between ULLS DSLAMs and LSS DSLAMs (and similarly any distinction between those that are capable of providing PSTN voice services and those that are not) becomes irrelevant. Entrants deploy DSLAMs when they believe the investment will be profitable. Neither ULLS- nor LSS-based entry would occur if this was not the case, and I have demonstrated in my original report that ULLS-based service provision is economic at relatively low customer numbers.

Further, I point out in my original report that the incremental cost of upgrading from a network based on DSLAMs optimised to LSS use, or ULLS DSLAMs that are not voice capable, to voice capability, is small. Indeed, in many instances this would merely involve moving to provide VoIP, and upgrading the nature of planned future installs, rather than prematurely replacing existing DSLAMs. Therefore LSS-based DSLAM deployment is just as relevant to the consideration of competitive conditions in an ESA and therefore to the consideration of an exemption. Thus I conclude that any distinction drawn between ULLS DSLAMs and LSS DSLAMs would be superfluous in this context.

Further to these reasons, a focus on general DSLAM-based entry (rather than a focus on ULLS-capable DSLAM deployment) is supported by recent data on ULLS SIO growth. In particular, there is strong evidence to suggest that ULLS-based entry and supply is growing rapidly in the exemption area. For example, between March and September 2007 the number of ULLS SIOs in Band 2 exemption area ESAs grew by [c-i-c].<sup>21</sup> In this 6-month period, ULLS-based supply to end customers commenced in [c-i-c] ESAs in the exemption area, and ULLS SIOs were added in over [c-i-c] of band 2 exemption area ESAs (see Figure 2). This is further evidence that there are not material barriers to ULLS-based entry.

**Figure 2: [c-i-c]**

In short, this evidence of rapid growth in ULLS-based supply in the exemption further supports my view that conditions in the exemption area are conducive to this form of competition.

### 3.2. THE EFFECT OF DECLARATION ON COMPETITION

Telstra has submitted in its exemption application that declaration, whilst potentially affecting the number of *competitors*, is no longer required to promote *efficient competition* in the downstream retail market. Rather, to the extent that it discourages investment by competitors in their own facilities, declaration is in fact likely to hold back efficient competition.

The Commission in its Discussion Paper has asked the following questions in relation to the promotion of competition:

*What alternative providers to Telstra of PSTN OA currently operate in the wholesale market? Do these providers offer any significant competitive constraint on the pricing of PSTN OA?*

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21 [c-i-c]

And further:

*In the absence of access to a declared PSTN OA in the CBD and metropolitan exemption areas, would such firms provide a meaningful constraint on the pricing of the PSTN OA or equivalent services?*

As indicated in section 2 above, I consider this focus on the wholesale market for PSTN OA misplaced since the primary consideration should be competition in the retail fixed voice market. Nonetheless, I express my view on these matters below.

In my view, the availability of ULLS at prices intended by regulatory design to emulate the prices that would emerge in a competitive market is sufficient to allay the Commission's concern – ULLS-based supply is in fact equivalent to the self-supply of PSTN OA-like services. This, coupled with the low barriers to ULLS-based market entry in the exemption area, removes any substantial market power Telstra might otherwise have either in the supply of resale services such as PSTN OA, or downstream in retail markets.

I also consider it likely that:

- the wholesale market structure described by the Commission has fundamentally arisen due to the availability of the regulated resale services, in particular: PSTN OA in conjunction with wholesale line rental (WLR), the local carriage service (LCS) and terminating access (TA); and
- in a market where an unconditioned access line could be leased at prices not unlike those that would prevail in an effectively competitive market, basic access and voice services at both wholesale and retail layers would typically be sold as part of a bundled service.

I come to these conclusions on the basis of the view that it is substantially more efficient to supply the full range of voice, and increasingly other, services that can be simultaneously provided over an access line, than to split provision of these services into unbundled components. In particular, there are substantial economies of scope shared by those services that can be supplied over the same access line in both production and consumption.

That said, the availability and uptake of regulated ULLS (and where it exists, full facility-based competition) in the exemption area means that the Commission does not need to determine whether there are cluster markets for voice services provided at both the wholesale and retail layers, or whether these elements would be unbundled in either or both layers. As Telstra does not have market power over wholesale or retail services, the Commission can rely on market forces to determine whether wholesale supply, on either a bundled or unbundled basis, is efficient or not.

If there is an efficient demand for resale services, then, given the availability of ULLS (and where they exist, full facilities), Telstra and its rivals would supply efficient resale services (whether bundled or unbundled, and whether in the form of PSTN OA, or some other form).<sup>22</sup>

Consider, for example, the case where Telstra sought to foreclose wholesale supply of what in fact was efficient provision of a PSTN OA like product (presumably with the intention of claiming market rents in the retail market). Any access seeker could purchase ULLS on regulated terms and conditions (or where relevant, rely on its own facilities) and self-supply (as well as possibly supply to third parties) its own PSTN OA-like products. Access seekers would have strong incentives to do this, since Telstra's exit would leave the wholesale market without an incumbent competitor. The result would be to ensure resellers could continue to constrain Telstra's retail prices (as well as ULLS-based access seekers directly retailing services at prices that undercut Telstra's retail prices).

Similarly, any attempt by Telstra to set inefficiently high wholesale prices for PSTN OA like products, and ultimately to collect retail market rents, would be defeated by the same means.

This conclusion does not require there already be an active wholesale market for PSTN OA-like services. Rather, it depends on the scope for the market to respond to Telstra withdrawing supply of PSTN OA or pricing these services supra-competitively, through self-supply of PSTN OA-like services or actively trading these wholesale services if there is an efficient demand for resale services.

In my view the more important question posed by the Commission which goes to the heart of the statutory 'promotion of competition' test is:

*In the absence of a declared PSTN OA service, would competition in downstream retail markets for relevant services be effective?*

In my opinion, competition in the retail fixed voice market would be effective in the absence of declaration. This conclusion is based on evidence of:

- Current deployment of infrastructure for the supply of fixed voice services including DSLAMs and alternative networks; and
- Demonstrated low barriers to further facilities-based market entry.<sup>23</sup>

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<sup>22</sup> However the regulated availability of LSS, which requires the separate purchase of basic access, may artificially create a market for basic access.

<sup>23</sup> See my original report for evidence of DSLAM and alternative network deployment in the exemption area.



The presence of competitive infrastructure and the prospect of future deployment will be sufficient to constrain Telstra's behaviour in the retail market post-exemption. Any attempt made to extract supra-competitive rents will be met by a competitive response not only from present facilities-based players, but also from new entrants.

Moreover, exemption is likely to promote efficient competition in the retail market by increasing the *depth* of competition. In the event that operators migrate to self-supply using ULLS, they will enjoy greater scope to differentiate their offerings and supply innovative products. This implies that competition will extend not only to price dimensions of product offerings, but also to non-price dimensions such as quality and functionality. The benefits of facilities-based competition are well recognised by regulators, including the Commission which states in the Discussion Paper:<sup>24</sup>

*The ACCC considers that, where efficient, facilities-based competition is likely to be both effective and promote the LTIE. This is because rivals are able to differentiate their services and compete more vigorously across greater elements of the network and supply chain.*

Despite acknowledging these benefits of deeper competition, the Commission states that PSTN OA was declared with a view to facilitating product differentiation and the creation of new and innovative bundles.<sup>25</sup> I am of the opinion that even if it was once true that this declaration was important for the promotion of innovation and differentiation (and it is difficult to see these effects operating below the marketing/retail level, as resale gives no scope for quality of service differences), it is clearly no longer the case. At best, declaration of PSTN OA allows new entrants to compete on the price dimension of a limited set of products. At worst, it discourages facilities investment and platform competition, reducing the degree of product differentiation and innovation. PSTN OA use ties the access seeker to the functionality of the incumbent's network and therefore dramatically reduces the scope for product differentiation compared to DSLAM-based or full facilities based supply.

In contrast, competition based on ULLS is likely to promote more vigorous competition on both price and non-price dimensions of the product. Therefore, to the extent to which it encourages reliance on regulated wholesale products and discourages infrastructure investment and facilities-based competition, declaration is in fact harmful to product differentiation and innovation.

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Finally, there may be a concern that certain classes of operator may not be able to continue operations if PSTN OA is exempted from access regulation in the exemption area. I addressed this issue directly in my original report, where I looked at the possible post-exemption outcomes for the three specific types of operators that might be impacted by the exemption: pure pre-selection operators, override operators and voice resellers.<sup>26</sup>

For pure pre-election operators and override operators, I conclude that while these business models may not survive in a post-exemption world (depending on whether Telstra or third parties find it economic provide PSTN OA-like services), downstream competition would not be diminished, not the least because of their *de minimus* presence in the market. For voice resellers, which currently have a more substantial presence in the market, I show that it would be economic for them to supply the bulk of voice-only retail customers using ULLS (and of course even more profitable to supply customers taking a bundle of voice and broadband services).<sup>27</sup>

### 3.3. VERTICAL INTEGRATION AND COMPETITION

The Commission asks if Telstra's vertical integration raises the issue of price and non-price constraints on the ability of entrants to compete. There are a number of points to consider here.

First, there are extensive regulatory constraints on anticompetitive behaviour by vertically integrated operators, and Telstra is no exception in being subject to these rules.<sup>28</sup> Therefore any attempt by Telstra to use its position as a vertically integrated operator to foreclose or limit the ability of other operators to compete could be expected to be met by swift disciplinary action. Since anticompetitive behaviour is dealt with by the regulatory regime already, it should not be a relevant consideration to the exemption application.

Second, it is likely that Telstra benefits from substantial efficiency gains by virtue of being vertically integrated. By definition, these efficiency benefits do not rely on anticompetitive behaviour, rather they are benefits of economically efficient vertically integrated supply. Competitors should face incentives that signal the costs and benefits of vertical integration and separation, and consumers should benefit from what proves to be the most efficient form of supply. Contrary to present access pricing, this will lead competitors to vertical integration when this is efficient. Setting access prices in this way will also allow Telstra, and in turn its customers, scope to benefit from legitimate vertical efficiencies. In contrast, the present arrangements unnecessarily and artificially pass at least some of these vertical efficiencies onto firms that are highly un-integrated.

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26 Telstra, "Statement by Dr Paul Paterson of CRA International for Mallesons Stephen Jaques on the Economic Considerations for a PSTN Originating Access Exemption", Annexure A to "Telstra's PSTN Originating Access Exemption Application – Supporting Submission", October 2007.

27 Updated modelling on voice-only viability modelling is presented in Appendix A of this report.

28 In fact the ACCC has, through Part XIB of the Act, more scope in the telecommunications industry than elsewhere to expeditiously pursue and bring to a halt what it alleges to be anticompetitive conduct.

In summary, it is my view that the Commission is in fact asking the wrong questions when it considers Telstra's vertical integration. Rather, the Commission should be asking how best to encourage other operators to compete with Telstra at the platform level. Competition will bring the greatest benefits when it is between operators supplying the market in an economically efficient way. In my view this almost certainly involves vertically integrated rivals, though the role of regulation here is to provide correct incentives, rather than to determine outcomes. Profit-maximising firms in competition with each other, if given cost-based incentives with sources of error minimised, will determine efficient firm and industry structure.

#### **3.4. THE EFFECT OF COMPETITION ON TELSTRA'S COMMERCIAL INTERESTS**

The Commission asks whether granting the exemption would allow Telstra to recover more than its legitimate commercial interests.

First of all, it is important to consider what is correctly meant by Telstra's legitimate commercial interests. As with any commercial entity, Telstra has a legitimate interest in making a reasonable risk-adjusted return on its efficient costs. This is its legitimate commercial interest.

In my view, over any reasonable period of time, Telstra will be unable to recover any more than this in the event of an exemption since any attempt to price supra-competitively will be met by either: (i) taking of market share by existing ULLS and/or facilities based competitors; (ii) de novo ULLS-based or facilities-based entry.

In short, Telstra will continue to face competitive constraints in the retail market post exemption and consequently will not be in a position to recover more than its legitimate commercial interests.

## 4. INVESTMENT IN INFRASTRUCTURE

The Commission asks whether exemption would affect plans to invest in maintenance, improvement and expansion of network infrastructure by: (a) Telstra; or (b) competitors. Specifically, the commission asks whether granting the OA exemptions would inhibit or stimulate the development of next generation networks (IP core networks and next generation access networks – NGANs).

Under the current regulatory framework there is a significant risk that access prices (including the price of PSTN OA) will be set in such a way that a less than efficient level of access-seeker investment will occur. There are a number of reasons for this:

- First, basing access prices on *efficient*, rather than *actual* costs has the effect of distorting build versus buy incentives. For example, consider the case where an access seeker's cost of self supply is above the efficient cost of regulated access but below the actual cost incurred by the access provider. In this case setting access prices based on efficient costs would mean forgoing the productive and dynamic efficiencies flowing from self-supply by the access seeker at a cost below that of the access provider.
- Second, access pricing based on efficient costs involves significant risk of error since it relies on various assumptions of efficient cost structures rather than observations of actual costs.
- Finally, in practice the Commission has demonstrated a preference for often unrealistic assumptions of what an efficient network would like over evidence of actual operating conditions.<sup>29</sup> This apparent preference is likely to greatly increase the risk of regulatory error.

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For example, in calculating trench costs – a large component of CAN costs – the Commission has chosen to rely on algorithms to calculate the minimum trench lengths possible. Whilst these algorithms are able to calculate the shortest distance between customers and points of interconnection, they are not able to account for physical constraints such as rivers, roads and buildings. Even where Telstra has adopted the algorithm approach, its calculations have been rejected by the Commission on the basis that alternative algorithms could potentially produce shorter trench distances (see for example ACCC, 'Assessment of Telstra's ULLS monthly charge undertaking: final decision', August 2006).

Moreover, even if costing out the network did perfectly reflect what was reasonably achievable in terms of actual industry practice, it is my view that cost-based regulated pricing is still likely to lead to investment below efficient levels due to inappropriately low access prices. This is due to these prices typically failing to reflect the true risks facing the access provider. In particular, the truncation of returns to investment I describe in my original report will result in cost-based prices that are below appropriately risk-adjusted costs – this is discussed in greater detail below. A separate but related point is that investment disincentives for both access seekers and the access provider are also likely to flow from the asymmetric allocation of risk.<sup>30</sup>

Having made these general points, I now turn to the specific impacts of continued regulation on investment by Telstra and its competitors.

#### 4.1. TELSTRA INVESTMENT

For consideration of Telstra's exemption application, Telstra's investment decisions can be broken down into three broad categories:

1. those relating to enhancement of voice services already provided over the existing network architecture. Such enhancement may include the provision of value-adding services such as 'Call Return' or 'MessageBank';
2. those that relate to investment in the core network; and
3. those relating to upgrades of the customer access network and in particular decisions on FTTN deployment.

In my view, to the extent that PSTN OA exemption results in a greater reliance on ULLS rather than PSTN OA and other resale or network element services, granting the exemption sought by Telstra will promote investment in enhancements to existing services. The reason for this is that, while use of PSTN OA ties the access seeker to the functionality of Telstra's network, use of ULLS or alternative networks provides greater scope for provision of unique and innovative enhancements by access seekers. Where entrants are providing their own enhancements, Telstra will need to innovate and invest in new features itself simply to compete. In short, greater facilities-based competition will drive Telstra to invest in these enhancements to its existing services.

Exemption is unlikely, in the short term, to have a significant impact on investment in the core network. This is because investment in upgrades to the core network – and in particular migration to an all-IP core – is well progressed and is unlikely to be affected by an exemption order.

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<sup>30</sup> Pindyck, Robert S., 'Mandatory unbundling and irreversible investment in telecom networks', *Review of Network Economics*, vol. 6, no. 3, September 2007, pp. 274-98

However in the medium term, Telstra's incentives and ability (and the incentives of entrants) to invest even in next generation core services will be reduced to the extent that competing carriers use this capacity at below true cost. As discussed above and in my original report, below cost pricing arises not only where network costs are underestimated but also where returns on network investment are truncated, as this is generally not reflected in the risk-adjusted price. The capping of returns through regulation implies that prices for access (including PSTN OA) based on network costs must be risk-adjusted upwards to account for truncation of expected returns. If such adjustments are not made, then network investment will fall below economically efficient levels.

Finally, I am of the opinion that continued declaration of PSTN OA is likely to adversely affect Telstra's investment in developing the access network, through both diminished incentive and diminished ability to invest.

*Incentives* to invest in substantial access network upgrades will be strongest where there is competition at the facilities layer. Network owners such as Telstra will only have incentives to out-do competitors by investing in network capability and providing innovative products where competitors are themselves providing differentiated competitive offerings. Continued regulation of resale-based wholesale products such as PSTN OA will not enhance and will most likely diminish incentives for investment by Telstra. Where access seekers are using PSTN OA and similar products for the provision of retail services, they will have limited scope to challenge Telstra on any product dimension other than price. Alternatively where competitors are differentiating their product offerings using ULLS or alternative networks, Telstra will be driven harder to invest in network upgrades.

Telstra's *ability* to invest in access network upgrades (such as migration to FTTN) will ultimately be driven by the revenues it currently receives and expects to receive in the future. I indicate in my original report that regulation can have the effect of truncating returns to investment. Truncation of returns through regulation reduces ability to invest by lowering expected returns on investment. For an investment with returns  $x$ , following a normal distribution with mean  $\mu$  and standard deviation  $\sigma$ , the expected return in the absence of regulation would be:

$$E(x) = \mu$$

However where regulated access pricing caps returns on that investment at  $p$ , the expected return becomes:

$$E(x|x \leq p) = \mu - \sigma M(p)$$

Where  $M(p)$  is the inverse Mill's ratio evaluated at  $p$ .<sup>31</sup> In lay terms this means that cost-based pricing of network access products such as PSTN OA must be adjusted upward to reflect investment risk. Any regulated pricing of wholesale access (including PSTN OA pricing) set to reflect non-risk-adjusted costs will in effect be *below* cost and will lead to incomplete cost recovery and hence reduced scope to attract funds for future investment, resulting in less than efficient levels of network investment.<sup>32</sup>

I am of the opinion that this is particularly the case with respect to investment in access network upgrades and expansion. Where an access provider such as Telstra is considering major upgrades to its customer access network (such as migration to a NGAN), such investments can involve significant downside risks. As with any investor, Telstra will expect to be compensated for incurring this downside risk through the ability to rely on an "upside" (that is some expectation of an above average return). However where regulated access to the network (including PSTN OA) is involved, the upside is capped by the terms of regulated access. This implies that Telstra's expected return on the investment is lowered to below what would prevail in the absence of regulation, thus diminishing Telstra's ability to invest.

Arguably, the telecommunications industry is currently witnessing the effect of regulation on Telstra's incentives to invest in network upgrades. Telstra has indicated it has been reluctant to commit to rollout of fibre-to-the-node primarily based on concerns around the degree to which regulation is likely to cap returns on that investment. This is in contrast to the less regulated mobile sector where Telstra has recently invested in its NextG Network based on greater certainty around expected investment returns.

In conclusion, I am of the opinion that exemption will promote investment by Telstra in all aspects of its network operations. By promoting facilities based competition, exemption will improve both Telstra's *incentives* and its *ability* to invest in network upgrades. Keeping these considerations in mind, I now consider the effect of exemption on investment by Telstra's competitors

#### 4.2. COMPETITOR INVESTMENT

The Commission asks whether declaration of PSTN OA has discouraged investment in alternative infrastructure by access seekers and whether exemption is likely to impact on the efficient use of upstream products such as the ULLS.

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<sup>31</sup> Jerry Hausman, 'The effect of sunk costs in telecommunications', paper presented at Columbia University, October 2 1998

<sup>32</sup> This revenue shortfall will occur directly from below-cost wholesale prices, but also indirectly through lower retail prices as Telstra's competitors can price below Telstra's true costs of supply.

As I indicate above, I am of the opinion that exemption, by promoting facilities-based competition, will lead to greater investment in service enhancements by both Telstra and its competitors. Simply by relying less on the functionality of Telstra's network and having greater scope to provide differentiated products, entrants are more likely to invest in product enhancement.

Moreover, it is likely that exemption will promote efficient investment by entrants in customer access networks. Such investment may involve either migration to ULLS-based supply or use of alternative access networks. In either case, such investment will allow for a movement towards efficient facilities based competition and its associated benefits. In my view, the continued regulation of certain wholesale products including PSTN OA in areas where barriers to self-supply (and possibly third party supply) have been demonstrated to be low has had a distorting effect on access seekers' investment incentives. In my original report I documented the lack of use of and investment in alternative infrastructure by Optus, which I consider to be partly attributable to the availability of wholesale products such as PSTN OA. In addition, I am of the view that continued declaration has prevented an efficient level of DSLAM-based investment occurring despite low barriers to DSLAM-based market entry in the exemption area.

Even if one accepts that current regulatory pricing is properly calibrated to reflect realistic network architecture and operating costs, as indicated above such pricing is unlikely to take into account the different levels of risk involved in DSLAM-based versus resale-based supply nor the truncation of returns inherent on regulated services. That is, regulated prices are unlikely to reflect appropriately risk-adjusted costs and hence continued declaration of PSTN OA in areas where barriers to DSLAM-based entry are low will reduce incentives for investment by access seekers below efficient levels.

I am also of the opinion that continued PSTN OA declaration is likely to dampen entrant investment in alternative customer access networks, including NGANs, for two reasons.

- First, in parallel to the impacts on Telstra of PSTN OA declaration and the attendant under-pricing, entrants will be less inclined to invest in their own NGN as well as DSLAM-based networks whilst declaration in the face of competition persists.
- Second, in my view, DSLAM-based competition should be viewed as in aid of migration to full facilities-based competition and it follows from this that exemption, to the extent that it promotes DSLAM-based competition, will facilitate alternative network competition. DSLAM-based competition, whilst still relying on access to the CAN, allows entrants to provide differentiated retail offerings and build up a customer base attracted to these offerings. That is, it may be advantageous, if not necessary, for an entrant to be engaged in DSLAM-based competition before embarking on NGAN investment and engaging in full facilities based competition.

For these reasons I am of the opinion that to the extent that continued regulation of access products such as PSTN OA dampens DSLAM-based investment, it is also likely to have the effect of reducing entrant investment in alternative infrastructure such as NGANs.



Furthermore, insofar as the PSTN OA service includes carriage over part of the core network, for similar reasons as outlined above, there are also likely to be a dampening of entrant investment in next generation core networks from ongoing regulation in the exemption area.

### *Conclusions*

The Commission in its Discussion Paper indicates that in deciding to declare PSTN OA, it considered that:<sup>33</sup>

*...declaration would encourage efficient investment in infrastructure by facilitating market entry and reducing risks associated with infrastructure deployment by access seekers.*

It may be true that ubiquitous declaration of PSTN OA (and other wholesale services) was once seen as important for facilitating market entry and allowing operators to develop a customer base before embarking on further investment. However in my view such declaration is no longer necessary (if it ever was) in the exemption area where competitor entry has occurred and progress towards infrastructure competition is either actually happening or is likely to happen (ie prevailing competitive conditions make it possible). Rather, continued provision of lower level regulated access, including PSTN OA, is likely to discourage efficient investment in network assets by entrants while reducing Telstra's incentives and ability to innovate. I have provided evidence of this inefficient "regulatory dependence" in my original PSTN OA exemption report, including limited use of existing alternative infrastructure.

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## **APPENDIX A: CONTESTIBILITY OF VOICE-ONLY CUSTOMERS – REVISED MODELLING**

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## APPENDIX B: MES SENSITIVITY ANALYSIS

[c-i-c]

## APPENDIX C: LETTER OF INSTRUCTION FROM MSJ

[c-i-c]

## APPENDIX D: CURRICULUM VITAE

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Bachelor of Agricultural Economics  
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University of New England

Master of Economics  
Australian National University

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Paul Paterson is a Vice President at CRA International. Paul joined CRA from NEEG and brings with him commercial and government experience in industry analysis, corporate strategies, regulation and policy development. Paul has senior executive experience in the telecommunications industry. Prior to joining NEEG, he was with Telstra Corporation Ltd as Director Regulatory from 2001 to 2004.

As a founding member of the Regulated Industries Forum in 2003, and convener since then, Paul also has extensive insight into regulatory issues in the utilities and transport sectors.

Prior to his appointment as Director Regulatory at Telstra, Paul was the Group Manager Competition, Regulatory and External Affairs for Telstra from 1998 to 2001. Until leaving Telstra he was on the Board of the Australian Communications Industry Forum. Paul has authored numerous economic reports and publications since 1978.

### EXPERIENCE

Advice on regulatory, competition, commercial, strategic and government policy matters to major corporations and government agencies in telecommunications and other network industries. Jurisdictional experience spans Australia, New Zealand, Singapore, Hong Kong, Japan, United Kingdom, Ireland, Italy and the USA.

### PROFESSIONAL HISTORY

Nov 04 – Present	Vice President, CRAI, Australia
2004	Principal, NEEG, Australia
2001 – 2004	Director Regulatory, Telstra
1998 – 2001	Group Manager Competition, Regulatory and External Affairs, Telstra
1992 – 1998	Executive Director, Policy & Resources, Department of State and Regional Development (previously Chief Business Economist, Office of Economic Development, New South Wales Premier's Department), Sydney

1988 – 1992	Chief Economist, OTC Limited (now Telstra), Sydney
1987	Visiting Economist, Department of the Treasury, Canberra
1986	Special Advisor, Department of Trade, Canberra
1985 – 1986	Assistant Director, Bureau of Labour Market Research, Canberra
1983 – 1984	Administrator, Organisation for Economic Co-Operation and Development, Paris
1980 – 1983	Senior Project Manager, Bureau of Labour Market Research
1977 – 1980	Project Manager, Bureau of Agricultural Economics

## SELECTED PUBLICATIONS, PRESENTATIONS AND REPORTS

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