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The Todd Report on Competition in New Zealand Telecommunications: A Critique

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> *"The real problem with this world of ours is not that it is an unreasonable world, nor even that it is a reasonable one. The commonest kind of trouble is that it is nearly reasonable, but not quite."*
>
> G. K. Chesterton
> "Orthodoxy"

The Todd Consortium has produced a report ('the Clear report') that seems reasonable, but that on closer examination proves not to be. It relies on strong assumptions, most of which it fails to document, to make its point. Vary these assumptions, and the report's results fall away. This is hardly a robust basis for deriving strong conclusions – yet the Consortium would have New Zealand make drastic changes on that basis.

What is even more worrying is the Consortium's very limited disclosure of information. Only the sketchiest details are provided of how the results it relies on were derived. In many instances, no information at all is presented – for example, about what the Consortium has taken as the rate of return Telecom should earn. This makes it impossible to fully understand or test the results. Under normal circumstances, no weight would be given to assertions that others cannot test. Again, this is not a suitable basis for debating, let alone making, public policy.

Fundamentally, the report has three things to say. The first is that the cost modelling it presents suggests that Telecom's revenues far exceed its economic costs – so that Telecom is earning monopoly profits. The second is that because revenues exceed economic costs, the Kiwi Share Obligations impose no costs on Telecom. The third is that the high profits it claims are being earned by Telecom are best corrected by moving to a more interventionist regulatory framework, in which interconnection charges would be substantially lower than they currently are. Each of these claims is considered below.

The Report's Modelling of Telecom's Profits

The Clear report relies on a "bottom-up", forward-looking cost model to estimate Telecom's costs. In principle, models of this kind measure the resources that would be required now were a firm (in this case Telecom) to provide the standard services it supplies using the best, widely used, technology available. The report then compares its estimate of Telecom's costs with its estimate of Telecom's revenues and concludes that Telecom is earning large monopoly profits.

Most New Zealanders know that Telecom earns healthy looking profits each year. As a result, the Report's conclusions seem reasonable. But how well founded are they really?

Monopoly profits are the difference between revenues and costs, where costs are measured on an economic basis, and where the difference between revenues and costs results from market power. Telecom's revenues can be established from its Annual Report, and hence should not be contentious.[1] What is contentious is the level of Telecom's economic costs. Estimating

[1] However, the Clear report, for reasons that are not apparent, makes a large number of changes to publically reported numbers. For example, the report states Telecom's revenues from local service as an amount some $NZ47.4 million greater than the amount set out in Telecom's 1998 Annual Report; and for reasons that

these is the purpose of the report's forward-looking cost model, and it is on this model that the report's credibility rests.

Now, what needs to be borne in mind is that cost models of the kind used in the report are 'hypotheticals' – they model an 'as if' world. In this world, costs are modelled 'as if' Telecom's network was being built right now, in one fell swoop. There is no way of testing this kind of modelling against observation. Consequently, its reasonableness can only be assessed by examining the plausibility of the results and the rigour of the modelling from which these results are derived.

One way of assessing the plausibility of the results is to compare them with results obtained elsewhere. I will begin by looking at the report's estimates of costs per line and then examine its estimates of the costs of carrying traffic.

Generally, one would expect the costs of service in New Zealand to be higher than those in the United States, reflecting the more dispersed population and the smaller total size of the market. A comparison of the Todd results for *access line costs* with those obtained by similar analyses in the US therefore provides a first 'sanity check'.

The two main US forward-looking cost models -- the Hatfield model, version 5.0a, and the Benchmark Cost Proxy Model (BCPM) -- can be used to derive estimates of costs per access lines for a representative range of States. In US dollars, average monthly costs per line are $14.38 for the Hatfield model and $26.00 for the BCPM. Working on an approximate exchange rate of 50 US cents per New Zealand dollar, the "cost per line" results reported by the Consortium are barely a third of those generated by the BCPM and two-thirds of those generated by the Hatfield model in the US.

A second 'sanity check' can be obtained by comparing the Clear report's results with those obtained by OFTEL in the UK. Using its top-down model, OFTEL estimates an average cost per line for the UK of approximately 123 pounds per annum. OFTEL notes that estimates derived from its bottom-up model (which is more closely comparable to the model used in the Clear report) are even higher. These estimates are more than one and a half times as high as those in the Clear report.

A third 'sanity check' can be obtained by a comparison with Australia. The Australian Competition and Consumer Commission (which has responsibility for regulating telecommunications in Australia) recently commissioned the UK branch of NERA to construct a forward-looking cost model of the Telstra network. The NERA model covers a broader range of services than are included in the model used by the Clear report. Because costs are spread over a wider range of services, unit costs should be lower. Moreover, the larger scale of the Australian market should also affect relative costs. However, NERA estimates the unit cost of an access line as being A$495, over two and a half times the estimate reported by Clear.

In short, the cost per line results set out by the Todd Consortium are consistently and substantially lower than those obtained in comparable studies overseas.

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are again not apparent, it also understates the number of lines. The combined impact of these errors is, of course, to increase revenues and reduce costs, hence contributing to the finding of monopoly profits

Turning to *traffic-related costs*, the report does not directly disclose the results of its analysis of costs per traffic minute. However, it does state the cost per minute of interconnection is, on its estimates, $NZ 0.0063. It can be assumed that this is a cost per end-minute (so that a conversation both originating and terminating on the Telecom network would cause this cost twice). It can therefore be compared to the per-minute conveyance costs reported for other models. These are set out in the following Table:

Table 1:
Per-minute conveyance costs: selected countries

Country	US -- Georgia	US -- Montana	UK -- end office	UK -- tandem	Australia -- end-office	Australia -- tandem
Model	*Hatfield*	*Hatfield*	*OFTEL*	*OFTEL*	*NERA*	*NERA*
NZ$ per end-use minute	0.002223	0.003744	0.011934	0.017082	0.01989	0.02106

In the US, conveyance costs per minute are only available for the Hatfield model, as the Benchmark Cost Proxy Model does not separately report the cost of conveyance at end offices and tandem switches. In the UK, OFTEL used the conveyance costs estimated by its 'top-down' model to set per-minute interconnection charges, with the 1998 values being reported in the Table. Calculations using the OFTEL bottom-up model suggest that long-run average incremental costs are some 10-25 per cent higher than the fully allocated rates the Table reports (see "Long Run Incremental Costs: The Bottom-Up Network Model", version 2.2, OFTEL, March 1997). The NERA estimates are presented in its draft report to the ACCC.

As can be seen from Table 1, the per-minute costs set out in the Todd report are far below those obtained for the UK or Australia. Moreover, while they appear comparable to the US estimates, the US data do not include the costs of links from the local switch to remote concentrators. Including these would increase the approximate US cost per end-use minute to about 0.6 New Zealand cents.

It is difficult to see why the costs of providing telecommunications service in New Zealand would be very much lower than those recorded anywhere else. There are economies of density to providing access lines and economies of scale in the conveyance of traffic. As a result, costs in New Zealand would be expected to be higher than those in the comparator countries. The finding that they are either well below those reported elsewhere (as for access lines) or at the very bottom end of the range (as for conveyance) must cast considerable doubt on the report's analysis.

On closer examination, it appears that the authors of the Clear report made a number of modelling choices that are likely to result in an under-estimate of costs. These choices are not well documented in the report, nor are there implications discussed.

The easiest way to correct for these choices is to replace the cost estimates used in the report with those for overseas. As can be seen from the following Table, the monopoly profits the Todd Consortium claims to have found rapidly disappear when this is done.

Table 2: Local service surplus ($million per annum)

Using unit cost estimates from:	**Clear Report**	**Hatfield US**	**BCPM US**	**Oftel UK**	**NERA Aust.**
Todd Assumptions	382.588	173.880	-323.084	131.326	-230.812
Todd Assumptions with adjusted revenue (*)	335.188	126.480	-370.484	83.926	-278.212
Todd Assumptions with adjusted revenue and lines (**)	318.220	102.719	-410.420	58.780	-315.145

Notes: (*) The Todd Report estimates the annual total revenue derived from access and local calls to be $904 million.[2] According to Telecom's 1998 Annual Report, the actual amount of access and local call revenue received by Telecom in the 1997/98 financial year was $856.6 million.[3] Thus, the Todd Report has overstated revenues by approximately $47.4 million per year. As is shown in Table 1, holding all other parameters constant, but adjusting the revenue in the Todd Report model lowers the local service surplus to approximately $335 million per annum.

(**) The Todd Report assumes that Telecom's network consists of 1,782,000 access lines, whereas Telecom's most recent annual report puts this figure at 1,840,000. This has two implications for the accuracy of the model. The first is that revenue per line has been overestimated. However, the aggregate effect on revenue has already been taken account of above. The second is that the total cost has been underestimated. Correcting for both the overestimation of revenues and the underestimation of costs yields a local call surplus of $318.2 million.

The costs of the KSO

The report claims that the KSO imposes no costs on Telecom *because* Telecom earns an economic profit on the provision of local service. This claim is flawed from both an analytical and an empirical viewpoint.

Analytically, the cost of imposing an obligation on a supplier is the difference in its profits 'with' and 'without' that obligation. Say Telecom, even without the KSO, were losing $100 million supplying local service – and that the KSO then caused it to lose $300 million. It would not be sensible to claim that the KSO was costless 'because' Telecom was losing money in any case!

Equally, even if it was the case that Telecom was earning an economic profit supplying local service, the cost of the KSO would still be the change in economic profits caused by the KSO. Even on the report's figures, this change is substantial (a loss of $NZ84 million annually). But these figures cannot be accepted as they stand.

As noted above, the report's authors have made modelling choices which substantially and at least in my view implausibly reduce estimated costs per access line. Table 2 shows that adjusting these estimates to the levels reported overseas eliminates the alleged monopoly profits. Additionally, when one raises the average cost per line, but keeps the geographical structure of costs as it is reported by the Todd Consortium, the proportion of lines that are

[2] See section 7.3.2 of Todd Report.
[3] See TCNZ Annual Report 1998, p37.

loss making increases very substantially.

This can be seen from Table 3. According to the report, less than 9 per cent of Telecom's lines are loss-making. However, when the NERA estimates of cost per line are used, this rises to 75 per cent.

Table 3: Percentage of lines that are loss-making

	Percentage of lines that yield an economic loss
Todd Report	8.42%
Hatfield US	12.86%
BCPM US	74.62%
Oftel UK	12.86%
NERA Aust.	74.62%

Moreover, on all cost estimates other than those of the Todd report itself, Telecom incurs a loss on supplying local service to residential customers – the core group protected by the KSO. This can be seen from Graph 1 (appended at the end of this note), which shows that the profit Todd reports Telecom earning on residential local service turns into a substantial loss once more realistic estimates are used of costs per line.

However, it is not only the average *level* of costs that the report seems to have gotten wrong. Rather, the report also seems to have distorted the geographical *structure* of costs. More specifically, the model used by the Todd Consortium appears to artificially reduce the cost penalty associated with serving high cost areas. It therefore understates the real economic costs of the KSO.

The data presented in the report imply that any cost penalties associated with population density are overcome once density exceeds 150 people per square kilometre. This level of population density should be about equivalent to 75 lines per square kilometre. But it is difficult to see how this result could be derived from the Hatfield model version 5.0a. In effect, running that model for the US[4], one finds that monthly costs per line are about $US40 in wire centres with a density of 5 to 100 lines per square mile; just above $US20 in wire centres with a density of 100 to 200 lines per square mile; and then reduce steadily to about $6 in wire centres with a density above 10000 lines per square mile. The Clear report, in other words, says that economies of density are fully exploited at density levels far below those shown by the Hatfield model for the US. A very similar result emerges when the comparison is made to the BCPM.

This implies that costs in low density areas are significantly higher relative to the average than the report suggests. This in turn means that the losses being incurred in these areas are under-stated by the report, and likely seriously so.

In short, the report's claim that the KSO imposes no costs on Telecom are greatly exaggerated. The report itself admits that it has not modelled KSO costs in Fiordland. But even for the areas it does cover, the report systematically understates the costs the KSO entails.

[4] For the states of Florida, Georgia, Missouri, Montana and Maryland.

Interconnection and competition

Having argued that Telecom earns substantial monopoly profits, the report proceeds to assert that these need to corrected through a significant decline in interconnection charges. Specifically, it claims that these should be reduced from 2.8 cents per minute at peak to 0.63 cents.

The report is oddly pessimistic about the prospects for facilities-based competition. After all, Clear itself has a substantial local network in place in the major population centres. And Clear is not the only firm building local loop in competition with Telecom.

The report's claims in this respect are all the more puzzling given its estimates of Telecom's monopoly profits. For example, the reports states that Telecom earns over $NZ250,000 a year in excess profits from corporate customers. However, more than half of New Zealand's large businesses *only* have sites in CBD's – the area covered by Clear's network. Were Telecom's monopoly profits from these businesses as large as all that, surely Clear could use its own network to bid these customers away -- as could Telstra through its micro-wave network in the Auckland area.

Rather, it seems likely that the access network, rather than being vastly profitable, entails substantial economic losses. Two consequences follow.

First, the rather low level of rentals relative to costs is likely to be a major obstacle to the roll-out of competing networks. If it is true that charges do not reflect costs, particularly in high-cost areas, then it is hardly surprising that there is little incentive for alternative local loop to be deployed on a national basis.

Second, the losses being incurred in supplying local service need to be reflected in interconnection charges. The report refers to the need for 'effective competition'; but what New Zealand needs is *efficient* competition – that is, competition in which it is the firms with the lowest cost and/or the best service that secure the market. If Telecom, and Telecom only, has to covers the losses the KSO causes in the access network, then it could readily be undercut by rivals whose economic costs were higher than Telecom's own. Such an outcome would not promote the efficient use of scarce resources now or in the future.

What this means is that interconnection charges must contain a contribution to the access deficit. The report's claim that competitors should 'use the train without paying for the track' veers very close indeed to special pleading.

Conclusions

The Todd Consortium preaches openness but does not practice it. The results it has released are so poorly documented as to be extremely difficult to assess. Its arguments would be more credible if the report's authors would allow them to be tested. Until then, any analysis of the report's claims must rely on a fair measure of intuition and some guess-work. Inevitably, that will involve some approximation.

Even so, it is clear that the report's results rest on assumptions about the costs of providing service that are artificially low. Correct these assumptions and the results change dramatically. Normally, one would expect a report of this kind to provide some sensitivity

testing along these lines. The Todd Consortium's report does not. Once this is done, it becomes apparent that the report's strong claims are unfounded.

The Todd Report's flaws are an extreme example of the risks inherent in 'forward looking' costing of the type used in studies compared here. Cost models of this type are an exercise in making assumptions. The best a good model can do (and the Todd model does not seem to be a good one) is make assumptions that are reasonable. Even then, however, one needs to be realistic about how much such models can deliver.

In particular, models such as these tell us relatively little about the future. They may claim that it is the future that they are modelling; but what they are really doing is re-building the past. Their primary concern is with what the circuit-switched PSTN (the network that provides "plain old telephone service") would look like, if it were being built anew. But no-one would ever build it anew. Rather, the telecommunications networks of the future seem likely to look far more like the Internet than like the PSTN, and will combine data, voice and other types of traffic far better than the current circuit-switched network can.

What then counts in terms of public policy? Surely it is not how we perform relative to a purely hypothetical reconstruction of yesterday's PSTN. Rather, it is how well placed we are in terms of getting to consumers the gains that innovation offers, both in terms of reduced prices and of new and better services. We should, in other words, be looking at *outcomes*, rather than at inputs. And those who want to change the current policy arrangements should say how and why better *outcomes* will be obtained.

Here too, the Todd Report falls well short of the mark. What the report's authors want is a move away from the current system. But they never spell out what they have in mind – is it the Australian system, where an army of regulators has led to interconnection charges no lower than New Zealand's? Is it a system like the US, where commercial competition plays second fiddle to unending battles with and among contrasting levels of regulation? Or, if it is a hybrid, quite how will it work? And why will any of these options perform better than what we now have – not against the standard of a hypothetical model of the past, but in delivering the gains open to us in the future?

Telecommunications policy is too important to be left to leaps in the dark. The Todd Consortium would have done better to be up-front, both about the analysis it has carried out and about the changes it would like to see. Until it is, it will do little to advance the public debate.

Graph 1: Local Service Surplus per annum for Residential Customers ($m)