

FUTURE FUNDING OF THE TELECOMMUNICATIONS UNIVERSAL SERVICE OBLIGATIONS IN AUSTRALIA

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Abstract

This paper focuses on possible new arrangements for the funding of future universal service obligations (USOs) in telecommunications.

The Minister for Communications, Information Technology and the Arts announced a review of the current USO arrangements in June 2007. This paper is written in the hope that it will provide some input into this review.

The paper provides an overview of the development of the USO and its funding since it was formally introduced under the *Telecommunications Act 1991*. It notes the difficulty the Government has had with the process of calculating the cost of the USOs. It also discusses the implications of other Government policies on the USO, in particular the increased level of direct funding of services in rural and remote areas.

The formal USO covers only standard telephony services, yet more and more broadband services are becoming ubiquitous. In addition, competitors to Telstra are beginning to provide telecommunications services in rural areas.

For these and other reasons the Communications Minister has announced that the Government will conduct a review of the USO arrangements in late 2007.

An earlier review was conducted by the Department of Communications, Information Technology and the Arts (DCITA) in 2003-04 which considered a range of options for revision of the USO arrangements. This paper contends that while that review offered a thorough analysis of the issues at the time, developments since then have made the options considered then impractical now. Accordingly a wider range of options needs to be considered. Two additional options are discussed: a line tax as suggested by the Organisation for Economic Cooperation and Development (OECD) in 2003; and for the Government to take over direct management and funding of the USO.

This paper includes an evaluation of the options, drawing on recently published work, to conclude that it is probably inevitable that changes will need to be considered to the management and funding of the USO.

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Future funding of the Telecommunications Universal Service Obligations in Australia

This paper focuses on possible new arrangements for the funding of future universal service obligations (USOs) in telecommunications. It is argued that current arrangements are not working effectively and that future industry changes will require a new approach.

Background

The paper acknowledges the work undertaken by the Department of Communications Information Technology and the Arts (DCITA) for its 2004 “Review of the Operation of the Universal Service Obligation and Customer Service Guarantee”. That review provided an extensive overview of the history and development of USO policy in this country and a consideration of options for the future.

This paper necessarily covers some of the same ground. However, it aims to highlight areas where different conclusions could be reached. It also draws on other contributions to the debate since that report was released as well as recent developments in the telecommunications industry in Australia which suggest a wider range of options now need to be considered than those canvassed in the 2004 report.

The establishment of current USO funding arrangements

Prior to competition being introduced in 1991 into telecommunications the incumbent, then called Telecom Australia, funded USOs from monopoly profits earned, primarily, from its operations in the cities. This policy had been government practice in developed countries over many decades.

Through a number of policy measures, such as subsidised installations and line rentals and uniform local call pricing successive Australian Governments had encouraged the take up of telephone services throughout the country. A telephone service at a reasonable price was perceived as a right of all citizens whatever the cost.

While a government monopoly Telecom simply funded high cost, loss making services, chiefly in rural and remote areas, from its overall monopoly profits. However, when the government of the day was considering introducing competition into the market in the late 1980s it was argued that competition would remove monopoly profits and that Telecom would be unable to fund these services. In 1988 the Government commissioned a study into the costs. The then Bureau of Transport and Communications Economics (BTCE) and Telecom, undertook a joint study (BTCE 1989).

At the time, there was considerable confusion over the definition of the USO. While it was recognised that rural areas were more likely subsidised than urban areas many argued that there was a subsidy from long distance services to local services, or from usage to access, the joint study focussed on customers. The ‘obligation’ is to provide a service to all customers. However, the ‘cost’ is the ‘loss’ that the customer causes Telecom. That is, a customer was considered a USO customer if, in supplying all her telephony services, Telecom made a net loss. Two elements were considered important in the definition:

- That the customer was loss making; and
- Telecom would not supply services to that customer unless required to do so.

In measuring the loss the BTCE adopted an economic approach based on the concept of avoidability – that is, it looked at only the revenue and cost that could be avoided if Telecom did not provide services to that customer, given that all other customers were provided with services. Telecom adopted an approach that had a more ‘accounting’ focus. It basically looked at the profitability of each exchange after distributing higher level national and district costs among exchanges – what is termed a ‘fully distributed cost’ approach.

Strictly, the USO cost is the sum of the net cost of all USO customers. Telstra can, of course, have a large USO cost, even though it is very profitable overall. It would be even more profitable if it just served the profitable customers and not the USO customers. To measure the total USO cost, one should divide all customers into profitable and loss making and sum the loss making. Thus, for example, if the returns from a group of customers were: +1, -2,+5, +3, -4, +3, -5 and +2 then the group as a whole would be profitable (+3) but the USO would be 11. By not serving the USO customers a profit of 14 would be made.

It is not sufficient to argue that because Telstra makes a large profit overall, or it does not have a rural deficit, it should simply be required to fund the USO. This is because there are economic inefficiencies in supplying loss making services and funding them from profitable services. These arise because some customers are not paying the full economic cost of services while other customers are paying more than the economic cost. Efficient resource allocation requires ascertaining the extent of the cross subsidies and then instituting policies to provide for funding the loss making services in the most efficient manner. The first step is to measure the cost of the existing USO.

The BTCE study

In practice, it is not possible to measure the profitability of every one of the 10 million or so Telstra services. The smallest unit used in the BTCE’s study was a ring of customers at a given distance from an exchange (for example, out to 1km, from 1km to 2km and so on). Costs and revenues for customers in each ring were calculated using a model developed by the BTCE into which data was provided from Telstra’s accounts. Every one of the 5000 or so exchanges was assessed for USO customers. In later versions of the model, the ring analysis was not used but exchanges were simply divided into built up areas and non-built up areas. To the extent that these groups are not totally homogenous (that is, all loss making, or all profitable, customers) the estimate of the total USO will be an underestimate – in the later version of the model more so than in the original BTCE model.

The study group reported in mid 1989. The BTCE reported a cost estimate of around \$240 million while Telecom’s estimate was around \$800 million. The Government at the time accepted the BTCE’s methodology and cost estimate and decided that this was within the capacity of the industry to fund.

The Government established a regime to provide for the continued funding of, by then, Telstra’s USOs in its 1991 legislation. This introduced a costing and funding regime employing the BTCE avoidability methodology. The annual USO cost was initially determined using the BTCE’s costing model which was later redeveloped. All carriers contributed to a Universal Service Fund the funds in which were largely passed to Telstra.

There were a number of unique features of the original BTCE USO costing model. They are outlined here to demonstrate how difficult it would be for Australian Communications and Media Authority (ACMA) or the Australian Competition and Consumer Commission (ACCC) to regularly upgrade the model as the market develops.

Some of the features meant that the model was quite complex.

- The concept of avoidability required the development of two key features of the cost model.
 - The first was the calculation of incoming call revenue since Telstra would lose revenue from calls *to* USO customers as well as revenue *from* USO customers if they were no longer provide with services. This brought a major complication. The model had to be designed to remove double counting of call revenue between USO customers (but not between USO and non-USO customers). However, which customers were USO customers had to be determined by the model at the same time. This required a recursive model to perform both tasks at the same time.
 - Secondly, avoidability differs at different levels within the network. For example, avoidability at the customer premises is different from avoidability at the exchange. Removing a customer from the network may save that customer's premise equipment but very little exchange equipment.
- It was impractical to calculate costs at the level of each of the ten million or so customers. Instead groups of customers at each exchange were evaluated (see below for discussion on 'rings'). As a consequence, the model would underestimate the USO cost because it involved some averaging of costs and revenues within these groups.
- The model employed a long run view of costs and revenues. This was because the obligation was for an indefinite period. This required consideration of the costs of replacing assets. Telstra has a huge number and range of assets to value.
- The model adopted an approach that was later embodied in the concept of 'forward looking' costs. This required that assets had to be valued at market prices which reflected both depreciation plus obsolescence (that is assets may be devalued where newer versions could provide services more cheaply, for example digital switches replacing analogue switches).
- A large sample survey was conducted by Telstra to help determine the avoidable costs of the customer access network, the largest elements of fixed costs. Using a 'ring' analysis, the cost was determined for laying out the customer access network (CAN) within the first kilometre from the exchange, then the avoidable cost of laying out the network within the second kilometre, given that the network within the first kilometre was in place. Cost for successive 'rings' around the exchange were determined for a large range of exchanges (predominantly rural and remote). Statistical analysis was employed to determine a relationship between cost and two key factors: population density of each ring and distance from the exchange, the former being the more significant variable.
- Small surveys were conducted to determine a range of other relationships including: the ratio of incoming to outgoing trunk calls for customers at different sized exchanges; and the ratio of local calls to trunk calls at different sized exchanges.

Because of its complexity, and the fact that the model is reliant on Telstra to provide all the data inputs, disputes quickly arose over the 'robustness' of the model. This culminated in the regulator, AUSTEL (subsequently the Australian Communications Authority (ACA) and now ACMA) commissioning a new model.

Some of the areas of contention included:

- The need for the model to be updated to incorporate new CAN technologies coming to market (including wireless and satellite technologies);
- The rate of return on assets needed to be determined more carefully (in the original analysis a range of values was employed);
- The need for a more accurate 'life cycle' model to determine depreciation of assets and their current market value.

As well as these features, there were other, more general, bones of contention apart from the fact that all the data for the model had to be supplied by Telstra with AUSTEL not being in a position to verify it. In addition, other carriers complained that Telstra obtained a number of benefits from being the Primary Universal Service Provider (PUSP) that offset, at least in part, the cost of the obligation. These benefits were considered by the ACA but, with advice, it decided that they were either difficult to measure or not valid benefits of Telstra's position as the PUSP. It is at least debatable that most, if not all, the benefits touted accrue to Telstra by virtue of its being the ubiquitous national carrier and that they would largely remain if the few per cent of USO customers or USO payphones were no longer serviced.

One benefit that has been contentious relates to what has been termed 'life cycle' effects. In essence, though, it is not so much a benefit but rather relates to the definition of a USO. Specifically it concerns customers who may be a USO at one time but may not be forever. For example, customers in new housing estates may be unprofitable for a few years but ultimately become profitable. One could argue that Telstra would be prepared to provide service to them, even if not required to do so. If so, they would not meet the second element of the BTCE's definition above. However, this second condition would be difficult to establish for a lot of marginal cases around the country. This issue is being complicated by the fact that other carriers have been providing telephony services in some new housing estates. Should they share in USO funding?

The new model commissioned by AUSTEL in 1995 was first used by the ACA to calculate the 1997-98 USO cost. However, controversy surrounded this model as well, not least because of the much higher cost estimate of \$548.1 million. Some key issues still remained, including debate over the appropriate cost of capital employed, or Weighted Average Cost of Capital (WACC), the inability to check Telstra's inputs and other issues with the earlier model.

The model was not used from 1998-99 as the Minister, on advice, determined the subsidy amount that year, and has done so up until the present, at a much lower level. The level each year has been largely determined using trend analysis of costs and revenues since 1997-98. However, while this may produce a result more acceptable to the industry, in no way could it be considered as producing results that reflect the real USO cost. This is because the USO net cost will never follow simple trend relationships between revenue and cost. A simple example will illustrate this.

Suppose the cost for a customer is \$2500 in a year and the revenue \$2450. The USO cost is \$50. If cost increased by, say, one per cent but revenue stayed the same, the net USO cost would increase by 50 per cent to \$75. There will always be variation in costs and revenues, that is costs and revenues will not uniformly change, across exchanges and customers. Small changes in cost and revenue can produce large variations in USO cost. These are impossible to predict without a model. The inclusion of incoming call revenue complicates the picture

enormously as does the avoidability cost analysis which is far from linear. The sensitivity of the model to small changes in costs was noted in controversy regarding the WACC in particular when the first results were obtained from the new model in 1997-98. Small changes in the WACC produced large changes in the modelled cost.

Given all the controversy over use of the model, and no easily recognised alternative to calculating the real USO cost, what options are available? This is discussed further below. Before that, it is worth considering what happened when the Government introduced a policy of making the USO subsidy contestable in 2000 as an alternative approach to providing the USO, rather than funding Telstra alone to provide it.

USO Contestability arrangements

In an effort to encourage competition in the provision of the USO the Government announced in 2000 the establishment of contestability pilots. These were regions where competitors would be allowed to take over provision of the USO in return for the subsidies applicable to the regions. Two regions were initially chosen; an area on the South Australian/Victorian border and one on the north eastern New South Wales/Queensland border.

The two areas were divided into over a hundred Universal Service Areas for each of which a 'per service' subsidy was calculated by the ACA based on the existing USO cost model. Some built up areas in the two regions attracted no subsidy because they were calculated as profitable areas.

Competitors to Telstra were encouraged to provide services in these areas provided they offered their services to all customers in the areas for which they were registered. That is, they could not attempt to pick out only profitable customers within the areas.

In the event no operator took up the offer to enter any of the areas. While DCITA 2004 argued that there were a number of benefits from the experiment, nevertheless, in practice it was a failure. Indeed, it was obvious at the time that it would fail to attract any interest – although this in itself may have had a benefit in silencing those operators who had argued that the subsidies Telstra had been receiving were too high.

The reason the experiment failed was because the subsidies were an insufficient inducement. It was obvious that they would be, for a number of reasons. Firstly, because the USO modelled costs were based on a forward looking methodology, the USO cost is not Telstra's actual cost, but what it would be if Telstra used the latest and best technology. Thus it is a *minimum* cost. No one, including Telstra, could, by definition, come in with a new technology at lower cost. The only way a competitor could provide services at a lower cost would be if it had much lower administration costs.

Secondly, Telstra had a key advantage, which was reflected in the USO cost estimates. Telstra had economies of scale and scope throughout the two regions, and throughout its whole network. No competitors could match these. And because Telstra had one hundred per cent of the infrastructure, and a new competitor would start with zero, and then have to win market share from Telstra, it would take many years before it could hope to approach Telstra's economies of scale. Thus, the subsidies were estimated based on the assumption of a monopoly provider. It was highly unlikely that any other provider could become the monopoly provider (and thus Telstra completely exits the market in that area) and the costs for

two or more providers would be likely to be significantly higher than the costs for a monopoly provider (for example, because of duplication of infrastructure).

Of course, if the modelled USO costs are a *minimum* this suggests two things. Firstly, Telstra is not being compensated for its *real* costs, only *efficient* costs. That is, if Telstra is inefficient in any area it has to bear the cost. Of course, this provides an incentive to become efficient. Secondly, if the USO were ever opened up for competitive provision, the cost would likely increase, perhaps substantially.

The experiment also raised a number of issues which would have to be considered if ever a competitor took over servicing a USO area in future. The first of these is what happens to the existing Telstra network. This question has a number of dimensions, not all of which were considered at the time.

The issue of a back up was considered. That is, if a new competitor were to withdraw, for whatever reason, an alternative was required if customers were not to be left high and dry. It was decided that Telstra would be required to maintain its network, for which it would receive a subsidy. However, because no operator did take up the challenge, some consequential issues were not addressed. For example, what if the competitor wanted to be provided with non standard telephony services by Telstra to resell to the customer? Not all of these are 'declared' so Telstra would not be obligated to provide them. What about price if Telstra did agree? This would be subject to negotiation. If there was no agreement the ACCC may not be able to intervene where the services were not 'declared'.

On the other hand, what would happen over time if new services were introduced by the competitor that Telstra's network could not supply? At the time of these contestability arrangements broadband services had not taken off. Today, if a new competitor supplying a range of broadband services were to leave the market Telstra may not be able to step in and supply these services. Could Telstra take over the competitor's network? Would Telstra be forced to upgrade its network to enable it to provide equivalent services? This gets to the issue of a broader, or upgraded, 'obligation' which will be discussed further below.

Another more subtle criticism of the approach concerns the method of calculating the USO subsidies.

The national USO cost model relies heavily on averaging. By that it is meant that costs and revenues cannot be determined for each of the ten million customers. It is a model after all. There has always been criticism that costs, for example, were modelled using an insufficiently large sample of exchange areas. The sampling errors were large². However, given large numbers of customers at exchanges and the large number of rural exchanges, over 4000, the statistical laws of large numbers will help cancel errors. Costs at some exchanges may be too high, and at others too low but overall these should largely cancel each other.

However, trying to estimate subsidies for small, individual Universal Service Areas exposes all the errors. The estimate for any given area is likely to be significantly in error, even though across the nation a reasonable cost estimate may be produced. If they were to produce

² Of course, the sample may also have been biased. That is, it may not have had a large enough share of remote exchanges in it. Since remote exchanges are the most likely to have USO customers, they should be very highly represented in the sample.

their own estimates, based on detailed characteristics of each area, they could find a large discrepancy between their own costings and the subsidies offered. Even an area as large as each of the two contestability areas would be a risky proposition. Alternatively, it could offer potential gains. It could open up opportunities for arbitrage – new competitors could enter areas where the subsidy is excessive and leave to Telstra areas where the subsidy is insufficient. This would be economically inefficient.

The model was designed as a national costing model. To estimate costs at the exchange level would require a considerably more complicated model incorporating a much greater number of variables (for example terrain and topology, maybe soil types, existence of footpaths, residential density (eg high rise buildings), detailed population mapping and so on).

The experiment was bound to fail. But as a testing ground, it did at least expose some issues that will have to be addressed if the USO is to be opened to competition in the future.

Before examining options for future USO provision, there is one more development in recent times that has the potential to significantly affect USO delivery in future. That is the growing importance of Government funding programs in recent years, particularly those aimed at providing services to rural and remote customers.

Government funding programs

Ever since the Telecommunications Service Inquiry into the state of Australia's telecommunications in 2000 the current Government has instituted a range of funding programs to improve services in the bush, including USO areas. These range from provision of telephone services through satellite phone subsidies, various mobile phone network assistance programs, extending untimed local calls, and recently, provision of broadband telecommunications services to rural and remote areas.

Through these programs, the Government has been partly assuming the role of provider of USO services, to the extent that these services have been taken up by USO customers. In addition, the Government has, de facto, extended the scope of the obligation beyond that of a standard telephone service. Indeed the current Communications Minister has been quoted as saying now that everyone is now entitled to a broadband service. De facto, the obligation is for a broadband service. In fact, under the current Broadband Connect program, services provided to rural and remote customers must be equivalent to those in metropolitan areas, in terms of price and data speeds, albeit that these requirements have not formally been applied to the USO.

Recently the Government awarded OPEL³ \$600m under the Broadband Connect Infrastructure Program, plus an additional \$358m to enable OPEL to go further. This marked a big step towards the Government becoming intimately involved both in setting service standards in rural areas and actually managing the provision of services.

It is likely that this new infrastructure investment will provide services to some existing USO customers. It appears from the maps provided publicly of the OPEL consortium's plans, that there will still be some customers without access to broadband services. The Government proposes that the issue of providing these with broadband services will be examined in the

³ OPEL Networks PL is a joint venture between Optus Networks PL and Elders Telecommunications Infrastructure PL.

forthcoming review of regional telecommunications. Funding has already been set aside for this under the Australian Broadband Guarantee and the Communications Fund. There are a number of possible options: small broadband providers could be invited to fill in the gaps (it may well be profitable for them to do so or they may seek a subsidy as was provided under the HiBIS scheme, for example) or the Government might call for specific tenders for services. Under either of these options at least some current USO customers could well end up being served by carriers other than Telstra.

In addition, in the future, even the OPEL infrastructure will need upgrading as the demand for ever greater bandwidth and new multimedia services outstrips network capability. The number of USO customers could increase. There may well be a need for further Government assistance. In many of the areas to be covered by OPEL infrastructure Telstra is already providing some broadband services. It could also well be that the Government is faced with more than one carrier in some areas, each seeking assistance for USO customers.

Multiple USO service delivery

The issue of multiple USO providers raises a range of other matters. One ramification has already been discussed. That is, whether there is a need to keep Telstra's network operational in case a new provider discontinues service provision for whatever reason. If so, this is really a price to be paid for competition. At the time of the USO contestability pilots, this cost was assessed to be small. However, that would only be true in the short term. In the longer term, as equipment had to be replaced the cost would be increase as it would with broadband rather than telephony equipment. In theory, with all the network in place, but no revenue received by Telstra, the cost of maintaining the network, including capital costs, would greatly add to the current real cost of the USO.

In any case, Telstra's existing network would eventually be unable to provide the new services being offered by the new entrants. How would the Government be able to ensure no loss of services to USO customers? If only STS were guaranteed, there would be constant pressure to upgrade the commitment. Would Telstra, as the only operator with ubiquitous presence, be allowed to operate, or take over, a competitor's network? What compensation would be required at the fire sale? Might this not be a cheap way for Telstra to acquire some broadband assets? Would Telstra be allowed to buy out competitors or would this be prevented by the ACCC just as it refused to approve the FOXTEL purchase of the Galaxy/Australis pay TV operation even though it meant that that operation went out of business?

ULL access dispute

Recently the issue of USO funding was highlighted in public discussions over access prices for unbundled local loop (ULL) services. What highlighted the issue from the USO viewpoint was the Government's announcement in December 2005 to reiterate its parity pricing policy for retail line rental services. That is, Telstra was required to continue providing a line rental product in rural areas at the same price as in urban areas, despite cost differences. Telstra argued that this policy conflicted with de-averaged access prices for wholesale ULL services – that is, different prices in different geographic areas. In essence, it is the parity pricing policy that 'causes' the USO. That is, if Telstra and other carriers could charge different prices for the same service around the country, to cover costs, there would be no USO.

In early 2006 the Government requested the ACCC to report on the desirability of de-averaged ULL access prices in light of its parity pricing policy. This analysis included the claim by Telstra the low access prices in urban areas were reducing its (monopoly) revenues

making it difficult for Telstra to meet its USO obligations. Telstra claimed that the subsidy received from the universal service fund (USF), now set by the Minister, was insufficient to meet its actual costs. The ACCC accepted that Telstra's argument of the relevance of USO costs and subsidies was material but did not accept that Telstra had provided evidence that the USF subsidy was insufficient.

The ACCC dismissed Telstra's claims although clearly the ACCC is not in a position to calculate the impact of the ULL access prices on Telstra's ability to fund its USOs without a model to assess the cost of the USOs. While the ACCC might be able to judge, from its models, the overall profitability of Telstra's business in its remote areas, this gives little guidance on the USO cost. As noted earlier, the size of the USO cost bears no relationship to the overall profitability of an area. In addition, the ACCC analysis could not properly take account of incoming call revenue, cost avoidability at various levels and a range of other factors. The ACCC access models have their own problems, particularly in measuring the range of costs in rural and remote areas (which was of little importance in the early days when access was only required in urban areas). They are cost models only, not USO models. They were never designed to throw any light on USO costs and revenues.

Nevertheless the ACCC did recognise the need to monitor the USO position thus implying that there might be a shortfall between the USF and actual USO costs in the future.

The ACCC's decision to refuse Telstra's 'averaged' ULLS access charge was appealed by Telstra to the Australian Competition Tribunal. In its decision, published in May 2007, it argued that the question of a subsidy shortfall was irrelevant and that the Tribunal could not 'disregard the actual subsidy fixed by the Minister'. That is, the Tribunal argued that the issue of actual USO costs was largely irrelevant and that the key issue was the efficient cost of the ULL service. It also argued that Telstra's contention that de-averaged charges would harm its ability to fund its USOs was based on the assumption of what competitor would do in urban areas which was in turn based on the assumption that competitors could not bypass Telstra's network in urban areas. Bypass destroys the ability of an averaged access price to protect Telstra's ability to fund its USOs. The Tribunal noted evidence that there was some measure of bypass.

The Tribunal also appeared worried that averaged access prices might enable Telstra to make sufficient profit on other services in urban areas that were not subject to the parity pricing requirement to completely subsidise its rural services and so be free to undercut competitors in urban areas for services subject to the parity pricing requirement and thus destroy competition. The Tribunal noted that it could not reach a definitive conclusion on this point – that is, Telstra doesn't need above normal profits on ULL services in urban areas since it makes sufficient above normal profits in other areas of its operations. It concluded that while wholesale price averaging may not inhibit competition in urban areas it would be unlikely to promote it.

The Tribunal does appear to accept a link between the USF payment and the case for averaging ULLS charges across the country. The Tribunal's stated that:

If the USF does not compensate Telstra for losses it would make when supplying line rental services in rural areas, then it may be that it needs to average its ULLS charges in order to ensure it can recover above-cost revenues from the provision of retail line rental

services in urban areas in order to recover fully the cost of providing the ULLS and a normal rate of return on its capital. (ACT para 230)

However, the Tribunal was not convinced that the USF failed to fully compensate Telstra for its USO costs. This appears to be based largely on the fact that the Tribunal did not accept the PIE II model used by Telstra to estimate its costs.

Of course, Telstra's PIE II model was not built as a USO model, rather as a straight forward cost model. So the same criticism could be applied to its use to determine USO costs as to the ACCC's calculations.

The key point about the foregoing discussion is that the USO issue is now having a major impact on debates about access prices which, in turn, are crucial elements in debates about the future competitive structure of telecommunications. Following the ULL debates, the arguments have carried over to Telstra's proposal to build a fibre to the node (FTTN) network. Unless the issue of the cost of the USO, and how it is to be financed, are resolved, it will continue to complicate regulatory and investment decisions.

Upgrading the USO

The 1994 Communications Futures Report (BTCE 1994) which looked into the then future implications of a broadband network for Australia noted that the issue of upgrading the USO from standard telephony to broadband would, in due course, have to be resolved. In order to assist in addressing this issue it set out a five-step framework for considering a possible contender for an upgraded USO:

1. adequately identifying and defining the product;
2. determining that the product is sufficiently 'essential' to justify the major policy interventions associated with a USO designation;
3. determining that costs are reasonable relative to benefits;
4. finding a practical and efficient implementing mechanism; and
5. working through any likely effects on other policy goals.

DCITA 2004 did not address the issue of upgrading the USO. Indeed its recommendations were based on the obligation remaining as one covering standard telephony only.

The Communications Futures Project modelled the likely cost of a broadband network in the bush and estimated that it could require a subsidy of \$1 billion per annum. That was over 12 years ago. The estimate was based on estimating overall costs and revenues for the network rather than using the recognised avoidability approach.

The CFP report rejected the upgrading of the USO on a number of the above grounds, but particularly because, at the time, it was not considered sufficiently 'essential'. However, this has changed since then. The Government's policy is now to make broadband services available to everyone. The price of broadband for most customers has decreased significantly and most of the other grounds listed by the CFP have now largely been met. Indeed, the Minister for Communications, IT and the Arts announced on 18 June 2007 that "fast affordable broadband access' will, under the Australia Connected program, by June 2009 'become a reality' for 99 per cent of the population (Coonan 2007). While not specified in the Telecommunications (Consumer Protection and Service Standards) Act 1999 broadband is becoming the *de facto* obligation.

While equipment costs have fallen over time, it is possible, indeed very likely, that upgrading the USO to cover broadband services could increase the net cost. It is notable that per customer subsidies provided under the Broadband Connect program were around \$3000. While they are multi year, it is likely that regular costs may be incurred if the service quality (eg data speed and downloads) standards are upgraded regularly additional costs would be incurred over time. A key issue may be whether the current USO customers are to be provided with subsidised services other than satellite broadband services. If so, the cost could increase significantly above that for providing standard telephone services (STS). Many more customers might become unprofitable besides the 400 000 or so identified in the last run of the USO model.

The cost of a broadband USO would largely depend on the technology solution adopted. In recent times relatively inexpensive wireless broadband systems have been developed which have been deployed by small operators. Even the larger carriers are providing alternative services, such as Virgin's 3G based wireless local loop service that includes a box that can provide a connection to the standard analogue telephone handset and a WiFi signal for broadband services. Sometimes they do not have all the carrier grade features of systems deployed by the major carriers – for example, battery backup for emergency calls. However, they may be the only cost effective systems for many rural areas. Nevertheless, they may pose longer term risks, as outlined earlier, that the operators may not be able to technically upgrade them later, or may choose to exit the market in the face of high upgrade costs. A higher grade service, with customer service guarantee requirements, could cost considerably more.

The options

Before considering the options it is worth reviewing some of the recent literature on USO provision. The OECD has released a number of papers on UAO issues in recent years including one by Patrick Xavier (2006)

This report examined a number of financing options:

- Cross subsidy
- A tax on each telephone number
- A connection based system
- General taxation
- Contribution from local government and other government departments
- Contribution from spectrum auctions, spectrum pricing and privatisation.

The first of these is largely the current situation. In essence, the other options boil down to two basic funding options – direct funding from the budget or through a dedicated, or hypothecated funding mechanism. Because the OECD has supported the line tax option, this has been chosen to represent the other Xavier options.

Three options were considered by DCITA 2004. These include:

- Telstra funds the USO without subsidy
- Previous arrangements restored with a new cost model developed
- Previous arrangements with a simpler method of determining the subsidy developed.

The main reason the DCITA 2004 options are considered is because recent developments, including funding programs, have altered the merits of the options. It will be argued that the favoured option in that report, that Telstra funds the USO without subsidy, can no longer be considered a useful option.

Combining all of these a set of five options emerges – the three considered by DCITA 2004 plus:

- a line, or number, tax, and
- budget financing and management by the Government.

OPTION 1 - Telstra funds the USO without subsidy

The arguments in favour of this option are canvassed in DCITA 2004 so they will not be covered in detail here. In essence, this option would remove the need for costing the USO and so do away with all the arguments over the method, remove the need for the universal service fund and sharing of costs by the industry. It is obviously the simplest option. However, it should be noted that in DCITA 2004 it is conditional on the obligation not being extended beyond the standard telephone service. With this condition it was considered the favoured option.

However, apart from the impact on Telstra, there are two arguments against this proposal which have become stronger since that report was released.

The first is Telstra's argument that its ability to fund the USO has been compromised as competition has increased, particularly through the requirement on Telstra to provide access to unbundled local loop services.

While it is beyond the scope of this paper to assess the merits of Telstra's claim, whether now or in the future, it is worth noting that the OECD has recognised this as an issue for many countries where the incumbent telco has specific universal service obligations. The ACCC and the Australian Competition Tribunal have both looked at the issue but both have stated that they are unable to reach a conclusion. The only way to answer the question is with an agreed USO model.

The second problem, that adds force to the first argument, is the gradual move towards making broadband services ubiquitous. No longer can the obligation be held to standard telephony services. Telstra is already facing pressure to make broadband services available to rural and remote customers. The Government is providing grants for upgrading to broadband and the Minister has claimed that anyone who wants broadband can now get it (albeit only a satellite service in many areas).

The cost of moving Australia to broadband, and then keeping parity between the bush and the city, will be huge and we cannot expect Telstra to shoulder the bill for all unprofitable services. This would gradually have a significant effect on Telstra's overall operations.

A final nail in this option's coffin is that Telstra's competitors are starting to supply services in rural areas through Government funding programs. In due course they will take over some loss making, and so USO, customers. They may do so soon enough through the BCIP. If we were to adopt this option, would Telstra's competitors have to provide service to these customers in the long run without any subsidy as well?

OPTION 2 - Previous arrangements restored with a new cost model developed

The key aspect of this option is the development of a new model. However, as noted above, this will require agreement, or at least acceptance, of a number of existing and new features of the model. Some of these include:

- Settling the question of USO benefits;
- Settling the issue of the definition of a USO customer eg whether customers in new estates are included;
- Settling the question of the appropriate WACC;
- Commissioning a much larger sample of exchanges with which to assess avoidable costs;
- Extending the model to cover competitive USO provision;
- Designing the model to be as close to customer level as possible;
- Avoiding of the 'year one' problem through proper depreciation calculations; and
- Building in flexibility to include services other than the standard telephone service eg broadband.

Not all of these issues have so far been discussed.

The issue of the WACC will probably always be contentious. Certainly the ACCC and Telstra disagree. There is a literature on the question of risk and the value of options theory in helping to quantify the effect of various risks. In the end the ACMA will have to be the arbiter unless it ends up in the courts.

The sample size is a critical issue. In the AUSTEL commissioned model only a small sample of exchanges was employed resulting in all exchanges being classified as one of about seven types. This is clearly insufficient, particularly for remote areas where most exchanges with loss making customers are located. There are a huge number of small exchanges and costs vary widely - particularly CAN costs. Costs per customer vary enormously and so a much greater number of exchange types is needed for remote exchanges, if not a return to a formula approach relating cost to population density and other relevant factors. While distance is less relevant for wireless networks, population density is a big factor in the cost pre customer for wireless and wired networks. The difference in costs per customer between an exchange of one thousand lines, for example, and an exchange of twenty lines is likely to be orders of magnitude.

Implications of competitive delivery for the model

A key issue is how to calculate the USO subsidy for the new operators. In terms of the USO costing model, competitive USO delivery complicates the modelling. The model would have to identify USO customers in each network as well as then calculating incoming call revenue from USO customers within networks and between networks – all within each iteration of the model. This is because incoming calls across networks provide revenue through terminating access charges.

The inclusion of competitive USO providers into the model will be very complex. It may also require that the basic measurement unit of the model be reduced. At present towns are divided into built up and non-built up areas. This can reduce the USO cost considerably because it can hide loss making customers within built up areas with profitable customers in

non-built up areas. With competitive USO provision there may be groups of customers of different competitors within the one non-built up area, for example. If so, the area will have to be disaggregated to identify groups of customers belonging to each carrier. This may increase complexity of the model enormously. At present each area only has to be categorised as one of seven types. With competitive provision many of the 4000 or so exchange areas will have to be disaggregated – wherever there is another carrier besides Telstra.

In the end, at least initially, it may even be easier to calculate separate USO costs for the other carriers manually. However, it should be on a basis consistent with the USO model.

The year one problem relates to the fact that at the start of the period the model is measuring, a reliable method is needed for calculating the ‘forward looking’ market value of assets employed in producing the USO. On top of this, one has also to determine the historical cost of the assets. The rate of return, or WACC, is applied to the ‘forward looking’ market value of assets and in year one, depreciation is equal to the difference in this market value of the asset at the beginning and end of the period. However, over the life of the asset the depreciation allowance should exactly equal the historical cost. With many USO providers, this issue will also become more complex.

On top of these issues, there are a number of other issues on which there is disagreement within the industry (generally Telstra versus the rest), in particular whether there should be an allowance for the benefits Telstra gains by being the USO provider. Taken together, they seem to suggest that a new model would be problematic. However, if the industry was willing to accept the limitations of a model this could still remain a viable solution. After all, the industry accepts the use of a model by the ACCC in setting access charges (although Telstra argues for its own PIE II model). While the ACCC model is only a cost model, there is little to suggest that that model is any more robust than the USO model. The problem is, of course, as suggested in DCITA 2004, the model may well indicate that the USO cost is much higher than the current levy set by the Minister and so requiring a much greater contribution from the industry. In reality, there is no point in progressing with a new model until the industry agrees to stop disputation and accept the outcome of the modelling process.

The impact on the industry could be substantial. The model produced a cost estimate in 1997/98 of \$548 million. The current levy, determined by the Minister, is less than \$150 million. Industry currently pays around 30 per cent of the levy and Telstra around 70 per cent. This would imply an increase in the annual levy payment by Telstra’s competitors from less than \$50 million to over \$150 million, and possibly more if the USO is upgraded to broadband.

OPTION 3 – Employing a simpler method of calculating the USO cost

This option largely boils down to setting a cost estimate by consensus initially, with some basis for moving forward. It reflects the current status quo. DCITA 2004 saw merit in the proposal in that it was fair and provided a measure of certainty to the industry. It saw the approach as striking a reasonable balance between efficiency and equity objectives.

It essentially involves a political judgement by the Government. It is difficult to see how any simple approach could approximate what is a complex model and so the chances of coming up with a solution that reflected the real USO costs would be negligible. One would suspect the final figure would simply reflect judgement: on the one hand, about the ability of Telstra’s competitors to fund the USO without impeding their ability to compete with Telstra; on the

other, based on a recognition that the real cost of the USO is likely to be much higher than the current levels of compensation. It is likely, as DCITA 2004 suggests, that the subsidy would be at a level similar to that currently set by the Minister rather than return to the levels estimated in the past by the model.

The option does have the advantage that it is a much simpler process. It does not require all the administrative effort involved in running the model.

The problem with a process that does not make any attempt to find out the real cost of the USO means that we will never know the efficiency losses involved, nor will we be able to assess Telstra's claims in future that its ability to fund the USO is diminishing.

In fact one could argue that this option is worse than Option 1 in that the subsidy actually received by Telstra is so small, currently around \$50 million compared with revenues of over \$20 billion that it makes hardly any impact on Telstra yet still imposes a burden on Telstra's competitors, straight from their bottom line profits. Option 2 hurts competitors more but at least it can be argued to have efficiency gains.

OPTION 4 – A tax on lines or numbers

In a paper examining the case for unbundling the local loop in member countries the OECD (2003) noted the potential for loss of revenue to the incumbent from mandatory provision of access to the local loop might diminish the ability of the incumbent to continue subsidising its USO services. The OECD proposed an efficient 'universal service tax or subsidy (p35) which could be applied to ULL lines. The OECD claims that the proposal has a number of merits: it can be designed to be economically efficient, it links the payment for the USO to the loss of monopoly profits from telephony from providing ULL services; it is equitable in linking the beneficiary (the access seeker) directly to the cost whereas under current arrangements the link between levy liability and eligible revenue is very tenuous.

A key issue is the size of the levy. Without a model to calculate the USO it is difficult to assess the appropriate level of the levy. However, the OECD argues that it can be set efficiently, with minimal distortion to the market. Presumably, with a relatively small access price, competitors should be able to pass most of the levy onto customers. With the last calculated USO cost estimate at \$550 million per annum and given around 10 million lines, the charge would be around \$55 per annum or \$4.60 per month per line. Of course, not all the USO funding need be collected through this charge to ensure that competitors who did not access Telstra lines, for example those providing wireless services, might also contribute to the USO. In effect the tax could be a 'customer' tax. Decisions might have to be made about whether those customers who only used mobile telephony services should contribute to the USO.

While a tax of around \$4 per month might be a small compared with current rentals it would, as Xavier notes, be a regressive tax and may require additional programs to protect low income earners. The alternative of a number tax would, of course, need to be much less per number, given that there are over 30 million numbers.

The negative efficiency impacts of this option may be larger than those for Options 2 and 3. For Options 2 and 3 the subsidy cost come off the bottom line of each carrier and should have minimal affect the pricing of individual products. The line or number tax, on the other hand involves increasing the price of a specific product provided by all carriers. However, line and

number access has generally been assessed as having a low price elasticity of demand and so welfare loss should still be low. In addition, it is spread widely, so minimising the level of the tax which should minimise its effect. The extent of the distortion imposed by the tax will, of course, depend on the size of the tax.

OPTION 5 – The Government takes over the responsibility – for both determining service levels and funding them (ie budget funding).

As noted above, the Federal Government, and to some extent State and local governments, are already starting to fund some USO services. Through its funding programs in recent years the Federal Government has poured well over a billion dollars into telecommunications, some of which would have flowed to USO customers. The recent announcement of Broadband Connect Infrastructure Program grants will ensure many USO customers obtain broadband services, at least for the foreseeable future. Given that the Government has been called upon more and more to fund these services, and will undoubtedly be called upon into the future, then it might seem sensible for the Government to take over formal control of USO funding. This it has done for a range of other public services, such as national roads and air services. Of course these are in areas the Federal Government does not have full constitutional responsibility whereas it does in telecommunications.

For the Government to take over the USO it would need to scope it. That is, identify USO customers or at least areas where it would accept responsibility for ensuring services were provided – or else provide criteria or a mechanism for defining them.

In the areas identified as USO areas (whether they contain non-USO customers does not really matter) the Government could provide funding for USO service providers, through, for example annual contracts or tenders with the Government setting the minimum level of services.

In effect, the Government is doing a lot of this now. The HiBIS program and Broadband Connect Infrastructure Program do this. Many of the NTN and associated projects did this, for example the mobile phone contracts for small towns and highways.

If done widely, to cover all USO areas this would be expensive, at least initially. No one, including Telstra, would tender for the USO for less than the current USF subsidy. It is likely that any provider would want considerable more. Initially there may be little competitive tension in the bidding process. Telstra may simply win many of the contracts at a higher price. However, this may in part reflect the fact that the current subsidies are far below the real cost. If the USO subsidies reflect the true cost of services then there may well be more interest shown by other carriers in supplying them.

The other reason that the cost may be higher is if the obligation were to be increased to a fast broadband service. This is basically inevitable now that the Government has stated that it will ensure that almost all customers can access fast broadband services. However, over time demands for even better services will inevitably increase. Customers might have more success in getting services upgraded from the Government than from a private supplier. The cost of providing such services is likely to increase.

Over time telephony services are likely to be absorbed into broadband services. With the growth of voice over internet protocol (VoIP) services telephony will become a minor data

stream in the broad multi media services provided to customers. The growth of mobile services may mean that fixed telephony services become less important to customers. The obligation may remain *de jure* as standard telephony but will gradually become a *de facto* broadband obligation. Even though rural and remote customers may be asked to pay for their broadband services, because prices for these services have been effectively linked to metropolitan prices through the HiBIS and Broadband Connect programs, many of these customers will not be paying the full cost of their services – effectively creating a broadband USO.

As Xavier notes, funding expenditure from general taxation is generally the favoured method of economists as it is less, although not completely, distorting than taxing specific goods or services. That is, it is better that taxpayers decide how to reduce their expenditure in the face of additional taxation, and so minimise their welfare loss, rather than the Government deciding. He also notes that the Regional Telecommunications Inquiry (2002) supported funding of upgraded services from the budget, in line with many other subsidies for rural areas and industries, in preference to the industry funding them through the current USO mechanism (249-250).

Some critics oppose budget funding on the basis that it is vulnerable to changes in fiscal policy whereas predictability is important. To the extent that this is true, it only reflects the fact that Governments have to make fiscal decisions. The other side of the coin is that Governments should make better choices when the costs are transparent to all. It is not normally economically efficient to link a particular revenue source to an expenditure item – revenue raising should be based on efficient pricing principles (for example, marginal cost pricing) while expenditure decisions should be based on benefits (for example, through benefit cost analysis) but also take into account economy wide resource allocation principles.

The Regional Telecommunications Inquiry (Estens Report) basically supported direct Government funding. It noted that the USO “is not an effective mechanism to provide broad consumer access to an increased range of services into the future”. It suggests that the Government should have a role in funding broadband services to loss making customers even if not through the USO mechanism. Once the USO moves beyond vanilla STS someone has to make decisions as to the level of services to be provided in unprofitable areas. There is an argument that this should not be left to Telstra, or any other carrier. The fact that Government has instituted reviews such as the RTI tends to support this. However, if, as noted above, standard telephony is becoming simply one of many data services offered as part of a broadband package of services to customers, it will progressively become difficult to sustain a separate telephony USO but a Government policy of providing broadband services to all. Broadband services will become the *de facto* universal service, which will include telephony services. The major practical difference might be that those who did not want broadband services, or rather, pay for them, might still be able to choose a standard telephone service. Over time, these customers will become few in number.

A further argument in favour of Government responsibility for the USO is the complexity that will inevitably arise as, over time, other competitors enter the market. With multiple USO suppliers there will inevitably be tension among customers receiving different levels of service. The risk of business failure could well increase as it did in urban areas after 1997. There is less of a problem in urban areas though, where there are more alternative suppliers. The problem of retaining a USO provider of last resort may be more easily resolved if the Government has greater control over service provision.

On the other hand, the Government may not wish to become too deeply involved in the business operations of a number of USO providers. The Government has been seeking to divest itself of various business undertakings over the past two decades. However, it is already starting to become involved through its funding programs and will inevitably be more so given the large amounts set aside for future funding through the Communications Fund.

In a way, this would be an extension of the contestability USO scheme started in 2000. One could argue that that scheme was unsuccessful largely because the level of subsidies offered was too low. But also, the range of alternative technologies has increased markedly since then, particularly lower cost wireless technologies, which now make it more profitable for new competitors to enter rural markets. The Broadband Connect Infrastructure Program highlights the impact of technology on business models over the past few years. In 2000 such a program would not have been sensible as there was no effective alternative to copper technology.

In the past there was a view that budget funding could well entrench Telstra's monopoly. Telstra has certainly received a large share of Government funding over the years. However, this is also changing as a result of technology. There are now more viable alternatives to Telstra's network and technology. The chances of more competition are greater today, and should become even greater in future. The Broadband Connect Infrastructure Program offers a chance for significant competition into rural areas.

Of course, assuming the management of the USO will create problems for the Government. In some areas Telstra may be the only carrier willing to provide the service. It may seek more money. The Government will need to develop an independent process, presumably through ACMA, for determining whether Telstra's claim for subsidy is reasonable – not a model but at least some costing guidelines. Initially the Government may need to continue the current ministerially set USO arrangements in the short term and gradually move away from them for those areas where it is possible to tender services.

A further constraint may be that the USO customers are not grouped together in a way that favours single contracts, rather they are dispersed. But this issue is already being addressed through Broadband Connect (for example, through the large OPEL contract).

Assessment of options against the Xavier and Economides criteria

Attempts have been made in the literature to provide a framework for assessing various USO options. Both Xavier (OECD 2006) and Economides (1997) set out a range of useful criteria. The table below attempts to assess each of the five options against the Xavier and Economides criteria.

Table 1 – Assessment of five funding options against Xavier and Economides criteria

Criteria	Options				
	<i>New model</i>	<i>Simple model</i>	<i>No Telstra funding</i>	<i>Line or number tax</i>	<i>Budget</i>
Xavier					
Efficiency	X	X	X	X	√
Equity	√	√	√	?	√
Certainty	?	X	X	√	X
Transparency	?	?	?	√	√
Competitive neutrality	X	X	X	X	√
Technological neutrality	X	X	X	X	√
Cost effectiveness	X	X	√	X	√
Economides					
Broadly funded	√	√	√	√	√√
Narrowly targeted	X	X	X	X	√
Overall ranking				2	1

To some extent there is a measure of judgement in the assessments of each option, as there is in defining each of the assessment criteria. Xavier (OECD 2003, 50) has defined the criteria as follows:

Criteria for assessing a funding mechanism

- *Economic efficiency* – the financing of universal service should distort economic behaviour as little as possible;
- *Equity* – equity is a contentious ‘normative’ criterion that may be variously defined/assessed eg whether there are similar costs for people with similar abilities to pay, and whether contributions are fair and reasonable;
- *Transparency* – the opportunity for public scrutiny of information, to the maximum extent possible;
- *Certainty* – specific, predictable and sustainable arrangements;
- *Competitive neutrality* – does not discriminate in favour of any company;
- *Technological neutrality* – does not discriminate in favour of any technology;
- *Cost effectiveness* – cost effective to introduce (if a new scheme) and cost effective to administer on an ongoing basis.

Source: The regulation of Access services (with a focus on telecommunications), OECD, 7 November 2003 (<http://www.oecd.org/dataoecd/23/61/18645197.pdf>)

Economides has a similar range of criteria but introduces two extra ones:

- *Narrowly targeted* – the funding is targeted to those who ‘need’ it; and
- *Broadly funded* – the incidence of the tax or other funding should fall as widely as possible and not be a burden on only a small group of users.

While efficiency is the first assessment criterion in the table it will be dealt with separately below. This is because it has separate aspects including administrative efficiency or complexity and economic efficiency.

Only the line or number tax is rated poorly on equity grounds because it is a regressive (fixed) tax that will impact poorly on low income customers. However, this could be mitigated by programs to assist low income earners. The other options involve the burden falling on taxpayers or telecommunications users in general or Telstra's customers – fairly wide groups. The incidence on individuals can only be avoided or reduced by reducing consumption of telecommunications services. It is not clear cut, of course, as lower income customers use telecommunications services to varying degrees and there are currently low income assistance measures available. A number tax might be somewhat less inequitable than a line tax if it is the case that higher income earners are more likely to have a mobile phone, or even several, and that many mobile phones are used for business.

The Telstra funding option is rated poorly on the criterion of certainty. The reason was that the less compensation provided to Telstra the less likely it is to provide better services to its loss making customers. Of course the other two options may only be marginally superior on this criterion since Telstra may continue to argue that is not being adequately funded – even with an agreed model. The budget funding option is rated poorly on certainty on the grounds that it is subject to budget priorities. Xavier notes, however, that any form of cross subsidy, which is implicit in all but the last option, will become increasingly unsustainable over time with increasing competition. Therefore, all but the line or number tax options fare poorly on this criterion.

On transparency, the use of a new model would improve our understanding of the real cost of the USO. Likewise, tendering for the USO under the budget funding option will also clarify the real cost. However, while the provision of the USO is left to Telstra there is less transparency as to how the money is spent. The budget funding option, with competitive delivery of the USO would be much more transparent.

The construction and operation of a new model rates lower on cost effectiveness, because of the administrative cost involved. The line or number tax could also involve some administrative cost. However, considering the overall cost of the USO, even these costs would be relatively small.

All the options are broadly funded. The first two involve all customers of all carriers (except the very smallest) sharing in the funding. The third would only affect Telstra's customers, although they are about 70 per cent of the total. The fourth involves all fixed line (line tax) or all telecommunications (number tax) customers and the last all taxpayers – basically the same group as all telecommunications users.

The assessment of options against the criterion of narrow targeting of services is partly philosophical. Is it better for say Telstra to decide on services to USO customers, guided by its own business interests, albeit constrained by regulation, or is it better to the Government to set the parameters? For example, through a tender process the Government may be offered a range of solutions to choose. The other options involve leaving the decision on level of services to particular customers to Telstra. Of course, in one important sense the whole USO is not well targeted. Services are subsidised on the basis of higher cost not on equity or need.

That is wealthy people in rural areas get the same subsidies as poorer people in those areas (apart from those on Government pensions etc who receive specific additional subsidies).

Efficiency

There are at least two separate aspects of efficiency. The first is administrative complexity. The first three options have in common the fact that Telstra largely decides on the services offered to customers, although currently with a regulatory regime to ensure at least basic levels of service are maintained. However, over time there have been changes in Telstra's commitment and approach. For example, prior to 1988 there was concern that Telstra may have 'gold plated' its network in the absence of competition. In more recent times there have been criticisms of Telstra's services. For example, claims that it has let maintenance slip, that it has chosen technical options that have hindered deployment of ADSL services (for example, use of RIMs and pair gain systems) and that it has failed to utilise its network to the fullest in providing the latest ADSL2+ services.

The option of the Government managing the USO through, say, public tenders, may enable the tighter control through contractual arrangements. The Government may be in a better position to specify the type and quality of services available than leaving more decision making to Telstra. However, it would still require considerable Government administrative oversight.

On the question of economic efficiency the assessment is largely turns on the merits of industry funding, Telstra funding through cross subsidy, a service tax or budget funding. In theory cross subsidy is the worst option in that it distorts demand decisions for USO customers and all profitable customers who are faced with prices that are excessive. Industry funding could be less distorting. However, there is the likelihood that the impact could be more problematic on Telstra's competitors, particularly if the cost is large. Very few carriers, for example, even make a profit and USO contributions could represent a substantial cost to smaller carriers and thus hinder competition.

As noted earlier a tax on lines or numbers has economic efficiency implications because it too, like cross subsidy, distorts prices. However, if the elasticity of demand is low, which is likely, then the efficiency impact of either option will be less.

As noted by Xavier, Budget funding is likely to be less distorting than a tax on services.

Overall assessment

On balance, on these criteria, budget funding or a line tax rate most highly. The other options, including the DCITA 2004 preferred option, rate poorly. Budget funding, in particular, scores best on the criteria of technological neutrality, competitive neutrality and technical efficiency because it removes the decision making on services from Telstra. That is, the Government can tender services to any carrier using whatever technology the carrier chooses. It can be driven by the market. Of course, this assumes that the Government takes expert advice. It also scores well in economic efficiency since a tendering process can introduce competitive tension which is not present in the current USO process.

The line tax option does not rate significantly above the first three options, largely because the funds are still largely passed to Telstra to disburse. It also suffers from the need to decide what level of tax to levy and to link this to the services actually provided. The budget funding option provides more flexibility, albeit with less certainty of funding.

The line tax and budget funding options could be combined. That is, the Government manages the USO but funds it through a line tax rather than having it funded from the bottom line (that is, from the profits or added to the losses) of each carrier as at present. The line tax would be a less preferable means of raising revenue than through general taxation but it might offer some political advantages. It would link the USO to telecommunications based funding and provide a measure of certainty for USO funding (although there may be efficiency arguments in basing Government funding on a wide range of factors, including macro economic factors, rather than tying it to particular sectional demands).

Costing versus management

As suggested above, funding and the management of the USO can be divorced. A line, or number, tax could be combined with all the other options except for Option 3 – no Telstra funding. Equally budget funding could be combined with Options 1 and 2.

The key to the attractiveness of the budget funding option is that it facilitates direct management of the USO through contracts, rather than the current indirect regulatory approach (legislation, pricing policies, customer service guarantees etc). In particular, provision of the USO through a competitive mechanism, such as a tender process, can ensure greater efficiency. It may result in one monopoly replacing another but at least there can be some competitive tension in the tender process. The Government could, of course, involve itself in greater management of the USO provision through tenders but yet continue requiring industry to fund the cost.

There are still major issues to resolve if we were to move to Government management of the USO. The Government would still have to decide the level of funding, or its corollary, the level of services to be provided. However, there would no longer need to build a new USO cost model as the Government would determine it. That provides this option with a major advantage over a line or number tax linked to the current universal service fund. The latter option requires a determination of the level of the tax.

To some degree telecommunications is becoming more like other areas of Government involvement such as roads, public transport and municipal services. Wherever possible, provision by the private sector in a competitive market is desirable. Where this is not possible, services should be supplied in a competitive selection process with government oversight of standards and levels of service.

The cost

Theoretically, a tender process could reduce the ‘apparent’ cost of the USO if it covered profitable areas as well as unprofitable areas, as did the Broadband Connect Infrastructure Program. As noted earlier, the bigger an area considered, and the more heterogeneous it is, in terms of profitable and unprofitable customers, the less the ‘apparent’ USO cost. Thus a large tender could force bidders to cross subsidise some or all loss making customers from the above normal profits of other customers. The resulting bid, in terms of subsidy required could be lower than the actual USO cost. Tender arrangements change the rules – they hide the USO cost in a cross subsidy. However, as noted earlier, cross subsidies involve inefficient resource allocation.

Of course tender arrangements may not work everywhere. In more remote areas, in particular, only Telstra may wish to bid. If there is no competitive tension there are no market forces on Telstra to prevent a bid for an excessive subsidy. In these areas the Government

may have to continue current arrangements but perhaps with an auditing by the ACMA of Telstra's USO claims for these areas.

In those areas where a tender is feasible while the cost to the Government, or industry, may be lower than the true USO cost, the impact on Telstra could be larger. If Telstra is to remain in these areas and is to continue to be the USO provider of last resort, its USO cost has still to be funded even though it faces a competitor. In addition, because it will lose market share, its USO cost may rise, possibly substantially. This is because it is likely to lose much more revenue than cost. This reflects the fact that much of rural and remote Australia is still a natural monopoly. Duplication of the network in many rural and remote areas may be an inefficient allocation of resources.

If Telstra is not to be required to remain USO provider of last resort then it should be compensated for the write off of its USO assets if it chooses to vacate the market since these assets were only put in place because of the USO. So to if another carrier is offered a subsidy to provide these services. Depreciation of these assets is part of the economic cost of the USO. Even though many of these assets are old, their market value in total could still be large.

As noted earlier, it is difficult to estimate the cost of the USO today or in the future, especially if it is upgraded to a broadband USO. It will depend to a large extent on the technology solution adopted. There is no consensus concerning the real cost of the current standard telephony USO. Telstra has claimed on many occasions that the real USO cost is much higher. The last estimate using the USO model was \$548.1 million in 1997-98⁴. DCITA 2004 (141) accepted that the cost could be significantly higher than the current ministerially set subsidy level of \$157 million. The only way to measure it accurately is with another large, costly and time consuming modelling exercise.

On top of the annual USO payments from industry, the current Government has spent or allocated well over \$1 billion towards providing broadband services in rural and remote areas through HiBIS, ABG and the Broadband Connect Infrastructure Program. A similar sum is likely to be available from the earnings of the Communications Fund over the life of the Fund.

The way forward

Given the difficulties of costing the USO it is likely that that Government will continue the current arrangements while it moves to gradually take over the management of at least much of the USO. No doubt programs such as Broadband Connect will continue. Of course, there may always be some areas, particularly remote areas, where no other carrier besides Telstra may be willing to provide fixed line, or even wireless, services. Satellite services may provide much of the solution but there may remain some customers who rely on their terrestrial Telstra solution.

The current arrangements might be revamped somewhat. For example, a small scale study of current costs, particularly the cost of providing broadband services, could at least suggest

⁴ When the new model was first run in 1997-98 a cost estimate of \$1.8 billion was produced. This was later discounted mainly because it was discovered that it was based on the new, or current replacement, price of assets, rather than the market, or depreciated, value of assets.

whether the current ‘determined’ cost is in the right ‘ballpark’ of the real USO cost. This could be useful for other policy debates as well, such as whether or how quickly to roll out a fibre based network beyond major urban areas.

Where there are identified alternative providers to Telstra, some apportionment of the cost could be made on a ‘per service’ basis, much as was provided under the unsuccessful contestable USO program. These ‘per service’ subsidies might be determined for a range of areas of the country reflecting remoteness, or population density, the chief drivers of costs.

While the 2004 review noted that such simple measures were unsatisfactory, they may well suffice to fill in the gap as the Government introduced new arrangements for managing the USO on a more permanent basis.

Unfortunately, bringing competition to the bush through some form of Government managed tender process still leaves many issues unresolved. Some of these were outlined above – for example, what to do if Telstra withdraws from one or more areas and a new provider fails. Will the Government require new providers to allow Telstra, or another provider, to use their infrastructure to provide services if they cannot? What if these assets are tied up in bankruptcy proceedings? Should the Government require Telstra to provide a temporary service (for example, satellite phones or mobile phones or even a broadband service such as a 3G service)?

Conclusion

Market conditions surrounding the USO have changed markedly since it was formally established in legislation in 1991 and particularly in recent years. The option favoured in DCITA 2004 now no longer seems attractive. The current USO framework is becoming unworkable and will become more so as new competitors to Telstra start providing services in USO areas. The gradual upgrading of services to broadband makes the basis of the current obligation, to provide a standard telephony service, likely to become progressively outdated. In addition, even though the USO may, *de jure*, remain as a standard telephony obligation, it is becoming *de facto*, a broadband obligation. The cost of providing broadband services to rural and remote areas could increase the overall cost of providing telecommunications services to loss making customers. For these reasons a major revision of the funding and management of the USO is required.

The Government has already moved towards funding USO services directly through its funding programs such as Networking the Nation and Broadband Connect. This will undoubtedly continue with the money set aside in the Communications Fund. This is probably the right direction. At the same time it will bring some measure of competition to rural and remote areas for the first time.

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