

International Benchmarking Study

A comparative review of retail
minus wholesale discounts

November 2002

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Executive Summary

1. The Telecommunications Act 2001 (the Act) provides for the Commerce Commission to determine the initial discounts that will apply to the wholesale provision of designated services on the basis of international benchmarks. This report presents the findings of the Commission's benchmarking study of wholesale discounts, and takes into consideration written and oral submissions by interested parties. It describes the Commission's approach to choosing comparator jurisdictions and presents the wholesale discount rates required in order to obtain appropriate benchmarks.

Methodology

2. The Act requires the Commission to fix a discount off retail price benchmarked against discounts in 'comparable countries'.
3. Globally, the use of a regulated wholesale pricing policy based on retail minus avoided costs is rare. The survey identified only three countries that mandate wholesale pricing in this way: Australia, the United Kingdom and the United States. Amongst these, the Commission identified individual US States as potential comparators, as the local regulatory regimes are similar to that described in the Act. Owing to differences in methodology and scope, the Commission considers that the UK experience is not a relevant benchmark. The Commission also considers Australian wholesale discounts to be unsuitable as benchmarks for New Zealand for similar reasons.
4. CostQuest Associates, on behalf of the Commission, developed a survey to collect data on discount values, cost calculations, and wholesale policy from regulatory agencies, incumbent operators and new entrants. Additional secondary data was collated on wholesale discounts and the cost compatibility criteria. In light of the comments received on earlier drafts of the International Benchmarking paper¹, the Commission has updated the benchmarked wholesale discount rates to include as many U.S. states as possible from publicly available sources. It was observed that most U.S. states expressed their wholesale discounts as a percentage of the retail price and calculated them on the basis of accounting top-down cost principles. Most respondents used a single wholesale discount for retail services, although a minority had different discounts depending on the type of service and end user.
5. Data for forty-seven states was collected for the benchmarking study. For the thirty-three states that use a single discount rate, the rates ranged from 12.20% to 29.47% with an average of 18.91%. The remaining fourteen states use multiple discounts. All wholesale discount data is current as at the date of this paper.

¹ "International Benchmarking Discussion Paper", Commerce Commission, 5th April 2002.

Executive Summary

6. In some of the benchmark jurisdictions, discounts differ depending on whether the wholesale services offered are to be resold to business or residential customers, which should ideally reflect differences in the retail costs saved. However, there is no clear pattern in these differentiated discounts that would unambiguously suggest that retail costs incurred in serving residential customers are higher than those incurred for business customers or vice versa.

1 Introduction

7. This Report presents the findings of the Commission's benchmarking study of wholesale discounts. It is published with the intention of describing the Commission's approach to choosing comparator jurisdictions and discount rates required in order to obtain appropriate benchmarks for application of the initial pricing principles in making a determination of the terms of supply of certain wholesale services.
8. On 5 April, the Commission released a benchmarking discussion paper based on a study undertaken by CostQuest Associates in conjunction with Commission staff on behalf of the Commerce Commission for industry consultation. The purpose of the study was to provide information to support the Commission's role in making access determinations.
9. Written submissions in response to this discussion paper were received from Econet Wireless New Zealand Limited, Telecom New Zealand Limited, TelstraClear Limited, Telecommunications Users Association of New Zealand ("TUANZ"), Vodafone Limited, Walker Wireless Limited and WorldxChange Communications Limited.
10. On 16 and 17 May, the Commission held a public conference on the benchmarking discussion paper, where Telecom, TelstraClear, Vodafone and TUANZ provided oral submissions.
11. The Commission, after further consideration of the written submissions by interested parties, and the oral submissions made at the conference, revised the report. This revised report reflects the consideration of the issues raised.

2 Methodological issues

12. The Act provides for the Commerce Commission (the Commission) to determine the discounts that will apply to the wholesale provision of designated services (wholesale discounts). The purpose of the wholesaling regime (in line with other provisions in Part 2 and Schedules 1 to 3 of the Act) as set out in Section 18 of the Act is "*to promote competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand,*" taking into account the effect on efficiencies that will result when assessing "*whether or not, or the extent to which, any act or omission will result, or will be likely to result, in competition in telecommunications markets for the long-term benefit of end-users of telecommunications services within New Zealand.*"
13. Subject to sections 22 and 23 of the Act, applicants may make an application to the Commission under section 20 for a determination of all or some of the terms on which a designated access service must be supplied during a period of time specified in the application. The initial pricing principle to be applied in making a determination following an application requires the Commission to fix a discount off retail price benchmarked against discounts in 'comparable countries', whereas the final pricing principle will be set on the basis of cost studies.

3 Study results

3.1 Selection of participating countries

14. Globally, the use of a regulated wholesale pricing policy based on retail minus avoided costs is rare. This reflects the fact that telecommunications regulation in many countries has not yet advanced to this stage. Meanwhile, some OECD countries have considered, but rejected, mandatory wholesale discounts. For example, Canadian legislation forbids incumbent telecommunications providers from prohibiting the resale of retail services, but the Canadian Regulatory Authority declined to establish mandatory discounts for the resale of retail services. The survey identified only three countries that regulated wholesale pricing policy for telecommunications on a retail minus basis: Australia, the United Kingdom and the United States. Each of these countries is discussed below.

3.1.1 Australia

15. In a recent report², the Australian Competition & Consumer Commission (ACCC) set out its procedure for calculating indicative prices for Telstra's Local Carriage Service (LCS), a local call resale service. The ACCC calculated wholesale prices for LCS using a "retail minus retail costs" methodology, with the objective of promoting competition in the local call retail market.
16. The ACCC defines the relevant cost measure as average retail costs and not as a measure of retail costs actually avoided. Its definition of avoidable cost saved is:

"Avoidable costs are the costs that an access provider could avoid if it ceased retail operations completely, whereas avoided costs are those costs that the access seeker actually avoids when it ceases retailing to the end-users who are now supplied by its competitor... What is sought to be measured, however, is not so much the quantum of costs that the access provider could conceivably avoid through its supply of wholesale services but rather the average retail cost of supplying a particular service (e.g. local calls). In this regard, the definition of avoidable costs provides a means of identifying and estimating retail costs. That said, the Commission acknowledges that the terminology 'avoidable costs' is capable of creating the impression that the access provider can avoid those costs, when in reality this may not occur. Consequently, the

² ACCC, April 2002, *Local Carriage Service pricing principles and indicative prices*

Study results

Commission has chosen to express the methodology as 'retail-minus retail costs'."

17. The indicative prices released by the ACCC were released to inform the market of the prices that the ACCC was likely to adopt if it had to arbitrate future access disputes or assess undertakings for access to the services. The ACCC noted that the prices were only indicative and not binding on the ACCC and the parties to any future arbitrations. In these circumstances, the Commission does not intend to include Australian data in the benchmarking analysis below.

3.1.2 United Kingdom

18. In the United Kingdom, there are two wholesale telecommunications services priced on a retail minus basis: Calls and Access for fixed lines; and Indirect Access (IA) to mobile networks. However, the Commission does not consider that either of these services could provide suitable benchmarks for New Zealand:
 - As Network Strategies/Analysys point out in their report for Clear Communications³, the wholesale prices for the Calls and Access product are calculated using a fully rebalanced and purely notional retail tariff and not on an available retail tariff. As such, it is not an appropriate comparator for New Zealand. In addition, the UK Calls and Access product is not considered very successful and Oftel is currently in the process of replacing it with a cost-based Wholesale Line Rental product⁴.
 - IA to mobiles is based on an available retail tariff and has been mandated on a retail minus basis for BT Cellnet (now O₂) and Vodafone. Although the methodology used is comparable to New Zealand, a comparison with fixed line wholesale access would be inappropriate owing to the very different cost structures involved in supplying mobile and fixed line services. In addition, Oftel is likely to remove this obligation in the near future as it has recently revoked its determination that BT Cellnet and Vodafone have market influence⁵ (which was a key factor in its decision to mandate conditions of access for IA to mobile services).

³ Network Strategies and Analysys, 30 October 2001, *Wholesaling Issues in Telecommunications*, Final report for Clear

⁴ See Oftel, January 2002, *Protecting consumers by promoting competition*

⁵ Oftel, April 2002, *Determinations to remove the determinations that Vodafone and BT Cellnet have Market Influence*

Study results

3.1.3 United States

19. The United States employs a federal regulatory system overlaying state-level implementation of access principles and state-level price regulation. Wholesale prices are therefore set at a state rather than a national level. Accordingly, the United States as a country is not a relevant comparator for the purposes of this study. However, the regulatory framework at the state level for wholesale access pricing is similar to that under the Act. The Commission has accordingly considered individual US States as potential comparators and has applied comparability criteria at the state level.
20. Under the United States Telecommunications Act of 1996 (TA96), the Federal Communications Commission is charged with promulgating rules, but the state commissions are responsible for arbitrating disputes and establishing prices where necessary. In its First Report and Order implementing TA96, the FCC recommended that avoided costs in the case of the wholesale discount for resale services ⁶:
 - shall include direct retail accounts and a pro-rata portion of indirect accounts;
 - shall be calculated as if the ILEC were no longer in the retail business; and
 - do not have to actually be saved by the incumbent.
21. Furthermore, the FCC suggested a default wholesale range of between 17-25% below retail rate levels. This default range can be revised for an individual carrier within a given state with an actual wholesale costs study that is approved by the relevant state commission. In essence, the FCC required that an avoided, rather than an actual, cost standard be applied. Many of the ILECs interpreted the requirements of the US Telecommunications Act of 1996 differently to the FCC, and proposed discounts more closely representing a 'retail minus actual cost'. This data is generally available and can be compared with the actual rulings, based on avoided costs, implemented by the state Public Utility Commissions.

⁶ Federal Communications Commission (FCC), Re-Implementation of the Local Competition Provisions of the Telecommunications Act of 1996. (FCC 96-325)(release August 8, 1996). Final Rules Appendix E: Country Profiles of Survey Responses.

4 Data collection

22. The Commission sought to collect wholesale discount information for the 50 U.S. states from publicly available sources. Data for 47 states was collected. There were three states for which information was not available to the Commission, those states being Illinois, Hawaii and Alaska.
23. Public sources were: the Bureau of Economic Analysis of the US Department of Commerce for the Gross State Product (GSP) data, The US Department of Labor for the telecommunications labour cost proxy, US Census 2000 for the population density data, The Federal Communications Commission and US Census 2000 for tele-density and the US Census Bureau for the urbanisation data⁷.
24. In each state the data was collected from the largest incumbent operator (ILEC). The data comprises wholesale discounts for Verizon, SBC Communications, Bell South and Qwest.

4.1 Comparability assessment

25. Along with the wholesale benchmark data the Commission has gathered information on factors that might lead the Commission to refine its comparability assessment. The information is selected on the basis that it is considered to exhibit some relationship with wholesale discounts and so a comparison of these factors with the equivalent New Zealand measures might provide some basis for the choice of a subset of comparator states from the full set of 47 states. This comparability data represents three categories those being telecommunications, population and economic data.
26. The comparability data falling into the three categories are as follows:
 - Population data:
 - Population density (number of people per square kilometre); and
 - Urbanisation (proportion of people living in urban centres)
 - Telecommunications data:
 - Tele-density (access lines per 100 population); and
 - State telecommunications sector labour expenditure (proxied by employee salary)
 - Economic data:

⁷ See table 1.

Data collection

- Gross domestic product (GDP) or Gross state product (GSP)
27. Network costs represent a significant cost category. These in turn depend on a number of factors, including the total size of the network, the level of capacity utilisation, the choice of technology, installation and procurement costs and the distribution of the population, which affects actual infrastructure requirements.
28. For telecommunications companies, the average cost of supplying network services should be closely correlated to the network density, as this will in part determine the efficiency with which network infrastructure can be deployed. There are a number of reasons for this:
- The price per unit for core network equipment typically drops as a telecommunications provider buys larger sized units. For example, the price per pair on a 25 pair cable is higher than the price per pair on a 4,200 pair cable.
 - A significant amount of telephone plant is sized and sold in fixed capacity steps. For example, channels on a termination frame may typically be purchased in quantities of 500.
 - The greater the distance between switches and the greater the distances between customers served by a switch, the longer the cabling that will be required to serve them.
29. The ability or inability to use the full capacity of these items of plant will influence the ultimate cost of plant on a working unit basis. Company-specific data on network density is generally unavailable. However, data on population distribution and telecommunication line density can be used as a suitable proxy for international comparisons.
30. Population characteristics have a significant bearing on network density. A recent study by the Productivity Commission of Australia⁸ found that differences in population distribution between Australia and several other countries and US states were an influence on the cost of providing local telephone services. Population density can be used as a proxy for the relative average cost of supplying network services to individual customers. However, it will tend to exaggerate the potential cost of network roll-out in situations where the population is highly concentrated relative to the total land mass. In this regard, urbanisation – considered in combination with population density – provides a useful proxy for the variation in the distribution of population. In general, much lower unit costs can be expected in serving urban areas than rural ones, and, in turn, from serving a relatively densely populated rural region than a sparsely populated one.

⁸ Productivity Commission of Australia (August, 2000) Population distribution and telecommunication costs, Staff Research Paper.

Data collection

31. Any data on population distribution should be considered in combination with data on tele-density as this will determine the actual scope to utilise equipment in any given area. In this regard, infrastructure utilisation may also be affected by the number of operators competing in the same geographic area to the extent that the duplication of network infrastructure reduces the scope to maximise the efficient use of any given piece of equipment.
32. With respect to installation and maintenance costs, these are driven in part by population distribution (longer cables may be more costly to lay and maintain) and also by labour cost and productivity.
33. Finally, network costs will also be driven by the level and type of demand for services from customers. The GSP per capita data provides a proxy for the ability of the population to purchase telecommunications services. As a general rule, the wealthier and more economically advanced the state is (as proxied by a higher GSP per capita), the higher the likely demand for telecommunications services, especially sophisticated data services. This is likely to translate into the earlier and more extensive deployment of new network technologies, such as digital switching.
34. Unlike network costs, which have a large procurement component, retail costs are labour-intensive and are characterised by relatively low fixed costs. In general, one would expect the greater the level of labour costs relative to procurement costs, the larger the share of retail costs in total costs. In response to comments received during the consultation exercise, the Commission has examined US telecommunications labour costs in relation to the equivalent labour cost in New Zealand. This shows that labour cost differences between New Zealand and the US states are not as significant as between states. The data shows that New Zealand's labour cost falls within the range of labour costs across the US states.
35. The Commission recognises that stringent use of a limited set of selection variables could potentially exclude some comparators to the extent that a meaningful benchmarking exercise is not possible. This is a critical point as the selection of the comparability variables is based on assumptions about what the determinants of wholesale discounts are likely to be. Therefore it is appropriate to examine the basis for such assumptions and then to conduct tests to determine whether there is an empirical relationship between wholesale discounts and the comparability criteria proposed.
36. Across the 47 states, there is a significant variation in the criteria, and no state is particularly similar to New Zealand with respect to all criteria. Nevertheless, looking across the criteria, it is the Commission's view that these states in general have sufficiently similar characteristics to provide a benchmark for determining a range in which the New Zealand wholesale discount should be set.

Table 1: Comparability criteria for selected US states and New Zealand

State	Population Density ⁹	GSP ¹⁰	Labour Costs ¹¹	Tele-density ¹²	Urbanisation ¹³
Alabama	33.84	\$25,938.25	\$49,214.00	49.7	70.1
Arizona	17.46	\$28,152.48	\$47,286.00	57.8	87.8
Arkansas	19.82	\$24,338.67	\$45,438.00	37.1	48.6
California	83.90	\$36,120.89	\$63,505.00	66.8	96.7
Colorado	16.03	\$35,385.44	\$67,489.00	66.2	84
Connecticut	271.51	\$43,893.74	\$64,018.00	63.8	95.6
Delaware	154.93	\$44,643.95	\$59,022.00	72.9	81.6
Florida	114.49	\$27,599.58	\$47,222.00	70.1	93
Georgia	54.62	\$33,773.72	\$59,193.00	54.6	68.9
Idaho	6.03	\$26,356.44	\$44,423.00	54.8	38.3
Indiana	65.47	\$35,613.70	\$56,761.00	60.5	84.5
Iowa	20.24	\$29,100.67	\$43,863.00	39.1	44.6
Kansas	12.71	\$30,018.03	\$52,982.00	49.2	56.4

⁹ Ref. US Census Bureau Census 2000, Geographic Comparison Table;

¹⁰ New Zealand GDP per population is from the ITU, expressed in \$U.S., and adjusted using the World Bank 2001 Purchasing Power Parity (PPP) values. The U.S. figures are Gross State Product (GSP) taken from Regional Accounts Data, Bureau of Economic Analysis of the U.S. Department of Commerce;

¹¹ Average cost of labour in the telecommunications sector per employee per annum proxied by state specific telecommunications sector salary expenditure. With the exception of the value for New Zealand, this data has been taken from the U.S. Department of Labour statistics. The corresponding figure for New Zealand has been obtained by taking from the Telecom annual report for the year ended 30 June 2001 the New Zealand labour expenses for 2001 (NZ\$M 372) and divide these by New Zealand personnel numbers for 2001 (5,242). The resulting labour cost per employee per year for 2001 (NZ\$ 70,965) has then been converted using an exchange rate of 0.55, which the Commission has previously used in the context of its interconnection determination;

¹² Access lines per 100 population. Ref. FCC 2000 Statistics of Communications Common Carriers (SOCCC) Table 2.19 – Total Billable Access Lines and U.S. Census Bureau Census 2000;

¹³ Ref. U.S. Census Bureau 1990 Census of Population and Housing, Population and Housing Unit Counts (CPH-2-1).

Data collection

Kentucky	39.28	\$27,804.41	\$43,453.00	48.8	55.7
Louisiana	39.63	\$28,640.12	\$41,996.00	52.9	75.2
Maine	15.95	\$26,822.01	\$49,321.00	56.5	35.8
Maryland	209.32	\$32,882.37	\$60,403.00	72.7	92.7
Massachusetts	312.80	\$41,156.56	\$60,905.00	70.1	96.1
Michigan	67.60	\$31,323.21	\$50,044.00	60.6	82.6
Minnesota	23.87	\$34,931.75	\$50,957.00	47.6	70.1
Mississippi	23.41	\$22,772.16	\$45,145.00	46.5	35.9
Missouri	31.36	\$30,329.33	\$49,126.00	55.6	68
Montana	2.39	\$22,793.30	\$42,952.00	42.9	33.4
Nebraska	8.61	\$31,407.80	\$50,442.00	47.0	51.8
Nevada	7.03	\$34,759.29	\$46,353.00	66.2	86.1
New Hampshire	53.23	\$35,294.14	\$57,334.00	64.1	60.2
New Jersey	438.18	\$39,570.97	\$72,484.00	81.0	100
New Mexico	5.79	\$27,406.12	\$35,866.00	47.5	57
New York	155.24	\$39,492.15	\$66,069.00	58.1	91.9
<u>New Zealand</u>	14.00	\$20,049.00	\$39,031.00	49.6	85.9
North Carolina	63.81	\$32,371.96	\$50,132.00	57.2	67.1
North Dakota	3.59	\$26,452.82	\$42,772.00	34.0	43.1
Ohio	107.11	\$31,403.03	\$49,909.00	57.6	81
Oklahoma	19.43	\$24,874.70	\$39,834.00	46.4	60.5
Oregon	13.75	\$32,106.75	\$51,240.00	58.8	72.7
Pennsylvania	105.84	\$31,146.35	\$53,953.00	63.3	84.5
Rhode Island	387.50	\$30,671.96	\$51,103.00	62.7	93.8
South Carolina	51.45	\$26,724.50	\$43,655.00	42.3	70
South Dakota	3.82	\$28,759.58	\$43,499.00	37.2	34
Tennessee	53.30	\$29,951.40	\$47,807.00	51.0	67.8
Texas	30.75	\$32,847.78	\$56,111.00	51.1	84.5
Utah	10.51	\$28,112.52	\$46,552.00	52.2	76.7
Vermont	25.42	\$28,260.90	\$50,753.00	58.8	27.9
Virginia	69.06	\$34,002.61	\$66,379.00	65.0	41.9
Washington	34.22	\$35,516.41	\$66,432.00	60.7	82.9
West Virginia	29.01	\$22,465.86	\$42,728.00	47.0	41.9

Data collection

Wisconsin	38.16	\$30,868.76	\$46,392.00	46.4	67.8
Wyoming	1.97	\$35,353.66	\$44,013.00	52.9	29.6

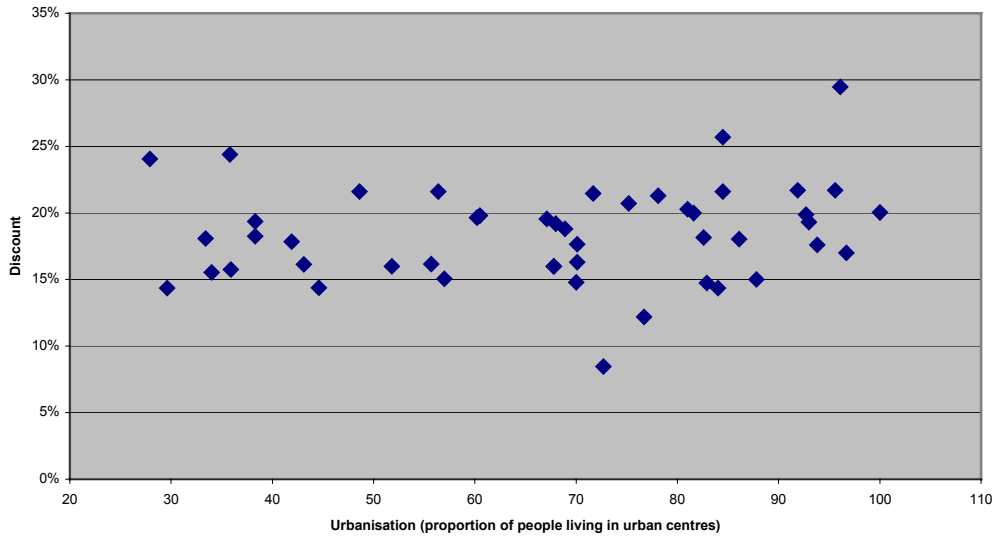
4.2 Establishing an empirical relationship between wholesale discounts and the comparability data

37. The data for the five comparability criteria were collected from a number of different sources and at a theoretical level bear some relationship to the level of wholesale discounts observed. The Commission has examined the comparability data for observable relationships that might either assist the assessment of comparability or, more particularly, give the Commission some basis for selecting an appropriate discount.
38. For the purposes of the analysis, where a state employs separate business and residential discounts the Commission has averaged the two discounts on an equal basis to create a single discount structure across all states. Lacking the information required in order to establish appropriate weighted average discounts¹⁴ the Commission regards this as appropriate and notes that the use of a simple average would not in any way affect the results for the purposes of determining comparability.
39. Below are plots of wholesale discounts against four of the comparability criteria: urbanisation, tele-density, GSP per capita and population density. A visual appraisal of data in this way should highlight any features that will assist the Commission's analysis.

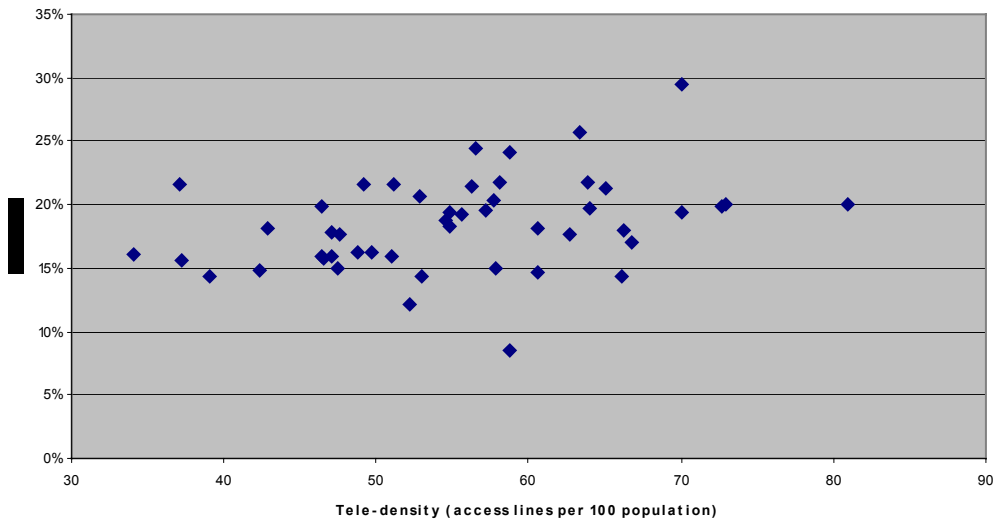
¹⁴ This would include information on the relative volumes of business and residential services offered, and the corresponding retail prices.

Data collection

Discount versus urbanisation

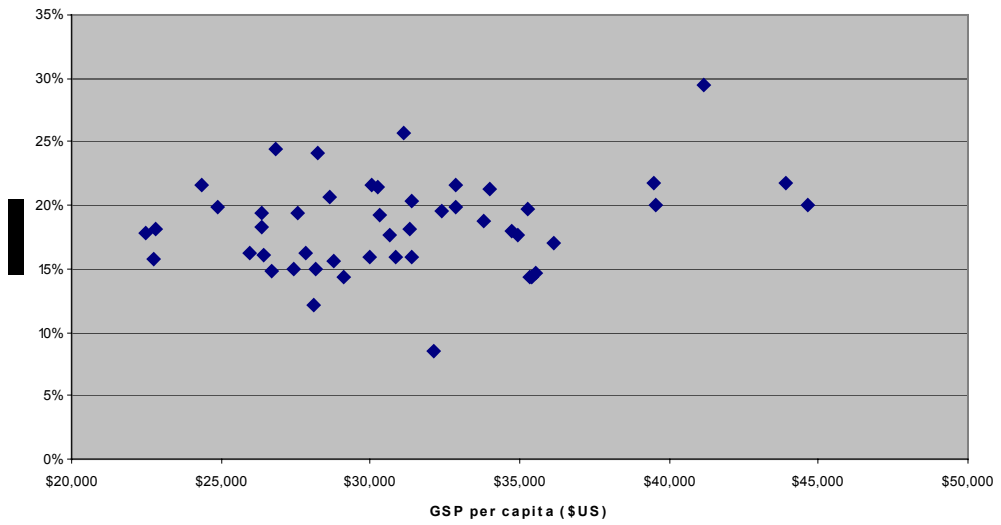


Discount versus tele-density

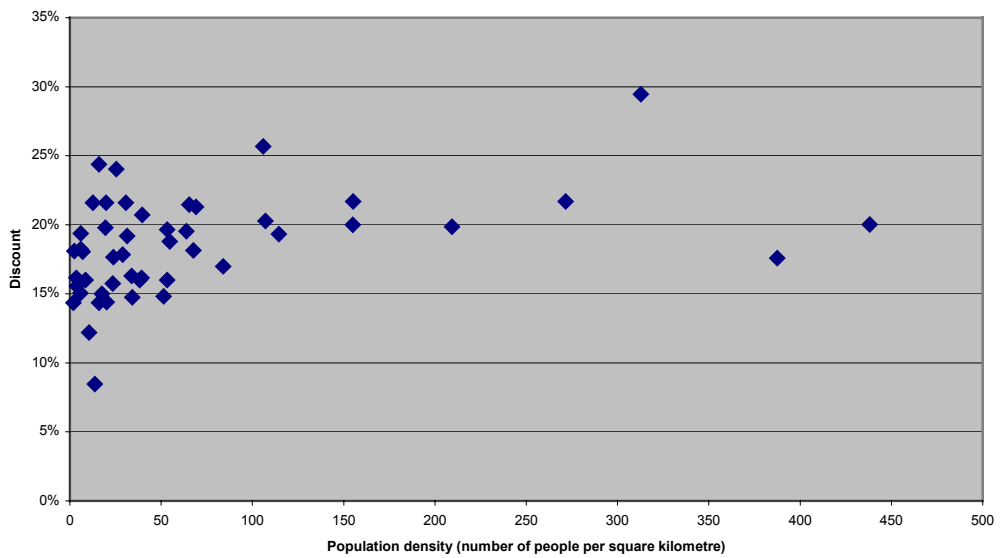


Data collection

Discount versus GSP per capita



Discount versus population density



40. The scatter plots presented above reveal a lack of any clear relationship between wholesale discounts and the four comparability criteria as shown.

Data collection

- 41. Based on submissions from the parties labour costs are considered to contribute significantly to the costs associated with retailing activities¹⁵. The Commission has accordingly conducted a more detailed analysis of the relationship, if any, between wholesale discount levels and labour cost.
- 42. Below is a plot of wholesale discounts against labour cost, grouped by ILEC.



- 43. The plot shows that the discount data falls into roughly three or four different groups based on company name with the higher discounts for Verizon being associated with a generally higher labour cost and the lower discounts for Qwest being associated with a generally lower labour cost. This particular feature provides evidence of a systematic relationship between the company name and the level of the wholesale discount. The broadly flat nature of the trend lines suggests however that a particular company might offer discounts that apply over a range of different labour costs and so casts doubt on the assumption that labour cost is a determinant of wholesale discount, in this case.

¹⁵n/e/r/a "Wholesale Business Service Benchmarks For Telecom New Zealand", August 2002, pp 7

4.3 Regression analysis

44. The relationship observed above might extend to the other comparability criteria in a similar fashion or alternatively there might be some other patterns of causality and so the Commission has sought to model the relationships between wholesale discount and comparability criteria by employing linear regression analysis¹⁶.
45. By initially regressing wholesale discount on labour cost, population density, GSP, tele-density and urbanisation, results in an adjusted R square of approximately 0.1¹⁷.
46. This gives a measure of the overall explanatory power or goodness-of-fit of the model and in general the higher this value is, the better the fit of the model. In this case the model yielded a low value, which can be expected given that there is an assumed systematic variation in the data due to the observed discount/labour cost relationship.
47. This analysis can be improved upon by the use of dummy variables in order to capture the effect of the systematic relationship assumed. This can be conceptualised as a shifting of the trendline intercept in the plot of discount versus labour cost above.
48. As an additional regression, the Commission has added dummy variables to the model to account for the effect of the company name. This pass results in an adjusted R square of 0.43. Although not particularly high, this indicates that the model is better explaining the variation in the wholesale discount data than without the dummy variables. It is noteworthy that this result is characteristic of cross-sectional studies of this nature where data is gathered from a number of economic units, here telecommunications companies, at a given point in time.
49. By conducting a further test, the Commission concludes that the combined effects of company name have a statistically significant impact upon the wholesale discount level¹⁸
50. Given that the comparability criteria overall fail to exhibit any significant statistical relationship to the wholesale discount data the Commission has sought to employ more elaborate econometric techniques to model the data. On the basis of evidence of a systematic relationship between wholesale discount and company name the data was modelled using a dummy variable regression. This analysis failed to satisfactorily explain variations in wholesale

¹⁶ Least squares estimation.

¹⁷ The adjusted R square measure provides a penalty for over-including descriptive variables in the model as doing so will always improve the 'fit' of the model at the expense of parameter efficiency.

¹⁸ An F-test at the 5% level of significance leads us to reject the joint null hypothesis that the coefficients attaching to the dummy variables equal zero.

Data collection

discounts using the comparability criteria though indicated that a systematic relationship does exist between wholesale discount and company name.

51. As a result of this analysis the Commission has concluded that a comparability assessment augmented by the use of the chosen comparability criteria is not supportable. The Commission therefore finds no basis for including or excluding particular states and so will select benchmarks from within the range indicated by the 47 states for which the Commission has collected wholesale discount data.

4.4 Discount data

52. The discounts published by each state are listed in Table 2. For single discounts, these range from a low of 12.2% in Utah to a high of 29.47% in Massachusetts. The unweighted average discount is 18.91%.

Table 2: Summary of discount data

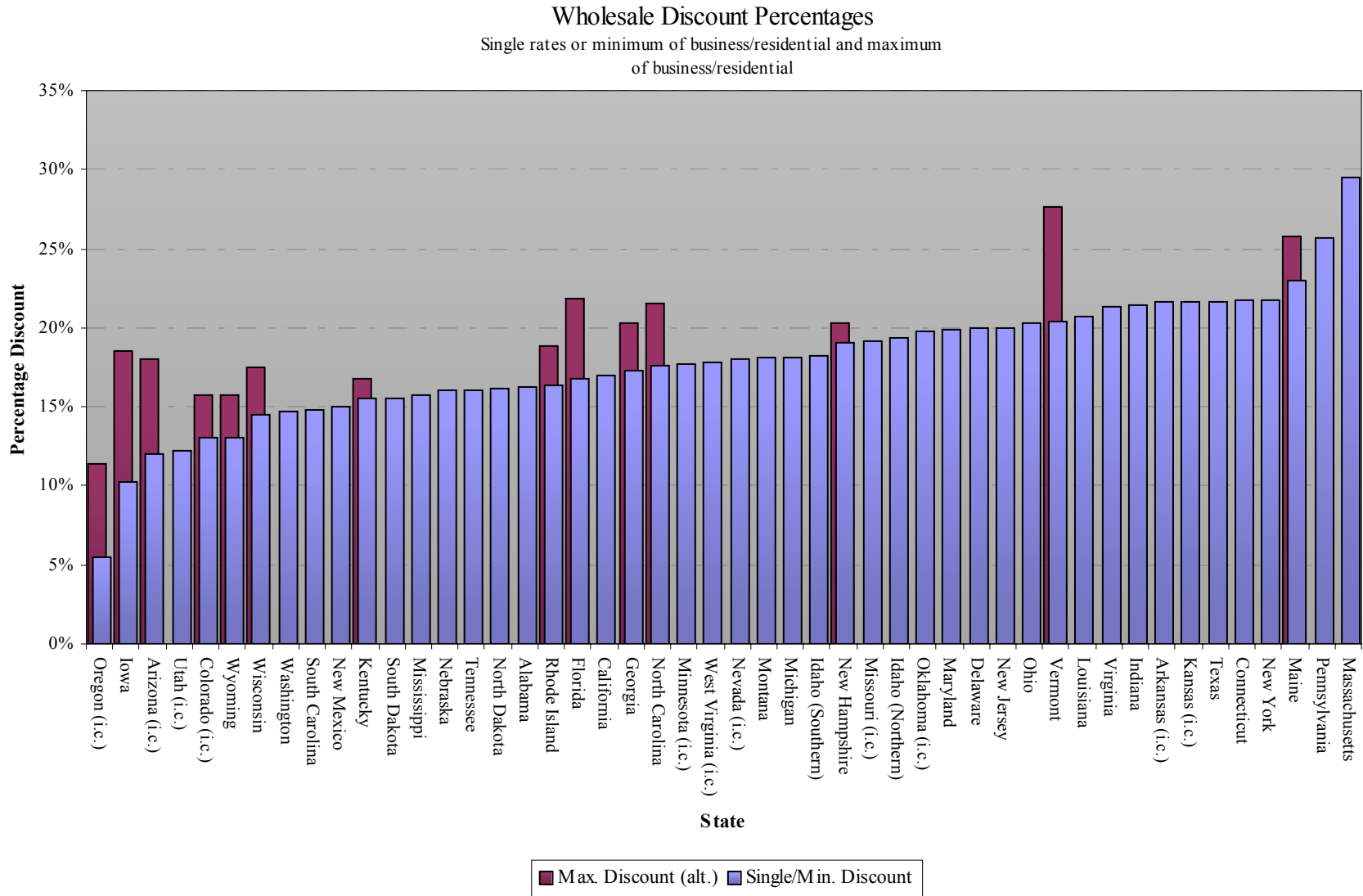
State	Company	Single Value	Business	Residential
Oregon (i.c.)	Qwest		11.43%	5.49%
Iowa	Qwest		18.50%	10.27%
Arizona (i.c.)	Qwest		18.00%	12.00%
Utah (i.c.)	Qwest	12.20%		
Colorado (i.c.)	Qwest		15.70%	13.00%
Wyoming	Qwest		15.70%	13.00%
Wisconsin	SBC		17.50%	14.50%
Washington	Qwest	14.74%		
South Carolina	Bell South	14.80%		
New Mexico	Qwest	15.05%		
Kentucky	Bell South		15.54%	16.79%
South Dakota	Qwest	15.55%		
Mississippi	Bell South	15.75%		
Nebraska	Qwest	16.00%		
Tennessee	Bell South	16.00%		
North Dakota	Qwest	16.15%		
Alabama	Bell South	16.30%		
Rhode Island	Verizon		16.38%	18.82%
Florida	Bell South		16.81%	21.83%

Data collection

California	SBC	17.00%		
Georgia	Bell South		17.30%	20.30%
North Carolina	Bell South		17.60%	21.50%
Minnesota (i.c.)	Qwest	17.66%		
West Virginia (i.c.)	Verizon	17.84%		
Nevada (i.c.)	SBC	18.05%		
Montana	Qwest	18.10%		
Michigan	SBC	18.15%		
Idaho (Southern)	Qwest	18.25%		
New Hampshire	Verizon		20.25%	19.04%
Missouri (i.c.)	SBC	19.20%		
Idaho (Northern)	Qwest	19.37%		
Oklahoma (i.c.)	SBC	19.80%		
Maryland	Verizon	19.87%		
Delaware	Verizon	20.00%		
New Jersey	Verizon	20.03%		
Ohio	SBC	20.29%		
Vermont	Verizon		27.66%	20.43%
Louisiana	Bell South	20.72%		
Virginia	Verizon	21.30%		
Indiana	SBC	21.46%		
Arkansas (i.c.)	SBC	21.60%		
Kansas (i.c.)	SBC	21.60%		
Texas	SBC	21.60%		
Connecticut	Verizon	21.70%		
New York	Verizon	21.70%		
Maine	Verizon		25.74%	23.03%
Pennsylvania	Verizon	25.69%		
Massachusetts	Verizon	29.47%		

53. The data is represented visually in the following figure.

Figure 1: Discounts of selected US states



4.5 Features of the discount data

54. A number of observations can be made about the approach used to develop wholesale discounts in the United States:

- Almost every discount is expressed as a percentage of the retail price. In calculating the size of the discount, most states used retail revenues as the denominator.
- Wholesale discounts are typically based upon accounting top-down cost principles. Only one company, SBC, proposed wholesale discounts based on more detailed, bottom-up forward-looking costs. The Commission notes that top-down cost models are often criticised in relation to cost-plus based regulation, owing to their tendency to overstate costs where an operator is inefficient. However, this tendency may be a virtue in the case of wholesale discount regulation. If an access provider's retailing costs are inefficiently high, this will reduce the price and create an opportunity for a service provider to enter the market by undercutting the access provider's retail price. This in turn will intensify pressure on the incumbent to eliminate inefficiencies. Overall, there is a much stronger case for the use of top-down costing methods for the purposes of implementing retail-minus regulation than there would be for cost-based access price regulation.
- A majority of US states use a single wholesale discount value, which applies to all retail services. The remainder employ variations of a multiple discount structure, depending on the type of service provided. Typically, different services are categorised depending on whether they include operator services/directory enquiries or are targeted at business or residential end users. Most firms that are subject to multiple discounts also employ a derived 'composite' discount that applies to other services for which a specific discount is not provided.