

**A NOTE ON THE ECONOMICS OF
TELECOMMUNICATIONS PRICING IN CHILE**

Arnold C. Harberger

University of California, Los Angeles

Paper Prepared for Telefónica CTC Chile, March 2001

This paper should be considered as an exercise in economic diagnostics. It is being written in Chile, as one aspect of a general review of the economics of the telecommunications industry. And just as in medical diagnostics it is the task of the physician to identify problems and prescribe or suggest ways of solving them, so it is the job of the economic diagnostician to do the same, identifying problems and suggesting appropriate solutions.

Obviously, there are many different angles from which an industry as complex as telecommunications can be viewed, many if not all of which have been visited in the course of my brief survey. In most cases, such an examination produces additional facts to those one had before, and provides a further appreciation of the complexity of the industry's activities and operations, but without allowing one to get a sharp diagnostic focus on a particular problems or set of problems.

One angle of attack, however, proved extremely fruitful in this last sense, and it is this line of attack that we will follow in this paper.

We begin with what I see as the principal problem facing Telefónica CTC-Chile, and in a certain sense also the Chilean government and its regulatory authorities in a nutshell. The problem is that T-CTC does not appear to have an appropriate incentive to invest in new lines, even when such investment would be beneficial for itself and for the country, under a pricing scheme that faithfully reflected economic realities. This is a problem for T-CTC because it

places an artificial barrier in the way of its pursuit of its own economic interest. And it is a problem for the regulating authorities because it is their appropriate task to facilitate, not hinder the making of investments that are in Chile's economic interest.

The key insight that lies at the base of this paper consists of focusing directly on the "investment margin", and treating the investment decision and its consequences as a "package". If one wants to identify the real-world counterpart of the exercise we have in mind, one should think of a simple project evaluation, in which the project in question consists of T-CTC investing in installing additional fixed telephone lines.

When this exercise is carried out under the present Chilean rate structure and regulations, it turns out to be non-economic from a business point of view for T-CTC to undertake the investment, yet the investment itself is economic from the point of view of the Chilean economy taken as a whole (something that we now typically call the economic point of view, and that we used to call the social point of view).

The exercise that we have in mind is the building of new capacity to meet a demand that is growing over time. We contemplate a major expansion in the number of lines, in part in order to try to ensure that we do not neglect any significant element of costs. The actual cost figures we use are those estimated in 1999 by the office of the Undersecretary of Telecommunication, Ministry of Transport de Communication. These costs were stated in terms both of pesos and of dollars we have used the dollar cost estimates, making the implicit assumption that there has been no significant inflation of these costs, in dollar terms.

The cost estimates were not based on the historical costs of any actual enterprise. They were instead intended to be the estimated costs of a hypothetical or virtual efficient, modern company. It is on this basis that we assert that these are investments which would be economically justified as soon as they are required in order to meet an increasing demand.

Given these costs, the relevant question would be to find a rate structure that is adequate to elicit the necessary investments, and that is itself economically efficient (i.e., free of any significant distortions). We do not in this paper attempt to calculate such a rate structure. Instead, we simply perform experiments with the present rate structure, as it is and with a few hypothetical modifications.

Looking forward to the future of the telecommunications industry in Chile, we do not see the need for the regulatory authorities to enter into any program of detailed rate-setting. Rather, its role is that of creating an environment in which a competitive solution can be found. For this it needs to establish a framework, within which the different telecommunications enterprises face a “level playing field” as they compete with each other; in which economic distortions are minimized, and in which there are adequate safeguards against monopolistic pricing on the one hand and predatory pricing on the other. In this paper we will deal with various aspects of such a framework.

Testing the Present Rate Structure

In this section we attempt to test whether the present rate structure facing T-CTC Chile would be adequate to cover the costs of an efficient investment. Two exercises will be carried out, one dealing with “replacement”, the other with “expansion”. These two concepts were employed by the Ministry of Transport and Telecommunications in their calculations of the costs of an efficient enterprise, and readers are referred to the basic source for further details. At this point it probably suffices to think of “replacement” as covering the full costs of capacity, and of “expansion” as covering the long run marginal costs associated with a substantial (e.g., 50%) expansion of capacity. Under the full cost concept, the capital cost per line is U.S. \$916; under the expansion concept it is U.S., \$626.

In our calculations, we will be working with the internal rate of return obtained under each of a set of alternative specifications. Since internal rate of return calculations operate on the cash flow concept, we do not treat depreciation as an expense. Depreciation does enter the calculations indirectly, however, because we deal only with the first five years of operation under each hypothetical investment. The assumption we make is that the residual value of the investment, at the end of five years, is its initial cost minus what the MINTCOM study took as the depreciation allocable to the first five years. In the “replacement” case this residual value is U.S. \$916 minus $(5 \times \text{U.S. } \$100) = \text{U.S. } \416 . In the “expansion” case, the residual value is U.S. \$626 minus $(5 \times \text{U.S. } \$68) = \text{U.S. } \284 .

Table 1 shows the tariffs currently received and paid, in pesos. Nearly everything is based on the basic SLM (average local service) rates of 17.68 pesos per minute (normal) and 2.95 pesos per minute (reduced). T-CTC Chile reserves these rates on the calls which both originate and terminate on its lines. On 3 calls received from internet users or mobile phones, the relevant access charge is 7.61 pesos (normal) and 1.27 pesos (reduced). These figures amount to 46% of SLM charges, and represent the access charges authorized by MINACOM for T-CTC Chile. All other access charges are authorized at 4.75 pesos per minute (normal) and 0.79 pesos per minute (reduced). The rates discussed up to now or 27% of SLM cover all but one of the cells of column 2, Table 1. This last cell deals with the access charges paid rather than received by T-CTC Chile.

The issue of access charges point is somewhat unclear, since MINTCOM has not fixed access charges for any of the carriers other than T-CTC and ???????????? I-CTC operates under informal agreements with Encel and Manquestrise???. In the first of these cases the access charged the same in both directions and are equal to 27% of SLM. In the case of Manquestrise???, the informal agreement is based on the supposition of equal traffic in both

directions. This is compatible with different rates being paid and collected by the two carriers (with each carrier “paying itself” for its incoming calls, by “charging itself” for its outgoing calls; but the compatibility disappears once the supposition of equal traffic is broken. For this reason we have interpreted the Manureira agreement as being compatible with the same rate (27% of SLM) being applicable to both carriers. With respect to the other carriers, T-CTC Chile actually pays the asking prices of two (Telcom and CNT) and is involved in legal disputes with the other three (CMET, Telesat and VCR). In our calculations we have assumed that the access charge applicable to calls originating with T-CTC would be the same as the access charges that these carriers collect on long distance calls. Table 2 summarizes our calculation of the rates assumed for outgoing local-to-local calls originating with T-CTC Chile.

The revenues per year stemming from each of the listed sources are presented and expressed in U.S. dollars, in the last column of Table 1. Their total (U.S. \$120 per line) is net of access charges paid, which appear as negative component of the sum, is given at the bottom of this column. To it must be added the sum (U.S. \$117.09) of 12 monthly fixed charges, to produce total revenues per line of U.S. \$239.13. From this we deduct wage and salary costs (U.S. \$45.42 per line) and material and services costs U.S. \$93.34 per line) to reach net income per line of U.S. \$100.38 per year.

At the very foot of Table 1 we have summary profiles of the projects of “replacement” and “expansion”, under the assumptions just outlined. It can be seen there that the internal rate of return is 5.9% per annum for the case of expansion and only 0.1% in the case of replacement.

In speaking of the actual situation, it is appropriate for us to note that several of the other carriers are asking for access charges to be fixed at rates significantly higher than those shown in Table 2 and embodied in the calculations of Table 1. We believe we are giving a fair representation of these requests when, in Table 3, we introduce an alternative access charge (paid

by T-CTC to other carriers). of 12 pesos (normal) and 2 pesos (reduced). This has a comparatively modest effect on the rate of return of the expansion (5.2%) and replacement (-0.4%) projects, though the fact should be noted that this modification is sufficient to throw this latter rate of return into negative territory.

The results of Tables 1 and 3 require little comment. The rates of return calculated are very far from being adequate to justify a “replacement” project, and indeed are quite far from the levels necessary to justify a general expansion of facilities and operations.

We take this as posing a serious problem, to which a solution must be found. Accordingly we explore alternatives in the next two sections -- the first looking at solutions which leave the SLM untouched, and the second also considering the possibility of modifying the SLM.

Adjusting Access Charges

One aspect of Table 1 that should be plainly noted, is that T-CTC Chile pays different access charges than it receives. Apart from the access charges entailed in local-to-local traffic, T-CTC Chile receives either 46% of SLM or 22% of SLM as an access charge. These compare with the much higher rates received by others. The rates shown in Table 2 represent the rates received by other carriers on their long distance calls, with the exception of Entel and Manquintine???. These companies are carried in Table 2 as charging T-CTC Chile's ??? access charges -- but the rates they charge for long distance calls are higher (9.77, 1.63 pesos for Manquintine??? and 5.79, 1.08 pesos for Entel).

The next step is to see how far the returns on these two projects would be carried if T-CTC Chile were to be granted access charges equivalent to those we have used to represent the requests made by other carriers. This is done in Table 5, where all access charges are valued at 12 pesos (normal) and 2 pesos (reduced). Without a doubt, this move carried the expansion

project into the “interesting” range, but it still leaves the replacement projects without any serious incentive.

TABLE 2

Calculating of Access Charges Paid by T-TCT Chile

(?? of November 2000, net of IVA)

Terminating Carrier	Share of CTC's Outgoing Local-Local Calls	Rate per Minute (Chilean pesos)	
		Normal	Reduced
VTR	23.9%	10.17	1.70
CNT	5.5%	11.74*	1.96
Telcon	0.2%	13.41*	2.24
Entel	31.5%	4.85	0.81
Telestat	5.4%	12.47	2.08
CMET	15.8%	13.20	2.40
Manquet??	<u>17.4</u>	<u>4.85</u>	<u>0.81</u>
	100.0		
Weighted Average		8.07	1.51

*In these cases, different rates were charged for different localities (e.g., larger and smaller cities). The rate appearing in the table is that for larger cities or locations, which account for the overwhelming bulk of the traffic in question.

ANNEX 1

On the Issue of Parity of Access Charges

A key test that one should apply in the assignment of access charges is that of parity or nondiscrimination between operations that should in principle entail similar costs. Consider that we install ??? new lines, which will on average carry two million calls covering ten million minutes per year. One million of these calls originate with the new lines, the other million are reserved by them. Clearly, the costs associated with these particular lines are the same, regardless of whether the destination of the calls was to other clients of the same company, or to those of another company. If all the calls, in Case I, were “internal” to the ??? new lines installed, there would be just one million of them, entailing one million originations and one million receptions. So long as the investment itself was efficient (i.e., satisfied economic criteria), the rates charged on the new lines should be sufficient to cover their full cost (including, naturally, the relevant costs of administration, billing, etc.). Consider now Case II, where these same lines makes one million calls to phones outside the CTC system, and receive one million calls from the outside. I can find no reason, whatsoever why costs should be more than normally??? different in Case II from Case I, hence I conclude that in principle the regulations should allow -- indeed, ensure -- that the company should receive the same cash flow in both cases.

Let us take the presently established rate structure as the base. If all the calls were “internal” to the new lines, receipts would be, say, U.S. \$10 per month for each of the new lines, plus, say, U.S. .03 for each peaktime minute and U.S. \$.005 for each off peak minute on a million calls “originated and received” Now if the same situation were to be replicated with calls to and from other carriers. These direct receipts from customers would be the same -- the same fixed monthly charges plus the same rates per minute in the originated calls. What is different in

the second case is that two sets of access charges are now involved -- those paid by CTC on the outgoing calls and those received by CTC on the incoming calls. The principle there I am asserting is that CTC costs being fundamentally the same in Case II as in Case I. CTC receipts should also be the same, which means that, in principle, the two sets of access charges should cancel. This means that CTC-Chile should pay the same access charges to other carriers on the calls originating with it, as it receives from those other carriers or the calls originating with them.

This principle applies without modification to local-local calls within the same area, to and from fixed lines. The condition where the principle needs modification is clear where a different access charge is imposed on an outgoing call, the difference should be collected from CTC's originating customers. In the Chilean case, access charges to mobile phones are much higher than those to fixed phones, but the customer pays the difference.

ANNEX 2

A Note On the Phenomenon of “Cherry Picking”

Chile’s telecommunications industry has undergone drastic changes in recent years. In the process it has passed from a single-firm state monopoly to a substantially competitive sector with numerous firms contesting most segments of the market. Simultaneously, the volume of traffic has multiplied more than tenfold, with new companies accounting for more than half of this huge increase. This has occurred within a legal and regulatory framework that aspires to simulate the workings of a competitive market. This aspiration has at best only be partially fulfilled in reality -- with the result that the present system is characterized by a number of serious distortions..

This report will focus on two main types of distortions:

- a) regulations that preclude one particular provider (T-CTC) from meeting the prices offered by the other providers in the same category (fixed, local).
- b) regulations that establish or permit (or allow to continue without being explicitly permitted) different companies of the same type and in the same location to charge substantially different access fees.

In the case of telephony???, scale can be measured in different dimensions, several of which can be relevant at the same time. But in light of actual experience in Chile, one can say that probably the most critical scale element for rate-making issues is traffic density in a relevant area. This is what gives rise to the phenomenon known as cherry-picking.

The story is an old one. The United States Postal Service complains that entities like Federal Express and DHL can offer attractive prices to clients who live in and around major cities, and simply decline to serve customers in other areas. Result, these carriers “steal” from the USPS its most attractive customers, while simply not entering the market for deliveries to

rural areas and other remote places. But the USPS has its hands tied. It must, by law, serve those rural and remote areas, and is prohibited, by law, from charging them a price that reflects the higher cost of delivering mail to them. The consequence is that the USPS loses part of its traffic to low-cost destinations and is left with a preponderance of traffic to high-cost destinations.

This appears to be what has happened to T-CTC in Chile. Of the six companies that provide local service in the greater Santiago area, all but T-CATC Chile are allowed to set their rates freely, but, perhaps more importantly, they are free to design “rate packages” at will. T-CTC Chile, on the other hand, must abide by an established rate structure -- a fixed charge per line per month, plus a variable charge per minute, which in turn can differ as between normal and reduced rate hours. Thus we have a fixed charge of about U.S. \$10 per month, a normal rate of about U.S. \$.03 per minute, and a reduced rate of about U.S. \$.005 per minute. T-CTC Chile is free to modify any portion of this structure downward but not upward. But it cannot change the basic shape of the structure. Thus, it is free to make the monthly fixed charge U.S. \$8 instead of U.S. \$10, or the normal rate U.S. \$.02 instead of U.S. \$.03, but it cannot offer a fixed-price package covering unlimited local calls, nor an alternative package which entailed raising the fixed charge and lowering ??? or both of the charges per minute. Moreover, any changes that it makes must extend to all customers in a very broadly-defined area.

In contrast, the competitors of T-CTC Chile are able to create rate packages at will. While in principle such packages should extend to all its customers in, say, the greater Santiago area, in fact such companies market special packages as promotions, about which customers are typically informed in telephone solicitations. In this way, the companies are able in practice to “target” customers with a particular historical pattern of demand, offering them packages which

are profitable for the company and interesting for the customer -- yet those same packages would be unprofitable if extended to all customers in the area.

This is the phenomenon known as “cherry picking”. It is the least analogy of the example, given earlier, of the commercial carrier companies vis-a-vis the United States Postal Service.

The simplest remedy for cherry-picking in the case of Telefónica CTC Chile would be to give that company exactly the same freedom to set rates and create packages that all its competitors already enjoy. Personally, I see no strong case against this alternative, but I am mindful of arguments linked to T-CTC Chile’s historical position as a monopoly enterprise.

Matching is very easy to oversee and administer in markets like those of La Seseman, Talran, Puerto Montt, etc., which are essentially geographically separate “islands”. It is somewhat more complicated to apply matching within the greater Santiago area. Perhaps the most natural solution here would be to require that each company offering a plan should define its applicable area in terms of consumas???. Thus one plan might apply just in Santiago Centro???, another in just Mauper??? and San Bernardo and another in, say, Vitacura???, Provideirera??? and Las Condes. Companies other than T-CTC Chile are free to match or not match in and to its current position as a dominant firm, at least in some segments of the market. It may be that in order to assuage any fears that such a position might be abused, the authorities might want to maintain a degree of special treatment of T-CTC Chile, as a dominant firm.

I believe that a two-pronged approach would be appropriate, in which the first prong is to permit a matching by T-CATC Chile of any packages offered by a competitor, and the second prong is to allow flexibility for T-CTC Chile to exercise its own initiative in creating rate packaging and plans, so long as these did not entail elements either of monopolistic or of predatory pricing ?? any case, but T-CTC Chile would under this suggestion to meet the

competition provided by these plans, matching each plan in the comunas to which that plan applies.

The second prong would give T-CTC Chile ample scope to design its own plans. In a sense it would be treated just the same as any other company, with the exception that its plans would be subject to review by a regulatory authority. In principle, there would be only two grounds for denying approval of a plan submitted by T-CTC Chile -- that of monopolistic pricing and that of predatory pricing. The motive behind this suggestion is to create as level a playing field as possible, as among the competing providers of local telephone service in Chile with free competition being the general rule, and with the regulating authority being limited in principle to “guarding the boundaries” of this competitive playing field.