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Indonesia has begun the transition from the traditional international norm of state-owned and operated telecommunications monopolists to a more liberalized telecommunications sector. The transition is in response to a variety of interacting forces, some global in scope, and some specific to Indonesia. At the global level, technological progress has dramatically altered the economics of telecommunications networks and the cost structures that once may have justified treating the sector as a natural monopoly. Though initially resisted in many nations, these forces have brought telecommunications privatization and liberalization in varying degrees to most countries. Indonesia has an opportunity to learn from the experiences of other nations. The path of reform around the world has not been smooth, and painful and expensive lessons have been learned along the way. Indonesia has an opportunity to adopt policies that avoid the errors and blind alleys that have been attempted elsewhere.

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PRICING AND TARIFFING OF TELECOMMUNICATIONS SERVICES IN INDONESIA: PRINCIPLES AND PRACTICE

Martin Taschdjian, PhD¹

21 August 2001

I. Introduction

Indonesia has begun the transition from the traditional international norm of state-owned and operated telecommunications monopolists to a more liberalized telecommunications sector. The transition is in response to a variety of interacting forces, some global in scope, and some specific to Indonesia.

At the global level, technological progress has dramatically altered the economics of telecommunications networks and the cost structures that once may have justified treating the sector as a natural monopoly. Though initially resisted in many nations, these forces have brought telecommunications privatization and liberalization in varying degrees to most countries.

Indonesia has an opportunity to learn from the experiences of other nations. The path of reform around the world has not been smooth, and painful and expensive lessons have been learned along the way. Indonesia has an opportunity to adopt policies that avoid the errors and blind alleys that have been attempted elsewhere.

A. Elements Of Telecommunications Reform

There are five basic inter-related elements to telecommunications policy.

- Monopoly or competition?
The telecommunications sector is a key element of the Knowledge Economy that is widely recognized as the engine of economic development. Around the world, liberalization of this sector has been accompanied by enormous outpourings of investment and unleashed economic productivity. Every industrialized nation and many developing nations have adopted liberalized policies toward telecommunications in order to attain the benefits of economic growth. The GATS Agreement of the WTO, APEC, the OECD, and the European Union among others, have recognized the benefits of liberalization.
- Pricing and Tariffs

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Monopoly tariffs and pricing structures are no longer sustainable. Even in nations where monopoly has persisted longer, as in Indonesia, tariff changes are necessary in response to changes in underlying costs and global competition. But tariff rebalancing must also prepare the way for future liberalization. Therefore, consideration must be given to the problem of cross-subsidies between services and between regions and to monopoly pricing in a partly competitive marketplace.

- **Universal Service**
Tariff rebalancing raises politically difficult issues of affordability and universal service, as well as other social obligations. Different nations have taken different approaches to universal service, but generally policies address services for the poor and physically impaired, access to emergency services, subsidies for schools and libraries, and availability in high cost rural areas. Implementation issues revolve around definition, funding, collection of funds, and distribution. Often these implementation issues are complicated by delaying tactics of incumbents as a means of staving off competition.
- **Interconnection**
Universal service issues are usually intertwined with the pricing of interconnection between competing networks. Incumbents claim “access deficits” and extensive cross-subsidies that require contributions above actual costs from other operators in the form of interconnection charges. As a result, pure interconnection costs become loaded with other charges.
- **Abuse of Dominance**
The starting point of telecommunications liberalization is monopoly, and for the foreseeable future, incumbent operators will retain a dominant position. To prevent this dominance from being abused, a regulatory agency must be empowered that can oversee the industry and intervene when necessary. This regulator must be independent from the telecommunications operator. Its relationship to government must also be sufficiently arm’s length that, while reflecting government policy goals, it is insulated from short-term political pressure. Regulatory uncertainty is a substantial barrier to investment, so a consistent policy framework is a key component to attracting the needed investment into the sector to drive economic development. The formation of ECTEL has created the framework for addressing these issues.

These elements of telecommunications policy are inter-related, and must be addressed simultaneously.

II. Pricing and Tariffs

A. The Function of Prices

Prices are expected to perform many roles, and some of those roles are in conflict.

- **To the Economist:** Price is a solution to a set of supply and demand equations that clears markets; it represents the value of foregone resources in other uses.

- To the Marketer: Price is merely one of a group of dimensions that include Product, Package, Price, and Place (Distribution)
- To the Philosopher: Price is a concept involving fairness and justice.
- To the Businessman: Price is the average revenue per unit, which must cover average costs and a return to investors.
- To the Consumer: Telephone prices are not known exactly, but consumers have a general sense of cheap, moderate, or expensive, relative to income.
- To the Government: Price is a policy variable, like a tax, that stirs short-term political responses. Generally, lower is better.
- To the Investors: Price expectations are one indicator of potential returns to risky investments.

B. Issues to Be Considered in Tariff Policy

1. Who Is A Customer?

It is critical to understand the difference between a *customer* and an *interconnector*. Failure to grasp this difference is the root of most failures of telecommunications policy.

- A *customer* is an entity that uses a telecommunications network to initiate a communication to another customer of that network or another network. By contrast, an *interconnector* is a network operator that terminates a communication from a customer of another network operator to a customer of its network.
- Customers can have retail or wholesale relationships to their network operator. A residential or business retail customer buys finished services. A wholesale customer buys “indirect access” services from a local access network operator, and resells it bundled into its own service offering. For example, a long distance network operator buys wholesale local call origination services and bundles it into a long distance service. The end user pays the long distance provider who then pays the local access provider for the “indirect access.”
- The revenues earned from customers must in total cover the full costs of the provider. This includes overhead, common costs, recovery of historical costs, depreciation, dividends, profits, and all the costs of running the business. Only under the strict assumptions of economics textbooks will prices to customers be equal to marginal costs.
- Interconnectors, defined as providers of *call termination* to other network operators, are not customers – they are “*co-operators*” and both networks must co-operate for calls to be completed between their customers. The terminating network provides an essential service, without which no communication can take place. Therefore, the price for call termination is appropriately set by regulation at the economic level established by some

version of long run incremental cost.² Long run incremental cost is selected because it meets the following criteria: 1) It is economically efficient in the sense that it sends the right investment signals, and 2) it is fair in the sense that it fully compensates the terminating operator for the costs it incurs in terminating traffic from other operators and 3) it is the lowest price that meets criteria 1 and 2, and therefore does not include monopoly rents.

2. What Should Be Priced?

a. Rate Elements and Rate Structure

Price elements and the structure of prices are intended to address two related issues: on the supply side, to ration scarce resources, and on the demand side, to change consumption behavior of end users.

Responses to price changes occur at the margin. This means that decision-making occurs with respect to the *next unit*. The decision to make the next telephone call depends on the price of *that incremental call*, not the average price of all calls. The decision to talk for the next minute, once a call is placed, is based on the perceived price of *that incremental minute*. The decision to subscribe to a service is based on the perceived price of *that incremental service*. Each of these marginal decisions is performed by comparing the perceived price to the perceived benefit to be obtained. Customers often undertake these decisions with poor information, incomplete understanding, and only a vague notion of the actual price that will be charged.

Time-of-day pricing is a crude form of peak load pricing, intended to cause users to change their behavior by shifting some of their calling to off-peak periods. Multi-part tariffs (fixed charge + usage-sensitive charge) can be used to segment the market according to user characteristics. It can also be used to cover average costs when a firm operates with significant economies of scale, but sets prices for usage in relation to marginal cost.³

b. “Product” Definitions

Fundamentally, the circuit switched telephone network is a time-sharing network. Monopoly telephone companies set different prices for different minutes of use, depending on the identity of the user, the distance of the call, and the time of day. Telephone companies around the world have a very similar suite of service offerings that constitute their “products.” These “products” are really just pricing plans. The difference between local and toll can be changed with a stroke of the tariff pen. Similarly, the allocation of costs to “products” are in large part arbitrary. This has

²The focus of this paper is on prices to customers, not the complicated issue of setting prices for interconnection. Those issues will be addressed separately.

³ When economies of scale are present, average cost is constantly declining. Marginal cost therefore declines faster, and lies below average cost. If prices are set strictly at marginal cost, as economic efficiency would require, the firm will suffer a loss. Multi-part tariffs are a means of setting the marginal price equal to marginal cost, while still meeting the need to cover average costs so that the firm breaks even.

important implications for policies on rebalancing, access deficit calculations, interconnection charges, and universal service.

1. DIRECT AND INDIRECT ACCESS: *Direct access* is when a service provider builds its own local network facilities connected to its end user customers. Charges usually consist of a one-time installation charge, plus a periodic fixed charge. This charge usually is higher for business customers than for residential customers. *Indirect Access* is when service provider does not have its own local connection to a retail customer, but relies on the local network facilities of another operator to provide retail services to its customers. The service provider usually pays the local network provider to provide call origination from end users, and recovers that cost in its prices for services rendered. ISPs and long distance network operators make extensive use of indirect access.
2. LOCAL USAGE: Typically a low usage-sensitive rate (time or pulse), varying by time of day.
3. DOMESTIC TOLL: Typically a usage-sensitive rate that varies by time of day, and increases with distance.
4. INTERNATIONAL TOLL: Typically very high usage-sensitive rates, varying by world region called, varying by time of day.
5. FREE PHONE SERVICES: This service allows the called party to pay for all calls directed to it by end users who dial a special area code (e.g. 800). This can be used by ordinary business operations to provide customer service, take orders, etc. Telecommunications service providers can also use it as a form of indirect access, especially through the use of foreign exchange (FX) lines.
6. CUSTOM CALLING: These are a suite of vertical or value-added services such as Caller ID, Call Waiting, Call Forwarding, and 3-Way Calling, voice mail, special ringing, etc.
7. OTHER: There are a host of other services offered by telephone companies, including Operator Services, Directory Service, Information, provision and maintenance of equipment, and others.

c. Policy Issues

1. Control of Dominance

The fundamental reason for regulation of telephone prices is to control the potential for abuse of dominance. In a monopoly environment, this amounts to controlling overpricing, undue price discrimination, and refusals to serve. Once competition emerges, there are added concerns over predatory pricing, anti-competitive cross-subsidy between services and geographic areas, denial of and over-pricing to competitors of essential facilities.

2. Cost-based or Market-based Prices?

In a monopoly environment, regulators cannot rely on market-based prices to be a guide. For this reason, most nations that have relied on independent regulators have used some version of cost as the standard for pricing. Once effective competition is present as a result of liberalization, market forces of supply and demand allow a reliance on Market-based prices.

3. What cost basis?

- *Fully Allocated Cost (FAC) or Fully Distributed Cost (FDC)* is generally used to underpin the pricing of monopoly telecommunications suppliers. However, since most telecommunications services use many of the same network facilities, the allocation of costs is largely arbitrary. In practice therefore, a system of cost-based pricing is really a system of price-based costing. The distortions that are inherent in this system become a barrier to liberalization, as users and providers respond to the entrenched system and resist change. FAC/FDC methodologies are top-down methodologies.
- *Activity-Based Cost (ABC)* is a version of FAC that attempts to sharpen the allocation process. Instead of using gross allocators such as revenues, headcount, etc. ABC looks as closely as possible at the activities actually undertaken, so as to directly assign costs to activities and to services. It is most useful in assessing staff functions. The result is a reduction, but not elimination of the level of cost allocations that are arbitrary.
- *Current Cost Accounting (CCA)* estimates the cost of replacing embedded facilities with modern facilities of like functionality at current prices. However, it does not address the issue of the allocation process.
- *Short Run Marginal Cost* is the unit cost of supplying the next unit of output holding capital investment constant. This is a useful basis for setting the price of a capacity-constrained service whose demand varies by time of day or by season.
- *Long Run Marginal Cost* is the unit cost of supplying the next unit of output, allowing capital investment and other factors to vary.
- *Long Run Incremental Cost (LRIC)* does not address the next unit of output, but rather looks at the unit cost of supplying a large increment of additional output. This approach recognizes the need to do cost calculations on a large enough increment to be practicable.
- *Total Service Long Run Incremental Cost (TSLRIC)* estimates the forward looking LRIC of providing an entire service. In other words, it treats the entire service as the incremental unit.
- *Total Element Long Run Incremental Cost (TELRIC)* is an approach developed by the FCC in the United States to calculate the cost of unbundled network elements (UNEs) for purposes of calculating their prices. TELRIC is based on the engineering costs of the network elements.

4. Price Structure Different price structures have different implications for usage levels. A low fixed recurring price and a high usage sensitive price will encourage subscribership, but discourage usage. This structure is typical of cellular networks. A high fixed charge with a low or zero usage sensitive component will discourage

subscriptions, but encourage usage. This is the typical structure of local call pricing in the United States. This has important implications for Internet usage. Slow networks and long downloads require long holding times on dial up networks. Usage sensitive pricing discourages Internet usage. Flat rate monthly telephone charges are a major reason for the US lead in Internet usage at home.

Many price structures are possible, and under competition, users become segmented according to their pricing preferences, as evidenced by the variety of pricing packages that have developed for mobile services. Price structures can vary according to the structure of monthly fixed and variable charges, the number of usage units per month, caps on rates or bills, prices for incoming and outgoing calls, etc. The limits are set by the imagination of the marketing department, within the constraints set by regulators and the market.

C. COST METHODOLOGY ISSUES

1. Dominance versus non-dominance: Different cost methodologies are appropriate for different “products” because the revenues generated by them are intended to achieve different business and policy goals. The first point is that a distinction is necessary between dominant and non-dominant operators. The latter, lacking market power, should be unregulated with respect to pricing of services to end users. The following recommendations apply only to dominant operators.

2. Pricing Policies for Dominant Operators: For retail and wholesale services provided to users and resellers of retail services, use FAC/FDC and ABC including a risk-adjusted cost of capital for calculating the operating margins earned on the various services provided end users by a telecommunications operator. This includes all access services, toll services, international services, private line, and vertical services.

- Indirect access services should be provided at retail prices less avoidable cost.
- Volume sensitive pricing plans should be permitted, provided that they are shown to not be predatory.
- All services should be available for resale, so that arbitrageurs can discover efficient costs and prevent undue price discrimination.
- For call termination services provided by operators found to have a dominant position in the access market, use Forward-looking Long Run Incremental Cost, including a risk-adjusted cost of capital. Also include relevant common costs and associated overheads.
- For non-basic vertical services, allow sales at market prices.

3. Cross-subsidy issues: Incumbent telcos identify cross-subsidies in terms of FAC accounting. These types of accounts typically show that local access has negative margins, while toll and other services have positive margins. On this basis, they usually assert that toll *cross-subsidizes* local access.

A determination of the profit and loss associated with a particular service is very sensitive to the allocation of the costs and revenues attributed to each service. When, as in telecommunications, there are a high proportion of costs that are considered “common” to multiple services, the outcome rests on largely arbitrary and non-economic cost allocations. This is because there is no “right” way to allocate common costs. For example, in the United States for purposes of rate of return regulation, the costs of local access (Non-Traffic Sensitive Costs) were allocated between intrastate and interstate jurisdictions on the basis of relative minutes of use. That allocation over the years was first weighted, then capped and finally reversed by regulators as a response to political and competitive pressures. Because there is no right way, there is also no wrong way, and the allocation becomes a policy decision.

Thus, assertions of cross-subsidy are based on cost allocations that are in turn based on policy decisions that can be altered to show a very different pattern of prices, profits, and cross-subsidies.

Furthermore, the very definitions of some services can be arbitrary. The difference between a local call and a toll call is one that can be altered with a stroke of a tariff pen. Since the product boundaries themselves are somewhat arbitrary, and the cost allocations between them are also somewhat arbitrary, it is hard not to conclude that assertions of cross- subsidy are also somewhat arbitrary.

4. Profit Rates: There are two issues related to profitability. One is the level of margin on a particular service. The other is the rate of return to the enterprise that is considered “just and reasonable.” The former is a function of revenues less the costs attributed to the service, and we have seen above the arbitrary nature of a large portion of those costs.

With respect to the rate of return to the enterprise, regulators usually restrict monopoly utilities to earning the risk-free cost of capital plus a risk premium. PTTs, as government enterprises, are usually not explicitly regulated with respect to rate of return.

There is much debate on the proper methodology for calculating the allowed rate of return. Debates about the risk free rate usually begin by using the thirty year US government bond rate. Disputes about that rate usually center on debates over macroeconomic forecasts, expected inflation rates, and the impact of government monetary and fiscal policy.

More problematic is the appropriate risk adjustment. This often involves guessing at the “appropriate” level of debt and equity carried on the company’s books. Higher debt ratios are more risky, but long-term debt is often less expensive than equity. An assessment is needed of the riskiness of the telecommunications industry relative to other industries. This is usually addressed by using some variant of the Capital Asset Pricing Model (CAPM), but the assumptions required by this model have been criticized on theoretical grounds. Benchmarking against

similar companies is often used, but this approach is open to criticism based on the assertion that the comparative sample of companies is biased in some way; perhaps the localities chosen have different economic characteristics, or have more or less competitive markets, or differ in some significant way that affects the comparison.

5. Calculating the Rate Base: Once the rate of return is determined, there is the problem of what base to apply it against. In general, the rate base used is the property, plant and equipment and capitalized expenses, net of depreciation. In the United States, where rate base rate of return regulation has been practiced for many years, the calculation issues involve questions of:
 - Appropriate Depreciation rates and equipment depreciation lives.
 - Depreciation methodology: straight-line, accelerated depreciation, etc.
 - Original cost or replacement cost valuation
 - Treatment of construction work in progress
 - Treatment of capacity held for future use and expansion
 - Assessments of efficiency of operations and investment
 - Pass through of input costs, taxes, and external shocks.
6. Establishing the Price Schedule: The calculations above provide a number that represents the Revenue Requirement, i.e. the amount of money the company must earn annually to cover its operating costs, recover its capital investments, and pay a return to its investors. All this is needed before a pricing exercise can begin.

The pricing exercise requires that the price of each service and product, times its volume, added over all products and services, equal the revenue requirement.

$$\sum p_i X_i = \text{Revenue Requirement}$$

Mathematically, an infinite number of combinations are possible. The business and regulatory problem is to set the prices based on detailed knowledge of the state of existing and potential competition, the elasticity of demand for the product or service, and the other factors such as income that will affect demand and revenue.

a. Ramsey Pricing: A Word of Caution.

In this context, a word of caution is needed about a practice known as “Ramsey Pricing.” This is a form of second-best pricing that minimizes deviations from economically efficient prices set equal to marginal cost. Economists often recommend Ramsey Pricing in situations when a monopoly utility operates under cost conditions exhibiting substantial economies of scale. In this natural monopoly situation, because marginal cost is less than average cost, setting all prices equal to marginal cost (the “first best” approach) results in losses to the firm because revenues do not cover average costs. The Ramsey Pricing rule is to segment the market according to elasticity of demand, and deviate from marginal cost pricing inversely to

that elasticity. In this way, the least price-sensitive consumer segments pay prices above marginal cost, while the most price-sensitive segments pay prices equal to marginal cost. As a result, the distortions in consumption decisions are minimized.

Ramsey Pricing is a form of price discrimination that provides the usual economic argument for cross-subsidization in telecommunications and public utility pricing.

This pricing approach is only sustainable under two conditions:

1. It is not possible for competition to offer alternative services to the customers in the high price segment. This may be a result of technical, economic or other barriers to entry. Most often, however, it is accomplished through legal barriers to entry.
2. There is a barrier to arbitrage or resale between the various customer segments, preventing the low priced groups from reselling to the high price segment.

While Ramsey Pricing is a useful approach in a monopoly setting, it has perverse effects once competition is introduced. This is because the elasticity of demand for the incumbent is no longer equal to the elasticity of demand of the market; the presence of competitive choices makes the incumbent's demand more elastic in those segments where competition is present. Under the Ramsey Pricing rule, this means that prices should be reduced to the competitive segments and raised to the monopoly segments. Incumbents often use this logic to argue that competition should be forbidden based on "cream-skimming" and threats to universal service.

Ramsey Pricing is not an appropriate approach for pricing telecommunications services in a partly competitive environment. Behavior under Ramsey Pricing is indistinguishable from anti-competitive cross-subsidization, and rightly draws the ire of competitors and competition authorities.

D. DYNAMIC PRICING CONSIDERATIONS

a. Rate Rebalancing: Rate re-balancing refers to the policy of dropping prices for certain services, usually long distance and international toll, and offsetting those reductions with increases in the rates of other services, usually local access and usage. The term sometimes is also used to refer to reductions in business rates with offsetting increases in residential rates.

There are two explanations usually offered for these changes in rate structure. A version of the first explanation is that the transition from monopoly to more competitive telecommunications markets makes it necessary for prices to more closely align with costs. During the monopoly era, prices were more based on value of service (i.e. "willingness to pay"). But the advent of competition drives price toward costs, and undermines the cross-subsidy structure of monopoly rates.

A second version of the first explanation is that associated with the Ramsey Pricing approach discussed above. Re-balancing never involves raising rates in contested market segments and lowering them in monopoly segments. To this extent, re-balancing has the appearance of shifting cross-subsidies that existed in the monopoly era (from usage to access services, from toll to local services, and from business to residential) to a new structure (from monopoly to competitive services.) This new cross-subsidy structure often has the characteristic of revenue –neutrality, so that the incumbent’s total revenue stream is kept intact. But by earning a larger proportion from monopoly services, the incumbent is able to reduce prices in contested segments, to the detriment of its competitors, who usually have no alternative revenues of their own to support them.

For the re-balancing process to avoid an anti-competitive outcome three conditions are required:

1. Regulators must remove barriers to competitive entry into the monopoly markets, especially facilities-based local access networks and international services.
2. Interconnection rates (i.e. call termination) must be set on the basis of long run incremental costs. Otherwise, interconnection becomes saddled with monopoly pricing, and entry decisions are distorted.
3. Unlimited resale will prevent price discrimination and cross-subsidy.

Unless these steps are taken in conjunction with re-balancing, competitors will be caught in a price-cost squeeze between falling prices in contested markets, and uneconomically high interconnection charges. This has been the recent experience of long distance network operators like Mercury Communications in the UK, and MCI in the US, both of which have disappeared as separate companies. The same process is under way at AT&T and consolidation for the same reasons is under way among long distance carriers in Japan.

b. Access Deficits: Rate re-balancing discussions inevitably raise the issue of Access Deficits. Under the FAC cost methodology (discussed above), losses are generally shown in local access services. These losses are made up by large profits in usage-sensitive services. Full rebalancing would require that local access rates be raised to fully recover the costs of access, with offsetting reductions in usage-sensitive prices. In practice, governments have proven reluctant to raise access rates at the pace and to the level required to accomplish rebalancing. As a result, a continuing access deficit appears. Some countries have therefore added an “access deficit charge” (ADC) to interconnection rates charged to long distance operators.

An access deficit charge is a good approach as an interim measure, provided it is properly calculated and levied. Calculations require strict regulatory scrutiny in order to avoid burdening access services with unrelated overhead and excessive allocations of common costs. If an ADC is charged, it should be levied only on indirect access services provided by the local access provider, not on call termination. In other words, if a long distance operator decides to use the access services of another operator rather than build its own, then it should pay the ADC. The operator can then make an economic make-or-buy

decision. However, since there is no make-or-buy decision possible for call termination, no ADC should be levied on that service.

Finally, it is important that the Access Deficit not be confused with the universal service obligation.

E. SEPARATING THE ACCESS DEFICIT FROM UNIVERSAL SERVICE

UNIVERSAL SERVICE

During the transition to rate re-balancing and marketplace pricing, there is a risk that rising prices for local access and for residential services may put telephone service out of economic reach for certain segments of the population and in high-cost geographic areas. (This effect should be distinguished from the huge unserved population that exists in developing countries, where the lack of telephone service is more a function of capital starvation, monopoly output restrictions, and administrative indifference.) Therefore some policy structure is needed to address the needs of universal service.

The prerequisites for addressing universal service are: Liberalization of local access services to attract investment that can serve commercially viable demand; interconnection, end-user pricing; Interconnection policies so that new operators are able to interconnect to the PSTN and each other for the purpose of terminating calls between their respective customers; Pricing and Tariffs for services provided by non-dominant operators should be set by market forces with the exception of those provided as part of a universal service offering.

It is critical for policy clarity to draw a distinction between the concepts of “universal service” and the “access deficit.” Without this distinction, policies on universal service, tariff rebalancing and interconnection will be severely distorted and the development of competitive markets will be significantly hampered.

As countries contemplate liberalizing their telecommunications sectors, one of the first objections raised by incumbent operators is that competition will undermine universal service. Their argument generally goes along the following lines:

1. THE MONOPOLY INCUMBENT ARGUMENT

a. Competition Is A Threat To Universal Service: Under monopoly, profits from certain services are used to cross-subsidize losses incurred by other services. The loss-making services are those that need subsidies in order to be affordable. Affordability allows the customers of that service to subscribe to telephone service that would otherwise be beyond their financial means. Society benefits because with more subscribers on the

network, the network becomes more valuable to all.⁴ In addition, social cohesion is enhanced and economic activity is stimulated by widely available communications systems.

Under this view, incumbents assert that competition is a threat to universal service. Their argument is that “cream-skimming” new operators will only compete in those service segments and geographical regions that are profitable. Lower prices resulting from competition will erode the revenue sources needed to provide the subsidy. To stay financially whole, the ex-monopolist must re-balance its pricing structure by lowering rates in contested segments, with offsetting increases the monopoly loss-making segments. (Implicit in this argument is the assertion that the incumbent has a right to maintain its historic revenue.) The higher prices make the service less affordable, thus threatening universal service.

In practice, this means that competition in long distance and international services will erode the cross-subsidy needed to maintain low access prices for local residential and business customers. Within the local access category, there also is usually alleged to be a cross-subsidy between business services and residential services.

b. The Incumbent Solution: Impose USO Charges On Competitors: The monopolist’s preferred solution is to outlaw competition, but that argument is no longer sustainable. The alternative position is to argue that the new competitors should bear their “fair share” of the costs of universal service. Politically, this position is unassailable, and entrants inevitably agree. The debate then turns to calculating the size of the Universal Service Obligation (USO).

Because the USO charge is equivalent to a unit tax, it raises the marginal costs of new entrants, and the incentive of the incumbent is to make that charge as large as possible. By doing so, it increases the floor for pricing, and reduces the potential for competitors with lower cost structures to undercut the incumbent’s prices.

c. The Access Deficit: The incumbent usually equates its Universal Service Obligation with its Access Deficit. The calculation of the deficit is based on some form of Fully Distributed Cost approach. Typically, it appears as follows:

Service Category	Local Access	Local Usage	Long Distance 1	Long Distance 2
<i>REVENUE</i>	+	++	+++++	+++++
<i>COST</i>	-----	----	---	--
MARGIN	-----	---	+++	+++++

This table shows the typical (albeit greatly) simplified accounting results for a telephone company. Rates and revenues are high in long distance and low in access. Margins are

⁴ Economists refer to this as the “network externality.” As more subscribers connect, the number of potential connections increases exponentially, creating additional communications options and value for existing subscribers.

large and positive in long distance, and negative in local. In particular, there is a large negative margin for Local Access. This is the Access Deficit.

The incumbent recommends several steps to deal with the Access Deficit:

- Price Rebalancing: lowering the price of long distance and international services while raising the price of Local Access and Local Usage.
- Interconnection Charges: Adding a service called “Interconnection” that is charged to the long distance competitor. This typically equal to twice the Fully Allocated Cost of Local Access plus Local Usage. The charge is doubled because long distance networks use local access for both call origination and call termination. Note that the charges for Interconnection are higher than the retail price, which is very typical.
- Access Deficit Charge: In most cases, incumbents are not allowed to fully raise the prices to end users by the amount that would offset the reductions in prices for other services. Because of this, they claim that competitors who use the local access network should pay an Access Deficit Charge on top of their Interconnection charges.

The marketplace outcome of this framework is to squeeze service providers and long distance competitors between falling retail prices and high charges for Interconnection plus the Access Deficit Charge levied in the name of universal service. It has the effect of setting wholesale prices higher than retail prices.

2. THE COUNTER-ARGUMENT: COMPETITION HELPS ACHIEVE UNIVERSAL SERVICE

a. Critical Evaluation of Incumbent Arguments: There are several flaws in the position of incumbents.

1. The Definition and Size of the Access Deficit is Arbitrary

- The view relies on the accounting system and the underlying methodology of Fully Distributed Costs (FDC). This flaw results in the view that the Access Deficit and Universal Service Obligation are the same thing. The FDC methodology is based in turn on non-economic and largely arbitrary allocations of a substantial portion of costs.
- The service definitions of local access, local usage, and long distance are based around network components, not marketplace products.
- The definitions of a local call and a long distance call can be altered with the stroke of a pen.
- The local access network is necessary to make a long distance call, so its costs could reasonably but arbitrarily be allocated to long distance. A large number of reasonable but arbitrary cost allocations are possible, and each would result in a different pattern of profits and losses.
- Therefore, the whole idea of an access deficit is arbitrary; the size of the access deficit is arbitrary; the level of cross-subsidy is arbitrary; and pricing structures supported by the FDC accounting system are arbitrary.
- How the incumbent chooses to define its products and services and report its profits and losses for tax and regulatory purposes is an internal management decision and should not be used as a basis for setting charges to competitors.

- The Access Deficit has nothing to do with Universal Service.

2. Competitors Are Only Cream-Skimmers

A second flaw is the assumption that competition will only occur as a result of “cream-skimming.” For this to be true, one must assume that the incumbent’s cost structure and technology are the most efficient available, so that entry can only occur as a result of uneconomic pricing to create cross-subsidies. This case rests in turn on the economics of natural monopoly, defined as substantial and continuing economies of scale. While scale is not unimportant, technology has reduced network cost levels, decreased the minimum efficient scale, and allowed for alternative business models based on economies of scope. Thus broadband and wireless networks now offer lower cost options for local access. Indeed, these technologies are being applied in many countries to extend network access.

Second, to accept this argument, one must also accept the definitions of products and calculations of associated profits and losses are those that would arise in a competitive market. Given the proliferation of new service capabilities and economies of scope, the market definitions are manifestly not congruent to the incumbent’s service categories.

3. CONCLUSION

- The Access Deficit is an accounting artifact and not equivalent to the universal service obligation. It should not be considered as part of universal service policy.
- In developing countries with low telephone penetration, the primary issue is not demand-side affordability, it is supply-side network availability.
- Liberalization and fair competition, by introducing new sources of capital, lowering costs and prices, and introducing alternative technologies, can increase the supply of local network access.
- Prerequisite to local network liberalization is the development of an interconnection policy that sets prices independently of the incumbent’s FDC accounting cost models.
- Where there remain areas of low availability, a universal service fund can provide limited subsidies.
- If and Access Deficit Charge is imposed, it should only be collected on Indirect Access services, not on call termination.

F. PRICE CAPS

The general formula for a price cap is:

$$P_t = P_0[RPI - X - Y]$$

..where P_t is the current price level in period t ;

P_0 is the price level at the beginning of the price cap period

RPI is a retail price index intended to adjust for inflation

X, Y are adjustment factors that may be positive or negative.

Not in the formula as written due to mathematical complexity is a superscript meant to denote the application of the formula to various baskets of goods and services.

1. WHAT ARE THE APPROPRIATE BASKETS?

a. Capped and Uncapped Services: First, one must separate services that are under the price cap from those that are not. These designations may change over time as the market evolves. This is usually done by allowing the prices of competitive, non-essential, or discretionary services to be determined by market forces.

- Outside price caps and unregulated: retail cellular services, custom calling (star) services;
- Outside price caps and directly regulated: Interconnection (call termination), emergency services.

b. Proposed Baskets:

- Retail Services Basket-Business, Government (Non-carrier)
 - End user access, installation, reconnection
 - Inbound calling services
 - Local and National Calls
 - Daytime Inter-island (inside OECS) calls
 - Yellow Pages, Business White Pages
 - ISDN
 - Low – volume leased line
 - VPN
 - Managed Network Services
 - Business CPE rental
- Retail Switched Services Basket-Residential
 - End user access, installation, reconnection
 - Local and National Calls
 - Night and weekend Inter-island (inside OECS) calls
 - Operator Services
 - Directory Inquiry Services
 - Coin and Card Phone services
 - Residential CPE rental
- International (Outside OECS) Voice and Data Services
- Wholesale Non-Termination Services Offered to Resellers, ISPs, Other Network Operator Customers
 - High Volume Leased Lines
 - VPN
 - Indirect Access
 - 3rd Party Billing

- Data Network Services
 - Packet network services
 - Frame relay
 - Sonet
 - Digital Data Services
- New Services: New services would be assessed on a case-by-case basis to determine whether they should fit into an existing basket or a new one.

2. SETTING THE INITIAL PRICE LEVEL

For each basket, the initial average price level should be set at a level that fairly covers the relevant direct and indirect costs as well as a fair allocation of common costs and corporate overhead, and a fair rate of return on capital. This is an opportunity to begin the pricing regime from a level that eliminates past inefficiency, such as overvalued assets, capitalized labor, monopoly rents and inefficiently incurred costs.

In considering the initial level of P_0 , the following issues are relevant:

- The lower the starting point, the greater the immediate benefit to users;
- The lower the starting point, the less attractive is that market to new entrants;
- The lower the starting point, the more costs must be driven out of the business over the price cap period in order for the operator to maintain profitability. (See below, Adjustment Factors) While there is a natural wish to maximize the immediate benefits to users for economic and political reasons, the impulse must be balanced against the need to encourage and fairly reward risk-taking entrepreneurs and to encourage the existing operators to deploy advanced technology and continued investment. Setting prices too low will stunt the development of telecommunications infrastructure, and damage the development of this key element of the Knowledge Economy that increasingly drives economic development and growth.

3. DETERMINING THE APPROPRIATE MEASURE OF INFLATION

The expertise of the Eastern Caribbean Central Bank can be relied upon to provide objective, accurate and uncontroversial measures of regional inflation on an annual basis that can be used to adjust the price cap formula annually.

4. SETTING THE ADJUSTMENT FACTORS

Nations which have adopted price caps to telecommunications have generally applied one or more adjustment factors to the initial P_0 , denoted in the formula by X and Y. The X factor reflects anticipated changes in productivity, and is intended to create an incentive for accelerated cost reductions. Thus, if X is set at 2% per year, if the operator can reduce its costs after inflation by more than two percent, it will see its profits increase. The greater the value of X, the more costs must be squeezed out of the business in order to maintain profitability.

There is a tradeoff between the initial price level P_0 and the X factor. A low initial price should not be combined with a large value for X; the combination can threaten the viability of the operator, and deter new entry. Moreover, there is a danger that the operator will achieve cost reductions by reducing the quality of service.

For the initial price cap period, the X factor should be set at a relatively modest level, since there will be a great deal of uncertainty about the new regime. It can always be adjusted in succeeding rounds of price cap renewals.

The other adjustment factor Y adjusts for costs that are beyond the control of the operator and that should therefore not be counted against the price cap formula. These might represent cost increases from such factors as changes in tax laws, or other one-time costs that should fairly be passed through on a dollar-for-dollar basis. This may include things like a portion of charitable contributions, social spending or similar costs, as determined by the regulator.

There is no requirement that the X and Y factors be the same for every basket of service. Nor is it necessary that the factors be negative. The UK used its price cap formula to allow British Telecom to rebalance its tariffs, gradually raising the price of access at $RPI + 2\%$, while applying a negative X factor to usage-sensitive services that ranged over time from $RPI - 2.5\%$ to $RPI - 7\%$.

5. SETTING THE TIME PERIOD FOR PRICE CAPS

Longer periods provide greater certainty to investors and users and encourage greater cost savings and hence retention by the company of the benefits of cost savings; shorter periods provide for mid-course corrections, create opportunities for clawing back windfalls, but reduce the incentives for efficiency improvements. Short periods begin to look very much like rate of return regulation, with a regulatory lag; this increases the administrative burden and marketplace uncertainty.

An initial period of three years is appropriate. This will be long enough to allow for operators and potential competitors to do investment planning and to gather experience from the process. At the same time, it is short enough to allow for a relatively rapid correction in the event that problems arise.

6. ALLOWING PRICE VARIATION WITHIN A BASKET

Within a basket, the operator is free to set and adjust prices so long as the average level conforms to the price cap formula. However, there should be a ceiling and floor on the range of that variation. This goes to the extent of competition for services within the basket, and the degree to which the company should be able to respond to competition.

Initially, when dominance is still nearly complete, the upper and lower boundaries should be set very tightly. The ceiling is needed to prevent monopolistic pricing to captive customer segments that do not have alternative sources for services. The floor is needed to prevent predatory pricing in those segments of the market where competition is present

The ceiling and floor should widen as competitive forces become more effective, and eventually converge at stand-alone costs as a ceiling, and long run marginal cost as a floor. These are the standards used in most competition law to judge abusive pricing practices. In this way, the price cap regime has a mechanism that can evolve to regulatory withdrawal and reliance on market forces to set prices.

7. THE GEOGRAPHIC APPLICATION OF PRICE CAPS.

In order to minimize the administrative burden and the opportunity for cross-subsidy, the price caps should be applied uniformly across all ECTEL countries. Where the cost structure is dramatically higher in some areas than others, this should be addressed through the application of subsidies to make up the difference through the universal service fund.

8. USING PRICE CAPS AS A REBALANCING TOOL

By setting the basket definitions and X factors appropriately, the price cap formula can effectively lower prices for some services while raising them for others, thereby achieving rebalancing. However, price caps are intended as a tool that allows scope for market pricing while seeking to prevent abuse of dominance. It is not well-suited as a tool of strategic restructuring, and to use it as such can create significant distortions in the market. To the extent that rebalancing is deemed necessary, it can be accomplished more effectively through the setting of the initial price levels for each basket.

9. INTERCONNECTION PRICING

Call termination on the PSTN is a bottleneck service, and competing providers of switched services must rely on the PSTN operator to terminate calls from their customers to the customers of the PSTN. If the PSTN operator denies that service or overprices it, the competitor cannot survive. Because of its importance, call termination should be separately regulated and priced at forward-looking long run incremental cost, including a fair return on the capital employed.

Call origination (access) services are a prospectively competitive market, and with liberalization, can be provided by alternative operators such as cable TV, cellular and other wireless networks, wireless local loop, and satellite networks. Price caps should apply initially to those services to prevent abuse of dominance, and the proposed definitions of the baskets reflect that policy.

10. NEW PRODUCTS AND SERVICES

Experience shows that most new products and services offered by a PSTN operator represent the bundling, unbundling, or repricing and renaming of existing services. In these cases, they should be included in the relevant existing basket. However, in the event that a truly new service or product is brought to market, and it is deemed necessary to regulate its price, it may be necessary to create a new basket during the price cap period. These situations should be addressed on a case-by-case basis.

11. TERMINATING PRICE CAPS

Clearly, one cannot continue forever dropping prices under the formula, because eventually the company will not meet its legitimate revenue needs. Efficient cost structures are gained in two stages: the first is the elimination of “fat” through expense management, procedural improvements and administrative practices. But to achieve true long term efficiency requires that at some point the operator must incur the costs of investing in new systems, equipment, training, and technology. Price caps can deter these investments because they increase short run costs.

It is impossible to say when these problems may arise, and they are not likely to appear in the first three years. However, as successive rounds of price caps are imposed, care must be taken to prevent this damaging outcome.

12. A WEAKNESS OF PRICE CAPS

Indonesia recognized the value of price caps, and put in place a price cap structure. However, the Asian economic crisis demonstrated the weakness of price caps: they assume that economic conditions will remain generally stable over the period. When this is not the case, as with the Asian financial crisis, applying the formula leads to unreasonable prices and is unacceptable to users, but abandoning the formula undermines business and investor confidence. In a crisis atmosphere, a politically charged decision on pricing that strikes a reasonable balance is almost impossible to achieve. Contingency clauses that provide for a balanced approach that is understood in advance must be part of the price cap regulation.

13. SERVICE QUALITY

To prevent the effect of achieving cost reductions at the expense of service quality, a system of measurements to monitor service quality should be implemented prior to price caps being imposed. By this means, an initial benchmark of service quality will be established, and performance can be tracked over time. Accompanying the service quality measurements should be a system of fines and penalties for violating service quality standards. These fines should be substantial enough to serve as a deterrent to achieving price cap goals at the expense of service quality.