

Theory of Price Regulation

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Abstract

Price regulation is important in telecommunication service to achieve economic efficiency and social welfare. Among different approaches, price-cap regulation is most widely accepted. Details of price-cap regulation are discussed in this article. In interconnection market, typical issues like unbundled charges, universal service and ADC charges, price squeezing, and fixed-to-mobile call charges are mentioned with their possible pricing approaches provided.

Key words: regulation, price-cap, interconnection

1 Introduction

1.1 Objective of regulation

The objective of price regulation can usually be categorized into three groups¹:

- ✓ Financing objectives: to make operators get sufficient revenue to be viable
- ✓ Efficiency objectives: to reflect resource scarcity properly and to maximize the productivity
- ✓ Equity objectives: to distribute the welfare benefits between operators and consumers, and also among different consumer groups fairly.

Other objectives can be to restrict the anti-competitive pricing abused by dominant operators.

1.2 Rate balancing

One problem should be treated seriously in price regulation is the rate balancing issue. Theoretically, price should be closely aligned to or balanced with its cost although we do not mean that the price should be set at the incremental cost level exactly. Unbalanced price structure is not sustainable in the competitive environment e.g. it will encourage the entry of even high-cost operators in services with over-cost prices; and discourage the entry of low-cost operators in services with below-cost prices.

The unbalanced situation is quite common in unregulated monopoly environment. It can be handled by Ramsey pricing² which mean that price is raised above marginal

cost more for a lower demand elasticity (sensitivity) service and less for a higher demand elasticity service. Actually, Ramsey pricing is widely used to recover the fixed and common cost because it can minimized the adverse impact on economic efficiency.

Compared to rate balancing, peak/off-peak pricing can be view as unbalanced pricing in some aspect. Prices are set at a higher level in peak time to discourage use of facilities and transfer demand to off-peak periods. In this way, capacity utilization is maximized, traffic congestion reduced, quality of service improved, and purchase of additional equipment avoided.

2 Different approaches of pricing regulation

Price regulation has existed for a long time although it had changed over time as the market structure has changed from monopoly to competition. Nowadays, it is an oligopoly era which means a partly competitive and partly regulated market with a small number of operators.³

- ✓ Discretionary price: it is widely used when government operates the network to promote consumer-to-consumer equity objectives and characterized usually by below-cost local connection price compensated by over-cost long distance or international connection price. This will lead to an unbalanced and inefficient price structure in economics point of view. Also because of some political reason, price is raised to meet a certain level of revenue; part of the revenue is deprived from operator to other priority use... all these threaten the viability of operators.
- ✓ Rate-of-return regulation⁴: it aims to limit monopoly profit to a reasonable level by adjust the price to cover the calculated revenue requirement. This violates the efficiency objectives for there is no incentive for operators to reduce their costs. Moreover, it will lead to over-investment, various "cost-padding" activities, and lasting argument over

what a reasonable price is.

- ✓ Price-cap regulation: it places an upper bound (cap) on an index of the operator's price to restrict the price rather than the profit. It encourages the operator to reduce cost and to innovate. This will be discussed in more details later. Moreover, Although people are more concerning price increases, a price 'floor' is also important to prevent predatory (below cost) pricing practices which is against economic efficiency by driving or excluding lower-cost new entrants from the market.

3 Price-cap regulation

3.1 The formula and factors

The basic formula of price-cap regulation⁵:

$$P_t = P_0 * (1 + I - X)^t$$

P_0 = baseline price-cap

P_t = price-cap during year t after the institution of price-level regulation

I = rate of inflation

X = X-factor, which in turn consists of two components

3.1.1 'I' factor

Theoretically price can be indexed to the overall level of input costs accurately. In this way, regulators can focus on the whole industry instead of a specific operator in rate-of-return regulation. Thus regulated operators are encouraged to achieve at least below-average cost to gain the benefit of that efficiency. However, there is no such an industry-specific index so that regulators have to turn to broader reasonable inflation indices e.g. CPI (Consumer Price Index) and PPI (Producer Price Index) with its sub indices. In the UK and in Australia, CPI is used while someone may argue that it is not very preventative of changes in the cost of input factors used by operators. No matter how, any price index has limitations with time fluctuations. These limitations and fluctuations will be amplified when they move into micro level so selection criteria with adjustment mechanism should be taken great care of.

3.1.2 'X' factor

The operator will bear more pressure on cost reduction if the 'X' factor is higher. This will lead to some unnecessary threatening of viability of operator. On the other hand, too small 'X' will cause excessive profit and less incentive of improvement. In one word, 'X' should pose a significant, but not insurmountable, challenge to the operator.

Two main approaches to determine the 'X' factor are

- ✓ Historical productivity method: A popular method is to carry out TFP (Total Factor Productivity), which is an important basic offset. The important thing is that the X value should be equal to the difference between the productivity of the operator and the economy as a whole to make sure that every industry else being equal to avoid loss of investment in telecommunication.
- ✓ Regulatory benchmarking method: In some emerging market or the regulation is changing from discretionary price, this could be the only choice. Adjustments are more important than basic offset in this case.

3.1.3 Time period

Since price-cap regulation is used to encourage cost reduction, the productivity achieved should not be passed on to the consumer at once i.e. through an annual review to cause possible dilution of incentives. However, it will be out of line with current condition if the period is set too long. A proper period should be between 3 to 5 years (e.g. FCC adopted a 4-year price-cap period with AT&T⁶ and Oftel with BT for 4 years also except the initial price-cap for 5 years⁷).

3.2 Miscellaneous issues in price-cap regulation

3.2.1 Service Baskets

Services are usually grouped into one or more service baskets. Here we introduce two indicators API (Actual Price Index) and PCI (Price-cap Index). The API is calculated by the price increase of individual services times their weight which is determined by their revenues.

API should be equal or less than PCI. In practice, the regulator might set up a sub-cap index for one specific service in the basket to achieve more effective control.

3.2.2 Profit Sharing Mechanism

Because price-cap allows prices to diverge greatly from actual costs and generate “abnormal” profits, it reduces consumers’ welfare, favors operators, and also downgrades the regulator’s reputation. Recently, Ofcom and FCC intervene in operators’ activities more frequently than ever by distributing part of operators’ profit to customers through lower prices – this is called PS (Profit Sharing). The mechanism is that, if the regulator observes that one operator is making excessively high profits, it imposes a sharing rule. If the operator does not agree to it, it revokes the contract. To operators, the threat of revocation is very costly because of the capital intensive investment during contract period.⁸

3.2.3 Innovative service

It should be noticed when innovative services are newly introduced to the market, the price-cap regulation should not be applied because of the following reasons:

- ✓ There is no fierce effective competition in market.
- ✓ There is need for operators to exploit new markets and customers.
- ✓ Profit can be seen as a reward for innovation and introduction of new services.
- ✓ Profit can be seen a signal for new comer and trigger competition.

4 Price regulation in interconnection

The above discussion is more or less concerning the retail market. In this chapter, we will talk about the price regulation in wholesale market. Actually, interconnection charges occupy a significant proportion of end-user retail tariffs in telecommunications and their importance is obviously. Care should be taken to avoid too high interconnection charges which will impede competition while too low prices will discourage infrastructure investment definitely. To regulators, the most favored costing method is the LRIC (Long Run Incremental Cost) which is used widely not only in retail market but also in

wholesale market.

Generally costing method can use historical data or forward-looking approach. The later one is preferred because operators are supposed to respond competition by price adjustment more actively rather than price their service merely based on historic investment. The most widely accepted forward-looking costing approach is right LRIC which is estimated on the basis of current technology and best available performance standards. (The European Commission has adopted a TSLRIC (Total Service LRIC) -type approach called Long Run Average Incremental Cost (LRAIC) as its preferred costing methodology.⁹)

The price-cap regulation is also used as arbitration in wholesale market if commercial negotiation does not reach agreement. The typical example is that the operator raises its interconnection charges and lowers the retail prices to squeeze the profit margin. (See figure 1) Thus, competitors or new comers will be excluded. In this case, price-cap regulation can be used to avoid such anti-competition behavior and lower the interconnection fee probably in the end.

Some typical price regulation issues in interconnection aspect are listed below:

- ✓ Unbundled charges: This can be described briefly as “No service provider shall be charged for any interconnection facility it does not seek or require”¹⁰
- ✓ Universal service and ADC (Access Deficit Contributions) charges: this means that the interconnection charges should be separated where the cost of a particular component vary significant in different locations.¹¹

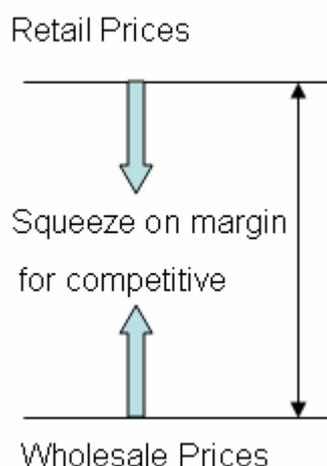


Figure 1

- ✓ Mobile/fixed interconnection in CPP (Calling Party Pays) regime: in CPP regime, a mobile operator pays the corresponding fixed operator a relative small interconnection charge for a mobile-to-fixed call while the charge is relatively high when a fixed operator pays the corresponding mobile operator for a fixed-to-mobile call. Many measurements including price-cap have been considered to address this problem. For example, Ofel modified the mobile operators' licenses in April 2003 to require the first 15 per cent reduction by July and further cuts of 15 per cent in each year for the next three years. In Singapore, CPP was opposed by three operators who claimed “CPP unfairly and positively discriminates against fixed line subscribers”¹² in 2002. On 23.12.2002, IDA (The Infocomm Development Authority of Singapore) decided to retain the existing MPP charging regime for mobile phone services.¹³

5 Price regulation in Hong Kong¹⁴

- ✓ In 1975, Scheme of Control (SoC) (Rate-of-return regulation) was established. The SoC set a maximum return to HKTC's shareholders of 16% of shareholders' funds.
- ✓ After 1991, the government realized that the SoC was no longer the most appropriate means. The government and HKTC mutually agreed to move to price-cap regulation

- ✓ In 1993, the Office of Telecommunications Authority (OFTA) was established to facilitate telecommunications liberalization and competition.
- ✓ The Telephone Regulation 1993 set out the initial form of the price-cap with an effective three year life. The price-cap is structured into an overall price-cap and two sub-caps.
- ✓ Since 2003, all telecommunication sectors in Hong Kong have been fully liberalized.
- ✓ At present, almost all retail prices for telecommunications services in Hong Kong are subject to determination by market forces without regulatory influence. Only PCCW HKT (former HKTC)'s price for local fixed network service are subject to regulation since it is designated a dominant operator.
- ✓ However, even in a competitive market, the regulator must maintain vigilance. For example, in early 2000, all mobile operators announced an increase in the monthly charge of HK \$20 at almost the same time. The price rise was withdrawn after OFTA declared that it would conduct an investigation to see whether any collusion was involved.
- ✓ IDD service was not included in the basket for historical reasons. Since the introduction of competition, the cost of some international services originating in Hong Kong has fallen by more than 98%. Moreover, the incumbent's market share is now less than 30%. As the incumbent is no longer dominating, pricing regulation for IDD service is no longer necessary now.

6 Conclusion

Price regulation should be set to meet its objectives. In principle, price is supposed to be aligned with its cost; in practice, Ramsey pricing can be adopted to recover the costs. The most favored costing method is LRIC which belongs to forward-looking costing approach. Among different price regulation approaches, discretionary price and rate-of-return regulation are obsolete because of their inefficiency. Price-cap regulation is the one most widely adopted both in retail and wholesale market but it should

not be applied to control innovative service at launching period. The regulation places an upper bound on an index of the operator's price to restrict the price rather than the profit. Thus, it encourages the operator to reduce cost and to innovate. When applying price-cap regulation formula, the inflation, "X" factor, and time period should be picked up carefully. Moreover, profit sharing mechanism can be used as a complementary option to favor customers. In wholesale market, principles have already been set up to address some typical issues e.g. unbundled charges, universal and ADC charges. However, in fixed-to-mobile interconnection aspect in CPPP regime, there are still many voices and price-cap regulation is used as a practice recently. The regulation has also used to prevent price squeeze successfully. The Hong Kong price regulation evolution is a vivid case to illustrate above discussions.

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