

ECONOMIC TOOLS FOR TELECOMMUNICATIONS STRATEGISTS

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Abstract: Because a firm's plans are impinged upon by a variety of market forces, a set of microeconomic tools should necessarily be applied to strengthen strategic forecasting and policy formulation. There exists a body of evidence in strategic planning which confirms that an understanding of supply and demand dynamics, elasticity, profit maximization, substitution analysis, and indifference curves are essential devices to calibrate strategy and probable competitive response [1]. While planning must address variables outside the domain of economic analysis—politics, social trends, and technological innovation, among them—there is little doubt that the tools described below can be of great assistance in clarifying the competitive landscape and informing the strategic management process.

JEL Classification: M2, M3

1. Introduction

The marketplace brings consumers and producers together. Transactions are measured in price. Prices are defined by the interaction of supply and demand. Some markets are local in nature, while others are regional, national, or international in scope. The geography of markets is an important characteristic in the evolution of telecommunications networks and the services they support.

2. Dynamics and Determinants of Communications Supply and Demand

In the telecommunications triad of the telephony, broadcasting, and computer sectors exists significant variation in competitive structures. While the computer industry remains fully unregulated, its counterparts are significantly regulated even after enactment of deregulation. Within telephony and broadcasting, some elements of the Act have modified or relaxed regulations, but government influence over local telephony has remained entrenched. Whatever the underlying public interest motive is, the fact remains that market supply and demand are influenced by government edict. We must therefore diagram intersecting supply and demand according to the market activity in which that enterprise is engaged.

The interaction of supply and demand defines price, with supply and demand curves changing constantly. Price will remain consistent if government asserts its regulatory powers with that aim in mind. Price stability will be sacrificed in the short-run if deregulation is manifested in the way its sponsors intended, but symmetry between market supply and demand will be achieved in the longer run. The effect of this congruence would, in theory, lead to equilibrium price, that situation in which buyers want to buy the same quantity that sellers are prepared to sell. Therefore, if a seller sets a price higher than equilibrium, surpluses occur: if a seller sets a price too low, excess demand ensues and shortages inevitably follow. Surpluses, in short, beget subsequent declines in price; shortages induce higher prices to the point of equilibrium.

It can be inferred that the use of supply and demand analysis is equally appropriate for content providers and carriers, though there is variance relative to product line. Those communications firms that supply content for infrastructure—telephony, television, and computers—thrive or die by the prevailing dynamics of supply and demand. Those who manage, control, design, or

create networking infrastructure operate, however, in a fundamentally different environment. Costs of generating content for infrastructure are labor-intensive; costs of developing that infrastructure are capital-intensive and typically require a longer time horizon to gain profitability. The cost of labor is decisive in content development; the cost of capital is pivotal in infrastructure development. Thus, economies of scope (cost savings through multifaceted service provision) coupled with economies of scale (the decline in per-unit costs as production rises) are essential for network managers. Reducing network costs per subscriber will likely be a preoccupation of firms in the immediate future. It is precisely this objective which is fueling the wave of mergers and acquisitions in the industry following 1996.

Large network providers hold a principal short-term advantage during the early stages of deregulation: firms best able to exploit the fundamental principles of economies of scope and scale are strategically positioned to engage in vertical integration by absorbing competitors [2]. There exists an intrinsic advantage for large network providers—the addition of each subscriber increases the value of the network for veteran users [3]. These considerations encourage vigorous marketing, thus leading potentially to expansive market share. Carriers in the short-term are concerned with market share and competitive threat; the law of supply and demand takes over in the long-run to define market winners and losers. Despite the comparative advantage of size, and thus financial leverage which some firms enjoy, the risks of committing long-term capital while network innovations advance signify major disincentives.

Aligned with capital risk is the complexity of user-churn, the frequency with which consumers move from provider to provider for their communication needs. With the prospect of proliferating competition, with new technologies supplanting veteran product lines, user-churn denotes threat and opportunity. One must simultaneously evaluate the risks of capital and user-churn while developing long-term strategy. In the absence of predictable cash flow, it is not practical to raise or borrow the capital required to build and maintain state-of-the-art infrastructure. It is for this reason that customer-led customization is now regarded as an emerging strategic priority by some firms.

3. Numbers' portability regulation

Number portability is a service that ensures the telephony end-users' possibility to keep their telephone numbers, while shifting to another provider of publicly available telephone services.

Number portability is available for the following numbering categories:

- **fixed telephone numbers (geographic and location independent)** – any fixed telephony subscriber will have the possibility to keep his/her fixed telephone number, when he/she decides to give up their subscription to the current fixed telephony provider and to subscribe to another fixed telephony provider; geographic numbers can be ported only within the same geographic area (respectively within one county or within the municipality of Bucharest and Ilfov county). The two providers, from/to which the numbers are ported, must offer services within the same geographic area and have blocks of geographic numbers, allotted by LURN, in the respective geographic area;
- **mobile telephone numbers (non-geographic)** – any mobile telephony subscriber will have the possibility to keep his/her mobile telephone number, when he/she decides to give up their subscription to the current mobile telephony provider and to subscribe to another mobile telephony provider, irrespective of the technology used (2G, 3G, CDMA etc.), of the payment method (post-paid or prepaid) or the type of services provided (voice, fax, data transmission);
- **non-geographic numbers, other than mobile telephone numbers** – this category includes telephone numbers for free access services (0800-type), universal access numbers (0801-type) and universal personal numbers (0802-type) and Premium Rate services (0900-, 0903- and 0906-type); the users of such services will have the possibility to keep their numbers when they request transfer from one provider of publicly available services to another, provided the initial destination of the number is maintained.

The implementation of number portability removes an important barrier to competition development in the electronic communications sector. The subscribers' possibility to keep their telephone number when shifting to another service provider is an incentive for considering alternative offers and ensures a greater freedom of choice, as the necessity of informing one's friends and partners on changing the telephone number disappears.

The additional competitive pressure created by the availability of portability is expected to be a catalyst for the providers' diligence to devise more convincing loyalty programmes for their current users and to offer more attractive services for potential new users.

Hence, the success of number portability will be assessed based on the amount of the telephone numbers ported from the initial networks, as well as on the operators' efforts to keep the current customers and their numbers.

In the long run, number portability could drive to dwindling differences between the tariffs for on-net calls those for off-net calls.

In view of accurately informing the end-users on the porting process and on the tariffs charged for calling a ported number, the telephone companies have the obligation to provide detailed, clear and updated information by means of:

- the Customer Relations service;
- publishing such information on the company's website;
- sending written notices, upon request, free of charge;
- posting, sending and making publicly available – at the company's commercial offices – the porting request, as well as its entry and validation procedure.

Furthermore, the providers must inform their users that call ported numbers, on a call-by-call basis, by releasing a distinct tone or propping a voice message.

Moreover, a web application will be made publicly available by the central database operator, which must:

- publish the numbering blocks containing portable numbers;
- provide a search engine which the end-users may interrogate to find out whether a number has been ported and, if so, the provider of publicly available telephone services who offers services by means of the respective number.

A number may be ported only upon the subscriber's request, when the latter decides to switch from a provider of publicly available telephone services (donor provider) to another such provider (acceptor provider).

The acceptor provider is held responsible for carrying out the porting process, as it is the one to initiate this process, upon receiving a porting request from an end-user. The porting process cannot exceed, under regular circumstances, a maximum term of 10 working days.

The porting process, including the information exchange between the providers in respect of the ported numbers, is to be managed by means of the central database (BDC).

According to the provisions of Law no.304/2003 on the universal service, the porting-related amounts due by subscribers must be affordable, ANRCTI being entitled to check compliance with this condition. Only the acceptor provider (to which the subscriber shifts) may charge such amounts. The donor provider (the provider from which the subscriber shifts) cannot bill the subscribers for the activities required in view of porting a number to the acceptor provider. In the European practice, part of the acceptor providers decided not to charge the subscribers for the porting service.

ANRCTI identified 4 types of costs associated to the implementation of number portability:

- Costs occasioned by the implementation of number portability on a provider's network
- Porting costs per number
- Costs of routing the call to a ported number

These costs will be born by operators. The donor provider will recover the costs incurred while porting a number from the acceptor provider. The tariffs charged on the acceptor provider by the donor provider will not exceed: 13 Euros for each ported number, as far as geographic and non-geographic numbers - other than the ones allotted for mobile telephone services - are concerned, and 11 Euros for non-geographic numbers assigned for mobile telephone services. These tariffs do not include VAT.

- Costs of implementing, managing, operating and maintaining the central database

So far, most European states have implemented the portability of geographic and non-geographic numbers.

According to the *12th EC Report on the Implementation of the Telecommunications Regulatory Package*, by October 2006, in the 24 Member States that provided data for this survey (except Great Britain), 31.4 million mobile ported numbers had been registered. The most significant growth in mobile ports is registered in Finland (more than 64%) and Denmark (32%), as well as in Spain and Sweden (20%). Belgium, Ireland, Italy and Netherlands register

a porting rate varying between 10% and 16%, whereas, in certain countries, this rate is very low: Luxembourg – 3.4%, Germany, Greece, France, Portugal and Austria – less than 1.9%.

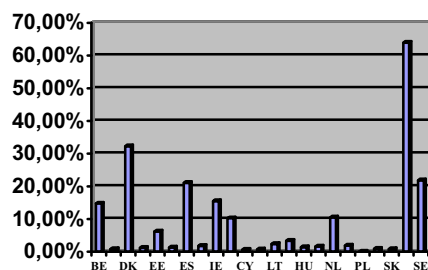


Figure 1 - % ported mobile numbers from the total amount of the mobile telephony subscribers (October 2006)

Source: ANRCTI

4. Telecommunications Price Elasticity

The measurement and evaluation of changes in quantity demanded in relation to changes in price is called price elasticity. Companies must estimate how responsive consumers will be with respect to variations in pricing within the same product line. Elasticity is calculated by dividing the percentage change in quantity taken by the percentage change in price. In defining elasticity at various pricing points, a firm is able to compute gross revenues in relation to the number of units sold.

The calculation of elasticity will yield one of three results in each application: a value greater than 1, equal to 1, or less than 1. A value less than 1 defines inelasticity, meaning demand is not responsive to changes in price. A value greater than 1 specifies elasticity, suggesting that demand fluctuates with changes in price. Unitary elasticity occurs when the computation equals 1. If price elasticity of demand yields a value greater than 1, then a rise in price will generate less revenue. If the demand for a product is said to be inelastic, then an increase in price will produce more revenue. In situations where demand is unit elastic, the percentage change in quantity equals the percentage change in price.

There is a spectrum of demand for communications products that is variously elastic or inelastic. Telephone service for most people is generally inelastic, since it is regarded as a staple of modern living. Cable television service has apparently assumed the same role for many Americans in recent years. For workers involved in occupations where mobility is crucial, cellular telephones are regarded as a necessity. On the other hand, interactive television service remains comparatively exotic, and thus pricing is highly elastic. The inelasticity associated with many consumer staples reflects potential opportunities for firms to increase prices. Yet, under conditions of emerging competition, the capacity of firms to raise prices while controlling market share is limited. Inelasticity of demand for certain services inspired proponents of regulatory reform, who sought to prevent higher prices associated with oligopolistic market structures.

5. Defining Profit Maximization in Telecommunications

A telecommunications firm optimizes profit by increasing sales and minimizing cost. The difference between revenue and costs yields profit. In competitive market structures, a company would compute its marginal revenue and marginal costs and identify that level of output at which the two are equal. Marginal revenue is defined as the change in total revenue precipitated by a one-unit change in output level. Marginal cost reflects the increase or decrease in total costs a firm bears as a result of producing an additional increment of output. Prices are defined through the intersection of supply and demand, and the calculation of marginal costs and revenues specifies output. The extent to which a firm sells its outputs maximizes its revenue; the difference between revenue and costs thus determines profit.

The measurement of profit is vital to outlining a firm's strategic vision. The computation of profit, the demonstration of profitability are essential in conveying a firm's credibility to stockholders.

The computation of profit margin provides communications firms with a valuable tool in justifying their strategies to potential investors. Profit margin is the ratio of income to sales and is measured in two formats. Gross profit margin is computed by the percentage return that a company earns over the cost of goods or services sold. It is measured by dividing gross profit (sales minus costs of goods sold) by total sales. The gross profit a firm earns essentially covers operating expenses, including administrative expenses, taxes, and interest. Net profit margin, or return on sales, reflects the percentage of net income generated by each sales dollar. The standard computation of net profit margin results from dividing the income statement figure for net income after tax by total sales [2].

These calculations provide investors and competitors with important clues about the value-added desirability of communications products. In an environment of rising competition, the firm which produces a product that provides value-added attributes is likely to generate higher profit margins. In this sense, the determination of profit margins is significantly more important than gross profits.

6. The Telecommunications Substitution Effect

The extent to which consumers choose from among alternatives so as to satisfy their needs is defined as the "substitution effect" [4]. The forecasting of dynamic substitution will grow in importance in the telecommunications industry in the years ahead. Multiple factors explain the dynamics of substitution, but most economists and marketers agree that the differentiation of elastic from inelastic preferences for segmented markets reveal much about the future of communications needs [5].

Most observers will not disagree that food and milk are, in principle, inelastic staples. It is reasonable to conclude that video cameras and vacations represent preferences best characterized as elastic, with consequently wider price fluctuations. Consumers do not alter their patterns of consumption of staples, regardless of changes in price. Price elasticity is related to variation in income for luxury items. In the communications palate, the issue of substitution becomes a complicated one amid rapid technological change. The need of individuals and organizations to communicate rapidly has grown exponentially in recent years, but consumers will always search out lower cost alternatives—in effect, lower-cost substitutes. How does one measure and project the course of substitution over time? Ephemeral factors make such forecasting highly complex, but in differentiating each communication product relative to another, we may deduce the determinants of market demand.

In contrasting "luxurious" versus "staple" communication products, there will exist substantial variation among income, occupational, and other stratified groups. Where market demand is elastic, consumers will have multiple alternatives available; this might eventually mean employing Internet telephony as a substitute for local or long-distance telephone service. In markets characterized by a wide range of substitutes, the price consumers pay tends to represent a higher percentage of income. Longer time horizons precipitate a propensity toward elasticity; new alternatives are introduced to market, and consumers are able to select the most desirable alternative. Consumers alter their tastes and preferences, as well, in response to emerging substitutes.

The economics of "substitution" can be expressed through cross-price elasticity, or the computation of responsiveness consumers exhibit toward changes in price for a particular product relative to changes in price for available substitutes. For purposes of this measurement, available substitutes may be either identical or complementary in nature. Technological innovation threatens veteran product lines. Forecasting cross-price elasticities will assume a heightened priority for telecommunications firms because it elicits important information about the strategic efficacy of existing products in terms of their pricing. There is expansive empirical evidence which suggests that consumers explore the desirability of substitutes in a way that their predecessors did not. The modern communications provider must maintain close scrutiny—that is, it must engage in competitive (or surveillance) analysis—with respect to those firms instigating such changes [7].

7. Conclusion

Consumers may opt for a simple bundle of telephony and television service, or shift to the Internet for delivery of all services, or select a single provider that can supply a menu of options unique to that palate. The interaction of the determinants of supply, as outlined, guarantee no outcome, and provide no assurance as to the extent to which consumers will augment or simply substitute those preferences.

Is it likely that the future need for information storage, interpretation, and transmission is so ravenous that today's emerging services will become tomorrow's staples? A general response to these questions cannot be formulated, but the measurement of reallocated communications budgets can be projected through the application of indifference curves. Under these conditions, a firm would design indifference curves for each of its consumer or business-to-business markets.

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