

Chapter 9

TWO-PART TARIFF PRICING IN A DYNAMIC ENVIRONMENT

Gila E. Fruchter

Bar-Ilan University, Israel

fruchtg@mail.biu.ac.il

Abstract A two-part tariff is a non-linear pricing technique in which the price of a product or service is composed of two parts: an entrance fee and a charge per unit of consumption. Compared to linear pricing, this methodology leads to higher profits by allowing a firm more freedom in extracting the consumer surplus. It is widely used in telecommunication services.

This chapter documents recent developments on non-linear pricing in a dynamic and competitive environment. The developments can also be viewed as extensions of the linear dynamic pricing literature by allowing a two-part tariff scheme.

1. Introduction

Two-part tariffs are widely practiced in the Internet and telecommunication networks. With the growth of these industries, the pricing of services that take into account the growth of subscribers, as well as the demand for services by members of the service, poses a challenge to managers. There are several key issues associated with this. The first has to do with the fact that services typically offer a two-part price that consists of a membership fee and a usage price. The membership fee is a fee to join the network while the usage price is variable. This raises an immediate question of what should be the optimal two-part tariff for a firm serving a growing network of subscribers. Appealing to Optimal Control, Fruchter and Rao (2001) offer an answer to this question. The paper deals with a situation, which is similar to that of a durable product in the sense that a customer becomes a member of the network

only once, just as a customer buys only one unit of a durable product. In other words, the customer adopts the service. However, the situation described in the paper is also similar to a non-durable product in the sense that the customer pays an ongoing fee and a usage price that could be thought of as a repeat purchase price. Durable goods pricing has been analyzed by Dolan and Jeuland (1981) and Kalish (1983) for a monopolist, and by Bass and Rao (1985) and Dockner and Jorgensen (1988) under competition. However, past work has not explicitly considered a two-part pricing policy that changes over time with the growth of a network. In a recent paper on the pricing of cellular phones, Jain, Muller and Vilcassim (1999) examined the question of how the pricing of a complementary product, such as the handset, influences the pricing of the metered service, phone calls. They conclude that under certain cost conditions and competition in a two-period world, the price of the telephones decreases over time while that of the calls is non-decreasing. In developing the model, they assume that the average demand per customer, in minutes of phone calls, decreases over time as the network size grows. The assumption is consistent with data and has also been observed by Manova et al. (1998). Fruchter and Rao (2001) make a similar assumption. However, instead of focusing on complementary products, they focus on network membership and usage by network members.

Another issue I want to address is that in reality the consumers, while belonging to the network of one company, communicate with some who belong to the same network and others, who belong to competing networks. In the latter case, consumers are using both networks. From the point of view of one of the networks, it incurs a greater cost to connect “its” customer with a user of the competing network than what it would incur if both users were on the same network. We can expect that this difference in the marginal cost of serving a customer (depending on whether they connect to a user on one’s own network or a rival network) would have pricing implications. Laffont, Rey and Tirole (1998b) examined pricing in such situations and showed that this could lead to network-based price discrimination. Network-based price discrimination in their model has a user connecting to another customer on the same network paying a lower price than she would if she were connecting to a customer of a rival network. There are several examples of network-based pricing strategies. One is MCI’s Friends-and-Family Program that offers better discounts to calls by MCI’s customers made to other MCI customers than to calls across other networks. Similarly, Orange—a wireless service operator in Hong Kong—provides a basic service plan that charges HK\$1 for each minute of calls between Orange and other networks but only HK\$0.2 for each minute of calls within its own net-