

Chapter XLV

Diffusion Forecasting and Price Evolution of Broadband Telecommunication Services in Europe

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ABSTRACT

This chapter is concerned with the methodologies for the study of the diffusion patterns and demand estimation, as well the pricing schemas for broadband telecommunication services in Europe. Along with the introduction of diffusion models and price indexes which can represent broadband convergence and diversity, a description of the theoretical models and methodologies are given and application of these models in European telecommunication market is performed. Evidence from Europe outlines telecom market behavior and contributes to better understanding of broadband diffusion worldwide. To this direction, a price index is constructed regarding the ADSL technology.

INTRODUCTION

The worldwide expansion of the Internet and other network-based services forced the participant agents of the area of telecommunications to reconsider their strategic plans, in order to be able to meet the continuously increasing demand for required bandwidth as well as the continuously increasing numbers of users.

On the other hand, as network infrastructures are being constructed to support the increasing demand, many multimedia applications will be realized. Nowadays, customers' desires consist of high-speed Internet access, as much as interactive, bandwidth-consuming multimedia applications.

Following these considerations, the area of telecommunications merits a continuous improvement and development towards the direction of the quantity and quality of the offered services. Contemporary technology allows extended network capabilities and the development of new products, which in turn increase the quality of services offered to customers. However, convergence of telecommunication services often disorients customers and regulators; the former concerning their potential selections among the offered products and the latter regarding market monitoring and regulation. The price at which a service or a product is offered is a substantially influential factor, as it is related to its future diffusion among the potential adopters. In addition, from an economics point of view, telecommunication services obviously reveal the characteristics which strongly relate them with the network externalities effects, the phenomenon that a good becomes more valuable to each user the more other consumers use the same or a compatible product.

Summarizing the above considerations, regarding demand evolution and pricing shapes of products and the related influential parameters, this chapter is devoted to the provision of answers/outlines concerning the following questions:

- How can we model the diffusion of broadband networks and services?
- How can we model the impact of countries/regions with higher broadband penetration to those with lower penetration levels?
- How can estimate prices for broadband services and products that enter the market for the first time or have been modified/converged?
- Can we determine a unified price index for these products in a specific period and what do these prices tend to become over time?

The rest of the chapter is organized as follows: a short overview of diffusion theory and diffusion models followed by a study of the evaluation of diffusion models over selected cases. The factors affecting broadband access development in whole Europe are then presented. An introduction of telecommunication services and ADSL high-speed Internet connections is given in the next section and then theoretical background to econometric methods and empirical models are given. The final section proceeds with a concluding discussion and suggestions for future development in the telecommunications area.

BACKGROUND

Diffusion Theory and Diffusion Models

As it is evident that innovations in the area of telecommunications and high technology, in general, are facing a significant and quite promising expansion, corresponding research activities focus on the study of the diffusion process dynamics. Their main targets aim towards the direction of developing and applying methods to provide comprehensive analyses concerning the demand for telecommunications products, services, and technology (Fildes & Kumar, 2002). The main areas of research interest include:

- The study and development of demand models
- The development of mathematical methods for the estimation of the models' parameters

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