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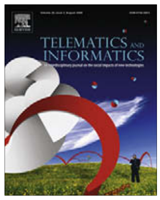

Policy implications of market segmentation as a determinant of fixed-mobile service substitution: What it means for carriers and policy makers

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The determination whether mobile and fixed telecommunications services operate in the same market not only affects business decision of service providers, but also has wide implications on public policy decisions pertaining to the means by which they should be regulated in the United States. This study conducts a two-stage cluster analysis implementing the American Customer Satisfaction Model on two datasets of 3251 and 5060 data points pertaining to mobile and fixed-line phone services, respectively, collected by the National Quality Research Center at the University of Michigan in order to determine whether the way consumers perceive these services can indicate as to their levels of substitutability. It concludes that different types of customers with different needs consume these products and offers policy makers some insight on how to further the penetration of mobile services.

1. Introduction

In fewer than 25 years of existence as a commercial telecommunications offering, wireless mobile services have changed dramatically. Originally perceived an expensive offering and a status symbol (Katz and Sugiyama 2005; Lemish and Cohen, 2005; Ozcan and Kocak, 2003; Turel et al., 2007), the mobile phone has become a common technology within reach of many. While at first it served mostly as a voice communications service, it has developed into a hub of multimedia products. Under these changing circumstances consumers have the opportunity to make choices among competing services that can be provided by either wireless or fixed means. Indeed, a survey conducted in 2007 by the National Center for Health Statistics (NCHS) in the United States concluded that during the second half of 2007 15.8% of American households had only wireless service and that in addition, 13.1% of American homes received all or almost of their calls on wireless telephones despite having a landline telephone in the home.[2]

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[2] http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200805.htm.

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The percentage of wireless only homes, according to the same study, grew threefold since 2004. Demographically, wireless only households tended to be occupied by younger, lower income adults, with smaller families, with a higher likelihood of being either Hispanic or black who rented rather than owned homes. The NCHS study also identifies a striking change in the utilization of mobile services, as early studies of fixed-mobile substitution in the United States (e.g. Rodini et al., 2003) indicated that such substitution was ''moderate'' and visible mostly with regard to a second telephone line. Indeed, this dramatic change in the basic definition of access to telephone has led the FCC to include mobile phones as a measure for ''telephone service'' (FCC, 2009, p. 2).

One phenomenon that stands out in this context is the dramatic change in the position of the United States among other nations with regards to the adoption rates of mobile services. Traditionally a trailblazer and world leader in connectivity and new technology adoption, in recent years the United States has become a follower of both Western European and East Asian powerhouses. The International Telecommunication Union (ITU) reports that in 2005, one-third of the world's population was subscribed to mobile services, and that over a half of the world's population was subscribed to fixed-line services. The Compound Annual Growth Rate (CAGR) from 2000 to 2005 was 5.2% for fixed phone lines and 24% for mobile subscribers (ITU, 2007). According to the same data, however, during the same period the CAGR for mobile subscribers in the United States was only 13%. While in 2007 there were approximately 84 mobile subscribers per 100 inhabitants in the United States, there were more than 90 in South Korea, 105 in the Netherlands, 113 in Sweden, 115 in Finland, and more than 100 in 31 countries in Europe alone.

A similar gap exists between the United States and European countries with regard to the wireless-only phenomenon. Across the European Union, 24% of households have only mobile access, however the number differs significantly between the wealthier EU 15 (20%) and the 12 New Member States (39%). The variation among the different European countries cannot provide a single explanation for consumers' preferences as, for example, in tech-savvy mobile-saturated Finland 61% of homes are wireless-only while in neighboring Sweden, where mobile penetration is similar (Sutherland, 2008), wireless only homes constitute only 3% of total households (EU, 2008).

The adoption rates and patterns of mobile services have attracted much scholarly attention in recent years (see Ahn and Lee (1999), with regards to a variety of 64 countries; Gruber and Verboven (2001), for the European Union; Gruber (2001), regarding Eastern and Central Europe; Madden and Coble-Neal (2004), regarding a variety of 56 countries; and Jang et al. (2005), regarding 29 OECD countries and Taiwan). One important attribute of mobile telephony is that the basic service it has been providing since its market introduction may potentially cannibalize a service previously offered by regular wireline companies. In addition to capturing the voice communications segment, mobile telephony also competes for sophisticated data and Internet services that are often superior to those offered by landlines. As a result, the question arises whether these two services can be seen as substitutes for each other.

The telecommunications landscape in the United States is unique in many ways and is a result of a combination of unique characteristics and circumstances ranging from geography through political philosophy to technological availability. There could be a few competing explanations for the laggardness of the United States market regarding new technologies: One could be high penetration levels and availability of wireline services, which slow the introduction of wireless substitutes; another could be high levels of consumer satisfaction with traditional fixed services; a third could be the subjective perception of mobile services as supported by marketing efforts, which place them in a separate ''luxury'' category, thus not intuitively perceived as a substitute or complementary service for wireline; and yet a fourth explanation could be that public policy, in particular with regard to interconnection and tariffs inhibits growth. This search, though, for a policy implication and subsequent recommendations would be limited by a comparison to markets that have demonstrated high wireline connectivity prior to the mobile revolution, as no doubt in developing countries in which wireline was unavailable, the growth of wireless services took place under incomparable conditions and there is no substitution effect.

In this study, we attempt to identify the substitutability between mobile and wireline services in the characteristics of fixed and mobile telecommunications consumers in the United States, and what their perceptions of the respective services to which they subscribe say about them and their identity as consumers. By identifying the different levels of loyalty consumers develop towards these services and the considerations that affect these decisions, the study attempts to determine whether mobile and fixed services have been determined as substitutes by United States consumers. In order to reach this conclusion, this study adopted the American Consumer Satisfaction Model and applied it to two datasets of 3251 and 5060 data points pertaining to mobile and fixed-line phone services, respectively that were collected in 2004–2006 by the National Quality Research Center at the University of Michigan. A Two-Step clustering technique was used in order to test similarities and associations between segments in representative samples of wireless and wireline users, without making any assumption on the final number of clusters. Making no assumption on the final number of clusters was possible for the following reasons. First, sample sizes were very large in both segments. Second, the average number of services in the industry was known. Third, we were interested in exploring differences in behavior between the samples. The market segments created then inform our understanding of the markets for the two services – fixed and mobile telephony. The existence of self-described different consumer groups implies whether or not the two markets are similar in the eyes of consumers, and thus whether or not through the subjective perceptions of consumers the two products serve as substitutes.

The study begins by discussing the characteristics of the mobile telephony market in the United States, by showing how it compares to some other relevant markets and by explaining the theoretical foundations for using consumer loyalty as a means for predicting substitution in telephony markets. It then describes data analysis, focusing on the differences between