Demand for Internet Services in Austria

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Extended Abstract

Market definition on wholesale broadband access markets has attracted some attention since Oftel (now Ofcom) and Comreg (the NRAs of the UK and Ireland) have notified their decisions to the European Commission in 2003 and 2004.[4] One of the main questions was whether access via cable networks (CATV-networks) forms part of the same market as access via copper networks (digital subscriber line - DSL). As Ofcom, Comreg and later a number of other NRAs (although not all of them) argued, there is an (indirect) constraint from cable on DSL which goes via the retail level. The elasticity of retail demand is therefore crucial not only for the definition of retail markets but also for the definition of the wholesale broadband access market.

Only few papers have analysed the extent of retail demand elasticities for broadband internet services so far. Rappoport et al. (2002) use a nested logit discrete choice model to describe the demand for internet access of residential customers in the US. They conclude that demand for DSL is elastic (own price elasticity of -1.462) and that therefore DSL and cable belong to the same retail market. Crandall et al. (2003) confirm these results (DSL own price elasticity of -1.184). Ida/Kuroda (2006) estimate a similar model for Japan including fibre (FTTH) – a rapidly growing access technology in Japan – in their choice set. They conclude

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[4] See Oftel (2003) and Comreg (2004). Decision on market definition and market analysis have to be notified to the European Commission which has a veto power.

that demand for DSL (at this time the main access technology with a share of 75%) is inelastic (own price elasticity of -0.846) but demand for cable and FTTH is elastic (own price elasticities of -3.150 and -2.500). They also find that the upper and lower end of the DSL market (very high and low bandwidths) are highly elastic as they directly compete with FTTH and cable on the high end and dial-up and ISDN (narrowband) on the low end.

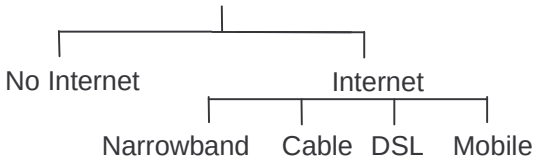
This paper analyses residential demand for internet access in Austria with a focus on broadband internet connections. Like the studies quoted above, we use a nested logit discrete choice model, however, there are several new features: (i) To our knowledge, this is the first analysis for an European country. Austria has a cable network coverage of about 50% and therefore is a good candidate to analyse the elasticity of demand for DSL where cable is available and where it is not. (ii) We include mobile broadband via UMTS or HSDPA in our analysis. These broadband services, offered by mobile operators, are available for 2-3 years and experienced high growth rates in 2006 with the introduction of HSDPA, which allows download speeds of (theoretically) up to 7.2 Mbit/s. The total number of residential users is still limited but there appears to be potential for becoming a subsitute to fixed broadband in the future. (iii) While the other studies use a two-level nested logit model, we use a three-level model which performs better than the two-level specification. (iv) We are able to derive conclusions for market definition by comparing estimated elasticities to critical elasticities.

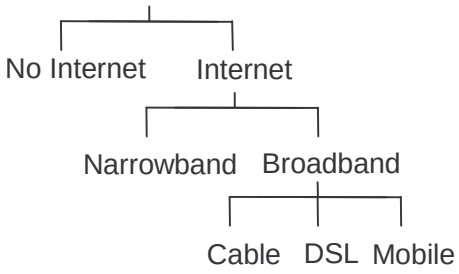
The data we use is from a survey commissioned by RTR (the Austrian National Regulatory Authority) which was conducted in November 2006. 4,029 households were asked about the type and characteristics of the internet connection they are using as well as the monthly expenses. Individual specific data such as age, education and household size was also collected. After eliminating observations with missing and implausible values we are left with almost 3,000 observations. For the estimation, these observations are divided into two sub-samples: One for the area where all four internet access technologies (DSL, cable, mobile,

and narrowband) are available and one for the area where only DSL and narrowband are available. With this data we estimate various nested logit models

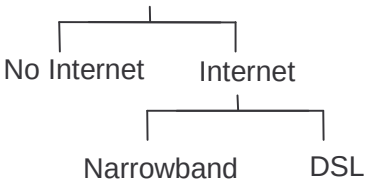
The specified decision trees that showed the best results are the following:

Decision tree for area where all four alternatives are available





Decision tree for area where only DSL and narrowband are available



Our preliminary results indicate that demand for broadband internet access services is rather elastic ($|\varepsilon|>2$ for DSL, cable and mobile) in those areas where several types of broadband access are available. This would indicate that different broadband access technologies constrain each other and that DSL and cable probably form a single market at the retail as well as at the wholesale level. The elasticity of narrowband is lower (-1.19) which may indicate that those users which are still using narrowband do not perceive broadband as an equally good substitute. In areas where only DSL and narrowband are available, the DSL

elasticity is much lower (-1.15) which suggests that the constraint from narrowband on DSL is limited.

However, the estimation results are not yet consistent with utility maximization, which is indicated by inclusive value parameters outside the unit interval. We are currently working on a specification according to Heiss (2002) to solve this problem. Once the problem is solved we will also perform a number of robustness checks and further model specification tests

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