

Switching costs in telecommunications: conclusions from a Hungarian survey¹

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1 Introduction

On the telecommunication markets, even if competition intensifies, it is often bounded by switching costs, which customers experience. Customers may face monetary switching costs: the most typical example is loyalty commitments. Additionally, transaction costs, such as managing the switching itself, differences in auxiliary services, access to help desk may make switching costly. Increasing switching costs is a strategic asset for operators with dominant position, thus information on them is necessary when analyzing dominance.

In this study we first overview theoretical models of switching costs, with special regard to telecommunication markets and regulation. Second, we review literature on methods of estimating switching costs. Next, we present survey results on the extent and elements of switching costs in Hungarian telecommunication services. Results include some comparison with U.K. data, and results on effect of multi-play offers. Additionally, we compare results of two methods for estimating switching costs and draw methodological conclusions.

1.1 Elements of switching costs

Switching costs can be divided in several sub-categories.

Transaction costs include the costs, which are related to canceling and entering to the new contract.² They arise about every service, when customers contract for subscription.

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² In a narrow sense. In broader sense, each of the following types can be regarded as transaction costs, except learning costs. (Klemperer and Farrell, 2006)

Compatibility costs arise, when after purchasing the original products, customers need to buy auxiliary products, such as toners for printers, etc. An example for these in telecommunication services is sim-locking.

Contract costs are typically monetary costs. These include penalties, which a customer have to pay if canceling the contract before it expires, but also the lost of discounts, which loyal customers may earn.

Learning costs are relevant about more complex products and services, when customers need to learn the use of the new product/service.

Risk and uncertainty arises about every service, which are not fully standardized, as customers are not certain, whether the new service or product fulfills their expectations.

Psychological costs may emerge, when the customer emotionally sticks to a given product, service or service provider.

Search costs almost always emerge about switching; however, some authors (Wilson, 2006) do not regard them as switching costs. While the above switching costs are usually additives, an increase in search costs may decrease other costs, such as uncertainty. Furthermore, search costs are not necessarily connected to switching, as they also emerge, when the customer searches for options but finally decides to remain with the original product or service.

The empirical study of Burnham et al (2003) identified three categories of switching costs, in which the elements highly correlate. These are:

- Procedural costs, which include managing transactions, learning costs, comparing alternatives and uncertainty.
- Financial costs, which incorporate penalties for canceling a contract and losing loyalty discounts
- Relational costs, which comprise the psychological and emotional costs of breaking the existing relations

Another possible division about switching costs is whether they are induced by the operator (endogenous), or they are the consequence of the switching itself (exogenous). This distinction is important when analyzing, whether they restrict competition.

1.2 Competition with switching costs

At first glance, switching costs make it possible for operators to restrict switching of their customers, thus they may become able to raise prices above the competition level by the extent of switching cost. However, scholars have shown that the case is usually not so simple, and switching costs often do not restrict competition. (NERA, 2003) From a dynamic point of view, on markets with switching costs operators may increase profits by extending their customer base. This may affect their pricing strategy: in the first period of the product life cycle, the operators' major strategic goal is to attract customers even by under-cost pricing, and they compensate their losses by increasing prices in the second period (bargain and rip-off strategy). As a result of this pricing strategy there is no supernormal profit taking into account the whole product life cycle.

Switching costs are especially relevant in telecommunication markets, having incumbent operators, which typically have an existing customer base despite to new entrant alternative operators. Market outcomes in this setting are different, depending on the possibility of price discrimination between existing and new customers (Klemperer and Farrell, 2006). If price discrimination is not possible, for incumbents with significant customer base it may be profitable to concentrate on existing customers, and keep the prices high (rip-off). In this setting smaller new entrants can aim new customers, who they can easily attract by offering lower prices. For such markets, entry can even be too easy. New entrants with higher costs than the incumbents can enter to the market. On the other hand, when price discrimination is possible, incumbents do not face the dilemma, whether to concentrate on old or new customers. They can offer higher prices for the old ones and reduced prices to new ones. This worsens the position of new entrants, who must offer high discounts.

Furthermore, it is a critical question, at which stage of the product life-cycle was the market liberalized. If it happened relatively early, prospect of the competition is favorable, even in the case of price discrimination. Significant base of potential new customers may be attractive for the new entrants, even if they must compete for them heavily with incumbents. Additionally, relatively low proportion of old customers provides only limited resources (profit) for the incumbents, which they can use in the competition for new customers. A more troublesome case is when liberalization has happened later, like in case of fixed voice telephony. In this case incumbents did not face competition in the first period of the product life cycle, thus ex-ante competition did not happen. Moreover, incumbents have a large, locked-in customer-base, which can be used to realize positive profit. If price discrimination

is possible, they can use this profit in the competition for new customers to offer below-cost pricing.

1.3 Regulatory consequences

Based on the previous analysis, when switching costs exist, regulators should take a dynamic approach taking into account the whole product life cycle. Otherwise serious regulatory failure can emerge. On competitive (from the beginning of the product life-cycle) markets using static approach, over-cost pricing in the second period may indicate need for regulatory action. However, introducing price regulation in this case may be harmful for the industry, and result in net losses overall on the two period, as operators competed intensively with under-cost pricing in the first one. In this case, a more liberal approach is favorable (NERA, 2003)

On the other hand, as, it was presented, lack of regulation is not beneficial, when liberalization has happened later on the product life cycle. In this case, as a consequence of switching costs, incumbents' foreclosure strategy does not even necessarily result in under-cost pricing. Thus, this case demands a tighter approach on regulation of foreclosure, than the general one.

An alternative instrument of regulators is to decrease switching costs themselves. In some cases decreasing switching costs may enhance competition, even if they are exogenous to the operators' activity. Different practices of this type can be found across European telecommunication regulation:

- Number portability is a specific instrument in telecommunication to eliminate switching cost originating from changing telephone number
- Regulating seamless transition on wholesale markets (LLU, bitstream access) to eliminate unserved transition period, when the customer chooses to switch to an alternative operator using these wholesale inputs
- Regulating / standardizing service contracts may decrease transaction costs connected to them
- A price-comparison tool may make it easier to compare complex offers of telecommunication providers

2 Methods

2.1 Practices for estimating switching costs

There is no single standard method for estimating switching costs in economic research. Examples of previous estimations use different methods (NERA 2003). The NERA study differentiates two ways of measurements: direct and indirect ones. Direct methods analyze actual behavior of consumers, while indirect ones use aggregate industry data. Indirect methods can be based either on estimating cross-price elasticity or on prices and price margins.

In empirical literature, switching costs are often measured using discrete choice models, which correspond to direct measurements (Chen and Hitt, 2002, Forman and Chen, 2003, Grzybowski, 2007). This method uses regression models of choosing a service provider, including price of the service, and the switching variable (whether the consumer used the same service in the previous period) as independent variables. Switching costs can be easily derived from the model: by dividing the coefficient of the switching variable by the price variable one can see how much money can be devoted to the fact that a customer does not change supplier. Beside the fact that this analysis requires panel data, prices are usually very difficult to determine, especially in telecommunication as operators use complex pricing. This may be the reason, why none of the above attempts have succeeded to estimate switching costs by analyzing the effect of the price variable.

A second way of estimating switching cost is based on Shy's (2002) method. The method was used by Krafft és Salies (2006), and Salies (2006) for estimating switching costs on the British electricity and the French broadband market. Szolnoki and Tóth (2008) used the model for forecasting the effect of liberalization on electricity prices in Hungary. The method assumes that operators set prices on equilibrium level, where assuming that their competitors undercut their prices by the extent of switching costs, it results in negative profits for the competitors. On the bases of the model switching costs are easy to determine from prices and market shares. Although it is easy to apply, it is based on the strong assumption that operators are aware of the extent of switching costs, and they set their prices based on them.

A third way of estimating switching cost is based on direct, hypothetical questions. This method is not based on revealed preferences, but on stated preferences. As such, its validity depends on the extent; that respondents can forecast their future behavior. Therefore, for valid

measurements, it is critical to create real-like scenarios for the hypothetical decisions, which are close to ones, in which respondents have experience. Beside its drawbacks, the method's advantage is that effect of several factors can be analyzed in hypothetical situations, which would not be possible in revealed preference models.

Our estimation method is based on this third method. Additionally, in section 3.5 we compare our survey results with ones, which could be estimated by the Shy method.

2.2 Sample

The research is based on an online questionnaire (N=2500), carried out by NRC Market Research in September 2007. The sample represents internet users in Hungary. 47% of respondents were women, 53% men. 40% of them were ages 18 to 29, 26% were 30 to 39, 17% were 40 to 49, and 17% were 50 to 69 years old. 3% had elementary or less education, 16% had skilled worker degree, 48% finished secondary school, and 33% hold BA or MA.

Switching costs were estimated for three telecommunication services: fixed line telephone, mobile telephone, and internet service. 58% of respondents had fixed line telephone, 98% had mobile phone, and 86% had internet access at home. (The remainders had internet access only at work / school).

2.3 Measurements

When estimating switching costs, attempt was made to create real-like hypothetical situations. For avoiding problems of time discounting, a short time frame was included in the questions. Two questions were created for estimating switching costs. The first considers monthly savings, which corresponds to real decision situations better, and the second a single amount, which corresponds to economic theory better:

1. At what level of saving in your monthly bill would you switch operator in two weeks, if the new operator would even cover the penalty for breaking your loyalty commitment (if you have one). However, both selecting the new operator and managing the switching would be your task.

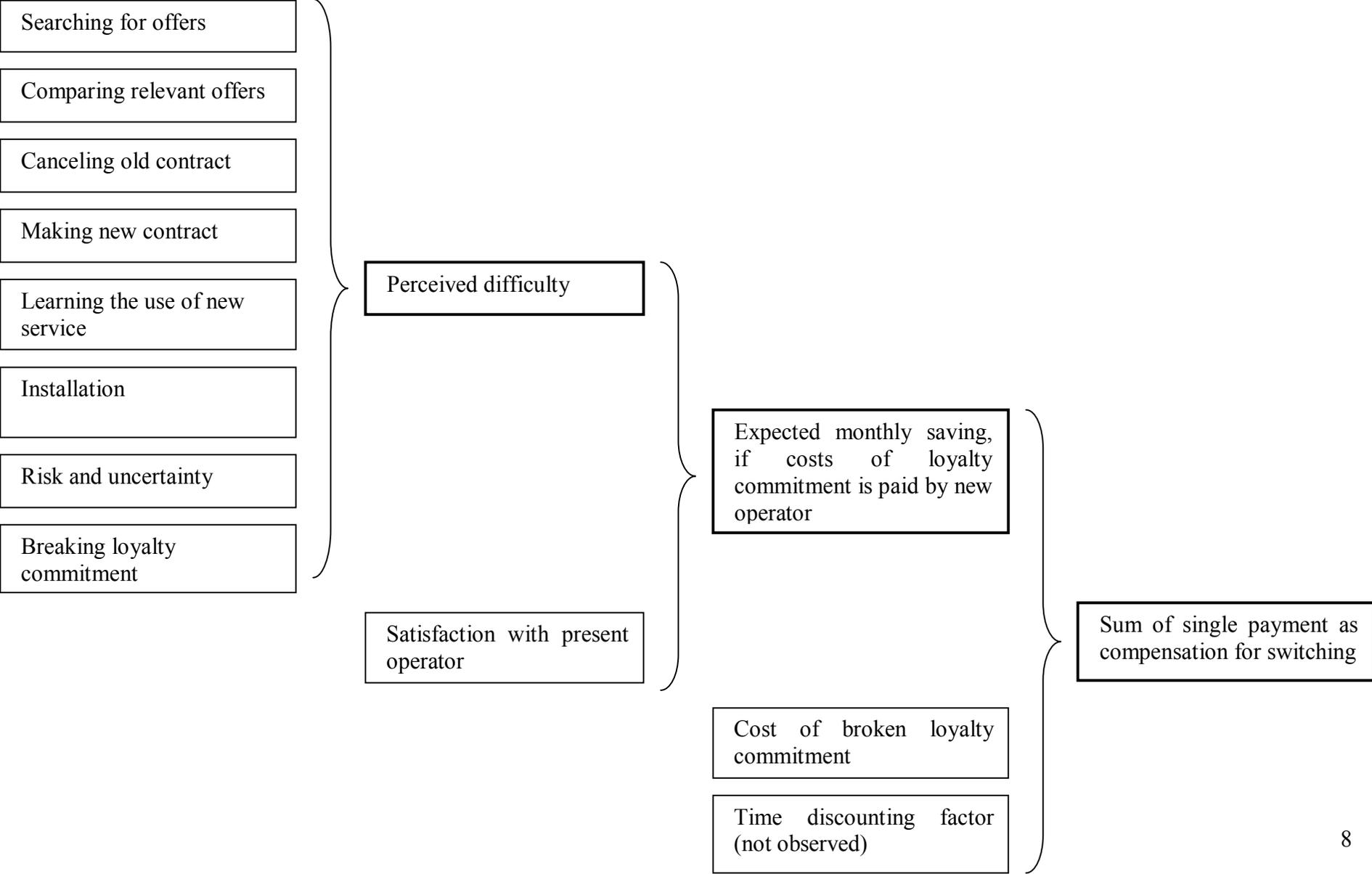
2. Assume, that you were compensated for switching operator. What sum of single compensation (which would be provided for you in cash now) would be necessary for you to switch operator in two weeks. (For this sum, selecting the new operator, managing the switching, and also financial costs would be your responsibility).

In addition, the research design made it possible to analyze elements of switching costs. The following factors were analyzed:

1. searching for offers
2. comparing relevant offers
3. canceling old contract
4. making new contract
5. learning the use of new service
6. installing new service (when relevant)
7. perceived risk or uncertainty
8. operator satisfaction
9. loyalty contract

Factors 1 to 6 were regarded as efforts/difficulties, and they were measured by five grade questions, like “When switching operator, what extent of effort would it demand from you, to search for offers of operators. 1: not at all 5: very much”. Additionally, it was asked, how much effort would it mean to switch operator at all (considering all of the factors). Perceived risk and uncertainty was also measured on a 1 to 5 scale: When changing operator, how risky is that you do not get the expected quality of services? Measuring operator satisfaction was done by using a 1 to 5 scale question too, while effect of loyalty contract was measured by the question, whether the customer actually have one. On the theoretical level, effects of these factors on the different measurements of switching costs are presented in figure Figure 1

Figure 1: Factors of switching costs

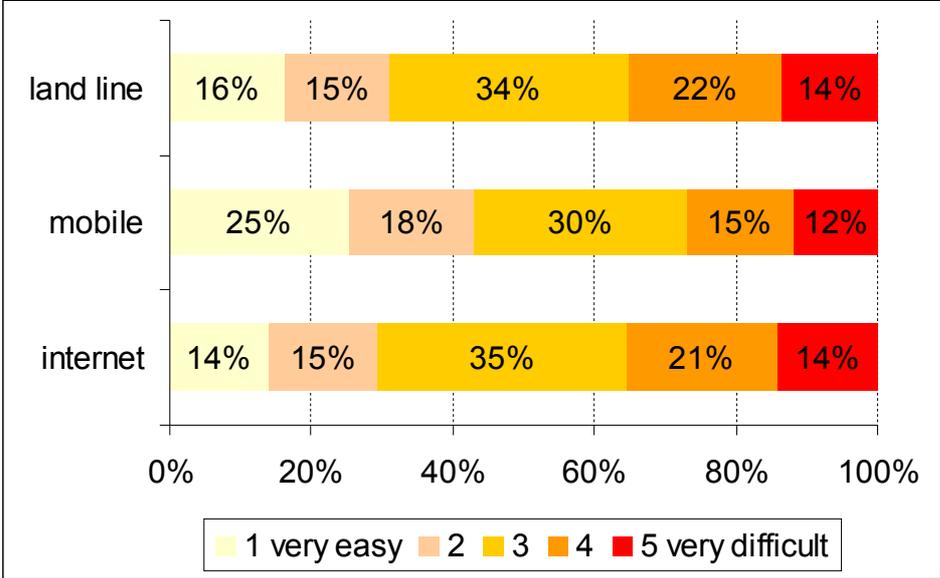


3 Results

3.1 Difficulty of switching and actual switching

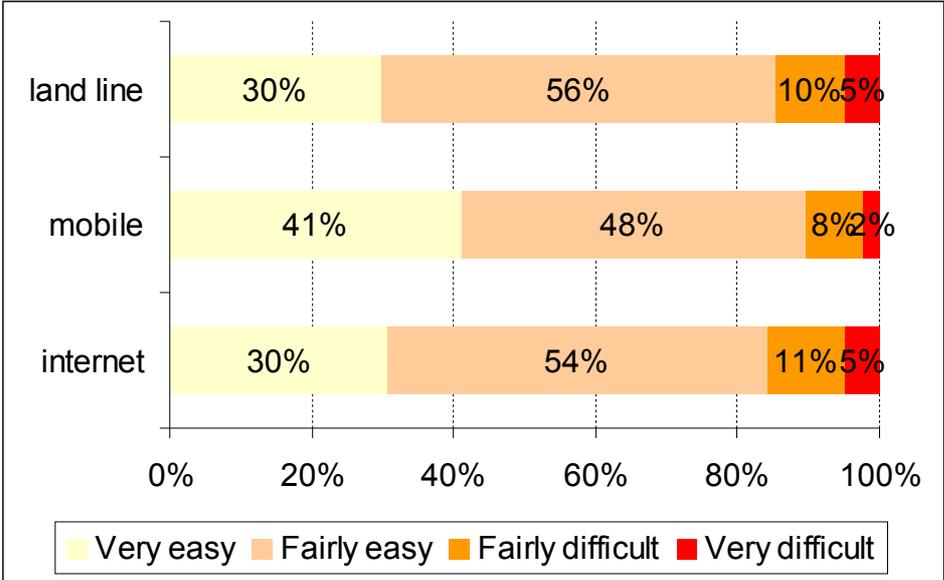
Perceived difficulty of switching was evaluated using a five grade scale in the case of the Hungarian customers. Frequency distribution shows that the level of difficulty is almost identical in case of the fixed line telephone and internet services, and switching mobile operator was reported somewhat easier than those two ones.

Figure 2: Perceived difficulty of switching: Hungarian customers



Considering the British customers (based on the Ofcom’s Customer Experience Report 2006 , the same pattern can be observed: switching mobile operator is somewhat easier than switching fixed line operator or internet service provider. However, comparing the level of difficulty for the British and Hungarian customers, switching was found significantly easier for the British ones. 15% of British customers found fairly or very difficult switching fixed operator, 10% of them found fairly or very difficult switching mobile operator, and this ratio in 16% for internet services. On the other hand, these figures are 35%, 27% and 36% for the Hungarian respondents respectively, however, as a five grade scale was used in the Hungarian questionnaire in contrast to the four grade one in the UK survey, these ratios should be lower in Hungary assuming similar difficulty.

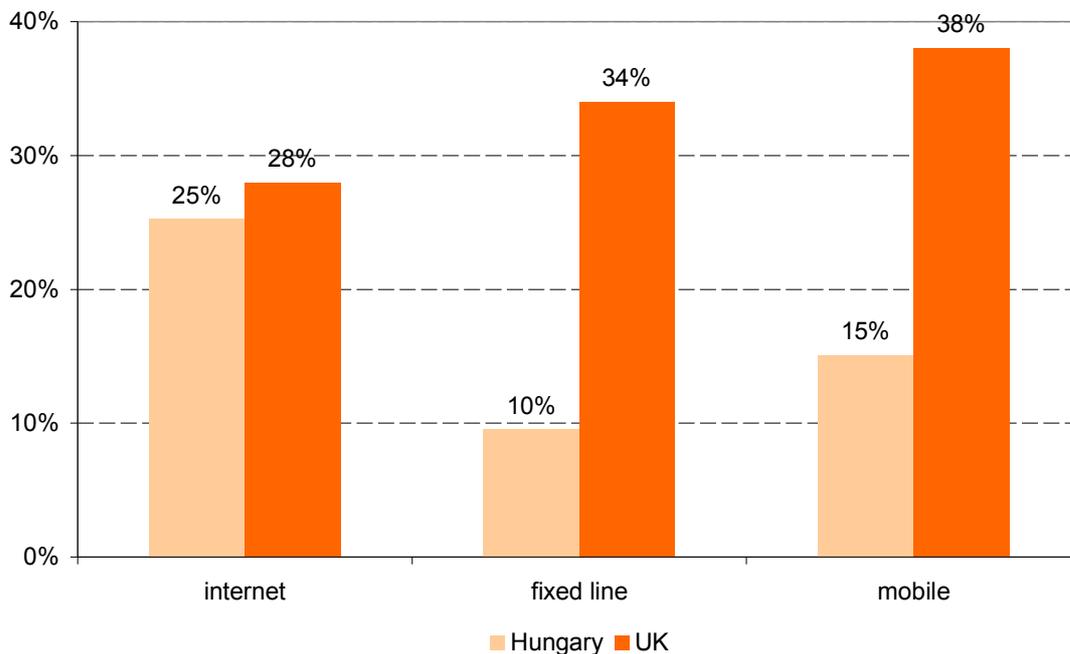
Figure 3: Perceived difficulty of switching: British customers



Source: Ofcom: *The Customer Experience, 2006*

Additionally, comparing actual switching behavior of the Hungarian and British customers, it becomes visible that actual switching is much rarer in Hungary. On the other hand, the difference is lower in the case of Internet services than the one for telephony, which suggests that beside the difficulty of switching, other factors influence actual switching behavior. This factor may be the range of choice and the trends in prices. From 2005 to 2007 average expenditures of Hungarian households decreased by 11% for fixed, by 6% for mobile telephony, and by 26% for Internet in nominal terms.

Figure 4: Switching telecommunication operator in Hungary and the UK in the two previous years



3.2 Factors of switching difficulty

In the next step, elements of the switching difficulties were analyzed. According to the model presented in figure Figure 1: **Factors of switching costs** six elements of this difficulty was analyzed: searching for offers, comparing relevant offers, canceling old contract, making new contract, learning the use of new service, and installing new service. Additionally, the perceived risk or uncertainty was asked from respondents, and the fact, whether they have a loyalty contract. Effects of these elements were analyzed using linear regression models. Additionally, demographic control variables were included in the equations. Explanatory power (R^2) of the models was unusually high for such cross-sectional surveys. Considering the demographic variables, effect of the age was significant statistically for Internet services, showing that people over 30 years cope easier with switching operator. Considering the elements of switching, effect of searching difficulty and learning the use of new service was negligible. Two elements: comparing the offers and making the new contracts have significant, but minor effect on the difficulty, but another one, canceling the old contract is the major contributor to overall difficulty. Perceived risk or uncertainty is another major factor in switching difficulty. Having loyalty contract also has a considerable effect, however,

magnitude of its coefficient is not directly comparable to the previous ones, as they were all measured in the 1-5 scale but having loyalty contract was a dummy variable.

Table 1. Factors of perceived difficulty

	Internet	Mobile	Fixed line
Education: skilled worker ⁺	0,48	0,06	0,10
Education: secondary ⁺	-0,07	0,15	-0,14
Education: BA or MA ⁺	0,05	0,12	0,31*
Age: >30 ⁺	-0,49*	-0,26	-0,36
Age: >40 ⁺	0,01	0,01	-0,06
Age: >50 ⁺	0,12	-0,11	0,06
Residence: Budapest	-0,04	0,06	0,07
Residence: city	-0,13	0,06	-0,06
Gender (woman)	0,09	-0,02	-0,04
Searching for offers	0,05	0,01	0,07
Comparing relevant offers	0,07*	0,14*	0,00
Canceling old contract	0,26*	0,30*	0,32*
Making new contract	0,16*	0,12*	0,09*
Learning the use of new service	-0,03	0,01	-0,02
Installing new service	0,06*		
Risk and uncertainty	0,30*	0,33*	0,33*
Loyalty commitment	0,36*	0,33*	0,16*
R ²	0,40	0,49	0,46

Beta coefficients of the linear regression models.

* $p < 5\%$

⁺ Effects compared to the previous category

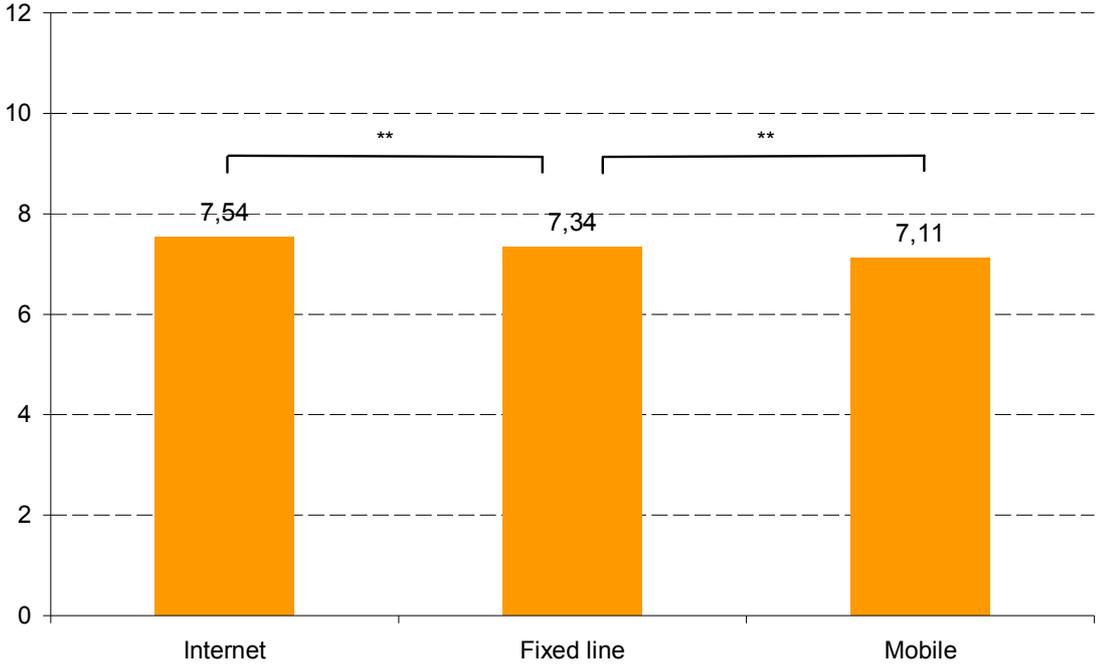
3.3 Analyzing expected compensation (switching cost)

After the subjective difficulties we turn to the analysis of switching costs, which were measured as expected compensation for switching operator. Two measures, monthly savings and a single sum were reported by respondents. Distribution of the expected compensation was skewed, and had a long tail over the 90th percentile. Median values of switching costs were HUF 2000 for fixed and mobile phone, and HUF 2500 for internet³. Means were compared after logarithmic transformation. It was found that switching cost is the lowest for mobile telephony, and the highest for internet service. The lowest switching cost for mobile phone is not surprising, as respondents have found this service the easiest to switch. On the other hand, the difference between fixed telephony and internet services cannot be explained

³ When conducting the study, exchange rate was about 250 HUF=1 EUR

by difference in difficulty. The comparison of means was done by paired samples t-tests for respondents, who have both internet and fixed telephone, and fixed and mobile telephone respectively. This method excludes the alternative explanation, that differences in switching costs may be a consequence of differences in social background of the users of these services. It must be noticed that although the differences are statistically significant, magnitude of them are not high.

Figure 2: Comparing switching costs (expected monthly saving, means after logarithmic transformation)



****:** $p < 0.01$ using paired samples t-tests

Next, antecedents of switching cost were analyzed. For this, linear regression models were used, with logarithms of switching costs as dependent variables. The above used factors of difficulties, and demographic variables were included in the model. Additionally, the level of overall difficulty, operator satisfaction and sum of monthly expenditure of the specific service was included. Results show that some of the elements, or the difficulty overall have some effect on switching cost, however, these are not systematic major effects in the six models. When analyzing expected savings in the monthly bill, monthly expenditure have a systematic effect, showing that people tend to compare these savings to the monthly bill. When considering single compensation, demographic variables play significant role: more educated and younger respondents have higher switching cost generally. Having loyalty commitment increased switching costs in all cases, although the question about monthly savings

formulated a hypothetical situation, when the new operator covers the costs of the broken loyalty commitment. Being a contract mobile phone customer increased switching costs compared to pre-paid users. On the other hand, reported switching costs did not differ between the three mobile operators in either model.

Table 2.: Factors of switching costs

	Monthly saving			Single sum		
	Internet	Mobile	Fixed line	Internet	Mobile	Fixed line
Education: skilled worker ⁺	0,68	0,27*	0,45	0,59	0,57	0,46
Education: secondary ⁺	1,09	1,47	1,79*	1,29	1,39	1,76*
Education: BA or MA ⁺	1,27	1,02	0,85	1,47*	1,44	0,86
Age: >30 ⁺	1,12	2,95	1,80	1,22	1,60	1,82
Age: >40 ⁺	0,98	0,72	1,06	0,65*	0,55*	1,07
Age: >50 ⁺	0,99	0,79	0,77	0,78	0,87	0,78
Residence: Budapest	0,94	1,05	0,86	0,93	0,96	0,86
Residence: city	0,88	0,84	0,91	0,79	0,82	0,92
Monthly expenditure (1000 HUF)	1,18*	1,08*	1,17*	1,02	1,00	1,17*
Searching for offers	0,84*	1,03	0,82*	0,94	1,11	0,82*
Comparing relevant offers	1,22*	1,08	1,20*	1,13	1,02	1,20*
Canceling old contract	0,96	1,19*	0,99	0,98	0,98	0,99
Making new contract	1,02	0,87*	1,05	1,06	1,02	1,05
Learning the use of new service	1,03	1,05	1,05	0,91	0,89	1,04
Installing new service	1,07			1,05		
Risk and uncertainty	1,00	1,05	0,91	1,13*	1,08	0,91
Perceived difficulty	0,99	0,95	1,06	0,99	1,34*	1,06
Loyalty commitment	1,24*	1,41*		2,79*	1,74*	
Operator satisfaction	1,10*	0,95	0,89	1,11	1,18*	0,90
Mobile: personal subscription		1,25			1,38	
Mobile: contract customer		1,53*			1,31	
Mobil: Pannon		1,05			1,04	
Mobil: Vodafone		1,06			0,94	
R ²	0,11	0,12	0,13	0,10	0,08	0,13

Beta coefficients of the linear regression models.

* $p < 5\%$

⁺ *Effects compared to the previous category*

3.4 Multi-play services

Multi-play offers became widespread in recent years considering telecommunication services. In this case, customers may subscribe to two, three or four services at one time. This may also effect switching costs: they can switch more services with a single action, which may result in lower switching costs, than switching two services separately. On the other hand, if one

subscribe to multi-play services, it may become more difficult to switch only a single service, as it affect(s) the other service(s) too. In this study we analyzed the first type of effect comparing switching cost of a bundle to the sum of the single switching costs, which this bundle includes. Considering the analyzed three services, a usual multi-play offer is internet and fixed line phone bundle. Customers, who have both of these services, were asked our first type switching cost question, which expresses switching costs as saving in the monthly bill. Median value of switching costs was HUF 5.000 for switching to the multi-play service, similarly to the median of sum of switching fixed line phone and internet separately. Comparison of the means of the two variables was done using independent samples t-test after logarithmic transformation of the variables. This comparison did not show significant difference either.

3.5 Survey results compared to the Shy method

this study may have a novel interesting methodological consequence, if we compare our estimates based on the survey results to ones, we could compute based on Shy's (2002) method. This can be easily carried out considering mobile services. To estimate switching costs based on the Shy method, prices and market shares are necessary. Mobile market shares are reported by HCA's "Monthly report on mobile telecommunications". They were 45.04%, 33.35%, and 21.61% for T-Mobile, Pannon, and Vodafone at the examined period. Estimating prices is possible using our survey. Average monthly spending on mobile phones were HUF 5987, 5756, and 5566 respectively. Of course, this estimation is a very rough one. For example, it does not take into account existing differences in usage patterns of the customer bases of the three providers. However, when one compares per minute prices of different pricing plans of the operators, the order of the prices are the same, and the difference is under 10%, which supports the usability of the survey results. Using the data presented, switching costs of the three operators are HUF 3538 for T-Mobile, HUF 2316 for Pannon, and HUF 1520 for Vodafone. The magnitude of the switching costs is roughly parallel to our estimate, in which median switching cost was HUF 2000 expressed as monthly savings. However, our models (Table 2) did not indicate differences among the three operators. No statistically significant difference can be found either, when no multivariate models are used, but pure means of the logarithms of switching costs are compared using one-way ANOVA.

4 Conclusions

Based on survey results, our study found significant switching costs in telecommunication services, median values amounting about a third of the average spending of these services. Difficulty of switching was reported considerably severe in Hungary than one found by Ofcom in the United Kingdom. However, comparing switching costs and actual switching indicate that, beside switching costs, other factors may influence switching activity of customers. These can be the choice of services and the trend in prices (whether they dynamically decrease or remain stable), however, analyzing these factors are out of the scope of the present study.

Our results indicate that two factors constitute the major difficulty in switching: canceling the old contract and uncertainty. Two further minor factors are creating the new contract and searching for the relevant offers.

Loyalty commitments also significantly increase switching costs. Moreover, they not only do it by the amount of the penalty, one has to pay, but it also creates additional psychological or transaction costs. These are illustrated by the fact that having loyalty commitment increased switching difficulty, and it increased switching costs, even when the question supposed that the new operator covers this penalty.

Beside the difficulties, other factors influence switching costs. These include social-economic variables. This result is not surprising assuming that alternative cost of the time (which one would need to devote to switching operators) is different socially. Results also may indicate, that people tend to relate switching costs to monthly spending, (and decide to switch, if the expected saving reaches some proportion of the monthly bill).

Results considering multi-pay offers regarded the comparison of switching to a double-play offer to switching to two separate ones. Although theoretically customers may save some switching costs when choosing the double-play offer, results did not support this hypothesis. This result indicates that the switching cost decreasing nature of multi-pay offers is not evident, however, further research is necessary on this issue. Beside the one examined, further effects of multiple-play offers could be tested, such as switching between two multi-play offers (further decrease in switching costs), and switching only a single service of the previously used multi-play offer (increase in switching costs).

An interesting methodological conclusion can be drawn comparing the survey estimates of switching costs to the ones got by the Shy method for mobile telecommunication. While the former did not show differences among the three operators, using the latter a two-fold difference was found. The survey method for forecasting customer actions and estimating reservation prices can be criticized on several bases. For example, it is evident that people discount cost of actions in these hypothetical situations, thus the method in default overestimates the magnitude of consumer's action. (On the other hand, the compensation offered in the questionnaire is also a hypothetical one, which results in an opposite bias): However, it is highly unlikely that if two-fold difference were in the switching costs, the survey would not find it. Rather, it seems that assumptions of the Shy method are too strong and was not realized in the examined example. This may regard either the cost-setting method of operators, or the distribution of switching cost in population. Thus, the awareness of these limitations is advised, when using that method for estimating switching costs for telecommunication services.

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