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**The Impact of Switching Costs on the
Customer Satisfaction-Loyalty Link: Mobile
Phone Service in the Czech Republic**

Bachelor thesis

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Abstract

This thesis seeks to explain the dynamics influencing customer loyalty in the Czech market for mobile phone services. Customer loyalty is an important concept in such a saturated market where acquisition of new customers nearly always merits convincing them to leave their current provider, so customer retention is a more adequate strategy to ensure business prosperity. Structural equation modeling is employed in order to build a reliable model which would explain the relationships among the concepts of customer satisfaction, customer loyalty, service quality, and the role of switching costs. The results yield supporting evidence for the positive relationship between service quality and customer satisfaction, as well as the positive relationship between customer satisfaction and customer loyalty. There is no conclusive evidence for the impact of switching costs on the satisfaction-loyalty link.

Abstrakt

Tato bakalářská práce se snaží osvětlit faktory ovlivňující věrnost zákazníků na českém trhu mobilních telefonních služeb. Zákaznická věrnost představuje na takto nasyceném trhu důležitý koncept, protože získání nových zákazníků téměř vždy vyžaduje jejich přesvědčení o tom, aby opustili svého stávajícího poskytovatele, a udržení stávajících zákazníků tedy představuje vhodnější strategii k zajištění prosperity podnikání poskytovatele. K sestavení spolehlivého modelu, který by vysvětlil vztahy mezi spokojeností a loajalitou zákazníků, vnímanou kvalitou služeb a rolí nákladů spojených se změnou poskytovatele, je použita modulace strukturních rovnic. Výsledky svědčí o pozitivním vztahu mezi kvalitou služeb a spokojeností zákazníků, stejně jako o pozitivním vztahu mezi spokojeností zákazníků a loajalitou zákazníků. Neexistují žádné

jednoznačné důkazy o dopadu nákladů na změnu poskytovatele na vazbu mezi spokojeností a zákaznickou věrností.

Klíčová slova

spokojenost, kvalita, věrnost, mobilní služby, náklady na přechod

Keywords

satisfaction, quality, loyalty, mobile service, switching costs

Declaration of Authorship

1. The author hereby declares that he compiled this thesis independently, using only the listed resources and literature.
2. The author hereby declares that all the sources and literature used have been properly cited.
3. The author hereby declares that the thesis has not been used to obtain a different or the same degree.

Prague 31.7.2017

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Institute of Economic Studies Bachelor thesis proposal

Author Zuzana Jiráková
Supervisor Mgr. Petr Polák MSc.
Topic The impact of switching costs on the customer satisfaction – loyalty link:
Mobile phone service in the Czech Republic

Topic characteristic

The market for mobile services has been growing rapidly over the past few decades. It is therefore a matter of great importance to study which factors influence customer behavior in order to carry out good managerial decisions. This thesis seeks to examine customer preference and find out what influences customer satisfaction and its link to customer loyalty in the Czech telecommunications market.

Research questions

1. What are the key drivers of customer satisfaction?
2. What is the relationship between customer satisfaction and customer loyalty and what influences is it subject to?
3. What role do switching costs play in customers' decision making process?
4. Is there any difference in the behavior of people based on the type of mobile plan they are using?

Methodology

The data will be collected via a self-developed questionnaire inquiring about people's attitude toward their mobile service provider. The data will be analyzed with the help of structural equation modeling in statistical software.

Outline

1. Introduction
2. Theory and Literature Review
3. Data Collection and Analysis
4. Discussion
5. Conclusion

Core bibliography

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Introduction

The market for telecommunication services is growing rapidly and its high saturation forces mobile service providers to utilize new strategies for attracting and keeping as many customers as possible. Many studies have been carried out in order to explain the dynamics at play during a customer's decision to stay with their current provider or to switch to another one. The research has covered the market for mobile services extensively in different countries, such as France (Lee, 2001), Spain (Calvo-Porrall et al., 2017), China (Chuah et al., 2017), Turkey (Aydin, Özer & Arasil, 2005), Nigeria (Oyeniya et al., 2010), United Kingdom (Grzybowski, 2008), Korea (Ahn et al., 2006) and many more. The Czech Republic has so far not been subjected to this research which is one of the main contributions of this thesis.

The main focus lies on customer loyalty which has been shown to be directly influenced by the level of customer satisfaction. However, other key factors play a role in the scheme - factors which influence customer satisfaction like service quality, customer value, trust, customization value, corporate image, as well as factors which play a role in the indirect effects among the variables. These could be switching costs, alternative awareness, sector knowledge, or the fact that people subscribe to different types of plans differing in the levels of switching costs, amount of services consumed, etc. This thesis works with customer satisfaction, service quality, switching costs and groups of people with a personal as opposed to a company or family plan, controlling for age and gender of the respondents.

The data were sampled through distribution of a self-developed questionnaire and yielded 199 responses, mainly among Czech university students. Studying the preferences of consumers of mobile services is relevant as almost everyone nowadays owns a mobile phone. The sample represents the distribution of customers among the main players in the Czech mobile market with various plan types well.

The analysis used structural equation modeling in order to best capture the intertwined relationships among the key variables. This method along with the partial least squares is the most commonly used one in the papers tackling this subject.

The thesis contributes to the current academic discourse with widening the scope of research to the Czech Republic and presenting supportive evidence for some of the

key relationship (customer satisfaction in relation to customer loyalty, service quality in relation to customer satisfaction, the ambiguous role of switching costs).

The thesis is organized into six main sections. It begins with describing the existing literature and the problem's relevance in the Czech mobile market. The variables are described in general terms as has been established by previous research. The obtained information lays some groundwork for formulating the hypotheses listed in the following section. The analysis method as well as the method for data collection are detailed in the next along with the specific measures used for this research. There is a section dedicated to testing the proposed measurement and structural models in order to ensure a good model fit. The last two sections present the findings and discuss their implications as well as the limitations of this thesis which should be improved upon by future researchers.

1. Literature review

With the ever growing importance of mobile phone services, provider's efforts to lower customer deflection have become all the more meaningful. One of the characteristics of the mobile service industry is that customers are more or less free to choose their service provider and change from one provider to another at their will. Companies providing mobile services consequently need to focus their attention on ensuring high levels of customer satisfaction along with other factors influencing customer loyalty to differentiate from the competition (Deng, Lu, Wei & Zhang, 2010).

One of these strategies is to focus on improving service quality, which has been shown to impact customer satisfaction in a major way (Yacob, Ali, Baptist, Nadzir, & Morshidi, 2016). Another strategy is to raise the level of costs that the customers must endure in order to switch to another provider. The research on determiners of customer loyalty is extensive and various other variables have been observed in connection with the problem, such as perceived value, customer value, sector knowledge, corporate image, intimacy, relational value with the provider, etc. However, this thesis focuses on four major variables – service quality, customer, satisfaction, customer loyalty, and switching costs – which could shed some light onto the issue and add to the existing evidence by analyzing data from the Czech market for telecommunications.

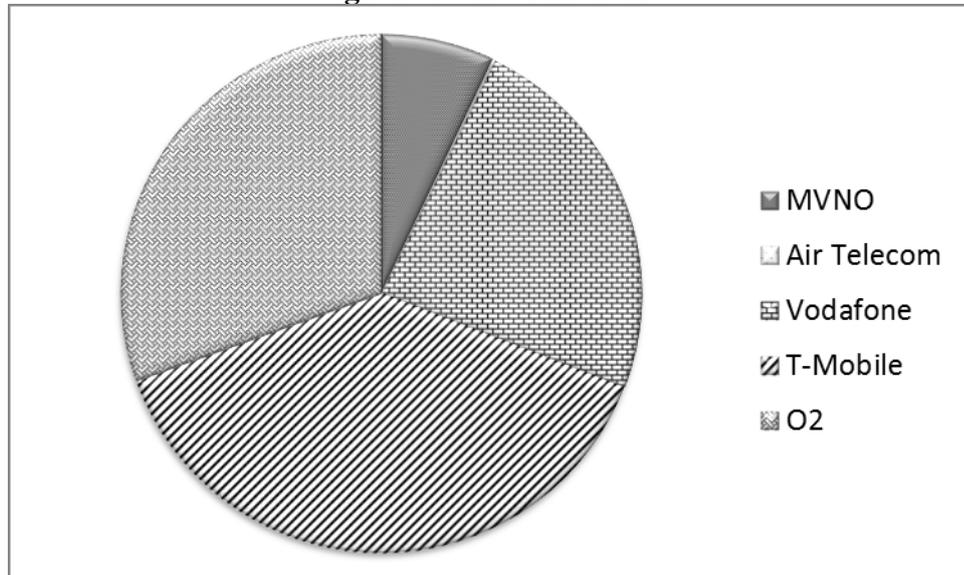
1.1. Relevance of the Czech telecommunications market

In the Czech Republic 98 % of people above 16 years of age use a mobile phone. The number of active postpaid SIM cards is estimated at 9.3 million units and the number of active prepaid SIM cards is estimated at just fewer than 4.8 million units (CTO, 2017).

The market is dominated by three main mobile network operators, which are T-Mobile (38.6 % market share), O2 (30.5 % market share), and Vodafone (23.7 % market share). The last provider is Air Telecom but its market share is only 0.2 %. In 2016 there were 157 businesses which provided mobile virtual network operator (MVNO) or mobile virtual network enabler (MVNE) services and 18 brand re-sellers. The share of virtual operators in the total number of active SIM cards was

approximately 7.0 % at the end of the first half of 2016, with a market share of financially independent virtual operators of approximately 3.4 %. The market shares are depicted in Figure 1.

Figure 1. Market Shares



Source: CTO yearly report 2016

Throughout 2016 the Czech Telecommunication Office (CTO) focused mainly on the development of market competition through supporting the improvement of the communication infrastructure and services of high-speed internet connection. The subsequent auction of broadband frequencies resulted in implementing the frequencies from the 1.8 GHz and 2.6 GHz bands (CTO 2016).

It is safe to say that internet connection is becoming more and more important in the context of mobile services as the ever growing usage of smartphones is dependent on it. In the Czech telecommunication market, this is demonstrated by the fact that in 2016 data consumption grew by 65 % compared to the previous year. This growth amounted to the usage of about 88 PB of data.

However, the mobile plans which include mobile internet have been undergoing significant change recently. All of the MNO's and a growing number of MVNO's changed their terms and conditions, shutting down data usage after a user has reached their FUP limit, whereas before, after a user has run out of data, their internet connection was only slowed down. One of the reasons for this change are the new rules

of the European Union according to which the classical consumer surcharges expired on June 15th, 2017 and the representatives of the European Union, the European Parliament and the European Commission have agreed on the level of fees charged by Member State operators among themselves. This does not mean that all roaming as such has disappeared, but operators will pay new charges for their customers abroad. This contributes to the operators' costs and leads to cutting in other areas, moreover, as free data used abroad become much more expensive for the operators (Mobilnet, 2017).

This recent development might very well lead to customers re-evaluating their preferences for different providers. As for example the branded re-seller Mobil.cz (operating under the T-Mobile network) was best known for the offer of free data as one of their main selling points, customers may decide to switch to another provider who offers other benefits. This thesis serves to lay out possible theoretical groundwork for the managerial decisions which should be carried out in order to ensure business prosperity.

It is noteworthy to say that the theoretical concepts explored in this thesis have been examined in the light of many different industries, mobile phone services being a fairly common area of interest, perhaps due to the mostly exclusive nature of the customer's relationship with one provider. The following sections describe the theory behind the key variables.

1.2. Loyalty

Customer loyalty has been traditionally understood as a commitment of a customer to use products or services of a brand or organization in the future, despite opportunities to switch to another provider (Oliver, 1999). Day (1969) suggested that customer loyalty may display bi-dimensional properties, incorporating behavioral and attitudinal aspects. Behavioral loyalty manifests as re-purchase intent of the customer, intending to purchase products from the same brand in the future (Russo, Confente, Gligor & Cobelli, 2017). On the other hand, attitudinal loyalty mirrors the customer's psychological disposition towards the brand, usually cultivated over a longer period of time when the customer builds their relationship with the brand. This positive attitude translates into the willingness to recommend one's provider to other people and generally express positive feelings about the company (Evanschitzky, Iyer, Plassmann, Niessing & Meffert, 2006).

1.3. Satisfaction

Customer satisfaction has been repeatedly shown to positively influence customer loyalty. Therefore, it has been the center of focus for firms trying to increase customer retention, through making significant investments and strategic decisions to ensure a high level of satisfaction. Even though the link between customer satisfaction and loyalty is very strong, it is important to distinguish between these two variables as they are not interchangeable and they do not explain each other perfectly. This is apparent in cases when customers remain loyal to a brand without necessarily being satisfied with its product and acting on behalf of some other external factors. Thus it is substantiated to believe that customer satisfaction alone is not enough to explain customer loyalty (Russo et al., 2017).

1.4. Service quality

One of the most important sources for customer satisfaction is the quality of service they perceive through their interaction with their provider. In relation to the mobile phone services, perceived service quality could be influenced by a number of factors – quality of area coverage, speed of data upload and download, sound clarity, efficiency of the billing system, customer service, etc. Previous research has shown that service quality drives customer satisfaction significantly (Calvo-Porrá, Faíña-Medín & Nieto-Mengotti, 2017).

1.5. Switching costs

When it comes to using mobile phone service and choosing the best offer, whenever a customer decides to change their provider, they face some switching costs. Switching costs (SC) are the costs one endures when they switch to another mobile plan or to another provider. Naturally, switching to another plan with the same provider induces smaller costs, so in this thesis by SC we mean the costs a customer has to bear in case they decide to change their provider. These of course include explicit and directly measurable costs (such as monetary costs), but these costs are typically fairly insignificant in the Czech mobile market since no explicit charges are usually included in the process. The exception is when the customer is in a lock-in contract with a specified duration period, and in case they decide to change their provider they have to suffer a penalty for ending their contract prematurely (Shi, Chiang & Rhee, 2006). One significant difficulty imposed on customers when switching to another provider used to

be limited phone number portability; however, from 15th January, 2006 the Czech regulator made the enabling of mobile number portability compulsory for the Czech providers, and the cost no longer plays a role as a switching barrier (CTO, 2017).

It is reasonable to expect that psychological, relational, and procedural costs tend to play an important role in the decision as well. These are the costs of uncertainty, discomfort stemming from change, relational costs, learning costs, procedural costs (e.g. how much time and effort the customer must expend in order to switch), etc. (Calvo-Porrall et al., 2017).

Previous research provided consistent evidence that SC are an effective mechanism which discourages customers from switching to another provider and stimulates repeat purchase behavior (Russo et al., 2017).

2. Hypotheses

H1a: *Quality has a positive effect on customer loyalty.*

Our first hypothesis concerns the direct effect of service quality on customer loyalty. If the customer perceives the provided service as good in terms of quality, they should be more inclined to stay with their provider and not feel the need for change.

H1b: *Customer satisfaction has a positive effect on customer loyalty.*

The positive relationship between customer satisfaction and customer loyalty has been repeatedly supported by previous research in many areas. It makes intuitive sense as well. If a customer is satisfied with the mobile service they are receiving from their provider, it makes them more likely to stay with that provider and express positive feeling towards the company.

H1c: *Quality has a positive effect on customer satisfaction.*

As previous research has shown, service quality is one of the key drivers of customer satisfaction. This hypothesis seeks to verify the relationship within our model with the data from the Czech mobile market.

H2: *Customer Satisfaction positively mediates the relationship between quality and customer loyalty.*

As worded by Yacob et al. (2016), “Service quality is a global judgment or attitude relating to the superiority of the service, whereas satisfaction is related to a specific transaction.” Both of the positive relationships between customer satisfaction and customer loyalty, and between service quality and customer satisfaction have been more or less established. Far fewer studies look at customer satisfaction as a mediator, an important link between service quality and customer loyalty. Yacob et al. (2016) have found evidence for this positive mediating effect in the field of credit cooperative, and there are good reasons to believe that the market for mobile services will display the same connection.

H3: *Switching costs strengthen the positive relationship between customer satisfaction and customer loyalty.*

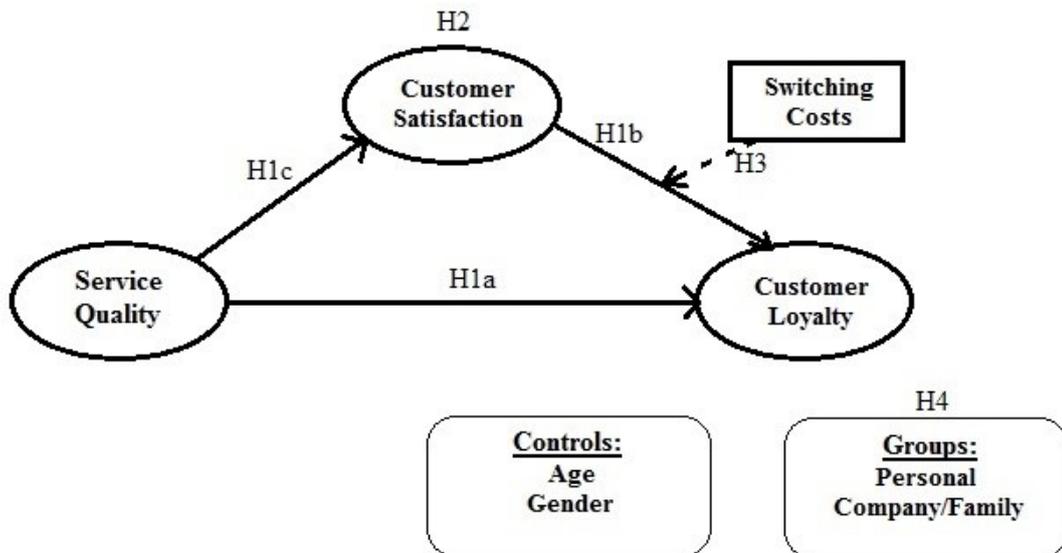
During the analysis of the effect of switching costs on the satisfaction-loyalty link, Lee (2001) describes the moderating effect as something which impacts the customer’s level of loyalty given that their level of satisfaction is the same. When switching costs are high, customers with the same level of satisfaction might be more loyal simply for the fact that switching is difficult. Even though Lee’s study provided supportive evidence for this interaction, most of the research on this topic has been inconclusive.

H4: *The positive moderating effect of switching costs on the positive relationship between customer satisfaction and customer loyalty is stronger for users with a company or family postpaid plan compared to users with a personal postpaid or prepaid plan.*

Different types of contracts may be associated with different levels of switching difficulty as well as the determiners of satisfaction (Calvo-Porrall et al., 2017). Specifically, for users with a company or family plan, we would expect the cost of switching to be higher as the decision to switch providers in case of a user with a family plan does not affect only the individual themselves but their family members too, and in case of company plans the individual usually does not decide about switching to another provider in terms of the whole company. In both cases, the source of customer satisfaction might differ from individuals with personal plans, e.g. due to the often more

favorable pricing, shift of responsibility onto somebody else, and so on. The hypothesis seeks to compare the two groups within the same model structure and look for evidence supportive of any differences which might be stemming from the different plan types.

Figure 2. Conceptual Model



3. Methodology

3.1. Measures

The data was collected via a self-distributed questionnaire based on previous literature. Aside from the demographic section and questions relating to the individual's mobile service provider, it included measures for customer loyalty, customer satisfaction, service quality and switching costs measured on 5-point Likert scale. The wording for these measuring items was adopted from previous research and translated into Czech. Subsequently, a preliminary version of the questionnaire was distributed in a test round in order to adjust the wording so that the items made sense to Czech native speakers and measured the intended variables.

The measures for customer loyalty and customer satisfaction were suggested by Lee (2001) and the wording was adopted from Chuah et al. (2017). For customer loyalty we used re-purchase intent and willingness to recommend the provider to friends and

family. For customer satisfaction we asked about overall satisfaction and satisfaction with pricing. For measuring service quality we used the overall perceived service quality (wording adopted from Calvo-Porrall et al. (2017)) along with the quality of area coverage as suggested by Lee (2001) and the speed of mobile internet adopted from Chuah et al. (2017).

For switching costs we used perceived difficulty to switch (Lee 2001) with the wording adopted from Chuah et. al. (2017).

3.2.Data

Responses were collected over the course of July 2017. The questionnaire was distributed via social media, e-mail, and in paper form. Altogether, 199 people completed the survey, out of the 250 invited to do so, yielding 80 % response rate, out of which 107 were male and 92 female. In terms of age, the respondents ranged from 12 to 80 years old, the median being 24 years. Most respondents were students (56.5 %), 34 % were employed and the rest were either unemployed, self-employed or they responded “other”.

Regarding the information on mobile services, the respondents were more or less evenly distributed among the main three mobile service providers on the Czech telecommunications market (34 % for T-Mobile, 31.5 % for O2, 29.5 % for Vodafone, and 5% for other providers). Since we are interested in the multi-group effects between users with a personal plan versus users with a company or family plans, we asked about the plan type as well, learning that 45 % of the respondents had a personal postpaid plan, 13.5 % were using prepaid services, 32.5 % had a company mobile plan and 9 % were using some sort of a family plan. Subsequently, that later during the analysis, the two groups we tested for multi-group effects were roughly of the same size.

3.3.Method

For testing out hypotheses structural equation modelling in the AMOS 24 software was employed as suggested by Blunch and Blunch (2013). The measurement model consisted of seven reflective items which measured three latent constructs - customer loyalty (*loyalty*), customer satisfaction (*satisfaction*) and service quality (*quality*). After some initial data screening exploratory factor analysis (EFA) was

conducted in order to better understand our data and build the measurement model appropriately. Following that the measurement model was subjected to confirmatory factor analysis (CFA) to assess the model fit. Using the imputed factor scores, the structural model was constructed according to the theory and the hypotheses were tested. Besides customer loyalty, customer satisfaction, service quality, and switching costs, we controlled for age and gender of the respondents in all the tests.

We started by testing the direct effects within the model. Subsequently, we used bootstrapping to test the mediating effects of customer satisfaction between service quality and customer loyalty. For the purposes of testing the moderating effect of switching costs on the relationship between customer satisfaction and customer loyalty, we first standardized the constituent variables, added switching costs and the product of *switching costs* and *satisfaction* into the model and ran the regression again. Lastly, we conducted a multi-group analysis, comparing the effects of switching costs within two models – one for users with a personal postpaid plan or a prepaid plan and the other one for users who had a company or family postpaid plan.

4. Analysis

4.1. Data screening

As all the items of the questionnaire were compulsory, we did not have any missing data. However, after further inspection we deleted data from three respondents due to their low level of engagement (the standard deviation of their answers to the Likert scale items was equal to zero because each of them gave the same answer to all questions). There were three outliers in terms of age being between 78 and 80 years old but we kept their data for the analysis since we controlled for age in the model, and the responses were of good quality and contributed to the model analysis.

We observed fairly normal distributions for our indicators of latent factors in terms of skewness and kurtosis. Only *age* displayed large values of both these properties, which was to be expected as most respondents were university students (Ferguson & Cox, 1993).

4.2. Exploratory factor analysis (EFA)

During the EFA we used 8 items (*Repurchase* for re-purchase intent, *Recommend* for the willingness to recommend one's mobile service provider to friends or family, *OvSat* for the overall satisfaction, *PriceSat* for the satisfaction with pricing, *Signal* for the quality of area coverage, *Speed* for the speed of the mobile internet, *OvQual* for the overall perceived quality, and *SC* for the perceived switching costs) and we ran an analysis of principal components. The adequacy measures were sufficient; KMO equaled 0.85 which is above the threshold of 0.7 and Total Variance Explained amounted to 82.4 %. We obtained good convergent validity as with a sample size of 196 we considered any factor loading above 0.4 to be sufficient (Osborne, 2008). The pattern matrix is displayed in Table 1 along with the values of Cronbach's alphas for the constructs measured by more than one item.

Table 1. Pattern Matrix

Cronbach's Alpha	Component			
	<i>satisfaction</i>	<i>quality</i>	<i>loyalty</i>	<i>switching costs</i>
Repurchase			,978	
Recommend	,560		,417	
OvSat	,871			
PriceSat	,986			
Signal		,890		
Speed		,945		
OvQual		,656		
SC				,989

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

a. Rotation converged in 4 iterations.

Source: author's computations

We observed that willingness to recommend one's mobile service provider to friends or family (*Recommend*) was loading on two components – *loyalty* and *satisfaction*. We ran the factor analysis only with the four items that should have reflected customer satisfaction and customer loyalty and found out that they load onto a single factor with Cronbach's alpha 0.86. This was indicative of the fact that our four

measuring items were not sufficiently different from each other and they measured a single latent variable which comprised of customer satisfaction and customer loyalty. However, as is obvious from the component correlation matrix in Table 2, the correlation between the two factors was still under 0.7 which satisfies discriminant validity. As the relationship between customer satisfaction and customer loyalty is a key concept of this thesis, we could not comprise the two components into one. Also, the distinction is supported by literature and common sense, hence we decided to retain the intended concepts as they were, and use overall satisfaction and price satisfaction as a measure of customer satisfaction and willingness to recommend and re-purchase intent as an indicator of customer loyalty. To test the reliability of the constructs we used Cronbach's alpha and confirmed that the values for both variables were still above 0.7 (0.757 for *loyalty* and 0.788 for *satisfaction*); however, we kept the issue in mind during the confirmatory factor analysis (MacKenzie, 2003).

There were no issues with the reflective measures for service quality and the Cronbach's alpha was at 0.814. The measurement model is included in Appendix 1.

Table 2. Component Correlation Matrix

Component	<i>satisfaction</i>	<i>quality</i>	<i>loyalty</i>	<i>switching costs</i>
<i>satisfaction</i>	1,000	,478	,662	,209
<i>quality</i>	,478	1,000	,410	,196
<i>loyalty</i>	,662	,410	1,000	,198
<i>switching costs</i>	,209	,196	,198	1,000

Extraction Method: Principal Component Analysis.

Rotation Method: Promax with Kaiser Normalization.

Source: author's computations

4.3. Confirmatory factor analysis (CFA)

Next, we performed CFA to confirm the validity and adequacy of our measurement model. The loading of overall quality on *quality* was greater than one which we addressed by constraining the three paths on *quality* to be equal.

The measures we used to establish validity and reliability were Composite Reliability (CR), Average Variance Extracted (AVE), and Maximum Shared Variance (MSV). The results are displayed in Table 3.

Table 3. Validity and Reliability

Factor	CR	AVE	MSV	<i>loyalty</i>	<i>satisfaction</i>	<i>quality</i>
<i>loyalty</i>	0.764	0.620	0.869	0.787		
<i>satisfaction</i>	0.797	0.663	0.869	0.932	0.814	
<i>quality</i>	0.816	0.598	0.408	0.607	0.639	0.773

Source: author's computations

For the factor constructs to be reliable the CR should be at least 0.7 which the results for our factors satisfied. Convergent validity was also established as AVE was larger than 0.5 for all three factors, meaning that the items correlated well within their parent factor so the factor was well explained by the observed variables (Malhotra & Dash, 2011). As the EFA foreshadowed, discriminant validity posed exactly the issue we expected. Since we used willingness to recommend as an item reflecting *loyalty*, even though it correlated more highly with *satisfaction*, the AVE for both of these factors was less than the MSV, and the square root of AVE was less than the absolute value of the correlation with the other factor. These results generally indicate that the latent factor is better explained by some variable from a different factor, in this case willingness to recommend.

Due to the testing of the fourth hypothesis including two groupings within our model, it is recommended to perform invariance tests to ensure that the two models do not differ due to the two groupings. In a configural invariance test, we obtained adequate goodness of fit, analyzing a freely estimated model across the two groups (users with a prepaid/personal plan and users with a family/company plan). As for metric invariance, we constrained the two models to be equal and we performed a chi-square difference test between the fully constrained and unconstrained models where the regression weights were constrained, and found them to be invariant (p-value = 0.577) (Vandenberg & Lance, 2000; Byrne, 2004).

Since our data were collected via a single questionnaire which was distributed mainly via social networks, we decided to test for the Common Method Bias. We

conducted common latent factor analysis and we found that the common variance among the items was 0.078 which was acceptable for our model (Richardson, Simmering & Sturman, 2009; Podsakoff, MacKenzie, Lee & Podsakoff, 2003).

We obtained good measurement model fit (Hair, Black, Babin & Anderson, 2010), the summary of which is listed in Table 4.

Table 4. Model Fit

Measure	Observed	Threshold
Chi-squared	27.443	-
df	13	-
CFI	0.963	> 0.95
RMSEA	0.099	< 1.00
PCLOSE	0.062	> 0.05
SRMR	0.072	< 0.09

Source: author's computations

We concluded the CFA with imputing factor scores for the final structural path model which can be seen in Appendix 2.

Lastly, we ran a Cook's distance analysis to determine if any (multivariate) influential outliers existed. In no case did we observe a Cook's distance greater than 1. Most cases were far less than 0.15. We also examined variable inflation factors (VIF) for all predictors on out dependent variable and observed no VIFs greater than .12, which is far less than the threshold of 10, making us conclude that there are no multicollinearity issues within our model (Hair, Black, Babin & Anderson, 2010).

5. Findings

The regression results are reported in Table 5. R-squared for *satisfaction* was 40.8 % and for *loyalty* 87.9 %.

Table 5. Standardized Regression Weights

		Estimate	P
<i>satisfaction</i>	<--- <i>age</i>	-,017	,802
<i>satisfaction</i>	<--- <i>gender</i>	-,017	,799
<i>satisfaction</i>	<--- <i>quality</i>	,635	***
<i>loyalty</i>	<--- <i>age</i>	,087	,116
<i>loyalty</i>	<--- <i>gender</i>	,031	,574
<i>loyalty</i>	<--- <i>satisfaction</i>	,924	***
<i>loyalty</i>	<--- <i>quality</i>	,031	,741

Source: author's computations

5.1. Direct effects

H1a: *Quality has a positive effect on customer loyalty.*

The first hypothesis is not supported. Although the estimate is positive as we expected (beta = 0.031), it is insignificant with a p-value of 0.741.

H1b: *Customer satisfaction has a positive effect on customer loyalty.*

The second hypothesis is clearly supported with a significant positive standardized estimate (beta = 0.924 and p-value < 0.001).

H1c: *Quality has a positive effect on customer satisfaction.*

The third of the direct effects hypotheses is also supported as the regression yielded a significant positive effect (beta = 0.635, p-value < 0.001).

5.2. Mediated effects

H2: *Customer Satisfaction positively mediates the relationship between quality and customer loyalty.*

We employed bootstrap estimation with 90 % confidence intervals and obtained supportive evidence for our hypothesis in a form of a significant p-value for the indirect effect (beta = 0.603, p-value = 0.001) (Hair et al., 2010).

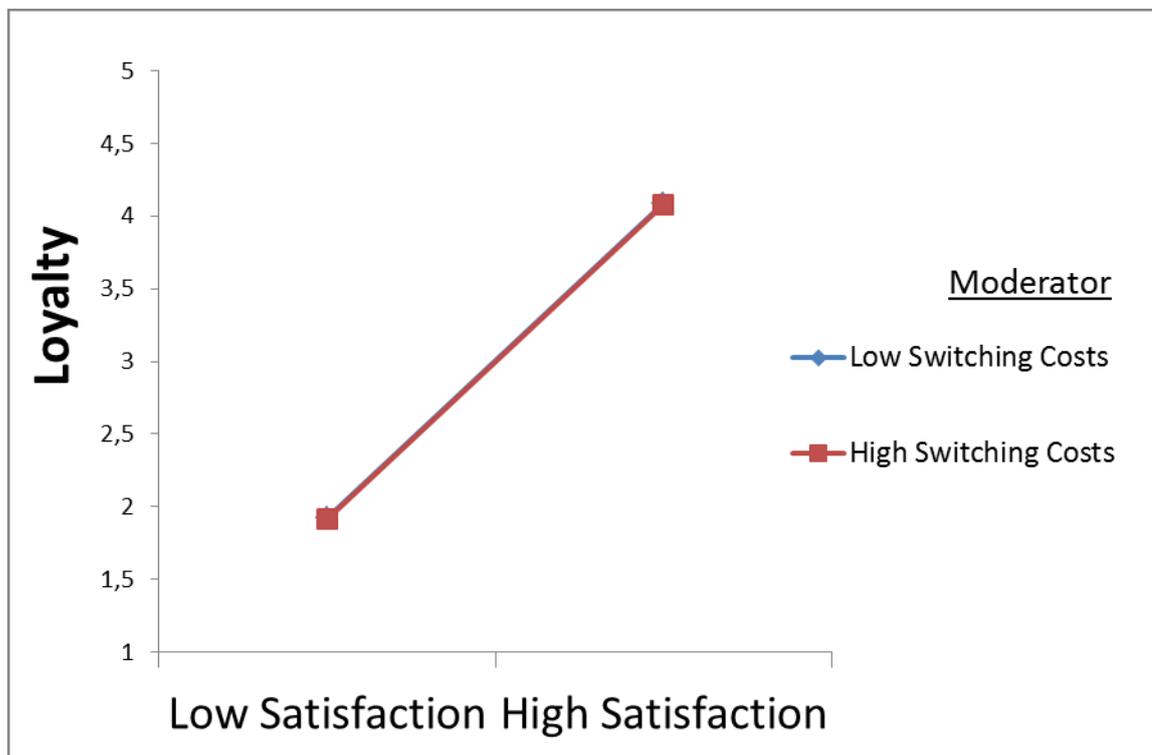
5.3. Moderated effects

To test for the interactions within our model, we first standardized the constituent variables (*satisfaction*, *loyalty*, and *switching costs*) and then included *switching costs* and an interaction term *satisfaction_x_SC* in the model. The adjusted model can be seen in Appendix 3. We tested the model fit again and found that while CFI was still excellent at 0.989, RAMSEA had somewhat deteriorated to 0.154 which no longer fell below the acceptable threshold of 0.1, and PCLOSE fell to 0.018 which was no longer insignificant. R-squared for *satisfaction* increased to 52 % and R-squared for *loyalty* to 97 % (which was a very high percentage of explained model variation and we treated it with suspicion). As a result, we concluded that the following moderated effects should be taken with a grain of salt.

H3: *Switching costs strengthen the positive relationship between customer satisfaction and customer loyalty.*

The regression results suggest that switching costs have no moderating effect on the link between customer satisfaction and customer loyalty (beta = -0.002, p-value = 0.89). To better illustrate this, we plotted the relationship on the following graph. (See Figure 3.)

Figure 3. Role of Switching Costs



In short, if there was a moderating effect at play, the two lines representing low and high switching costs would be distinctly different.

5.4. Multi-group moderated effects

H4: *The positive moderating effect of switching costs on the positive relationship between customer satisfaction and customer loyalty is stronger for users with a company or family postpaid plan compared to users with a personal postpaid or prepaid plan.*

To test our last hypothesis, we defined two models based on *tariff* as a grouping variable. For the first group we used data only from those users who indicated that they have a personal postpaid or a prepaid mobile plan and for the other group we used data from people who were using a company or family postpaid plan. We ran a chi-square difference test with the unconstrained vs constrained individual paths (namely *satisfaction -> loyalty*, *SC -> loyalty*, *satisfaction_x_SC -> loyalty*) and found no significant difference between the two groups (p-value = 0.987); hence, the hypothesis was not supported.

Table 6. Summary of Findings

Hypothesis	<i>beta</i>	<i>p-value</i>	<i>conclusion</i>
H1a: Quality has a positive effect on customer loyalty.	0.031	0.741	not supported
H1b: Customer satisfaction has a positive effect on customer loyalty.	0.924	0.000	supported
H1c: Quality has a positive effect on customer satisfaction.	0.635	0.000	supported
H2: Customer Satisfaction positively mediates the relationship between quality and customer loyalty.	0.603	0.000	supported
H3: Switching costs strengthen the positive relationship between customer satisfaction and customer loyalty.	-0.002	0.890	not supported
H4: The positive moderating effect of switching costs on the positive relationship between customer satisfaction and customer loyalty is stronger for users with a company or family postpaid plan compared to users with a personal postpaid or prepaid plan.		0.987	not supported

Source: author's computations

6. Discussion

We intended to describe the dynamics affecting customer loyalty and customer satisfaction in the Czech mobile service market. The model also included incorporation of service quality and the role of switching costs, all the while controlling for the possible effects of age and gender of the respondents. Aside from direct effects manifesting among the variables we explored the role of customer satisfaction from the perspective of a mediator between service quality and customer loyalty. Moreover, the moderating effects of switching costs on the relationship between customer satisfaction and customer loyalty were tested, first in the general model including all of the sampled data, and then also analyzing the possible differences between two groups of users –

people with a personal mobile plan and people who use either a company plan or a family plan.

An important finding of the thesis was that service quality significantly predicts the level of customer satisfaction. Since satisfaction works as a mediator between quality and customer loyalty, investing resources into improving service quality is a sensible strategy for decreasing customer deflection rates. The prioritization of improving service quality in the mobile service industry has been also recommended by Calvo-Porrall et al. (2017), Kuo, Wu and Deng (2009), and Lu, Tu and Jen (2011).

Contrary to our expectations, no supportive evidence for the moderating role of switching costs on the relationship between satisfaction and loyalty was found in the overall model, nor after splitting the respondents into two groups based on their mobile play type. This follows the trend of mixed evidence found across the conducted research. Chuah et al. (2017) note that the inconclusive findings may be due to the different approaches of the various researchers; some of whom treated switching costs as mediators and others as moderators. It is worth mentioning that our initially very good model fit deteriorated after adding the variable depicting switching costs into it and the results may therefore not truly reflect the nature of reality.

6.1. Limitations

There are important limiting aspects of this paper which future researchers who would wish to build upon this topic should take into consideration.

Testing the hypotheses across other countries and industries beside mobile phone services in the Czech Republic is useful for gaining perspective. The specifics of people's attitudes might differ across countries depending on the cultural background and economic circumstances. Additionally, mobile phone service market is rather specific in terms of the number of providers and the consequent amount of competition, as well as it differs from other markets in terms of the switching barriers imposed on customers. It is therefore reasonable to expect that research carried out in different industries and countries would yield alternate results and in order to be able to generalize the findings, further work must be done.

The sample collected for the purposes of this thesis was also fairly skewed and heavily focused on students as respondents. Even though we did not observe any significant effect age variation might have on either of our dependent variables,

conducting research with a more balanced population would surely yield more conclusive results.

We encountered some issues with factor loadings and consequently discriminant validity between customer loyalty and customer satisfaction during the model construction, but we decided to carry on with the concepts as defined by previous literature as the solution suggested by the results of the exploratory factor analysis was not feasible for us. One of the ways to fix this problem would be to include more reflective measures for the latent constructs in the questionnaire and thus obtain more room for improving the model fit during the construction of the model.

Conclusion

This thesis has studied the relationships affecting customer loyalty in the market for mobile phone services in the Czech Republic. Based on the existing literature and theory, a structural model was constructed and tested for its fit. The following analysis tested the direct, mediated, moderated and multi-group effects at play among the variables.

Supportive evidence was found for the positive effect of service quality on customer satisfaction, customer satisfaction on customer loyalty, and a positive mediating effect which customer satisfaction has between service quality and customer loyalty. Interestingly, direct positive effect of service quality on customer loyalty was observed, but it was not statistically significant. There was no conclusive evidence that switching costs moderate the relationship between customer satisfaction and customer loyalty, neither in the overall model, nor for two subgroups of users with a personal versus a family or a company plan.

Even though the analysis has its limitations, it is one of the first ones done in the Czech market for mobile services and thus contributes to the academic discourse by relaying the existing theory to the Czech telecommunications industry and testing the relationships suggested by previous literature on Czech data. It gives basis for future researchers to build on while exploring this topic further, possibly improving on some of the shortcomings that the research entails.

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Acronyms

AVE	Average Variance extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CR	Composite Reliability
CTO	Czech Telecommunication Office
df	Degrees of Freedom
EFA	Exploratory Factor Analysis
KMO	Kaiser-Meyer-Olkin
MNO	Mobile Network Operator
MSV	Maximum Shared Variance
MVNO	Mobile Virtual Network Operator
MVNE	Mobile Virtual Network Enabler
PCLOSE	p of Close Fit
RMSEA	Root Mean Square Error of Approximation
SC	Switching Costs
SEM	Structural Equation Modeling
SRMR	Standardized Root Mean Square Residual
VIF	Variable Inflation Factor

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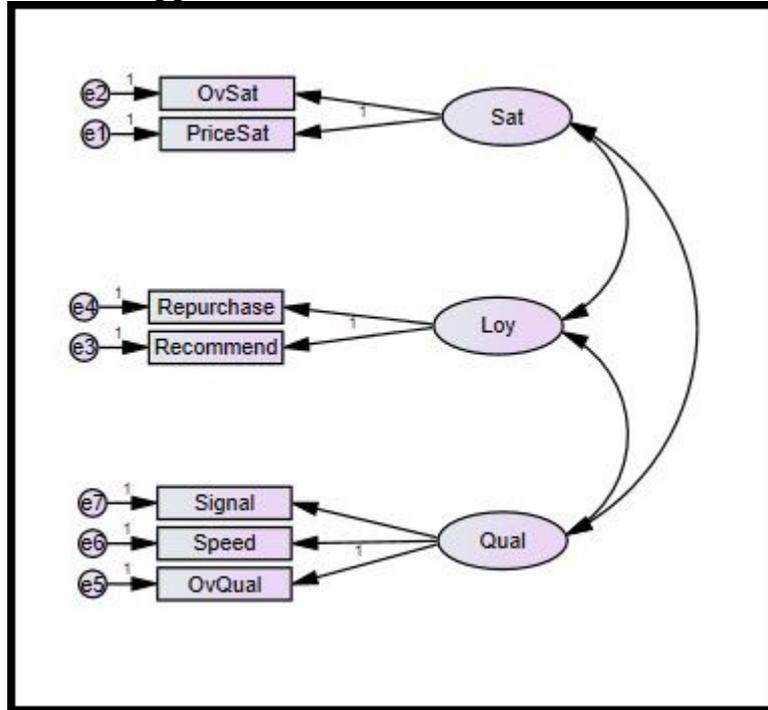
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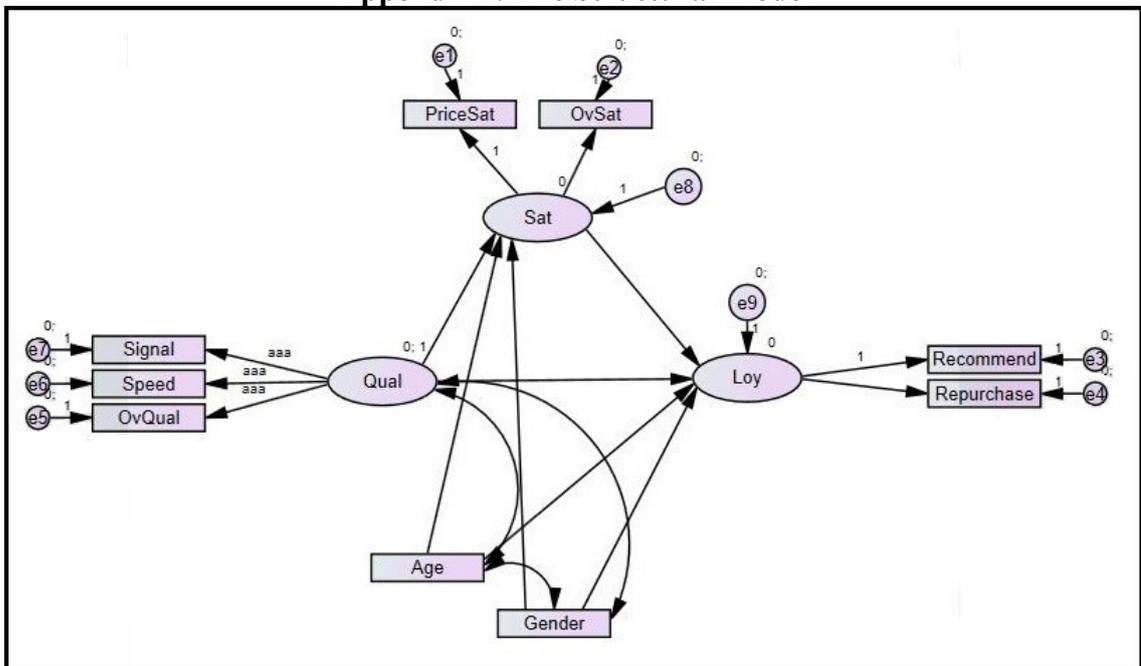
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Appendices

Appendix 1. The Measurement Model



Appendix 2. The Structural Model



Appendix 3. Moderation in the Structural Model