Network Quality, Price Perception and Customer Satisfaction: Case of Internet Service Providers in Albania

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Abstract
Internet has significantly changed the individuals' lifestyles and lots of aspects of society, as well as having a major impact on economic growth and sustainable development. However, the Internet usage and diffusion vary greatly depending on economic and social conditions of the country. In the situation we are in, it seems clear that internet access is so necessary, even more than ever before, that it has become an inevitable tool in our daily routine. Fixed broadband Internet access services have experienced steady annual growth during the last years in Albania. This study is conducted to identify customers view regarding network quality, price perception and customer satisfaction for Internet Service Providers in Albania. The target population of this study is comprised by individuals who use a fixed broadband Internet line. The results of descriptive analysis indicated that 52.4% of the respondents are satisfied with the Internet Service Provider offering the services, for 51% of the respondents the price charged by their Internet Service Provider is reasonable, and 51.7% can access the network at anytime without delay. The results of logistic regression model indicated that network quality and price perception were positively related to customer satisfaction, whereas monthly payment for the Internet service was negatively related to customer satisfaction. The findings of this study provide useful information for customers, government institutions, and top managers of Internet Service Providers.

Keywords 1
Fixed Broadband Internet user, network quality, price, customer satisfaction, Logistic regression.

1. Introduction

Internet has revolutionized communications and methods of commerce by allowing various computer networks around the world to interconnect. Internet firstly emerged in the United States in the early 1970s but did not become visible to the public until the early 1990s. By 2020, more than half of the world's population, or approximately 4.5 billion people were estimated to have access to the Internet [1].

The use of technology has gone through a rapid growth over the last decade in almost all countries in the world. What the internet enables us is not only comprehensive information but also communication and business continuity wherever we are. Thus, it is worth to highlight that having internet access nowadays is really important.

Internet Service Provider (ISP) is a company that offers people or businesses internet access as well as other internet services. "The World" was the first commercial ISP in the world that provided a direct connection to the internet with its first customer logging in in November 1989. By the late 1990s there were approximately 10,000 ISPs around the world, more than half located in the United States [2].

Dial-up is where the connection with internet got started. It required a phone-line to operate, so phone calls could not be made using a landline while the Internet was in use. With dial up the maximum speed is 56 kbps, relatively slow. At this speed, a single low-quality song would take around 10 minutes to download it at full speed. Speed was a significant issue in the early times. The next development of home browsing was the introduction of broadband and wireless Internet [3].

The earliest broadband was available by 1996, in North America. In the early 2000s dial-up started to be replaced by broadband as much as between 2000-2001 the number of subscriptions increased by 50%. By 2010 over 65% of U.S households had adopted fixed broadband. Fixed broadband access networks vary greatly in speed and other characteristics [4]. To access the Internet households can chose between different broadband technologies: DSL (digital subscriber line), cable modem, optic fiber, wireless and Satellite [5].

Internet is a powerful technology that has significant economic effect, has become an incredibly valuable informational resource and will have a long-term impact on the quality of life in developing countries [6]. Results of the study of [7] using World Bank data about Internet Users per 100 inhabitants, indicated that the diffusion of internet in Albania has achieved the maturity level. Fixed broadband access services have experienced steady annual growth during the last years [8].

The aim of this paper is to identify factors that influence the customer satisfaction for Internet Service Providers in Albania. The factors considered in this study are network quality, price perception, monthly payment for the Internet service and experience with an Internet Service Provider.

2. Development of Fixed Broadband Internet Market in Albania

The internet has brought significant changes also to the Albanian Society and economy. The first international connection to the internet in Albania was made in 1993 [9]. The internet service in the country for the first time was provided by the UNDP in 1996. To provide

internet service, the dial-up connection was used (via telephone lines). The first private company to offer paid internet service was ICC (Intellectual Communications Center) and its service started in 1998. Immediately after that, three other ISPs (Internet Service Provider - ISP) entered the market, namely ADA-Net, AbissNet and ABCom. The general public, businesses and institutions began to have somewhat a greater access to the Internet only after 2000, when in addition to private ISPs, the Internet began to be provided by the state operator AlbTelekom. The fixed broadband connection, which in western countries had started to be applied since 2001(bringing the transition of the Web to its second phase Web 2.0) in Albania had a very slow and limited spread. The access of Albanian families to the Internet continues to remain at a low rate until 2007. Number of subscribers with internet access through fixed broadband connection in 2007 was about 1800. The largest investments in recent years have been made in the direction of increasing internet access through fixed broadband connection. Thus, the number of subscribers with fixed broadband access has been growing over the last years.

Fixed broadband access services have experienced steady annual growth especially during the period of time 2013-2019. All major operators are noted to have a positive progress in recent years and the largest increase has been recorded by "other operators", number of subscribers of which during 2019 has been increased by 87% compared to 2018. The number of subscribers with fixed broadband access at the end of 2019 reached about 433 thousand, which is an increase of about 20% compared to 2018. Main fixed broadband operators include ALBtelecom with a share of 30.6% and Abcom with a share of 17.13%, ASC/Tring with 12%, as well as Abissnet with 9%, Nisatel 3% and Digicom 4%. The rest of the market is divided into alternative operators that offer Internet broadband, based on fixed networks [8]. The year 2020 was a novelty for all of us as we were obligated to continue working from home so accessing to the internet seemed very important. The number of subscribers with broadband Internet access from fixed networks in the third quarter of 2020 reached about 480 thousand, which is an increase of 1.6% compared to the previous quarter and an increase of about 17.3% in compared to the same quarter in 2019. During

2020, the largest increase in the number of subscriptions[2] was achieved during the second quarter of 2020 (because of lockdown) with about 462 thousand subscribers, which is an increase of 7.3% compared to the previous quarter and an increase of about 15.6% compared to the same quarter in 2019. [8, 10]
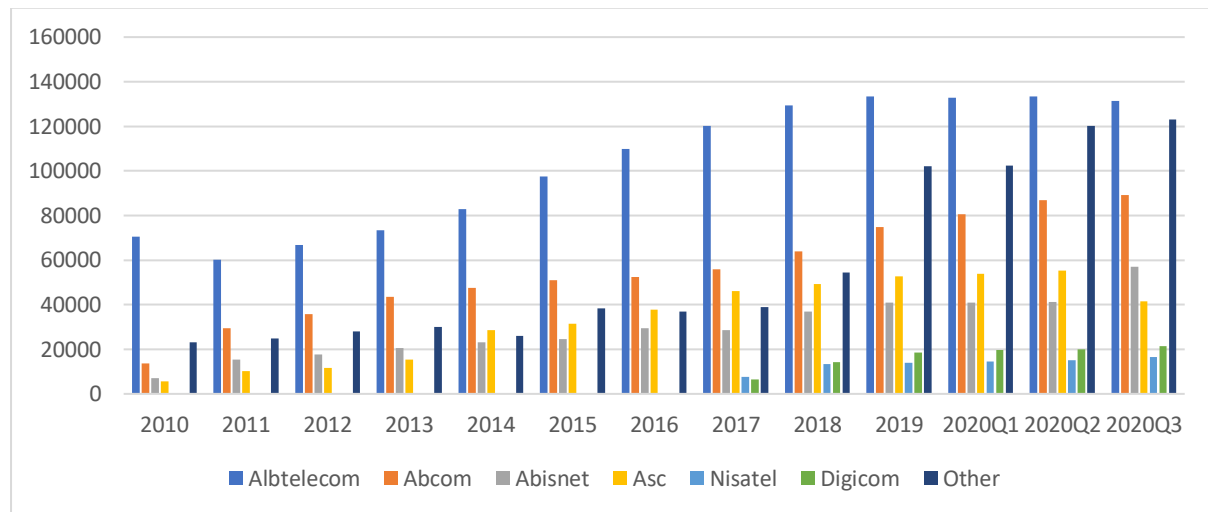
Figure 1. Number of subscribers with fixed broadband access (Source: [8],[10])

Fixed broadband penetration for both population and family, as given in the Figure 2, in the period 2013-2020 has increased more than twofold [10]. In 2019 the fixed broadband access penetration rate was about 60% per households and 15.6% for population.

The average penetration rate through fixed networks in urban area was 25%, and in rural areas was 5%.

Fixed broadband penetration remains well below the EU average and other penetration levels of neighboring countries, albeit growing by 10%-15% annually [10].
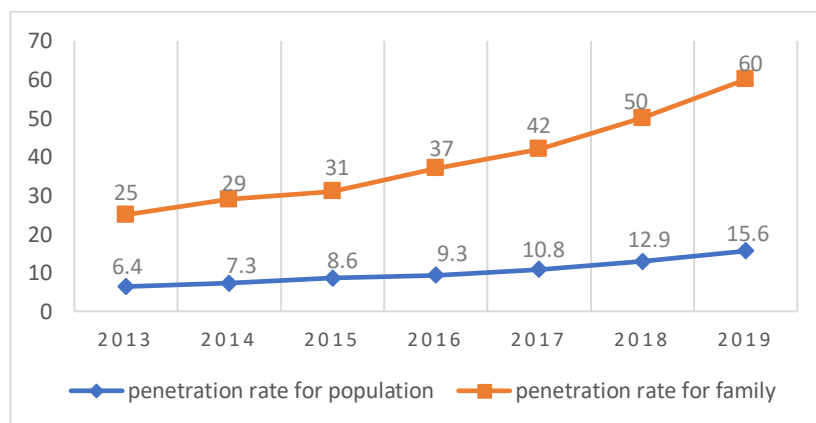
Figure 2. Penetration rate (Source: [8],[10])

The main technology that is used to deliver fixed broadband connections is via DSL followed by FTTH/FTTB. About 49% of the total connections are DSL and 29% are optic fibers. Optic fibers connections are increased by 4% compared to year 2018. The provision of

internet services through fiber optics offers the provision of service with the highest quality and stability.

As regard to fixed broadband by download speed, AKEP (Electronic and Postal Communications Authority) reported that the

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[2] The indicator includes internet access with broadband access from fixed network or wireless and satellite service. Mobile network broadband access is not included.

most commonly used speed is 4-10 Mbps with 55% of subscribers on 2019. The data show that the number of fixed broadband subscribers with speeds lower than 4 Mbps is decreased while for speeds above 4 Mbps, it is increased. Thus, even the speed of internet seems to have an upward trend [10].

According to [11], the average global speed for fixed broadband connection is 98.67 Mbps. Albania ranked 87th in this ranking with an average fixed broadband download speed of 43.72 Mbps.

Total revenues from fixed broadband Internet services at the end of 2019 were 8.69 billion ALL, with an increase of about 5% compared to 2018 [8].

According to [8] and [12] the main trends in the electronic communications market are: significant increase in the number of subscribers with broadband access from fixed networks, revenue growth for the sector and an increase of penetration rate.

3. Literature Review

Customer satisfaction is the central element of the marketing concepts. According to [13], "There is but little doubt that the maximization of consumer satisfaction is considered by most to be the ultimate goal of the market economy". If consumer satisfaction is the fundamental element of the market economy, it is important to understand satisfaction and dissatisfaction processes among ISPs to better market ISP services to them, develop new products, manage competitive forces, provide supporting services, and price services. [14]

Customer satisfaction with the purchase is determined by how tightly consumers' expectation is linked with the perceived performance of the product. A satisfied consumer is more likely to spread positive word-of-mouth and information received through word-of-mouth are more credible than a commercial advertisement [14].

Consumer satisfaction is often measured by how the product or service in question meets expectations [15]. If the perceived performance is above expectations, then the customer is satisfied. And if perceived performance will be under expectations, the customer is dissatisfied. Compatibility between customer's perception of the product and its initial expectations leads to customer satisfaction. The benefits of satisfied customers lead to much attention from company management on the subject [15].

In the telecommunications market, network quality is one of the most important drivers of overall service quality [16], which leads to customer satisfaction in the context of telecommunication ([17], [18]). In the Internet service industry, network quality includes the quality and strength of the network signal, number of errors, downloading and uploading speed [19]. Stability, transmission speed and network coverage are the core attributes of network quality [20]. Breaks in Internet connectivity can lead to poor perceptions of network quality in the customer's perspective. In this respect, timely recovery of network connectivity is essential. The uptime of service was tested to have impact on customer satisfaction as well as customer loyalty [18].

Price is also an important driver for consumers to make buying decisions. According to [21], "the price is defined as what is given up or sacrificed to acquire a service or product". The sacrifice or price that a customer pays typically consists of transaction costs and some degree of risk. While [22] suggested that "Price is the amount of money charged for a product or a service; the sum of the values that customers exchange for the benefits of having or using a product or service."

Customer value is evaluated on the benefit of the product or service that is perceived by the customers. The price of the product determines the value of the customers. Customers seek the product and services prior to the payment of the price. If the product price meets the expectations of the customers, the value will increase simultaneously otherwise it may decline. However, it is also very important to maintain the relationship with the customers along with price, product and so on [23].

With regards to price perception, although Internet broadband users are willing to pay more for better service, they will consider changing to another provider because of the price factor [20]. Therefore, it is believed that customers of Internet services are sensitive to price and the higher price level could lead to low demand, accordingly.

In the study of [24] was found that the satisfaction of the customer is mostly influenced by Responsiveness, Assurance, Empathy and Network Quality.

The findings of [25] reveal that dominant service quality dimensions for ISPs were

network quality, customer service, information quality and privacy. Furthermore, service quality directly influenced customers' complaining and switching intention.

The study of [26] found that the network quality has the most positive impact on customer satisfaction, followed by perceived quality.

In the study of [27], the results show that customer trust, service quality and price perception have a positive effect on customer satisfaction.

Study of [28] showed that price perception has a direct linear relationship with customer satisfaction in telecommunications.

4. Research Methodology

This study targets the family member over the age of 18 with a fixed Broadband Internet connection at their home and that use the Internet at least once a month. All data were collected through a self-administered questionnaire in the period 10 to 25 January 2021. Non-probability sampling (purposive sampling) was used to gather the data. Out of 650 distributed questionnaires, only 147 questionnaires were returned completed and valid to use for data analysis.

The questionnaire is designed in four parts. The first part includes questions about experience, type of link and speed of link, monthly payment, and also name and location of ISP. The second part of the questionnaire consists of questions about the network quality (4 items), price perception (5 items) and customer satisfaction (1 item). The third part of the questionnaire includes questions about the personal characteristics of the respondents such as age, gender, education level, family monthly income level. An open question about additional comments about the ISP is included in the questionnaire.

The items of the second section of the questionnaire were adopted from the literature ([26]). All the items were measured on a five-point Likert scale, ranging from 'strongly disagree' to 'strongly agree'. A higher mean score on an item indicates greater level of agreement. The Cronbach's alpha coefficient was calculated for all items to ensure that the items comprising factors produced a reliable scale. According to [29], reliability less than 0.6 are generally considered to be poor, those in a range of 0.7 to be acceptable and those over 0.8 to be good. Composite score is used to represent each factor by taking the average store of all items for that dimension, that is network quality and price perception.

To study the influence of network quality and price perception on customer satisfaction, the logistic regression analysis was used. A logistic regression model with a binary response was modeled. For the data analysis, the response was coded as 1 or 0, respectively. Logistic regression is recommended over linear regression model when modeling binary responses and estimates probabilities of the response occurring [30]. The logistic regression equation takes the form:

$$ln\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k$$

where p is the estimated probability that the customer is satisfied, and x_1, x_2, ..., x_k are independent variables.

The estimated probability of the response occurring (p) divided by the probability of it nor occurring $(1 - p)$ is called the odds ratio. Maximum likelihood method is used to estimate the odds ratios of the model. Values of odds ratios lower than 1 indicate negative association, odds ratios equal to 1 indicate no association, and odds ratios higher than 1 indicate positive association between independent variables and the dependent variable of the model.

STATA12 was used to data analysis.

5. Results and Discussion
5.1. Descriptive analysis

The respondents were from Tirana (49.7%) and 23.2% from Durres, 57.8% were female, 47.6% were between 18 and 25 years old and 25.2% were between 26 and 35 years old. About 36.7% of the respondents hold an university diploma, and 49% a master diploma. Majority of the respondents (46.3%) were employed in public sector, 24.5% work in public sector and 13.6% were students. Around 34.7% of the respondents have declared family monthly income between ALL 60,001 and 90,000, and 31.3% less than ALL 60,000.

Also, around 21% of the respondents have been using at home Internet service for less than 1 year, and 17.7% for 1 to 2 years and 30.6% for more than 3 years (Figure 3).
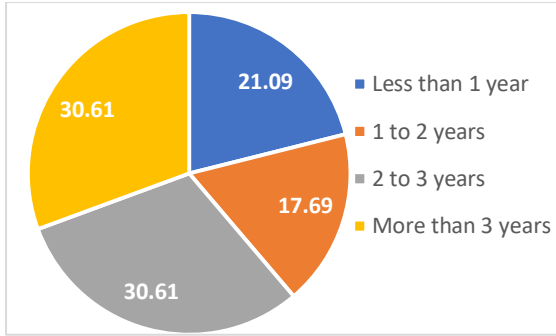
Figure 3. Experience with at home Internet service

About 26.5% of the respondents use the service of Albtelecom, 17% ABCom, 13% Tring, 8% Abissnet and 7.5% DigiCom (Figure 4).
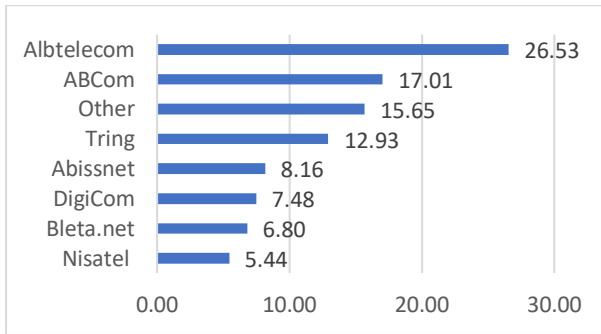

Figure 4. Internet Service Providers

Related to monthly payment for the Internet service, 43.5% of the respondents pay between ALL 1001 and 1500, and 38% pay between ALL 1501 and 2000 (Figure 5).
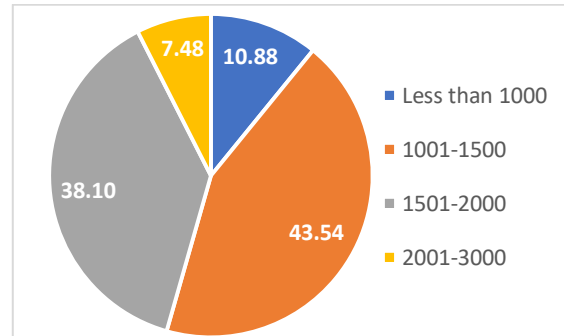

Figure 5. Monthly payment for the at home Internet service

Network Quality

Table 1 shows the results about four items of network quality. The results indicate that 43.5% of the respondents have declared that the upload and download speed of the network is always strong, 39.4% have declared that the uptime of the network is always available without interruption, 42.1% that the connection quality is always reliable and 51.7% that they can access the network at any time without delay. Also, all the items have Cronbach's alpha value higher than 0.84, so their reliability is good.

Table 1. Network quality

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Cronbach's Alpha
The upload and download speed of network is always strong.	6.80%	24.49%	25.17%	38.78%	4.76%	0.873
The uptime of network is always available without interruption.	6.80%	34.69%	19.05%	27.21%	12.24%	0.869
The connection quality is always reliable.	8.16%	19.05%	30.61%	33.33%	8.84%	0.856
You can access the network at anytime without delay.	6.80%	17.69%	23.81%	39.46%	12.24%	0.849

Price Perception

Table 2 shows the results about five items of price perception. The results indicate that 51% of the respondents have declared that the price charged by their Internet Service Provider is reasonable, 35.3% have declared that the service's price of their Internet Service Provider is cheaper than others, 42.2% that the service supplied by their Internet Service Provider is equivalent to its price, 44.2% that service offered by their Internet Service Provider is better value for money than what they would pay for the same service of others, and 37.4% that they are willing to pay more for better service quality. Also, four items have Cronbach's alpha value higher than the

generally accepted lower value of 0.7.

Table 2. Price Perception

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree	Cronbach's Alpha
The price charged by your Internet Service Provider is reasonable.	10.20%	13.61%	25.17%	34.01%	17.01%	0.679
The service's price of your Internet Service Provider is cheaper than others.	7.48%	21.09%	36.05%	25.85%	9.52%	0.711
Service supplied by your Internet Service Provider is equivalent to its price.	6.80%	21.09%	29.93%	33.33%	8.84%	0.707
Service offered by your Internet Service Provider is better value for money than what you would pay for the same service of others.	7.48%	17.01%	31.29%	36.73%	7.48%	0.717
You are willing to pay more for better service quality.	12.24%	20.41%	29.93%	27.89%	9.52%	0.845

Customer Satisfaction

The results of the item for customer satisfaction indicated that about 52.4% of the respondents have declared that overall, they are satisfied with the Internet Service Provider offering the services.

5.2. Logistic regression Analysis

The results of binary logistic regression model, shown in Table 3, indicate that the model was statistically significant (LR chi-square (8) = 98.63, p < 0.05). The value of Pseudo-R^2 was 48.48% and the percentage of cases correctly classified was 83.67. According to [29], the classification accuracy should be at least 25% greater than that achieved by chance.

Table 3: Results of Binary Logistic Regression

Variable	Coefficient	p-value	Exp(b)
Network Quality	1.859	0.000	6.416
Price perception	1.372	0.005	3.944
Experience:			
Less than 1 year (RC)			1.000
1 to 2 years	-0.404	0.604	0.668
2 to 3 years	-0.319	0.666	0.726
More than 3 years	-0.336	0.643	0.714
Monthly Payment for the Internet service (ALL):			
Less than 1000 (RC)			1.000
1001 – 1500	-2.448	0.037	0.086
1501 – 2000	-2.502	0.039	0.082
2001 – 3000	-3.385	0.026	0.034
Constant	-7.626	0.000	0.0005
LR chi-square (df),		98.63 (8)	
Prob > chi2		0.0000	
% correctly classified		83.67	
Pseudo-R^2		48.48%	

Note: RC indicates the reference category.

The odds ratios (values) indicated that the network quality was positively related to customer satisfaction, that is, customers that have experienced very good network quality were more likely to be satisfied with the Internet service. This finding is consistent with the results of [24], [25] and [26].

Price perception was positively related to customer satisfaction, that is, customers that have experienced a high value for the Internet service were more likely to be satisfied with the service. This finding is consistent with the results of [27] and [28].

Experience (time using the Internet Service) of the customer was not significant at 5% level. However, experienced customers were less likely to be satisfied with at home Internet service.

Also, monthly payment for at home Internet service was statistically significant at 5% level and negatively related to customer satisfaction, that is, the customer that pay more for the service were less likely to be satisfied customers.

6. Conclusions

The main objective of this study is to analyze the ISPs in Albania related to network quality, price perception and customer satisfaction.

Based on the results of this study, about 52.4% of the respondents are satisfied with the Internet Service Provider offering the service; for 51% of the respondents the price charged by their Internet Service Provider is reasonable, and 37.4% that they are willing to pay more for better service quality; 51.7% of the respondents can access the network at any time without delay and the upload and download speed of the network is always strong for about 43.5% of them.

The results of logistic regression model indicated that network quality and price perception were positively related to customer satisfaction, whereas monthly payment for the Internet service was negatively related to customer satisfaction at 5% level. There results indicate that the customers that have experienced very good network quality and high value for the service were more likely to be satisfied for the Internet service, while the customers that pay more for the Internet service were less likely to be satisfied customers.

The findings of this study provide useful information for customers, government institutions, and managers of Internet Service Providers. It will be helpful for businesses to know network quality and consumers' price perceptions for improving network quality and for realizing their pricing strategies.

This study has some limitation. Firstly, only four factors are studied. Secondly, the sample was small and it is not representative for all the country. Thirdly, the non-probability sampling was used to gather the data in short time.

In the future, the research can be performed to identify other factors such as service quality, perceived value, switching cost, trust, etc., that can influence the customer satisfaction and customer loyalty using structural equation modeling.

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