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Churn and loyalty behaviour of Turkish digital natives

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CHURN AND LOYALTY BEHAVIOR OF TURKISH DIGITAL NATIVES

Abstract

The mobile industry drives innovation and economic growth all over the world, thanks to the application industry, content providers and mobile handset producers and operators. With a very young and dynamic population and a remarkable 96 percent mobile penetration rate, Turkey is no stranger to this trend. Yes, this very segment – commonly referred to as digital natives – also poses a dilemma for telecom operators: a high rate of attrition or the churn phenomenon. This paper reports on an empirical examination of the churn and loyalty characteristics of digital natives in the Turkish context. We employ a large sample of youth and analyse their churn and loyalty likelihoods. Overall, we find convincing evidence that, by having a consumer-centric approach and knowing more about their individual customers, telecom operators can drive loyalty and prevent churn. The rise of big data and sophisticated analysis based on behavioral patterns implies that operators now have the tools they need to predict consumer behavior better than ever before.

Keywords: Digital Natives, Churn, Loyalty, Consumer Behavior, Turkey, Mobile Services

CHURN AND LOYALTY BEHAVIOR OF TURKISH DIGITAL NATIVES

1.Introduction

The mobile industry drives innovation and economic growth all over the world, thanks to the application industry, e-commerce, mobile handset and content producers and operators. So that, 4.5 % of global GDP in 2017, which makes \$3.6 trillion, is generated by mobile services (GSMA, 2018). Turkey is no stranger to this trend with its young and dynamic population and a remarkable 96 percent mobile penetration rate.

The appetite for fast mobile data triggers the continuous technological development in the mobile spectrum industry and keeps the mobile sector very dynamic. The mobile sector has pocket share of almost every consumer, and the sector directly or indirectly affects many other industries. Nevertheless, this sector is also facing formidable challenges. These include: enhanced competition between over-the-top (OTTs) content providers and telecom operators, slow-growing mature markets, reduced retail prices, switching behavior of customers for better deals, huge coverage costs and investment obligations, as well as high spectrum and network equipment fees. These competitive threats have compelled mobile operators into integration and consolidation. In Europe, the number of mobile operators has fallen by a quarter though regulators are reluctant to mergers and acquisitions. In this turbulent competitive environment, mobile operators are keen on keeping existing customers in order to preserve revenue flow and upsell opportunities. Various studies also confirmed that retaining customers is much more advantageous and cost-effective than gaining new ones (Keramati and Ardabili, 2011; Seo et al., 2008).

The churn phenomenon, broadly defined as customer attrition, has become a much riskier issue for mobile operators, not only in mature markets (Ahn et al., 2006), but also in growth markets such as Turkey. Turkish operators have a churn rate of roughly 2.5 percent a

month. Churn lies at the heart of competition. Customers leave their current mobile operators for better deals or negotiate with them to get better rates; otherwise threatening them to terminate their subscription.

Despite this grisly sector trends, with a median age of 30.5 years, and 40 percent of its population under 25¹, the Turkish mobile market offers exceptional growth opportunities for mobile operators. Meanwhile, traditional mobile subscriber turns from connected customer to the digital consumer (GSMA, 2018). These new digital consumers have smartphones and use mobile internet actively. Footprints of digital consumers are everywhere. Physical sales and customer services channels have been replaced by digital ones. Lifestyles of consumers are getting highly dependent on online ecosystems. Briefly, mobile internet and applications have changed the facet of the consumer with endless stream of interactions via mobile phones (communications, e-commerce, entertainment etc). The evolution of digital consumer led mobile operators to enhance their customer service channels served over social media and operator-specific mobile applications. Among these digital consumers of society, young people are the most digitally literate who were grown up in the world of digital games, music and chat. Furthermore, these young people during their university studies are much more empowered by technological skills as self-directed and curiosity-based platforms encourage software and application usage.

In our study, we focus on this youth segment, which we call the *Turkish Digital Natives* (TDNs). TDNs have benefited from the internet and technology all their lives. While Turkish mobile operators have developed aggressive youth loyalty programs to attract these TDNs, little is known about their consumption preferences and patterns. The literature is scant in its examination of digital natives. Thus, the present inquiry attempts to shed light on the behavior of digital natives in the Turkish telecommunications sector.

¹ Which amounts to some 33 million young consumers.

The 'digital natives' concept was first coined by Prensky (2001) to refer to youth who grew up with technology. Their early life is typically spent with computers, videogames, digital music players, video cameras, cell phones, and all other toys and tools of the digital age. In 1996, this new generation was also labelled as the *Net Generation* by Tapscott (1998). Essentially, digital natives are millennials who are likely to be equipped with smartphones, and have long had access to a variety of mobile applications. Meffert and Mohr (2017) refer to this segment as "*always on* digital customers". The business community has conducted several in-depth examinations of Millennials and their consumption preferences and patterns (see, for example, Ipsos Mori, 2017). Digital natives are generally online intensively and interact with their friends through social media. In the present paper, we investigate the TDN phenomenon among the Turkish youth. This generation grew up with the commercialization and widespread diffusion of information and communication technologies in Turkey. As such, it is indicative of their peers in other rapidly transforming emerging markets.

Specifically, our aim is to methodically predict the churn and loyalty characteristics of digital natives in the Turkish context, not only covering customers of one operator but also all of operators in the marketplace. Meanwhile, both academic literature and operators spend enormous efforts to predict the customer behavior in advance in order to prevent customer churn. Mobile operators also spend tremendous marketing activities on this young segment such as flexible quota program for social media and extra data usage in the late night etc.

With this background, the paper is organized as follows. First, we review the current research and determinants of churn and loyalty behavior in the mobile sector. Next, we examine the Turkish mobile market, its historical growth rates and regulatory developments. We then focus on the main contributions of this paper; an empirical review of both the churn and loyalty behaviors of Turkish digital natives, and the impact of key factors such as type of plans, usage trends, demographic characteristics, and customer satisfaction variables. As

such, this study represents a pioneering effort to examine this important market segment for telecom operators and bring some regulatory policy recommendations.

2. Literature Review on Churn and Loyalty Concepts

There is no agreed upon definition of churn in literature, which can be broadly defined as customer attrition, turnover, customer loss or defection. Churn is a word derived from 'change' and 'turn' (Lazarov and Capota, 2007), and it refers to the loss of customers who switch from one operator to another (Mozer et al., 2000; Glady et al., 2009). Churn can also imply low or no activity by the customer (Poel and Lariviere, 2004; Buckinx and Poel, 2005). In the context of this study, we simply define churn as the act of voluntarily switching from one mobile operator to another.

Churn is a formidable challenge for operators as it erodes market share and profitability (Keaveney, 1995). Therefore, customer churn has attracted considerable attention, due to the recognition by managers that the cost of acquiring new customers is much higher than retaining existing ones. Lowering churn rates is more profitable strategy than gaining market share or reducing costs since new customers are generally unprofitable for a some time after the acquisition and long term customers are much more likely to buy new services than short term customer and spread the positive word of mouth (Zeithaml et al., 1996). Customer retention, opposite of churn concept, can be described as activities of mobile operators performed to maintain long-term relationships with consumers (Srinuan et al., 2014). An increase in customer retention rate boosts company revenues, and, interestingly, also results in customers who are less sensitive to price increases (Lee et al., 2001). Thus, consumer loyalty can result in price inelasticity -- a desirable outcome from the perspective of the firm. Moreover, it is evident that loyal, long-term customers are less costly to companies and they broadcast positive word-of-mouth. While churn behaviour is an outcome managers wish to

avoid, customer loyalty is a virtue. When customers preserve their relationship with the company, loyalty results (Ahn et al., 2006; Gerpott et al., 2001, Lee et al., 2001). Loyal customers are less costly to the company and create new revenue streams via upsell opportunities (Garin-Munoz et al., 2016). Kim et al. (2004) argue that customer loyalty is key to company growth and performance. Kim and Yoon (2004) described loyalty as willingness to recommend her company to other people, which can be considered robust form of trust. This practical way of measuring loyalty is used nowadays by mobile operators. They frequently ask customers whether they could recommend their operator to friends and finally operators publish the recommendation results with customer satisfaction scores at their webpages.

Despite the enormous efforts of companies to stop churn, customers still churn (Kumar et al., 2015). Consequently, many companies have been developing sophisticated churn prediction tools to enhance customer retention (Dierkes et al., 2011; Ascarza et al., 2017). There is extension literature on churn prediction models in telecommunications sector (Huang et al., 2015; Hung et al., 2006; Almana et al., 2014; Au et al., 2003; Pendharkar 2009; Wei and Chiu 2002). Several churn prediction techniques have also been developed to assess why and when churn will occur. Buckinx and Poel (2005) attempted to determine when non-contractual customers relationships tend to be terminated. Verbeke et al. (2011) advises that appropriate segmentation of customers would let operators use their limited resources efficiently to detect customers who are most likely to churn. An extensive overview and discussion of the literature on churn prediction models can be found at the work of Verbeke et al. (2011).

Customers sometimes do not like to be bounded by inflexible contracts and according to a recent research customers would like to pay extra 1.3 Euro per month to reduce this period from 12 months to 6 months (Confraria et al., 2017). In recent years rival mobile operators

have started to cover the termination charge for the switching customer, so that targeted customers might not have to make a trade-off between a termination charge and the benefits of a new mobile operator. Barriers or costs that make switching tough are called as switching cost (Nakamura, 2010; Maicas et al., 2009) and early cancellation charge is one of those costs that mobile operators create not to lose their customers to the rivals (Buehler et al., 2006). Meanwhile, mobile operators find creative marketing tools to enhance switching costs such as loyalty programs. Verhoef (2003) found that loyalty programs with economic incentives drive much more customer retention.

In the telecommunications sector, the scale and coverage area of an operator has always affected the switching costs of customers. This kind of scale generally is beneficial for the operator with largest customer base while driving huge sunk costs to minimum. Scale provides a very strategic leveraging tool for increasing revenue and offering low-cost services meanwhile gaining competitive advantages on network quality and investment. Furthermore, mobile industry shows network effects which means the value of a mobile network increases when new adopters join this network (Corrocher and Zirulia, 2009). Off-net (calls to the other networks) and on-net (calls in the same network) call price difference has played role on choice of mobile subscribers (Birke and Swann, 2010), such that a subscriber, who generally calls her family members and friends, chooses the same operator of the consumer that she calls often (Corrocher and Zirulia, 2009). With on-net and off-net tariff differentiation strategies, incumbent operators could increase the switching cost for their own customers and decrease those of competitors (Atiyas and Dogan, 2007). Zucchini et al. (2013) found that dominant mobile operators are more likely to offer tariffs with on-net discounts in German mobile market. Maicas et al. (2009) found the probability that a customer selects a mobile operator increases with the number of members of her social network already subscribed to that mobile operator. Being a larger mobile network could be vital for some customers such that they would like to pay 2.5 euro more to be a part of

larger network (Confraria et al.,2017). Basaran et al. (2014) also find that social network ties are very important on the operator choice decisions of subscribers in Turkish mobile market. Birke and Swann (2006) confirm that individual choice of mobile operator is heavily affected by choices of other family members in the same household.

Various studies highlights the vital role of social interactions at churn management (Haenlein, 2013). Word of mouth is critical as customers broadcast their opinions to large audiences (Schultz et al., 2012). Those customers who switch operators can also affect others by spreading negative experiences (Verbeke et al.,2011). Word of mouth not also appears to be used for product recommendations but is a vehicle to spread dissatisfaction with a brand (Keiningham et al., 2007).

From the regulatory point of view, absence of mobile number portability (MNP) was vital switching cost that customers were facing utility loss such as missed calls, informing users (Buehler et al., 2006), that is why regulators introduced the MNP in order to increase competition in the industry.

Given the importance of customer churn and loyalty, scholars have explored the determinants of these two phenomena. Kisioglu and Topcu (2011) constructed a churn model based on Bayesian Belief Network with the data provided from one mobile operator located in Turkey. They found that minutes of calls, billing amount, tariff type and frequency of calls have impact on customer churn. A study (Keramati & Ardabili, 2011) conducted in Iranian telecommunications sector indicates that customer dissatisfaction, the amount of service usage and some demographic factors have significant impact on churn or remain. Keaveney (1995) identified eight factors that impact customer churn. These include: pricing, inconvenience, core services failures, service encounter failures, response to failed services, presence of alternatives, ethical issues, and involuntary switching. Other previous studies

underscore that customer satisfaction has a vital impact on customer churn (Kim and Yoon, 2004; Ahn et al., 2006; Gronholdt et al., 2000; Rust and Zahorik, 1993). As a result, highly satisfied customers tend to lift customer loyalty and retention (Kim et al., 2004). (Garin-Munoz et al., 2016) found out that probability of complaining with the bad service experience is higher for younger and educated individuals. A critical factor in determining customer satisfaction is service quality experience of customers. Satisfaction is necessary for customer loyalty but not sufficient for churning since even satisfied customers can churn (Aydin and Ozer, 2005; Oliver, 1999). Even, consumers who are disappointed with the services of companies not always raise voice and make a complaint Garin-Munoz et al. (2016), which highlights the importance of churn prediction and prevention mechanisms. It is necessary to note that , improving customer satisfaction still significantly contributes to customer retention and helps to minimize customer defection (Gijon et al., 2013; Eshgi et al., 2007; Gerpott et al., 2001).

Burez and Poel (2007) identify two types of churn management. First, there are broad, untargeted marketing activities, such as advertising. According to the industry practices (Springer et al., 2014), to prevent churn, telecom operators should invest more in customer services, rather than just advertising. They also need to closely monitor customer complaints and take proactive action before customers lose trust in the brand. A second approach is to specifically target customers who are likely to churn and prevent them from leaving. The second method can be either reactive or proactive. With the reactive approach, the company waits until the customer churns, or threatens to leave. With the proactive approach, however, managers employ monitoring systems to offer incentives for those customers who are most likely to churn. Naturally, management requires sophisticated monitoring and targeting systems to allocate and direct resources to mitigate churn tendencies. Large datasets and dynamic behaviour of millions of customers have compelled telecom operators to employ artificial intelligence tools to improve churn management.

Recent literature advises companies not to stop struggling even after churn of customers (Kumar et al., 2015; Gerpott and Ahmadi 2015; Pick et al., 2016). In other words, companies can reacquire the customers who left the firm already, which is called customer win-back.

3. Overview of the Mobile Market

Globally, 5 billion unique mobile subscriber base makes mobile industry the highest scale consumer technology market in the world (GSMA, 2018).

Scale is may be the most important cost and survival driver of mobile market success because of the very high infrastructure deployment costs and continuous spectrum fees driven by technological development. Therefore all over the world, even in very developed markets like US market, follower mobile players need to combine their synergy and business operations as recent merger case of T-Mobile US and Sprint (Deutsche Telekom, 2018).

Even after the business operations merge, the new market share of this new entity does not catch the second ranking mobile operator (Statista, 2018). Meanwhile, fixed operator BT has taken over mobile company and the transformation from mobile or fixed operator into fully integrated telecom operator has become conspicuous trend in the industry. Furthermore, legacy operators also struggle for the content market and fight with Netflix and Amazon Video with low-cost TV/movie applications.

Behind the demand for consolidation and cooperation activities in the mobile market, there lie coercive challenges from mobile market itself, OTTs and regulatory authorities.

Furthermore, customers look for better coverage and faster network response times while regulation imposes comprehensive coverage obligations. Meanwhile market competition necessitates business innovation in marketing and product portfolio to keep the competition pace with OTTs.

3.1. An In-Depth Examination of Turkish Mobile Market

As an emerging market, the Turkish economy has exhibited remarkable growth over the past three decades as it liberalized and transformed its industries. In Turkey, mobile services have been offered since 1994. Mobile operators generated \$26.4 billion of revenue (3% of GDP) in 2016, and invested some \$4.3 billion in infrastructure.

A recent research conducted by Deloitte (2016) suggests that smartphone dependency or 'addiction' in Turkey is the highest among all investigated emerging markets, including Brazil, China, India, and Russia. Another study² by the Turkish Ministry of Trade also confirms that smartphone ownership has reached 84 percent in Turkey. The same study indicates that the repurchase cycle of smartphones is 3.2 years. Roughly one-in-ten consumers renews her device every year, and two-in-ten do so every two years. All these tend to indicate that mobile industry alters the business and social landscape of Turkish technology ecosystem.

Until the market liberalization in the early 2000's, two private mobile operators (Turkcell and Telsim) provided mobile services where almost all over the world experienced the similar licensed duopoly era. Thereafter, high consumer prices and low network deployment pace led regulators to increase number of the players. In 2001, third and fourth operators entered Turkish the market, however, they failed to achieve a foothold in the mobile market and they had to merge into a new entity in 2003, as shown in Table 1. As observed from the same table, the Turkish mobile market has also exhibited a pattern of significant first-mover advantages (Atiyas and Dogan, 2007) and this trend has not changed for decades. As a result, there have been market failures such that two follower operators are not profitable for years, as seen in table 2. Because of their experience and scale, first-mover mobile

² The study was conducted in 26 Turkish urban areas; with a sample of 1,650, aged 18-69, September 2017.

operators face less churn and higher retention rates³, while late entrants tend to serve less attractive segments of the market (Jakopin and Klein, 2012). Furthermore, without needing on-net/off-net price differentiation strategy, incumbent mobile operator can influence the all telecom market with its huge customer base since network size serves as a quality signal (Karacuka et al.,2013). In Turkish market, this quality issue has been strongly associated with the incumbent operator for years and the leader operator highlighted its superior quality image at its advertisements and company reports and created strong perception in the industry.

Literature suggests that new subscribers joining a network increase the utility of current subscribers (Madden et al., 2004). In 2009, mobile operators started to offer their voice tariffs valid for all directions rather than making operator-based differentiation. This new tariff trend seems to weaken the utility mentioned above. However, considering huge fixed costs of mobile operators , gaining new subscribers can benefit the current subscribers by allowing mobile operator to cut its costs with the increase of scale if the mobile operator is a small one. Meanwhile, it might not be a preferred situation if the mobile operator is a big one since sometimes extra customers can mean quality problems because of the network congestion due to the insufficient capacity.

The pace of adoption of mobile services by Turkish consumers has been robust. While the share of mobile calls was 24 percent in 2004 among total (fixed and mobile) calls, this figure reached 72 percent in 2008, and 97 percent in 2017.

Turkey ranks at the top in the EU in means of calling minutes (MOU) and latest technology usage, as highlighted in the recent Turkish National Regulatory Authority (BTK) report (BTK, 2017).

³ Turkey is no different than this trend, please see Table 5.

Regarding technological developments in the mobile sector, the LTE auction was completed in mid- 2015, and operators began to offer LTE services in the first quarter of 2016 with aggressive rollouts and marketing campaigns. As a result, almost 52 million subscribers embraced the new technology and switched to LTE technology with high speed internet, much faster than the traditional xDSL services. With the launch of LTE in 2016, total mobile broadband subscriptions reached 53.4 million. The huge youth market continues to add to market growth. Today, there are some 76 million mobile subscribers in Turkey, including M2M subscriptions. However, the mobile penetration rate (96 percent) in Turkey is still lower than the EU average (105 percent), suggesting that there is room for further growth.

Table 3 presents the mobile penetration rates in Turkey. The subscriber base has been growing modestly, with an annual rate of 2.5 percent. As can be seen, mobile penetration started to drop sharply after 2008, and reached the levels of 2008 again only after 2014. The reason for this phenomenon was the introduction of the *Mobile Number Portability* (MNP) regulation at the end of 2008. Before this period, the lack of MNP regulation had forced some customers to own two mobile handsets to cope with the on-net/off-net pricing policy of incumbent operator.

In the mobile market, two forces drive growth: smartphones and mobile data⁴. The introduction of rapid data not only transformed society but also the revenue streams of mobile operators who saw a shift of revenue from traditional services (voice and SMS) to mobile data, which now accounts for nearly half of total mobile revenue. This is illustrated in Table 4. In order to compete with OTTs on content, mobile operators create competitive advantages by offering differentiated in-house or outsourced services such as p2p messaging applications, TV and music services, and so on.

⁴ Mobile data, mobile internet, mobile broadband are used interchangeably in this study.

Around the world, a wide array of fixed-mobile bundles is offered to consumers, thanks to mergers between fixed and mobile operators. Yet, such bundles cannot be offered in the Turkish telecommunications market due to terms of telecommunications regulations (Uner et al.,2014). In other words, operators either offer mobile services or fixed services. Therefore, telecom operators are structured as two separate companies, one for fixed services and the other for mobile service offerings. Therefore bundling considered as switching cost in Srinuan et al. (2014) , cannot be implemented in Turkish mobile market because of the regulatory limitations.

Turkish mobile customers tend to prefer post-paid tariffs (pay monthly) over prepaid (pay-as-you-go plan) ones. The current share of post-paid is 52 percent, but migration from pre-paid to post-paid subscriptions continues. Operators are also fond of post-paid plans⁵, as their ARPU (Average Revenue Per User) is higher than pre-paid plans, in addition to some lock-in terms of the contracts. Meanwhile, whether the customer has post-paid or pre-paid plan, switching among the operators persists. Table 5 details the occurrence of churn for the most recent period.

***** Insert Tables 1-5 about here *****

Customer churn rates are calculated by the BTK as dividing the number of switched customers to the total customer base for a selected time interval. Ahn et. al. (2006) found an annual churn rate of 20-40 percent in mobile sector in their studies. The Turkish mobile sector also falls within this range⁶. Kisioglu and Topcu (2011) also confirmed that, in the wireless sector, churn rate was around 2.2 percent per month. Kim et al. (2004) remarked that in Korea, monthly average customer churn rate was around 3.3 percent in early 2000's,

⁵ ARPU level of post-paid customers are at least two times more than of pre-paid ones.

⁶ 12 months x 2.5 % = 30 %.

as new technologies and number portability triggered an increase in the churn rate.

Importantly, the revenue implication of high churn rates is critical for operators. As revenues are in billions TL, churn loss is measured in the hundreds of millions TL.

Regarding the customer satisfaction environment in Turkish telecom sector, the NRA , BTK reported 50,499 consumer complaints in the first quarter of 2017. 52.4 % of them are related to mobile sector. The most complained issue has been the invoice related problems.

3.2. The Regulatory Framework

Even though, mobile industry have enjoyed a light touch regulatory regime, there were occasions that regulators imposed some necessary obligations where needed.

The absence of MNP regulation created switching cost for the subscriber, as one had to change her mobile number. Therefore, MNP regulation has sharply decreased this switching cost (Valletti and Cave, 1998; Gerpott et al., 2001, Sanchez and Asimakopoulos, 2012).

The BTK believes that smooth switching processes are necessary for fair competition and provision of high quality and innovative services. Since MNP regulation was introduced in late 2008, more than 100 million mobile numbers have been transferred. Regulatory authorities follow churn rates and maintain guidelines and rules for smooth switching in the telecommunications sector, such as short switching completion time and no-cost burden for the end users. While switching operators via MNP is beneficial for the consumers and for healthy competition, churn has created serious business risk/opportunities for telecom operators because of two factors: i) long term customers are much more profitable; and ii) customer retention is cheaper than gaining new customers (Verbeke et al., 2011), as mentioned earlier. In order to gain customers from competitors, some rival operators in

Turkey visit the customer at her premises to complete the legal MNP procedure quickly, and pay the cancellation charge on behalf of this customer, if there is one.

In addition to MNP regulation, to eliminate the market power of the dominant player, BTK also implemented wholesale tariff regulation in 2009 in mobile market. The wholesale tariff regulation was issued to prevent the market leader from applying cheaper on-net tariffs than its cost (mobile termination cost). This regulation covered only voice minutes between 2009-2014. Later, SMS was also regulated with a revised regulation in 2014. However, data was never included to this regulation. In summary, under this regulation, market leader Turkcell faced retail price restrictions at its tariffs and campaigns. After an impact assessment, wholesale tariff regulation was later abolished in August 2016. BTK implemented a carefully tailored-rule to protect competition and customers.

4. Research Methodology

4.1 Research objectives

The average mobile penetration in the EU is about 105 percent and this saturation level in the mobile market compels mobile operators to acquire new customers through churn campaigns. In contrast, in the growing Turkish market, penetration is around 96 percent and mobile operators have also turned their attention to the large youth segment, in addition to pursuing aggressive churn management. These churn campaigns have essentially followed three key strategies – or **3W**s: (1) **Who** has the highest propensity to churn? Or, which market segments present the greatest degree of attrition? (2) **When** will this group of customers churn? And (3) **Why** do this group of customers churn? The answers to these three questions provide an implicit guideline for managers to develop marketing strategies that eliminate or reduce the reasons to churn, and allows them to focus on customers with the highest propensity to switch. In other words, the analysis of 3W's serve to determine

target, content, and timing of potential marketing strategies.

Young digital natives, the focus of this research, follow technology closely and adopt quickly to new trends. They have the highest rate of smartphone ownership in Turkey (Deloitte, 2016). Mobile operators also aggressively target this segment (18 to 25 years old) with dedicated marketing campaigns and loyalty programs. Therefore, in the present study we focused on the youth⁷ (18 to 25 years old) who have a choice between switching or remaining loyal to their operator. Although the estimated number of youth in this customer segment is around 10 million in Turkey, not all might be digital natives. Mainly because of socio-economic constraints, some in this group did not grow up with mobile communications and had access to technology properly.

Depending on the findings of past research, we claim that customer satisfaction factors have positive impact on loyalty and negative on churning. High level of service usage is expected to enhance ties with operator so this factor seems to be positively associated with loyalty and negatively associated with the customer churn probability.

4.2 Data collection

Data collection targeted a randomly chosen sample of 18-25 years old undergraduate students in Ankara, the capital city of Turkey. Ankara hosts approximately 300,000 university students, from about six million overall in the country. Some 2,000 survey forms were distributed randomly to the state universities in January 2017, and roughly 1,200 were completed by February 2017. After accounting for missing data, we collected some 1,114 completed responses, representing a response rate of about 60 percent.

⁷ The teens younger than 18 years old would need written approval of their parents to be mobile subscribers.

4.3 Econometric Model

Individuals make decisions among some finite choices. Qualitative or discrete choice model assumes that an individual chooses an alternative which provides highest utility and the model predicts this choice probability based on observed factors. To predict customer behaviour for churning and loyalty, we applied an econometric model based on discrete choice theory. The methodology of the model in this study is replication the work of Kim and Yoon (2004), with some enhanced variables. The Binomial Logistic Regression method was used in order to measure the probabilities of churn attitudes of subscribers. The Binomial method is based on discrete choice theory, which gives consumers' probability for two options (prefer or not prefer) as a function of observed attributes of the subscriber. If a customer prefers churning, then we record this preference as '1' in the econometric model, otherwise as '0'. The same logic works for second independent variable, loyalty. The model predicts whether independent variables have an influence on customer preferences, and, if so, to what extent.

Table 6 lists two dependent variables – churn and loyalty-- and relevant independent variables of the model. The relationship is sought between explanatory variables and probability of churn and loyalty. Explanatory factors are grouped into demographic, customer satisfaction and other relevant variables.

***** Insert Table 6 about here *****

Customer satisfaction is a vital characteristic of churning; there are many previous studies that suggest a strong relationship between customer satisfaction level and churn (Ahn et al., 2006). Customer satisfaction is identified as unobservable/perceptual customer metrics by Gupta and Zeithaml (2006). Customer satisfaction has various sub-dimensions in the mobile

sector, such as network (voice and data) quality, billing, variety of services, tariff level and brand image. Call quality was identified as network quality in the study of Gerpott et al. (2001), which focused only on voice. However, recent developments in mobile technologies, such as 3G and 4G, have made mobile internet a strong substitute to fixed internet service⁸. In fact, many consumers have cancelled their fixed internet in favour of mobile-only internet, since speed and data allowances are becoming very favourable. Subscribers are interested in connectivity, which means minimum connection errors. Research companies in the industry measure call, text, and data performances separately (Rootmetrics, 2017). Therefore, we added mobile internet quality as a new variable (in addition to call quality), where speed is a critical driver of customer satisfaction. Internet quality is vital for consumers while they watch videos and make internet-based calls such as Facetime, Whatsapp etc. As a result, speed and data allowances have become the main determinants of tariffs and marketing campaigns of operators in the marketplace.

Recently, service variety has also been considered a competitive advantage, with operators offering their own 'over-the-top' (OTT) messaging applications, free magazines in mobile application format, music and TV services, and other digital services such as cloud. From the perspective of mobile operators, a wide array of services reduces the cost of customer acquisition while increasing revenue streams. Perceived value for money (Tariff Level), trust (Brand Image), correct billing, as well as the ability of the operator to offer a variety of services have all been included as customer satisfaction factors.

Service usage parameters, such as monthly allowance of data, calls and text, and monthly bills are included in order to analyse how heavy or light usage affects dependent variables.

Post-paid plans are offered in return for a commitment of 12 or 24-months. Post-paid, contractual, plans sometimes become a switching cost that prevent users from churning.

Another switching cost could be family plans, social ties, which are popular in Turkey, where

⁸ According to BTK(2017), mobile data download speed is around 7 Mbps which is a strong competitor to ADSL services, very common in Turkey.

many young university students are semi-dependent on their families. When a TDN is a part of family plan, it could affect their ability to switch operators. Confraria et al. (2017) describe this type of behaviour club network effects.

Longer subscription periods can make consumers much more loyal, while prior churn experience could also affect consumer churn (Kim and Yoon, 2004). As mentioned earlier, the youth is a very dynamic segment in Turkey. Mobile operators manage various youth loyalty club activities that offer some incentives designed specifically for this segment, including extra free mobile data, entertainment and shopping rebates, and even career advice. This club effect can create switching cost (Ahn et al., 2006) or can attract other operators' customers if it is effective and consumers are aware. Gupta and Zeithaml (2006) express that loyalty programs are very vital marketing instruments for retention.

5. Data Analysis and results

5.1 Descriptive Statistics

Some of the selected descriptive statistics for this sample are outlined in tables 7 and 8. The average monthly income of respondents is around 627 TL⁹. The sample includes roughly equal number of female and male participants.

As expected, Turkish Digital Natives use mobile services (925 minutes and 3.6 GB) more than the average Turkish mobile consumer¹⁰. As is the case elsewhere, they create and share a large amount of content via social media channels. On average, TDNs have been with their current operator for approximately three years, and they switched operators at least once before.

The average bill amount of TDNs is 40.9 TL, which is higher than the estimated average bill amount of 36.3 TL for the sector as a whole. This suggests that TDNs spend more on

⁹ 1 \$ equals to 3.7 TL (as date of January 2017).

¹⁰ Turkey average as 436 minutes and 2.2 GB (end of 2016, source : BTK)

telecommunications than the average Turkish consumer. In our sample, if a distinction is made between TDNs who would intend to churn and those who do not, then average monthly spend of churners (42.17 TL) is slightly higher than the ones who would not churn (40.56 TL).

The average monthly expenditure of 578 individuals in post-paid plans was 53.05 TL, while remaining 536 pre-paid subscribers spent only about 27.87 TL a month. Monthly bill amounts also changes, based on the operator: Avea 39.03; Turkcell 49.49 and Vodafone 36.70 TL. Regarding the preferred operators of TDNs; Avea ranks first (43percent), Vodafone second (37percent) and Turkcell third (25percent). This is in sharp contrast to the sector as a whole, where the respective figures are 25, 31, and 44 percent. The billing structure of the sample is similar with the population. It is worthwhile to note that post-paid subscribers can enjoy some discounts during their contractual term, and as a result any early cancellation of the subscription could result in a fee. Each TDN in our sample had a smart phone and a mobile internet subscription.

***** Insert Tables 7 and 8 about here *****

5.2 Empirical Findings

We ran a binary logistic regression using the SPSS software in order to predict the factors that affect loyalty and churn intention of TDNs. Logistic regression method is favourably used in marketing field specially at churn prediction studies because it provides good and robust results (Burez and Poel, 2009).

We then conducted several tests of robustness to assess the model fit as shown in table 9. The Omnibus Test of Model Coefficient is a likelihood-ratio chi-square test of the current model (with explanatory variables), versus the null model (without explanatory variables), for which the results are indicated in Table 9. A significance value of less than 0.05

indicates that the current model outperforms the null model. In other words, the overall model is statistically significant. This test explains the presence of a significant decrease at -2LL value in the current model shown in Table 10, compared to the null model.

***** Insert Tables 9 and 10 and 11 about here *****

As an alternative to chi square test, the Hosmer & Lemeshow test in Table 11 suggests the model is a good fit to the data as $p > 0.05$. The results of both these test demonstrate that the overall model is significant. For two different dependent variables (loyalty and churning), both Tables 12 and 13 list significant independent variables and their contribution to the model, respectively. In these tables; 'B' stands for coefficient of variables, 'S.E' for standard error of the coefficient, 'Significance' for p-value, and finally, 'Exp (B)' stands for the exponentiation of the B coefficient, an odds ratio. Overall, the statistical analysis suggests that most customer satisfaction factors affect both the churning and loyalty behaviour of TDNs. In detail, four customer service factors -- Call Quality (CS1), Tariff Level (CS3), Brand Image (CS4), Billing (CS7) affect both churn and loyalty. As expected, these figures for customer service factors are negative for churn and positive for loyalty.

***** Insert Tables 12 and 13 about here *****

In logistic regression, odds ratios are used rather than the interpretation of coefficients (B). As indicated earlier, the 'Exp(B)' column in Tables 12 and 13 refer to odds ratios, which is the exponential form of B coefficients. For example, satisfied customers on Call Quality (CS1) are 3.628 times more likely to be loyal than unsatisfied customers whereas unsatisfied customers are 3.367 times more likely to churn than satisfied customers¹¹.

¹¹ For the easiness of interpretation, we get the 3.367 from 1/0.297 for easier comparison.

Revenue composition of mobile operators are mostly generated from data. While unit cost of mobile data (per GB) is falling due to continuous technological improvements, there is still need for budget-conscious youth to offload data and stay connected at Wi-Fi spots. In our model, data has meaningful effect on churn. Increasing data usage decreases the probability of churning. Since data has been the main factor of the tariff in means of pricing, enhanced data usage means high monthly bills.

Awareness of operator campaigns increases the churn probability of consumers. In other words, those consumers who are aware of the choices in the marketplace are 1.934 times more likely to churn than those who are unaware.

As discussed earlier, family plans, characterized by at least two members and cheaper rates, are popular among Turkish mobile subscribers. Interestingly, the results of the study show that individuals who are members of family plan are two times more likely to churn than the members of individual plans. One explanation behind this can be that at least one member of the family plan is aware of the opportunities and different options in the marketplace.

Bill amount was not found statistically significant, one possible explanation could be the similar price levels of mobile operators for youth segment as the less variations on demographical variables which are not also significant.

The identity of the operator itself also affects the loyalty preferences of their subscribers. Compared to Avea (which is taken as base variable), subscribers of Turkcell and Vodafone are much more likely to recommend their operators. It seems that customers of market leader are much more fond of recommending their operator to friends.

Surprisingly, loyalty programs have no effect on either churning or loyalty, even though loyalty programs for youth are considered a switching cost (Klemperer, 1987). The

effectiveness of loyalty programs should be questioned and meanwhile literature warns that only three of seven programs are considered as effective (Gupta and Zeithaml ,2006)

Our findings also suggest that demographic factors do not have any significant impact on switching or loyalty. Even literature suggests (Owczarczuk, 2010) that pre-paid customers are much more likely to churn than post-paid ones, our findings do not support this finding. Unlike the findings of Gustafsson et al. (2005), prior churn has no effect on churn equation.

In summary, among 24 independent variables, of 8 independent variables influence churning while another different 7 set of variables have significant impact on recommendation (loyalty). It is necessary to remind that customer satisfaction factors generally do affect both loyalty and churn intention of individuals.

6. Discussion and conclusion

In today's intensely competitive mobile phone industry, the customer is king as telecom offerings are not coming only from traditional telecom operators. As this study reveals, yearly churn rates are above 30 percent in Turkish mobile market, resulting not just only in lost customers for operators but also declining revenue as well. The study identifies the factors that tend to contribute to customer churn and loyalty among youth in Turkey. Despite the considerable size and market potential of these digital natives, their churn behaviour has been largely neglected by literature. Young individuals are, compared to the past, much more knowledgeable, connected, and educated. They also expect more from mobile operators. As the mobile market is becoming ever more saturated, the focus of the mobile operators has shifted to retaining customers. Yet, as this analysis points out, attracting and retaining new customers in a country like Turkey with a large youth population is also critically important for long-term growth.

Mobile operators face various challenges in today's marketplace. The first challenge is intense competition, which has resulted in less loyal consumers. The second challenge for mobile operators is the threat of global OTTs, which provide services like messaging, calls, and other content directly via the internet. This has the effect of turning mobile operators into little more than data pipe conduits. Thirdly, many consumers are choosing to buy smartphones directly from the manufacturer, as this gives them the flexibility to upgrade their phones or switch operators whenever they want and decrease the lock-in effect of mobile operators. Lastly, the mobile market is getting mature, meaning it has limited growth potential, which is a dilemma for operators forced to invest significant capital in future technologies and licensing of bandwidth, like 5G. In this turbulent environment, operators need to keep the valuable customers inside the company and attract profitable new customers, making churn management and customer loyalty critically important.

In addition to findings of past literature, this study also has demonstrated that data usage, type of plan, and campaign awareness do influence the churn behavior of Turkish Digital Natives. Conversely, there does not appear to be a relationship between demographic variables and the churn and loyalty behavior of TDNs. In addition, we do not find any link between youth loyalty programs and churn behavior. As stated above, higher usage of mobile data decreases the probability of churn. As technology evolves and the industry moves more from focus on voice to focus on data, mobile data usage increases exponentially. Our research indicates that having sufficient data is a vital reason for decreased consumer churn. Therefore, mobile operators should focus on ensuring young consumers have high data plans.

Even though regulations (MNP and on-net decision) and operator strategies (thousands of free minutes to all directions/operators) have weakened the network effects in the market, our findings show that social ties are still important for the churn choice of customers. In other words, teens who are part of family plans are more likely to churn than the members of individual plans.

It seems that mobile operators sometimes fail to manage dynamic marketing activities (such as various add-on services over the current tariff) in a systematical way and cause customer complaints. Complex network layers and various business intelligence systems¹², uncertainty of roles and responsibilities between mobile operator and its resellers can create chaos and customer dissatisfaction. Mobile operators require modern tools, such as artificial intelligence, machine learning and big data management in order to prevent these problems in advance. In order to survive in this challenging environment, operators should be agile so that they could meet not only evolving needs of customers but investors and regulators. While operators acquire media companies or create premium content for their customers at their OTT battle, it is still vital to maintain their core business activities at an expected customer satisfaction level. So that, operators need to conduct customer surveys and segment 'likely churners' and offer appropriate deals and reduce churn (Frisiani et al., 2017). Early determination of potential churners can provide much more time to the operators in order to persuade those risky customers (Verbeke et al., 2012). Operators can also question the efficiency of youth loyalty programs which seem no effect on loyalty and churn.

Findings also suggest that call quality is very important customer satisfaction factor that both affect churn and loyalty. In addition to enforcing the coverage obligations, NRAs can force active and passive network sharing much more strictly in order to help both operators and

¹² <https://www.theguardian.com/business/2016/oct/26/vodafone-fined-46m-for-serious-breaches-of-consumer-protection-rules>

consumers where incremental network investment is even hard for small sized operators. The enhanced quality perception shall also be very beneficial for the operators of which quality perception is weak. It is necessary to note that the NRA took vital step to decrease switching cost of end users by number portability regulation and regulated the on-net pricing of the market leader operator. However, in a market where first-mover has still incumbency advantages (number of towers, amount of spectrum, brand name awareness and high quality perception etc.), this situation has direct implications over the follower operators, in means of call quality etc. and healthy competition. In case the number of operators do not change the competitive landscape, regulators need to consider to change the game rules again. Since on-net regulation in Turkish mobile market was result of economies of scale and network effects of the market leader, for two other follower mobile operators which make loss for years , it is not easy to gain market share from market leader which has high quality services and huge customer base. New future technologies such as 5G, demand for much more data and expectation of customer for better service require mobile operators to invest a lot, which is challenging since monetizing of 4G (or LTE) investment have not been realized. Therefore mobile operators either voluntarily or involuntarily (with regulatory approaches) might choose joint utilization of network resources such as national roaming, dynamic spectrum access and other infrastructure sharing mechanisms (Basaure et al., 2016).

As tariffs get so complicated and transparency seems to be lost among various long contract details, NRA can support tariff comparison websites. Thereby, campaigns shall be much more visible for the benefit seeker customers. In addition, in the industry, most of complaints are bill-related and number of complaints is increasing yearly. Consumers may not find the information they are looking for at the web sites of operators easily and wait more to reach call centre of operators. NRAs could take action to prevent the most frequent customer complaints on billing and prevent unfair practices of mobile operators and provide

healthy communication between end users and operators.

While the current study has addressed underlying drivers of customer churn and loyalty in the telecom market, further research is necessary. Future research can examine other customer segments in the mobile market in order to examine which types of customers present greater risk to operators. The impact of customer recommendations in the mobile sector could also be a subject of future research. Furthermore, enhanced sample size or different segment can support or reject the findings of this research.

Intentions may not perfectly predict subsequent behaviour. Behavioural intentions can be perceived as early warning system for showing the risk of churn and operators can take precautions on time. Even behavioural intentions are not actual actions of customers, they are indicators that signal whether customers churn or not (Zeithaml et al., 1996). Jones and Sasser (1995) suggest that measuring the future purchase intents of customers is not an assurance however they provide fairly accurate predictions on behaviour of customers. Further research might focus on actual behaviour of customers and relevant determinants.

In summary, we find convincing evidence that, by having a consumer-centric approach and knowing more about their individual customers, telecom operators can drive loyalty and prevent churn. The rise of big data and sophisticated analysis based on behavioral patterns implies that operators now have the tools they need to predict consumer behavior better than ever before. Customer satisfaction seems to be a strong predictor of customer churn and loyalty according to this study.

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Table 1: Market shares of key operators in the Turkish mobile market

	1994	2000	2001	2002	2003	2005	2007	2017	Subscriber Base (2017)
Turkcell	78.0 %	69.0 %	67.0 %	67.3 %	67.9 %	63.0 %	64.0 %	44.0 %	33.4 Million
Telsim¹³	22.0 %	31.0 %	29.2 %	25.4 %	19.6 %	20.5 %	20.0 %	31.0 %	23.6 Million
Aria	--	--	2.7 %	5.1 %	--	--	--	--	
Aycell	--	--	1.1 %	2.1 %	--	--	--	--	
Avea	--	--	--	--	12.5 %	16.5 %	16.0 %	25.0 %	18.7 Million

Table 2: Net profit of mobile operators (in Turkish Lira, in millions)

	2011	2012	2013	2014	2015	2016	2017
Turkcell	2262	2421	2365	2300	1730	510	285
Vodafone	-697	-92	41	54	-132	-370	-90
Avea	-1055	-753	-727	-793	-935	-1806	-1130

Table 3: Mobile penetration rates

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
92.1 %	86.5 %	83.8 %	87.4 %	89.5 %	90.9 %	92.5 %	93.5 %	94.0 %	94.9 %

¹³ Telsim was acquired by Vodafone at the end of 2005, and changed the brand name as Vodafone. Aria and Aycell merged into Avea.

Table 4: Trends in revenue composition trends for Turkish mobile operators

	Voice	SMS	Data
2008	81 %	9 %	1 %
2016	44 %	7 %	43 %

Table 5: Monthly churn rates of mobile operators (BTK, 2017)

	Average of last 12 months (Apr16-Mar17)	March 2017
Avea	2.5 %	2.8 %
Turkcell	2.1 %	1.4 %
Vodafone	2.5 %	2.8 %

Table 6: Variables and their Operationalization

Dependent Variables

Dummy for Churning	=1: Subscriber intends to churn; =0: Otherwise
Dummy for Loyalty	=1: Subscriber intends to recommend; =0: Otherwise

Customer Satisfaction (CS) Variables

Call Quality (CS1), Internet Speed Quality (CS2), Tariff Level (CS3), Brand Image (CS4), Variety of Services (CS5), Customer Services (CS6), Billing (CS7)	=1: Satisfied; =0: Otherwise
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Demographic Variables

Age	As integer number
Gender	=1: Female, =0: Male
Year at university	=1: First year; =2: Second year, ...
Monthly Income	As a range (inc. scholarship, family contribution etc.)

Tariff (Plan) Characteristics of Customer

Current Operator	=1: Operator1; =2: Operator2; =3: Operator3
Monthly Allowance of Calling Minutes	As integer number
Monthly Allowance of Messaging (SMS)	As integer number
Monthly Allowance of Data (Internet)	in GB as integer number
Type of Bill	=1: Pre-paid, =0: Post-paid
Amount of Monthly Bill	As integer number
Bill Paid by Whom	=1: By my family, =0: by myself
Type of Plan	=1: My plan is individual, =0: if it is part of family plan

Churn and Loyalty factors

Duration of Subscription	As number of months
Prior Churn Experience	=1: Not churned, =0: churned
If Churned, number of Churns	As integer number
Benefiting from Youth Loyalty Club Services	=1: Not benefiting, =0: benefiting
Following All Operators' New Campaigns	=1: Following, =0: not following

Table 7: Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Age	18	25	20.9	1.8
Year at University	1	8	2.7	1.4
Monthly Income (TL)	100	1,000	626.6	273.3
Monthly Allowance of Calling Minutes	0	10,000	924.6	904.9
Monthly Allowance of Messaging (SMS)	0	10,000	1729.2	1751.9
Monthly Allowance of Data (Internet) in GB	0	50	3.6	2.9
Duration of Subscription (in months)	0	240	36.5	32.6
Number of Churn	0	10	1.4	1.3
Amount of Monthly Bill (TL)	10	500	40.9	35.6

Table 8: Sample Characteristics

Variable	Detail	Frequency	Percent
Sex	Male	483	43.4
	Female	631	56.6
	Total	1114	100.0
Operator	Avea	479	43.0
	Turkcell	282	25.3
	Vodafone	353	31.7
	Total	1114	100.0
Type of Bill	Post-paid	578	51.9
	Pre-paid	536	48.1
	Total	1114	100.0

Table 9: Omnibus Tests of Model Coefficients

	Chi-square	df	Significance
Loyalty	324.031	8	0.000
Churn	169.384	8	0.000

Table 10: Model Summary

	-2 Log likelihood (-2LL)
Loyalty	993.426
Churn	1043.560

Table 11: Hosmer and Lemeshow Test

	Chi-square	df	Significance
Loyalty	5.919	7	0.549
Churn	8.486	8	0.388

Table 12: Loyalty - Variables in the Equation

	B	S.E.	Wald	Significance	Exp(B)
Operator			21.039	0.000	
Operator(1)	1.002	0.227	19,480	0.000	2.724
Operator(2)	0.476	0.182	6,823	0.009	1.610
CS1 Call Quality	1.289	0.247	27,135	0.000	3.628
CS2 Internet Quality	0.944	0.284	11,075	0.001	2.570
CS3 Tariff Level	0.390	0.199	3,840	0.050	1.477
CS4 Brand Image	1.105	0.251	19,433	0.000	3.018
CS5 Variety of Services	1.090	0.236	21,382	0.000	2.973
CS7 Billing	0.867	0.201	18,662	0.000	2.380
Constant	-4.162	0.394	111,708	0.000	0.016

Table 13: Churn - Variables in the Equation

	B	S.E.	Wald	Significance	Exp(B)
CS1 Call Quality	-1.215	0.208	34,186	0.000	0.297
CS3 Tariff Level	-0.574	0.178	10,389	0.001	0.563
CS4 Brand Image	-0.837	0.230	13,273	0.000	0.433
CS6 Customer Services	-0.392	0.200	3,839	0.050	0.676
CS7 Billing	-0.498	0.203	6,042	0.014	0.608
Monthly Allowance of Data	-0.095	0.037	6,775	0.009	0.909
Type of Plan	-0.679	0.316	4,627	0.031	0.507
Following campaigns	0.660	0.232	8,112	0.004	1.934
Constant	2.021	0.463	19,044	0.000	7.547