



Impact of Disruptive Innovations on Mobile Telecom Industry in Lebanon

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Abstract

The telecommunication industry is different from other industries in the basis of innovation rate. This industry continuously provides end users with new technological generations and disruptive technologies. Due to the complexity of the nature of the product served, telecommunication industry is an important case to study in order to explain the real reasons for the challenges facing telecom companies. Researching in this area will explain why some companies survive while others fail. The wide range served technology innovations is most likely to result in rapid mutation of consumers' spending habits thus directly influencing the mobile phone companies. The aim of this is to test the reliability of innovations and its impact on companies' profitability. For that purpose, a survey with 200 end users and 20 employees from two telecom providers ("Alfa, and "Touch") was conducted to investigate various disruptive and conventional means and their impact on the financial performance of telecom industry. The results show that most of the revenue of telecom industry comes from usage of data while the industry is lacking for competition, and quality services while charging high tariffs for customers. Currently customers are migrating to data, therefore performing a pressure on the industry to improve its services. To conclude, network operators need to decide what to they want to sacrifice and how far they want to go to reach targeted results.

Key words: *Telecom Industry; Disruptive Innovation; Profitability; Mobile Phones.*

JEL classification: *J62*

Introduction

The mobile telecom industry is changing and the competitive landscapes for mobile network operators are disrupted. The industry is shifting from an environment characterized by reliability and scale of networks, to an environment where choice and flexibility of services is more prominent. As a result, the basis of competition changed thus representing a shift from "mobile telephony" to "mobile computing" (VisionMobile, 2012). Today, this sector is playing a key role in the Lebanese economy even if it is performing below

potential growth. Despite the small population and high urbanization level-Lebanon-- is one of few countries in the Middle East and North Africa Region of mobile phone penetration rate less than 100% in the end of 2012 (BMI, 2013). This trend attributed to low competition in the market, which kept tariffs relatively high and delayed the roll out of network services to underserved areas. Furthermore, it forecasts mobile phone penetration in Lebanon to reach 100.8 subscriptions per 100 inhabitants in 2013 and to rise to 110.1 subscriptions per 100 inhabitants in 2017. BMI is expecting the mobile phone sector in Lebanon to post steady growth between 2013 and 2017 despite relatively uncompetitive tariffs and poor quality of service. Lebanon's young and well-educated population will continue to drive demand for advanced communication services (BMI, 2013).

Therefore, mobile network operators launched third-generation (3G) mobile networks in 2001 and the high-speed wireless data transfer enabled the mobile network operators to distribute more services (Steinbock, 2005). The mobile network operators worldwide attempted to control the services in closed ecosystem portals (VisionMobile, 2011a). The portals gave the mobile network operators the opportunity to build empires and lock-in the customers by restricting them from accessing potential competitors' services. The development of 3G technologies provided a foundation for the upcoming smartphone era; as an example, in 2007 Apple launched the iPhone (Sharma, Operator's dilemma (and opportunity): the 4th wave, 2012a). A small segment of primarily business people previously used Smartphones, but the iPhone managed to target mainstream customers. Ahonen (2011) stated that the introduction of iPhone transformed the industry and that there is a differentiation between two times in mobile telecom industry- "before iPhone" and "after iPhone".

The smartphone era enabled dozens of new services for phones (Sharma, 2012a), which were boosted by touchscreens (Salz, 2011). The content of smartphones is controlled by platforms such as Google Android and Apple iOS, and not by the mobile network operators. This caused the mobile network operators portals to decline rapidly, thus loose some of their interaction with end-users (VisionMobile, 2011a). The mobile network operators were previously able to generate large profits and maintain high margins from the traditional voice and messaging services. However, in the smartphone era the profits from voice services stopped growing or even declined for some mobile network operators, but the usage of data access on the increased rapidly due to the smartphone usage (Sharma, 2012a).

Given the complexity of innovation activity, it seems difficult to find a universal definition. According to Schumpeter (1935), the realization of an invention and the implementation of corresponding innovation are economically and sociologically two different things. Similarly, Alter (2002) describes the invention to be \ the creation of a technical or organizational novelty, of goods, services, or devices, while innovation represents the entire social and economic process bringing the invention to be ultimately used or not. The term 'innovation' applies to both the result of a creative process (which is new), and process itself (Mayrhofer, 2011). Cantwell (2010) defined innovation as the introduction of new products and processes (process). The main difference between product innovation and innovation process (processes): the first relates to the product or service marketed, particularly in terms of functionality, whereas the second characterizes the manner in which the offer is developed and distributed, particularly in terms of costs and qualities (Johnson, 2011).

Hence, Christensen (2013) defines disruptive innovations to be products or services with business models that introduce performance packages that are inferior to what mainstream customers value. During the early development of a disruptive innovation, it only serves niche segments. Both the disruptive innovation and the established offerings improve; the disruptive innovation improves enough over time to satisfy the mainstream customers and eventually replaces the established offerings and incumbents to exceed the demanded performance, see Fig.1 (Christensen C. M., 2013).

Disruptive innovation has completely reshaped numerous companies and industries, thus causing companies to fail while other flourish. Many firms need engage periodically in processes of disruptive innovation to have long-term survival (Christensen C. M., 2003).

Disruptive innovation had an unusual amount of attention from both scholars and practitioners, which is considered rare (Daannels, 2004).

Several authors discussed the impact of disruptive innovation; such as (Bower & Christensen, 1996), (Christensen, E., & M., 2001), (Adner, 2002), (Gilbert & Bower, 2002), (Charitou & Markides, 2003), (Christensen C. M., 2003), (Daannels, 2004), (Schmidt, 2004) (Adner & Zemsky, 2005), (Utterback & Acee, 2005), (Christensen C. M., 2006), (Danneels, 2006), (Govindarajan & Kopalle, 2006), (Markides, 2006); (Tellis, 2006), (Dan & Chieh, 2008), (Sandstrom, Magnusson, & Jörnmark, 2009), (Ansari & Krop, 2012), (Wessel & Christensen, 2012), (Christensen C. M., 2013). These authors focused on definitions, such as causes of disruptive innovation and how it can be classified, foreseen, or handled. However, there is no extensive research on the overall effects of disruptive innovation at an industry level. This study aims to shed the light on the relation between disruptive innovation and value migration.

Knowledge about the effects of disruptive innovation can help managers understand the consequences of their strategic decision-making. Several researchers question the ability of making predictions of disruptive innovation in advance (Thomond & Lettice, 2002) yet others Christensen (2006) and Govindarajan & Kopalle (2006) emphasize possible predictions. Therefore, findings of the effects of disruptive innovation can result in more cost-efficient investments, which positively influences on the company and the societal perspective. New knowledge adds to the theoretical field of disruptive innovation from a practical perspective, the latter is explained by the large interest in disruptive innovation by practitioners (Daannels, 2004).

Through gathering information on the mobile telecom industry in Lebanon, the author identified three main categories of the mobile telecom value network: (1) Mobile networks operators, (2) Infrastructure providers, and (3) OTT players. The mobile network operators play a critical and dominant role in the mobile telecom industry since its start. Almost 94 % of the value of the mobile telecom flowed through the mobile network operators and 97 % of the profits were collected in 2011 (BMI, 2013). The sector of mobile communication in Lebanon is one of the main contributors to the Lebanese economy with a 2% GDP. According to the Ministry of telecommunications, the number of subscribers of mobile telephony exceeded 3 million in May 2011. Despite these important developments, Lebanon is considered the least competitive country in the mobile telephony market of Arab countries. However, mobile telephony in Lebanon recorded an increase of subscribers, BMI (2013) forecasts the number of mobile phone subscriptions to grow at a Compound Annual Rate (CAGR) of 2.9% during the 2013-17 period and to reach 4.9 million in 2017.

Mobile telecom became an important sector to derive technological growth, and impacts human communication and interaction of everyday life (Sharma, 2012a). Disruptive innovation as described before in this paper, however no complete analysis of disruptive innovation lessons from the mobile network operators in Lebanon is available affected the mobile network operators. Indeed, Lebanon is lagging behind other countries in terms of mobile phone, regardless the penetration rate, which has doubled since 2008 to around 60% in summer 2013, it is still considered lower than the penetration rate in other countries in the region such as Saudi Arabia (177%). Despite the fact that recent growth attributed to significant reduction in mobile tariffs, and to a growth in the Internet and free chat applications, Lebanese telecom market is one of the most expensive in the world. We propose to explain how the Lebanese Mobile Operators (LMO) deal with the technological innovations and free services in the telecom market.

Indeed, the innovation in mobile telecom industry is accelerating at a breakneck pace. New telecommunication technology significantly reduces the barriers to market entry and eliminates intermediaries, thus allowing businesses to interact directly with their customers around the globe. The start of the converged voice, data and video technologies show that media, entertainment, computer and telecommunications organizations will all be merging their activities. In the last five years, we have witnessed a particular growing body of research regarding the importance of innovation called disruptive and its impact on financial performance. Mobile telecom became critical to drive technological growth, and impact humans' communication and interaction in their everyday life (Sharma, 2012a). The disruptive innovation influenced the mobile network operators as described by Christensen (2007). The objective of this study is to show how the Lebanese mobile operators, who are applying technological innovations and free services in the telecom market, can constantly profit and ensure their continuity in the market. We believe that understanding the impact of disruptive innovation for Lebanese mobile telecom industry is the most sensitive approach. This paper will discuss the following:

What are the problems and challenges with the telecommunications in Lebanon?

Can the LMO ensure a competitive place in the presence of free applications on the telecom market?

What are the solutions and the policies adopted by these companies to protect their market share?

Literature Review

According to Christensen (2013), disruptive innovations are products or services with business models that introduce performance packages and are inferior to mainstream customer's value. During the early development of a disruptive innovation, it only served niche segments. Both the disruptive innovation and the established offerings improve; however the disruptive innovation improves enough over time to satisfy the mainstream customers and eventually replaces the established offerings and incumbents that exceed the demanded performance, see Fig.1.

Eventually almost all products improve beyond the needs of the mainstream customers. As a result, a shift in the basis of competition occurs to focus on price, flexibility, convenience or customization, so disruptive competitors start to replace established offerings (Christensen, E., & M., 2001). Christensen & Raynor (2003) describes disruptive innovation as a process rather than an event and states that many disruptive innovations fail because they are part of a value network that cannot be adapted to support the disruption.

Most waves of disruptive innovation are captured by other than the earlier leaders of an industry (Christensen, 2013). One example is the computer industry, IBM dominated the mainframe computer market, but missed the emergence of minicomputers by years (Christensen C. M., 2003). The mainframe computers were available for few experts working at universities only, but minicomputers made the technology available to a much larger population. Desktops, then laptops and now smartphones later followed the minicomputers. One explanation for this is that leading companies listen to their customers wants, so they miss the emergence of innovation that is not valued initially by their customers. However, there are also exceptions when leading companies manage to stay on top (Christensen & Raynor, 2003).

A number of authors broadened the concept of disruptive innovation and there is a debate on what exactly can be defined as disruptive innovation. Many authors classify and use disruptive innovation in a broader sense (Danneels, 2006) (Dan & Chieh, 2008). Christensen (2006) stated that previous researchers improved disruptive innovation and that building a theory on disruptive innovation is an on-going process.

Christensen & Raynor (2003) divides disruptive innovation into, (1) low-end, and (2) new-market disruption. Low-end disruption, targets the most over served and least-profitable customers at the low end of the original value network. Whereas, new-market disruptive innovation creates a new value network, that is it expands the market to new customers. Markides (2006) agrees that disruptive innovation can enlarge the industry through attracting new customers and making existing customers consume more. Furthermore, he states that disruptive innovation can significantly change customers' behaviors and habits.

On the other hand, Govindarajan & Kopalle (2006) distinguished between (1) high-end, and (2) low-end disruptive innovation. High-end disruptive innovation is disruptive innovation with a higher-per unit margin than established offerings, but with different performance features that mainstream customers do not value at the time of introduction, thus serving a small niche before it disrupts the market.

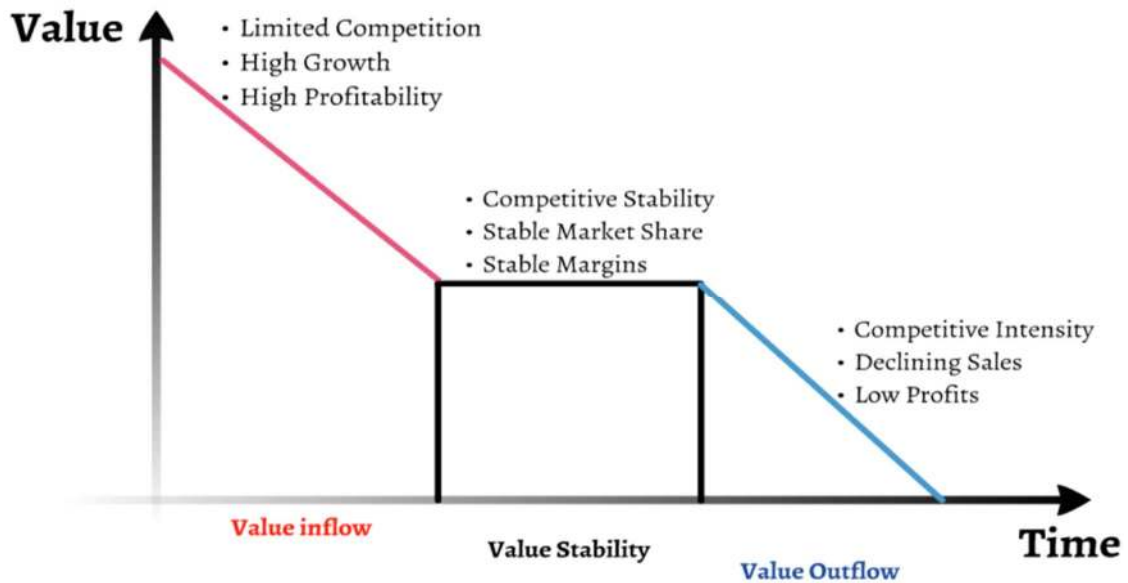


Figure 1: The three phases of value migration in accordance with Slywotzky (1996)

According to Slywotzky (1996) business designs go through life cycles, from growth to economic obsolescence. Value migration occurs when value moves from out-dated business designs to new ones, which better satisfy customers' priorities. The driving force of value migration is the changing pattern in what customers want, need and are willing to pay for.

Slywotzky & Baumgartner (2006) defines the term business design as the blueprint of the way a company does business. For example the way a company selects its customers, what value proposition it offers, which profit model it uses, which activities it engages in, what strategy it uses to capture profits and which organizational architecture it uses to implement decisions.

Three phases of value migration can be identified; (1) the value inflow, (2) value stability, and (3) value outflow phase, see Fig. 3 below (Slywotzky, 1996). The phases describe how well business designs can create value, which matches customers' priorities in relation to its competitors, and as a result generates high returns. The model describes value migration within a company, between companies and between industries.

The value inflow phase provides several opportunities to abstract value from a surrounding with high growth, limited competition and profitability (Slywotzky, 1996). Value can be absorbed from other parts, for example from an industry if the business design is superior in meeting customers' priorities. A shift in value migration occurs when a company employs a new business design, as a response to customer priorities that triggered competitors neglect or fail to see. Companies with business designs in the value inflow phase are often characterized by excitement, confidence, and capability to attract top talent.

In the second phase, value stability, business designs match customer priorities well and a competitive balance predominates the market (Slywotzky, 1996). Companies can grow by continuing to serve customer's priorities and improving operational efficiencies, but only at a low or moderate pace. Market shares and margins remain steady and the focus is on improving activities that have led to success in the past. In the final phase, value outflow, the competition is intensifying, the opportunities to abstract value are decreasing and profits decline (Slywotzky, 1996). Value migrates from obsolete business designs to new ones, which are better able to satisfy customers' evolving priorities. Moreover, in-bound talent, customers and resources leave at an accelerating rate. In the value outflow phase, focus should be on redesigning obsolete parts of a business design.

The length of the phases varies depends on at which rate new business designs better respond to the customer priorities emerges (Slywotzky, 1996). However, shorter product life cycles, international

competition and well-informed customers made the phases shorter. A company can only exist in one phase at a time, and only moves from value outflow to value stability, or from value stability to value inflow, if it applies a new business design. Performance is often demanded early in business designs life cycles (Slywotzky, 1996). However, as products or services mature and competitors match the performance, the consumers' priorities often shift to cost-efficiency as long as the business designs remain the same. The reason is that what was initially new is regarded as something that all products or services must have at a later phase, i.e. commoditization.

Transition of phases

Business design phase transitions are typically subtle with no sharp transition points, so managements can easily miss them (Slywotzky, 1996). Managers have tendencies to dismiss downturns as seasonal effects or special circumstances. The above-mentioned limitations can lead to unexpected collapses of companies that have not adapted their objectives in line with the business design life cycle. Furthermore, value can migrate towards several new types of business designs simultaneously and becomes even harder to be prepared for. Flexible organizations with an ability to detect early signals of transitions and adapt to them, have better preconditions of handling transitions.

As mentioned previously, transitions normally occur when new business designs, which better meet customer priorities, become available and customers' priorities change (Slywotzky, 1996). However, unexpected external shocks can also trigger business design phase transitions. For example trade restrictions, aggressive pricing, war, regulations and innovation can result in value migration from one business design to another. Companies can sometimes reduce the damage or even benefit from these external events if they understand them at an early stage.

Bargaining power in relation to value migration

Bowman & Ambrosini (2000) argues that the realization of value is determined by the bargaining relationships between the sellers and buyers. For instance, the level of differentiation, switching costs, presence of substitutes, strength of distribution channels and supplier competition can determine a supplier's bargaining power, which in turn decides its ability to capture value (Bowman & Ambrosini, 2000). Cox (2001) concluded that value migrates in the direction of power. If the buyer is dominant, the seller has few alternatives for its services and products, thus the value flows to the buyer.

Hypotheses

Upon the theoretical literature discussed previously, it is clear that new trends in Telecoms Innovation lead to improvement in the financial performance in Telecom Companies. Therefore in order to achieve our ultimate goal (whether an innovation, in particular by smartphones and its content, is disruptive at the mobile network operators and so on the industry level?) it is important to understand the impact of applying a variety of "intelligent" user-driven innovation tools in telecom services on customer satisfaction. The hypotheses are as follows: H1: Decrease in price of product/service would lead to increase in customer satisfaction. H2: Qualities of services would increase the number of satisfied customer. H3: Innovation of products/services would increase the number of satisfied customer hence enhances customer satisfaction and financial revenue by a telecom industry.

Research and Methodology

Questionnaires were designed assess the hypotheses and answer the following questions, divided in to three aspects to serve the objectives of this paper: (1) Does a pricing strategy in which a Telecom company offers relatively low prices for mobile calls lead to improvement in demand for many other services provided? (2) Does a business strategy emphasizing on client profiles (age, occupation) to meet various expectations and needs lead to increase in the number of satisfied customer? 3) Do the telecom companies have the need to follow up new technologies to limit losses on customers in a competitive market? And is it sufficient?

In 2007, Tthe iPhone platform was launched as result of disruptive technologies as discussed previously. The focus of this paper is on data starting from 2007 (see Table 2 and Fig 2). In our case, the mobile

network operators did not provide net income or ARPU for their mobile segments, thus estimating ARPU is replaced by viewing the mobile segments revenue as number of subscribers between the years 2000 to 2012.

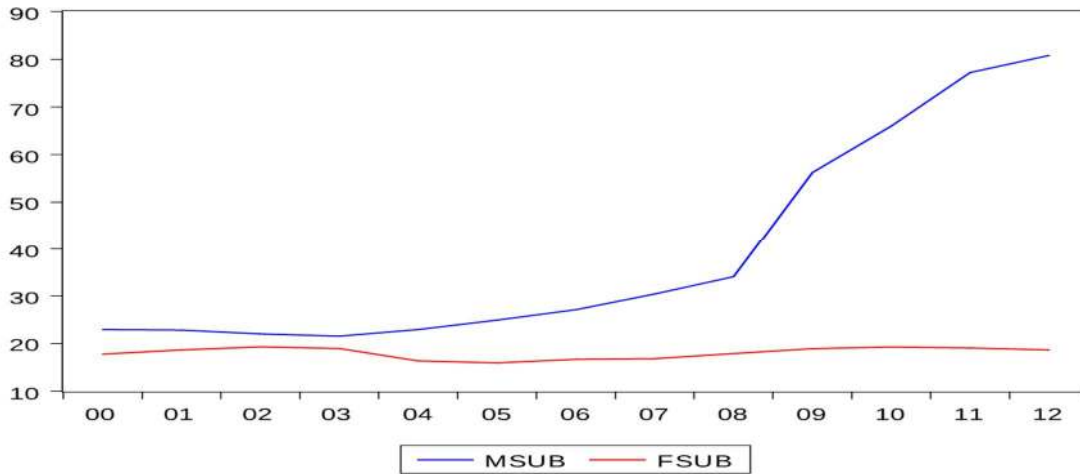


Figure 2: Global Fixed Telephone Lines vs. Mobile Subscriptions, 2000 – 2012.

All prices are set by the MOT and previous governments followed strategies to limit subscriber numbers with high tariffs. Monthly ARPU levels were over US\$60 until end of 2009. It is until April 2009 that the government took a radical step to lower tariffs and increase the maximum number of subscribers for both operators, arguing that total revenue would increase. This step affected subscriber growth and generated significantly higher ARPU.

Table 1: Revenues and ARPUs

	2008	2009	2010
Cellular			
Cellular revenues (\$ 000)*	1 361 000	1 460 000	1 573 743
Monthly ARPU (\$)	84,8	62,4	45.0
Internet			
Internet revenues (\$ 000)*	48 685	62 063	74 680
Monthly ARPU (\$)	14.0	15.0	16.0

Source: The Arab Advisors Group

In the information and data gathering process, information related to the mobile segment of the network operators was gathered. Some of the network operators provide fixed - line services that also might have been affected by the disruptive innovation. A main problem, substantial to the argument, is to show a relation between financial performance and usage of disruptive innovations in telecom industry.

Data

Lebanon's telecommunications sector is entirely owned by the government and two other main licensed and working operators in 2014 (including granted and expected):

(1) ALFA, a Mobile Interim Company, operated by Orascom Telecom's Alfa, established in 1994, and (2) Touch, a Mobile Interim Company operated by Zain telecom's MTC Touch, established in 1983 (Fig 4).

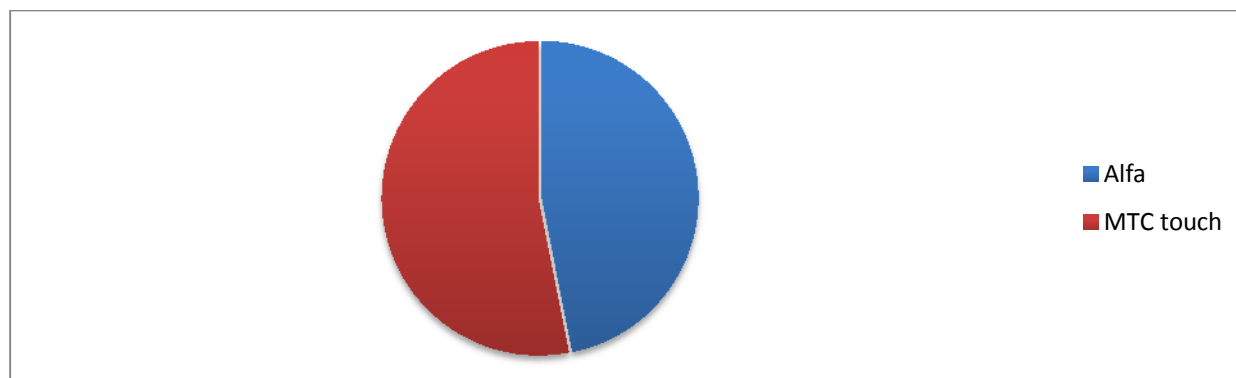


Figure 3: Lebanese operator share of mobile subscribers, 2010

Companies Reports

By mid-2013, Alfa announced an increase of 296% on mobile phone subscriptions and 446% on Internet services (over the past 13 months).

According to Touch Company reports, mobile phone subscriptions have grown more than eightfold over the past 18 months (from 100 000 to 800 000), and an average increase of 145% up to 270 MB is estimated on personal consumption. CDL: 10-05-2013. (See Table 2)

Table 2: Distribution of Mobile subscribers in Lebanon

	Dec. 2009	Dec. 2010	% Variation
<i>Subscribers Alfa</i>	210 750	241 142	+14,4
Prepaid phone card – Alfa	856 802	1 101 243	+28,5
Total Alfa	1 067 552	1 342 385	+25,7
<i>Subscribers Touch</i>	212 234	238.528	+12,4
Prepaid phone card - Touch	1 110 531	1 282 751	+15,5
Total Touch	1 322 765	1 521 279	+15,0
Total	2 390 317	2 863 664	+19,8

Source: MOT.

High competition between companies operating in the Internet industry requires enhancement of productivity from the mobile operators, government and ISPs to follow up-to-date technology and give Internet the power of communication.

A set of services is available, such as Mobile broadband, ADSL, 3G licenses and other international Internet bandwidth which connect the large majority users in Lebanon. On November 1, 2011 Alfa and Touch launched the 3G service in Lebanon (CDL/ 21-10-2011). The 4G networks were well installed in Beirut, Dbayeh, Jounié & Kesrouan by end of 2013 and were implemented in Tripoli, Saida & Zahlé in 2014, according to CDL (31-05-2013).

The 4G is the latest technology in the world of mobile data transfer and data downlink speed can go up to 100 Mbps. Cell phone Plans in Lebanon are offered with a wide range of \$99/10GB to \$249/100GB – per month). Rapidly growing mobile Internet usage surpasses highly monetized desktop Internet usage. Moreover, it is known that eCPMs is 5x lower on Mobile than desktop. Thus, because of innovation, mobile ARPU can raise rapidly straining Revenue Growth in the telecom service sector.

Table 3: Telephone Subscribers and Internet Users for Lebanon 2000-2012.

	Mobile cellular Subscriptions/100 inhabitants	Fixed telephone Subscription/100 inhabitants	Internet users/100 inhabitant	Fixed (wired)-broadband internet subscribers per 100 inhabitants
2000	22,96*	17,80	7,95***	0%
2001	22,84*	18,64	6,78***	0%
2002	22,05*	19,31	7,00*	1,00
2003	21,56*	18,97	8,00*	1,90
2004	22,95*	16,35	9,00*	2,08
2005	24,92*	15,92	10,14 ^(a)	3,26
2006	27,12*	16,70	15,00*	4,66
2007	30,44**	16,85	18,74	4,64*
2008	34,09*	17,92*	22,53 ^(b)	4,66*
2009	56,28	18,93	30,14 ^(c)	4,64
2010	65,97	19,30	43,68 ^(a)	6,98*****
2011	77,19	19,09	52,00**** ^(d)	8,28*****
2012	80,81	18,66	61,25*	9,71*****

Source: MOT. * ITU estimate. **BMI. ***Lebanese Broadcasting International. ****Presidency of the Council of Ministers. ***** TRA.

Notes:

- (a) Estimate based on population aged 6+.
- (b) TRA estimates the number of Internet users based on the number of Internet subscriptions (3 users for every subscription).
- (c) Estimate based on population aged 15+.
- (d) Population age 15+.

ITU: International Telecommunication Union.

TRA: Telecommunications Regulatory Authority.

MOT: Ministry Of telecommunications.

CDL: Commerce du Levant.

The provided statistics and stated facts from previous sections lead to elaborate a hypothesis for this study and test its validity. The financial statements from the telecom industry could not be attained, therefore a survey was conducted with both end users and providers to investigate various disruptive and conventional means influencing the financial performance of telecom industry. The survey consisted of two set of questionnaire, the first set was conducted with 200 customers randomly selected, and the second set was conducted with 20 employees from the two-telecom providers offices in North Lebanon, 'Alfa' and 'Touch'. All items were measured with a five-likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

The questions were designed in a clear manner and targeted employees and customers from different locations in the district to ensure the credibility and variety of sources. Moreover, the secondary data was obtained from websites, research articles, and journals. The questions dealt with financial performance and the role of disruptive innovations in its development, the hypothesis was tested based on the gathered data. In this study, the disruptive innovations are categorized in to several aspects, usage of mobile phones for internet browsing, download and upload, VoIP, and social media communication (which is replacing to a the conventional means of communication). Whereas the conventional means are classified in to calls, sms and mms services.

Results and Discussions

The results are presented in (Table 4), and show that 53%male and 47% female and a majority of youths with age ranging between 16 and 40 (representing the biggest sector of end users). Furthermore, the results show that 89% of customers own smart phones, and 90% are subscribed for broad band internet. Thus showing the customers are highly demanding advanced communication services which was not the

case in the past few years. In line with Markides (2006), these numbers indicate how customers are migrating from conventional to disruptive innovations through enlarging consumption of disruptive services.

Table 4: Demographic

Characteristics	Category	N	%
Gender	Male	106	53
	Female	94	47
Age	16-25	72	36.4
	26-40	82	41.4
	41-60	28	14.1
	61-80	16	8.1
Subscription to broadband services	Yes	184	92
	No	16	8
Company	Alfa	106	53
	Touch	82	41
	Both	12	6
Usage of Conventional terms (SMS, Calls)	More than 30 minutes daily	52	26
	Less than 30 minutes daily	148	74
Usage of Disruptive Innovations	More than 30 minutes daily	164	82
	Less than 30 minutes daily	36	18

Table 5: Linear Regression Analysis

Predictor	Beta	p value	Condition index
Calls	.191	.040	6.456
Upload	.208	.038	6.983
Social network services	.283	.004	4.719
VoIP	.084	.337	5.530
Email	.201	.028	9.796

The hypothesis was tested through a two part survey, (1) with end users of telecom services n=200, (2) with employees from two service providers Alfa and Touch with n=20. The Cronbach's alpha show that calls, upload, social, Voip, and email have the following reliability scores: 0.546, 0.615, 0.633, 0.511, and 0.524 respectively. The reliability level for these variables is 0.674, and linear regression equation was used to better analyse these independent variables.

Reading the results in (Table 5), we get the regression equation for Telecom sector (with correlation parameters on the variable in the following equation): Total Telecom revenue=0.19*Calls+0.2*Upload+0.28*Social network+0.2*E-mail

The coefficient of determination; R square is 0.474, thus indicating that 47.4% of variance in the variable customers' performance is explained by the model. All the values present in (Table 5) are statistically significant having a value smaller than 0.05, except VoIP was not proved in this study (Sig greater than 0.05). Furthermore, the condition index values for the five variables are below 15; showing that this study has no serious problem with co linearity, the linear regression and collinearity results are presented in (Table 5)

The second part of the survey, targeted the providers, found that the widest area for development is in the broadband services as presented in Fig.4. Thus meet results of the previous section that the shift of customers from conventional modems to up to date services, results in higher profit levels. Partly in line with this, Christenen (2013) claimed that with time, disruptive innovation would improve and replace other services, thus introducing more profits from data access. As a result, the profit from disruptive innovation

will lead to a great impact on the era. Fig. 4 shows that the quality of services plays an important role in the future telecom market, boosting the customers' consumption and satisfaction and leading to higher demand for services.

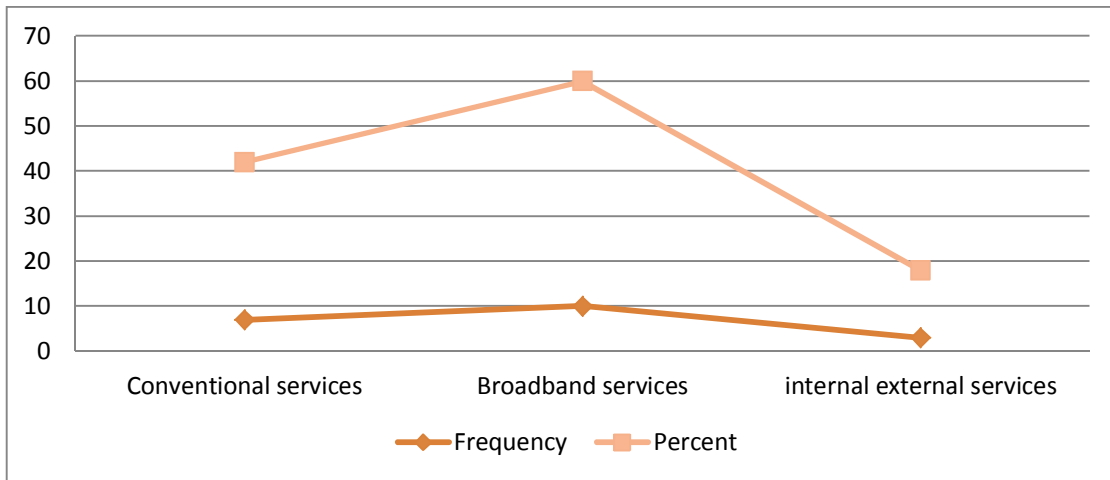


Figure 4: Providers' Frequencies of Future Migration

Conclusion

In an era of increased competition and increased customer demands various factors are affecting the telecom industry and prohibiting it from flourishing. The case of telecom industry in Lebanon shows there is lack of competition, high tariffs, and relatively poor connexion since there are only two service providers in the country-- Alfa and Touch. However, the Lebanese customers are in frequent demand for advanced communication services, making Internet an essential mean of communication. Nowadays, customers are migrating to data, thus performing a pressure on the industry to improve its services and to provide a good value bundle offer.

In conclusion, the results in the regression equation stated previously show that the highest revenue comes from Social network and upload and download services whereas no significant response was found on VoIP (where the use of this service is prohibited in Lebanon). Therefore, most of the revenue is covered by the usage of data such as social networks and uploads. This fact should be identified by the organizations as signals, and then adapt these signals to reach targeted results in the telecom industry and meet other neighboring countries instead of lagging behind them. Upon previously stated hypotheses and literature review, we conclude that the tariffs of services affect customers.

For future recommendations, the presence of more competition in telecom industry will provide customers with a satisfying service and will encourage them to consume more thus resulting in higher revenues for the telecom industry.

References

- Adner, R. (2002). *When Are Technologies Disruptive? A Demand-Based View of the Emergence of Competition* (Vol. 23). Strategic Management Journal.
- Adner, R., & Zemsky, P. (2005). *Disruptive Technologies and the Emergence of Competition* (Vol. 36). The RAND Journal of Economics.
- Ahonen, T. (2011). *Insiders Guide to Mobile: The Customers, Services, Apps, Phones and Business of the Newest Trillion Dollar Market*. TomiAhonen Consulting.

- Ahonen, T. (2012). *Phone Book 2012: Statistics and facts on the Mobile Phone Industry*. TomiAhonen Consulting.
- Allen, F., & Carletti, E. (2006). *Mark-to-Market Accounting and Liquidity Pricing*.
- Alter, N. (2002). *Les logiques d'innovation: Approche pluridisciplinaire*. Paris: La découverte.
- Ansari, S., & Krop, P. (2012). *Incumbent performance in the face of a radical innovation: Towards a framework for incumbent challenger dynamics* (Vol. 41). Research Policy.
- Asso, P., Kahn, G., & Leeson, R. (2007). The Taylor rule and the transformation of monetary policy. *Monetary Policy Rules: From Adam Smith to John Taylor* (p. 41). Kansas: Federal Reserve Bank of Kansas City, Economic Research Department.
- Backus, D., & Kehoe, P. (1992). International Evidence on the Historical Properties of Business Cycles. *American Economic Review*, 82(4), 864-888.
- Batini, N., & Haldane, A. G. (1999). *Forward Looking Rules for Monetary Policy, in Monetary Policy Rules*. University of Chicago Press.
- Baxter, M., & King, R. (1995). Measuring Business Cycles Approximate Band-Pass Filters for Economic Time Series. *NBER Working Paper N 5022*.
- Bernake, B. S., & Gertler, M. L. (2000). Monetary Policy and Asset Price Volatility. *Economic Review*, 17-51.
- Bernanke, B. S., Gertler, M., & Gilchrist, S. (1999). The financial Accelerator in a Quantitative Business Cycle Framework. In J. Taylor, & M. Woodford (Eds.), *Handbook of Macroeconomics* (1 ed., Vol. 1, pp. 1341-1393). Elsevier.
- BIS. (2009). Retrieved from www.bis.org
- BMI. (2013). *Lebanon This Week* (Vol. 320). Beirut: Research Economic Research & Analysis Department: Byblos Bank.
- Borio, C. (2005). The Search for the Elusive Twin Goals of Monetary and Financial Stability. *DG ECFIN Annual Research Conference*. Brussels.
- Borio, C., & Lowe, P. (2002). *Asset Prices, Financial, and Monetary Stability: Exploring the Nexus*. Switzerland: Bank for International Settlements.
- Bower, J. L., & Christensen, C. M. (1996). *Customer Power, Strategic Investment, and the Failure of Leading Firms* (Vol. 17). Strategic Management Journal.
- Bowman, C., & Ambrosini, V. (2000). Value Creation Versus Value Capture: Towards a Coherent Definition of Value in Strategy. *11*(1).
- Bullard, J. B., & Schaling, E. (2002). *Why the Fed Should Ignore the Stock Market*. The Federal Reserve Bank of St. Louis.
- Cantwell, J. (2010). *"Innovation and information technology in the MNE"*. (T. O. Business, Ed.) Oxford University Press.
- Castelnuovo, E. (2003). Taylor rules, omitted variables, and interest rate smoothing in the US. *Economics Letters*, 81(1), 55-59.
- Castro, V. (2008). Are central banks following a linear or non linear (augmented) Taylor rule? (N. U. Minho, Ed.) *NIPE Working Papers*.
- CBO. (1995). *Method For Estimating Potential Output*. Washington.
- CBO. (1995). *Method For Estimating Potential Output*. Washington.
- CBO. (2003, 2004). *CBO's method for estimating potential output*. The Congress of the United States, Congressional Budget Office.

- CBO. (2004). *CBO's method for estimating potential output*. The Congress of the United States, Congressional Budget Office.
- Cechetti, S. G., Genberg, H., Lipsky, J., & Wadhvani, S. (2000). *Asset Prices and Central Bank Policy*. Geneva: ICMB and CEPR.
- Chadha, J. S., Sarno, L., & Valente, G. (2004). Monetary Policy Rules, Asset Prices, and Exchange Rates. *IMF Staff Papers*, 51(3), 529-552.
- Charitou, C. D., & Markides, C. C. (2003). *Responses to Disruptive Strategic Innovation*. MIT Sloan Management Review.
- Chow, G. (1960). *Tests of Equality Between Sets of Coefficients in Two Linear Regressions*. *Econometrica*.
- Christensen, C. M. (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*. Cambridge MA: Harvard University Press.
- Christensen, C. M. (2006). *The Ongoing Process of Building a Theory of Disruption*. The Journal of product innovation Management.
- Christensen, C. M. (2013). *Disruptive Innovation*. <http://www.claytonchristensen.com/key-concepts>.
- Christensen, C. M., E., R. M., & M., V. (2001). *Skate to where the money will be*. Harvard Business Review.
- Clarida, R., Jordi, G., & Mark, G. (1998). Monetary policy rules in practice: some international evidence. *European Economic Review*(6), 1033-1067.
- Committee, M. o. (2009 йил 3-4-November). *Board of Governors of the Federal Reserve System*. From <http://www.federalreserve.gov/monetarypolicy/files/fomcminutes20091104.pdf>
- Daannels, E. (2004). *Disruptive Technology Reconsidered: A Critique and Research Agenda*. The Journal of product innovation Management.
- Dan, Y., & Chieh, H. (2008). *A Reflective Review of Disruptive Innovation Theory*. PICMET 2008 Proceedings, Cape Town.
- Danneels, E. (2006). *Dialogue on the Effects of Disruptive Technology on Firms and Industries* (Vol. 23). The Journal of product innovation Management.
- Filardo, A. J. (2001). *Filardo, A. J. 20Should Monetary Policy Respond to Asset Price Bubbles? Some Experimental Results*. mimeo. Economic Review.
- Friedman, M., & Schwartz, A. (1960). *A monetary history of the United States, 1867-1960*. Princeton University Press.
- Gilbert, C., & Bower, J. L. (2002). *Disruptive Change – When Trying Harder Is Part of the Problem* (Vol. 80). Harvard Business Review.
- Goodhart, C. (1988). *The evolution of central banks* (Vol. 1). MIT Press Books.
- Goodhart, C. (1994). What should central banks do? What should be their macroeconomic objectives and operations? . *The Economic Journal* , 1424-1436.
- Goodhart, C., & Hofmann, B. (2000). *Financial Variables and the Conduct of Monetary Policy*.
- Goodhart, C., & Hofmann, B. (2002). Asset Prices and the Conduct of Monetary Policy. *Royal Economic Social Annual Conference*.
- Govindarajan, V., & Kopalle, P. (2006). *The Usefulness of Measuring Disruptiveness of Innovations Ax Post in Making Ex Ante Predictions* (Vol. 23). Journal of product innovation Management.
- Hodrick, R., & Prescott, E. (1997, February). Postwar U.S business cycles: An empirical investigation. *Journal of Money, Credit and Banking*, 29, 1-16.

- Hoffmann, B. (2012). *Taylor rules and monetary policy: a global "Great Deviation"?* BIS Quarterly Review.
- Johnson, G. W. (2011). *Stratégique*. Paris: Pearson Education France.
- Johnston, L., & Williamson, S. (2013). *What was the U.S. GDP then ?* . Retrieved 2013, from measuring worth: www.measuringworth.com/usgdp/
- Judd, J. P., & Rudebusch, G. D. (1998). Taylor's Rule and the Fed: 1970-1997. *Economic Review-Federal Reserve Bank of San Francisco*, 3-16.
- Kahn, G. (2009). Taylor rule deviations and financial imbalances. *Economic Review(Q II)*, 63-69.
- Louis, F. R. (n.d.). Central To America's Economy. Retrieved from <http://www.stlouisfed.org/>
- Markides, C. (2006). *Disruptive Innovation: In Need of Better Theory* (Vol. 23). The journal of product innovation management.
- Markides, C. (2006). *Disruptive Innovation: In Need of Better Theory*. The journal of product innovation management.
- Mayrhofer, U. U. (2011). *Management international: Des pratiques en mutation*. Paris: Pearson Education France.
- McCallum, B. T. (1988). Robustness properties of a rule for monetary policy. *Carnegie-Rochester conference series on public policy*, 29, pp. 173-203. North-Holland.
- McCallum, B. T. (1999). Chapter 23 Issues in the design of monetary policy rules. In B. T. McCallum, J. Taylor, & M. Woodford (Eds.), *Handbook of macroeconomics* (Vol. 1C, pp. 1483-1530). Carnegie Mellon University and National Bureau of Economic Research.
- McCallum, B. T. (2000). Alternative monetary policy rules: a comparison with historical settings for the United States, the United Kingdom, and Japan. *National Bureau of Economic Research*(No. w7725).
- Orphanides, A. (1997). *Monetary Policy Rules Based on Real-Time Data*. Washington: Board of Governors of the Federal Reserve System.
- Orphanides, A. (2001). Monetary policy rules based on real time data. *American Economic Review*, 91(4), 964-985.
- Orphanides, A. (2003). Historical monetary analysis and the Taylor rule. *Journal of Monetary Economics*, 50(5), 983-1022.
- Orphanides, A. (2003). Historical monetary policy analysis and the Taylor rule. *Journal of Monetary Economics*, 50(5), 983-1022.
- Orphanides, A., & Van Norden, S. (2003, January). The unreliability of inflation forecasts based on output gap estimates in real time. *CIRANO Scientific Series s-1*.
- Orphanides, A., Porter, R., Reifschneider, D., Tetlow, R., & Finan, F. (2000, January/April). Errors in the measurement of the output gap and the design of monetary policy. *Journal of Economic and Business*, 52(1/2), 117-141.
- Rajan, R. (2005). Has financial development made the world riskier? (pp. 313-369). Federal Reserve Bank of Kansas City.
- Ravn, M., & Uhlig, H. (2002). On adjusting the Hodrick-Prescott filter for the frequency of observations. *The Review of Economics and Statistics*, 84(2), 371-375.
- Reinhart, C., & Rogoff, K. (2011, August). From financial crash to debt crisis. *American Economic Review*, 101(5), 1676-1706.
- Rudebusch, G. D. (2002). Term structure evidence on interest rate smoothing and monetary policy inertia. *Journal of monetary economics*, 49(6), 1161-1187.

- Rudebusch, G., & Lars EO, S. (1999). Policy rules for inflation targeting. In B. J. Taylor, *Monetary Policy Rules* (pp. 203-262). Chicago: University of Chicago Press.
- Salz, P. A. (2011). *The Netsize Guide: Truly Mobile, Gemalto*.
- Sandstrom, C., Magnusson, M., & Jörnmark, J. (2009). *Exploring Factors Influencing Incumbents' Response to Disruptive Innovation* (Vol. 18). Journal Compilation.
- Schmidt, G. (2004). Low-end and High-end Encroachment Strategies for New Products. 8, 167-191.
- Schumpeter, J. (1935). *Théorie de l'évolution économique*. Paris: Dalloz.
- Sharma, C. (2012a). *Operator's dilemma (and opportunity): the 4th wave*. Mobile Future Forward.
- Sharma, C. (2012b). *State of Global Mobile Industry Annual Assessment 2012*. Mobile Future Forward.
- Slywotzky, A. J. (1996). *Value Migration*. Boston: Harvard Business School Press.
- Steinbock, D. (2005). *The Mobile revolution - The making of mobile services worldwide*. Kogan Page Limited.
- Sveiby, K.-E. (2012). Innovation and the global financial crisis - systemic consequences of incompetence. *International Journal of Entrepreneurship and Innovation Management*, 21(1-2), 30-50.
- Svensson, L. E. (2003). What Is Wrong with Taylor Rules? Using Judgment in Monetary Policy through Targeting Rules. *Journal of Economic Literature*, 41(2), 426-277.
- Taylor, J. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy*, 39, 195-214.
- Taylor, J. (1999). The robustness and efficiency of monetary policy rules as guidelines for interest rate setting by the European Central Bank. *Journal of Monetary Economics*, 43(3), 655-679.
- Tellis, G. J. (2006). *Disruptive Technology or Visionary Leadership?* (Vol. 23). The Journal of Product Innovation Management.
- Thomond, P., & Lettice, F. (2002). *Disruptive Innovation Explored*. Concurrent Engineering Conference Proceedings.
- Utterback, J. M., & Acee, H. J. (2005). *Disruptive Technologies: An Expanded View* (Vol. 9). International Journal of Innovation Management.
- VisionMobile. (2011a). *Developer Economics 2011*.
- VisionMobile. (2012a). *The Telco Innovation Toolbox: Economic Models for Managing Disruption and Reinventing the Telco 2013*. In association with Ericsson.
- VisionMobile. (2012b). *Mobile Industry Dynamics 2012*.
- Wessel, M., & Christensen, C. (2012). *Surviving Disruption*. Harvard Business Review.