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# **A COST-BENEFIT ASSESSMENT OF THE REGULATORY POLICY IN CAMBODIA'S MOBILE TELECOMMUNICATIONS MARKET**



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## **ABSTRACT**

### **Keywords**

Cost-benefit assessment  
Stated preference analysis  
Conjoint analysis  
Regulatory policy  
Telecoms law  
Mobile telecommunications.

Mobile telecommunications service has exceptionally developed for decades in most part of the world and it recently becomes a widely used technology. Since the development of mobile telecommunications technology evolves in accordance with the regulatory policy and framework, Cambodia is facing some challenges due to the absence of regulations in telecommunications sector. Based on the ADB technical team, the draft of telecoms law is still under the review of the National Assembly and it should be discussed with the public. Therefore, this paper is to assess the costs and benefits of regulatory policies in telecommunications industry incorporating with the consumer perspectives on three factors, the economic efficiency, fairness and stability. With the stated preference method, the fairness is the first significant factor with the coefficient of 38.11% while the economic efficiency at 33.00% and the stability at 28.90%. The fairness is more preferable to be regulated at upper medium level. However, the regulatory intervention for improving the economic efficiency should be at lower medium level while it is required to have high regulatory policies for the development of mobile telecommunications service. In the context of Cambodia, the regulatory policy in mobile telecommunications industry should focus on the fairness, the economic efficiency and the stability respectively.

**Contribution/ Originality:** This study is one of very few studies which have estimated the costs and benefits of regulatory policy in telecommunications sector, by using the stated preference method which incorporates with the consumer perspectives. It is to ensure the development of the telecommunications industry and the protection of the social welfares.

## 1. INTRODUCTION

### 1.1. Challenges of Regulatory Policies

Mobile telecommunications technology predominantly serves majority of people on the planet and it becomes more important for the daily communication. While the market competition has continuously evolved, such development is accompanied by every nation's legislative and regulatory policies. The introduction of new laws and regulations and the changes of a massive expansion of independent regulatory agencies are taken into the account of the development. There are differences in the levels of the regulatory intervention and their measures from country to country according to the market conditions. The implementation of regulation varies from country to country depending on some various factors, including the level of market maturity and the legal and regulatory framework. Additionally, the objectives of the telecommunications regulatory policies are mostly similar. The widely accepted ones are the promotion of the universal service, competitive markets and the well-functioning processes, the investment for network expansions, the public confidence, the protection of consumer rights and empowerment, and other goals of the efficiency (Hank, 2000). However, some conflicts are usually caused by the tradeoff during the establishment of the regulatory policies, especially the economic efficiency and the fairness. For instance, to ensure the fairness, the universal service causes the inefficiency when the service is provided at a lower price than the production cost or it is subsided from the government. The tradeoff becomes a major issue for policy makers. Therefore, this paper would like to analyze the costs and benefits of the tradeoff in the regulatory policies of mobile telecommunications industry. Cambodia has a unique distinction of being a first country which the number of mobile subscribers far exceeds those on the fixed network (Mahesh, 2006). Cambodia has a long history and has suffered from many civil wars in which almost all the infrastructure of civilized society has been destroyed (John, 2005). Since the Paris Peace Agreement in 1991 under the settlement of the UN Transition Authority in Cambodia (UNTAC), the telecommunication system in Cambodia was also secured and the media system was supported by the communication system of the UNTAC<sup>1</sup>. Then, there were only 3000 telephone lines in Phnom Penh and the short wave radio with limited capacity was used to connect these lines to other provinces (Sum, 2008). It became a lack of landlines due to the poor infrastructure development and high installation costs (Roberts, 2011). The first telecommunication provider came to Cambodia during the first national election in 1993 and it was originally a joint venture between Shin Satellite PLC, Thailand and the Ministry of Post and Telecommunication (MPTC). Since its establishment in 1993, the MPTC played an important role as the policy maker, regulator and service provider (Im, 2015). Later, the Telecom Cambodia (TC) was created in 2006 to take charge of the development of an appropriate and modern information and telecommunications in Cambodia, and the Telecommunication Regulator of Cambodia (TRC) was

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<sup>1</sup> <http://downloads.bbc.co.uk/mediaaction/pdf/cambodia.pdf>

established in 2012 to be responsible for reviewing the existing laws and the establishment of new policies to manage telecommunication markets.

Although many licenses have been granted to many mobile telecommunication suppliers in Cambodia, the license agreements are under the foreign direct investment laws and the management of radio frequencies remains unclear due to the absence of regulatory policies. Also, the competition of telecoms market seems excessive as a result of a large number of suppliers and some key challenges in their commercial activities such as predatory pricing, unfair competition, interconnection issues, poor SIM management, gambling, and so on ([Moa, 2014](#)). The absence of telecom laws also makes the detailed tariff and interconnection regulation in a difficult situation. Consequently, there were critical problems with the unfair competition and interconnection. Because of the lack of legal framework, the MPTC plays a role as an arbitrator to compromise all business conflicts and dispute resolutions. To facilitate business and dispute resolution, the Cambodian government has issued circulars and orders (N.1277) on anti-unfair competition and on the measure to cease the interconnection block between some service operators in 2009. In contrast, the order on the price floor was still halted because of the public demonstrations which were held by the public, and some mobile carriers continue their predatory pricing policies and promotional campaigns ([Moa, 2014](#)). Thus, few mobile carriers, namely Star-cell, Mfone and Beeline, were bankrupt. Without regulatory policies to control the merger and acquisition, some mobile carriers gain bigger and bigger market shares to dominantly control the market, such as SMART Axiata and Viettel. With the ADB technical assistance, the telecoms laws in Cambodia have been drafted and still under the legislative process. The approval of these laws has been delayed and reviewed several times. For most practical issues, the fundamental tradeoff in the establishment and the implementation of telecommunications policies usually appears. The Australian competition and consumer commission (ACCC) defines the scope of regulations to cover the economic efficiency, the equity and the sustainable development. This argument is also strongly parallel with the explanation of the European Commission<sup>2</sup>, [William \(1997\)](#); [Hank \(2000\)](#) and [ITU \(2013\)](#). The ADB also suggests that the government of Cambodia should have public discussions prior to the submission to National Assembly to be more beneficial for the social welfares. This raises some questions about the costs of benefits of regulatory policies in the telecoms laws of Cambodia. Therefore, this paper aims to examine the available evidence of actual consumer behavior and analyze the implications for the policies. In cooperating with consumers' perspectives, the dissertation also investigates the consumer preference for tradeoffs in telecoms laws.

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<sup>2</sup> European Commission. Regulatory Framework for Electronic Communications in the European Union. Situation in December 2009.

<https://ec.europa.eu/digital-agenda/sites/digital-agenda/files/Copy%20of%20Regulatory%20Framework%20for%20Electronic%20Communications%202013%20NO%20CROPS.pdf>

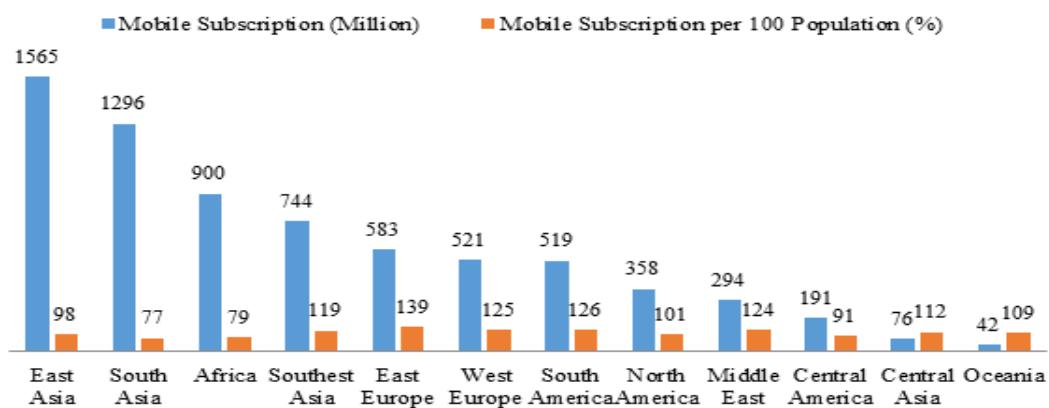
## 1.2. Objectives

This study is to examine the costs and benefits of the regulatory policies in Cambodia's mobile telecommunications sector. From the individual perspectives over the tradeoffs between the efficiency, fairness and stability, the findings of this paper will bring better understanding of the insights of actual consumer behavior. This demand-side analysis on the actual consumer decision-making behavior is playing a crucial role for designing the flexible regulatory policies for the protection of consumer interests and empowerment. It is also to ensure the increase of the adoption of the mobile telecommunications services and new technology innovations.

## 2. LITERATURE REVIEW

### 2.1. Development of Mobile Telecommunications Service

When the telecommunications industry has undergone dramatic developments and changes in the recent years, the number of subscribers and network expansion are also increasing. At the same time, new products, services and technologies have been introduced into the market. The first radiotelephone service was introduced in the US at the end of the 1940s to connect mobile users in cars to the public fixed networks. The mobile telephone service was the first technology-based of the analog system which was developed in the late 1960s and the early 1970s. The mobile cellular telephone was, then, introduced in the Europe and Japan in the early 1980s and in the US in 1983 ([Martin et al., 2006](#)). In 2011, the ITU announced that the coverage of mobile telecommunications network was about 90% the world population, while this 2G network coverage was as high as the population covered by the a 3G network<sup>3</sup>. Recently, the percentage of mobile subscriptions of total population was about 98% at the early of 2015, according to the [Simon \(2015\)](#). For the regional overview, the East Europe has the highest subscription percentage of 139% while the Central Asia stands lastly with 76%, compared to Africa of 79% (Figure 1).



**Figure 1. Mobile Subscription by Regional Overview**

Source: Digital, Social & Mobile in 2015 ([Simon, 2015](#))

<sup>3</sup> Source: ITU World Telecommunication/ICT Indicators database

The widespread of mobile telecommunications creates new opportunities in all sectors and it becomes a valuable addition to the lifestyles of the final users and the businesses. For example, by using the expenditure function (consumer surplus) and the estimation of a cost of living index (COLI), the introduction of mobile telecommunications service is claimed to provide significant effects on the consumer welfare from [Martin et al. \(2006\)](#). Moreover, this recently plays a more important role of enabling individuals to have a better and faster communication through the mobile internet-based applications. It also impacts on the business development of many industries to become a mobile business and it improves the administrative works in the government to a mobile government. Besides, the mobile handsets have nowadays turned into smart-phones, which are equipped with digital cameras, internet-enabled video, pre-installed SNS applications, music/ video player and so on. These smart phones are currently built with the consumer and business interfaces which mostly become multifunctional computers, rather than to the traditional phones ([Nicholas, 2005](#)). Thanks to the rapid development of technology, the telecommunications service is of its essential means for enabling individuals to reduce poverty and to improve quality of life ([Martin et al., 2006](#)). This long term evolution keeps moving forward, with the intention of growing importance of mobile telecommunications for the national economies and international trades. In some developed countries, the competitions and markets are broadly beneficial to their residents because of the universal services.

As the technology development provides a huge impact on users and governments, there is a mutual relationship between the development of telecommunications industry and the regulatory policies. Both theoretical and empirical studies have been conducted to simulate this interrelationship. On one hand, the regulatory policy is playing a part in the development of the telecommunications industry and the introduction of the technology innovations to market. On the other hand, the evolution of technology causes changes in major legislative and regulatory developments. In recent times, the technology changes in every aspect of the telecommunications industry, especially from the effects of digitalization and the market structure from monopolistic or vertically integrated firms to a variety of competitive companies. These changes have seen a massive achievement in the United States of the 1996 Telecommunications Act (TA) and the introduction of a large number of new laws and regulations in Europe and elsewhere.

## *2.2. Rationale of Regulatory Policies*

As it happens, the mobile telecommunications service has expanded to cover about 98% of the world total population and it has become more important. Nevertheless, in most developing world, the digital divide remains a problem between the urban areas and the remote communities, in which the differences in the adoption of the technology are impacted by a number of factors ([ITU, 2006](#)). Suppliers normally provide their services and products at the place of a high demand with low production costs while they have no incentive to do it at the areas of a low demand or high production costs. In the most fundamental objectives of the regulations under the public utility principles, the government intervention is required to ensure that everyone has the access

to acceptable services at reasonable prices. In the telecommunications sector, the economic perspective is mentioned that services should be provided to all types of users with the optimal efficiency, while the social perspective brings the availability of services to everyone and the expansion of networks, not to the limit of economic efficiency but to the limit of social demand ([William, 2001](#)). Without any specific regulation, the success or failure of a market crucially depends on the demand and the cost conditions. For instance, the world submit on the international society (WSIS) is recently working on the impacts of ICT on society and the need to ensure the reduction of the global digital divide. It suggests all countries to set a standard for the implementation of ICT for the reduction of the digital divide, for the economic development and for the technological innovations ([Mohsen and Sanou, 2011](#)). In point of fact, the regulation of the universal services has been applied in the most developed world to build-out networks and to make access available at reasonable price. However, the developing world meets some different challenges to achieve the objective. With the unique economic situation, culture and demand, it is vital to understand the consumer preference from which each mobile carrier could examine the strengths and weaknesses of others within the sector to improve their competitive strategies. They can be the diffusion and motivational factors based on consumer perspectives.

Policy makers are also aspired to review all policies which foster all major operators to provide innovative technologies, to improve quality of service and to compete in terms of price. New technology innovations could efficiently produce services at a lower cost to fulfill consumer demands, while they are not adopted if they are too costly or they impact on the incumbents' incomes. New innovations could also bring more benefits to reduce sunk costs and production costs. Similarly, they enlarge the market expansion and increase the marking competition. For instance, the services-based competition (SCB) forces all incumbents to open their networks to all entrants in order to reduce the duplicated installations of hardware and to reduce production costs for the ease of new entrants. Yet, many countries have not introduced it to their market. The SBC has been introduced since the last few decades in the most developed countries for the reduction of these entry barriers (start-up costs) and the improvement of the competitive efficiency. Technically, it allows the entrants to enter one market by relying partially or entirely on the facilities or services of other carriers from the resale of incumbents' wholesale of end-to-end products or from the lease of the unbundled local loops. Based on Stackelberg model and its assumptions, the facilities-based competition (FBC) is more effective for the dynamic efficiency when a market is at its growing stage with new technological innovations, while SBC is found out to be more effective for the static efficiency to promote workable competition, service quality and consumer surplus by reducing production costs ([Seo et al., 2008](#)). Also, a comparative study between the US and South Korea shows that the broadband penetration diffuses faster with more efficiency after the evolution from the FBC to the SBC ([Choi, 2011](#)). Moreover, the profits from the SBC can be considered the opportunity costs of an entrant to build its own facilities. An entrant can delay their facilities-based entry until the time that it is optimal to adopt the new technology. This ladder of investment is to gain some experiences in the industry, by reducing

asymmetric information about the demands and the markets (Bourreau and Pinar, 2004). On the other hand, the competitors might choose a mix strategies of both competition models in accordance with the TA of 1996 when a different strategy may be used in different regions according to the real situation (FCC, 1999). Cave *et al.* (2002) also support the ideas of the ladder of the investment to reduce entry carriers. They claim that both strategies are required. An entrant uses the SBC to firstly enter market and then it changes to the FBC to increase the services after gaining some experiences about the market demands. However, the incumbents are not voluntarily opening their networks for their competitors or new entrants. By this mean, the regulator is a main actor to force the suppliers to open their networks, so called the local network unbundling in the mobile telecommunications services.

Moreover, the lack of new innovations mostly happens for the consumer side in some developing countries, such as mobile number portability (MNP). The MNP allows subscribers to change mobile operators by retaining their phone numbers and it is applicable for both fixed and wireless carriers. It is for identifying the reduction of the switching costs, for increasing the customer satisfaction and for improving the competition. In this regard, the MNP has been imposed to the mobile operators by many countries. Singapore was the first country to use the MNP in 1997, followed by UK, Hong Kong and Netherland in 1999<sup>4</sup>. The Federal Communications Commission (FCC) of the U.S did not promulgate the regulation for the wireless carriers until late 2003 (Singer, 2014) after the European Union also requested all members to provide number portability in 2002. Lately, the MNP was presented in 80% of Europe, 35% of Americas, 19% of Asia, and 13% of Africa by November 2013. However, in the developing world, only one quarter of the markets has used the MNP when other 15% in the process of implementing it GSMA (2013). Several empirical studies have found that the MNP has influences to reduce the obstacles and barriers in switching mobile carriers and these barriers include a change of phone numbers, a loss of contact, a loss of business opportunities and other costs (Shapiro and Hal, 1996; Buehler and Justus, 2004; Kagwathi *et al.*, 2013). Additionally, the implementation of the MNP in Japan would reduce the switching costs by 18%, but it increases the consumer switching intention by 2.6% (Kitano and Hiroshi, 2011). On one hand, the MNP helps operators, especially new entrants, to gains more subscribers; however, it, on the other hand, becomes the pressures for some operators to retain the subscribers. Subscribers give an indication of the potential demand for the MNP if the operators help to ascertain how much it may impact on the market while the regulator is the one who drives the implementation and who ensures a win-win strategy for both subscribers and operators (Iqbal, 2010). Based on the sunk costs and the sigh effects of the MNP on the interactions between mobile operators, the MNP is in difficult stage to be implemented from the favor of all carriers. It is also in question who will pay for this innovation. Meanwhile, according to the diffusion of innovation (Roger, 1962) each country imposes the rules to implement the MNP at different time frames of the diffusion process

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<sup>4</sup> Source: [http://en.wikipedia.org/wiki/Mobile\\_number\\_portability](http://en.wikipedia.org/wiki/Mobile_number_portability)

as the recent adopters should be either the early majority or late majority. Also, due to Hui (2009) the introduction of the MNP might theoretically reduce the market growth and the social welfares when the market scale is substantially increasing, but it might increase the social welfare when the growing speed is not so high, or the market is almost saturated. Therefore, the policy maker is playing a crucial role in mandating the regulations for bringing any technology innovation to the market. They have also to decide the responsibility of all parties for the sunk costs, which are possibly or partially subsidized by the government. Similarly, the findings of Jayson mention that the regulators play an important role in maximizing the adoption of the ICT (Jayson, 2009). Another crucial role of regulations is to support competition policy or the worldwide scale of the competition in mobile telecommunications market. Many countries, such as the U.S and the UK, enhance a strong role of regulators in competition policy. The U.S, as example, traditionally used complex federal and state regulatory structures, but later, the 1996's TA attempts to adapt the regulatory structures to technological reality. This competition policy in the telecommunications is formulated from the agreement of the department of justice (DOJ), the federal trade commission (FTC), the congress and the FCC. In Europe, a number of member states operated a framework of the market competitions in the 1980s and a new legislative framework has been developed in the 1990s. It was to promote and ensure the competitive interactions and these competitive problems focused on the monopolization, the interconnection and mergers (Martin *et al.*, 2006). The growth and the diversification of markets have reduced the monopoly issues of the long-distance communication in the U.S by breaking up the AT&T networks (Nicholas, 2005). At the same time, the monopolization and the leveraging of the market power were resulted from the foreclosure and their tying activities. As a result, the FCC decided to consider the large-scale telecommunications mergers with the intention of limiting the suppliers' market power. Also, a spate of the horizontal mergers in the long-distance is put under the antitrust policies, while the vertical integration between the local exchanges and the long-distance communications indicates an importance of one-stop shopping. To improve a stronger local service competition from the merger, the FCC set up many regulatory conditions for merged firms to open their local networks. Additionally, some private antitrust actions were also mandated to control the pricing policy, the connection to terminal equipment and the interconnection to other service providers. The mandate was to avoid the failure of the market competition and to remove the legal barriers to new entrants. So, the regulatory policies are required for the market competition and the policy makers have to establish the regulations with the timely needs and the particular type of each market. With the development in the mobile telecommunications industry, the regulatory policies have been also changed considerably. Additionally, many various developing countries have considered the implementation of the relevant rate of the return regulations. The regulations have evolved from their primary and traditional purposes, such as licensing, assigning spectrum and other scarce resources, dealing with interconnection issues and contributing to universal access support programs. Recently, the regulatory policies shift the focus toward on the creation of an enabling environment for the

furniture investments, the market growth and the effectiveness of the digital technologies ([ITU, 2010](#)). Some issues are particularly arising from the new technologies, including the voice over internet protocol (VoIP), the social networking service and so on. These innovations consequently make some existing regulations irrelevant. For instance, the network and the voice services must be owned and operated by the same firm. [Colin and Lara \(2011\)](#) also examine that the long-distance services are mostly affected by the VoIP and then by the mobile-based applications. The digital revolution causes further challenges for the regulators in protecting the minors, the privacy and the intellectual properties. The minors are highly affected by some contents which probably impact on the physical, mental, or moral development of children. In Cambodia, the MPTC has regulated several codes to block a complementary service of 3G, so-called video call, with the aim of avoiding cyber sexual harassment. However, since many mobile internet-based applications in smart phones have built free video calls, such former codes are out of date. To sum up, various countries with different cultures exhibit widely varying degrees of regulations, including the pornography, cybersex, gambling, child exploitation, cyber-attack and the like. Therefore, the need of the mobile telecommunications regulations varies according to the conditions of the market places. Another particular development of the mobile telecommunications regulations is to seek for specific measures for the consumer protection and empowerment. Fundamentally, the prior regulations focus on the supply side for the economic efficiency, the competition, the universal services and the like. However, since the competition in some markets has substantially developed and the consumers have wider choices of providers and services, then the regulators' attention on consumer side becomes the concern. For instance, a number of OECD members recently concentrate on well-functioning markets by introducing the MNP aimed at facilitating the way the consumers exert their ability and choose between the competing suppliers. It is believed that the full exertion of their ability could consequently stimulate the firms to innovate, improve quality and compete in term of prices. In contrast, the consumers remain unable to benefit from the competition when they have little information, poor quality information or asymmetric information. The regulators and the policy makers, in turn, try to minimize the detriments to consumer interests, by incorporating with the available evidence of the actual consumer behavior. Hence, the insights of consumer behavior imply far-reaching and broad importance for policy decision making. The policy is all about the change in the consumer behavior and then the design of policies should be effective or more effective ([EC, 2014](#)). So, it is widely to express the purposes of the pro-competition policies to enhance the consumer welfares, protection and empowerment which are of their essences for an economic and social welfares.

### ***2.3. Regulatory Policies in Network Economics***

Following the concepts of [Nicholas \(2005\)](#) the paper defines regulatory policy as both the economic and the social rules. The economic regulation basically refers to the market competition and the price control, where the social regulation focuses on the performance of firms or the effects of their operations on the social welfares. The economic regulation is in need for the

markets where the market conditions cannot lead to competitive outcomes, or where there is socially undesirable deviation from the economic efficiency. Sometime, it is applied where there is a clear difference between the social and private benefits, or where it requires a coordination for the technical standards or the market equilibriums ([Nicholas, 2005](#)). Likewise, the level of the regulatory intervention varies according to the market conditions. Other factors are about the market maturity and the regulatory framework. Therefore, it is required to consider the local political, economic, social conditions and some other circumstances before the design of the appropriate legal and regulatory instruments<sup>5</sup>. Moreover, an effective regulation should promote the public confidence and to ensure the stability, transparency, competition, investment, innovation and the growth in the sector according to the ACCC, the European Commission, [William \(1997\)](#) and [ITU \(2013\)](#). The economic efficiency also focuses on an economic goal to allocate scarce resources efficiently for the optimal production and consumption, or to produce the products or services at the lowest possible cost through any mean. It is to introduce new products, services or cost-reduction innovations at timely and profitable manners. Similarly, it can ensure that the products or services are efficiently supplied to the public. In the telecommunications sector, the scarce resources can be efficiently allocated by providing licenses to permit the market entry, by efficiently monitoring the frequency spectrums, and by controlling the numbering plan. Next, the allocative process can be achieved from different types of auctions. At the same time, with the aim of producing products or services at the possible lowest cost, the regulators might intervene the production through the price controls, price rebalancing, price of interconnection, or network unbundling. According to [Cave et al. \(2002\)](#) a variety of the incentive regulations are proposed as mechanisms for the providers to have more opportunities to gain more profits. The profits can be either additional revenues or cost savings, which are resulted from their own efforts within a specific time frame. To give an example, the price cap regime determines beforehand the change in prices in real terms, by the estimation through the benchmark or the use of the engineering cost models of the current level of efficient cost, and the change of the forwards projection of the production in unit cost. Another example is about the access price which all firms have to pay to their rivals' subscribers to terminate calls. Because the incumbents or the dominant firms might set access price too high for restricting the interconnections from new entrants, the policies for optimal access pricing depend on the assumptions and the degree of the market competition ([Cave et al., 2002](#)). For dynamic efficiency, the policy makers are in charge of facilitating the process of adopting the new technology innovations and creating the enable environment for further investments ([ITU, 2010](#)). It is to help the industries achieve the technical compatibility and to avoid the fragmentation from some limited applications. In particular, the technological evolution of the first, second, third, and fourth generation, bring the most advantages of a better service quality and a higher capacity with a high speed movement at a lower cost to the consumers. As well, the SBC which allows

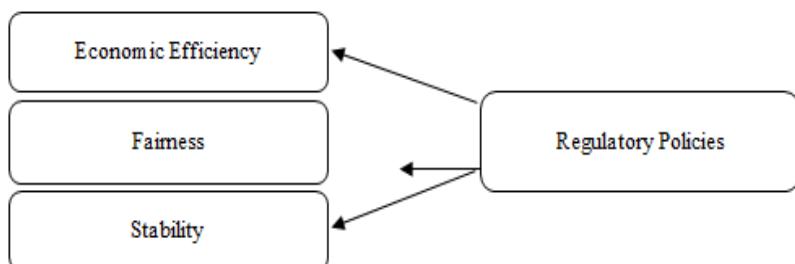
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<sup>5</sup> Source: [www.ictregulationtoolkit.org](http://www.ictregulationtoolkit.org)

firms to share their network equipment, becomes an effective tool for static efficiency to promote a workable competition, service quality and consumer surplus ([Seo et al., 2008](#)).

Another determinant of the regulatory policy concentrates over the fairness, which is mostly about non-economic criteria. It includes the social policy, the equity consideration, the availability of goods or services to consumers, and the social impact of pricing practices. More specifically, all players have to fairly or transparently act. That is why the governments of some countries consider the mobile telecommunications service as an essential public service to be accessible to all types of users fairly. The national concepts of the public interests, such as the policy of the universal service in telecommunications industry, underlie the general availability of affordable basic services to all citizens at any place. Moreover, in some cases, the universal service causes inefficiencies because the basic services are provided below the costs. In the U.S, it was traditionally to grant the subsidies for the line rental charges with the aim of promote the universal service. Thus, the wisdom of this policy is also to have great impacts on the economies of scale, according to the FCC. The fairness concept also includes the policies to facilitate well-functioning markets to ensure that the consumers have the ability and confidence to engage in the markets, after effectively installing competing alternative carriers. According to [Hank \(2000\)](#) where the competitive market is failed, the government or the regulator has to prevent the abuses of the market power such as the excessive pricing and the anti-competitive behavior by some dominant suppliers, and to promote the public confidence through a transparent regulatory and licensing processes. In the light of the TA of 1996, the antitrust policy focuses on three major themes; the monopolization, the interconnection and the merger/acquisition. The monopolization refers to the firms' behavior towards the monopoly, through various means, such as the predatory pricing and the rival's costs. Additionally, the regulators have also to protect the market from the leveraging behavior when one firm might use its monopoly power in one market to obtain the market power in the second market ([Hank, 2000](#)). The leveraging behavior is caused from the strategies of both the essential facilities and tying doctrines. For the problems of the interconnections, all firms usually have different incentives for the interconnections to terminate the cross network calls, due to the network size (network externalities). For voice calls, the value of the network depends on the number involved in the network. In the Metcalf's law, the value of the network is proportional to the square of the number of connected users of the system. Therefore, the larger firms are unwilling to interconnect with new entrants or smaller firms. Hence, the regulations have to facilitate the interconnections. Another widely accepted concept of the fairness is to reduce the detriment to the consumer interests which are frequently caused by a lack of the consumer information, misleading information, mis-selling information, or the bounded rationality. In the UK, the Ofcom mentioned about an unfair-business practices "mis-selling", from the consumer complaints in mobile and fixed telephone industries ([Ofcom, 2007](#)). These harmful business practices are also restricted by the regulations of other OECD members, in term of the fairness of the contract terms and the conditions used in the business contracts. In the U.S and French, by the way, the improvement of the consumer protections were revealed by

the problems of draft bills, according to the FCC and the French *Conseil des Ministre* in November 2006. Later, the draft bill was examined by the French *Assemblee Nationale* in the course of 2007. To be transparent and non-discriminatory, the ICT Toolkit claims that the governments have to encourage the public participation in the decision-making process of the regulations. Along with the meaningful purposes of the pro-competition policies, some regulators have started to work on many different measures to enhance the consumer protection and empowerment. To give an instance, the MNP has been introduced among the OECD members. Moreover, many regulatory policies have been established to protect the consumer interests and right. So, the demand-side analysis becomes major the concerns for the regulators or policy makers who are timely seeking for better understanding of the insights of the actual consumer behavior and who wish to apply the implications for the policies. The last widely accepted objective of the regulative policies is the stable development in mobile telecommunications services for long term ([William, 1997](#)). Beside the main roles of regulatory policy to ensure the successful transition of a monopolistic telecommunications market to a competitive market, to safeguard consumer interests, and to maintain an effective competitive marketplace, it is also to foster the long-term development of the ICT sector, according to the ICT regulation Toolkit. It stimulates the investment in software and hardware upgrades, improving customer service, or introducing new technology innovations. Similarly, based on the wisdom of telecommunications regulations, policy maker has also to create a favorable environment to promote the investment and to expand the telecommunications network ([Hank, 2000](#)). The stable market competition and the development of mobile telecommunications sector are guaranteed by many regulations and policies. The pro-competition policies are also comprised of ex-ante regulation to foster sustainable competition, including asymmetric regulation ([Patrick, 2008](#)). Policy makers must be careful with policies related to the mobile growth potential.



[Figure-2. Proposed Model and Measure of Tradeoff](#)

Though, for most issues in the establishment and implementation of telecommunications policies is a fundamental tradeoff. According to the ACCC, there is usually an apparent conflict between the economic efficiency and the fairness, or so called between the economic and the social goals. It leads to the mechanisms to achieve the equity without completely sacrificing the efficiency goals. Like the case of Australia, the government has developed a mean of the community service obligations (CSOs) to provide the subsidies at greater transparency relative to

other approaches. Normally, the establishment of such regulatory policies is consciously or unconsciously based on certain preferences. The aims have been chosen between some alternatives according to worthwhile or their weights compared to another (Tinbergen, 1956). The preference is required to be consistent to find the total welfare or utility, and they are usually presented by some central, all-embracing, concept in mind of the regulators. In the collective sense, all individual utility functions are the elements of their importance to the community as a whole. Where the policy-oriented approach is used, the efficiency goals are mostly to take precedence over other two factors. So, the government and the policy maker are required to estimating the strengths and weaknesses of the alternative policies. For this reason, the thesis introduces the cost-benefit method that incorporates consumer behavior to determine the consumer preference over the alternatives of regulatory policies in the Cambodia's mobile telecommunications industry.

#### *2.4. Stated Preference Method*

The stated preference (SP) method was firstly adopted by Thurstone (1931) to estimate the individual choices between the combinations of coats, hats and shoes. This technique is the most popular in the transportation contexts because the alternatives are typically the descriptions of the situations in accordance to the purpose-designed surveys and a variety of the SP method is applied based on the projects. It was used for the valuation of the users' concepts of the tradeoff in using electronic games by Hoinville (1971). The model has its strengths in forcing the respondents to evaluate the tradeoffs of all attributes separately, implying the welfare effects to be estimated for the multiple scenarios, estimating the level of the customer demand or satisfaction for the alternatives of some products and reducing the respondents' incentive to behavior strategically (Canberra, 2001).

**Table-1.** Characteristics and Scales of Measurement of Sated Preference

Method	Ordinal-level response				Ratio-level response
	Binary choice	Multi-nominal choice	Ranking	Rating	
Open-ended contingent valuation					✓
Dichotomous contingent valuation	✓				
Attribute-based method	✓	✓	✓	✓	
Paired-based method	✓				

Source: Stated preference question types (Thomas, 2003)

Where there is tradeoff, the policy makers usually refer their decisions consciously or unconsciously on the preferences. The SP to nonmarket valuation relies on the responses from the conducted survey. This family technique uses an individual's statements about the preferences in a set of options or alternatives to estimate the utility functions (Kroes and Sheldon, 1988). Beside

the monetary value, the valuation method is possibly used to the measurement of the preferences among goods with some specific attributes though the ranking or an interval scale. Therefore, the SP is classified into three; (1) the contingent valuation used to evaluate monetary value of a single or sometimes several closely related goods with different attributes, (2) the attribute-based methods used to measure the preference order or monetary value of several goods of different attributes, and (3) the paired comparison used to evaluate the consumer preferences for different goods (Thomas, 2003). Referring to the same meanings of the SP, another author categorizes it as conjoint analysis, fractional measurement, trade-off analysis, and the transfer price method. The first three talk about a single approach used to generate the alternatives for the respondents, while the fourth one is less widely used because of the differences in a number of the respects. Furthermore, the individual preference is measured in monetary amounts, choices, ratings, or other indications of preference (Thomas, 2003). To better understand how a variety of approaches are used, it is helpful to know the characteristics and the scales of measurement which are either ordinal or ratio methods (Table 1). The ordinal judgment takes forms of the binary response (yes/no), the multi-nominal judgment (choose the most preferable one from several choices), ranking a set of alternatives, and rating a set of alternatives along a category of scales. The ratio-level response is about an individual's statement of a numerical amount to indicate the value of or their preference for each alternative. The SP has then become more useful for the transportation sector to study the utility expression in the travel demands (Lerman and Louviere, 1978) the passengers' behavior to choose travelling facilities (Hensher and Stopher, 1979) the demand travelling with direct utility assessment (Kocur *et al.*, 1982) the travel behavior (Wardman, 1988) the effectiveness in transportation control measurement for the work trips (Beaton *et al.*, 1992) the travel behavior by identifying the behavioral responses to the situation (Hensher, 1994) and so on. Meanwhile, since its development for the marketing research in the early 1970s, the SP had become broadly adopted by many studies of different research fields, including the economics and environment. The SP and choice model have been applied to observe the consumer demands for the design of new products in market (Jordan and Harry, 1990) to measure the willingness to pay for particular benefits (Bateman *et al.*, 2002) and to understand the consumer behavior to choose the airport and airline in the U.S (Thomas, 2003). The SP method is also widely accepted for research's purpose of protecting the environment and the public policies (Hanley *et al.*, 2001). Regarding the objectives of this proposed research, the SP method has been selected with the purpose of analyzing the costs and benefits of regulatory policies in the Cambodia's mobile telecommunications sector.

### **3. METHODOLOGIES**

#### *3.1. Explanation of Attributes and Levels of Regulatory Policies*

To solve the research problems, the paper proposes three main measures of regulations, including the economic efficiency, fairness and stability. However, all regulatory goals are rarely achieved at the same time. So, the policy makers usually give a reduced weight to one goal in

favor of another, and these goals are supposed to be valued by the individuals' preferences. Hence, the regulatory policies in the mobile telecommunications industry have been established with specific objectives, in accordance to the three alternatives in the proposed model. Therefore, this paper defines the measures with the following characteristics. The Economic efficiency refers the regulatory policies on licensing, frequency allocation, numbering plan, pricing controls, access pricing, network unbundling, and new technology innovation. By the way, the fairness concentrates over universal service, consumer right and protection, asymmetric information, competition policy, interconnection and promotion (Table 2). Finally, the stability goal concerns over the government intervention of the network unbundling, network expansion, stable market competition and the development of investments in mobile telecommunications service.

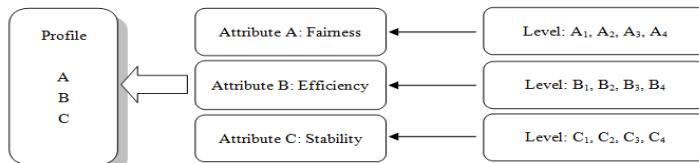
### *3.2. Design of Scenarios for Regulatory Policies*

The SP is used to estimate the compensation associated with the policies as it is impossible to measure costs and benefits of the regulatory policies in non-monetary unit. According to the SP, three measures of the regulatory policies are considered attributes, each of which is assumed to have four significant levels (Figure 3). These levels represent the extent to which the government or the regulators should intervene the mobile telecommunications market. The level is hard to exactly calculate, but it is possibly to estimate the regulated market in percentage. So, they are scaled from 1 (less regulated than 25%) to 4 (strictly regulated more than 75%).

**Table-2. Characteristics of Attributes of Regulatory Policies**

Attribute	Explanation	Level
Fairness	<ul style="list-style-type: none"> <li>- Universal service</li> <li>- Quality of service</li> <li>- Consumer right and protection</li> <li>- Asymmetric information</li> <li>- Competition policy</li> <li>- Interconnection</li> <li>- Promotion</li> </ul>	<p>Percentage to achieve <i>fairness</i> goal by government intervention in mobile telecommunications market:</p> <p>B<sub>1</sub>: 0 – 25% (low regulation)</p> <p>B<sub>2</sub>: 25 – 50% (lower middle)</p> <p>B<sub>3</sub>: 50 – 75% (upper middle)</p> <p>B<sub>4</sub>: 75 – 100% (high regulation)</p>
Economic Efficiency	<ul style="list-style-type: none"> <li>- Licensing</li> <li>- Frequency allocation</li> <li>- Numbering plan</li> <li>- Pricing controls</li> <li>- Access pricing</li> <li>- Network unbundling</li> <li>- Technology innovation</li> </ul>	<p>Percentage to achieve <i>economic efficiency</i> goal by government intervention in mobile telecommunications market:</p> <p>A<sub>1</sub>: 0 – 25% (low regulation)</p> <p>A<sub>2</sub>: 25 – 50% (lower middle)</p> <p>A<sub>3</sub>: 50 – 75% (upper middle)</p> <p>A<sub>4</sub>: 75 – 100% (high regulation)</p>
Stability	<ul style="list-style-type: none"> <li>- Network unbundling</li> <li>- Network expansion</li> <li>- Sustainable competition</li> <li>- Investment or development</li> </ul>	<p>Percentage to achieve <i>stability</i> goal by government intervention in mobile telecommunications market:</p> <p>C<sub>1</sub>: 0 – 25% (low regulation)</p> <p>C<sub>2</sub>: 25 – 50% (lower middle)</p> <p>C<sub>3</sub>: 50 – 75% (upper middle)</p> <p>C<sub>4</sub>: 75 – 100% (high regulation)</p>

Four levels of the first attribute of the economic efficiency are labeled as A<sub>1</sub>, A<sub>2</sub>, A<sub>3</sub>, and A<sub>4</sub>. Similarly, the levels of the fairness are B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, and B<sub>4</sub> while the levels of the stability are noted C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub> and C<sub>4</sub>, as shown in the Figure 3. Hence, the full factorial design produces 4<sup>3</sup> alternatives. Because of the complexity of the numerous alternatives, as well financial and time constraints, the proposed study tries to reduce the number of alternatives by using a fractional factorial design. Based on the consideration and the interactions to reduce the number of scenarios of the full factorial design conducted by many previous studies, the orthogonal design of SPSS generates 16 options (Table 3).



**Figure-3.** Relationship between Profiles, Attributes and Levels

From the aforementioned features, the paper includes all scenarios and the characteristics into the questionnaire which refers to the design of the survey instruments to represent the above 16 scenarios. The paper attempts to use a research technique of the rating scale to elicit the preference information. This method is also along with the information integration theory ([Anderson, 1981](#)) because of its main advantages to make a cardinal number of the measurement assumption and the unknown properties of the parameter estimates. It is commonly applied to estimate a series of the hypothetical products by their features. Since the rating paradigm assumes that the rating data satisfies the assumptions on the interval levels of the measurements, this survey tries to measure the closest preferences from 10 scales; 0 (not at all like) and 10 (certainly prefer). Moreover, the conjoint analysis, so called multi-attribute compositional model, is used to analyze the rated preference for a series of the tradeoffs, by revealing the relative importance of the component attributes. The ratings are also transformed in to the utility scales.

### *3.3. Analytical Specification*

Analytical technique in this paper includes the conjoint analysis method, which is a particular application of the regression analysis and which is the most popular approach for measuring the consumer preference in marketing research. This methodology requires the respondents to evaluate the different alternatives or options separately based on their own preferences. It does not require to compare between any pair of the alternatives or to select one specific preferred alternative, when the alternative are usually a series of multi-attributes and each of them is formed by a series of levels ([Ramirez-Hurtado, 2010](#)). However, it decomposes the data into components with the qualitative attributes of the alternatives. Afterward, the most commonly technique used in the conjoint method, is the ordinary least square (OLS) which calculates the rating scores against the attributes. Factors are assumed to be discrete as default to indicate that their levels are categorical and the relationship between factors and scores is not assumed. The

analytical method will produce a numerical part-worth utility value for all levels of each attribute. The large part-worth utilities imply the most preferred levels while the small ones represent the least preferred levels. Moreover, the attributes with the largest part-worth utilities are known as the most important ones.

**Table-3.** Scenarios of Regulatory Policies.

Cards	Attributes			Cards	Attributes		
	Fairness	Efficiency	Stability		Fairness	Efficiency	Stability
1	25 - 50%	25 - 50%	75 - 100%	1	A <sub>2</sub>	B <sub>2</sub>	C <sub>4</sub>
2	25 - 50%	0 - 25%	25 - 50%	2	A <sub>2</sub>	B <sub>1</sub>	C <sub>2</sub>
3	75 - 100%	0 - 25%	75 - 100%	3	A <sub>4</sub>	B <sub>1</sub>	C <sub>4</sub>
4	50 - 75%	25 - 50%	0 - 25%	4	A <sub>3</sub>	B <sub>2</sub>	C <sub>1</sub>
5	50 - 75%	0 - 25%	50 - 75%	5	A <sub>3</sub>	B <sub>1</sub>	C <sub>3</sub>
6	0 - 25%	50 - 75%	75 - 100%	6	A <sub>1</sub>	B <sub>3</sub>	C <sub>4</sub>
7	0 - 25%	0 - 25%	0 - 25%	7	A <sub>1</sub>	B <sub>1</sub>	C <sub>1</sub>
8	0 - 25%	75 - 100%	25 - 50%	8	A <sub>1</sub>	B <sub>4</sub>	C <sub>2</sub>
9	50 - 75%	75 - 100%	75 - 100%	9	A <sub>3</sub>	B <sub>4</sub>	C <sub>4</sub>
10	0 - 25%	25 - 50%	50 - 75%	10	A <sub>1</sub>	B <sub>2</sub>	C <sub>3</sub>
11	75 - 100%	25 - 50%	25 - 50%	11	A <sub>4</sub>	B <sub>2</sub>	C <sub>2</sub>
12	75 - 100%	75 - 100%	50 - 75%	12	A <sub>4</sub>	B <sub>4</sub>	C <sub>3</sub>
13	25 - 50%	75 - 100%	0 - 25%	13	A <sub>2</sub>	B <sub>4</sub>	C <sub>1</sub>
14	50 - 75%	50 - 75%	25 - 50%	14	A <sub>3</sub>	B <sub>3</sub>	C <sub>2</sub>
15	75 - 100%	50 - 75%	0 - 25%	15	A <sub>4</sub>	B <sub>3</sub>	C <sub>1</sub>
16	25 - 50%	50 - 75%	50 - 75%	16	A <sub>2</sub>	B <sub>3</sub>	C <sub>3</sub>

### 3.4. Sample of Population

The questionnaire takes the account of the respondents' demographics, including gender, age, marital status, education, occupation, monthly income, and monthly payment for the mobile phone services. Firstly, a small scale primary study is conducted prior to the performance of the full-scale research project. The pilot test has been conducted to ensure a meaningful and practical questionnaire. Through online, a sample of 50 respondents is randomly selected from Cambodian Facebook users in Phnom Penh. Finally, the questionnaire has been adjusted to the Cambodia's context and the survey is possible to be conducted as planned. Due to the time and financial constraints, the sampling covers ten provinces and cities in Cambodia. Furthermore, the number of sample of each province and city is the proportion of the population. Two thousand sets of questionnaire have been sent out by different teams simultaneously.

The data collection method in this research is based on the random selection of individuals from five different provinces and cities to represent the four geographical regions and the biggest city of Cambodia. These four regions are categorized as plain region, Tonle Sap region, coastal region, and plateau or mountain region. After the modification, 1200 copies of questionnaires have been sent out by different teams at the same time. As a result, 810 data sets have been collected

from the whole random population. However, not all returned questionnaires are eligible for further analysis while 775 are taken into account.

#### 4. FINDINGS AND DISCUSSION

**Table-4. Demographics of Respondents of Regulatory Policies**

Description	Items	Frequency	Percent
Marital Status	Single	564	72.8%
	Married	209	27.0%
	Other: .....	2	0.2%
Education	PhD	15	1.9%
	Master	74	9.5%
	Bachelor	378	48.8%
	High school	204	26.3%
	lower than high school	102	13.2%
	Other: .....	2	0.3%
Occupation	Student	365	47.1%
	Government Officer	73	9.4%
	Employee	198	25.6%
	Self-employed	87	11.2%
	Agriculturist	30	3.9%
	Non-governmental organization (NGO)	13	1.7%
	Other: .....	9	1.2%
	No income	225	29.0%
Monthly Income	Less than 100\$	141	18.2%
	101 – 200\$	125	16.1%
	201 – 400\$	130	16.8%
	401 – 600\$	84	10.8%
	601 – 800\$	31	4.0%
	801 – 1000\$	12	1.5%
	More than 1000\$	27	3.5%
	No payment	11	1.4%
Monthly Payment	Less than 5\$	224	28.9%
	6 – 10\$	341	44.0%
	11 – 15\$	81	10.5%
	16 – 20\$	49	6.3%
	21 – 50\$	52	6.7%
	51 – 100\$	13	1.7%
	More than 100\$	4	0.5%

##### 4.1. Demographic Results for Regulatory Policies

The SPSS 20.0 is used to analyze the collected data and the results of the respondents' demographics indicate that out of participants 49.2% are females and males are 50.8%. This figure is reflecting the gender proportion in Cambodia. About half (44.6%) of the respondents age between 19 and 28 years old, and other 24.2% are younger than 19 years old. Likewise, about 20.3% of them who are mobile phone adopters in Cambodia are 29-38 years old, while about 10% are anticipated by people who are older than 39 years old. Moreover, in terms of the marital status, majority of the adopters are single, and about 27.0% are married respondents. The respondents are educated with about 50% of them holding the undergraduate degree, and 10% are from the post-graduation. About 40% of the research participants possess high school degree or

lower. The descriptive statistic also summarizes the professional occupations and the economic status of the respondents, and most of which are students and employees of private organizations. 47.1% are students and 25.6% are employees. In the meantime, the government officers, agriculturalists, and sole proprietors also participate in this survey with 9.4%, 3.9%, and 11.2% respectively. About 33% of the participants show their personal incomes of 101US\$-400US\$, and 20% earn more than 400 US\$ per month. However, there are also 18.2% of the participants who have the incomes of less than 100US\$ and 29.0% have no income. Additionally, the monthly payment for the mobile telecommunications service at less than 10US\$ constitute the majority (about 74%). The minority of 16.8% pay for mobile service fees between 11US\$ and 20US\$, while less than 8% have monthly payment higher than 20US\$. For more detailed information of respondents is presented in the below Table 4.

#### *4.2. Consumer Preference for Regulatory Policies*

The Table 5 summarizes the estimated part-worth utilities which are computed for each level of each attribute. For the first attribute “economic efficiency,” the most preferred level is assigned to the lower middle level with the largest part-worth utility at 0.766, while the least preferred level of the economic efficiency attribute is given to the high regulation. Besides, the respondents also score the highest favorable level of the fairness at the upper middle level with the estimated utility value of 1.198. Similarly, the high government intervention in the fairness is the least preferred. However, the third attribute (stability) is differently scored by the participants who do recommend the government to have a high intervention on the sustainable development of the mobile telecommunications market with the largest estimated partial utility of 0.610.

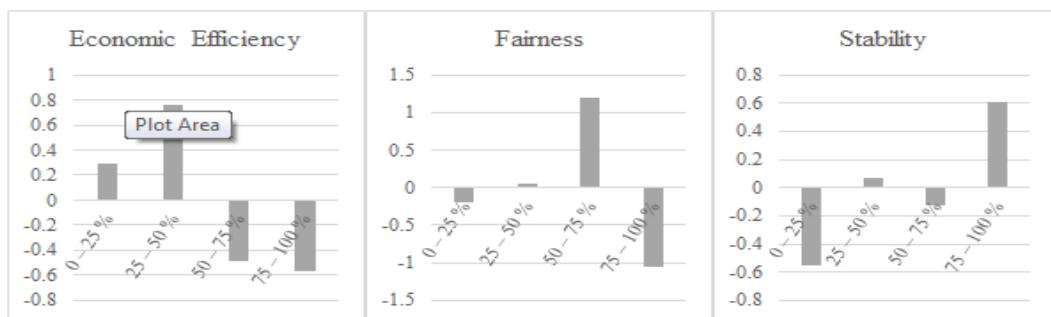
**Table-5. Part-Worth Utilities for Regulatory Policies**

Attributes	Levels	Utility Estimate	Relative Importance (%)	Rank
Economic Efficiency <sup>a</sup>	0 – 25%	0.291	33.00	2
	<b>25 – 50%</b>	<b>0.766</b>		
	50 – 75%	-0.491		
	75 – 100%	-0.566		
Fairness <sup>a</sup>	0 – 25%	-0.196	38.11	1
	25 – 50%	0.057		
	50 – 75%	1.198		
	75 – 100%	-1.058		
Stability <sup>a</sup>	0 – 25%	-0.555	28.90	3
	25 – 50%	0.070		
	50 – 75%	-0.124		
	75 – 100%	0.610		
(Constant)		4.509		
Correlation		Value	Significance	
Pearson's R		0.97*	0.000	
Kendall's tau		0.83*	0.000	

Note: <sup>a</sup> Discrete; \* Significant at 99% level of confidence

From the conjoint analysis, the relative importance of each attribute has been also calculated. The attribute with the largest part-worth utility value is considered the most important in

prediction the consumer preference for the regulatory policies. In the table 5, the fairness has the estimated relative importance of 38.11%. The second one part-worth utility value if the economic efficiency and then the last one is the stability. The former scores 33.00% and the later scores 28.90%. The results of this conjoint analysis have been proved to have a good quality of the reproduction from the empirical data by the values of Pearson's R and Kendall's Tau. The correlations between the observed and predicted data (0.97 and 0.83) indicate a good fit of data at 99% of confidence. So, the data well fits for the research model at the significant and representative level. The figure 4 shows the part-worth utilities of most and least preferred levels of the attributes and the levels with higher value of utility are preferred over those with lower or negative value.



**Figure 4.** Part-worth Utilities for Various Attributes

Among the four levels of economic efficiency, majority of respondents prefer the level of lower medium while the fairness factor is preferred at upper medium and the stability is desired at the highly strict level.

The estimated partial utilities of the levels of all attributes allow the computation of the total utility values for all scenarios. So, the total utility values of all cards can be calculated similarly, by adding up the constant with the partial utility values of all components of each card or scenario. The table 6 brings up the total utility values computed for all 16 alternatives and ranges them according to their utility values. Out of all alternatives, the scenario 6 has the highest total utility (6.608). So, the government should pay the high attention on a low regulation in the economic efficiency, the upper medium regulation in the fairness, and the highly regulated policies of the development. In contrast, the least preferred scenario is the scenario\_16 (2.760) which is composed of the high governmental intervention in the economic efficiency and the fairness, and the upper medium regulation in the sustainable development.

#### *4.3. Implication*

The empirical study seeks for the costs and benefits of the regulatory policies in the Cambodia's mobile telecommunications sector. Based on the individual perspectives over the tradeoffs between the economic efficiency, fairness, and stability, this paper brings better understanding of the insights of the actual consumer behavior that these three alternatives are set

to have four regulated levels, which create 16 scenarios through factorial fractional design. Individuals are asked to rate each scenario separately based on their own preferences.

**Table-6.** Total Utility of Scenarios of Regulatory Policies

<b>Scenario</b>	<b>Attributes</b>			<b>Utility of Each Scenario</b>	<b>Rank</b>
	<b>Economic Efficiency</b>	<b>Fairness/ Transparency</b>	<b>Stability</b>		
1	25 - 50%	25 - 50%	75 - 100%	5.941	3
2	25 - 50%	0 - 25%	25 - 50%	5.149	5
3	75 - 100%	0 - 25%	75 - 100%	4.357	8
4	50 - 75%	25 - 50%	0 - 25%	3.520	15
5	50 - 75%	0 - 25%	50 - 75%	3.698	12
6	0 - 25%	50 - 75%	75 - 100%	6.608	1
7	0 - 25%	0 - 25%	0 - 25%	4.050	10
8	0 - 25%	75 - 100%	25 - 50%	3.812	11
9	50 - 75%	75 - 100%	75 - 100%	3.570	14
10	0 - 25%	25 - 50%	50 - 75%	4.732	6
11	75 - 100%	25 - 50%	25 - 50%	4.070	9
12	75 - 100%	75 - 100%	50 - 75%	2.760	16
13	25 - 50%	75 - 100%	0 - 25%	3.662	13
14	50 - 75%	50 - 75%	25 - 50%	5.286	4
15	75 - 100%	50 - 75%	0 - 25%	4.586	7
16	25 - 50%	50 - 75%	50 - 75%	6.348	2

The results from the conjoint analysis signify the statistical significance of all alternatives at 99% of confidence. The most significant attribute is the fairness with the relative importance of 38.11% and the second one refers to the economic efficiency (33.00%) while the stability attribute has the lowest relative importance of 28.90%. The findings of this research are really appropriated to the objectives of the regulatory policies of many countries, such as Australia, the U.S, the European members, and so on. In aggregation, the most preferable regulatory policies should focus on the fairness at the upper-medium regulated level, the economic efficiency at a lower medium regulated level and the stable development at a high regulated level.

Incorporating with the consumer perspectives, it implies that the main objectives of the regulatory policies in the mobile telecommunications sector should firstly concern on the transparency or fairness. Consumers prefer the regulatory policies at the upper medium level to improve the fairness in mobile telecommunications market and they include the enlargement of the networks and services to all citizens at any place, the improvement of the service quality, the measures for the consumer protection and empowerment, the reduction of the asymmetric information. Moreover, the well-functioning market is to ensure the transparent business operations and to improve the competitions among suppliers. Accordingly, the FCC applies the competition policy in three domains which are monopolization, interconnection and merger/acquisition. In addition, the respondents also show their preference for the government intervention to improve the economic efficiency. With the relative importance of 33.00%, the policy maker has to establish the regulatory policies to improve the economic efficiency at the low

level. This means that the respondents do not want the government to put a high regulation to improve the efficiency because this might cause the increase in price or the restriction of some promotional campaigns. The widely accepted objective in the economic efficiency refers to the pricing control, which includes the pricing strategies or within network pricing strategies, and the access pricing or cross network pricing strategies. Then, the economic perspective can be obtained through introducing new production technologies to reducing the production costs. Also, the regulator is required to efficiently control all scarce resources of mobile telecommunications industry such as new entry licenses, frequency, or mobile number plan. Finally, the regulations have also to guarantee the improvement and the development of the mobile telecommunications service. The participants demand a high government intervention for the stability of the market competition and the development of the market. The stability still has a statistical significance on the establishment of policies with the relative importance of 28.90% at 99% level of confidence. This informs policy makers to set up more regulations to ensure the sustainable development and to encourage more investment.

## **5. CONCLUSION**

All in all, the empirical analysis is successful to analyze the costs and benefits of regulatory policies by investigating the consumer preference for the tradeoffs. The paper makes a concrete conclusion for the regulatory policies in the Cambodia's mobile telecommunications industry from the consumer perspectives. Should the government or policy makers bring the regulations for the development of the mobile telecommunications service in Cambodia, the first prioritized objective would be the fairness or transparency, and then it would refer to the economic efficiency and the stability of the development respectively. It is more preferable to the regulation at upper medium level to ensure the fairness objective. However, the regulatory intervention to improve economic efficiency is also preferred at lower medium level while it is required to have high regulatory policies for the development of mobile telecommunications services. The findings of this study would also like to introduce some implications for regulators or policy makers. To establish the most applicable and acceptable regulations, the policy maker should be more careful about the three main alternatives including fairness, economic efficiency, and stability. Similar to the context of Cambodia, the regulations should firstly give the priority to the fairness, the economic efficiency and then the stability. Besides, the regulations would also enhance consumer empowerment, to create higher social benefits and to increase the customer's utilities.

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