

Final Report

Estimating the Impact of Competition in Text  
Message Service to Consumer Welfare

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## Chapter 1

# FOREWORD

### 1.1. BACKGROUND OF THE STUDY

Telecommunication industry in Indonesia has evolved significantly from 1994 until now. In 2009, The Central Statistical Bureau has noted that the growth of telecommunication sectors reach 30.9%. Rapid technological development and also the deregulation and market openness policy (based on Law No. 36 year 1999 concerning telecommunication) have been attributed to the significant growth.

In terms of competition in the industry, during 1994-2003, there were only three cellular operators, which are Telkomsel, XL, and Indosat. The introduction of Fixed Wireless Access (FWA) created new players in the industry. Those players are PT. Mobile-8 Telecom, PT. Bakrie Telecom, Telkom, Star One, and PT. Sampoerna Telekomunikasi Indonesia. Adding these five operators to the industry, in 2004-2007 there were eight operators. In 2007-now, there are three additional players in the industry, which are Hutchison, PT. Smart Telecom, and NTS.

Text messaging is an additional service from voice service provided by cellular and FWA telecommunication service. For this service, operator sets a tariff which has to be paid by customer who sends the message (Sender Keeps All, SKA). As the competition among firms in the industry increased, operators differed their text messages tariff between on-net tariff (within the same operators) and off-net tariff (across operators) in 2004-2007. However, in time, to guarantee interconnection among operators, each operator made interconnection cooperation agreement with each other to avoid the possibility of traffic increase between operators. Based on Chapter 5 Law No. 5 year 1999, this case against the law for business players in price agreement with competitors.

The set tariff for text message among these operators was concerned by the Commission for the Supervision of Business Competition (Komisi Pengawas Persaingan Usaha, KPPU) to make consumer welfare reduced in a significant amount. Based on the findings and facts obtains during the investigation, KPPU decided that there have been agreements related with price fixing arrangement during the period 2004-2007 which coordinated by the market leader and followed by other telecommunication operator. With KPPU's Decree, consumers benefitted by text message tariff reduction between 50-70%. Before the Decree, the tariff for text messaging is Rp 350,- per message, after the decree, the tariff is Rp 100,- per message.

To gain the actual and exact impacts of tariff reduction in text messaging services in consumer welfare, KPPU needs to estimate and measure them. It is expected from this estimation that KPPU's contributions to consumer welfare enhancement can be documented. Also, it is hoped that the model and methodology applied in this study could be implemented by KPPU's human resources for another cases and conditions.

## 1.2. GOALS OF THE STUDY

The main objectives of this survey are to measure the effect of KPPU's Verdict on the competition in text messaging services and to estimate the impact of increasing competition in text messaging services towards consumer welfare (or surplus). The reduction in text message tariff affects consumer by enhancing consumer's utility. To explore the effect on consumers of the changes in text message tariff, a calculation of welfare change in the sample period is needed.

## 1.3. THE AIMS OF THE STUDY FOR KPPU

This study may provide the data analysis in telecommunications industry, such as structures, behaviors, and performance of the telecommunications industry. This study is expected to become an input for Commission of the Supervision of Business Competition (KPPU) in carrying out the functions of law enforcement and advocacy functions to the government in a fix the policy in the telecommunications sector. In addition, the results of this study are expected to harmonize the telecommunications sector, so these policies can prevent the existence of monopolistic or unfair business competition caused by business actors.

## 1.4. THE OUTPUT

The expected output of the study is to come up with an estimation of the possible welfare improvement (additional consumer surplus) from tariff reduction in SMS following to KPPU's Verdict in 2007. The study also attempts to further breakdown the welfare improvement into operators level, hence which customers (from which operators) that have gained the largest improvement. Not unimportantly, the study attempts to establish a link between these improvement with the information on consumer pattern of mobile phone use obtained from primary data (consumer survey).

## Chapter 2

# COMPARATIVE STUDY ON MODEL AND METHODOLOGY

To calculate consumer welfare, consumer's demand needs to be obtained first. Dick (2008) estimates a structural demand model in order to measure the effects on consumers given dramatic changes in banking regulation in US 1990s. Demand is derived following a discrete choice approach. By defining consumer preferences over product characteristics, as opposed to specific products of firms, the approach avoids the estimation of a large number of substitution parameters across firms. It is assumed that consumers have demands for multiple services, and incur a fixed cost for each new firm they have to deal with.

Formal equation:

$$u_{ijt} \equiv \delta_{jt} + \epsilon_{ijt} \equiv P_{jt}^d \alpha^d - P_{jt}^s \alpha^s + x_{jt} \beta + \xi_j + \epsilon_{ijt}$$

$u_{ijt}$  is a linear utility function such that the conditional indirect utility of consumer  $i$  from choosing bank  $j$ 's services in market  $t$ .  $P_{jt}^d$  and  $P_{jt}^s$  represent interest rate paid by banks on deposits and service charges on checking accounts,  $x_{jt}$  is a  $K$ -dimensional row vector of observed characteristics,  $\xi_j$  represents unobserved bank characteristics (depicted as a mean across consumers), and  $\epsilon_{ijt}$  is a mean zero random disturbance. The  $K+2$ -dimensional vector  $\theta_D = (\alpha^d, \alpha^s, \beta)$  represents the taste parameters.

The predicted market share for bank  $j$  is

$$\bar{s}_j(\delta) = \frac{\exp(\delta_j)}{\sum_{k=0}^j \exp(\delta_k)}$$

Thus, the derived market shares depend only on mean utility levels  $\delta$  such that a simple structural relationship between the marginal utilities and the observed market shares is obtained. Using nested logit model to reduce restrictive substitution problems by allowing consumer preferences to be correlated within product categories, the consumer utility is

$$u_{ij} \equiv \delta_j + \varsigma_{ij} + (1 - \sigma)\epsilon_{ij}$$

where  $\varsigma_{ig}$  is shared among products in the group and has a distribution that depends on  $\sigma \in [1,0)$ . As  $\sigma$  approaches 1, the correlation of utility across products in group  $g$  approaches one as well.



Moreover, Dick divide banks into two groups based on their geographic diversification, multi-state banks and banks that have presence in single state. The nested logit model becomes:

$$\ln(s_j) - \ln(s_0) = x_j\beta + p_j^d \alpha^d - p_j^s \alpha^s + \sigma \ln\left(\frac{\bar{s}_j}{\bar{g}}\right) + \xi_j$$

where  $\ln\left(\frac{\bar{s}_j}{\bar{g}}\right)$  represents the market share of bank j, which belongs to group g, as a fraction of the total group share.

Dick uses equivalent variation (EV) to measure welfare effects of changes in the choice set between period s and s-1 in a given market. EV is defined as the amount of money that would make consumers indifferent, in expectation, between facing the two choice sets. Then, one has that:

$$EV = S_s(p', x'; \vartheta_D) - S_{s-1}(p, x; \vartheta_D)$$

$$\text{where } S(p, x; \vartheta_D) = \ln\left[\sum_j \exp(\delta_j(p_j, x_j, \vartheta_D))\right] / \alpha.$$

Hassan (1995) uses three measures often used to evaluate the welfare implications of a policy change which are consumer surplus, compensating variation, and equivalent variation.

### 1. Consumer Surplus

Measuring consumer welfare using consumer surplus is obtained by using Marshallian Demand Function(MDF). MDF is usually derived from the utility function with subject to budget function,  $q(p,m)$ . But it can be obtain also by applying Roy's identity to Indirect utility function  $u=u[q(p,m)=v(p,m)$ :  $[\partial v(p,m) / \partial p_i] / [\partial v(p,m) / \partial m] = q_i(p,m)$ . This Marshallian demand function gives the quantity demanded as a function of prices, holding income constant while changing the level of utility. We can derive a monetary measure of utility change,  $dw = dv / \lambda = dm[\sum_i q_i(p,m)dp_i]$  by assuming that  $\lambda$  is constant and positive

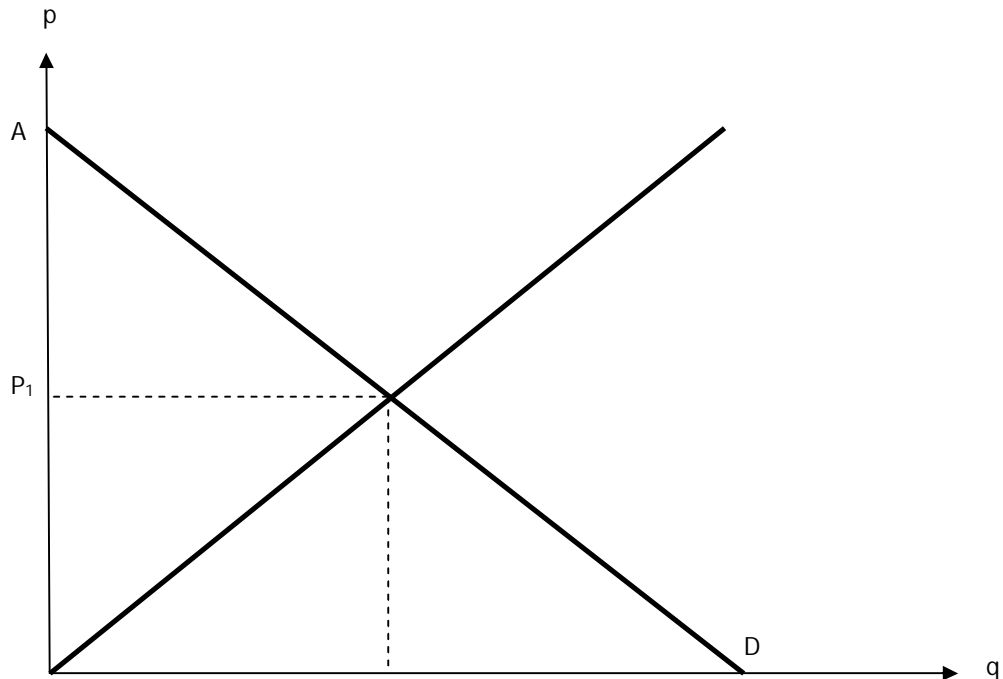
with  $dv = \sum (\partial v / \partial p_i)dp_i + (\partial v / \partial m)dm = \lambda [dm \sum q_i(p,m)dp_i]$ , using Roy's identity.

In discrete measure,  $\Delta w \approx \Delta m[\sum_i q_i(p,m)\Delta p_i] \approx \Delta m[\int_0^1 q_i(p,m)dp_i]$ . This measure of

welfare change is what considered to be the consumer surplus. The consumer welfare is the difference between the market price and their willingness to pay as shown as the area of triangle  $p_1AB$  (see Figure 2.1). Consumer surplus is considered as a unique measure of

utility change<sup>1</sup> when the marginal utility of income is constant. Constancy of marginal utility of income guarantees path independency of the line integral, whereas path independency of the line integral does not guarantee constancy of marginal utility of income.

Figure 2.1. Consumer Surplus



## 2. Compensating Variation

Compensating variation (CV) is defined as the amount of income that must be taken away from a consumer (positive or negative) after an economic change to restore the consumer to the original welfare level. The CV is the income adjustment required to make the consumer indifferent between consuming the original basket and facing the lower price basket in different utility level.

More formally, the CV for a change in prices and income from  $(p_1, m_1)$  to  $(p_2, m_2)$  can be written as:

$$\begin{aligned} CV &= m_2 - e_1 \\ &= m_2 - e(p_2, u_1) \end{aligned}$$

<sup>1</sup> Here, consumer surplus is a measure of utility change since we derive it from consumer (utility optimization) theory. See Hassan (1995).

$$\begin{aligned}
 &= m_2 - m_1 + m_1 - e(p_2, u_1) \\
 &= \Delta m + e(p_1, u_1) - e(p_2, u_1) \\
 &= \Delta m \int_{p_1}^{p_2} \sum_i [\partial e(p, u_1) / \partial p_i] dp_i
 \end{aligned}$$

Where  $m_2$  is the new budget function, while  $e_1$  is the original expenditure function.  $p_1$  and  $p_2$  are original and new price respectively.  $u_1$  and  $u_2$  are original and new utility function.

If the price of a normal commodity,  $q_i$ , changes while all other prices and income remain constant, then CV reduces to:

$$CV = \int_{p_1}^{p_2} \sum_i q_i(p, u_1) dp_i$$

Consumer welfare is measured using Hicksian Demand Function (HDF) from the derivation of the movement from the original basket in the original budget and utility function to the new basket in new budget and utility function. HDF is obtained by minimizing budget function with subject to utility function,  $q(p, u)$ .

### 3. Equivalent Variation

In contrasts to the CV, the equivalent variation (EV) is defined as the amount of income that must be given to consumer (positive or negative) in lieu of an economic change to make him as well off as with the change. EV uses the level of utility after price and income changes as a basis.

$$\begin{aligned}
 EV &= e_2 - m_1 \\
 &= e(p_1, u_2) - m_1 \\
 &= e(p_1, u_2) - m_2 + m_2 - m_1 \\
 &= e(p_1, u_2) - e(p_2, u_2) + m_2 - m_1 \\
 &= e(p_1, u_2) - e(p_2, u_2) + \Delta m \\
 &= \int_{p_1}^{p_2} \sum_i [\partial e(p, u_2) / \partial p_i] dp_i + \Delta m \\
 &= \int_{p_1}^{p_2} \sum_i q_i(p, u_2) dp_i + \Delta m
 \end{aligned}$$

where  $m_1$  is the original budget function, while  $e_2$  is the new expenditure function.  $p_1$

and  $p_2$  are original and new price respectively.  $u_1$  and  $u_2$  are original and new utility function.

For a decrease in the price of a normal commodity,  $q_i$ , the EV is written as:

$$EV = \int_{p_1}^{p_2} q_i(p, u_2) dp_i$$

Same as Compensating Variation, Hicksian Demand Function used to measure EV. HDF itself is calculated by minimizing budget function with subject to utility function,  $q(p, u)$ . Moreover, EV is obtained from the derivation of the movement from the original basket in the original budget and utility function to the new basket in new budget and utility function.

Table 2.1. Comparison of Three Methods to Calculate Consumer Welfare

	Consumer Surplus	Compensating Variation	Equivalent Variation
Demand	Marshallian Demand Function, $q(p, m)$	Hicksian Demand Function, $q(p, u)$	Hicksian Demand Function, $q(p, u)$
Path Dependency issue	Arise	Do not arise	Do not arise
Consumer Welfare	$(P1 * Q1) - (P2 * Q2)$ in MDF	$(P1 * Q1) - (P2 * Q2)$ in HDF	$(P1 * Q1) - (P2 * Q2)$ in HDF

## 2.1. PROS AND CONS OF EACH MODEL AND METHODOLOGY USED FOR ANALYSIS REGARDING THE INCREASE OF CONSUMER WELFARE BROUGHT BY INCREASING COMPETITION

Because of the restrictive assumptions concerning the constancy of the marginal utility of income and the question of path dependency of the line integral in measuring welfare with consumer surplus method, alternative measures that do not suffer from these defects have been advanced, including the compensating and equivalent variations.

Compensating Variation and Equivalent Variation Method do not have any path dependency issues as described in the consumer welfare method but required careful consideration in choosing between the two methods. From theoretical point of view CV uses the new price as the base while EV uses initial price. If the study is conducted before an expected price change, EV is better suited. When the research of welfare measure has been done after a price change then CV is better suited.

As for the demand function, each model usually follows certain unique econometrics method. In choosing an appropriate method, many things need to be considered especially for availability of the data that has always been a classic issue in developing country such as Indonesia. Using nested logit model as in Dick (2008) could pose some problem since we have very limited data with small time series. Using simple OLS or IV method also is not appropriate with very few data series. This study suggests the use of panel data in order to pool all the data to achieve better result.

## 2.2. PROS AND CONS OF EACH MODEL AND METHODOLOGY USED FOR ANALYSIS REGARDING THE EFFECT OF GOVERNMENT'S POLICY OR LAW ENFORCEMENT TOWARD INCREASING COMPETITION

As mentioned before, since the KPPU verdict happens in 2007, the price of text message has been lower considerably. Thus the choice of measuring the welfare effect with CV method will be appropriate. For the econometrics model, we will include a possibility of introducing dummy variable for period before and after the verdict. If better specification result is achieved we will use this dummy variable. If not, we will stick to other optimum specification. Also, we cannot use Dick (2008) model since using a discrete choice model requires a survey at national level that requires a lot of effort and fund. This large survey is needed to represent the national impact of KPPU verdict. Therefore the model will use national secondary data in estimating the welfare effect of each operator.

## 2.3. RECOMMENDATIONS ON DESIRABLE MODEL AND METHODOLOGY FOR THE STUDY

Of several welfare changes measurements<sup>2</sup>, we plan to employ a Compensating Variation (CV) method. In essence, CV is the compensating payment (in monetary measures) that leaves the consumer as well off as before an economic change. The economic change phenomena could be in the case of a price rise, a price decline or an income change that leads to a change in consumer's utility. The compensating payment will have positive sign if a welfare loss occurs and negative sign for a welfare gain. In other words, the payment is being made to the consumer in the case of a welfare loss and/or taken from the consumer in the case of a welfare gain. In our case, the verdict of KPPU is expected to create welfare gain for consumer due to its tariff cut impact.

In practice, the method is widely applied when measuring welfare impact and fairly easy to calculate.<sup>3</sup> Also, the secondary data to construct the model is relatively accessible from several statistical sources.

Apart of the above practical reasons, the use of CV is also consistent from theoretical point of view. CV asks how much income change would be necessary to compensate the consumer using the new price. Unlike EV method that uses the initial price as the base, CV uses the new prices or after-change prices as the base. Since the study is conducted after a price change, therefore it is suitable to use compensating variation (CV) to measure the welfare change from changing in text message tariff.

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<sup>2</sup> There are other common measurements including Equivalent Variation (EV), Consumer Surplus (CS) methods. Further detail of these methods can be found in many Microeconomics text books such as Varian (1992), Carlton and Perloff (2004).

<sup>3</sup> See for example Hausman (1981), Hausman, Pakes and Roston (1997).

In mathematical form, CV is defined as the change in consumer's indirect utility in two different economic environment. If the two-good-case demand function is  $x = e^c p^\alpha y^\delta$  (with  $p$  and  $y$  is normalized with  $p_2$ ) or in log-linear demand function form is  $\log x = c + \alpha \log p + \delta \log y$ , then the formal form of compensating variation (CV) from Hausman (1981) is the following:

$$CV = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y^{-\delta} (p_1 x_1 - p_0 x_0) \right] + y^{1-\delta} \right]^{\frac{1}{1-\delta}} - y \dots\dots\dots (1)$$

where:

$x$  = quantity of demand,

$p$  = (text message) price,

$\alpha$  = (text message) price elasticity,

$\delta$  = income elasticity,

$p_0 x_0$  = revenue from using initial price,

$p_1 x_1$  = revenue from using new price, and

$y$  = income.

A general specification of a system of demand equations would be  $x_i = x(p, y, z, \varepsilon_i)$  with  $i = 1, \dots, N$  different goods, where  $p$  is the price vector,  $z$  is a vector of socioeconomic characteristics, and  $\varepsilon_i$  is the stochastic disturbances. Hausman (1981) shows that since the focus will be on the change of  $p_1$  as the '*contemplated policy measure*', it is assumed that  $z, y$  and  $p_2, \dots, p_n$  will remain constant. This is a common partial equilibrium analysis. With Hicks' composite commodity theorem, the equation can be rewritten resulting again in simple demand function  $x = e^c p^\alpha y^\delta$  (with  $p$  and  $y$  now is normalized with a composite price index  $q$ ).<sup>4</sup> Individual chooses among three services product: text message service, call service and data (internet) service. Since the available data is only for the first two and also data (internet) service has not been widely used in Indonesia, we can proceed with the simple two goods specification. Also, with this specification we can inherently include the substitution effect between the uses of text message and call service. Socioeconomic characteristics are assumed to be constant in our

<sup>4</sup> See Hausman (1981) paper.

model (*ceteris paribus*) except for the advertising cost variable that plays a significant role in their strategic behavior. We will also include a dummy variable dividing the term before and after the verdict if necessary (when a significant structural break in the data presents).

Previous literatures have implemented a model developed by Hausman (1981) to measure changes in consumer welfare. Petrin (2002), Hausman and Leonard (2002), Brynjolfsson, Smith, and Hu (2003), Pofahl, Richards, and Tonsor (2009) applied a log-linear demand function and compensating variation from Hausman (1981) in panel data. The result of Petrin's study (2002) is an increase in consumer surplus from the existence of new entrants in USA minivan market. Hausman and Leonard (2002) shows an increasing of consumer surplus in toilet paper market from a new entry product. Brynjolfsson, Smith, and Hu (2003) demonstrates an increase in consumer surplus resulting from an increase in books' titles variation sold by online bookstore. Pofahl, Richards, and Tonsor (2009) concludes there is a difference between consumer surplus obtained by high income and low income consumers from the introducing of three new products in juice market. High income consumers experienced negative consumer surplus, while low income consumers experienced positive consumer surplus. These four literatures using panel data and log-linear demand function with compensating variation support the usage of panel data in this paper.

## Chapter 3

# PROFILE OF SHORT MESSAGE SERVICE IN INDONESIA

### 3.1. MARKET STRUCTURE OF TELECOMMUNICATION INDUSTRY IN INDONESIA (FOCUS ON SMS AND RELATED SERVICES)

#### 3.1.1. History and Latest Update of the Market

Early development of telecommunications services in Indonesia started in the Dutch East Indies Colonial era in 1882. In 1884, the Government of Netherlands East Indies formed the Post-en Telegraafdienst (Post Telegraph Telephone / PTT). This company was a pioneer of postal service and telecommunications in Indonesia. At a period before Indonesia's independence, the firm experienced various name changes. These changes are in line with their work function. In 1906, the Dutch Government started to create government agencies. The task of one of the agency was to take over telecommunications services from the private sector. In 1961, the status of '*jawatan*' was changed into State Enterprise of Post and Telecommunications (Postel PN). In 1965, PN Postel was divided into two parts, State Enterprise of Post and Giro and State Telecommunications Company. In 1974, State Telecommunications Company was changed into Public Telecommunications Company (Perumtel). In 1991, based on Government Regulation No. 25 Year 1991, Perumtel was transformed into PT. Telekomunikasi Indonesia (Telkom).

In 1966, when Suharto was President of the Republic of Indonesia, he set up a Presidential Economist team. Their duty was to assist the First Development Cabinet and issued Law No. 1 on Foreign Direct Investment. These conditions created an opportunity, later on captured by ITT (International Telephone and Telegraph Corporation), a telecommunications company from United States. This first foreign firm had invested in Indonesia at the field of telecommunications, as well as the second foreign firm after Freeport at the field of mining industry.

Government of Republic Indonesia represented by Ministry of Transportation had worked with ITT in investing their capital to Indonesia amounted to US\$ 6,1 million. This project made the first earth station in Indonesia. The station located in Jatiluhur. On 29th of September 1969, development of the telecommunications stations had been completed. The opening of the station was inaugurated by President. It was a historic day for telecommunications industry in Indonesia.

In 1989, the first telecommunications law was issued (Law No. 3/ 1989). This law, to a limited extent, opened the Indonesian telecommunications market to private investor. Under



the former law, telecommunications services were divided into two broad categories. The First is basic telecommunications services i.e. telephone (both fixed and mobile), telex, and telegrams and the second is non basic telecommunications services.

The provision of basic telecommunications services was controlled by the government through two state-owned telecommunications operators, PT. Telkom and PT. Indosat. PT. Telkom is in charge for the provision of local and domestic long distance fixed line services while PT. Indosat serves the provision of fixed line international services.

After ten years since the first Act was implemented, the new Telecommunications Act was born, namely Law No. 36 Year 1999, which became effective on September 8th, 2000. Most of these laws reflect the substance of telecommunications policy, known as Blueprint of 1999. At mid-year, the document was approved by the Decree of Ministry of Transportation No. 72 Year 1999.

Beside these laws, to create a healthy competition in telecommunications industry, governments also had issued several laws and regulations. Most importantly is the Law No. 5/1999 on prohibition of monopoly practices and unfair Business competition followed by Minister of Transportation Decree No. 35/ 2004 on implementation of local wireless fixed line with limited mobility and Minister of Transportation Decree No. 33/ 2004 on the supervision of healthy competition in fixed network and the implementation of basic telephone services.

In many countries, government has made communications sector as monopoly. But at the end, government realized that not all parts of the telecommunications industry need to be monopolized where technology offers a reduction in investment costs and public demand grows as new capacity is installed. We will summarize several changes in telecommunications industry paradigm in the table below.

Table 3.1. Paradigm Changes in Telecommunications Industry

Old Paradigm	New Paradigm
<ul style="list-style-type: none"> <li>• Monopolistic market</li> <li>• Tight regulation</li> <li>• Telecommunications infrastructure</li> <li>• Non basic and basic services</li> <li>• The dominance of channel wire / cable</li> <li>• Determination of tariffs by the amount of "minutes"</li> <li>• The dominance of state owned enterprises</li> </ul>	<ul style="list-style-type: none"> <li>• Competitive market</li> <li>• Almost without regulation</li> <li>• Information infrastructure</li> <li>• Networks and Services</li> <li>• The dominance of wireless and mobile</li> <li>• Determination of tariffs by the amount of "bytes"</li> <li>• The dominance of private firms and public companies</li> </ul>

Source: *Telematics Blue Print 2005-2015, Mastel*

Sometimes in several countries, government is unable to interpret the paradigm changes that have been occurred. Supposedly, government defines competition as the ultimate goal and not only as an alternative to monopoly in public policy framework, such as in the form of available telecommunications services growth, price reduction, and increasing private investment. Government should prepare to intervene if competition provides undesirable influence on overall economic policy.

With the enactment of new law, it is expected a healthy competition will occur as new entrants enter the telecommunications industry. Also, government needs to increase transparency and accountability in their policy, especially concerning the telecommunications sector. Furthermore, they must stimulate foreign investment in telecommunication sector through various incentives such as more transparent and accountable policies. Table 3.2 will provide information about categorization of telecommunications services in Indonesia.

Table 3.2. Categorization of Telecommunications Services in Indonesia

Telecommunications Network	Fixed	Local fixed lines Long distance fixed lines International fixed connection lines Closed fixed lines
	Mobile	Terrestrial mobile lines Cellular mobile lines Satellite mobile lines
Telecommunications Services	Basic telephone Services	Telephone, facsimile, telex, telegraph
	Value added telephone	Premium call, Calling card, Virtual private phone number, public phone recording, Call centre Store and forward
	Multimedia	VoIP, internet and intranet, data communications, video conference entertainment video services
Special Telecommunications Services	Own purposes	Individuals, government agencies, special service offices, legal bodies
	Services for state defence and security	
	Services for broadcasting purposes	

Source : Government Regulation No. 52/ 2000 on Telecommunications Businesses

Enactment of Law in telecommunications encourages the establishment of two new institutions. ITRB was established in 2003 as implementation agency of the Telecommunications Law. ITRB was an independent regulatory body intended to reduce the

government's role in the telecommunications industry. The duty of the ITRB is to regulate, monitor, and control the operations of the telecommunications sector. ITRB assisted The Telecommunications Traffic Clearing System (TTCS), since its establishment in 2003. Through TTCS, ITRB will obtain data about the profile of interconnection traffic among operators to ensure transparency in interconnection fees charge.

In 2009, the Minister of Communications and Informatics issued Decree No14/PER/MKOMINFO/02/2009 dated February 25, 2009 regarding Telecommunications Traffic Clearing which regulates the transfer of TTCS operation to the operators. The Government acts as a supervisor, while the operators are responsible for the system and operation. The TTCS performs as a tool for the government to maintain a check and balance mechanism for verifying operator traffic clearing data.

Next is the formation of Telecommunications Interconnection Clearing Association (ASKITEL). This institution was built by the telecommunications operators. It is a nonprofit institution which will accommodate the interests of their members in competing in the telecommunications industry. In addition to managing the automation of the clearing system interconnection among operators, Askitel also acts as a mediator if dispute among operator is present. This institution is expected to be credible because it represents all telecommunications operators in Indonesia.

Currently, the Indonesian telecommunications market has been progressing quite rapidly. It is inspired from a change in the phase transition from fixed telephone to mobile telephone. Supposedly, Indonesia can still develop further. From the ITU report, in 2005, the Indonesian telecommunications market penetration rate is still relatively low, amounting to 20 percent. When compared with other countries, particularly Malaysia and Thailand, the Indonesian telecommunications market penetration rate is still quite low. Table 3.3 presents the level of fixed line and mobile teledensity in several Asian countries including Indonesia.

Table 3.3. Cellular Penetration and Teledensity in Several Asian Countries, 2005

Country	Population (Million)	Fixed Line Penetration (%)	Cellular Penetration (%)	GDP Per Capita (US\$)
Hongkong	7,04	53,94	123,47	34.670
Singapura	4,35	42,39	100,76	29.780
Korea Selatan	48,29	49,17	79,39	21.850
Malaysia	26,00	16,79	75,17	10.230
Thailand	64,23	10,95	42,98	8.440
Filipina	84,21	4,00	41,30	5.300
Cina	1315,84	26,63	29,90	6.600
Indonesia	222,78	5,73	21,06	3.720

Source : ICT Statistics 2005, ITU

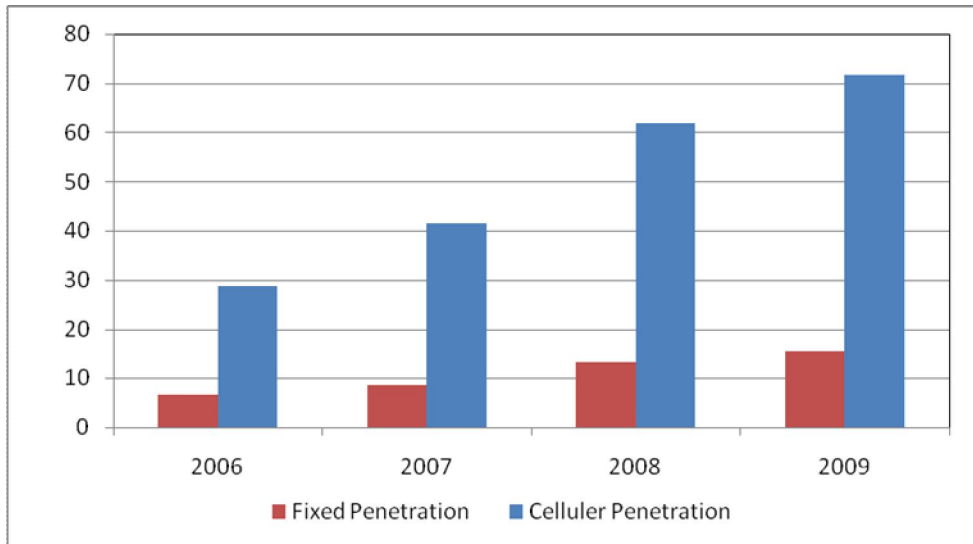
The low teledensity of fixed line and cellular penetration rate in Indonesia allows the growth of the customer. Indonesia has a large population when compared with these two countries. With increasing need for public communication and large areas that have not been touched by telephone networks, further development is expected to occur.

Based on Table 3.3, China and Indonesia have large populations. Overall, both countries ranked lower than countries with less population. In penetration of fixed lines, Indonesia is still better compared to Philippines where the penetration of fixed telephone lines reached 5.73 percent while Philippines is only 4 percent. For cellular penetration, Indonesia has a low percentage compared with other Asian countries at 21.06 percent. In term of penetration of fixed telephone and mobile phone, Indonesia is still unable to compete, when compared with other Asian countries. These include Southeast Asian countries such as Singapore, Thailand, and Malaysia.

From the table, the potential growth in the number of cellular subscribers in Indonesia is still large despite of low penetration in fixed telephone subscribers. This is a big opportunity for major operators in Indonesia to enter the cellular market categorized as fixed wireless access. Compared with fixed telephone networks, the development of FWA services is more profitable with a smaller investment costs. Besides, there are still many areas which have not been served by mobile operators and fixed line network.

To expand the local market, mobile operators must build a network reaching remote areas, especially the potential ones. This effort is very beneficial for the Indonesian government, because according to the International Telecommunication Union (ITU), each additional 1% teledensity in a country will improve economic growth at 3%. From Figure 3.1, we can view the development of fixed line teledensity and mobile phones in Indonesia.

Figure 3.1. Fixed and Celluler Penetration in Indonesia, 2006 - 2009



Source : Calculated from Statistical Book of Posts & Telecommunications 2010, DGPT.

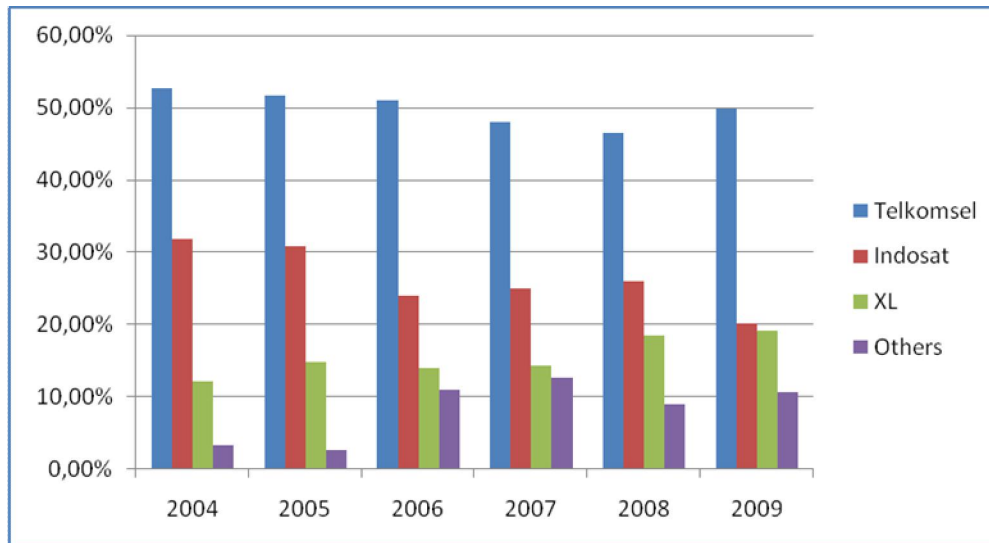
The development of teledensity, teledensity of fixed line and mobile phones, has increased significantly. Figure 3.1 indicates that teledensity has increased during this period. Fixed line teledensity had increased, although not amounting to an increase teledensity in mobile phone. In 2007, mobile phone teledensity increased quickly, marked by the entry of new mobile operators such as Hutchinson, Smart, and Sampoerna Telecom Indonesia.

By noticing mobile market size in Indonesia (including mobile and fixed wireless market access), fixed wireless access product has a small market share, while cellular product is the largest one. Currently, there are ten operators in the mobile telecommunications industry in Indonesia, ie., Telkomsel, XL-Axiata, Indosat, Telkom Flexi, Smart Mobile-8, Bakrie Telecom, Hutchison, Sinar Mas Telecom, Natrindo Cellular Phone, and Sampoerna Telecommunication Mobile. Four companies such as Hutchison, Sinar Mas Telecom, Natrindo Cell Phones, and Sampoerna Telecommunications are new player. Hutchison entered the cellular market, while others entered the fixed wireless access market. The presence of new players in the telecommunications industry shows that there is still large potential market in this industry. However, from ten operators, only three operators have a market share over 10 percent. These are Telkomsel, Indosat, and XL-Axiata.

Based on Figure 3.2, in 2004, the entry of several new operators based on CDMA technology provides a significant influence on the composition of cellular customer acquisition. It made the concentration ratio of three mobile operators drop in the same year. Then, in 2006 and 2007, new operators succeeded in raising cellular customers in Indonesia gaining 11% and 12,7% share respectively. It causes the market share of other cellular

companies (Telkomsel, Indosat, and XL) to drop. This indicates a positive sign, as the cellular industry in Indonesia becomes less concentrated in several operators.

Figure 3.2. Shares of Cellular Phone Subscribers, 2004 - 2009

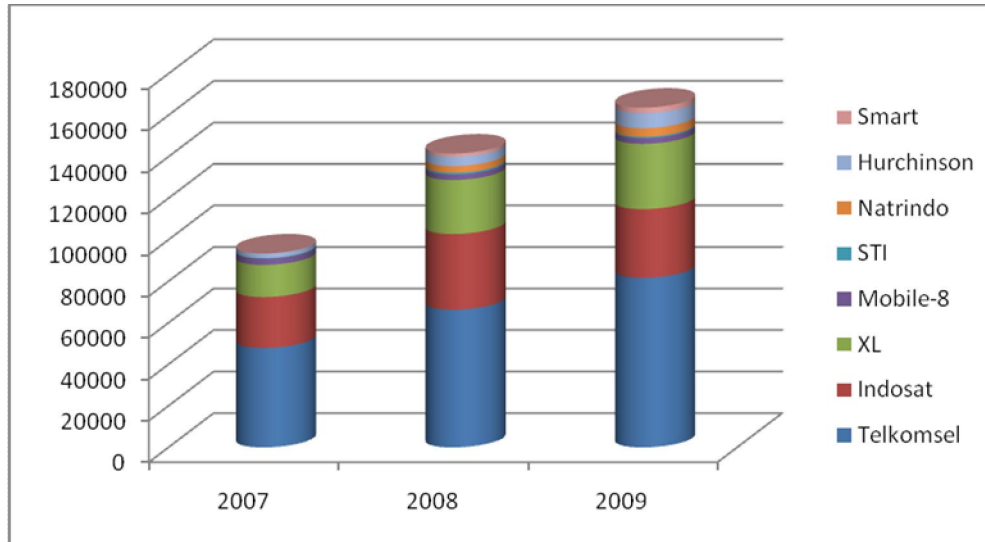


Source : Calculated from Statistical Book of Posts & Telecommunications 2010, DGPT.

The graph above indicates that the three main operators have the largest number of subscribers. They were Telkomsel, Indosat, and XL. Although the number of subscribers of the three operators indicates an increase, the share of Telkomsel operator tended to decline compared with the two other major operators. The subscriber number of new operators is still far below the three main operators, although all three had experience an increased. A vigorous campaign and a range of facilities/feature offering could not attract customers to switch to the new operators.

Small operator customers such as STI, Hutchinson, and Smart showed a rapid increase. This happens because the number of subscribers is still relatively small although the three major operators also showed high customer growth. Figure 3.3 presents the development of the number of subscribers for each operator.

Figure 3.3. Share of Cellular Phone Subscriber for Each Operator, 2007 - 2009



Source : Calculated from Statistical Book of Posts & Telecommunications 2010, DGPT.

Although changes in market concentration are quite significant, according to ATSI, almost half of the customers of three operators (Telkomsel, Indosat, and XL) also have CDMA-based numbers. These conditions indicate that the customer can change the numbers based on CDMA to GSM or vice versa at any time. This situation illustrates the strong dominance of Telkomsel brand in their product. Telkomsel is a dominant firm which has a percentage of 45% or more, although the level of competition was increasing with many new operators which played in the Indonesian telecommunications industry.

For mobile phone subscribers by region, the majority of customer concentration is found in Java, followed by Sumatra. According to DGPT., in 2009, total subscribers in Java reached 85.4 million customers. Jakarta-Banten reached 32.6 million subscribers and West Java-Central Java-East Java reached 42.8 million subscribers. For Sumatra region the number of subscribers reached 35.7 million and Kalimantan reach 11.1 million subscribers as shown in Table 3.4.

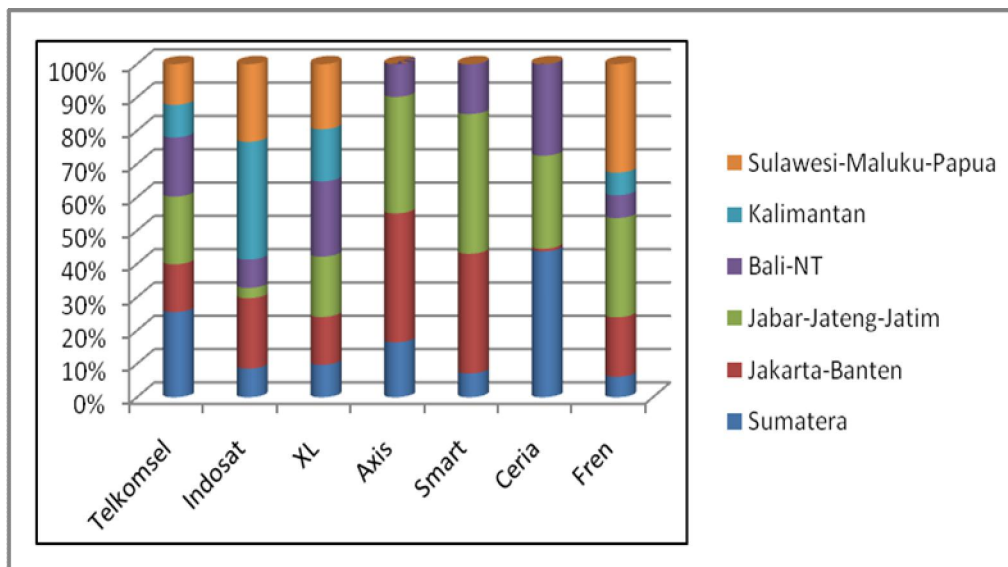
Table 3.4. Number of Cellular Subscribers by Region, 2009 ( Million )

Operator	Sumatera	Jakarta-Banten	Jabar-Jateng-Jatim	Bali-NT	Kalimantan	Sulawesi-Maluku-Papua	Total
Telkomsel	24450	12443	23156	3417	1046	1147	65659
Indosat	4118	9203	1750	821	1891	1099	18882
XL	5832	7797	12900	2716	1046	1147	31438
Axis	711	1514	1795	85	0	0	4105
Smart	202	923	1414	85	0	0	2625
Ceria	335	6	254	42	0	0	637
Fren	272	722	1575	61	34	142	2806
Total	35921	32607	42844	7228	4017	3536	

Source : Statistical Book of Posts & Telecommunications 2010, DGPT.

According to the reports DGPT. 2010, the largest proportion of mobile phone subscribers are in the region of West Java, Central Java, East Java and Yogyakarta, with the proportion reaches 30.2% of total subscribers in Indonesia. When combined with mobile customers in Jakarta and Banten, the total proportion of subscribers reached 53.1% or over half of total mobile phone subscribers in Indonesia. Meanwhile, the total proportion of mobile phone subscribers reached 25.1% in Sumatra. Other three regions (such as Bali-NT and Sulawesi-Maluku-Papua) have customers less than 10 percent.

Figure 3.4. Distribution of Cellular Phone Subscribers for Each Operators by Region, 2009



Source : Calculated from Statistical Book of Posts & Telecommunications 2010, DGPT.

Based on the distribution of cellular phone subscribers for each operator per region, Telkomsel has a relatively even distribution spread. Distribution of the biggest customers is



in the region of Sumatra, followed by the region of West Java, East Java, and Central Java-Bali-NT. Indosat has large cellular subscribers in Kalimantan. This distribution of cell phone subscribers could overcome Telkomsel. For the third major operator (Telkomsel, Indosat, and XL), tight competition actually occurs in the region of Jakarta-Banten with the three operators have relatively equal market shares in the region of Sulawesi-Maluku-Papua.

In line with the increased number of customers, it also increases the performance of mobile operators. The indicator used is the total operating revenue and ARPU (Average Revenue Per User). Both indicators are basically reflects the service revenue derived from telecommunications services provided.

Total operating revenue represents revenue earned from services provided, such as post-paid telephone service (post paid), pre-paid (prepaid), international roaming, interconnection, and other services (including SMS). Table 3.5 shows total operating revenues every operator.

Table 3.5. Total Operating Revenue for Each Operator, 2006-2009  
( Billion Rupiah )

No	Operator	2006	2007	2008	2009
1	Telkom	51294	59440	60689	64597
2	Indosat	12239	16488	18659	18393
3	XL-Axiata	4682	7990	12061	13706
4	Bakrie	608	1290	2202	2743
5	Mobile-8	589	883	732	369
6	Smart Telecom	n.a	5	200	546
7	Hutchinson	n.a	117	296	615

Source : Statistical Book of Posts & Telecommunications 2010, DGPT

Total operating revenue from every mobile phone operator in Indonesia showed an increase trend during the last four years, except for Mobile-8. In 2009, total operating revenue showed varying conditions. Mobile-8 has decreased significantly and Indosat also decreased although only 0,4%. Other operators such as Telkom, XI-Axiata, and Bakrie has increased, including new operators such as Smart Telecom and Hutchinson.

Average Revenue per Unit represents revenue obtained by one operator customers who use their products. ARPU value indicates the average amount of revenue earned by operators from a single customer. That is, although the number of customers slightly, but the operator has a great ARPU if customers quite intensive use of telecommunications service operators. Table 3.6 shows the development of cellular mobile ARPU every operator.

Table 3.6. Cellular Mobile Phone ARPU, 2007 – 2009 (Rupiah)

No	Operator	2007			2008			2009		
		Pra Bayar	Pasca Bayar	Blended	Pra Bayar	Pasca Bayar	Blended	Pra Bayar	Pasca Bayar	Blended
1	STI	37000	196000	37147	23813	186483	210296	22221	128541	22252
2	XL-Axiata	43000	155000	47000	35000	152000	37000	34000	167000	36000
3	Natrindo	36124	48351	41666	6500	n.a	6500	6300	n.a	6300
4	Hutchinson	14829	114049	14971	11161	128928	11414	11000	194000	11000
5	Mobile-8	37218	115312	39791	14495	73963	17621	11310	48918	12986
6	Smart Telecom	25000	110000	45000	24000	55000	26000	25000	52000	26000
7	Telkomsel	71086	264000	80000	53000	216000	59000	43000	214000	48000
8	Indosat	47028	182682	52828	34654	182147	38282	33138	175327	37330

Source : *Statistical Book of Posts & Telecommunications 2010, DGPT*

ARPU decline significantly occurred in pre-paid customer service. This decrease was seen clearly in the three major operators such as Telkomsel, Indosat, and XL-Axiata. On average, in 2009, prepaid ARPU decreased amounted to 6,89% of all operators. While the decline in postpaid ARPU all operators only 2,1%. This happens, when most post-paid ARPU declined, XL-Axiata and Hutchinson has increased, amounted to 9,87% and 50,47%.

### 3.1.2. Business Actor Profile

#### 3.1.2.1. PT. Telekomunikasi Seluler (TELKOMSEL), Tbk

Telkomsel is Indonesia's largest telecommunications company. Telkomsel provides mobile telecommunications services, known as Kartu Halo, Simpati, and As. Initially, Telkomsel is the mobile telecommunications system services managed by PT. Telkom. This service comes after a successful pilot project of GSM cellular telecommunications network in Batam and Bintan.

Beginning in 1993, the government requested PT. Telkom to create GSM pilot project in both regions. This project runs very well, finishing within only two months. These events became the milestones of mobile telecommunications in Indonesia. The success inspired new implementation elsewhere in Medan and Pekanbaru. Also, Telkomsel is encouraged to register with the world operator organization, based in Dublin.

Based on requests from central government, Telkomsel became a joint venture between PT. Telkom and PT. Indosat. PT. Telkom serves the local network while PT. Indosat operates overseas network. On 26<sup>th</sup> of May 1995, with a Verdict by Minister of Tourism, Post, Telecommunications and Minister of Finance, Telkomsel was defined as a second GSM operator in Indonesia.

A desire to become international standard operator, two strategic partners is invited to join. Both partners are the Netherlands KPN Telecom and PT. Setdco Megacell Asia. With these second partners, starting 11<sup>th</sup> of March 1996, Telkomsel has foreign investment (PMA). Less than two years, precisely on 29<sup>th</sup> of December 1996, all provinces of Indonesia, spreading from Sabang to Merauke has been provided telecommunications services by Telkomsel. Currently, Telkomsel had expanded telecom services not only to big cities but also to regencies in Indonesia.

Currently, Telkomsel is a mobile company with the largest market share in Indonesia. Telkomsel is the first mobile telecommunications operator that offers prepaid GSM service. Previously, Telkomsel launched post-paid services on 26<sup>th</sup> of May 1995. Telkomsel have three GSM products, namely Simpati and Kartu As which is a prepaid service and Kartu Halo which is a postpaid service. At this time, Telkomsel is owned by PT. Telkom and Singapore Technologies Telemedia Pte Ltd.

In 2009, Telkomsel has 30.992 base transceiver station (BTS) and produced 90.2 billion minutes of usage and 100.4 billion minutes for SMS traffic. At this time, Telkomsel is owned by PT. Telkom and Singapore Technologies Telemedia Pte Ltd.

#### 3.1.2.2. PT. Indosat, Tbk

PT. Indosat Tbk is an Indonesian telecommunications company that began operating since 1969 as a foreign capital company. Indosat become one of the companies that serve the international telecommunications services.

In 1980, PT. Indosat is a State-Owned Enterprises. The Indonesian government has all the shares of Indosat. Since 1994, Indosat registered shares on the Jakarta Stock Exchange. At the end of 2002, the Indonesian Government sold shares of Indosat to Singapore Technologies Telemedia Pte.Ltd by 42%.

Indosat provides telecommunication services with two technologies namely GSM and CDMA. With GSM technology, Indosat has three product services, such as Matrix, Mentari and IM3. For the CDMA technology, Indosat offers Star One. To support telecommunication services, in 2009, Indosat has 16,804 BTS and produced total traffic of 1,988 million minutes.

#### 3.1.2.3. PT. XL-Axiata, Tbk

PT. Excelcomindo Pratama, Tbk (XL) was established on 6 October 1989. Previously, the company name is PT. Grahametropolitan Lestari that engaged in trading and general services. Six years later, the company took an important step. The company holds cooperation with three foreign investors (NYNEX, AIF and Mitsui). Then, the company name

changed to PT. Excelcomindo Pratama with main business in the field of basic telephone service.

In 1996, XL started commercial operations with focus on coverage area in Jakarta, Bandung, and Surabaya. It makes XL as the first private company in Indonesia that provides cellular mobile telephone services.

In September 2005, it became a landmark for the Company. By developing all aspects of their business, XL became a public company and listed on the Jakarta Stock Exchange (now Indonesia Stock Exchange).

Currently, the majority of XL's shares are held by TM International Berhad through Indocel Holding Sdn Bhd. Other remaining shares were held by Emirates Telecommunications Corporation (Etisalat) via Etisalat International Indonesia Ltd. In addition, XL employs 19,349 units of BTS and producing 87.6 million minutes of usage.

#### 3.1.2.4. PT. Telkom

The history of PT. Telkom starts since the Dutch era in the form of the PTT. Furthermore, the company was taken over by the Government of Republic of Indonesia to become a state enterprise (PN). In the process, the PN change into the Public Telecommunications Company (PERUMTEL), then again in 1991, the company transformed into Limited Liability Company (Persero). In 1995, the company became a public company by listing their shares on several stock exchanges, including Jakarta, New York, and London. Currently, the majority ownership of the company is owned by the Indonesian government. The remaining shares are owned by public.

PT. Telkom launched a brand called TELKOMFlexi. This product is a fixed wireless services based on CDMA technology. This technology serves home phone and mobile phone. This product is the first brand in Indonesia that uses CDMA technology. Products were divided into two: pre paid via FlexiTrendy and postpaid via FlexyClassy. In 2009, to support telecommunication services, Flexi increased its BTS to 5,543 units and producing 16,001 million minutes of usage and 4,639 million messages of SMS.

#### 3.1.2.5. PT. Bakrie Telecom

PT. Bakrie Telecom is one of the pioneer private companies in Indonesia that provides telecommunications services to public. Since 1993, the company name is PT. Ratelindo engaging in telecommunications industry. This company holds a license as a provider of network and telecommunications services including voice services, data, internet, and multimedia.

In September 2003, PT. Ratelindo transformed into PT. Bakrie Telecom. It uses the latest technology, called CDMA 2000 1x RTT. By this technology, it launched a new product with a brand known as Esia. In February 2006, the company registered its entity on the stock exchange, named BTEL. Three years later, in 2009, PT. Bakrie Telecom have reached 3,677 units of BTS and produced 18,448 million minutes of usage.

#### 3.1.2.6. PT. Hutchison Wampoa, Ltd

Hutchison is one of the new players in Indonesia telecommunications services. It has a vision to provide the best communication services in the future. At global level, the company had become one of the world's largest telecommunications service company.

For Indonesian market, the company formed Hutchison CP Telecommunications Indonesia or HCPTI. Since March 2007, Hutchison CP Telecommunication Indonesia offers telecommunications services in 2G and 3G technology, known as "3" (read: three). Hutchison serves Indonesian cellular subscribers using GSM technology.

#### 3.1.2.7. PT.Natrindo Telepon Seluler

PT. Natrindo Cellular Phone is also known as Lippo Telecom. It entered Indonesian market with AXIS brand. The company is one of the cellular service providers for GSM and 3G in Indonesia. Previously, AXIS is named Lippo Telecom. It offers the first mobile telecommunications service in Indonesia with GSM 1800 technology. Beginning in 2001, the company operates in East Java.

After a while Axis also operates in Java and Sumatra. Today, Axis is expanding aggressively for 2G and 3G network into other areas in Indonesia. AXIS supported by two leading operators in Asia: Saudi Telecom Company, a national telecommunications service provider in Saudi Arabia, and Maxis Communications Bernhad, the largest telecommunications service provider in Malaysia.

#### 3.1.2.8. PT. Mobile-8 Telecom

Since 16<sup>th</sup> of December 2002, PT Mobile 8 Telecom began to enter telecommunications industry in Indonesia. In 2003, the Company acquired two licensed mobile phone operators, namely Komselindo and Metrocel, and began operating as a service provider based on CDMA technology. In 2004, the Company acquired another licensed mobile phone operator, namely Telesera. Companies uses products brand of Fren and Hepi. However, Fren is more known by people. It uses a network of three companies. All three companies were the results of acquisitions, such as Metrocel, Telesera, and Komselindo. Products Mobile-8 used CDMA 2000-1x technology. Companies served customers with pre-

paid and post paid services. PT Mobile-8 was the first cellular company that uses 3G technology. Before the acquisition, Mobile 8 decreased its network capacity by operating 1,458 BTS in 2009 from 1,563 in 2008 due to relocation of the units.

#### 3.1.2.9. *PT. Smart Telecom*

PT Sinar Mas Telecom entered mobile industrial market via Smart. On September 2007, it introduces mobile telecommunication products to public. The company used CDMA 2000 1x technology and EVDO-RevA technology. When first launched, Smart has reached the island of Java and then to Sumatra, Kalimantan, and Sulawesi.

#### 3.1.2.10. PT. Sampoerna Telekomunikasi Indonesia

PT. Sampoerna Telekomunikasi Indonesia owned CDMA2000 1x technology license in Indonesia. The company established in Indonesia after it acquires PT. Mandala Cellular Indonesia. PT. Mandala Cellular holds licenses in 450 MHz technology. PT. Mandala Cellular Indonesia provides telecommunications services after acquiring PT. Mobisel. Mobisel is one of NMT (Nordic Mobile Telephone) and AMPS operators.

In February 2006, Sampoerna Telekomunikasi Indonesia signed an agreement with Axesstel Inc. (USA), one of the leaders in product design and development of fixed wireless voice and broadband data. The company supplies STI with fixed wireless phone product type P450R and L450R. Axesstel Company headquartered is in San Diego, California with research and development center and manufacturing in Seoul, South Korea.

#### 3.1.3. Market Share in Telecommunication Industry

In measuring market share, a variable that is usually used in telecommunication industry is the number of customers rather than sales. This paper also conducts the market share measurement using the number of customers in each operator counted from both prepaid and postpaid. Table 3.7 below describes market share of each operators in 2004-2009.

In 2004, Indonesian telecommunication industry has six firms operating on GSM and CDMA basis. Telkomsel is dominating the industry by having market share of 51% counted from the number of customers. Indosat and XL employ the second and third position of the largest share in the industry. The smallest share in this industry is Bakrie Telecom with 0.22%. Market share n.e. of some operators such as STI, NTS, Hutchison, Smart, and Indosat Star in this following year due to the non-existence of these operators during 2004. With six operators existing in the industry, the positions of largest market share firms in 2005 remain the same, but with different shares magnitude. Telkomsel and Indosat were experiencing a

decline in market share, while the others had increasing market share.

Table 3.7. Market Share in Telecommunication Industry 2004-2009

No.	Operator	2004	2005	2006	2007	2008	2009
1	Telkomsel	51,36	47,69	51,25	45,96	40,44	42,99
2	Indosat	30,75	28,51	24,05	23,56	22,61	17,45
3	XL	11,95	13,71	13,72	14,85	16,11	16,55
4	STI	n.e.	n.e.	0,19	0,30	0,49	0,34
5	NTS	n.e.	n.e.	0,02	0,005	2,00	2,16
6	Hutchison	n.e.	n.e.	n.e.	1,96	2,79	3,85
7	Smart Telecom	n.e.	n.e.	n.e.	0,11	0,95	1,37
8	Bakrie	0,22	0,73	2,13	3,67	4,40	5,50
9	Mobile-8	1,31	1,56	2,63	2,89	1,86	1,51
10	Telkom Flexi	4,41	7,80	6,01	6,11	7,88	7,97
11	Indosat Star One	n.e.	n.e.	n.e.	0,60	0,47	0,31

Source: Calculated from Annual Report of Telecommunications Operator (Various Edition)

Sampoerna Telekomunikasi Indonesia (STI) and Natrindo Tel. Selular (NTS) entered the market in 2006. Despite of this two new operators, Telkomsel's market share increased to 51.25% because these two contributions to the market share are relatively small and significant decreased of Indosat and Telkom's market shares. In 2007, three additional operators, named Hutchison, Smart Telecom, and Indosat Star One, entered the industry. Although new, Hutchison has a significant number of market share among the new five entrants. Telkomsel still dominates the industry by having 45.96% market share. While the smallest market share of 0.05% is acquired by NTS.

In 2008, after KPPU's Verdict on text message cartel tariff, Telkomsel as the largest market share in the industry has a decreasing market share to 40.44%. Indosat Star One obtained the smallest market share of 0.47%. The conditions remain the same in 2009 with Telkomsel as the largest share and Indosat Star One as the smallest share in the Industry.

Overall, during 2004-2007, Telkomsel is leading in this industry with market share that is always above 40% in every years. After KPPU's Verdict in 2007, Telkomsel's market share dropped to its lowest percentage point in 2008. However, the compositions of largest market shares remain the same.

#### 3.1.4. Market Concentration using CR4 and HHI Analysis

To measure the fewness of suppliers in telecommunication market, this paper uses concentration ratio using CR4 and Herfindahl Index, HHI. CR4 reports the percentage of industry shares accounted for by the largest 4 firms. HHI has the merit of combining information about the market shares of all firms in the market, not just the largest four counted in CR4. Shares in telecommunication industry is measured using operator's

customer base. Table 3.8 below elaborates CR4 in overall telecommunication industry.

Table 3.8. CR4 and HHI in Telecommunication Industry 2004-2009

	2004	2005	2006	2007	2008	2009
CR4	98,47	97,71	95,03	90,47	87,05	84,96
HHI	3747,16	3338,72	3440,72	2951,04	2504,45	2544,20

Source: *Calculated from Annual Report of Telecommunications Operator (Various Edition)*

During these three years, 2004-2009, CR4 in the industry decreased from 98.47% to 84.96%. However, Table 3.8 shows that four operators dominating the market (Telkomsel, Indosat, XL, and Telkom) remain the same. Telkom is the only CDMA based operator that is counted in CR4 which indicates the strong performance of Telkom not only in CDMA market but also in overall telecommunication industry. Observing from the CR4s that are very close to 100, competitiveness based on fewness of operators dominating the market is limited. Although the number of operators entering Indonesia's telecommunication industry is relatively high compared to other countries<sup>5</sup>, oligopoly occurred in this market.

HHI trend also shows a decrease in fewness which means that the industry becomes more favorable to competition. The favorable number of Herfindahl index for healthy competition is 1800<sup>6</sup>. Judging by these indexes in Table 3.8, the competition in this industry in 2004-2009 is still limited which supports the market structure predicted using CR4.

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<sup>5</sup> Statistik Data Postel 2010

<sup>6</sup> KPPU Regulation No. 13 Year 2010, US Horizontal Merger Guidelines 1997.



### 3.2. THE DEVELOPMENT OF SMS TARIFF AND PROMOTIONAL STRATEGY IN INDONESIA (INCLUDE TARIFF AND TRANSACTION VALUE)

#### 3.2.1. SMS Tariff (off net and on net)

SMS tariff for off net and on net in each card of each operators elaborated in Table 3.9 below.

Table 3.9. Off net and On net Tariff 2006-2011

Operator	Products	Type	Net	2006	2007	2008	2009	2010	2011
Telkomsel	Kartu Halo	Post Paid	Off-net	250	250/ 350 <sup>7</sup>	150	188	188	188
		Post Paid	On-net	250	250/ 350 <sup>8</sup>	125	150	150	150
	Simpat	Pre Paid	Off-net	350	350	150	150	150	150
		Pre Paid	On-net	299	299	100	150	150	150
	Kartu As	Pre Paid	Off-net	300	299	149	115	115	115
		Pre Paid	On-net	150	99/ 249 <sup>9</sup>	88	115	115	115
Indosat	Matrix	Post Paid	Off-net	300	300	150	100	100	100
		Post Paid	On-net	300	300	100	150	150	150
	IM3 bright	Post Paid	Off-net						
		Post Paid	On-net						
	Star One	Post Paid	Off-net	225	225	150	90.9/ 136.3 6 <sup>10</sup>	90.9/ 136.3 6 <sup>11</sup>	90.9/ 136.3 6 <sup>12</sup>
		Post Paid	On-net	100	100	100	22.72	22.72	22.72
	Mentari	Pre Paid	Off-net	350	350	149	99	99	99
		Pre Paid	On-net	350	350	99	149	149	149
	IM3 smart	Pre Paid	Off-net	350	88/ 350 <sup>13</sup>	100	125	125	125
		Pre Paid	On-net	88/ 100/ 150 <sup>14</sup>	40/88/ 100/ 150 <sup>15</sup>	100	125	125	125

<sup>7</sup> 350 is SMS tariff for Kartu Halo with free abonemen .

<sup>8</sup> 350 is SMS tariff for Kartu Halo with free abonemen .

<sup>9</sup> 99 is SMS tariff to other Kartu As, 149 sms tariff from Kartu As to other Telkomsel's cards.

<sup>10</sup> 90.9 is tariff to other Indosat's cards.

<sup>11</sup> 90.9 is tariff to other Indosat's cards.

<sup>12</sup> 90.9 is tariff to other Indosat's cards.

<sup>13</sup> 88 is a special tariff in Bali, Nusa Tenggara, Sulawesi, Ambon, Papua 100 is special voucher tariff in January.

<sup>14</sup> 88 is tariff outside Java.

Operator	Products	Type	Net	2006	2007	2008	2009	2010	2011
							90.0/ 136.3 6 <sup>16</sup>	90.0/ 136.3 6 <sup>17</sup>	90.0/ 136.3 6 <sup>18</sup>
	Star One	Pre Paid	Off-net	350	350	150			
		Pre Paid	On-net	100	100	100	22.72	22.72	22.72
	Xplor	Post Paid	Off-net	250	250	250	125	125	125
		Post Paid	On-net	250	250	250	150	150	150
	Bebas	Pre Paid	Off-net	350	350	350	0	0	0
							0/ Promo <sup>19</sup>	0/ Promo <sup>20</sup>	0/ Promo <sup>21</sup>
		Pre Paid	On-net	350	350	350			
	Jempol	Pre Paid	Off-net	299	299	299			
							0/ Promo <sup>23</sup>	0/ Promo <sup>24</sup>	0/ Promo <sup>25</sup>
		Pre Paid	On-net	99	45/ 99 <sup>22</sup>	99			
	Flexi Classy	Post Paid	Off-net		250	250	75	75	75
		Post Paid	On-net		75	75	136	136	136
	Flexi Trendy	Pre Paid	Off-net		350	350			
							0/ Promo <sup>26</sup>	0/ Promo <sup>27</sup>	0/ Promo <sup>28</sup>
		Pre Paid	On-net		100	85			
	Fren	Post Paid	Off-net		250	250	88	88	88
		Post Paid	On-net		100	100	88	88	88
		Pre Paid	Off-net		300	250	88	88	88
		Pre Paid	On-net		100	100	88	88	88
	Esia	Post Paid	Off-net		250	275			
		Post Paid	On-net		50	55			
		Pre Paid	Off-net		250	250			
		Pre Paid	On-net		50	50			
NTS	NTS	Pre Paid	Off-net	350	350	150	60	60	60

<sup>15</sup> 40 is super voucher tariff for 200 SMS in May; 88 is tariff outside Java.

<sup>16</sup> 90.9 is tariff to other Indosat's cards.

<sup>17</sup> 90.9 is tariff to other Indosat's cards.

<sup>18</sup> 90.9 is tariff to other Indosat's cards.

<sup>19</sup> Promo free 1000 sms to other XL's cards.

<sup>20</sup> Promo free 1000 sms to other XL's cards.

<sup>21</sup> Promo free 1000 sms to other XL's cards.

<sup>22</sup> 99 is peak time tariff, 45 is off peak time tariff.

<sup>23</sup> Promo free 1000 sms to other XL's cards.

<sup>24</sup> Promo free 1000 sms to other XL's cards.

<sup>25</sup> Promo free 1000 sms to other XL's cards.

<sup>26</sup> Promo free 1000 sms

<sup>27</sup> Promo free 1000 sms

<sup>28</sup> Promo free 1000 sms

Operator	Products	Type	Net	2006	2007	2008	2009	2010	2011
		Pre Paid	On-net		50	150	60	60	60
Hutchison	3	Pre Paid	Off-net		100	100	75	75	75
		Pre Paid	On-net		0	50	75	75	75
Smart	Smart	Pre Paid	Off-net		275	275	100	100	100
		Pre Paid	On-net		25	25	100	100	100
		Post Paid	Off-net			250	100	100	100
		Post Paid	On-net			22	100	100	100
STI	Ceria	Pre Paid	Off-net		200	200	200	200	200
		Pre Paid	On-net		200	200	200	200	200

Source: KPPU's Verdict 2007

From Table 3.7, It is clear that after KPPU's Verdict, in 2008, tariff for sms decreased significantly in operators such as Telkomsel, Indosat, and NTS. However, later on, almost every operators decrease their tariffs.

### 3.2.2. Promotional Strategy Used by Operator

#### 3.2.2.1. PT. Telkomsel, Tbk

In 2009, Telkomsel acquired various types of promotions. In terms of cellular services, Telkomsel producing new starter packs in small denomination to reach a broader market segment by launching a starter pack in Rp 5.000,- price for Kartu As, a new Simpati Pedes starter pack in Rp 10.000,- price that also has the advantage of enhanced data usage and content value, and a Simpati Max starter pack that provides free content bonuses and 5 MB of free internet access. New packages are introduced in the form of SMS pro package which is designed to make SMS communications easier for customers using additional new features and iPhone package plans that consist of kartuHalo package plan for corporate and priority customers and Simpati package plan. Telkomsel also provides additional services such as a new SMS service for Facebook users targeted to adolescent market segment which offers content updating, a hosted push email service for the benefit of Telkomsel's corporate customers, and T-Remittance service to facilitate fund transfers for Central Village Cooperative Unit (Pusat Koperasi Unit Desa) members in East Java.

For non-cellular promotions, Telkomsel launched a Next Generation Flash project to upgrade its wireless broadband technology, organized 'Mudik Bareng Gratis' an event to facilitate the return home for the Idul Fitri celebration using six different transportation modes, and simultaneously organized a 'SIAGA' program that serves customers during this high traffic holiday. In addition, Telkomsel held a Customer Day program in 6 cities concurrently to thank customers for choosing Telkomsel products.

#### 3.2.2.2. PT. Indosat, Tbk

Indosat segmented Indonesian population by location, disposable income, and other factors that are believed indicate the desire and ability of individuals and corporations to purchase our products and services. This strategy resulted in diversified cellular subscriber base spread throughout Indonesia's major population centers. To retain their existing valued cellular subscribers and to acquire new cellular subscribers, they conduct nationwide marketing and promotional activities. Indosat focuses on marketing efforts which show the convenience, ease of activation, avoidance of fixed commitments, and lack of credit checks associated with prepaid cellular plans for which Indonesian cellular subscribers tend to favor.

In strengthening marketing channels, Indosat opened integrated walk-in centers under the names "Galeri Indosat" which are operated directly by Indosat and "Griya Indosat" which are operated by Indosat's exclusive distributors. These walk-in centers function as sales outlets and provide potential and existing cellular subscribers with customer service and product information.

In 2009, Indosat launched "Mentari Thousands of Calls Free Daily" program including a new starter pack and a re-designed Mentari Logo. In IM3 product, Indosat launched an IM3 Groov3 program and in Star One product, Indosat expanded the services to 55 cities all over Indonesia. Various services are introduced during this year, including in flight calls and sms services through AeroMobile services, link capacity improvement for Blackberry subscribers, and Blackberry enterprise service on demand (BES on Demand) for cards that can be activated on both postpays and prepaids cards.

#### 3.2.2.3. PT. XL-Axiata, Tbk

In 2009, the maturity of voice and sms services for XL, hence, XL focuses on promoting value added services and internet mobile/ broadband which have increasing roles in XL development. XL simplifies tariff schemes to improve customers' satisfaction in using the services all day. XL introduced a key initiative of "Value Beyond Price" to its customers and launched a single portal \*123# as an access channel for customers to get information and change packages. Realizing the importance of sms in XL services, it launched various sms promotions such as free sms after sending some sms, sms packages, affordable sms price after having free sms, and free sms after top up bills in certain amounts.

XL also improved fun activity features such as ring back tone and social networks (Facebook, Twitter, etc.) and customer service relations. XL initiated a cooperation with BNI and Celcom Malaysia in instant transfer feature which provides transfer from TKI in Malaysia to Indonesia using XL. Moreover, XL launched international pulse transfers that allows people to transfer their pulses between Indonesia and Malaysia. For enhancing corporate position in

the industry, XL changed corporate logo and the name of the company from PT. Excelcomindo to PT. XL Axiata, Tbk.

#### 3.2.2.4. PT. Telkom (Flexi)

In 2009, Telkom Flexi launched unlimited internet access using "FlexiNet Unlimited" which allows customer to access unlimited internet by paying Rp 2.500,- a day, Rp 15.000,- a week, or Rp 50.000,- a month. Entering Idul Fitri month, Telkom Flexi launched a new handset terminal named FlexiMuslim that provides Qoran application, Islamic contents, and Qoran learnt features.

#### 3.2.2.5. PT. Bakrie Telecom

BTEL with its fixed wireless in CDMA basis known as ESIA offers special tariff packages for each prepaid and postpaid customers, special tariff for voice and sms among group members that have been previously registered. These tariffs are also supported by attractive starter packs such as Suka-suka starter pack that allow Esia subscribers to choose their own Esia number, SP 8 starter pack that is a limited edition starter pack for Jabodetabek regions using 8 as prefix in their Esia number rather than 9 as what it used to be, and Esia Termurah Starter Pack that offers the lowest tariff of Esia services.

In general, a direct distribution channel allows BTEL to interact directly with customers, such as through Gerai Esia (Esia outlets), corporate road shows, and alternative channels such as roadside kiosk or sales stands in large supermarkets. In terms of customer relationship management, BTEL has shifted this paradigm into a CRM that provides solutions rather than just information to customers.

#### 3.2.2.6. PT. Hutchison Wampoa, Ltd

Hutchison with its product in Indonesia known as Three (3) offers packages related to free SMS, free short calls, and free internet connection for 5 days with terms and conditions applied. Three also offers promo tariff to call up to 200 countries in the world started from Rp 210,-/ minutes. Three provides special packages for calling and sending sms, features for Blackberry, no expired date for telephone number used, and other features such as ring back tone and Islamic features. To attract customers, Three uses quizzes with going to Old Trafford to watch Manchester United football club play as the prizes and offers customers to play in Rudi Sudjarwo's film using terms and conditions applied.

#### 3.2.2.7. PT. Natrindo Telepon Seluler

NTS with its brand Axis provides numerous promotions for prepaid such as SMS packages, free 1000 minutes calling, free roaming in Arab Saudi, pulse bonuses for accepting

call from other operators, and using Twitter and Facebook applications by SMS. Axis also offers packages to win handphone, blackberry bundling and features, international services, and having promotion ticket price for International Java Jazz Festival, a music event. By purchasing paired handphones, Axis gives free calling package for a year to these paired handphones. Postpaid customers have the privileged for having three different tariff packages that contain of both sms and calling.

#### 3.2.2.8. PT. Mobile 8 Telecom

In terms of tariff, Mobile 8 reduces SMS tariff for both prepaid and postpaid cards to all of operators, reduces data tariff to accomodate the increasing demand, and offers special long distance tariff. Mobile 8 attracts customers using Geger Quizz which gives significant revenues to the company and launched loyalty program in the form of top-ups bearing gifts of daily needs products. During homecoming ritual in Lebaran holidays, the company held a travel insurance program with Bank Mega and an Infaq program which allows customer to donate to increase Indonesian people welfare in general. During this holidays, Mobile 8 also issued limited edition top-up vouchers named "Voucher Ramadhan" that provides information on not only prayers but also advise pertaining of ritual of fasting.

#### 3.2.2.9. PT. Smart Telecom

Most of promotions offered by Smart are bundling promo with the purchasing of complementary goods for telephone cards. Smart offers bundling promo of handphones with special packages of call and sms services, bundling Blackberry with Blackberry features and special tariff offers, and bundling internet data packages with Smart modem. For post paid customers, Smart offers the customers to chose their own Smart number.

#### 3.2.2.10. PT. Sampoerna Telekomunikasi Indonesia

STI launched a starter pack with small denomination of Rp 15.000,- with activation period of 10 days. STI gives promotions in terms of purchasing handphone that is bundled with the ceria card to enjoy free calling for a year, the company also promotes the internet access by giving promotion of special deal of internet access by buying the modem from ceria.

### 3.2.3. Related Government Policy

Law No. 36/ 1999 about Telecommunication, point 27 and 28 stated that tariffs in operating telecommunication which is governed by the government and the magnitude is adjusted as the formula implemented by government. PP No. 52/ 2000 about Telecommunication Operation supports Law No. 36/ 1999 about tariff implementation of

each operator should be based on government's formula which is relied from cost expenses.

Other regulations related to tariff and telecommunication industry are KM 21/ 2001 about Telecommunication Service Operation, PM 8/ 2006 about Interconnection Tariff, and PM 12/ 2006 about Cellular Station Tariff.

## Chapter 4

# THE EFFECT OF KPPU'S VERDICT TOWARD THE DECREASE OF SMS TARIFF

### 4.1. DESCRIPTION

For the last ten years, as a guardian of the Law Number 5 Year 1999, The Commission for the Supervision of Business Competition of the Republic of Indonesia (KPPU) has been gained public awareness indicated by increasing report of alleged violation of the Law Number 5. In year 2005, KPPU received 191 reports, and in 2008 this number rose significantly to 707 reports, while in 2009 KPPU received 730 reports. Most of the reports (about 84%) that KPPU received is related to collusive tender. But in the last five years, the reports and Verdicts that KPPU made are also related to cartel arrangement. Some says that this development indicates that KPPU has moved to higher level.

Cartel arrangement is considered as one of the most serious violation of competition law. Cartel basically is an agreement between competitors not to compete in the market. The elimination of competition process in the market is resulting in the loss of consumer welfare and market welfare as a whole. In cartel, firms agree to fix price and number of output quota, and to divide the market.

Horizontal price-fixing is a violation of article 5 in the Law Number 5. One of the case that handled by KPPU regarding alleged violation of article 5 is Case No.26/KPPU-L/2007 about price fixing cartel in the mobile telecommunication short message service (SMS) market.

In June 2008, the KPPU sanctioned a price fixing cartel amongst six Indonesian mobile telecommunication operators related to the off-net SMS tariffs, infringing article 5 of the Law Number 5 Year 1999, during the period from 2004 until April 2008.

#### 4.1.1. Case on SMS Price Fixing in Indonesia

##### 4.1.1.1. Overview

Telecommunication activities in Indonesia were originally controlled by the state through the state-run enterprise, namely PT. Telkom, Tbk., whose 51.19 percent of its shares as of the year 2006 were owned by the government and which monopolized the domestic



telecommunication services and PT. Indosat, Tbk. ("Indosat") whose the whole part of its shares were acquired by the government in the year 1980 and which monopolized the international telecommunication services

The revolution of telecommunication technology in Indonesia was initiated by the establishment of PT. Satelit Palapa Indonesia ("Satelindo") in 1993 which obtained a license for International Direct Dial, cellular phone and exclusive rights on some communication satellites. Satelindo introduced cellular telephone service in November 1994.

On May 26<sup>th</sup>, 1995, PT. Telekomunikasi Selular ("Telkomsel") was established as cellular telephone operator and the first operator in Asia which offered the pre-paid services. On October 1996, PT. Excelcomindo Pratama ("XL") started its operation in the cellular market and became a new player in the telecommunication service competition in Indonesia. In December 2003, a new player entered the market, namely PT. Mobile-8 Telecom with its "Fren product" which operates under the CDMA technology, but it also possesses the cellular license.

Following the change of PT. Radio Telepon Indonesia (Ratelindo) to be PT. Bakrie Telecom which had obtained a license for Fixed Wireless Access (FWA) in the year 2003, PT. Bakrie Telecom had also introduced a new player in this period with its "Esia" product. In order to expand its coverage, Telkom had obtained the FWA license and launched the "Flexi" product in the year 2003.

More players in the FWA services following the entry of StarOne into the market in the year 2004, which is a product of Indosat.

At the end of the year 2005, PT. Sampoerna Telekomunikasi Indonesia started its commercial launching for the FWA services under the brand Ceria and added another new player in the period. On March 30<sup>th</sup>, 2007, Hutchison conducted commercial launching under the brand of 3. After the presence of 3 in the market, PT. Smart Telecom also launched a cellular product under the brand of Smart with the CDMA technology on September 3<sup>rd</sup>, 2007.

The last in this period, NTS which had obtained the license since 2001, but provided regional telephone service in Surabaya only, has conducted gradual national launching under the product brand of Axis on February 28<sup>th</sup>, 2008.

#### 4.1.1.2. Alleged Violation

KPPU has received a report on the alleged violation of Article 5 of Law Number 5 Year 1999 on Prohibition of Monopolistic Practices and Unfair Business Competition committed

by PT. Excelcomindo Pratama, Tbk., PT. Telekomunikasi Selular, PT. Indosat, Tbk., PT. Telekomunikasi Indonesia, Tbk., PT. Hutchison CP Telecommunications, PT. Bakrie Telecom, Tbk., PT. Mobile-8 Telecom, Tbk., and PT. Smart Telecom.

The violation committed by the Reported Parties is they have entered into an agreement which results in the off-net SMS cartel in the period of 2004 to April 2008. Those Reported Party have imposed the SMS rate with the interval of Rp 250 – Rp 350 which has allegedly violated Article 5 of Law Number 5 Year 1999:

- (1) *"Business actors shall be prohibited from entering into agreements with their business competitors to fix the price of certain goods and or services payable by consumers or customers on the same relevant market";*
- (2) *The provision as referred to in paragraph (1) shall not be applicable to:*
  - a. an agreement made for a joint-venture business; or*
  - b. an agreement based on an applicable law*

#### 4.1.1.3. Characteristics of SMS

Before making evaluation whether there was a breach or not, the Commission firstly describes discussion on the market concerned in this case. The market concerned in accordance with Article 1 point 10 of Law No. 5 Year 1999 shall be the market related to a certain marketing coverage or area of business actors for the same or similar goods and/or services or substitution for the said goods and/or services. In essence, the objective of product market analysis is to determine the types of goods and/or services that were similar or dissimilar but were the substitution therefore that were competitive with one another.

The object of this case is Short Messages Service (SMS) which is an added value service of cellular and FWA telecommunication services which is now inseparable from voice services. For this service, operators charge the rate to pay by customers sending the SMS, also known as the term, Sender Keeps All (SKA).

The use of SMS is to send one-way short messages from one owner of handset to another handset owner. Voice communication has a different use because there is exchange of messages occurring directly or two-way at the same time; whereas in the use of SMS, the message is only one way. Other features that are generally found in telecommunication services and may function identically to SMS are among others: voice mail, Multimedia Messaging Service ("MMS") and push e-mail, all of which have functions to deliver one-way short messages. Therefore, from the perspective of use, SMS is substitute for voice mail, MMS, and push e-mail.

Eventhough they have the same use, there are significantly different characteristics between SMS and other features that have identical use. SMS feature is the feature sent and received in the form of text messages, which are different from voice mail that is sent and received as voice messages. SMS messages are channeled through signaling canal, whereas MMS and push e-mail use data canal. As a result, SMS feature can only send and receive text messages, whereas MMS enables delivery and receipt of pictures, music, voice records, animation, video, and other files of multimedia. On the other hand, push e-mail besides being able to cover multimedia messages can also send and receive messages wider than the messages of multimedia in nature, such as delivery and receipt. of softcopy documents in various formats.

In addition, SMS pricing pattern is calculated on the basis of number of deliveries without any fee being spent by SMS receivers, which is different from voice mail that uses pricing pattern based on duration, whereas MMS and push e-mail use pricing pattern based on the number of data used, so that both senders and receivers of voice mail, MMS, and push e-mail must also pay in accordance with their pricing pattern. Exemption applies to the users of Bakrie's SMS that uses price pattern based on the number of sent text characters that is newly applied, but without omitting the fact that only SMS senders who pay the said service, whereas SMS receivers do not spend any expenses so that despite the different pricing pattern applied by Bakrie, SMS features are different from those of other message delivery so that they cannot substitute for one another.

With respect to the price, in general the price of SMS feature per delivery shall be in a range much cheaper than voice mail, MMS, and push e-mail. Exemption applies to push emailservices taking into account the size of the delivered e-mail and the price of data applied by each operator, so that the price of push e-mail services may vary. This is different from the price of SMS that is fixed per delivery with exemption of SMS feature provided by Bakrie with the price dependent upon the number of characters used. But in general, with respect to the price, SMS cannot be substituted by voice mail, MMS, and push e-mail.

Therefore, the product market in this case is SMS service, which is separate from voice, voice mail, MMS, or push email services.

The Commission deemed that the difference of cellular and FWA telecommunications was not relevant in the use of SMS services provided by each operator, both cellular and FWA. Based on market analysis of the above products, difference of cellular operator and FWA operator licenses would not affect the analysis of use, characteristics, and price of SMS services.

#### 4.1.1.4. Development of SMS Rates

##### a. 1994 – 2004

At the beginning of this period, the SMS could only be sent from and to the same operator. Based on the information provided by XL, SMS among operators was started around the years 2000 – 2001. The rate of SMS in the period of 1994 -2004 was the same for all operators (Telkomsel, Indosat, XL) either off-net or on-net, i.e. Rp 350,00 for prepaid subscribers. In this period, no operators offered promotional SMS rate to their subscribers.

##### b. 2004 – 2007

This period was signed by the entry of some new operators such as PT. Mobile-8 Telecom (Fren), PT. Bakrie Telecom (Esia), and PT. Sampoerna Telekomunikasi Indonesia (Ceria). In addition, Indosat and Telkom also launched their CDMA products, StarOne and Flexi consecutively; In this period, some operators started to apply different rates for the on-net and off-net SMS. The increasing number of the operators in this period has also led some operators to offer promotional rate of SMS which was lower than applicable base rate In the year 2004, XL introduced Jempol product which offered lower rate for the on-net SMS In the same year, Telkomsel also introduced a new product, i.e. Kartu As, which offered lower rate for the on-net SMS.

The SMS base rates of each operator in this period are illustrated in the following table:

Table 4.1. SMS Base Rate 2004-2007

Operator	Products	Type	Net	2004	2005	2006	2007
Telkomsel	Kartu Halo	Post Paid	Off-net	250	250	250	250/ 350
		Post Paid	On-net	250	250	250	250/ 350
	Simpat	Pre Paid	Off-net	350	350	350	350
		Pre Paid	On-net	350	350	299	299
	Kartu As	Pre Paid	Off-net	300	300	300	299
		Pre Paid	On-net	300	150	150	99/ 249
Indosat	Matrix	Post Paid	Off-net	300	300	300	300
		Post Paid	On-net	300	300	300	300
	IM3 bright	Post Paid	Off-net	250/ 350	250/ 350		
		Post Paid	On-net				
	Star One	Post Paid	Off-net	225	225	225	225
		Post Paid	On-net	100	100	100	100
	Mentari	Pre Paid	Off-net	350	350	350	350
		Pre Paid	On-net	350	350	350	350
	IM3 smart	Pre Paid	Off-net	350	350	350	88/350
		Pre Paid	On-net		150	88/ 100/ 150	40/88/100/ 150
Star One	Pre Paid	Off-net	350	350	350	350	
	Pre Paid	On-net	150	100	100	100	
XL	Xplor	Post Paid	Off-net	250	250	250	250
		Post Paid	On-net	250	250	250	250
	Bebas	Pre Paid	Off-net	350	350	350	350

Operator	Products	Type	Net	2004	2005	2006	2007
		Pre Paid	On-net	350	350	350	350
	Jempol	Pre Paid	Off-net	299	299	299	299
		Pre Paid	On-net	99	99	99	45/ 99
Telkom	Flexi Classy	Post Paid	Off-net				250
		Post Paid	On-net				75
	Flexi Trendy	Pre Paid	Off-net				350
		Pre Paid	On-net				100
Mobile 8	Fren	Post Paid	Off-net				250
		Post Paid	On-net				100
		Pre Paid	Off-net				300
		Pre Paid	On-net				100
Bakrie	Esia	Post Paid	Off-net				250
		Post Paid	On-net				50
		Pre Paid	Off-net				250
		Pre Paid	On-net				50
NTS	NTS	Pre Paid	Off-net	350	350	350	350
		Pre Paid	On-net				50
Hutchison	3	Pre Paid	Off-net				100
		Pre Paid	On-net				0
Smart	Smart	Pre Paid	Off-net				275
		Pre Paid	On-net				25
		Post Paid	Off-net				
		Post Paid	On-net				
STI	Ceria	Pre Paid	Off-net				200
		Pre Paid	On-net				200

Source: KPPU Verdict, 2007

c. 2007 to present

This period was signed by the entry of some new operators, i.e., Hutchison (3), PT. Smart Telecom (Smart), and the commercial launching of PT. Natrindo Telepon Seluler (Axis). At the launching, Hutchison offered the off-net promotional SMS rate of Rp 100 and on-net promotional rate of Rp 0. Meanwhile, NTS offered a flat promotional SMS rate of Rp 60 per SMS either for on-net or off-net, but the base rate was Rp 150 per SMS

The SMS base rate for each operator as of April 25<sup>th</sup>, 2008 is illustrated in the following table:

Table 4.2. SMS Base Rate 2007-2008

Operator	Products	Type	Net	2007	2008
Telkomsel	Kartu Halo	Post Paid	Off-net	250/ 350	150
		Post Paid	On-net	250/ 350	125
	Simpati	Pre Paid	Off-net	350	150
		Pre Paid	On-net	299	100
	Kartu As	Pre Paid	Off-net	299	149
		Pre Paid	On-net	99/ 249	88
Indosat	Matrix	Post Paid	Off-net	300	150
		Post Paid	On-net	300	100
	IM3 bright	Post Paid	Off-net		
		Post Paid	On-net		
	Star One	Post Paid	Off-net	225	150
		Post Paid	On-net	100	100
	Mentari	Pre Paid	Off-net	350	149
		Pre Paid	On-net	350	99
	IM3 smart	Pre Paid	Off-net	88/350	100
		Pre Paid	On-net	40/88/100/ 150	100
	Star One	Pre Paid	Off-net	350	150
Pre Paid		On-net	100	100	
XL	Xplor	Post Paid	Off-net	250	250
		Post Paid	On-net	250	250
	Bebas	Pre Paid	Off-net	350	350
		Pre Paid	On-net	350	350
	Jempol	Pre Paid	Off-net	299	299
		Pre Paid	On-net	45/ 99	99
Telkom	Flexi Classy	Post Paid	Off-net	250	250
		Post Paid	On-net	75	75
	Flexi Trendy	Pre Paid	Off-net	350	350
		Pre Paid	On-net	100	85
Mobile 8	Fren	Post Paid	Off-net	250	250
		Post Paid	On-net	100	100
	Pre Paid	Off-net	300	250	
		On-net	100	100	
Bakrie	Esia	Post Paid	Off-net	250	275
		Post Paid	On-net	50	55
	Pre Paid	Off-net	250	250	
		On-net	50	50	
NTS	NTS	Pre Paid	Off-net	350	150
		Pre Paid	On-net	50	150
Hutchison	3	Pre Paid	Off-net	100	100
		Pre Paid	On-net	0	50
Smart	Smart	Pre Paid	Off-net	275	275
		Pre Paid	On-net	25	25
	Post Paid	Off-net		250	
		On-net		22	
STI	Ceria	Pre Paid	Off-net	200	200
		Pre Paid	On-net	200	200

Source: KPPU Verdict, 2007

#### 4.1.1.5. Agreements on SMS Rates among Operators

In order to assure a sustainable interconnection among the operators, the operators enter into an Interconnection Cooperation Agreement one another. Such agreement is entered into by the Access Providing Operators which have usually prepared the template for each agreement and the operators searching for the access. There are two types of clauses regarding the imposition of SMS rate as contained in the Interconnection Cooperation Agreement, i.e.:

*the SMS rate of the operators searching for the access:*

- (a) shall not be lower than Rp 250,*
- (b) and then retail rate imposed by the access provider.*

Based on the information provided by Telkomsel and Bakrie, the clause (a) as referred above is contemplated in the Interconnection Cooperation Agreement entered into between Telkomsel and Bakrie.

The clause (a) is contained in Article 18 paragraph 2 of the Interconnection Cooperation Agreement entered into between XL and Hutchison (formerly known as Cyber Access Communication/CAC).

The clause (a) as referred to above be also stipulated in Article 18 paragraph 2 of the Interconnection Cooperation Agreement entered into between XL and Bakrie.

The clause (a) as referred to above be also stipulated in Article 6 of the Interconnection Cooperation Agreement entered into between XL and Mobile Seluler Indonesia/Mobisel.

The clause (a) as referred to above is also stipulated in Article 18 paragraph 2 of the Interconnection Cooperation Agreement entered into between XL and Smart (formerly known as PT. Indoprima Mikroselindo/Primasel).

The clause (b) as referred to above is also stipulated in Article 28 paragraph 2 of the Interconnection Cooperation Agreement entered into between Telkomsel and Smart (formerly known as PT. Indoprima Mikroselindo/Primasel).

Based on the information provided by Telkomsel, the clause (b) as referred above is contemplated in the Interconnection Cooperation Agreement entered into between Telkomsel and Telkom.

The clause (b) as referred to above be also stipulated in Article 5 of the First Addendum to

Interconnection Cooperation Agreement entered into between Telkomsel and NTS.

The clause (b) as referred to above be also stipulated in Article 6 of the First Addendum to Interconnection Cooperation Agreement entered into between XL and NTS.

On May 30<sup>th</sup>, 2007, Indonesian Telecommunications Regulatory Body (BRTI) held a meeting with the Indonesian Cellular Telephone Association (ATSI). In the meeting, BRTI stated that the imposition of the SMS rate violates the Law Number 5 Year 1999 and hinder fair business competition. As a follow up to the meeting, ATSI issued a Circular Letter No.002/ATSI/JSS/VI/2007, dated June 4<sup>th</sup>, 2007 requesting all of its members to comply with the Law Number 5 Year 1999 consistently and annul agreements, notices, gentlemen agreement and other matters which are binding in relation to the imposition of the SMS rate.

By virtue of such Circular Letter, the cellular operator which stipulates the clause on the imposition of the SMS rate in the Interconnection Cooperation Agreement shall make an amendment to the agreement by deleting the stated clause. The last amendment was made by Telkomsel and NTS on December 10<sup>th</sup>, 2007, and by XL and NTS on December 3<sup>rd</sup>, 2007.

Based on the information obtained from the BRTI, SMS rate of Rp. 250 – Rp 350 is considered too high. The elements for calculation of SMS comprise of Network Element Cost (NEC) + Retail Service Activity Cost (RSAC) + Profit Margin, where the amount of NEC is Rp 76, RSAC : 40% of total elements of SMS rate, and profit margin of 10% of the total elements in SMS rate.

Based on the information obtained from the Tritech that the service cost expended by telecommunication greatly depends on the *fixed cost* and service traffic, the service itself closely relates to the number of subscribers and their behaviors. Consequently, two (2) operators may not have the same cost, despite the same infrastructure it used. New operator is impossible to offer SMS products with the price higher than that offered by the existing operator.

Based on the information obtained from Expert Witness, the same SMS rate imposed by operators constitutes a cartel. In general, the price cartel applies a range.

#### 4.1.1.6. Analysis of Price Fixing Agreement

The Commission states that XL, Telkomsel, Telkom, Bakrie, Mobile-8, and Smart have breached Article 5 of Law No. 5 Year 1999 because they had conducted price fixing agreement. The Investigating Team has found several agreements in writing regarding off-net SMS price fixed by operators as one unity of Cooperation Agreement on Interconnection



a. Rate Agreement with Competitors

Agreement by virtue of the provisions of Article 1 point 7 of Law Number 5 Year 1999 shall mean the action of one or more business actors for binding themselves to one or more other business actors under whatever name, either in writing or not in writing. In the competition law, unwritten agreement regarding the price can be analyzed in the event of the existence of two conditions: 1) the same or parallel price 2) communication among business actors on the price.

The Examining Team finds some written agreements on the price fixing by operators which form an integral part of the Interconnection Cooperation Agreement as illustrated in the Matrix of SMS Rate Fixing in the Interconnection Cooperation Agreement in the part of Facts and Finding. Formally, it has included in the category of cartel which is conducted by XL, Telkomsel, Telkom, Hutchison, Bakrie, Mobile 8, Smart, and NTS. However, the Examining Team also finds the same SMS rate among operators in each period, although there is no clause on price fixing in the Interconnection Cooperation Agreement.

Therefore, the Examination Team considered that SMS rate agreement executed by operators only effectively applicable to the off-net SMS rate. In the meantime, the Examination Team assessed that since the year 2004, the agreement that provided for the on-net SMS minimum rate was not effectively applicable, despite of the fact that SMS rate agreement was just formally amended in the year 2007 after the issuance of ATSI's

Circular Letter, No. 002/ATSI/JSS/VI/2007, dated June 4<sup>th</sup>, 2007.

Based on information provided by new entrant operators to the Examining Team, in carrying out the interconnection negotiation, new entrant operators did not have sufficient bargaining powers in facilitating their interests in the interconnection agreement. At the same time, if the incumbent operators inserted the clause on the minimum SMS rates, the new entrant operators were not in the position to reject the clause.

However, the Examining Team is in the opinion that the concern of the incumbent operators should have not been anticipated by using the rate instrument as it would result in a loss to the new entrant operators and prospective subscribers who would use the SMS service. In other words, Interconnection Cooperation Agreement which fixed the final rate was incorrect.

New entrant operators were lost out by the clause on price fixing as they were unable to attract new subscribers by offering the off-net SMS rate which was cheaper than the off-net SMS rate offered by the incumbent operator.

Therefore, the Examining Team is in the opinion that there was a cartel on the off-net SMS rate in the period of 2004-2007.

b. Analysis for the Period of the year 2007 to present;

The entry of Hutchison which offered the off-net SMS rate of only Rp 100 per SMS, despite the fact that Hutchison is bound with the SMS rate agreement with XL, it has obviously stricken the rate to be maintained by the incumbent operators. As acknowledged by XL and Hutchison and supported by written documents obtained by the Examining Team, Hutchison received a warning from XL and was instructed to revise its off-net SMS rate. However, Hutchison keeps violating the agreement by not changing its off-net SMS rate.

Therefore, the cartel of SMS rate has not been formally applicable since the year 2007. However, material evidencing is more crucial in the business competition law than formal one. Therefore, the Examining Team is still conducting an observation on the SMS rate imposed in the market after the amendment to the agreement on SMS rate.

The Examining Team finds no direct changes done by each operator after the amendment to the SMS rate agreement. The applicable SMS rate was the same as the period prior to such amendment. The Examining Team is in the opinion that there were two possibilities on which such occurrence was based: 1) the cartel of SMS rate was still effective 2) the SMS rate as promised was the rate in the market equilibrium; therefore, the SMS rate would be the same, despite of the agreement is executed or not after April 1<sup>st</sup>, 2008, the operators lowered the SMS rate without changing the internal and external cost of the SMS service.

The Examining Team is therefore in the opinion that the operator may impose cheaper SMS rate to the subscribers long before the reduction of interconnection rate by the government. The cancellation of lowering the SMS rate was solely due to the fact that the cartel agreement among the operators was still effective and enforceable, despite the fact that it had been formally amended in the year 2007.

Therefore, in this period, out of three new cellular operators (Hutchison, Smart, and NTS-Axis), only Smart complied with the cartel agreement. Although it formally signed the agreement, Hutchison never materially performed the provisions thereof. Although NTS-Axis had formally signed the cartel agreement since the year 2001, as the Axis was just launched in 2008, after the revocation of the clause on the rate cartel, it has never formally performed the provisions of the agreement.

#### 4.1.1.7. KPPU's Verdicts

Based on the analysis on the facts and evidences in the form of information given by the Reported Parties, Witnesses, Experts and documents collected during the examination, the Examining Team comes to the following conclusions.

Whereas, there was no cartel of SMS rate in the period of 2000-2004 which was conducted by Telkomsel, Indosat, and XL.

Whereas, there was a cartel of SMS rate in the period of 2004-2007 which was created by Telkomsel and XL and Telkom, Mobile 8 and Bakrie were forced to follow.

Whereas, there was a cartel of SMS rate in the period of 2007 up to April 2008 which was a continuity of the previous period and Smart was forced to follow.

Whereas Indosat, Hutchison, and NTS are not proven to conduct the cartel of SMS rate.

Therefore, PT. Excelcomindo Pratama, Tbk, PT. Telekomunikasi Selular, PT. Telekomunikasi Indonesia, Tbk, PT. Bakrie Telecom, PT. Mobile-8 Telecom, Tbk, PT. Smart Telecom are proven to violate Article 5 of Law Number 5 Year 1999.

Whereas, PT. Indosat Tbk, PT. Hutchison CP Telecommunication, and PT. Natrindo Telepon Seluler are not proven to violate Article 5 of Law Number 5 Year 1999.

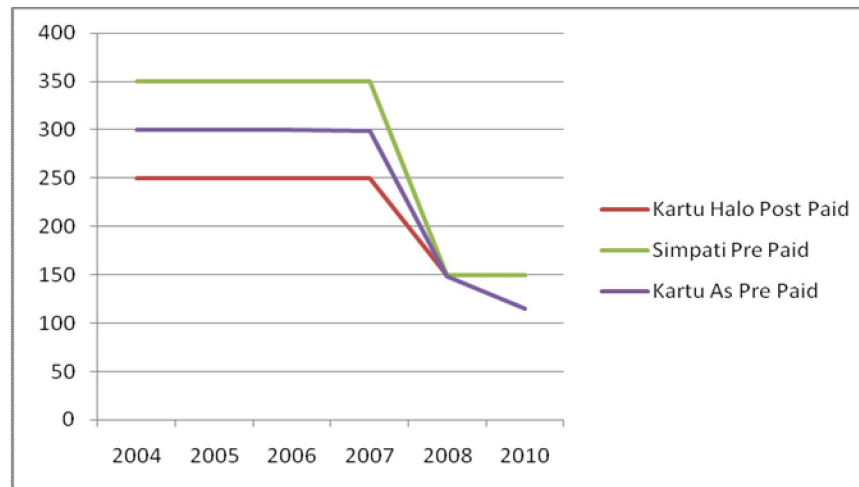
#### 4.1.2. Profile of SMS Tariff Before and After KPPU's Verdict

To describe the difference of SMS tariff off-net between year 2004-2007 and year 2008-2010, this section will divide the analysis for each main operator i.e: Telkomsel, Indosat, and XL.

##### Telkomsel

As we can learn from KPPU Verdict prior, the alleged violation of article 5 regarding price fixing, the reported parties agree to maintain price of SMS to other operator above Rp.250. This cartel was agreed during period 2004 until mid 2008. From figure below, cartel period indicated by pattern of Telkomsel's SMS price which held constant on Rp 350 for Simpati, Rp 300 for Kartu AS, and the lowest price is Kartu HALO with price Rp 250.

Figure 4.1. Telkomsel SMS Tariff



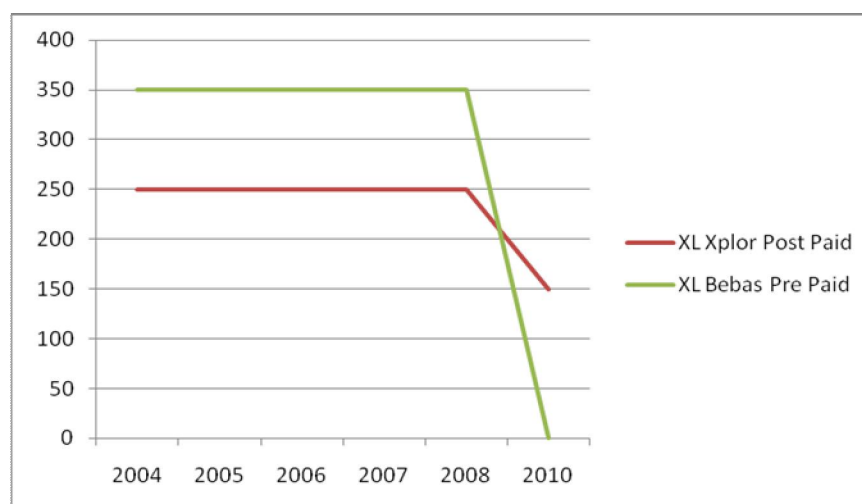
Source: author calculation

After KPPU sanctioned the operators, the price of SMS decreased significantly in 2008 for each Telkomsel's product. All the three products of Telkomsel, decreased to the same value that is Rp 150. For Kartu AS, the price decrease continues in year 2010 with the price Rp 115. The highest decrease was coming from Simpati (prepaid) with percentage 66.67%.

#### XL-Axiata

XL is also one of the operators that is sanctioned by KPPU because XL involved in cartel agreement from 2004 until mid 2008. The pattern of SMS price off-net of XL is similar to pattern of Telkomsel's SMS as we can see from the figure below.

Figure 4.2. XL-Axiata SMS Tariff



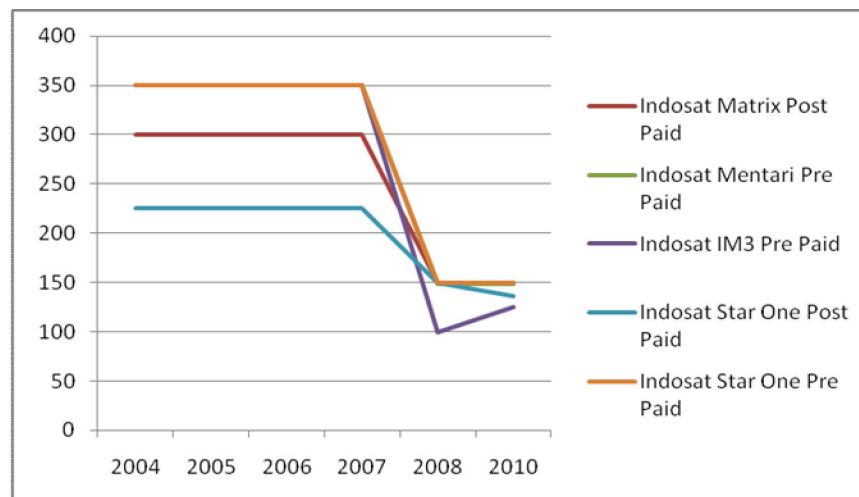
Source: author calculation

The highest price is on XL's prepaid product with the price Rp 350 and XL's postpaid with the price Rp 250. After KPPU sanctioned XL for breach of the article 5 of Indonesia Competition Law, SMS price off-net of XL decreases significantly. XL lowered the price of postpaid to Rp 150, while that of prepaid decreases to almost Rp 0. The price of SMS with Rp 0 gives to consumer who bought the starter pack. For each starter pack, XL gives 2000 SMS for free that can be used to all operator.

### Indosat

Although Indosat was not sanctioned by KPPU because there was no evidence that Indosat involved in the cartel agreement, the pattern of SMS price of Indosat is very similar to previous operator that proved to breach article 5 of the Law Number 5 Year 1999. We can see that pattern in the figure below.

Figure 4.3. Indosat SMS Tariff



Source: author calculation

All the prepaid product of Indosat, such as Mentari, IM3 and StarOne (CDMA product of Indosat) were priced at Rp 350, and held constant during period of 2004 until mid 2008. The lowest price of Indosat product was StarOne postpaid with the price Rp 225. After the verdict, the entire Indosat product was decreased to Rp 150, except IM3 which have lowered price (Rp 100). This IM3 product has the highest percentage of decrease compared to other product which is 250%. But in year 2010, the price of IM3 was increase to Rp 125.

### Other Operators

The decreasing pattern of SMS price off-net as described above also occurs in other operators, such Esia, Mobile 8, Three, and AXIS. For Esia, since we don't have the data during

the cartel period, the section only discuss the difference of year 2007 and after 2008. In 2007, the SMS price of Esia was Rp 250 for prepaid and postpaid. But after year 2008, Esia change the method to calculate the price that t consumer must paid. After year 2008, the price of SMS is no longer 'per SMS' but Rp 1 for each character.

Other CDMA operator which is Mobile 8, with the product name 'Fren' also experienced the decreasing pattern after KPPU's Verdict. The price of Fren's SMS was decreased from Rp 300 (prepaid) and Rp 250 (postpaid) to Rp 88 for both products.

Three, the product from Hutchinson only experiences slightly decreases. As a new entrant and the operator that does not comply with cartel agreement, in year 2007, Three has SMS tariff Rp 100. And in year 2010, that tariff lowered to Rp 75.

The decreasing pattern of SMS price was also take place in AXIS. This operator charges their SMS for Rp 350 in year 2007, and lowered the tariff to Rp 150 in year 2008. In 2010, the price of SMS off net of AXIS was continued to decrease to Rp 60.

SMART was also having the decreasing pattern of its SMS price. In year 2007, tariff SMS for SMART was Rp 275, and after year 2008, this tariff lowered to Rp 100.

The only operator that did not lower its SMS tariff after KPPU's Verdict is STI with its product called Ceria. In year 2007, its tariff was Rp 200 and remains Rp 200 until 2010.

#### 4.1.3. Descriptive Statistics of Survey and Secondary Data

##### 4.1.3.1. Descriptive Statistics of Survey Data

###### 1. Respondent Profile

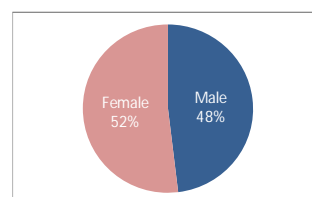
The socio-economic background of respondent is as follows. Total number of respondent in our mobile phone survey is 308. The respondent has average age of around 34 year, with male - female composition is about 48:52 respectively. See Table 4.3 to 4.4.

Table 4.3. Age of Respondent

Mean	34.11
Median	32.00
Mode	30
Std. Deviation	9.545
Minimum	18
Maximum	65

Source author calculation

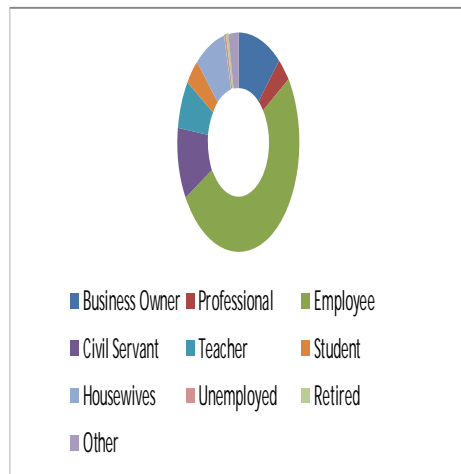
Figure 4.4. Male Female Composition of Respondent



Source author calculation

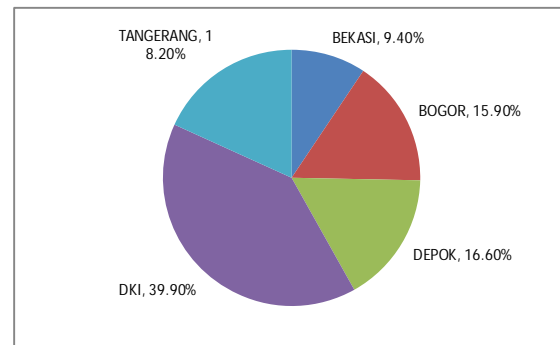
Respondents are mostly domiciled in Jakarta (40%), while the rest are scattered in Tangerang (18%), Depok (16.6%) and Bogor (16%). Further, large portion of respondent are working in private sector (51%), entrepreneur/own business (11.7%), and civil servant (10%), respectively, with relatively high education level attained; high school graduate (35.4%), university undergraduate (31.4%) and diploma degree (21.4%). See Table 4.5-4.7 below.

Figure 4.5. Respondent by Occupation



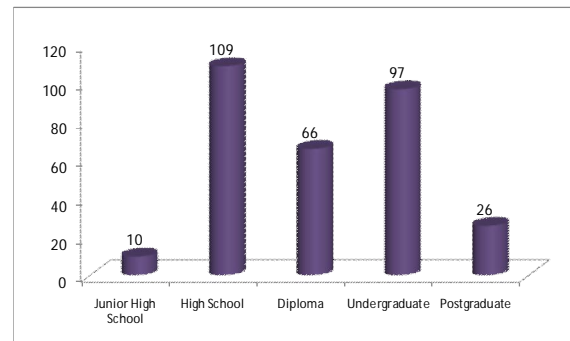
Source author calculation

Figure 4.6. Respondent by Location



Source author calculation

Figure 4.7. Respondent by Education Level



Source author calculation

Concerning income level, large concentration of the respondent can be considered as a lower middle income group, with monthly income bracket between Rp. 1 million – less than Rp. 2.5 million (33.8%) and Rp. 2.5 million – less than Rp 5 million (33.4%). See Table 4.8 below.

Table 4.4. Respondent by Income Level

	Frequency	Percent
< Rp. 500 thousand	3	1.0
Rp. 500 thousand - < Rp 1 mio	30	9.7
Rp. 1 mio - < Rp. 2,5 mio	104	33.8
Rp. 2,5 mio - < Rp. 5 mio	103	33.4
Rp. 5 mio - < Rp. 10 mio	41	13.3
Rp. 10 mio - < Rp. 15 mio	17	5.5
Rp. 15 mio - Rp. 20 mio	5	1.6
> Rp. 20 mio	5	1.6
Total	308	100.0

Source author calculation

## 2. Mobile phone ownership

Most of respondents had their first mobile phone in the early year of 2000, and majority of them had TELKOMSEL (51%) and INDOSAT (28%) as their operators. This is not surprising as these are the two first mobile phone operators in the country. Both TELKOMSEL and INDOSAT entered the business in mid 1990s.<sup>29</sup>

Interestingly, almost half of our respondents (150 of 308) are actively using more than one mobile phone. Of this number, around 124 have 2 mobile phones, 24 of them have 3 mobile phones and 2 respondents have even 4 mobiles. Two main reasons of having multiple mobile phones according to respondents are catering the need for various purposes (e.g. social network, business, personal) and taking advantage of different network systems (GSM and CDMA). This pattern may indicate that mobile phone has now become one of important modern appliances in life.

As time changes, new mobile phone technology emerges. Some brands have even launched a mobile phone with dual numbers/operators. This technology accommodates an individual to bring only one mobile phone but can use two operators and hence network system at once, either a combination of GSM-GSM or GSM-CDMA. Table below present the distribution of respondent according to number of operators.

<sup>29</sup> INDOSAT was formerly known as PT Satelindo, a partial subsidiary of INDOSAT before it was fully acquired in 2003.



Table 4.5. Distribution of Respondent and Number of Operators

Number of Mobile phone operated	Single operator	Dual operator	Total
1	150	8	158
2	122	2	124
3	24	-	24
4	2	-	2
Total	298	10	308

Source: Authors calculation

For those who use only single operator (one operator for each mobile phone), some pattern of typical operators and type of subscription appears. Table below summarizes this. General pattern reveals that GSM is the most common network used for the first mobile phone and the typical operators is TELKOMSEL. For the second, third or fourth mobile phone the common network system used is CDMA with ESIA is the most selected by respondent. This finding is in line with the above proposition that one of the reasons of having multiple mobile phones is to take advantage of different network system. On top of this, the most frequent type of subscription for all these mobile phones is pre-paid.

Table 4.6. Single Operator: Number of Phone, Typical Operators and Type of Subscription

No. mobile phone owned	Operator 1	Operator 2	Operator 3	Operator 4	Subscription
1	TELKOMSEL (GSM)				Pre-paid
2	TELKOMSEL (GSM)	ESIA (CDMA)			Pre-paid; Pre-paid
	INDOSAT (GSM)	ESIA (CDMA)			Pre-paid; Pre-paid
3	TELKOMSEL (GSM)	INDOSAT (GSM)	ESIA (CDMA)		Pre-paid; Pre-paid; Pre-paid
4	INDOSAT (GSM)	INDOSAT (GSM)	SMART (CDMA)	ESIA (CDMA)	Post-paid; Post-paid; Pre-paid; Pre-paid
	TELKOMSEL (GSM)	INDOSAT (GSM)	THREE (GSM)	ESIA (CDMA)	Pre-paid; Pre-paid; Pre-paid; Pre-paid

Note: abbreviation in the bracket is the network system operated

Source: author calculation

A similar pattern of subscription also exists for dual operators (two operators for one mobile phone), whereas pre-paid is the most frequent one. Below table present this configuration.

Table 4.7. Dual Operators: Operator Combination and Type of Subscription

Dual operator	Combination	Type of subscription
GSM – GSM	TELKOMSEL – THREE (3)	Pre-paid – Pre-paid
	TELKOMSEL – INDOSAT (2)	Pre-paid – Pre-paid
	XL – INDOSAT (2)	Pre-paid – Pre-paid
	AXIS – XL (1)	Pre-paid – Pre-paid
GSM – CDMA	TELKOMSEL – ESIA (2)	Pre-paid – Pre-paid

Note: number in the bracket represents amount of respondent  
Source: Authors calculation

Regardless of how many mobile phones owned, majority of respondents prefer pre-paid subscription. This may suggest at least three characteristics of respondent. Majority of respondents (1) have relatively high cost-consciousness; (2) desire low switching cost to other operator, if they want; and (3) want a hustle-free procedure. By having a pre-paid card, respondent can control directly their spending on mobile phone. Although depending on the operator, the initial pre-paid card can be obtained as cheap as Rp. 5000 to Rp 10.000, much lower than Rp. 25.000 a minimum amount to be paid in post-paid. An additional credit can even be purchased by at least Rp. 1000. Furthermore, obtaining a pre-paid card is easy without any registration or other procedure.

### 3. Mobile phone usage

More than 80% of our respondent considers mobile phone important and very important in their daily life. Based on the ranking of importance, personal use (family, friend, social networking, etc) is the first, followed respectively by for working purposes and for source of information purposes. This may suggest that mobile phone nowadays becomes a *“don't leave home without it”* device for every individual.

Table 4.8. The Importance of Mobile Phone by Rank

Reasons	Avg. weight	Rank
Personal use (family, friend, social networking, etc)	1.7	1
Working purposes	1.8	2
Source of information	2.7	3
Entertainment purposes	3.0	4
Others	3.7	5

Note: the smaller the value, the highest the rank is  
Source author calculation

At present, large proportion of our respondent have average monthly spending about Rp. 51.000 – Rp. 100.000 (38%) and Rp. 101.000 – Rp. 250.000 (36.7%) for their mobile phone use. Relative to their present income, such amount accounts only for about slightly less than 5% of their monthly income.

Table 4.9. Operators and its Use (in percentage)

Mobile operators	Text		Voice		Data/internet	
	Mean	S.D	Mean	S.D	Mean	S.D
TELKOMSEL	39.9	20.2	46.0	20.9	14.2	20.1
INDOSAT	43.4	21.9	41.1	23.9	15.5	21.0
XL	38.5	24.8	44.2	23.3	17.3	23.4
AXIS	26.4	24.1	43.3	31.9	30.3	31.6
THREE	42.9	25.5	37.1	21.7	20.0	28.3
TELKOMFLEXI	27.3	13.2	69.8	17.5	2.9	9.7
ESIA	29.0	20.0	69.0	21.8	2.0	7.5
SMARTFREN	30.9	28.9	41.3	31.7	27.8	39.5
TOTAL	37.0	22.1	50.2	25.1	12.8	21.2

Source: author calculation

The overall pattern of mobile phone use from the survey suggests that respondent use 37% for text messaging, 50% for voice messaging and only 13% for data/internet. However, table above also shows some interesting variation between networks as well as operators. First, there exist some variations in percentage of text, voice, and data/internet use between GSM and CDMA operators.<sup>30</sup> Although almost all operators in both networks have larger percentage of voice messaging use, the variation with other features (text and data/internet) is less apparent for GSM operators relative to those for CDMA operators. The relative composition for GSM operators for text, voice and data is about 35 : 40 : 25, while for CDMA is about 25 : 60 : 15 respectively. This may imply that respondent would prefer to use GSM operators for voice and/or text messaging need, while CDMA is predominantly used for voice message.

Second, interesting pattern and variation in mobile phone operators also appears. Within GSM operators, INDOSAT and THREE are the only ones that contain higher percentage of text messaging use. Relative to other operators in CDMA, SMARTFREN is the only operator with higher percentage of use for text messaging. Another interesting notion is that the relatively new established operators such as THREE for GSM networks and SMARTFREN for CDMA seems paying more attention on text messaging and data/internet use, market that had not yet been fully explored by the incumbents.<sup>31</sup> This can be seen from their intense advertisement on these features in the media.

<sup>30</sup> GSM operators comprise of TELKOMSEL, INDOSAT, XL, AXIS and THREE, while CDMA operators include ESIA, TELKOMFLEXI and SMARTFREN.

<sup>31</sup> THREE entered the business in 2007, while SMARTFREN – a merger company between MOBILE 8 TELECOM and SMART TELECOM was first entered the business in 2002 via MOBILE 8 TELECOM.

#### 4. Respondent Behavior

Approximately about 71% of our respondents haven't switched operators since 2007. At least two likely reasons for this attitude include (a) the number has been recognized widely (68%) and (b) already satisfied with the services provided by the current operators (22.5%). In Indonesia, technology that allows keeping the same number for different operators has not been applied yet. For that reason, mobile phone users are reluctant to switch operators, but rather to have new mobile phone should they need new numbers.

However, for the other 29% of respondent who switch operators, their most likely reasons are the new operators offer (i) a cheaper tariff rate in general (38%) and (ii) better signal and wider coverage/accessibilities (31%).

Table below summarizes comparison between monthly average income, average spending and usage of mobile features text, voice and data/internet with 5 years ago.

Table 4.10. Percentage of Respondent and Changes They Made Since the Past 5 Years

	Increase very significantly	Increase significantly	Increase fairly	Do not change	Decrease fairly	Decrease significantly	Decrease very significantly
Monthly avg income	13	27	40	11	5	3	1
Monthly avg spending	11	29.5	32.5	14	8	4	1
Text usage	8	27	33	22	6	2	2
Voice usage	11.5	31	28	22	5	2	0.5
Data/internet usage	16	18	19	42.5	3	0.5	1

Note: fairly increase : < 15%; significantly increase : 15 – 30%; and very significantly increase : > 30%  
Percentage with respect to total respondent

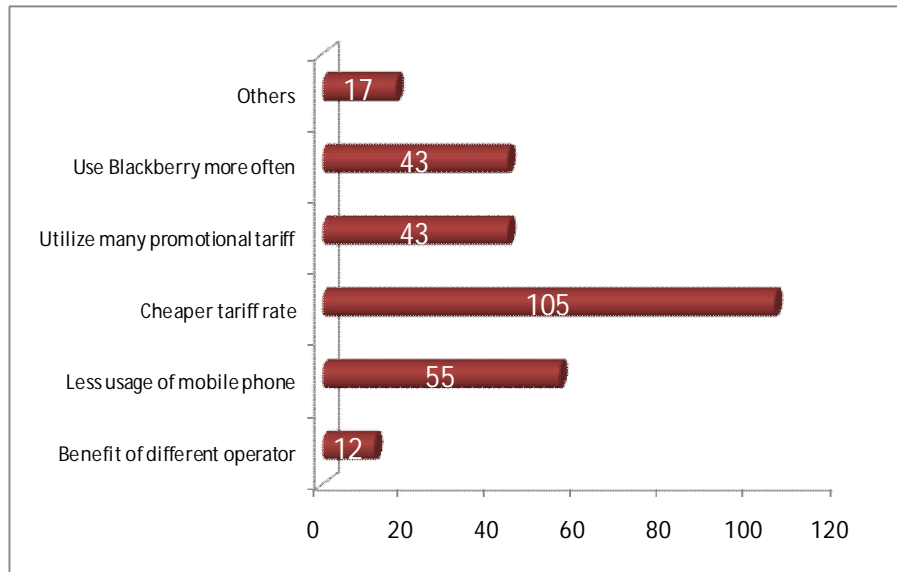
Source author calculation

The pattern from the above table suggests that large concentration of respondent perceived their average monthly income had increased relative to 5 years ago, most of which (40%) believed increased only fairly. A similar pattern also appears for monthly average spending on mobile phone, albeit with a smaller percentage, 32.5%. Intuitively, these majority patterns may indicate the presence of behavioral changes toward mobile phone usage for some respondents.

An appealing pattern of mobile phone features usage appears to confirm this. Relative to the past five years, cumulative percentage of respondent who claim an increase in use (respondent who answer increase fairly, increase significantly as well as increase very significantly) is always greater than those who claim they do not change or experiencing a decrease in use of these features. However, the pattern of increases for each feature varies greatly. For text messaging use, large concentration of respondents (33%) believes they have increased fairly. For voice messaging use, large proportion of respondents (31%) thinks they have increased significantly. While only for data/internet use, large part of respondents (42.5%) assumes they do not change at all. Conjecturing from this pattern of use, it seems that the increase of voice messaging use by respondent is more prevalent than the increase use of text messaging. This may partly indicate a switch from text to voice messaging use.

Coherent with the aim of the study to measure the welfare improvement following a tariff reduction, about 34% of respondent stated that the main reason for such changes is due to a cheaper tariff rate. This finding is further substantiated by the fact that around 65% of respondent did notice a reduction of SMS tariff rate since 2007. Table 4.15 summarizes these reasons.

Figure 4.8. Reasons of Changing Behavior



Source author calculation

Respondent attitude toward this decision and the likely impact of tariff reduction is clear. Cumulatively, more than 70% of respondent reveals their agreement (those who answer fairly agree, agree, and strongly agree) that KPPU's decision on prohibiting SMS tariff fixing had significant impact on the competition in the SMS tariff rate. In addition, almost 80% of respondent conform (those who answer fairly agree, agree, and strongly agree) that increase competition in SMS tariff rate improve consumer welfare. This can be seen from Table 4.16 below.

Table 4.11. Attitude of Respondents Towards the Statements (%)

Statement	Strongly agree	Agree	Fairly agree	Fairly disagree	Disagree	Strongly disagree
Do you think KPPU verdict (no 26/KPPU-L/2007) which canceled price fixing agreement between several mobile operators leads to significant increase in text message tariff competition	23.4	29.2	21.1	12.3	3.9	10.1
Do you think the increase competition on text message tariff leads to a higher consumer welfare of mobile phone users (less average monthly spending, more frequent use of features, etc)	28.7	32.6	17.9	13	4.9	2.9

Source author calculation

Table 4.17 below sums up the characteristics of respondents who agree (i.e. fairly agree, agree, and strongly agree answers) with the KPPU's decision.

Table 4.12. Respondent Characteristics and Their Attitude Towards KPPU Decision

Profile	Agreement towards KPPU's decision (%)		
	fairly agree	agree	strongly agree
Number of respondent #	21.1	29.2	23.4
Gender*			
- Male	17.6	29.7	27.7
- Female	24.4	28.8	19.4
Occupation*			
- business owner	11.1	33.3	30.6
- professionals	9.1	27.3	45.5
- employee	22.8	28.5	25.9
- civil servant	12.5	31.3	21.9
- teacher/lecturer	40.9	31.8	9.1
- student	16.7	41.7	25.0
- housewives	28.0	28.0	8.0
- unemployed	50.0	0.0	0.0
- retired	-	-	-
- others	12.5	12.5	12.5
Income level (Rp)*			
- < 500 tho	33.3	33.3	0.0
- 500 - < 1 mio	3.3	30.0	30.0
- 1 - < 2.5 mio	26.9	22.1	25.0
- 2.5 - < 5 mio	21.4	40.8	19.4
- 5 - < 10 mio	22.0	19.5	24.4
- 10 - < 15 mio	11.8	29.4	29.4
- 15 - < 20 mio	0.0	20.0	20.0
- > 20 mio	40.0	20.0	20.0

Note: # percentage to total respondent

\* percentage to respective group

Source : Author calculation

Although majority of both male and female respondents agree with the decision, male respondent tend to have a stronger degree of agreement than that of female.

With respect to type of occupation, some interesting variations in degree of agreement appear. Business owners, professionals, employee and civil servants are among those who are likely benefiting from the decision rather than type of occupation such as teacher/lecturer, housewives and unemployed. Such indications can be seen from their relative stronger degree of agreement (agree and strongly agree) to the latter group.

Another appealing pattern of variation also emerges relating to income level. Overall, the higher the income level is the greater the tendency to have a stronger degree of agreement towards the decision, except for the highest income level.

#### 4.1.3.2. Descriptive Statistics Secondary Data

For regression purposes, LPEM-FEUI obtained secondary data of telecommunication industry from several sources described in Table 4.18 below.

Table 4.13. Data and Source of Data

Variables	Data	Source	Notes
X	Number of Customers	1. Annual Reports of Mobile Operators 2. Directorate General of Pos and Telecommunication	
Pt	Nominal Price of SMS	Annual Reports of Mobile Operators 2004-2004	Using ARPU of each mobile operator every year from 2004-2009 that is weighted according to ratio of sms revenue to cellular operating revenue.
Pc	Nominal Price of Calling	Annual Reports of Mobile Operators 2004-2009	Using ARPU of each mobile operator every year from 2004-2009 that is weighted according to ratio of voice revenue to cellular operating revenue.
P	Nominal price blended	Annual Reports of Mobile Operators 2004-2009	Average Revenue per User
AC	Advertising Cost	Annual Reports of Mobile Operators 2004-2009	
BTS	Base Transceiver Station	Annual Reports of Mobile Operators 2004-2004	
CPI	Consumer Price Indexes for Transport and Communication  <i>*to make real prices</i>	Central Statistic Agency (Badan Pusat Statistik)	Base year = 2000
Y	Real GDP per capita	Central Statistic Agency (Badan Pusat Statistik)	Base year = 2000

Annual reports used are published in official website of operators, which are PT. Telkomsel, PT. Indosat, PT. XL-Axiata, PT. Telkom, PT. Bakrie Telecom, and PT. Mobile 8. LPEM-FEUI employed data from these six operators to observe the consumer welfare changes from the implementation of KPPU's Decree about text message tariff. PT. Telkomsel, PT. Indosat,



and PT. XL-Axiata represent three largest shares of GSM operators which together, their share represents 97% in GSM operators in 2007, the year of KPPU's investigation. While PT. Telkom, PT. Bakrie Telecom, and PT. Mobile 8 are three largest operators in CDMA base with cumulative market share of 95% in 2007 CDMA industry. Table 4.19 below shows customers and network development from 2004-2009.

Table 4.14. Average Customers and Network Development 2004-2009

Type		2004	2005	2006	2007	2008	2009
GSM	Customers	9,945,536	15,253,151	20,609,870	29,301,474	42,608,588	48,739,631
	BTS	4,196	5,317	9,673	14,258	19,254	22,382
CDMA	Customers	628,251	1,711,566	2,493,695	4,398,834	7,609,686	9,483,091
	BTS	543	704	793	1,352	2,796	3,559

Source: author computation

Network is represented by Base Transceiver Station (BTS) employs by operators. Increasing number of average customers across years for both GSM and CDMA operators is accommodated by the increasing number of BTS employed by them. There are no huge differences between proportions of BTS employed to customers served by GSM and CDMA operators. In 2009, 1 GSM BTS served 2,178 customers while 1 CDMA BTS served 2,664 customers.

SMS as the core discussion of this paper has important role in operator's operating revenue. Table 4.20 and Table 4.21 show the average ARPU and role of sms and call in cellular's operating revenue.

Table 4.15. Average Nominal ARPU 2004-2009 (in Rupiah)

Operator	2004	2005	2006	2007	2008	2009
ARPUt	24,300	14,141	11,543	11,240	10,062	9,077
ARPUc	133,025	49,776	37,891	30,947	23,110	18,190

Source: author computation

Table 4.16. Revenue Percentage of Cellular Operating Revenue 2004-2009

Operator	2004	2005	2006	2007	2008	2009
% SMS	17.30458	19.90037	19.39442	19.64645	24.63367	25.31582
% Call	61.80242	60.23281	60.7188	56.96375	57.85688	54.32713

Source: author computation

ARPUt which is a proxy used in this paper to represent price of SMS experienced decreasing over years from 24,300 in 2004 to 9,077 in 2009 and ARPUc which is a proxy of calling tariff is also decreasing from Rp 133,025 in 2004 to Rp 18,190 in 2009. This decrease in ARPUt supports the usage of ARPUt as a proxy to sms price because price of sms is indeed

decreasing from 2004 to 2009. This paper does not use SMS price because SMS tariff data is not published in time series. Official websites of operators only provide current sms tariff.

With the decreasing of ARPU, Table 4.21 shows the increasing role of SMS revenue to cellular operating revenue from 17% in 2004 to 25% in 2009. However, the role of call revenue to cellular operating revenue is decreasing from 61.8% in 2004 to 54.3% in 2009.

#### 4.2. ANALYSIS

In order to compute CV, we need to calculate the price elasticity ( $\alpha$ ) and income elasticity ( $\delta$ ) on operator level. Values of  $\alpha$  and  $\delta$  are calculated by estimating this demand function:

$$\log X_{i,t} = c + \alpha \log P_{i,t} + \sum_{j \neq i} \beta_j \log P_{j,t} + \delta \log Y_{i,t} + \gamma \log A_{i,t} + \theta D_i + \varepsilon_{i,t} \dots \dots \dots (1)$$

Notes:

$X_{i,t}$  = demand, number of operator i's customers in year t

$P_{i,t}$  = Text message price,  $P_t$  divided by call price,  $P_c$  of operator i in year t

$P_{j,t}$  = Text message price,  $P_t$  divided by call price,  $P_c$  of operator j (other than i) in year t

$Y_{i,t}$  = Income per capita Indonesia divided by call price,  $P_c$  of operator i in year t

$A_{i,t}$  = Advertising costs divided by operating cost,  $OC$  of operator i in year t

$D_i$  = Dummy variable before and after the KPPU verdict

$\varepsilon_{i,t}$  = error term

i = 1,2,3,...6 (1 = Telkomsel, 2 = Indosat, 3 = Excelcomindo, 4 = Telkom, 5 = Bakrie Telecom, 6 = Smart – Mobile-8 Telecom)

t = 2004, ..., 2009

We can estimate this equation for each operator using OLS or IV Methods. Estimating demand function using OLS technique will not be appropriate with the presence of endogeneity problem. We will see the possibility of improvement by doing instrumental variable estimation to correct the bias of using OLS. We can perform Hausman test to verify the estimation choice between OLS and IV estimation. The instrument for the price variable will be the number of BTS (Base Transceiver Station) as a proxy of technological progress. Since the data series is found to be very limited we will assume that the text message price of other operators will be fixed via ceteris paribus assumption.

$$\log X_{i,t} = c + \alpha \log P_{i,t} + \delta \log Y_{i,t} + \gamma \log A_{i,t} + \theta D_i + \varepsilon_{i,t} \dots \dots \dots (2)$$

Notes:

$X_{i,t}$  = demand, number of operator  $i$ 's customers in year  $t$

$P_{i,t}$  = Text message price,  $P_i$  divided by call price,  $P_c$  of operator  $i$  in year  $t$

$Y_{i,t}$  = Income per capita Indonesia divided by call price,  $P_c$  of operator  $i$  in year  $t$

$A_{i,t}$  = Advertising costs divided by operating cost,  $OC$  of operator  $i$  in year  $t$

$D_i$  = Dummy variable before and after the KPPU verdict

$\varepsilon_{i,t}$  = error term

$i = 1, 2, 3, \dots, 6$  (1 = Telkomsel, 2 = Indosat, 3 = Excelcomindo, 4 = Telkom, 5 = Bakrie Telecom, 6 = Smart – Mobile-8 Telecom)

$t = 2004, \dots, 2009$

From equation (2), we can infer a panel data structure. There are three methods that can be used to estimate panel data, which are pooled regression model (PRM), random effect model (REM), and fixed effect model (FEM). We can perform Hausman test to support our specification choice. We can perform Hausman test to verify the estimation choice between fixed and random effect. We will call this equation (2) as model 1.

Furthermore, not all ARPU of SMS and call services is available in the data. Thus, we will also perform estimation of model 2 that does not include normalization using call price and therefore using text message tariff per usage (for only GSM operators with complete data series) and blended ARPU data to proxy the text message price data:

$$\log X_{i,t} = c + \alpha \log P_{i,t} + \delta \log Y_{i,t} + \gamma \log A_{i,t} + \theta D_i + \varepsilon_{i,t} \dots \dots \dots (3)$$

Notes:

$X_{i,t}$  = demand, number of operator  $i$ 's customers in year  $t$

$P_{i,t}$  = Text message price of operator  $i$  in year  $t$

$Y_{i,t}$  = Real Income per capita Indonesia of operator  $i$  in year  $t$

$A_{i,t}$  = Real advertising costs of operator  $i$  in year  $t$

$D_i$  = Dummy variable before and after the KPPU verdict

$\varepsilon_{i,t}$  = error term

$i = 1, 2, 3, \dots, 6$  (1 = Telkomsel, 2 = Indosat, 3 = Excelcomindo, 4 = Telkom, 5 = Bakrie Telecom, 6 = Smart – Mobile-8 Telecom)

$t = 2004, \dots, 2009$

We use real income per capita and real advertising cost in model 2, since we do not use ratio measure here. Finally for both model, we will also see whether the addition of dummy variable involving the time before and after the verdict and advertisement cost data into the model could improve the estimation result. By employing different specification we will come up with the most efficient model for calculating the CV to measure the welfare effect. This study will use secondary data. Table 4.18 describes data needed and the source of the data.

#### 4.2.1. Analysis Regarding the Increase of Consumer Welfare by Tariff Reduction

Due to data limitation unfortunately we can only gather time series data from 2004 to 2009 for 6 operator, that is Telkomsel, Indosat, Excelcomindo, Telkom (flexi), Bakrie Telecom (Esia), and Mobile-8 Telecom (Smart). Although we cannot get a hold of the data for three other ones, these operator already represent more than 50 percent of market share. Telkomsel, Indosat and Excelcomindo provide GSM services while Bakrie Telecom (Esia), Mobile-8 Telecom (Smart) and Telkom Flexi provide CDMA services. Proxy for Text message tariff using blended ARPU is available for the whole series of each six operators. Unfortunately we cannot get their (call and SMS) complete tariff data from the entire operator. The available data for text message tariff from 2004 to 2009 is only available for three GSM operators (Telkomsel, Indosat and Excelcomindo). We will use an average of the tariff data for different postpaid and prepaid product and also for off-net and on-net tariff in estimating the model. Although KPPU verdict only affected the off-net tariff, the price decrease is also applied in the on-net tariff by each of the operator. Blended ARPU of call and text services as a proxy is available for all 6 operators, but ARPU of SMS service and ARPU of Call services are only available for 5 operators. Telkom (flexi) only have data series of ARPU of SMS and Call services from 2006 to 2008.

We will try estimating the panel data for the whole series using blended ARPU as a proxy for SMS price and using only 5 operators for the specification using ARPU of SMS and Call services. We will also estimate a model for GSM operator only using the available text message tariff. These limitations of data require a simple model, since too many independent variables will decrease degree of freedom and hence worsen the estimation result. We will not include the price for other operators since estimating this model require sufficient time series interval. The plan is to estimate model 1 for 5 operators only (with available data), model 2a for the whole 6 operators using blended ARPU price as proxy and model 2b for only GSM operator using text message tariff data. The following table describes the expected sign:

Table 4.17. Variables a priori expected sign in the Model

Variable	Definition	Expected sign
Text message tariff/ARPU	Logarithm of Text message tariff/ARPU	-
Income per capita	logarithm of Income per capita	+
Advertisement expenditure	Log of advertisement and promotion expenditure	+
Dummy Variable (before KPPU Verdict=1)	Dummy variable before and after KPPU verdict	-

Demand elasticity is expected to have a negative value following economic theory justification. Income elasticity is expected to have a positive value since it is assume the service is normal goods. Advertisement needs to be positive since increased advertisement expenditure eventually should lead to greater demand. Dummy variable should be negative since it is expected after KPPU verdict the text message tariff is lower followed by increased demand. The following tables summarize the estimation result of model 1, 2a and 2b:

Table 4.18. Estimation Results for Model 1 (n = 30)

Independent Variables	Model (1a)				Model (1b)				Model (1c)			
	Common Panel		IV panel		Common Panel		IV Panel		Common Panel		IV Panel	
	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Text message tariff/ARPU	-.0524 (.1869)	.1643 (.2573)	.5553 (.4628)	2.3615* (1.0351)	-.0521 (.1841)	.1122 (.2543)	.7134 (.6109)	2.9600** (1.5384)	-.1191 (.1797)	.0965 (.2281)	1.1285 (1.0636)	2.8620* (1.2207)
Income per capita	1.0055* (.1485)	.9318* (.2547)	.8987* (.1953)	-.0854 (.6592)	1.0691* (.1006)	1.1388* (.1716)	.9334* (.1670)	.2231 (.6313)	1.1238* (.0930)	1.0778* (.1281)	.9690* (.2066)	.5557 (.4016)
Advertisement expenditure	.6225 (.5058)	-1.5690* (.3568)	1.0756 (.6888)	-.4434 (.8162)	.6522 (.4958)	-1.5877* (.3591)	1.2225 (.7826)	-.1557 (1.0980)	-	-	-	-
Dummy Variable (before KPPU Verdict=1)	-.1378 (.2337)	-.4399 (.4034)	-.13600 (.2866)	-1.2850 (.8904)	-	-	-	-	-	-	-	-
Constant	10.9761* (1.7077)	7.0524* (2.2250)	13.3510* (2.6180)	18.8444* (6.5979)	10.5797* (1.5464)	5.4504* (1.6764)	13.5785* (3.0114)	17.6392* (7.3821)	8.7360* (.6641)	9.2781* (.9696)	11.1832* (2.3094)	15.8070* (3.5314)
Hausman test in favor of	√		√		√		√		√		√	
R <sup>2</sup>												
F-value	0.8796	0.7408	0.8190	0.4826	0.8776	0.7208	0.7815	0.3565	0.8680	0.2793	0.5914	0.3715
	38.36*	68.97*	31013.97*	24.41*	52.59*	68.33*	26904.40*	16.21*	75.62*	77.66*	15043.89*	15.18*

Note: Standard error is within parentheses. Significant at \* 5%, \*\* 10% level of significance. FE is Fixed Effect estimation and RE is Random Effect estimation

Table 4.19. Estimation Results for Model 2a (n=36)

Independent Variables	Model (2a1)				Model (2a2)				Model (2a3)			
	Common Panel		IV panel		Common Panel		IV Panel		Common Panel		IV Panel	
	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Text message tariff/ARPU	-0.9217* (.1676)	-0.8289* (.1772)	-1.2944* (.5795)	-1.6619* (.7895)	-0.8949* (.1530)	-0.8265* (.1621)	-1.3483* (.6612)	-1.7720** (.9553)	-1.0780* (.1994)	-1.0634* (.1978)	-2.4844 (.9339)	-2.5236* (.8850)
Income per capita	-0.3855 (2.1825)	0.07596 (2.3420)	-3.8642 (5.6575)	-7.4949 (7.6696)	0.3032 (1.4404)	0.1930 (1.5243)	-2.7067 (4.5454)	-5.8166 (6.5718)	2.8458 (1.8056)	2.9620** (1.7920)	-8.3522* (7.5732)	-8.6643 (7.1747)
Advertisement expenditure	0.7276* (.1647)	0.8724* (.1623)	0.6052* (.2548)	0.5411 (.3128)	0.7495* (.1541)	0.8722* (.1528)	0.6371* (.2375)	0.5875** (.3060)	-	-	-	-
Dummy Variable (before KPPU Verdict=1)	-0.0955 (.2247)	-0.0158 (.2405)	-0.2833 (.3699)	-0.4521 (.4759)	-	-	-	-	-	-	-	-
Constant	11.593 (35.7992)	0.5795 (38.3578)	71.8940 (97.154)	133.333 (131.679)	-0.0613 (22.6727)	-1.3040 (224.1271)	52.8998 (78.9092)	105.953 (114.1603)	-23.6100 (29.7965)	-25.5463 (29.5767)	162.9373* (125.9763)	168.1359* (119.3937)
Hausman test in favor of	√			√	√			√		√		√
R <sup>2</sup>	0.9367	0.7095	0.9247	0.4643	0.9363	0.7098	0.9156	0.4610	0.8804	0.2506	0.6681	0.1478
F-value	96.24*	339.08*	96942.36*	222.31*	132.27*	352.40*	89778.00*	181.40*	103.10*	207.53*	23684.57*	80.19*

Note: Standard error is within parentheses. Significant at \* 5%, \*\* 10% level of significance. FE is Fixed Effect estimation and RE is Random Effect estimation

Table 4.20. Estimation Results for Model 2b (n=18)

Independent Variables	Model (2b1)				Model (2b2)				Model (2b3)			
	Common Panel		IV panel		Common Panel		IV Panel		Common Panel		IV Panel	
	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE
Text message tariff/ARPU	-.14590 (.1083)	-.1179 (.4381)	.7276 (2.0651)	-4.2461 (5.8253)	-.1510 (.1045)	-.1348 (.4194)	.79324 (2.2259)	-4.1382 (5.3375)	.0467 (.1120)	.05332* (.1263)	.2646 (.6458)	.6298 (1.0068)
Income per capita	3.0236 (1.9845)	.8611 (7.1600)	14.6188 (27.6469)	-46.1948 (67.9353)	2.7041 (1.8235)	-.0456 (6.1582)	14.8332 (28.7978)	-42.3590 (57.6166)	8.3382* (.7530)	8.3704* (.8490)	9.3937* (3.1840)	11.1630* (4.9632)
Advertisement expenditure	.7683* (.2407)	1.2238 (.7669)	-.3100 (2.6029)	4.8228 (5.4087)	.7481* (.2300)	1.2005 (.7367)	-.4605 (2.8963)	4.8672 (5.1831)	-	-	-	-
Dummy Variable (before KPPU Verdict=1)	.06791 (.1335)	.1565 (.5637)	.1684 (.4224)	-.5791 (1.8755)	-	-	-	-	-	-	-	-
Constant	-51.5307 (26.8892)	-29.6060 (101.0299)	-211.9213 (382.151)	645.702 (973.5407)	-45.8200** (23.6687)	-14.3377 (81.9095)	-211.5132 (392.8037)	582.4225 (808.7238)	-116.4261* (12.4526)	-116.9754* (14.0407)	-134.4276* (54.1886)	-164.6052** (84.4689)
Hausman test in favor of		√		√		√		√		√		√
R <sup>2</sup>	0.9735	0.6544	0.8169	0.1654	0.9729	0.6523	0.7882	0.1730	0.9489	0.5809	0.9341	0.5578
F-value	101.00*	24.61*	47984.80*	3.67	143.44*	26.27*	45268.93*	4.09	120.80*	190.06*	157559.52*	77.71*

Note: Standard error is within parentheses. Significant at \* 5%, \*\* 10% level of significance. FE is Fixed Effect estimation and RE is Random Effect estimation



In model 2a, we can see that almost all IV estimation result have unexpected result, with wrong sign for text message price or/and income elasticity estimator. This is also kind of expected since small sample data usually leads to inefficient result of IV estimation. Thus, we will focus more on common panel specification. We need the parameter of text message tariff and income to be significant in order to have good result. After dropping the advertisement data and dummy variable, we found good result with simple specification of Random Effect Panel Model in part 2a3. Also, the parameters of text message price and income elasticity are statistically significant and Hausman test support the choice of the specification. Furthermore, in model 1 we have three specifications with correct sign on text message price and income. All of them are common fixed effect model in part 1a, 1b and 1c. Dummy variable is not significant, thus we prefer to drop it entirely. Although advertisement expenditure is not significant in all three specifications, we still consider the variable to be important in our analysis. Thus, we prefer to use the specification of common fixed effect in part 1b where Hausman test is also in favor of it. Compare to model 2a, we prefer using model 1 since it incorporates the substitution effect between the choices of text message and calling service. Model 2a uses blended ARPU of text message tariff and call service which actually is not a good proxy. We still perform the calculation since using the proxy utilizes all available data ( $n=36$ ). Hence, we will use the result of common fixed effect estimator in part 1b as our leading model.

For model 2b, we also have many problems in the sign of the parameter and even fewer parameters that are statistically significant. After comparing the estimation result, we choose the Common Fixed Effect estimation in part 2b2. The specification has two statistically significant estimators with correct sign. Although the Hausman test suggests that we should use Random Effect estimation, correct sign is very important in carrying out our analysis further. These estimators will be used to calculate welfare change based on text message tariff per usage for GSM operator only, unlike model 1 and 2a that uses ARPU data. Using estimator found in part 1b, we can calculate the welfare change for all 6 operators.

Table 4.21. Yearly Welfare Change by Operator<sup>32</sup>

Operator's Name	Based on Model 2b				Based on Model 1			
	2006-2007		2008-2009		2006-2007		2008-2009	
	Average Individual Welfare Change (In billion Rupiah)	Total Welfare Change (In billion Rupiah)	Average Individual Welfare Change (In billion Rupiah)	Total Welfare Change (In billion Rupiah)	Average Individual Welfare Change (In billion Rupiah)	Total Welfare Change (In billion Rupiah)	Average Individual Welfare Change (In billion Rupiah)	Total Welfare Change (In billion Rupiah)
Telkomsel	-7870.63	-328.55	-7292.00	-535.76	-7055.27	-294.51	-6535.75	-480.19
Indosat	-8164.15	-168.39	-2087.32	-72.69	-7318.61	-150.95	-2413.92	-84.06
Excelcomindo	-2446.27	-30.57	-1883.09	-54.10	-2191.60	-27.39	-1686.92	-48.46
Bakrie Telecom (Esia)					-13559.11	-35.93	-5131.28	-44.99
Mobile 8					-7144.56	-17.29	-5164.16	-15.17
Telkom Flexi					-3712.47	-19.56	-7854.96	-109.44

Note: We use real blended ARPU since it has complete series for the whole operator to approximate  $p_1x_1$  and  $p_0x_0$ .

From the table above we can compare the change in welfare effect before and after the KPPU verdict. We choose interval year of 2006-2007 to approximate the middle interval of year 2004-2007. We also pick 2008-2009 period in the analysis because price decrease is administered since 2008 after the verdict. As we can see, most operators (Telkomsel, Excelcomindo, Bakrie Telecom and Telkom Flexi) in effect of the verdict show an increase of total welfare gain in the period of 2006-2007 compare to period of 2008-2009. It seems that Indosat does not indicate any anti-competitive behavior due to higher welfare gain that Indosat achieved during the period before KPPU verdict. As for Mobile 8 itself, the welfare gain is slightly higher during period of 2008-2009 compare to period of 2006-2007 because they lost some costumers during the period of 2008-2009.

#### 4.2.2. Analysis regarding the effect of KPPU's Verdict toward the decrease of SMS tariff (tariff reduction and consumer welfare analysis)

After obtaining the result of the demand and income elasticity, we used the formula in Hausman (1981) paper in order to compute CV that is:

$$CV = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y_0^{-\delta} (p_1x_1 - p_0x_0) \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} - y_0$$

We use blended ARPU as the proxy for the price since this is the only data that is completely available for all 6 operators from 2004-2009. Using the estimation result, ARPU

<sup>32</sup> See appendix on detail explanation of the calculation. This also applied to the following two tables in the next section.

data and real income per capita we calculate the average individual welfare change before and after the KPPU verdict. The total effect is obtained by calculating the result with total consumers of each operator. The results from model 1 and model 2 have the same sign, meaning that a welfare gain has occurred during the period before and after the KPPU verdict. We pick 2007 as the initial year, since it is the last condition of the industry right before and during the verdict process. We make an average of 2008 to 2009 in order to capture the change in the industry two years after the verdict. Also, as mentioned before, the tariff reduction only occurred since 2008. From the table below (by using model 1) the largest welfare effect is Telkomsel amounted to 1.155 billion rupiah follow by Indosat and Excelcomindo with 341 billion and 201 billion rupiah respectively. This is not a surprise since they are the big players of the industry using GSM technology.

Bakrie Telecom, Mobile 8 and Telkom Flexi also show welfare gain improvement, although with a considerably lower amount at 73, 38 and 151 billion rupiah respectively. They use CDMA technology comprising lower market share with a tendency for the consumer to use call services due to their lower tariff. Telkom Flexi has the highest gain among this group since they have the largest consumer among CDMA operator, followed by Bakrie Telecom and Mobile 8. Although Indosat is not affected by the KPPU verdict, the effect of competition will eventually force them to lower their tariff also. Average individual welfare effect per operator also can be seen in the table with Telkomsel having the highest value follow by Telkom Flexi and Mobile 8. Thus, KPPU verdict has succeeded in increasing the competition of text message service industry, subsequently increasing the welfare effect of the consumers.

Table 4.22. Welfare Effect from KPPU's Verdict Toward The Decrease of SMS Tariff

Operator's Name	Based on Model 1			Based on Model 2b		
	Average Individual Welfare Change (in rupiah)	Total Welfare Effect/ Competitive Effect (In billion rupiah)	Percentage of Total Welfare to real GDP	Average Individual Welfare Change (in rupiah)	Total Welfare Effect/ Competitive Effect (In billion rupiah)	Percentage of Total Welfare to real GDP
Telkomsel	-19031.36	-1154.84	0.00053	-21203.15	-1286.63	0.00059
Indosat	-11489.28	-341.05	0.00016	-12811.18	-380.29	0.00018
Excelcomindo	-9074.80	-200.53	0.000093	-10121.64	-223.67	0.00010
Bakrie Telecom (Esia)	-11723.01	-73.79	0.000034			
Mobile 8	-12795.61	-38.08	0.000018			
Telkom Flexi	-14855.45	-150.75	0.00007			

Note: We use real blended ARPU since it has complete series for the whole operator to approximate  $p_1x_1$  and  $p_0x_0$ . In this calculation  $p_0x_0$  is real blended ARPU in 2007 and  $p_1x_1$  is an average of real blended ARPU data from 2008 to 2009. We use Real GDP in 2009 to make percentage of total welfare to GDP.

Using model 1, in total the welfare effect gain by KPPU verdict is approximately

around 1.6 trillion rupiah or around 0.00074 % of 2009's real GDP (in the period between 2007-2009) for the text message industry as a whole from five operators affected by the Verdict which are Telkomsel, Excelcomindo, Bakrie Telecom, Mobile 8, and Telkom Flexi. From six operators, including Indosat, the total welfare effect is counted for almost 2 trillion rupiah. We can use summation of all the five operators in our calculation since in Indonesia; one individual might use more than one mobile phone often with different operators. Our survey found that there exist certain individual that uses 4 phones actively. Thus, one individual can experience multi-welfare gain in their consumption.

Table 4.23. Total Welfare Effect of Operators affected by KPPU's Verdict

Operator's Name	Based on Model 1			Based on Model 2b		
	Welfare Effect (in rupiah)	Total Welfare Effect/ Competitive Effect (In billion rupiah)	Percentage of Total Welfare to real GDP	Welfare Effect (in rupiah)	Total Welfare Effect/ Competitive Effect (In billion rupiah)	Percentage of Total Welfare to real GDP
Telkomsel	-19031.36	-1154.84	0.00053	-21203.15	-1286.63	0.00059
Excelcomindo	-9074.80	-200.53	0.000093	-10121.64	-223.67	0.00010
Bakrie Telecom (Esia)	-11723.01	-73.79	0.000034			
Mobile 8	-12795.61	-38.08	0.000018			
Telkom Flexi	-14855.45	-150.75	0.00007			
<i>Total Welfare Effect due to KPPU's verdict</i>	-67480.2	-1617.99	0.00074	-31324.8	-1510.3	0.00070

*Note:* We use real blended ARPU since it has complete series for the whole operator to approximate  $p_1x_1$  and  $p_0x_0$ . In this calculation  $p_0x_0$  is real blended ARPU in 2007 and  $p_1x_1$  is an average of real blended ARPU data from 2008 to 2009. We use Real GDP in 2009 to make percentage of total welfare to GDP.

## Chapter 5

# CONCLUSION AND RECOMMENDATIONS

### 5.1. CONCLUSION

Using panel data estimation and subsequently calculating the CV value, consumer has experienced a welfare gain from the KPPU verdict. For all six operators, Telkomsel users experienced the highest gain with 1.155 billion rupiah followed by Indosat and Excelcomindo by 341 and 201 billion rupiah respectively. Other operators such as Bakrie Telecom, Mobile 8 and Telkom Flexi experienced smaller welfare gain with 73, 38 and 151 billion rupiah in value. The first three operator use GSM technology while the rest of them use CDMA technology. Higher welfare gain for GSM operator is expected since they have larger market share compare to CDMA operators. Also, consumer that uses both GSM and CDMA technology tends to utilize text message more frequent in their GSM mobile phone as supported from our survey result.

Telkomsel and Excelcomindo welfare gain is relatively large supporting the effectiveness of KPPU verdict on their anti-competitive behavior. Although Indosat welfare gain is also relatively large, the value is quite close to Excelmindo in contrast with a huge gap to Telkomsel welfare gain value. This number again shows that the verdict has an effect in increasing welfare gain of the consumer and also competition among them to lower price further. As for the CDMA operators, welfare gain is also relatively large especially for Bakrie Telecom and Telkom Flexi. Both of them are proven to violate the antitrust law. Although mobile 8 operators is also proved to be one of the firm that breach the law, their welfare gain is relatively low. This happens since they have a considerably low market share in the industry. In total, the welfare gain achieved from the KPPU verdict is approximately around 1.6 trillion rupiah roughly from 2007 to 2009 (0.00074 percent of total real GDP in 2009), making an average of around 800 billion rupiah per year. Thus, we conclude that the KPPU verdict has play an important role in increasing their competition and creating higher welfare gain for consumer as a whole.

The welfare gain may lead to behavioral change of pattern in the use of mobile phone by customer. Apart from portraying some picture of Indonesian mobile phone users, the consumer survey attempts to capture and elaborate these changes. Some appealing findings occurred, they are as follows.

1. Despite majority of respondents reported that both monthly average income and spending on mobile phones have increased fairly relative to five years ago, the extent of increment varies. Intuitively, this may indicate the presence of behavioral pattern of change in mobile phone use.
2. In terms of mobile phone use, the current overall pattern of use suggests that about 50% respondent use mobile for voice messaging, around 37% for text messaging and about 13% for data/internet. Relative to five years ago, these patterns have undergone some changes. Survey shows that percentage of respondents who report an increase (i.e. a combination of fairly, significant and very significant increases) in text messaging, voice messaging and data/internet use are 68%, 70% and 53% respectively, and are much larger compare to those who said do not change or experiencing a decrease in use.
3. As claimed by large proportion of respondent (around 34%), these increases of use of mobile phone features are mainly due to a cheaper tariff rate.
4. Nevertheless, the degree of increment varies within these features. For text messaging use, majority of respondents (33%) have experienced only a fairly increase, while majority of respondents (31%) have reported a significant increase for voice messaging use.
5. Survey also reveals the composition of mobile phone features usage by operators. The results are also consistent with welfare gain computed from compensating variation method. The top three welfare gainers are customer from GSM network operators, namely TELKOMSEL, INDOSAT and EXCELCOMINDO (XL). In addition to that of holding incumbent position, and hence have already a large number of subscribers, these three operators have relatively high use of text message service, with an average of 40%. This figure is much higher than that of CDMA operators, with an average of 29%.

## 5.2. RECOMMENDATIONS

The lesson learned is that competition is good as it benefits the consumers. KPPU's decision to annul the price agreement among several mobile phone operators leads to a significant increase in text message competition tariff. By utilizing a compensating variation method the total welfare gain for consumer from 2007-2009 can be computed and is as large as Rp. 1959 billion or approximately 0.0009 % of Indonesia's real GDP at 2009. In addition, the benefit also comes with some behavioral pattern of changes in the use of mobile phone features. Survey has shown that such changes do exist, especially as more and more text and voice messages services have been used by respondent, as a result of cheaper tariff rate.

Consumer surplus for each operator seems to relate to their market share in text message service industry. In consequence, consumers will gain more consumer surplus if the dominant firms lower their tariff further. KPPU needs to monitor the strategic behavior of these dominant firms.

Having said this, KPPU's decision plays a key role in preserving competition among mobile phone operators. With such decision, along with the new entrance to the industry, text messaging tariff rate have undergone a significant decrease and hence creating intense competition among operators. Such competition can be found in various forms, one of which the obvious is heavy promotional tariff advertising in the media.

To further promote competition in the industry, an important aspect that KPPU must closely pay attention to is that telecommunication has become one of the industries with the fastest growing technology in the world. The development of new technology has brought this industry into a new frontier of infrastructures, devices, services and any other aspects, all of which may change the competitive settings in the industry. For that very reason, knowledge and understanding on the characteristics of the industry is imperative in order to be able to make breakthrough competition policies.

In the future, we hope that a larger sample size of the data can be obtained in order to improve our result. If we can do a survey at national level, we can employ discrete choice model to estimate the welfare effect. This kind of effort needs cooperation from other institution such as BPS, local government, etc. An online survey might be feasible and more efficient but we need to check thoroughly the implementation feasibility in Indonesia.

## REFERENCES

- Annual Report. Telkomsel. (Various Edition).
- . Indosat. (Various Edition).
- . XL. (Various Edition).
- . Telkom. (Various Edition).
- . Hutchinson. (Various Edition)
- . Mobile 8. (Various Edition)
- . Sampoerna Telekomunikasi Indonesia. (Various Edition)
- . Natrindo. (Various Edition)
- Brynjolfsson, E. Smith, M.D., & Y. Hu. 2003. "Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers". *MIT Sloan School of Management Working Paper*, 4305-03
- Carlton, Dennis W., Jeffrey M. Perloff. 2004. *Modern Industrial Organization*. 4th International Edition. Addison Wesley.
- Dick, Astrid A. 2008. "Demand Estimation and Consumer Welfare in The Banking Industry." *Journal of Banking & Finance* 32 (2008): 1661-1676.
- Directorate General of Post & Telecommunications. (1980). *Sejarah Pos dan Telekomunikasi di Indonesia (Jilid V) Masa Orde Baru*. Jakarta : CV Cahaya Makmur. [in Bahasa Indonesia]
- . (2009). *Statistical Book of Post and Telecommunications*. [Online] Available : [http:// www.postel.go.id/wedupdate/dastik](http://www.postel.go.id/wedupdate/dastik) (26 December 2010)
- . (2010). *Statistical Book of Post and Telecommunications*. [Online] Available : [http:// www.postel.go.id/wedupdate/Dastik](http://www.postel.go.id/wedupdate/Dastik) (20 February 2011)
- International Telecommunications Union, ICT Statistics 2005
- Hassan, Zuhair A. 1995. "Measurement of Welfare Change: A Review." *Working Paper* 95-WP 141 (November).
- Hausman, Jerry A. 1981. "Exact Consumer's Surplus and Deadweight Loss." *The American Economic Review* Vol. 71 (September): 662-676.
- Hausman, Jerry A., Ariel Pakes, & Gregory L. Rosston. 1997. "Valuing the Effect of Regulation on New Series in Telecommunications." *Brookings Papers on Economic Activity. Microeconomics* Vol. 1997 (1997): 1-54.



- Hausman, J.A. & G.K. Leonard. 2002. "The Competitive Effects of A New Product Introduction: A Case Study". *The Journal of Industrial Economics*, 50, 237-263.
- KPPU. (2007). Decision Case Number 26/KPPU-L/2007. [Online] Available : <http://www.kppu.go.id> (24 February 2011)
- Martin, Stephen. *Industrial Economics: Economic Analysis and Public Policy*. Second Edition.
- Mastel. (2005). Masukan-Masukan Menuju Cetak Biru Telematika 2005 – 2015 Serta Sarat Tindak Jangka Pendek Buku I Bidang Telekomunikasi. [Online] <http://mastel.files.wordpress.com/.../cetak-biru-telematika-buku-i-telekomunikasi.pdf> (26 December 2010). [in Bahasa Indonesia]
- Paylasova, Lenka. (2004). Development and Regulation of Telecommunications Market in India, Indonesia, Malaysia, and Thailand. Master Thesis. National University of Singapore. [Online] <https://scholarbank.nus.edu.sg> (29 December 2010)
- Petrin, A. 2002. "Quantifying the Benefits of New Products: The Case of Minivan." *The Journal of Political Economy*, 110, 705-729.
- Pofahl, G.M., T.J. Richards & G.T. Tonsor. 2009. "Valuation of New Products in The Face of Consumer Income Disparity". Selected Paper prepared for presentation at the Agricultural & Applied Economics Association Annual Meeting, Milwaukee, WI.
- Rachman, Faisal. 2010. Analisa Competitive Effect Produk Baru: Studi Kasus Masuknya Produk Three ke Dalam Pasar Layanan Telepon Seluler Berbasis GSM (Global System for Mobile Communication) di Indonesia. Skripsi.
- Telkom. (2009). *Overview of Telecom Industry in Indonesia*. [Online] <http://www.telkom.co.id/UHI/assets/pdf/ID>
- Varian, H. R. 1992. *Microeconomic Analysis*, 3rd Edition. New York: W.W. Norton & Company, Inc.
- Yulianto, Ivan. 2010. Analisis Kinerja Subsidi Public Service Obligation (PSO) di Sektor Angkutan Laut Ditinjau dari Consumer's Welfare. Tesis. Jakarta.

APPENDIX 1

$$CV = \mu(p_1; p_0, y_0) - \mu(p_0; p_0, y_0) \dots\dots\dots (A1)$$

$$\mu(p_1; p_0, y_0) = e(p_1, v(p_0, y_0)) \dots\dots\dots (A2)$$

Notes:

$p_0$  = initial price

$p_1$  = current price

$y_0$  = initial income

$\mu(p; p, y)$  = utility function

$e(p, v(p, y))$  = expenditure function

This relation measures how much money needed in minimum by consumer in price level  $p_0$  to keep consumer's utility remains the same as when he/ she has price level  $p_0$  and income  $y_0$ .

By substituting equation (A2) to equation (A1) and replacing  $\mu(p_0; p_0, y_0)$  with  $y_0$ :

$$CV = e(p_1, v(p_0, y_0)) - y_0 \dots\dots\dots (A3)$$

This equation shows that CV is a difference between minimum expenditure from having  $p_1$  needed to hold the utility remains the same as before (having  $p_0$ ) and the initial income used to be spent in initial price.

Using Shepard's Lemma:

$$\frac{\partial e(p_1; p_0, y_0)}{\partial p} = x(p_1, \mu(p_1; p_0, y_0)) \dots\dots\dots (A4)$$

$$\frac{\partial \mu(p_1; p_0, y_0)}{\partial p} = x(p_1, \mu(p_1; p_0, y_0)) \dots\dots\dots (A5)$$

If demand function is  $x = e^c p^\alpha y^\delta$  or in log-linear demand function form is  $\log x = c + \alpha \log p + \delta \log y$ , then:

$$\frac{\partial \mu(p_1; p_0, y_0)}{\partial p} = e^c p^\alpha y_0^\delta \dots\dots\dots (A6)$$

Since  $\mu(p_0; p_0, y_0) = y_0$ , then:

$$\frac{\partial \mu(p_1; p_0, y_0)}{\partial p} = e^c p^\alpha \mu^\delta \dots\dots\dots (A7)$$

$$\frac{\mu^{-\delta} \partial \mu(p_1; p_0, y_0)}{\partial p} = e^c p^\alpha \dots\dots\dots (A8)$$

$$\int_{p_0}^{p_1} \mu^{-\delta} (\partial \mu / \partial t) dt = e^c \int_{p_0}^{p_1} t^\alpha dt \dots\dots\dots (A9)$$

$$\frac{(\mu(p_1; p_0, y_0)^{1-\delta} - \mu(p_0; p_0, y_0)^{1-\delta})}{(1-\delta)} = \frac{(p_1^{1+\alpha} - p_0^{1+\alpha})}{(\alpha+1)} \cdot e^c \dots\dots\dots (A10)$$

$$\frac{(\mu(p_1; p_0, y_0)^{1-\delta} - y_0^{1-\delta})}{(1-\delta)} = \frac{(p_1^{1+\alpha} - p_0^{1+\alpha})}{(\alpha+1)} \cdot e^c \dots\dots\dots (A11)$$

$$\mu(p_1; p_0, y_0) = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} (p_1^{1+\alpha} - p_0^{1+\alpha}) e^c \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} \dots\dots\dots (A12)$$

Since  $e^c = x / p^\alpha y_0^\delta$ , Then:

$$\mu(p_1; p_0, y_0) = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y_0^{-\delta} (p_1 x_1 - p_0 x_0) \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} \dots\dots\dots (A13)$$

Substituting equation (A13) to equation (A3)

Note: remember that  $\mu(p_1; p_0, y_0) = e(p_1, v(p_0, y_0))$

$$CV = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y_0^{-\delta} (p_1 x_1 - p_0 x_0) \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} - y_0 \dots\dots\dots (A14)$$

$$CV = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y_0^{-\delta} (p_1 x_1 - p_0 x_0) \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} - y \dots\dots\dots (1)$$

Notes:

$\alpha$  = text message price elasticity

$\delta$  = income elasticity

$p_0x_0$  = revenue from using initial price

$p_1x_1$  = revenue from using new price

$y$  = income

## APPENDIX 2

### Draft Questionnaire

#### Background of the Survey

This survey is conducted by LPEM in cooperation with JICA and KPPU to identify the impact of competition on consumer welfare in mobile phone industry, especially in text messaging services. The result from this survey will assist KPPU to evaluating their judicial verdicts.

All information gathered in this survey is to be treated confidentially and will be used only for the purposes stated above. For more information about the survey, please contact Mrs. Desi Setidestriati at 021-314 3177 (ext. 609)

Thank you for your cooperation.

#### A. Respondent General Profile

- 1.Name : \_\_\_\_\_  
 2.Age : \_\_\_\_ years  
 3.Home address : \_\_\_\_\_  
 4. Sex : ( ) Male ( ) Female

#### 5. Type of occupation (please select only 1):

a.	Entrepreneur	f.	Students
b.	Professional	g.	Housewife
c.	Private sector employee	h.	Unemployed
d.	Public sector employee	i.	Others:.....
e.	Teacher/Lecturer		

#### 6. Level of education completed

a.	High school or lower
b.	Diploma
c.	Bachelor degree
d.	Master degree
e.	Doctoral degree

7. Current monthly average income :

a.	Less than 500.000 rupiah	e.	10 – < 15 million rupiahs
b.	500.000 rupiahs – < 1 million rupiahs	f.	15 – < 20 million rupiahs
c.	1 – < 4 million rupiahs	g.	20 – 25 million rupiahs
d.	4 – < 10 million rupiahs	h.	More than 25 million rupiahs

8. Relative to five years ago, how is your current monthly average income (please circle):

Increase very significantly (> 30%)	Increase significantly (15 – 30%)	Increase slightly (< 15%)	Do not change	Decrease slightly (< 15%)	Decrease significantly (15 – 30 %)	Decrease very significantly (> 30%)
1	2	3	4	5	6	7

B. Present Mobile Phone Ownership

1. Do you have a mobile phone? ( )YES ( )NO

2. In what year did you first use a mobile phone? \_\_\_\_\_

3. Current mobile phones that you actively used?

Type of mobile phone	Operator	Network			Subscription			Initial year of use
		GSM	CDMA	Dual	Post-paid	Pre-paid	Dual	

Please specify the reasons if you use more than 1 mobile phone

- a. Benefits from using different network (GSM, CDMA)
- b. Wider accessibility from using different operators
- c. Different functions (personal, business, etc.)
- d. Others, specify:

C. Mobile Phone Usage

1. On a scale 1-6, How important your mobile phones for daily activities ? (please circle)

Extremely unimportant	Unimportant	Fairly unimportant	Fairly important	Important	Extremely important
1	2	3	4	5	6

- a. Please specify the reasons
- a. For work purposes
  - b. For social network & relationships (family, friends, etc.)
  - c. For source of information
  - d. For entertainment purposes (games, internet, chat, etc.)
  - e. Others, specify:

2. Current average monthly spending on mobile phones that are actively used

a.	< Rp 100.000	e.	Rp 550.000 – < 700.000
b.	Rp 100.000 – < 250.000	f.	Rp 700.000 – < 850.000
c.	Rp 250.000 – < 400.000	g.	Rp 850.000 – 1.000.000
d.	Rp 400.000 – < 550.000	h.	> Rp 1.000.000

3. Type of daily mobile phone usage

Type of mobile phones	Operator	SMS/Text	Talk	Data/internet	Total
		%	%	%	100%
		%	%	%	100%
		%	%	%	100%

4. Since 2007, have you ever switched mobile phone operators? ( ) YES ( ) NO

- a. If YES ,
- a.1. How many times \_\_\_\_\_; Year \_\_\_\_\_
  - a.2. Please specify the reason
    - a. Cheaper tariff
    - b. Better signal and Accessibility
    - c. Many promotion offer (concert tickets, discounts, etc.)
    - d. Bundling with the phone (Blackberry, I-Phone, etc.)
    - e. Others, specify:.....
- b. If NO; Please specify the reason
- a. Satisfied with the existing tariff applied
  - b. Satisfied with the existing services given by the operator
  - c. Mobile phone number has widely recognized for networking
  - d. Others, specify:.....

5. Relative to five years ago, how is your current average monthly SPENDING on mobile phone (please circle)

Increase very significantly (> 30%)	Increase significantly (15 – 30%)	Increase slightly (< 15%)	Do not change	Decrease slightly (< 15%)	Decrease significantly (15 – 30 %)	Decrease very significantly (> 30%)
1	2	3	4	5	6	7

6. Relative to five years ago, how is your current average monthly USAGE for these features on your mobile phone (please tick)

	Increase very significantly (> 30%)	Increase significantly (15 – 30%)	Increase slightly (< 15%)	Do not change	Decrease slightly (< 15%)	Decrease significantly (15 – 30 %)	Decrease very significantly (> 30%)
SMS/Text	1	2	3	4	5	6	7
Talk	1	2	3	4	5	6	7
Data/internet	1	2	3	4	5	6	7

7. What is the reason of the changes (if any)?

a.	Benefit of different operator	e.	Use Blackberry more often
b.	Less usage of mobile phone	f.	Due to KKPU judicial verdict
c.	Cheaper tariff overall	g.	Others, specify.....
d.	Use many promotion tariff	h.	

8. Do you know that the text message tariff has been cut since 2007? ( ) Yes ( ) No
9. On a scale 1 to 6, do you think KPPU verdict (no 26/KPPU – L/2007) which canceled the price fixing agreement between several mobile phone operators leads to a significant increase in text message tariff competition? (please circle)

Highly Disagree			Highly Agree		
1	2	3	4	5	6

10. On a scale 1 to 6, do you think the increase competition on text message tariff leads to a higher consumer welfare of mobile phone users (e.g. less average monthly spending, more frequent use of features in mobile phone, etc)? (please circle)

Highly Disagree			Highly Agree		
1	2	3	4	5	6

Thank you for your participation



### APPENDIX 3

#### Steps in Calculating Welfare Effect

In order to conduct the estimation, this study gather data from various sources described in Table D.5. Using model specification (1) and (2), this study regress the variables using Common Panel and Panel Instrumental Variable (IV) methods. Since we use panel data, this study employs both random effect and fixed effect specification for each model. Different models, methods, and specifications are employed to produce optimal results.

This study also employs different specification in terms of eliminating non-substantial variables due to produce a favorable estimation. In acquiring this estimation, our study will analyze the estimator signs of the independent variables, statistical significance, and Hausman test of each specifications. After choosing the best model, coefficient from price and income variable which represent demand ( $\alpha$ ) and income ( $\delta$ ) elasticities are used to compute the welfare effect using compensating variation.

$$CV = \left[ \left[ \frac{(1-\delta)}{(\alpha+1)} y_0^{-\delta} (p_1 x_1 - p_0 x_0) \right] + y_0^{1-\delta} \right]^{\frac{1}{1-\delta}} - y_0$$

In computing the welfare effect, CV is calculated for each operator for selected yearly interval and period before and after the KPPU Verdict. The selected yearly interval is 2006-2007 and 2008-2009. The reasoning behind this selection can be found in detail in section 4.2.1. To analyze the KPPU verdict closely, we utilize ARPU data in 2007 as the initial year to approximate  $p_0 x_0$  and use the average of ARPU from 2008-2009 to approximate  $p_1 x_1$ . Price decreased by operator in effect of KPPU verdict begins to administer since 2008. Initial income ( $y_0$ ) uses real income per capita. Since CV uses ARPU (average revenue per user), the welfare effect computed is an average at individual level. To obtain the total welfare, we multiplied the result with total customers of each operator.

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