ABSTRACT

This study formulates quality differentiation model between UBER and regulated taxi in a context of Thailand taxi market. The goal is to be able to identify a gap between the regulations enforced by Department of Land Transport and current performance of both types of service, and sheds a light on strategies suggested to both providers and service regulator in identifying gaps of the missing qualities. The research also proposes a tool to solve fundamental issues of the unpopularity in Thai taxi service.

KEYWORDS: Service quality, application service providers, transportation

INTRODUCTION

A multifaceted relationship among players in service industry is trivial. Customers posit expectations for quality of service to be delivered, service providers juggle quality priorities to sustain profits and to comply with standards set by regulators, and role of regulators is to design quality standard to maximize benefits of social welfare. An understanding in a gap between customer expectation and service provider performance is crucial, but it is more important to solve fundamental conflict of welfare-and-profit maximizing goal between suppliers and regulators. In regular cases, the regulator set the lowest price to ensure non-negative profit for the service provider, price constrains profit generation and forces provider to lower their level of quality which will impact all aspects of the services. Yet, this study argues that price is not the only determinant enforced by the regulator, but other written rules and regulations may improve the service quality if regulators understand the needs of customers. Many economics and operations literature suggested analytical models that optimize goal of all three parties, yet limited study has looked into practicalities and cases in validating such settings, especially in a high competitive market such as ground transportation industry.

Transportation is one of the most significant infrastructures in accommodating commuters and passengers in all metropolitan areas. While there are many types of public transportation modes in Bangkok, such as Bangkok Mass Transit System (BTS), Metropolitan Rapid Transit (MRT), Suvarnabhumi Airport Rail Link (SARL), an increase in demand of competitive private taxi market is duplicated in the three past decade (ThaiPBS, 2015), namely regulated taxis, Tuk-tuk (rickshaw), vanpool, and motorcycle taxis. An understanding of how well the services are being provided is crucial not only to customer’s evaluation on the services, but also important to service providers to the differentiation in the dimension of qualities being provided. Unsatisfied or poor service occurred because service provider does not realize what customers are actually seeking, or they might be operating under regulation constraints set by regulators. For example, regulated taxis in metro Bangkok area may appear as one of the worst mode of transportation services provided according to major complaints on taxi refuses to pick up passengers, or unfair
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Quality differentiation model for regulated and non-regulated taxi services in Thailand

charges (Sakawee, 2013). Although drivers and passengers are regulated by ground transportation act of taxi control (article 92-99)\(^1\), commuters commonly experienced dangerous driving behaviors of drivers, poor maintained car conditions, and safety of rides.

While other types of private taxis played roles in Transportation service in Bangkok metropolitan area, this study concentrates on a competition between private taxis and mobile application based, UBER, EasyTaxi, or GrabTaxi. For UBER, the company entered Thailand's taxi market in early 2014. As of November, 2014, services provided by UBER was claimed illegal according to Ministry of Transport due to unlicensed process of cars, driver registrations, and a claim that mobile credit card transaction discriminates against people who have no access to credit cards. However, the company continues running the business illegally by ignoring the compliances to registration fees for cars and drivers, nor standard fares set by Department of Land Transport. Customers who access the application can make reservation for a pick-up, locate route and destination, and complete transaction from mobile phones. As for security issues, the Thai government has enforced a Bht4000 (equivalent to $130) if UBER services are caught by Thai police on the roads. However, UBER services gained popularity among young professionals in reliability, convenience, and courtesy to the passengers. The circumstance suggests the identity of differentiated services in product offerings of two types of taxis (regulated and UBER), and questionable of the necessity in the alignment of the regulations. In Fig.1, a triangular relationship among customers, service providers, and regulators are showed to illustrate a non-existing connection of the compliance where UBER services are unregulated. As a consequence, UBER only communicates directly to customers in terms of providers the expected services, and as UBER does not comply with laws and regulations, regulators are not able to oversight welfare provided to the customers. The first goal of this study is to empirically identify a phenomenon of a decline in marginal evaluation of quality from customer’s point of view due to lack of regulation imposed to maintain the level of quality from the regulated taxis. The outcome from this portion should be able to give suggestion to regulator that their role is not only focusing on registration fees, road transportation usages, and pricing regulations, but also determining what quality levels to satisfy customer welfare. The second goal will shed a light on how regulator can acquire knowledge of customer preferences and desired quality to close the gap of this problem.

![Fig. 1 UBER services without regulations compliance](image)

**LITERATURE REVIEW**

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\(^1\) According to [http://www.trafficpolice.go.th](http://www.trafficpolice.go.th), retrieved on April 15, 2015
Relationship between monopoly and service quality was discussed widely in a context of a comparison between socially welfare relative to monopolistic optimum (Sheshinski, 1976; Spence, 1976; Mussa and Rosen, 1978; Besanko, et al, 1987; 1988). The seminal work suggested that equilibrium quality may be higher or lower than socially optimum due to price elasticity of demand. Lewis and Sappington (1992) found that optimal regulatory policy depends critically on the regulator's ability to monitor the firm's activities. They presented a set of condition under the equilibrium welfare of both buyer and supplier that is higher when quality is verifiable. The study had proven that when quality is captured, the customers have all the bargaining power. However, quality can motivate the supplier by designing the optimal contract than when quality is unverifiable. According to Laffont and Tirole (1994), regulator can take part to set a regulation if verifiable quality to formally align the regulations with level of quality offered by the firm.

Another line of literature identified relationship between service quality and regulatory policies from multiple industries such as postal service (Cremer et al, 1997) and travel agents (Agarwal 1997; Butler 1980; Cooper 1997; Saveriades 2000; Smith and Krannich 1998; Garcia and Tugores, 2006). These studies focused on determining strategy by offering differentiation and design to accommodate heterogeneous demand and multiple cultural backgrounds. Moreover, many studies have identified approaches to resolve for an optimal strategy using analytical methods such as packaged price (Papatheodorou, 2002) and product differentiation (Eilat and Einav, 2004). Yet, there is no empirical evidence to bridge a relationship between the role of regulator and a design for service differentiated qualities.

Measurement of service quality is developed by Parasuraman et al. (1988), using five dimensions of tangibles, reliability, responsiveness, assurance, and empathy (SERVQUAL). The measure has been used widely in services to assess customer satisfaction (Parasuraman et al., 1988; Brensinger and Lambert, 1990; Cronin and Taylor, 1992; Babakus and Boller, 1992; Headley and Miller, 1993; Smith, 1995). Customer experience is found to be related to the firm’s image (Zins, 2001; Gilbert and Wong, 2002; Park, et al, 2004; 2006), preference in choosing the product or service (Ostrowki et al, 1993), emotional stereotypes (Zins, 2001), and attention to buy (Park et al, 2006). In transportation context, previous studies aimed identifying service quality for commuters and public transportation (Flem and Schiermeyer, 1997; Galetzka et al, 2008; Michel, 1999; Evans and Shaw, 2001). However, these studies focused on identifying in a translation demand side rather than viewpoint from improvement scheme from the viewpoint of both providers and regulators.

BACKGROUND THEORY AND RESEARCH PROPOSITIONS

The conflict between service provider and regulator is common. According to Sappington (2005) in a setting of monopoly provider for a single commodity, the service provider normally seeks to set a high price to generate maximum profit but the price will be set by regulator. Regulator sets the lowest price that ensures that welfare or benefits to the customers are maximized. For example, if service provider's cost (C) of producing x units of service with service quality level q, the price that customers will pay is P(x,q). If an output unit of x is holding as constant, the provider will expand quality (q) to the point where quality is offset by the extra cost if increasing another unit of quality, or xP(x,q) = C(x,q) Simultaneously, in order to maximize welfare to all customers, quality would be increased to the point where the incremental surplus (to customers) is offset by the extra cost of increasing marginal quality (shows in integral of the equation), or
\[ \int xP(x,q) \, dx = C(x,q) \]  

(1)

It is apparent that the service provider will supply more than the welfare-maximizing level of quality if the marginal customer values additional quality more than the average customer's evaluation, hence:

\[ xP(x,q) > \frac{1}{x} \int xP(x,q) \, dx \]  

(2)

However, when regulator imposes price regulation, provider reserves limited amount of unit \( x \), hence, there will be a decline in customer's evaluation on quality. The inequality will be reversed, or

\[ xP(x,q) < \frac{1}{x} \int xP(x,q) \, dx \]  

(3)

As a result, customer's marginal evaluation on quality will also decline or \( P(x,q) < 0 \). It is very usual overtime that service provider consequently chooses to provide poor or low quality service. As all taxis in Thailand is obligated by one set of price and operating regulations by Department of Land Transportation that includes registration fees and fare charges, the regulated taxi operations is assumed to comply with the single regulator model. The first step of this study is to empirically identify a phenomenon of a decrease in marginal evaluation of quality from customer's point of view due to lack of regulation imposed to maintain the level of quality. The goal of this step is to make suggestion to regulator that their role is not only focusing on price and safety regulations, but also determining what quality levels to satisfy both customer welfare.

According to a study of regulated riverboat of Bangkok (Tansitpong and Toworakajonkun, 2015), the study found that while customers seek for multiple quality aspects (tangible, reliability, responsiveness, assurance, and empathy), the regulator only focuses on tangible items and security system as a part of their safety standard but highly ignores other important attributes such as empathy of their staffs. As analytical models suggested a decline in level of services controlled by pricing schemes, the first research proposition is suggested that there should be a horizontally differentiation in the evaluation of the service quality. The first research question is set to identify if multiple aspects of quality have different impacts on overall service satisfaction of the five service dimensions being provided (SERVQUAL).

Research proposition 1: Multiple aspects of quality have different impacts on overall service satisfaction of the services being provided.

UBER offers two types of products which are UBER-X and UBER-Black in Bangkok, Thailand. UBER-Black offers more comfortable fleets (such as Mercedes E-Class, and Toyota Camry), trained staffs with uniforms, and provides bottle of water and snacks in the car. UBER-black charges a base fare of 50 Bht ($1.3), with extra charges of 2.5 Baht (0.8 cents) per minute and 14 Baht (4.5 cents) per kilometer. UBER-X, on the other hand, offer smaller fleets of older cars (Toyota Vios or Prius, or older and less comfortable such as vans), however, the services are slightly cheaper. UBER-black charges a base fare of 25 Bht ($0.8), with extra charges of 1 Baht (0.3 cents) per minute and 4.5 Baht (5 cents) per kilometer. Meanwhile, regulated taxi charges a base fare of 35 Baht ($1) with extra charges of 5 Baht (0.15 cents) for every 8 kilometers. According to Johnson and Myatt (2003), firms are symmetric and offer both high and low quality products, the offerings of low quality products will be increased with a convexly increasing the ratios between in quality comparison of its unit cost to quality. On the other hand, another line of literature suggested that firms should increase product offerings to increase differentiation between high and low quality products \( (qH/qL) \) (Bhargava and Choudhary, 2001; Iyer and Seetharaman, 2003; 2008). This study uses an
assumption that UBER provides differentiation in their services, while regulated taxi only offers one (low quality) of service in the competition.

Research proposition 2: Quality differentiation has an effect on different evaluations toward overall satisfaction, service quality of the providers with mobile applications should have higher impact on overall satisfaction.

Since number of taxis are limited during daytime rush hours, taxi drivers (e.g., taxi companies and private owners), commuters often speculated a decline in the quality of the services from regulated taxis. Also, due to standard fare scheme which is regulated by the government, service operators may choose to avoid traffic areas because the revenue limits their profit generation if the cars is not moving in distance. This scenario results in low quality for product (or service) offerings and customer evaluation on the services can be considered as suboptimal. According to Yayla-Kullu et al. (2009a, 2009b) and Yayla-Kullu and Swaminathan (2010), the studies suggested that as the quality ratio of the two products (qH/qL) increases, the social planner should supply only the low-quality product for all capacity levels where capacity is limited. The third research question is extended to test whether quality differentiation has increased between the two quality products provided by UBER, and whether the service quality has declined during the peak of traffic hours for both high and low quality products (UBER vs. regulated Taxi).

Research proposition 3: Capacity limitation plays important role in providing service qualities, service quality declines during the peak of traffic hours for both high and low quality products.

METHODOLOGY

A set of survey questions was designed to confirm the propositions. The questionnaire aims to reach UBER-Black, UBER-X, and taxi users. The survey contains three sections, the first section comprises nine questions that request general information such as gender, age, and occupation, the second section consists of frequency of service usages, frequent hours, type of mobile applications were used to access the services (UBER-X, UBERBlack, EasyTaxi, GrabTaxi or regular taxis), and average price the customer paid for the services. The third section contains 20 SERVQUAL items as an assessment of service quality and one overall satisfaction using a 7-point-Likert scale. SERVQUAL dimensions were adapted from Parasuraman, et al. (1994). The first research proposition will be tested using structural equation modelling (SEM) using IBM's AMOS. The goodness of fit indices will be evaluated, including the normed chi-square, the root mean square error of approximation (RMSEA), standardized root means square residual (SRMR), Tucker-Lewis index (TLI), and comparative fit index (CFI). Logistic regression will be used to test the second and third research proposition.

CONCLUSIONS AND RECOMMENDATIONS

As this study investigates tools to improve service quality of regulated transportation services in Thailand, the research propositions suggested that technology (such as mobile service apps) plays important role in a communication in a search for quality between customers and service providers. While customers seek for quality of service in multiple aspects (tangible, reliability, responsiveness, assurance, and empathy), the study proposed that different quality aspects may have different impact on the overall service performance. Base on previous investigation, if regulator only focused on tangible items and in-placed secured system as a part of their safety standard, they highly ignored other important attributes such as empathy of their staffs, and without intervention, service of the ‘offline taxis’ are less likely to deliver good quality. The study suggests that the regulator can take part to set regulations that align with customer expectations.
Our propositions also suggest that the regulator should acknowledge customer preferences and desired quality, to be able to set up an appropriate quality level imposed to the provider in determining what quality levels to satisfy, and maximize and accommodate the needs of both customers as well as the providers.

Full details of the background theory, hypotheses, methodology, results, and discussions can be found in the full length paper (Tansitpong et al., 2015).

REFERENCES

References available upon request.