

Motorcycle Taxi Service in Vietnam – Its Socioeconomic Impacts and Policy Considerations

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Abstract: Motorcycle taxis have been emerging in developing countries, especially developing Asian countries, as an informal public transport service. It could provide a fast, flexible, and cheap transport service to the general public. At the same time, it may also be main sources of income for the urban poor. Unfortunately, wider socioeconomic and environmental impacts of the service have never been understood fully. Regulations on the service have been lacking as well. This study aims to understand the main characteristics of the service, explore its broader impacts, and identify its possible roles in the future urban transport system. Questionnaire surveys were conducted in Hochiminh City, Vietnam in 2012 that covered 400 users, 100 operators or drivers, and 20 stakeholders. Based on the results, the study suggests necessary changes in the service business model and regulatory measures to improve the image and the quality of the service.

Keywords: Urban Transport, Motorcycle Taxi Service, Socioeconomic Impacts, Regulations, Developing Countries

1. BACKGROUND AND MOTIVATION

In Asian cities (such as Hochiminh City, Hanoi, Jakarta, Bandung, Bangkok, and Davao), motorcycle taxis are found everywhere, including bus stops, train stations, shopping plazas, and main entrances to residential neighborhoods (Cervero, 2000). This mode is called “xe om” in Vietnamese, “ojek” in Indonesian or “habal-habal” in Filipino. The motorcycle taxi usually carries one passenger, but sometimes two or more who ride as the pillion behind the motorcycle driver. In the case of the Philippines, a hybrid of the motorcycle taxi, the “skylab”, can carry up to 6 passengers.

For the past decades, these cities have seen the rapid growth of motorcycle ownership and use (Tuan, 2012), thus it has made these cities natural breeding grounds for motorcycle taxi services. The failure to provide adequate public transport services in these cities is believed to be one of the main causes for such phenomenon (Guillen and Ishida, 2004). In Bangkok, for instance, since bus and train lines are only available along the main streets or highways, many high density communities that are located far away from the main street and along local streets or “sois” have poor accessibility to these systems. Fortunately, the current operation of motorcycle taxis along the narrow dead-end side-streets branching off the major streets assist to connect the passengers from these local communities to the buses and railway stations, thereby improving the accessibility of the community (Oshima et al., 2007). The motorcycle taxi has some advantages over other modes. These include its higher speed and

ability to beat the perpetual traffic jams in many Asian cities. Particularly, it provides fast, flexible and cheap mobility service as compared to public bus and car taxi (Iles, 2005).

Furthermore, the operation of motorcycle taxis creates jobs and generates incomes for a portion of the urban population (Cervero, 2000). Every year, thousands of immigrants are moving to urban centers. Many of them are uneducated and unskilled, and cannot get a job in a highly competitive formal labor market. To get a job and earn an income, many of them turn to the informal job markets, including working as a motorcycle taxi driver. However, there is a lack of understanding on the broader socioeconomic and environmental impacts of the motorcycle taxi service in developing Asian cities.

Despite its increased popularity, motorcycle taxis have still been operating without any regulation in many cities and countries (Cervero, 2000). As a result, serious problems are arising. These include poor safety conditions for passengers, variable fares and cheating, as well as low security for the driver. Of which, the poor safety condition is the most serious. It is hardly surprising that motorcycle taxis have a notoriously dangerous reputation and accidents occur frequently particularly in wet and slippery road conditions. Since drivers usually try to run at high speed to save time, any kind accident could easily be very serious. The fare is usually set through an open negotiation between the driver and the passenger, and it is therefore highly dependent on the driver's attitude, time and place. In other words, fare is not negotiated based on distance, and the complicated negotiation process may actually prevent people, especially foreign visitors, from using the service. In 2005, Thailand became the first country in the world that regulated motorcycle taxi services. The Thai regulations covered the requirements for operational safety (such as, installing a handle and providing helmet for the passenger), annual registration tax, driving license, and penalty for traffic law violation (Oshima et al., 2007).

Till now, most Asian countries have not regulated the service yet. Several countries, including Vietnam and Indonesia, have already discussed the issues and the need for regulating the service since years ago as the service become increasingly important. In Vietnam, starting 2010 the discussion became serious among the authorities, the drivers or operators and civil society representatives. Again, a question that remains unanswered is what are the impacts of the service, what are the problems or issues facing it, and whether and how to regulate the service. This study aims to create an in-depth understanding on the characteristics of motorcycle taxi service, its wider socioeconomic impacts, and identify its possible roles in the future urban transport system in developing cities.

This paper is structured into five parts. The first part introduced the background and research motivation. The second part presents the methodology and the survey in Hochiminh City. The third part shows the main findings of the analysis on different aspects of the motorcycle taxi services, including the usage, operation and service perceptions. Based on the results, the fourth part discusses the possible roles of the motorcycle taxi in the future transport system and how to regulate the services. The last part concludes with policy recommendations.

2. METHODOLOGY AND SURVEY

2.1 Methodology

To pursue the research objectives, this research followed a framework as shown in Figure 1. Users, operators, and stakeholders were structurally interviewed to capture the main characteristics of the service usage and operation, and to understand people's perceptions and

opinions on the impacts, policy issues and possible future roles of the service. Based on these understanding, concrete policies were suggested to improve motorcycle taxi service.

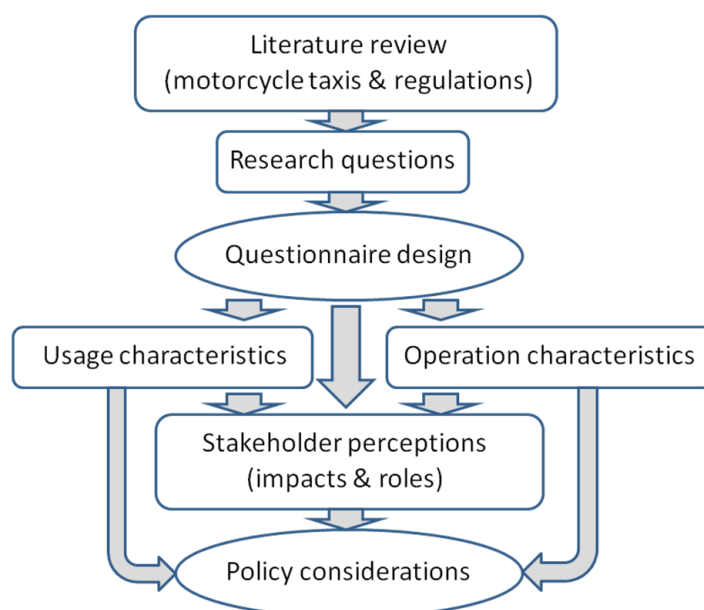


Figure 1. Study framework

Questionnaires were specifically designed to each group. User questionnaires aimed to ask the users information on socioeconomic profile, use frequency, average travel distance, trip purpose, fares, and factors influencing motorcycle taxi choice. Operator questionnaires were to get information from the operators or drivers on ownership forms, operational characteristics, and actual operational efficiency of the services they are providing. The three questionnaires had a common part, which asked the respondents (including users, operators and stakeholders) about their perceptions of the impacts, issues and possible roles of the motorcycle taxis.

2.2 Survey in Hochiminh City

Characteristics of the City

HCMC is located in the Southern Region of Vietnam. It is considered to be the biggest as well as the most modern city in the country. The city is comprised of 25 districts with a total area of 2,095 km² and a total population of 7.4 million (HCMC Statistical Yearbook, 2011). One of the most distinctive features of HCMC is that its population is generally composed of immigrants from other areas of Vietnam, thus, serving as a melting pot of culture and activities. In addition, HCMC's road system is complicated with a lot of small alleys and dead-end streets. The restrictive widths allow two-wheelers, including motorcycle taxis, to proliferate. Currently, there are about 680 motorcycles per 1,000 population and activities in the city heavily rely on motorcycles (HCMC Department of Transport, 2011).

Characteristics of the Samples

The surveys were conducted in HCMC in January 2012. The respondents included approximately 400 users, 100 drivers or operators, and 20 stakeholders. Characteristics of the samples are summarized in Table 1.

Table 1. Sample characteristics

Characteristics	User	Operator/Driver	Stakeholder
Number of respondents	400	100	20
Gender distribution (%)			
Male	34	96	
Female	66	4	
Age distribution (%)			
19 or under	9	0	
20-29	40	4	
30-39	24	17	
40-49	15	49	
50-59	7	24	
60 or older	5	3	
Occupation distribution (%)			
Professional/Executive	1.8		
Businessman/Self-employed	13		
Worker/Employee	41.3		
Student	26.3		
Unemployed (retired, housewife)	17.8		
Monthly income distribution (%)			
Below 2 (million VND)	33.8	4	
2-4 (million VND)	28.3	73.7	
4-6 (million VND)	27.6	21.2	
Above 6 (million VND)	10.3	1	

Note: 1 USD = 20,850 VND (exchange rate in 2012)

3. FINDINGS

3.1 Usage Characteristics

This part of the analysis is aimed at understanding who is main users of motorcycle taxis, for what purposes, how often and how far they travel by motorcycle taxi, and how much they pay for the service. This understanding allows us to evaluate its market niche and potential roles.

As shown in Table 1, workers and students who belonged to the middle to low income levels are the main users. Their ages range between 20 and 50 years old. Observing their main trips over a week (Figure 2) showed that they use motorcycle taxis mainly for shopping (31%), followed by work trips (18%). Most of them do not use motorcycle taxi regularly. For example, only 12% of the respondents use it daily, 4% use twice a week, 13% use once the mode once a week, and the majority use it once a month or less (see Figure 3). This is because most of them have access to vehicles owned by their families, especially private motorcycles, as the survey revealed that nearly 100% the households that the respondents belong to owned at least one motorcycle and more than 60% had two or more motorcycles.

The observation also revealed that motorcycle taxi served about 5-11% of the total trips, quite comparable to the share of bus as a main public mode in the city (9-13%), as shown in Figure 4. Demand for motorcycle taxis may increase significantly on weekends due to increases in the number of shopping and leisure/social trips undertaken during weekends. Of course, private motorcycle is still a dominant mode (sharing 65-70%), but motorcycle taxi appears to be a true alternative to the former mode, in addition to buses (9-13%) and bicycles

(7-9%).

Similar to private motorcycle, motorcycle taxis are mainly used for medium distances (5-10 km) while buses are mainly used for long distances (above 10 km). As shown in Table 2, average trip distance by motorcycle taxi, private motorcycle and buses were 6.3 km, 8.0 km, and 13.0 km, respectively. It cost about 20,000 VND per motorcycle taxi trip (equivalent to 1 US\$/trip), or averagely more than 4,000 VND per km traveled (equivalent to 20 cent/km). In term of average cost per km, motorcycle taxi was 4.4 and 7.5 times more expensive than private motorcycle and bus, respectively, however it was just 0.4 times of car taxi. It is noted that trip cost for motorcycle taxi, car taxi, multi-cab and bus included the ticket cost or fare only, but it included fuel cost and parking charge (if any) for private motorcycle and bicycle mode.

In conclusion, motorcycle taxis are mainly used by workers and students, who are aged between 20-50 years old and belong to the middle to low income groups. This mode often serves medium distance trips for shopping, going to work/study, leisure or social visits. Though its modal share seems to be comparable to bus and bicycle, yet it is not used so frequently perhaps due to its considerably higher cost. The next section explains the reason for the high cost.

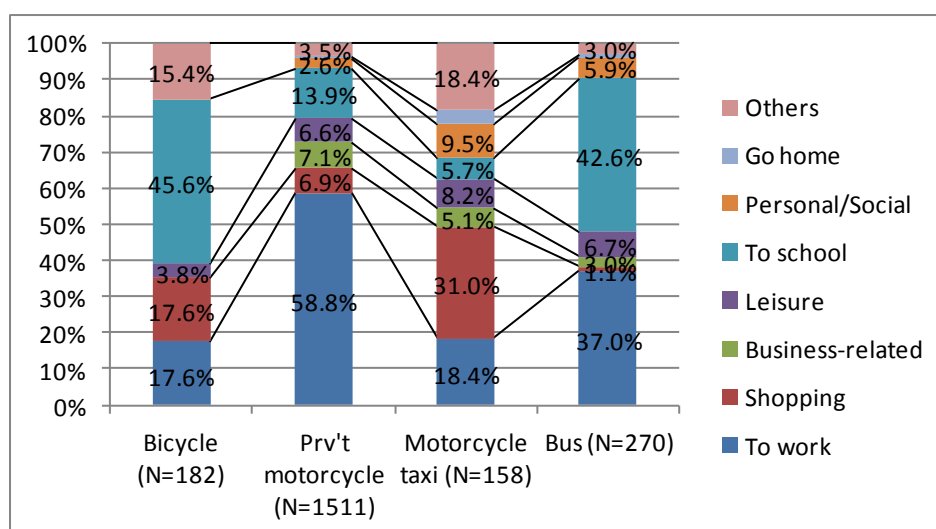


Figure 2. Trip purpose by mode for the main trips per week

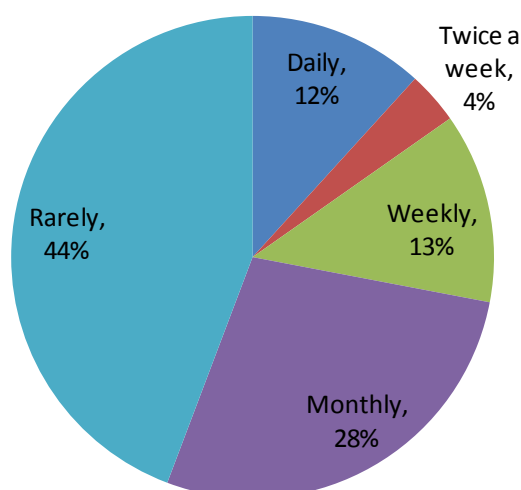


Figure 3. Frequency of motorcycle taxi use

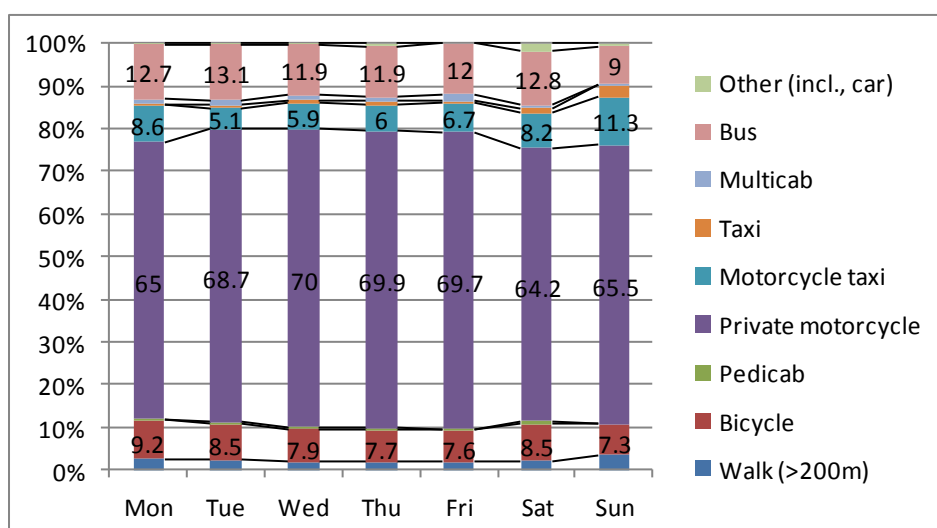


Figure 4. Mode choices for the main trips per week

Table 2. Cross-mode comparison of trip distance, trip cost and cost per km traveled

Mode		Trip distance (Km)	Trip cost (VND)	Cost per km traveled (VND/km)
Bicycle (N=182)	Mean	3.8	66	16
	Std. Deviation	3.04	243	63
Bus (N=270)	Mean	13.0	5,535	546
	Std. Deviation	8.63	6,055	559
Multi-cab (N=24)	Mean	4.9	3,500	761
	Std. Deviation	1.26	511	216
Prv't motorcycle (N=1511)	Mean	8.0	6,665	925
	Std. Deviation	7.52	5,522	704
Motorcycle taxi (N=158)	Mean	6.3	20,051	4,113
	Std. Deviation	5.66	13,309	2,506
Car taxi (N=19)	Mean	3.7	34,579	9,456
	Std. Deviation	1.73	14,143	721

Note: 1 USD = 20,850 VND (exchange rate in 2012); trip cost for motorcycle taxi, car taxi, multi-cab and bus included the ticket cost or fare only, but included fuel cost and parking charge for private motorcycle and bicycle

3.2 Operational Characteristics

The aims of this part were to examine main characteristics of the service operation and management, including the operator, operating routes, and operational efficiency. These are helpful to understand wider impacts and main issues of the service in developing countries.

It showed that almost 100% of the motorcycle taxis were run by individuals, who owned and operated just one motorcycle taxi at all times. Of which, 95% were males and aged between 40 and 60 years old (Table 1). Interestingly, 95% told that driving a motorcycle taxi is their main job; only 5% ran the service as a part-time job. That means the service provides employments and incomes for unskilled and low-income population. More than 90% of the drivers who just graduated from high school or who had lower levels of education (Figure 5).

On its operating route, while most drivers chose to wait for and pick up passengers at a specific or fixed place, they dropped off passengers at variable or floating places. Figure 6 showed that the fixed pickup places were mainly shopping mall and department store (30%), railway station and bus terminal (16%), and residential area (15%). As Figure 7 shows, nearly 80% of the passengers were identified by the interviewed drivers to be non-routine, only 22% used the service once or twice a week (Figure 7). This explains for the floating nature of the drop-off places.

Table 3 summarized the driver's working conditions, average costs and revenue. Driver's productivity seemed to be low. An average driver worked almost every day (including weekends), 12 hours a day, and making about 7-8 round trips. However, half of the time was spent on waiting for passengers, or so called dwell time. This is due to the fact that there were about more than 15 drivers operating on the same route or in the same area without any coordination.

On average, a driver could earn a net income of about 90,000-100,000 VND per day (equivalent to 4.5-5.0 US\$/day) after subtracting the total revenue by the total cost and fees. So a driver may earn around 2.7 to 3.0 million VND per month (equivalent to 135-150 US\$/month). The majority of the total cost was taken up by fuel (85%) and the rest were other costs excluding vehicle depreciation cost. It is worth noting that the net income from the service seemed to be relatively significant to the average per capita income, which is currently about 5 million VND/month or 250 US\$/month (HCMC Statistical Yearbook, 2012). However, there might be a possibility to improve the net income by increasing the driver productivity. Ways to do so are discussed in Chapter 4.

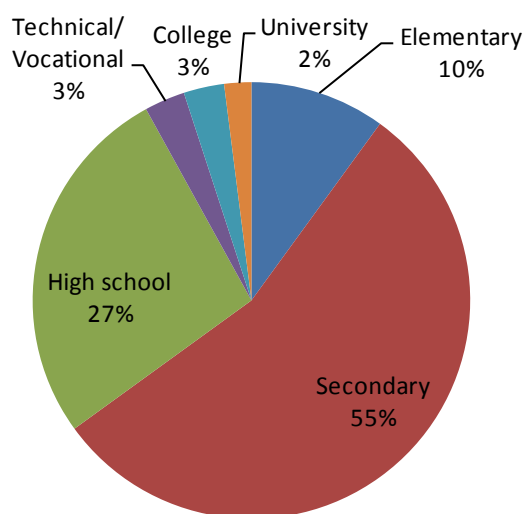


Figure 5. Education levels of motorcycle taxi drivers

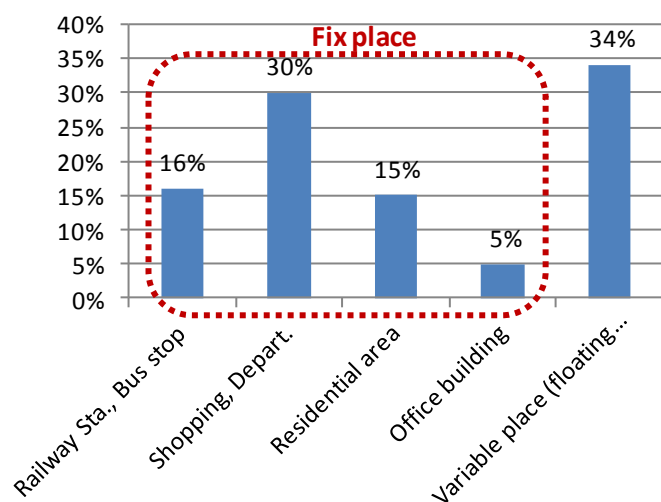


Figure 6. Passenger pick-up place characteristics

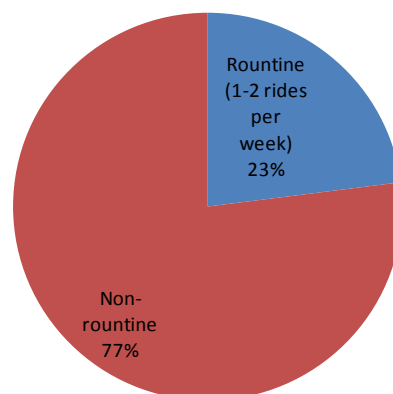


Figure 7. Passenger types

Table 3. Driver's working conditions, average operating costs and revenue

Item	Weekday	Weekend
I-Driver working conditions		
Total working hours per day (h/day)	11.7	11.9
Total wait & dwell time per day (h/day)	5.8	5.8
Total round trips per day (trip/day)	6.8	7.5
Total time per round trip (min./trip)	103	95
Average time per round trip, excluding dwell time (min./trip)	52	49
Average number of other motorcycle taxis operating on the same route or picking up passengers at the same place (unit)	16.0	16.2
II-Average operating costs and revenue (per driver)		
Total revenue per day (VND/day)	132,450	147,097
Total operating costs per day (VND/day)	41,197	44,847

Gasoline cost	86.6%	85.4%
Oil or lubricant cost	3.5%	3.4%
Terminal fee	2.4%	3.7%
Dispatcher fee	4.3%	4.3%
Association fee	3.1%	3.1%
Net income (i.e., revenue – operating costs) per trip (VND/trip)	13,420	13,633
Net income per day (VND/day)	91,253	102,250
Net income per month (VND/month)	2,737,600 ÷ 3,067,500	

Note: 1 USD = 20,850 VND (exchange rate in 2012)

3.3 Service Perceptions

As the motorcycle taxi service is relatively new to the transport sector, it is necessary to understand how local people perceive its main characteristics and possibly contribute to the improved accessibility and mobility of such communities. Such understanding may help identify possible future roles of motorcycle taxis and to determine the best possible policy solution (e.g. mainstream regulatory policies or not) in relation to the operation of the service.

Perceptions to Motorcycle Taxi's Features

All the users (N=400), operators or drivers (N=100), and stakeholders (N=20) were asked to state their opinions on some features or main characteristics of motorcycle taxis. The result showed that all the respondents strongly perceived that motorcycle taxis provide door-to-door service, are easily accessible, fast and have high speeds, and provide flexible transport services (Figure 8). In addition, motorcycle taxis were perceived to contribute to pollution, were not environmentally friendly, and cannot carry bulky and/or heavy goods. Interestingly, all of them would not think motorcycle taxis are informal or not regulated by the local government. In fact, almost all motorcycles used for transporting passengers and goods were licensed as private motorcycles, and therefore under regulation. However, the service operation itself is not regulated.

But they posed significantly different perceptions to the following service characteristics. Firstly, while the operators opined that travel time is predictable or reliable, the users and stakeholders do not think so. Secondly, it is interesting that while both operators and stakeholders thought the service was cheap, the users did not think so. Trip cost comparison already showed that cost per km traveled of motorcycle taxi was about half of that of car taxi (see Table 2). In fact, the traffic laws regulate that a motorcycle taxi can only carry one passenger at maximum. If two or more passengers share a car taxi, then it becomes cheaper than taking motorcycle taxis. So market niche for motorcycle taxis might be passengers who are not high income, sole rider or need to beat the congestion. Thirdly, though all opined that fares are always variable and dependent on time, place, and driver, the users and stakeholders perceived this matter more seriously than the operators. If this situation is not improved, people might become more reluctant to use the service in the future. Fourthly, and more importantly, is the safety issue. While both the users and stakeholders did not agree that the service is safe, the operators still thought they were providing the service safely. In HCMC and Hanoi, motorcycles including motorcycle taxis have recently contributed to nearly 60% of the total road traffic accidents (Hung and Truong, 2010). When asked, 47% of the drivers reported that they were in fact accused of violating traffic laws, such as red running, speeding, wrong lane encroachment, or carrying two or more adult passenger. Of

which, 80% violated the laws twice or more. Such bad driving behavior of operators explains the fears of the users and stakeholders. Unfortunately, the operators themselves seem to not be aware of their dangerous behaviors.

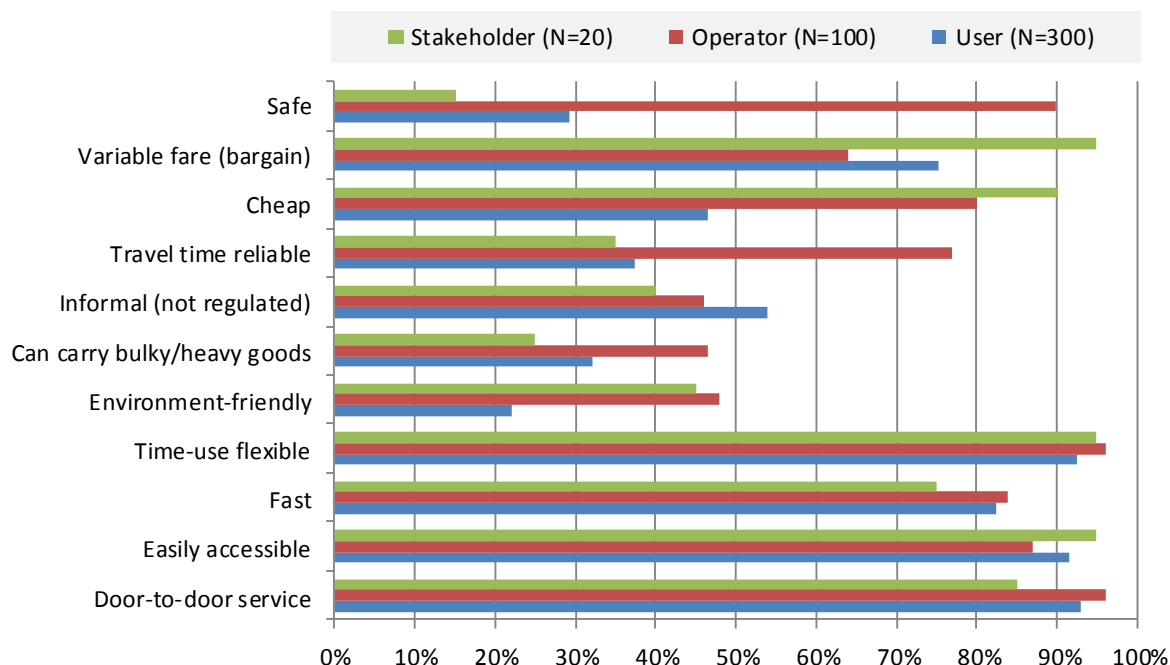


Figure 8. “Strongly agree & agree” response rates to motorcycle taxi’s features

Perceptions to Possible Contributions or Impacts from Motorcycle Taxis

Figure 9 presents the results of the survey on the motorcycle taxi’s positive contribution to society. All agreed that motorcycle taxis could be substantial income sources for unskilled and low income people and provide more travel options to the public, in general, and urban poor, in particular. They believe it could support the promotion or development of the overall public transport system as it would serve as a feeder service to main public modes, such as bus rapid and/or rail-based transit systems. The role of motorcycle taxis in promoting low-carbon transport technologies, such as electric motorcycle or tricycle taxi, seemed to be unsure as the total rate of strongly agree and agree responses was just around 50%. Interestingly, while the stakeholders and operators were quite sure that motorcycle taxis could provide mobility to people, goods and services during and after disasters (such as typhoons, cyclones or earthquakes), the users were not so sure about this.

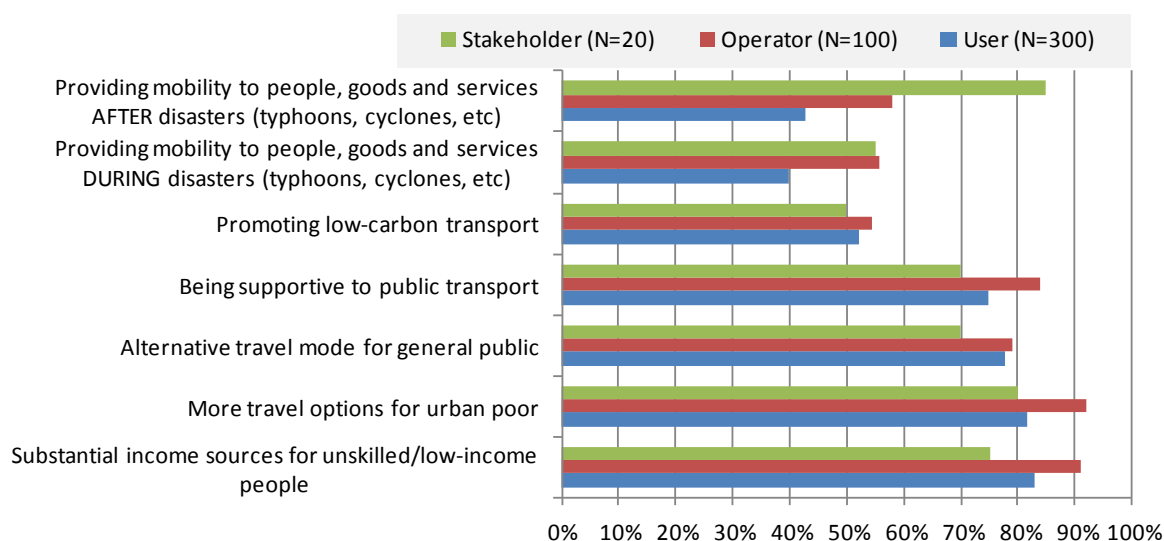


Figure 9. “Strongly agree & agree” response rates to motorcycle taxi’s contributions

4. DISCUSSIONS

This part discusses the future role of the motorcycle taxi and suggests regulations necessary for effectively managing and improving the service.

4.1 Defining Future Role for Motorcycle Taxis

In order to discuss the role of motorcycle taxis in the future, it is important to look at both the current situation and the likely future picture of urban transport system in developing cities, particularly HCMC. Asian developing cities provide a common context that could provide a strong rationale on the rapid increase of motorcycle taxis. First, bus network is often used as a main public transport mode, but quality and quantity of the service are relatively poor. In many areas, such as suburban areas, accessibility to the bus service remains low. Second, the inadequate road infrastructure and the poor land-use planning and control have brought about many areas accessible only by two-wheelers (Hung, 2006; Tangphaisankun et al., 2010; Van et al., 2013). The typical patterns of mixed land use and high density development in developing cities often generate a huge number of short-distance (1-2 km) trips (Barter, 2000). Third, the increasing road congestion in cities like Jakarta, Bangkok, Hanoi, and HCMC also make motorcycle taxis competitive to bus service and car taxis. Given these current conditions, the motorcycle taxi has gained its own market niche.

Regarding the future of urban transport, there are important questions facing Asian cities. These are how the urban transport network will look like in the future, what roles could be played well by motorcycles (including motorcycle taxis), and what policy measures will be required. The past trends in transport infrastructure and services suggest that the road infrastructure is likely to be inadequate and the public transport services might still be limited. Despite increased investment in new transit systems (like Mass Rapid Transit, Light Rapid Transit and Bus Rapid Transit), the coverage of public transport may still be limited. So the concept of hierarchical urban transport system will become strategically important. The future mass rapid transit lines should be connected with feeder services to improve accessibility of the entire transport system. Buses can be the first choice for the feeder services, but its coverage would be insufficient due to the lack of secondary roads in the future. Therefore, it

is necessary to promote other modes to fill up this gap. Perhaps, motorcycle taxis will continue to be a good choice for that purpose. By collecting passengers to and distributing them from railway stations and bus terminals/stops, it will be possible to utilize the space efficiency of and improve the safety for motorcycle taxis (Tuan, 2012).

The discussion above may imply that motorcycle taxis will continue growing and may play a significant role in supporting the public transport system. Of course, the service will also significantly contribute to the income of the urban poor in developing countries.

4.2 Innovating Motorcycle Taxi Business

Any further development of the service might be limited by its inherent weaknesses. These include the complicated fare negotiation, in which the customers are quite often cheated, and the low working efficiency of the drivers. It is necessary to innovate the way of running the service. The experience in Thailand and Indonesia suggests that motorcycle taxis should be equipped with meters to solve the complicated fare negotiation. In Thailand, this idea was first introduced in 2008 by Paul Giles, the President of World Moto (David Zax, 2011). Thanks to electric and mechanical technologies, it is possible to produce meters that are highly durable to environmental hazards (road dust, rain, and splashing water) and an average meter costs around 150 USD (see Figure 10). Both the passengers and the drivers or operators found the meter motorcycle taxi an extremely attractive option. It can help eliminate any misunderstandings about negotiated fare prices, which can be a serious concern when the customer's judgment is impaired due to alcohol or other intoxicants. This technical innovation has just been adopted into Vietnam and other developing countries.



Figure 10. A meter for motorcycle taxi (Source: David Zax, 2011)

It is found that working efficiency of the drivers is currently very low. The drivers usually spend more than half of their working time on waiting for customers. To reduce their idle time, it is necessary to shift the business model from the individual operation (current model) to company or association-based operation. Such changes may also help improve the service in terms of image and safety since the customers will find it more reliable. Go-Jek is the first motorcycle taxi company founded in Jakarta, Indonesia with about 200 motorcycles in service. This company is demonstrating an innovative model of running the service in a coordinated manner. At first, a user calls the switchboard to request for transporting a person, package, or shopping collection. A fare is then agreed upon depending on the distance involved, and a driver is sent out from the nearest available location. The user will then receive a text confirming their order, and the driver is assisted by the Go-Jek's call center en-route to avoid any unexpected difficulties. The driver will then arrive to pick up the

delivery or person, or drop off the shopping, and is paid upon completion of the task. All of the Go-Jek drivers travel with an extra helmet in an effort to ensure the safety of passengers on taxi jobs, and they are all recruited through a referral system to ensure their reliability. Currently focused in the South and Central areas of Jakarta, Go-Jek plans to expand its service coverage throughout the city. One of the remarkable impacts of the new service model is that it increased the effective working time of the driver by 25% and his income by 50%. The idea of motorcycle taxis in Jakarta may be nothing new, but the pricing transparency, reliability and safety offered by Go-Jek could give them an edge over unlicensed competitors (Source: <http://www.springwise.com/transportation/gojek/>). Further, the information provision to customers via the internet and/or telephones can also increase the attractiveness of the service.

In Hochiminh City, just a few motorcycle taxi companies have been recently established with an average fleet of more than ten motorcycles. The number of passenger has rapidly increased as the innovative service is cheaper, more convenient and reliable than the individually operated service. However, the existence of the new companies is being threatened by the individual drivers or operators. Therefore, at the same time it is important to introduce associations or groups to provide motorcycle taxi services, and encourage the individual drivers, who operate in the same area, to join. This would create fairer competition among the new companies and associations, thereby improving service quality and operational efficiency. Here, the local government or police may need to be involved in the establishment of such associations and it is certain that they will take part in the regulation of the service.



(a) Sending a passenger to office



(b) Sending off/ picking up a pupil

Figure 11. Innovative motorcycle taxi services in HCMC (Source: <http://dantri.com.vn>)

4.3 Regulating Motorcycle Taxi Services

As mentioned above, regulating the service becomes imperative as it will help better improve service quality and integrate the mode with the public transport system. Regulations shall cover issues related to fare setting, registration and licensing, passenger safety, and emissions.

The lesson of Thailand on motorcycle taxi regulation can be a useful reference while drafting the regulations for Vietnam and other developing countries. The Thai regulation of motorcycle taxi service is written under the Act of Legislation of Vehicle (Vol. 13) Year 2004 (Control of Motorcycle Taxi Service). This regulation has been enforced from May 2005. It includes the issues of formalizing the service, providing safety service, and controlling the

driver behavior. The formalization regulates the setting of fare rate. For example, the first two kilometers should not charge more than 25 Baht and charge per additional kilometer should not exceed 5 Baht. If the distance is longer than 5 km, the fare rate could be determined on the negotiation between the driver and the passenger. Licensed plate for motorcycle taxi is regulated to be in yellow color and with black font. All the drivers must wear specified jackets. Safety regulations require the drivers or operators compulsorily install safety equipments (e.g., handle and helmet for the passenger). The driver or operator has to register the service and pay an annual tax (about 100 Baht per year), and pay a fee for a driving license (costing about 150 Baht per 3 years). If the driver is found to violate the traffic rule or provide an inappropriate service, the driving license will be banned or cancelled, and a penalty is applied as well (DLT, 2006).

In the case of Hochiminh City, based on the usage and operational characteristics of the service it is suggested that the first two kilometers should not charge more than 15,000 VND (equivalent to 75 cents) and charge per additional kilometer should not exceed 1,800 VND (or 9 cents). This fare scheme could not only maintain the same net income per trip for the driver (as shown in Table 3) but also lower the fare for the passenger. The lower fare may bring higher demand, thereby increasing total income per day or per month for the driver.

Further, it is recommended that the regulation on motorcycle taxi in Vietnam should include emission standards for motorcycles including motorcycle taxis. The regulation should also require that every driver or operator has to join a motorcycle taxi association or company that is registered to the local community or police department. This is to improve the reliability and safety for the passengers as they were very much concerned about these issues, as depicted in Figure 8.

4.4 Introducing Safety Education for Motorcycle Taxi Drivers and Operators

From the viewpoint of the passengers and stakeholders motorcycle taxis are the most vulnerable to road traffic accidents (Figure 8). How to improve the safety of the service is the most important question. Since one of the main causes to the accidents is the risky behaviors of the driver, it is highly suggested to introduce a safe driving education program for the drivers. A good case could be found in Hanoi, Vietnam. In 2005, a safety program namely "Safe motorcycle taxi service in Tay Ho District of Hanoi" was held under the support of Asia Injury and Hanoi's Red-Cross. About 50 motorcycle taxi drivers were taught with safe driving theories and given the practical training. The program also provided the drivers with the basics of rescuing the passengers once an accident happens (Vnexpress, 2005). Unfortunately, such a program is not implemented continuously. This study strongly asks the local government, policemen, and motorcycle taxi companies and associations work together to continue introducing such a program.

5. CONCLUSIONS

The main characteristics of motorcycle taxi service in HCMC are summarized as follows:

- The main users are workers and students, whose incomes range between the low- and middle-income levels. They use motorcycle taxis mainly for going shopping, to work or study, and for the purpose of social visit. Trips usually fall between the short and medium distances (6 km on average). More than 70% of the users use the service just once a month or less frequently.
- Most motorcycle taxis are operated by individuals, who own just one motorcycle to

provide the service. As over 90% of the drivers are unskilled and low-income, driving a motorcycle taxi is their main job and source of income. Because most of them stand at fixed places and passively wait for passengers, their working productivity is very low. The idle time may occupy more than 50% of their total working time a day.

- Most of the surveyed users and the stakeholders perceive that motorcycle taxis can provide a door-to-door, easily accessible, fast, and flexible transport services. However, they think that the service is relatively expensive, unreliable, and unsafe. In fact, nearly half of the surveyed drivers reported to perform risky driving behavior and violated the traffic laws. More importantly, they agree that motorcycle taxis can serve as a feeder service to the main public transport systems now and in the future.

The study may suggest that given the current conditions of the urban transport in developing cities, motorcycle taxis has gained its own market niche, and will continue to grow in the future. They would assist the main public transport system significantly if the service is innovated and regulated properly. Therefore, it is highly recommended that motorcycle taxis shall be equipped with meters to solve the problem of complicated fare negotiation and cheating passengers. Motorcycle taxi companies and/or associations should be introduced to improve the service quality, and increase operational productivity and incomes for the drivers. Regulations should be framed up and implemented as soon as possible to better manage the fleets, improving service quality and strategically integrating the mode with the main public transport systems. Regulations shall focus on issues related to fare setting, registration and licensing, safety, and emissions. In addition, safety education programs should be regularly provided by the local communities, policemen, and motorcycle taxi companies and associations. A further study should focus on the formulation of specific regulations. The future study may include the mechanisms and necessary supports for the establishment of motorcycle taxi companies and associations.

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