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Vehicle Ownership Comparison between Ho Chi Minh city and Bangkok

Tran Vu TU [a*], Thakonlaphat JENJIWATTANAKUL[b], Chu Cong MINH [c]

[a] *Ho Chi Minh City University of Technology and Education, Vietnam*
[a] *E-mail: tutv@hcmute.edu.vn*
[b] *Siam University, Thailand; E-mail: thakonlaphat.jen@siam.edu*
[c] *Ho Chi Minh city University of Technology, Vietnam; E-mail: ccminh@hcmut.edu.vn*

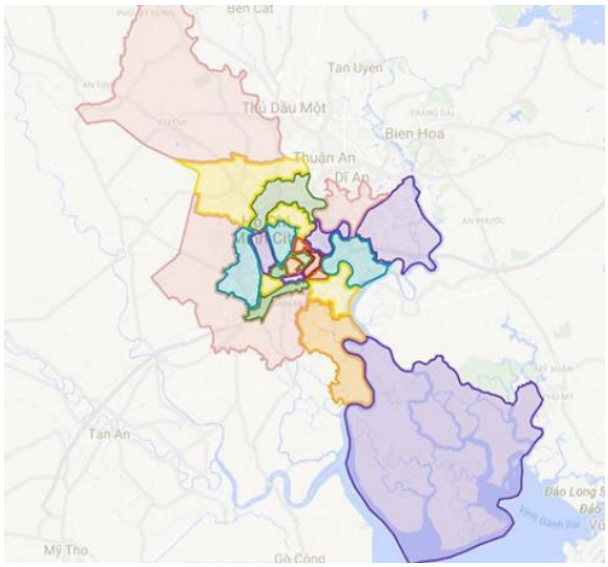
Abstract: This paper focuses on comparison of vehicle ownership between Ho Chi Minh city of Vietnam and Bangkok of Thailand. Based on data collected in 24 districts of Ho Chi Minh city and 50 districts of Bangkok, the research compares the ownerships of the two city under consideration of transport modes such as truck, car, taxi, cycle and motorcycle. By analyzing the relationship between motorcycle ownership rate and the number of persons in family, the research figures out that the two city have the same trends of motorcycle ownership proportion when the number of family member increases. As the result shows, the proportion of motorcycle ownership for the case of Bangkok decreases 16.7% when the average number of household persons increases by 1 person. Meanwhile, this figure is only 2.32%, much lower for the case of Ho Chi Minh city. The result is reasonable to explain the current dominance of motorcycle in Ho Chi Minh city as of 82.1% compared with 40.3% in Bangkok.

Keywords: Vehicle Ownership, Motorcycle, Public Transport, Comparison, TDM.

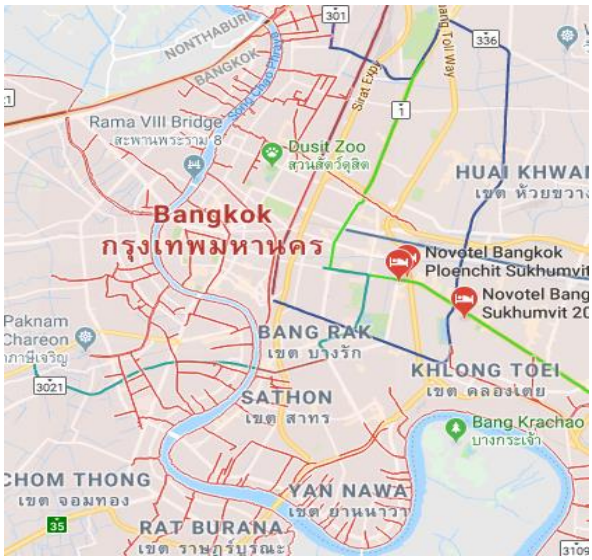
1. INTRODUCTION

Located in Southeast Asia, Vietnam and Thailand have many similarities in many areas in the terms of transport, ownership of vehicles or trends of transport infrastructure development. Being served by multiple transport systems, Bangkok has a variety of transport modes, from canal traffic till land traffic. The rail networks and national highway as well as by domestic flights connect Bangkok to the rest of the country. In Thailand, although there are many separate government agencies in charge of the individual systems, the Bangkok Metropolitan Administration (BMA) is responsible for overseeing the construction and maintenance of the road network and transport systems through its Public Works Department and Traffic and Transportation Department. An extensive bus network has been constructed in Bangkok, in which there are long-distance bus services to all provinces operate out of Bangkok. The city has plans to expand more bus rapid transit system. Car taxis that are either privately owned, or belonged to a company or cooperative, are ubiquitous and popular in Bangkok. The taxi ownership is reflected in the bright and distinctive paints: private taxis are green or yellow, while different companies have varying color schemes. Motorcycle taxis were previously unregulated. As for the rapid transit system, Bangkok is currently served by three rapid transit systems: Skype train, MRT, and Airport Rail Link, that serve to protect further public transport corridors from obstruction by traffic congestion. Similar to Bangkok of Thailand, Ho Chi Minh city has many types of transport mode, from airway, waterway to road traffic. The dominant transport mode on road is motorcycle, with the share of up to more 80%. The locations of the two cities are illustrated in the following figure:

* Corresponding author.



Map of Ho Chi Minh City (Source: internet)



Map of Bangkok (Source: internet)

Figure 1. Maps of Ho Chi Minh city and Bangkok

Similar to Bangkok of Thailand, Ho Chi Minh city has been facing with many problems such as traffic congestion, traffic accident, etc. According to Ho Chi Minh city Department of Transport, although number of locations facing with traffic congestion in the whole city decreases from 37 points (in 2016) to 28 points (in 2018), the traffic congestion situation is still very complicated and difficult to control. In addition, the death toll as well as the traffic accident remains hot problems in the city. Problems like shortage of infrastructure, traffic congestion, traffic accidents, traffic management, traffic pollution, accident, etc. relate to many aspects of the society such as economy, culture, etc. The authority uses traditional measures to solve the problems such as broaden the network infrastructure, developing public transportation or legislation improvement, etc.

The characteristics of vehicle ownership is an important aspect that the government should concern to solve these problems in a sustainable way. Analyses on vehicle ownership help to understand situation as well as partly control the Transport Demand Management (TDM). Based on the control, the authority may propose suitable policies or solutions to curb the situation, being able to forecast the future scenarios as well as conducting a sustainable development. According to a research about vehicle ownership trends in Asian Region (Yumiko N. et al, 2007), the ratios of Two-Wheeled Vehicle Ownership as well as Four-Wheeled Vehicle Ownership to population had a relationship with the GDP per Capita. The research showed that Thailand, Philippines and Indonesia were in a group of higher ratio compared with Vietnam, Pakistan, Sri Lanka, etc. that were in the lower group. The development of traffic in Vietnam seem to follow the path of Thailand, as shown in the following figures for the cases of two-wheeled Vehicle Ownership and Four-Wheeled Vehicle Ownership:

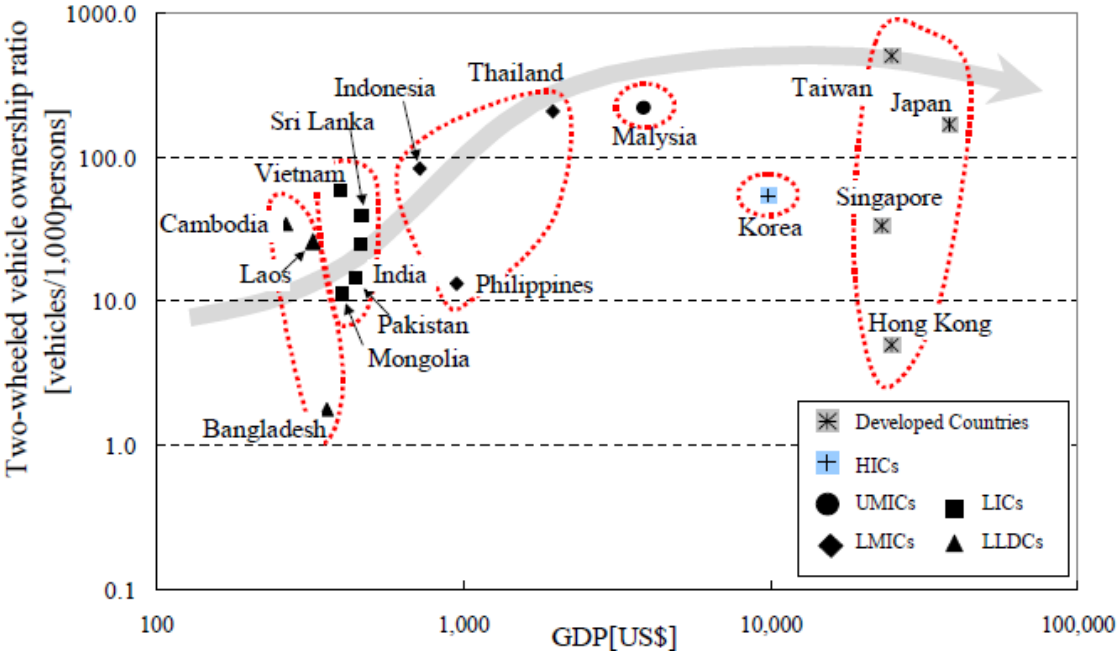


Figure 2. Relationship of Two-Wheeled Vehicle Ownership and GDP per Capita (Yumiko N. et al, 2007)

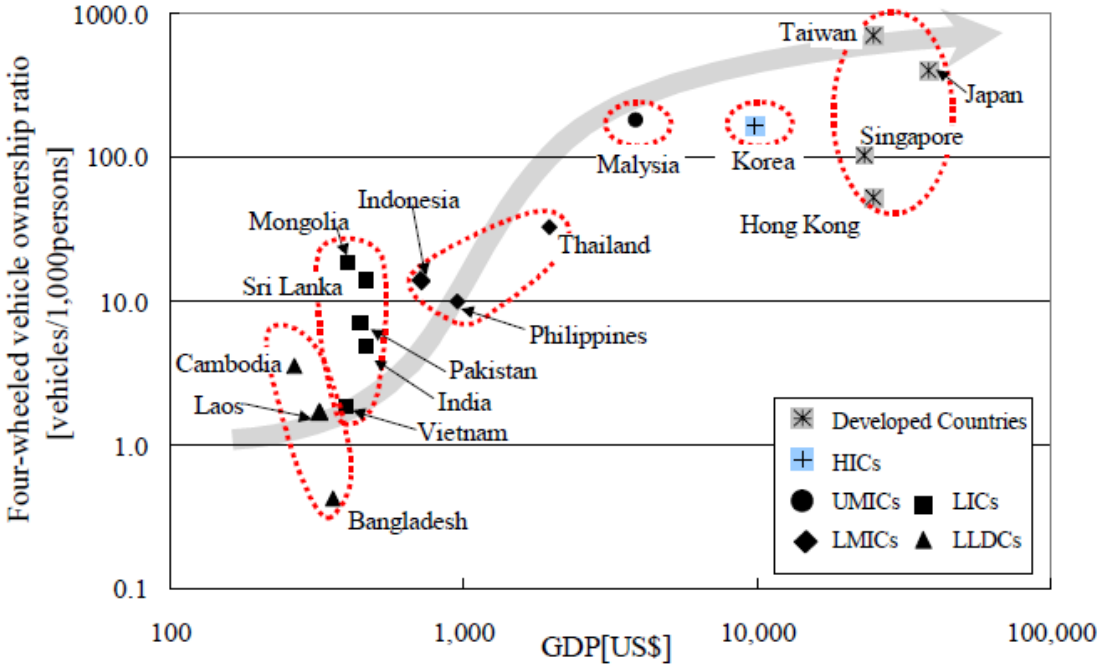


Figure 3. Relationship of Four-Wheeled Vehicle Ownership and GDP per Capita (Yumiko N. et al, 2007)

The path of the ownership is illustrated as in the figures and Vietnam somehow follow that way in terms of vehicle ownership. To understand the situation as well as find solutions for a sustainable transport development in Vietnam, a comparison of the vehicle ownership between Vietnam and Thailand is necessary to understand more the characteristics of travel demand and find good solutions to control traffic problems.

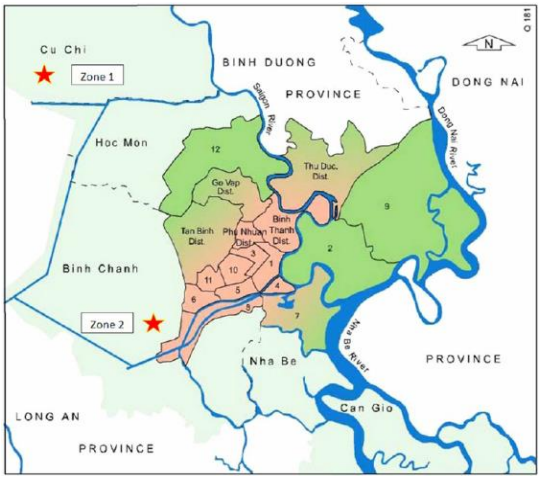
2. PAPER OBJECTIVE

The aim of this paper is to compare the vehicle ownership between Ho Chi Minh city of Vietnam and Bangkok of Thailand based on household survey conducted by the research group. Based on the comparison, the research aims at analyzing the differences in vehicle ownership and proposing useful suggestions for the development of traffic system in Vietnam.

3. DATA COLLECTION

To collect data, the research conducted method of collecting in direct and indirect ways. A question was build to collect information on vehicle ownership in Ho Chi Minh city of Vietnam and in Bangkok of Thailand. Indirect ways to collect data come from statistical sources, research papers on internet, etc. Household data includes information on types of owned vehicle, the number of persons of household, education, job types, families, households and housing, income, pensions, types of commuting, etc. The questionnaire sheet was delivered directly to household owners. The survey teams consulted the respondents how to fill up the questionnaire correctly. There are 24 districts in Ho Chi Minh city that were collected by the research team. Meanwhile, for the case of Bangkok of Thailand, the research team collected the household information in 50 districts of the city.

Districts in Bangkok (Source: internet)



Map of Ho Chi Minh City (Van Buuren and Potting, 2011)

Figure 4. Districts to be collected in HCMC and in Bangkok

A piece of photo conducted by the survey team in HCMC and in Bangkok is as follows:

Data collection in Ho Chi Minh city

Data collection in Bangkok

Figure 5. Data collection in HCMC and in Bangkok

A piece of the survey sheet is as follows:

HOUSEHOLD SURVEY

Name of investigator..... Order number of votes □□□□

Email..... Date of investigation (day, month, second) □□ - □□ - □

Question 1: The current address of the family ..... district/ward.....

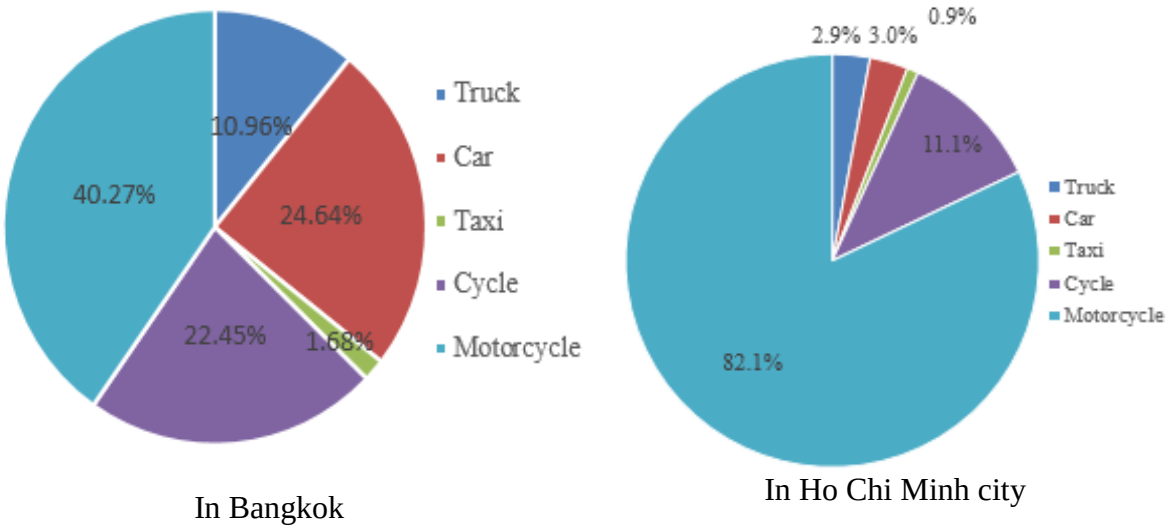
Question 2: Means of ownership

Truck	Type of ownership: □ 1. Owner □ 2. Purchase □3 Supported from company □ 4.Rent/Borrow Number of light trucks (under 2.5 tons): .... Medium and heavy trucks (over 2.5 tons)				
Passenger car	Type of ownership: □ 1. Owner □ 2. Purchase □3 Supported from company□ 4. Rent/Borrow Number of 16 seats: .... Number of cars with more than 16 seats:				
Car	Type of ownership: □ 1. Owner □ 2. Purchase □3 Supported from company □ 4. Rent/Borrow Number of car				
Taxi	Type of ownership: □ 1. Owner □ 2. Purchase □3 Supported from company□ 4. Rent/Borrow Number of taxi				
Bike	Type of ownership: □ 1. Owner □ 2. Purchase □3 Supported from company□ 4. Rent/Borrow Number of bicycles				
Motorbike	Type of ownership	Veh. capacity	Vehicle type	Used time (years)	Register Place

Figure 6. A piece of the survey template

4. RESEARCH RESULT

By collecting 898 household samples and 904 personal investigation samples in 24 districts of Ho Chi Minh city of Vietnam and 1500 samples in 50 districts in Bangkok of Thailand, the research tried to analyze the data of the two city and used tools to draw up the relationship. The proportions of vehicle ownership among transport modes such as truck, car, taxi, cycle and motorcycle are compared as shown in the following figure:



In Bangkok

In Ho Chi Minh city

Figure 7. Comparison on vehicle ownership proportion

According to the figure, the motorcycle ownership is highest in both Ho Chi Minh city (82.1%) and in Bangkok (42.3%). Meanwhile the figures for car are 24.6% for Bangkok and 3.0% only for Ho Chi Minh city. The cycle ownership is rather high in the both cities, with the figures of 22.4% in Bangkok and 11.1% in Ho Chi Minh city. The comparison by transport mode is shown as in Figure 7.

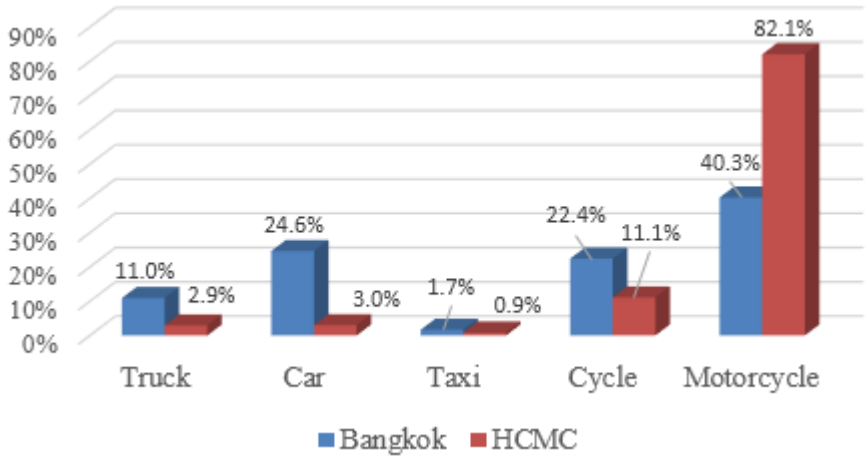


Figure 8. Comparison on vehicle ownership by transport mode

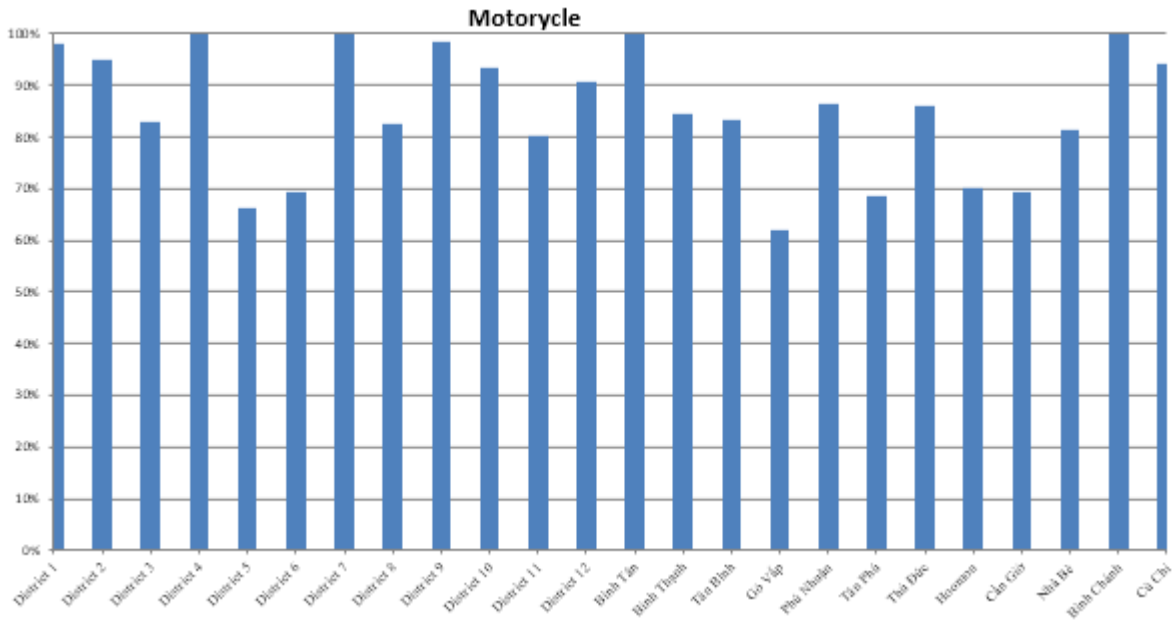
The paper collected data in 50 districts of Bangkok and 24 districts of Ho Chi Minh city. To indicate the district name of 50 districts in Bangkok, the research coded the numbers as shown in the following figure:

Table 1. The district name of 50 districts in Bangkok

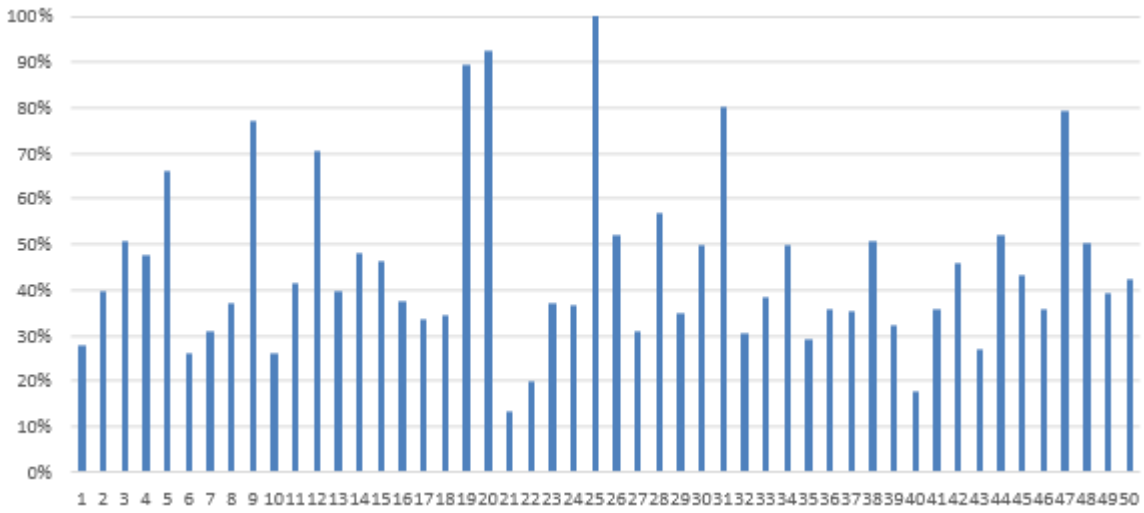
Encoded number	District name	Encoded number	District name
1	PhraNakhon	26	DinDaeng
2	Dusit	27	BuengKum
3	NongJok	28	Sathorn
4	BangRak	29	BangSue
5	BangKhen	30	Jatujak
6	BangKapi	31	BangKoLaem
7	Pathumwan	32	Prawet
8	PomprabSattuphai	33	KhlongToey
9	PhraKanong	34	SuanLuang
10	Minburi	35	JomThong
11	Ladkrabang	36	DonMuang
12	Yannawa	37	RatThewi
13	Samphantawong	38	LadPhrao
14	Phayathai	39	Wattana
15	Thonburi	40	BangKhae
16	BangKokYai	41	LakSi
17	HuaiKwang	42	SaiMai
18	Khlongsan	43	Kannayao
19	Talingchan	44	SaphanSung
20	BangKokNoi	45	WangThongLang

21	BangKhunThian	46	KhlongSamWa
22	Phasicharoen	47	BangNa
23	NongKham	48	TaweeWattana
24	Ratburana	49	ThungKru
25	BangPhat	50	BangBon

The motorcycle distribution among districts in Bangkok and Ho Chi Minh city is shown in the following figure. According to that, the distribution of motorcycle ownership among districts in HCMC is quite even, averagely up to more than 80%. Meanwhile this distribution is quite low in the case of Bangkok, only about 40%. The distribution is shown as in figure 8.



Motorcycle distribution among districts in HCMC



Motorcycle distribution among districts in Bangkok

Figure 9. Comparison of motorcycle distribution

The frequencies of motorcycle proportion among districts in Ho Chi Minh city and in Bangkok are compared a shown in Figure 10. The figure shows that the frequency of the proportion of 85% is the mean value for the case of Ho Chi Minh city. This figure is 45% for the case of Bangkok with the quite regular frequency distribution.

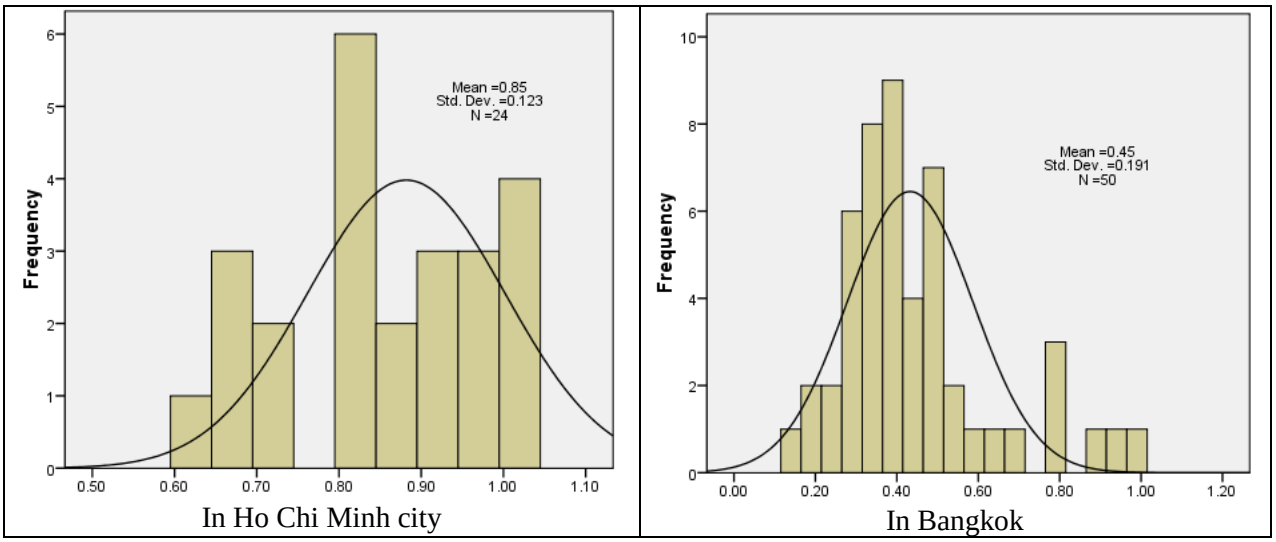


Figure 10. The comparison of the frequencies of motorcycle proportion

The motorcycle ownership has a strong relationship with the number of persons in each household. This research compared the number of persons in each household for 50 districts in Bangkok of Thailand and 24 districts of Ho Chi Minh city. The frequency figures are shown as follows:

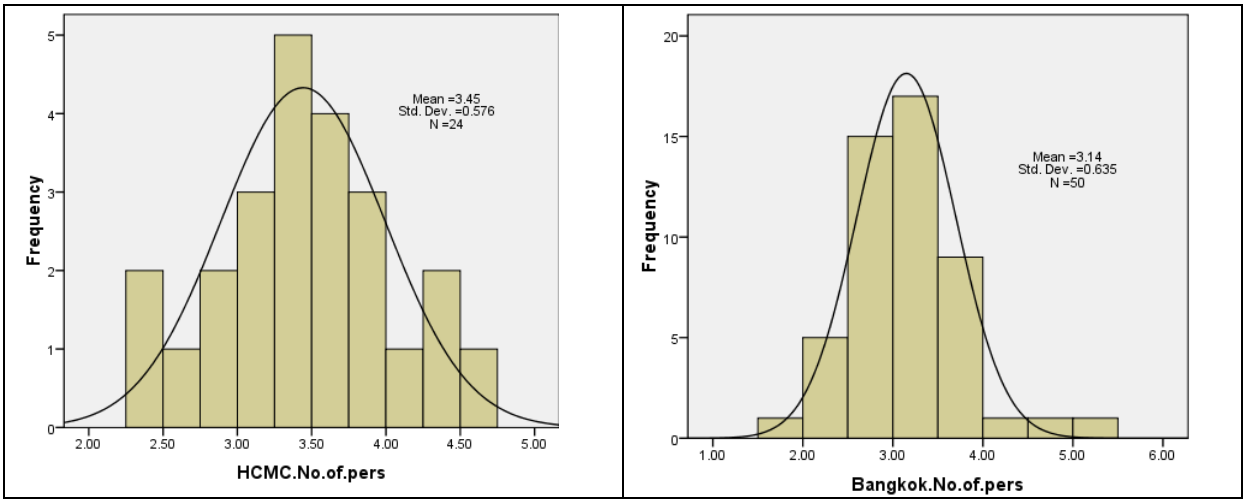


Figure 11. The comparison of the frequencies of the number of household persons

According to figure 11, the average number of persons in Ho Chi Minh city is higher than that in Bangkok, with the figure of 3.45 (for Ho Chi Minh city) and 3.14 (for Bangkok). The distribution in the case of Bangkok is more tapered, meanwhile the distribution in the case of Ho Chi Minh city is broader. This shows the larger dispersion of the number of household persons in Ho Chi Minh city compared with that of Bangkok. Besides that, the paper builds a model to show the relationship between the motorcycle ownership and the number of persons in each household. The paper compared the models for the cases of

Bangkok and Ho Chi Minh city. The details are shown in Figure 12.

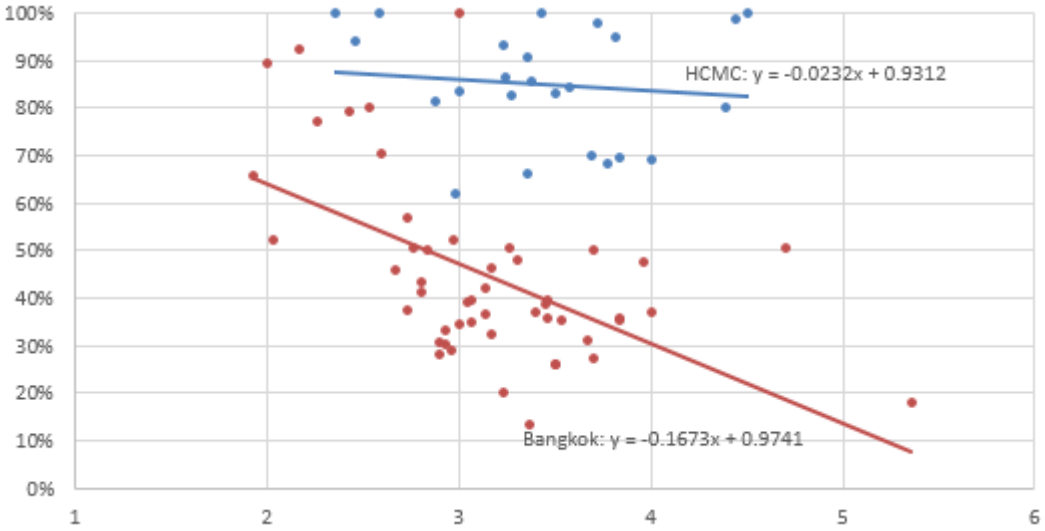


Figure 12. Comparison the relationship between motorcycle ownership and the household person numbers

Based on the collected data, the research used the regression technique to show the relationship between motorcycle ownership in Ho Chi Minh city and in Bangkok. The trends of the model show that, the proportion of motorcycle ownership for the case of Bangkok decreases 16.7% when the average number of household persons increases by 1 person. Meanwhile, this figure is only 2.32%, much lower for the case of Ho Chi Minh city. The regression slope is almost zero for HCMC. This shows that the average person numbers in each household for the case of Ho Chi Minh city does not affect much the motorcycle ownership. This indicates the saturation of ownership as well as the worse traffic situation in Ho Chi Minh city. The result is reasonable to explain the current dominance of motorcycle in Ho Chi Minh city as of 82.1% compared with 40.3% in Bangkok. These differences show that the readiness of changes in motorcycle ownership in the case of Bangkok when the average number of persons in household changes. This readiness is partly related to the easiness of ridership changes for each city.

5. CONCLUSIONS

This paper compares the characteristics of vehicle ownership in Ho Chi Minh city of Vietnam and in Bangkok of Thailand. By using survey data conducted by the research group, the paper figures out the basic difference in the ownership between the two cities. The developed model shows that the trends of the regression line are the same. When the number of household person increases, the tendency of motorcycle ownership decreases. The proportion of motorcycle ownership for the case of Bangkok decreases 16.7% when the average number of household persons increases by 1 person. Meanwhile, this figure is only 2.32%, much lower for the case of Ho Chi Minh city. The result is reasonable to explain the current dominance of motorcycle in Ho Chi Minh city as of 82.1% compared with 40.3% in Bangkok.

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