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Travel Behavior of the Urban Poor: A Comparative Study between Maputo and Nairobi

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Abstract

Commuters from poor households face increased challenges in their daily mobility in Sub-Saharan African cities, yet studies on their travel behavior are rare. Most poor individuals resort to walking long distances because they cannot afford motorcycles, bicycles, or even a single bus trip. Using person-trip data, this paper tries to investigate travel behavior of the urban poor through a comparative study between Maputo City and Nairobi City. The logistic regression results showed some similarities and variations among the factors affecting the travel behavior of the urban poor in Maputo City and Nairobi City. The likelihood of choosing Non-Motorized Transport (NMT) over public transport decreased with ownership of motorcycles and private cars in both cities. Surprisingly, gender had no impact on the likelihood of selecting NMT either in Maputo or Nairobi. This might indicate that men and women are equally likely to walk. Variations were observed with respect to the effect of age and residence location. For example, while the likelihood of selecting NMT is positively correlated with the residential location in Maputo, a negative relationship was observed for Nairobi. More explanations for these similarities and variations on the travel behavior are discussed in the article.

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Keywords: Person Trip Survey; Chapas; Matatus, Sub-Saharan Africa; Logistic regression

1. Introduction

Before discussing the travel behavior of the poor one needs to define what is the urban poor. There are two main approaches used to define poverty: conventional economic definition and absolute definition. The former defines people as poor when their income or consumption is less than that required to meet certain defined needs. Under the absolute definition, poverty is defined in

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absolute terms, and needs are considered to be fixed at a level which provides for subsistence, basic household assets, and expenditure on essential services such as transportation (World Bank, 1990; Wratten, 1995).

However, in Sub-Saharan African cities where informality is basically the rule and official statistics are unable to capture earnings from the non-formal sector, using conventional economic definition alone might be misleading. In this paper, we consider both definitions where monthly income is reported and use only household asset ownership where data is not available. Specifically, we define the urban poor as individuals whose households have limited assets (radio, TV set, computer, bicycle, motorcycle, private car, etc.), and with the lowest income in the income categories.

It is widely accepted that with the rapid urbanization, more people will live in urban areas in developing countries. As a result, the number of the urban poor is also expected to increase at a faster rate (World Bank, 2002; Wratten, 1995). Sub-Saharan Africa, in particular, contains a growing share of the world's absolute poor: one in three poor people live in Sub-Saharan Africa (Cohen, 2006). At least a minimum understanding of travel behavior is required to address the mobility needs of the urban poor. According to (Howe et al. 2010) relatively little is known about the travel behavior of the poor in developing countries as well as their residential location. Likewise, (Verma and Manoj, 2015; Cheng et. 2013) add that studies on the travel behavior of low-income in the developing world are rare. It is this limited background that motivated the present research.

The main purpose of this paper is to contribute to the understanding of the travel behavior of the urban poor through a comparative analysis of Maputo City and Nairobi City. As case studies, Maputo and Nairobi are selected because they still rank among cities with a higher level of poverty (World Bank 2016; Salon and Aligula 2012). Second, being cities with the young and rapidly growing urban populations these cities face more increased mobility challenges. The comparison can help policymakers to understand the factors underlying the travel behavior of the urban poor, but also to draw policies to influence the observed behavior.

1.1. Objectives

- To identify the similarities and variations on the travel behavior of the urban poor; and
- To investigate the factors influencing the observed travel behavior.

1.2. Structure

The paper is organized as follows. In section 2, previous studies on the travel behavior of the low-income are reviewed. Section 3 discusses briefly the dataset used in this study. Section 4 introduces the fundamental features of the selected cities, followed by travel behavior analysis in section 5. Section 6 is devoted to model estimation, as well as the discussion of the findings. Finally, the conclusion is presented in section 7.

2. Literature review

According to (Ben-Akiva and Lerman, 1985; Domencich and McFadden, 1975; Ortúzar and Willumsen, 2011) transport mode choice is influenced by the characteristics of the decision maker or individual, the number, and attributes of alternatives and the decision rule. Under travel behavior theories a decision maker is assumed to rank possible alternatives in order of preference and choose the available alternatives which he or she considers most desirable, considering his or her preferences and the relevant constraints placed on decision-making. The decision maker can be an individual or a group of people. Individuals not only face different choice situations, they also have different tastes (Ben-Akiva and Lerman, 1985). Any transport alternative is assumed to comprise a set of alternatives that are feasible and known during the decision process by the decision maker. The attributes of alternatives are measured on a scale of attractiveness such as speed, travel time or travel costs. Despite being widely used the standardized application of choice theories in developing countries should raise concerns. The main reason is that most of the assumptions do not hold. For example, decision makers usually do not have perfect information relative to the attributes of the transportation modes. As noted by Vasconcellos (1997) most people in developing countries have no choice than to use public transportation.

Study on the travel behavior in Nairobi by Salon and Aligula (2012) indicates that slum dwellers cannot afford any transport mode and they cope by reducing their travel to walking. Salon and Aligula (2012) also compared the travel patterns between poor and non-poor households and found the former to be systematically worse off. Likewise, Howe and Bryceson (2010) also investigated the mobility of low-income in two Sub-Saharan African cities, Harare in Zimbabwe, and Kampala, in Uganda. Their results show the livelihood of work to be the most frequent purpose of short-distance trips for all income groups. In addition, walking dominated the modal share in both cities with households in Kampala also relying on bicycle and motorcycle taxi. Venter et al. (2007) examined the relationships between residential location and travel behavior of low-income in South Africa and found the residential location to have a significant influence on travel behavior. Specifically, households in distant rural areas faced higher transportation costs compared to urban residents.

Sohail et al. (2004) investigated public transportation in Dar es Salaam, Tanzania, and concluded that poor people are affected not only by the current fares that are too high but lack of services in poor roads. Most poor people are reported to rely heavily on public transportation. Their main trip purposes include petty trading, work, school, farming, and social activities. A study on mobility in 6 Sub-Saharan African cities by Diaz Olvera et al (2013) revealed a relatively small public transport sector concentrated

on the major radial roads on one hand, and an increasing informal sector or paratransit. Household ownership of motorized two-wheelers and the private car is reported to be very low. A comparison of urban transport systems across African cites by Godard (2013) identified affordability as the main concern for the use of buses and paratransit. For example, a substantial share of urban dwellers was found to have no daily access to public transport services because these are expensive and not easily accessible.

Sumeeta and Rogers (2005) examined the travel behavior of low-income groups in India and found travel behavior measures such as mode choice, travel time, cost and frequency to be affected by location. According to Cheng et al. (2013), low-income households in China have lower mobility levels than non-low-income households. Low-income households not only make fewer trips but also short-distance trips. With respect to transport mode, walking, motorcycles, and bicycles were identified as the main non-motorized transport, whereas for motorized trips bus is the most dominant mode. Barter (1999) states that the mobility of the poor is extremely limited primarily because many cannot afford any form of motorized private transport or public transport although in some Asian cities low-income households may own motorcycles. Despite making shorter and fewer trips the urban poor take more time than people from higher-income households.

Finally, one of the most informative literature on the travel demand in the context of developing countries is the publication on public transportation in developing countries by (Iles, 2005). According to Iles (2005), public transport in developing cities is determined by various demographical, environmental, institutional, and economic factors. The author states that population density, distribution, and growth are three important factors determining the demand for transport. A serious demographic problem in developing countries in the form of the rising migration of the population from the rural areas to urban areas. This leads to rapid and often uncontrolled growth in urban areas. Economic factors include low levels of Gross Domestic Product per capita, uneven distribution of income, both demographically and geographically, fluctuations in the world commodity prices, and poor availability of foreign exchange (Iles, 2005).

3. Data and methodology

3.1 Basic statistics

The Household Interview Survey (HIS) or Person-trip data that are used in this paper were conducted in 2012 and 2013 in Maputo and Nairobi, respectively, by Japan International Cooperation Agency (JICA). Person trip data consist of a wide range of information including (1) household characteristics, (2) individual characteristics, and (3) the transportation behavior in the previous 24hour period. The sample dataset for two cities are is described in Table 1. It should be noted that:

- Person-trip data only covered the Nairobi City while in the case of Maputo the whole metropolitan area was surveyed.

- The occupation status information from Maputo was more disaggregated than in Nairobi and we had to adjust for comparison purposes.

Maputo is the capital of Mozambique in Southern Africa and has a population of 2.3 million in the 2007 census distributed over an area of 1228 km^2. **Fig.** 2 illustrates population distribution per square kilometers (km) in Maputo. On the other hand, Nairobi City with a population of approximately 3.1 million in the 2009 census (Roger Behrens et al. 2017) and an area of 700km^2 is the capital of Kenya in East Africa. Historically, Maputo city was established as a main urban center in early 1884 following the development of transport infrastructures such as road and railway connecting Mozambique and South Africa. Likewise, Dimitriou and Gakenheimer (2011) state that Nairobi was established as the colonial capital of British East Africa in 1907. It was initially a way station between the Port of Mombasa on the Indian Ocean and Uganda. The urban density of Nairobi is shown in **Fig.1**.

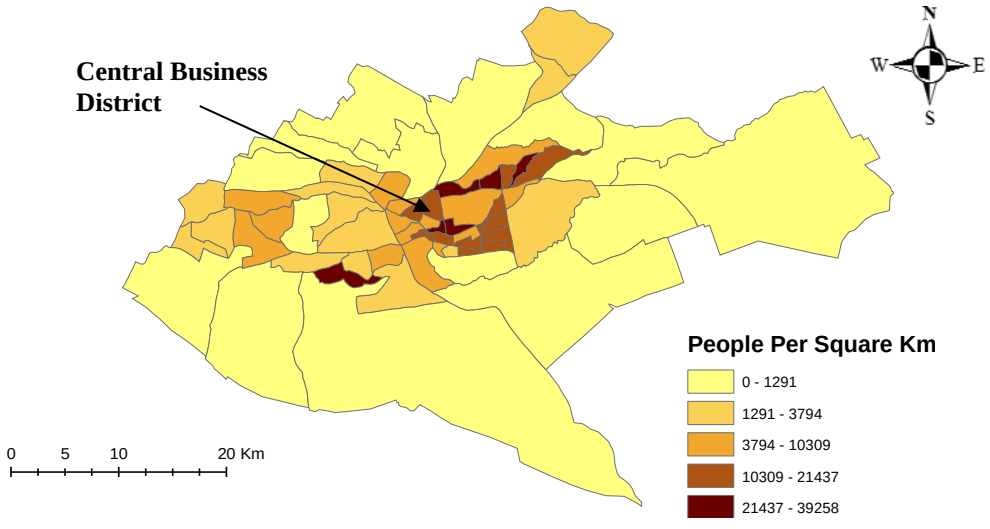

Figure 1. Location of Nairobi. Source: 2009 Census

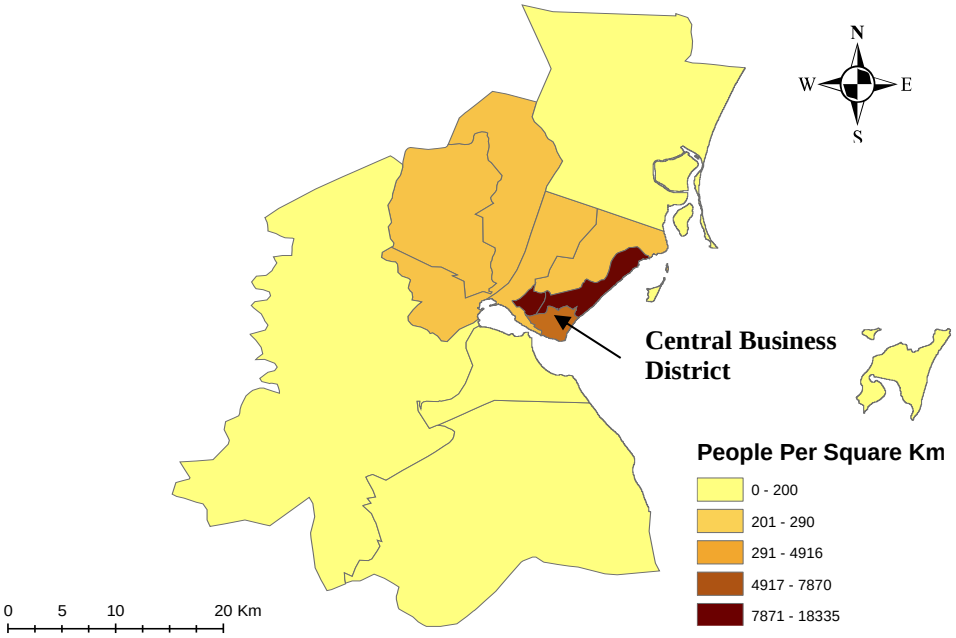

Figure 2. Location of Maputo. Source: 2007 Census

Table 1. Person trip data

	Maputo Metropolitan Area	Nairobi City
Population	2.3 million (2007 census)	3.1 million (2009 census)
Households Surveyed	9530	9973
Individuals Surveyed	43927	27618
Sample size	2%	1%
< 19 years old	45%	47%
20 – 60 years old	50%	50%
'> 60 years old	5%	2%
HH < 3 persons	11%	87%
HH> 3 persons	89%	12%
No job, housewives or students	67%	24%
Employed	20%	57%

3.2 Logistic regression analysis

Two separate regression models were estimated to achieve the goal of this research. According to (Gujarati, 2011) regression models that involve nominal scale variables can be either binary or dummy variable, dependent models. Binary regression models are employed when the objective is to choose between two discrete alternatives. For more than two discrete alternatives multinomial regression models are used. According to (Chacha & Bwire, 2013) logit models are by far the most widely applied discrete choice models due to the fact that the formula for the choice probabilities takes a closed form and is readily interpretable. For example, (Matsuyuki and Rinchumphu 2017; Oakil and Nijland 2016) used logistic regression to model the travel behavior. This research employed a logistic regression model for the reasons noted previously.

4. Fundamental features of the cities

We review the background upon which the urban transportation systems were built on to understand the travel behavior of the urban poor in each city. This can help us to understand the current conditions considering that none of these cities ever experienced significant changes in the supply side since their independence. First, we analyze how urban transportation systems evolved in Maputo followed by Nairobi.

4.1. Maputo

Mozambique is an independent country since 1975. Urban transportation systems were nationalized at the outset yielding to a regulated public transport system. Urban transportation services were exclusively provided by a state-owned Bus company, *Transportes Urbanos de Maputo*. Fares were regulated with a purpose to ensure affordability of the majority of the population. At the beginning of the 1980s, Maputo witnessed an increased immigration of people from rural to the capital city, while the Bus Company had difficulties to provide bus services to economic policies. For example, the bus utilization ratio which is the proportion of buses in service over the total bus fleet, reduced from approximately 37% in 1975 to roughly 13% as of 1985 (**Fig.3**). For this study nominal buses are defined as the bus fleet owned by the company, while operating buses represent the number of buses in service. As a result of the problems above, the number of passengers gradually declined from 60 million users in 1975 to 40 million in 1985 (**Fig.3**). Kumar and Barret (2008) argue that in the beginning public bus companies were able to operate without subsidies in Africa, however, as deficits grew and subsidies did not grow commensurately, bus operators faced enormous difficulties either to maintain or to replace bus fleet.

According to Matos (2003), in order to meet the increasing demand in urban areas, individuals initiated the paratransit services and gradually their number increased. These new minibus operators were formally acknowledged at the end of the 1980s when the government gave them permission to operate urban transportation services. This yielded to the development of minibus *chapas* industry (**Fig.4**). The designation *chapas* refers to the flat fare system, that is, fares were non-distance based. The seating-capacity of *chapas* range from 15 to 25 passengers. By the beginning of the 1990s, *chapas* operators had a significant share of the market. As of 2013, the urban transport modal share is dominated by walk (45.8%), followed by *chapas* (32.9%), private car (10.2%), bus (9.2%), rail (0.6%) and others (1.3%). Most of the operators of *chapas* are not the owners of the vehicles, but hired drivers. They are hired under 3 main conditions: (1) to pay a daily fixed amount of revenue to the owners; (2) to meet their own salary and (3) to provide for the daily operating costs. Meanwhile, minibus drivers usually hire a conductor who collects the fares from the passengers. There are no formal contracts either between the owners and the drivers of *chapas*, or, between drivers and conductors.

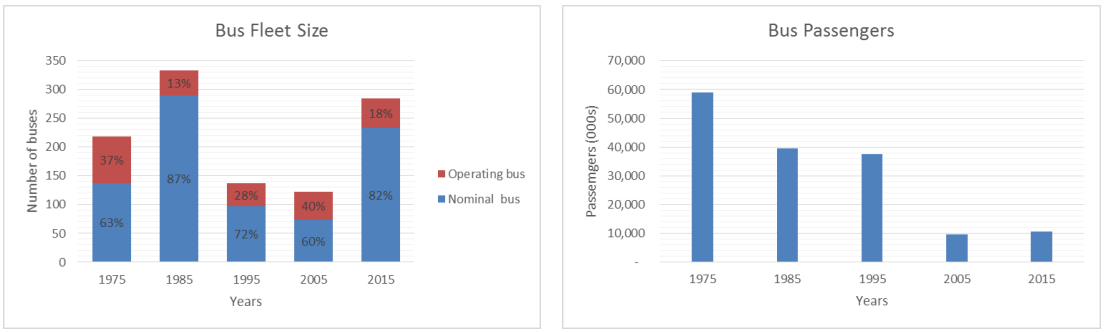

Figure 3. Evolution of bus fleet and passengers in Maputo. Source: Maputo municipality

Figure 4. Buses (left) and *chapas* (right) in Maputo. Source: http://www.transporte+publico+em+maputo

4.2. Nairobi

Urban transport services in Nairobi were exclusively provided by Kenyan Bus Services (KBS) until 1973 (UITP, 2008). According to (UITP, 2008), Kenya Bus Services (KBS) was established in 1934 and it operated urban transport services utilizing high capacity buses (double-decker). Bus fares were controlled at the level that allowed the company to operate profitably and to expand (Kumar and Barret, 2008). Kenya Bus Services also encountered difficulties due to regulatory institutions which resulted in the declining market share. Kenyan authorities legalized the paratransit operators *matatus* in 1973 to meet the increasing needs

for transportation (Kumar and Barret, 2008). However, *matatus* are reported to have started their transport services in the 1950s and they were considered as illegal commercial operators (UITP, 2008). Similarly, the seating-capacity of matatus ranges from 14 to 25 passengers. According to Kumar and Barret (2008), *matatus* were mainly used as a transportation mode of native Africans during the colonial period. The word *matatu* means 30 cents which were the standard flat fare that was charged. Kumar and Barret (2008) state that even with the legalization of *matatus* Kenyan Bus Company retained the monopoly status which was only broken at the outset of the 1980s with the formation of another state bus company *Nyayo Bus services*.

Dimitriou and Gakenheimer (2011) argue that the current public transportation is a complex paratransit system (**Fig.6**). Despite its demand flexibility, competitiveness, and spatial range, Dimitriou and Gakenheimer (2011) claim that the paratransit system can never be sustained as the primary transport for the metropolitan area because the quantity of service supplied is completely disconnected from the capacity and quality of the infrastructure. In other words, there is demand for the high number of operating *matatus*, but the current road infrastructure cannot accommodate them. As of 2013, the modal share **(Fig.5)** is primarily by walk (39.7%), followed by *matatus* (28.4%), private car (13.5%), bus (12.2%), rail (0.2%) and others (5.9%).

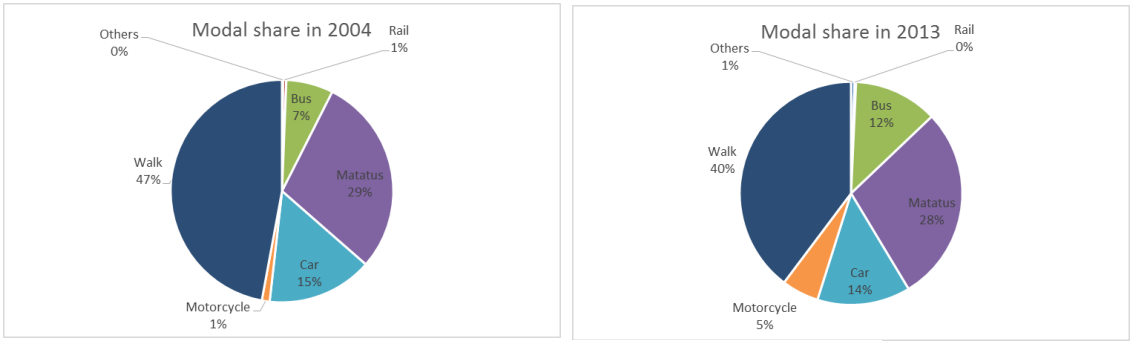

Figure 5. Modal share variation between 2004 and 2013. Source: HIS

Figure 6. *Matatus* (left) and buses (right) in Nairobi. Source: http:www.Kenyan bus services

4.3. Comparison

Table 2. Characteristics of bus transport

	Maputo Metropolitan Area	Nairobi City
Regulated to	Ensure Affordability	Operate profitably and expand
Subsidies	1 subsidized	2 competing privately owned
Difficulties	1980s – reduction in fleet size	1980s – increase in operational costs
Legal paratransit	1980s	1973
Paratransit fare system	Flat	Flat
Present bus mode share	Bus: Paratransit 9%:33%	Bus: Paratransit 12%:28%
Vehicle Size	Bus: Paratransit Normal: Minibus/Mid-bus	Bus: Paratransit Normal/Double-Decker: Minibus/Mid-bus
Fleet Size	Bus: Paratransit *chapas* 280:4150	Bus: Paratransit *matatus* 23000:72000
Route Coverage/number of routes	Bus: Paratransit 65:130	n/a

5. Travel demand analysis

Fig.7 shows the basic characteristics of the households in the selected cities. As it can be seen Maputo and Nairobi exhibit similarities and variations. The number of households with less than 3 members is minimal in Maputo but greater in Nairobi. There is at least two explanations for this result. Firstly, person trip survey only covered Nairobi City while in the case of Maputo the whole metropolitan area was surveyed. There is a tendency for households in the city area to owning more private cars compared to the rest of the metropolitan area. Salon and Aligula (2012) argue that most Kenyans move out of the city when they retire. **Fig.7** also summarizes household car ownership. Both cities are characterized by a greater number of households with no private car. The number of households with one vehicle is relatively greater in Nairobi City compared to Maputo. We analysed census data in **Fig.8** to deriver proper insights about the socioeconomic similarities and variations between the two cities. The number of households owning non-expensive assets such as radio, TV set is higher in Maputo than Nairobi. On the other hand, ownership of the computer, bicycle, motorcycle, and private cars is minimal in both cities. These results are not surprising because the two cities still rank among cities with a higher level of poverty (Salon and Aligula, 2012; World Bank, 2016).

Fig.9 presents the number of trips classified by age structure. The proportion of total trips dominated by individuals under 19 years of age is greater in Maputo than Nairobi. This result should be given the difference in the age structure of households. In contrast, the share of total trips by commuters aged 20 to 49 years old is higher in Nairobi compared to Maputo. This might result from differences in the working population between the two cities (**Table 1**). The proportion of the unemployed is greater in Maputo compared to Nairobi. Howe and Bryceson (2010) state that the employment in East Africa is dominated by the informal sector. As a result of the increasing importance of the informal sector activities as a source of income, travel behavior is also changing. In the case of Maputo, one of the main implications of age structure is that temporal trip distribution is characterized by three peak-hour periods in large part due to school activities (Tembe et al. 2017).

Fig.10 represents transportation choice by gender. Surprisingly, mode choice by gender is similar between and within the two cities. The most remarkable result is the proportion of female relying on walking as their transport mode is greater than the male in both cities. This is likely to be related to poverty issues that affect disproportionately the female-headed households in Sub-Saharan Africa region. The share of public transportation (*matatus*, *chapas*, and buses) is similar between the two cities, whereas the ratio of the private car is greater for male than female. Unlike, East Asian developing cities the share of motorcycle use by poor households is lower in the two cities. This is probably because of the higher costs associated with imports from the major motorcycle manufactures such as China.

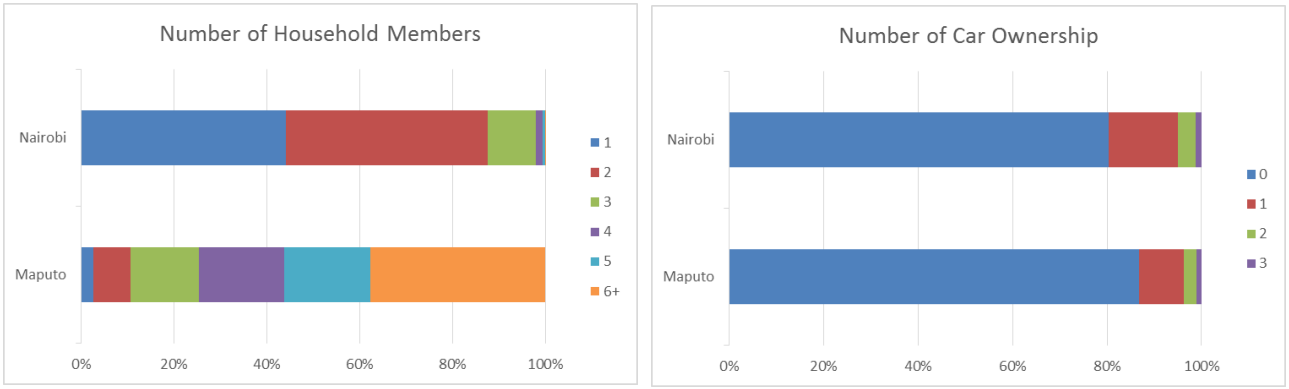

Figure 7. Household structure and car ownership. Source: HIS

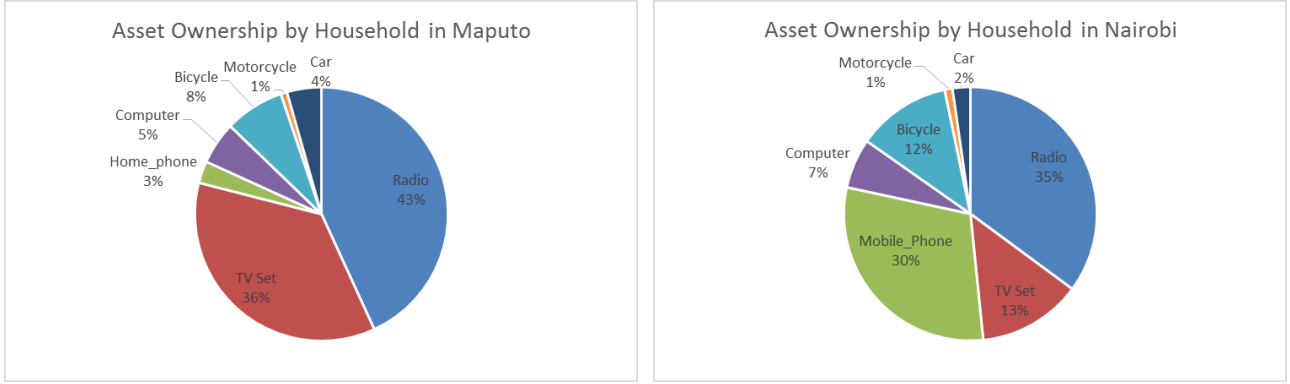

Figure 8. Household asset ownership. Source: 2007/9 Census

Figure 9. Age structure by trips. Source: HIS

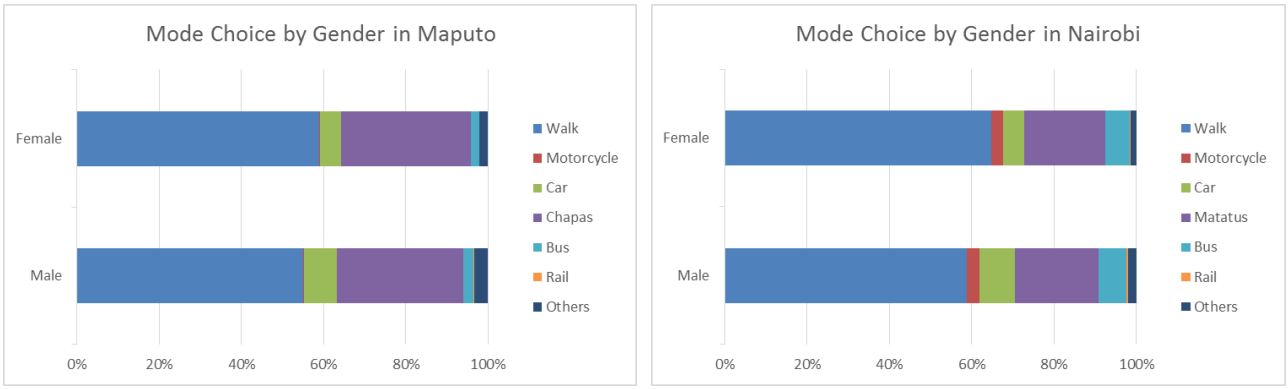

Figure 10. Mode choice by gender. Source: HIS

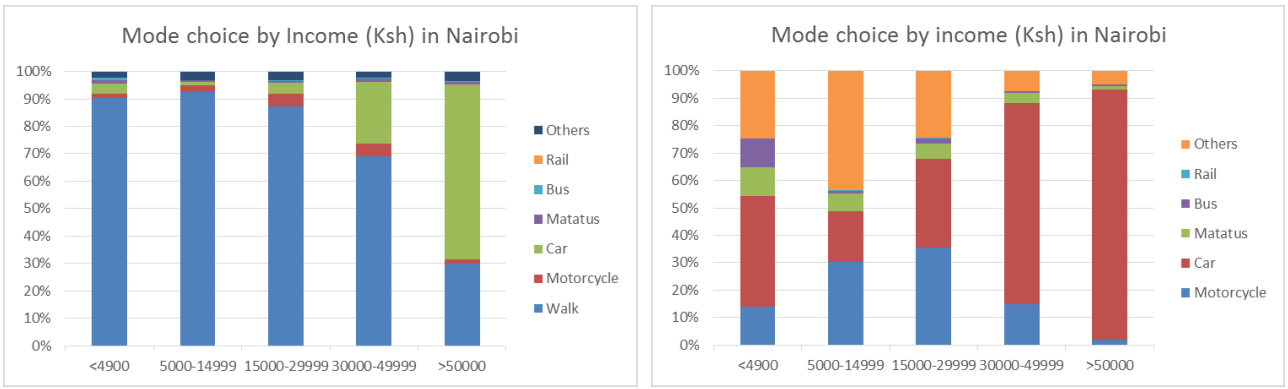

Figure 11. Mode choice by income category. Source: HIS

Fig.11 describes the mode choice by income category in Nairobi. As it was mentioned, households did not report their monthly income in Maputo. First, we classified the households into 5 income categories using Kenyan currency (Ksh.) to investigate the impact of income on transportation choice. The income categories are as follows: under 4999; 5000 to 14999; 15000 to 29999; 30000 to 49999 and 50000 over. As shown in **Fig.11**, for all income categories, the proportion of walking trips decreases with income, whereas the ratio for private car increases with income. For a better visualization, we had to exclude walk trips. The modal share of buses and paratransit (*matatus* and *chapas*) is highest for the lowest income group. This suggests that income in Nairobi City has an influence on travel behavior. Lastly, the modal share of the motorcycle is minimal for the highest income households and higher for groups within 5000 to 29999 Kenyan shillings.

6. Model results and discussion

The literature reviewed suggests some associations between transportation mode and individual socioeconomic characteristics. In this section, two logistic regression models were estimated based on the literature review as an attempt to investigate the factors influencing travel behavior. The proportions of bicycle trips were insignificant in both cities they are included in walk trips and designated as NMT. Only individuals commuting by NMT or public transportation were considered in the analysis. Table 3 shows the variables that area included in the models. The following assumptions are made:

- The dependent variable is the transport mode: Non-motorized transport (walk and bicycle) and public transport (buses, paratransit, and rail);
- Explanatory variables are individual attributes: Age, gender, income, vehicle ownership, number of household members, and household location.

Table 3. Variables in the models

Transportation mode	1= Walk; 0= Public transport (buses, rail, and paratransit modes)
Characteristics of the Trip maker	
Age	Age is years
Gender (Female)	1 = Female; 0= Male
Worker	1 = Yes; 0 = No
Motorcycle Owner	1= Yes; 0 = No
Car Owner	1= Yes; 0= No
Residence Location	Distance between zones and City center
	1 = 0-5 km
	2 = 5-10 km
	3 = 10-20 km
	4 = 20 km or more
Income (Kenyan shillings)	Income levels (Kshs)
	1 = Kshs 4999 less
	2 = Kshs 5000-14999
	3 = Kshs 15000-29999
	4 = Kshs 30000-49999
	5 = Kshs 50000 over

Overall, statistical indicators show that the models in **Tables 4-5** are relatively appropriate and a good fit with the Pseudo R-square at 66% and 41% respectively while the p-value (the exact level of significance level) is almost zero. **Table 4** shows the likelihood of the individual choosing Non-motorized transport (NMT) over public transport in Nairobi. From **Table 4**, we observe that age, income, vehicle ownership, and residence location are statistically significant variables when selecting NMT as a transportation mode. Similarly, **Table 5** shows the odds of selecting NMT over public transport relative to Maputo. Variables such as age, employment status, vehicle ownership, and residence location were found to be statistically significant. In logistic regression, a positive coefficient suggests increased odds of an alternative over the other, whereas a negative coefficient implies the opposite. Next, we proceed with the interpretation of model estimates, followed by discussion in next section.

From **Table 4** we observe that income, vehicle ownership, and residence location decrease the probability of selecting NMT over public transportation, holding other variables constant. The negative relationship between travel mode and the two explanatory variables (income and vehicle) appear to be consistent with travel demand theories (Ben-Akiva and Lerman 1985; Domencich and McFadden 1975). Motorcycles and private cars constitute competitor modes to NMT in terms of saving time. As the distance increases between residence location and city center, NMT becomes less popular as a transportation mode. This result is not surprising considering that many Sub-Saharan African cities lack the basic NMT infrastructures. In contrast, gender (female) has

no effect on the likelihood of choosing NMT in both cities. This finding is consistent with a previous study in which gender was found to be statistically insignificant. Men and women are equally likely to walk in Nairobi (Salon and Aligula, 2012).

Table 5 exhibits similar results relative to Maputo. Age structure, employment status, vehicle ownership, and residence location also decrease the likelihood of selecting NMT over public transportation, holding other variables constant. Unlike Nairobi, age structure has a positive affect when choosing NMT, whreas a negative relationship is observed between NMT and the residential location. Most residents are poor and they heavily depend on walking in their daily commute. Employment status can be seen as a proxy of income. As it would be expected, NMT is not popular among workers. Part of the explanation is increasing distances between the city center and residence of the workers. A substantial proportion of commuters live in suburban areas far from the city centre where public transport services are inadequate. As a result, individuals either rely on private or public transport for commute purposes.

Table 6 summarizes the similarities and variations among factors affecting the likelihood of using buses in both cities. The likelihood of using NMT decreases with the motorcycle and car ownership in both cities. Second, age and residence location have opposite effects on the likelihood of choosing NMT in these cities. Surprisingly, gender (female) has no significant impact on the likelihood of using NMT either in Maputo or Nairobi. This suggests that reliance on NMT is influenced by other socioeconomic characteristics of the individuals rather than gender.

Table 4. Results of regression for Nairobi

Variables	Coefficient	P-value
Intercept	3.12	0.00***
Age 6+	0.02	0.00***
Gender (Female)	-0.01	0.92
Income	-0.17	0.00***
Motorcyle Owner	-2.39	0.00***
Car Owner	-2.97	0.00***
Residence Location	-0.01	0.00***
Number of observations: 15932		
Log likelihood: -3191.09 (7 df)		
Chi-square p-value: 0.00		
Pseudo R-Square: 0.66		
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1		

Table 5. Results of regression for Maputo

Variables	Coefficient	P-value
Intercept	1.56	0.00***
Age 6+	-0.04	0.00***
Gender (Female)	-0.05	0.11
Worker	-0.85	0.00***
Motorcycle Owner	-0.26	0.08 .
Car Owner	-0.91	0.00***
Residence Location	0.01	0.00***
Number of observations: 25717		
Log likelihood: -10695.73 (7 df)		
Null/Residual deviance difference: 3239.88 (6 df)		
Chi-square p-value: 0.00		
Pseudo R-Square: 0.41		
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1		

Table 6. Comparison

	Significant Walk Coefficient Relative to Public Transport	
Attribute	Maputo	Nairobi
Age 6+	-	+
Worker	-	n/a
Income	n/a	-
Motorcycle Owner	-	-
Car Owner	-	-
Residence Location	+	-

7. Conclusion

This paper investigated travel behavior of the urban poor in two Sub-Saharan African cities: Maputo and Nairobi. As case studies, these two cities were selected because they still rank among cities with a higher level of poverty. Second, being cities with the young and rapidly growing urban populations the comparison can help policymakers in developing countries to identify factors influencing the travel behavior of the urban poor. Person trip data provided by JICA (Japan International Cooperation Agency) were used to estimate logistic regression models. Income and household asset ownership were used to classify the commuters. The comparison of the estimated results suggests some similarities and variation among the factors affecting the travel behavior between Maputo and Nairobi.

The model results showed that the likelihood of choosing NMT over public transport decreases with ownership of motorcycles and the private car in both cities. Although this negative correlation between motorcycle ownership and the odds of choosing NMT is obvious, it is surprising based on the findings from section 5. Surprisingly, gender (female) variable had no significant effect on the likelihood of using NMT either in Maputo or Nairobi. This might indicate that reliance on NMT is influenced by other socioeconomic characteristics rather than a gender issue. Variations were observed with respect to the effect of age and the residence location. For Maputo, the likelihood of choosing NMT was found to be correlated positively with the residence location and negatively associated with age. Meanwhile, in Nairobi, the likelihood of choosing NMT increased with gender and decreased with the residential location.

Several challenges remain for the future research in these cities. In this study, we did not consider the attributes of transportation modes mainly the travel costs. However, the reviewed literature showed that these factors have an influence on the transport behavior, our future task is to incorporate the generalized transport costs to better understand the travel behavior in Maputo and Nairobi.

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