



HAL
open science

Looking for the obvious: motorcycle taxi services in Sub-Saharan African cities

Lourdes Diaz Olvera, Didier Plat, Pascal Pochet

► To cite this version:

Lourdes Diaz Olvera, Didier Plat, Pascal Pochet. Looking for the obvious: motorcycle taxi services in Sub-Saharan African cities. *Journal of Transport Geography*, 2020, Informality in transport, 88, 10.1016/j.jtrangeo.2019.102476 . halshs-02182855

HAL Id: halshs-02182855

<https://shs.hal.science/halshs-02182855v1>

Submitted on 2 Mar 2021

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Looking for the obvious: Motorcycle taxi services in Sub-Saharan African cities

Lourdes Diaz Olvera* lourdes.diaz-olvera@entpe.fr

Didier Plat* didier.plat@entpe.fr

Pascal Pochet* pascal.pochet@entpe.fr

* Laboratoire Aménagement Economie Transports (LAET), Université de Lyon, ENTPE, rue Maurice Audin, 69518 Vaulx-en-Velin Cedex, France

Diaz Olvera L., Plat D., Pochet P. (2020), Looking for the obvious: Motorcycle taxi services in Sub-Saharan African cities, *Journal of Transport Geography*, Vol. 88.

<https://doi.org/10.1016/j.jtrangeo.2019.102476>

Abstract

Motorcycle taxis (MCT) have been present in many cities of Sub-Saharan Africa for several decades. This paper aims to answer two questions: How can we objectify the massive and lasting development of a “motorcycle taxi model” in the cities of SSA? How does this model function in practice? First, the spread of motorcycle taxis in Sub-Saharan Africa is examined by using an internet-based bibliometric analysis of academic output and local press articles. Second, the functioning of the industry and the informalization rationales at work in the deployment of the motorcycle taxi model are analyzed on the basis of a field study in Lomé, the capital of Togo.

The bibliometric analysis of the academic output shows the presence of MCT in 14 countries over a 30 year period, and that of the local press almost doubles the number of countries. It also provides some temporal reference points and suggests some reasons for MCT deployment. Three main features of the functioning of the MCT industry in Lomé are identified: the equivocal attitude of the State, the heterogeneous characteristics of the players, and the strong and multifaceted linkages of MCT with formal activities. The results from this research provide evidence that the development of the motorcycle taxi model in SSA is closely associated with globalization and informalization processes.

Keywords

Informal transport; Motorcycle taxi; Spatial diffusion; Bibliometric analysis; Field survey; Lomé

Highlights

- Motorcycle taxis are present in more than half of the Sub-Saharan African cities
- A sharp rise is observed on the number of academic documents on the internet
- In Lomé (Togo), strong barriers and imbalanced relations exist between players
- Interdependency is observed between motorbike taxi activity and the formal economy
- The equivocal role of the State contributes to maintain an informal setting

Looking for the obvious: Motorcycle taxi services in Sub-Saharan African cities

Lourdes Diaz Olvera, Didier Plat, Pascal Pochet

1. Introduction

The cities of Sub-Saharan Africa (SSA) are growing rapidly both in terms of population and surface area (Angel, 2012; Linard et al., 2013; Seto et al., 2011). The unbridled urban dynamic influences transport demand, which is increasing greatly whether measured by the number of daily trips to be catered for or the distances to be covered. This situation would tend to encourage the development of mass transport modes, at least in conurbations with more than a million inhabitants. As systems such as metros are too costly, Bus Rapid Transit (BRT) is put forward as a means of transporting large numbers of passengers with good quality of service and at reasonable cost (Gauthier and Weinstock, 2010). Consequently, since the early years 2000, the number of BRT projects has been increasing in African cities, in Lagos, Dar es Salaam, Abidjan, Accra, Addis Ababa, Dakar, Kampala, Luanda, Maputo, Nairobi, and nine cities in South Africa (Deng and Nelson, 2011; Hussen, 2016; Mobereola, 2009; Nkurunziza et al., 2012; Pirie, 2014; Rizzo, 2015; Vermeiren et al., 2015; Wood, 2015a). These technically innovative projects, at least at the continental level, draw from Latin American experience, in particular the Transmilenio in Bogota, and have been drawn up at the instigation of international donors and a number of pressure groups “who adamantly advocate for [sic] the adoption of BRTs” (Rizzo, 2015: 252). Their accompanying financial arrangements generally feature public-private partnerships for which only a small number of global firms compete (Siemiatycki, 2013: 1263). The dominant model that is responsible for the international spread of BRT is underpinned by the wide currency of neoliberalism, and targets, in particular, “the creation of an international market for bus service” (Paget-Seekins, 2015: 116). It is thus part of the trend

towards globalization, involving the simultaneous circulation of policies, concepts, capital and production tools (in this case buses). Africa's BRT projects are still having difficulties getting off the ground¹, in particular because gaining local acceptance is a slow process which requires the harmonization of the interests of a diversity of local stakeholders with the "norms" inherent in the Bogota model (Wood, 2015b; Rizzo, 2015). Nevertheless, the number of projects and the diversity of the national contexts in which they are being developed bear witness to the involvement of African countries in the dissemination and implementation of "good practices" in the area of urban transport and show the integration of the coveted African transport sector within the globalized world economy.

Mass transportation systems are therefore not, or not yet, able to satisfy the growing travel needs of Africa's urban residents. However, the functioning of the city requires that these needs be at least partially met, which has led to the continuous growth of informal transport. In 2000, Cervero stated that "As the world's poorest continent, informal transport services are as prevalent and extensive in Africa as anywhere" (Cervero, 2000: 149). Immediately after this statement, he pointed out that motorcycle taxi services were both already very present in African cities and at the same time expanding rapidly. Nearly 20 years later, informal transport is still the dominant form of public transport and the role of motorcycle taxis is still on the rise (Ehebrecht et al., 2018).

Motorcycle taxis undoubtedly share a number of features with earlier forms of "informal transport" or paratransit, such as shared taxis and minibuses (Behrens et al., 2016; Cervero, 2000; Cervero and Golub, 2011; Dimitriou and Gakenheimer, 2011; Khayesi et al., 2015; Venter, 2013). However, they reflect a more thoroughgoing form of "informality" than these other forms of public transport, whether we base our assessment on measurements of inputs or outputs: smaller vehicles and fewer passengers, less capital required to set oneself up in the business and the fact that the professional knowledge required to drive the vehicle is minimal.

The rise of motorcycle taxi businesses can be perceived as a sign of bottom-up resistance to the spread of neoliberalism in African societies through advocacy of local initiatives and resources and ultimately, as a counter-model that is in opposition to BRT projects. However, the development of motorcycle taxis in SSA can also be perceived more as the sign of another form of participation in

¹ So far, BRT projects have been implemented in only a few cities, namely Cape Town, Johannesburg, Lagos and Dar es Salaam.

the general movement towards neoliberal globalization and this paper is an attempt to provide support for this view. The globalized circulation of transport policies is still present, but here it takes the form of a critique, by donors (Kumar, 2011) and the local public authorities, of the anarchical operation of motorcycle taxis and external effects such as congestion, road traffic accidents and atmospheric pollution, which are extremely costly for society (Ezeibe et al., 2017). With regard to the globalized circulation of the factors of production, motorcycle taxi services depend on the availability of low-cost vehicles, which relies on the continuous increase in Chinese exports of cheap products to African countries (Kaplinsky, 2013).

But in the sphere of urban transport, the rise of motorcycle taxis also expresses one of the most striking facets of contemporary capitalism, namely the informalization of the production of goods and services in the societies of the South (Lourenço-Lindell, 2004; Meagher, 1995; Portes and Haller, 1989; Potts, 2008). Globalization and informalization are today "interwoven processes" (Rogerson, 1997:338) that determine and shape the functioning of African cities (Lindell, 2010; Meagher and Lindell, 2013; Rakodi, 1997). More precisely, our analysis of the informalization of urban transport in SSA draws upon the theoretical framework developed by Meagher in the African context (1995:261) which highlights the following analytical categories: "informal sector differentiation, the role of informal social networks, linkages with the formal sector, and the role of the state in the informalization process".

In order to gain a better understanding of the forces driving the development of motorcycle taxis in Sub-Saharan Africa and on the basis of empirical data, this paper will attempt to answer two questions. First, how can we objectify the massive and lasting development of a "motorcycle taxi model" in the cities of SSA? Second, how does this model function in practice? To begin with, at the subcontinental level, we shall describe the spread of motorcycle taxis in Sub-Saharan Africa by identifying the locations where motorcycle taxis are present, using an internet-based bibliometric analysis (Section 2). Then, on the basis of a field study conducted with a view to gaining a better understanding of the supply and demand for motor-cycle taxi services in Lomé, the capital of Togo, we shall analyze the informalization rationales that are at work in the deployment of the motorcycle taxi model (Section 3). Next, we shall discuss our main findings on the spread of motorcycle taxis industry and its dynamics in a context of globalization and informalization (Section 4). Finally, we shall conclude on the future of the motorcycle taxi (Section 5).

2. An Internet search on motorcycle taxis

Observing the spatiotemporal spread of motorcycle taxis in the cities and countries of Sub-Saharan Africa is not straightforward. Responsibility for urban transport mostly lies with the Ministry of Transport. However, in general these ministries do not have a database, or at least not one that is up-to-date and reliable, on motorcycle taxis as these are frequently tolerated rather than authorized. Matters are made even more difficult by the fact that cross-country comparisons are almost impossible, especially in the case of secondary cities. This is because the decentralization of governance is still limited and the attention of the public authorities tends to be focused on their larger and capital cities. Enormous human, financial and temporal resources would be required to overcome this lack of data by collecting information locally to confirm the presence of motorcycle taxis and quantify it in different countries.

We have therefore chosen another method, namely the bibliometric² monitoring of documents that deal with local motorcycle taxis based on the resources available on the Internet. We have based this work on bibliometric studies which examine the state of knowledge in a given field (identifying research topics and trends, the most active countries in terms of the number of publications, etc. — see for example the review conducted by Najmi et al., 2017 in the field of transport). Our bibliometric approach allows us to ascertain the geographical spread of motorcycle taxis by monitoring the documents dealing with them that are available on the Web.

To begin with, we considered academic research in the different countries by conducting on-line searches using Google Scholar (Section 2.1), after which we referred to articles dealing with large urban areas in the mainstream press, by using the Google search engine (Section 2.2). This method provides a novel view of the geographical spread of motorcycle taxis in Sub-Saharan Africa as a result of the globalization of informal practices in urban transport (Section 2.3).

² The fields of bibliometrics, scientometrics and informetrics are clearly defined by library and information science scholars (see for example Tague-Sutcliffe, 1992 for an overview or Hood and Wilson, 2001, for the definition of these terms and a historical survey of their development). However, the terms in question are often used as synonyms (Eom, 2008). Hood and Wilson (2001) acknowledge that “These terms are used to describe similar and overlapping methodologies.” (:291) and that “researchers outside the information science discipline will continue to use the more familiar (and established) term, bibliometrics.” (:300). For ease of understanding, in this paper we have therefore used the generic term “bibliometrics”, which concerns the “quantitative aspects of how different types of information are generated, organized, disseminated and used by different users in different contexts” (Björneborn and Ingwersen, 2004:1216).

2.1. An increasing presence on the scientific agenda

The hypothesis that underlines our first series of Internet searches is that the countries in which motorcycle taxis have expanded have generated academic research which is available on the Internet, because “Since its advent, the Web has been widely used in both formal and informal scholarly communication and collaboration” (Björneborn and Ingwersen, 2004:1216). The themes covered by scientific publications and their changing nature provide “a good signal of the emergence” of societal issues and the interest shown in them by the academic community via their presence on research agendas (Jeanneaux et al., 2012:12). Bibliometric analyzes show that while many scientific fields, such as physics, chemistry and natural science target an international audience “the output in many social sciences and humanities fields is primarily oriented at national or regional topics and a local public” (Nederhof, 2006:83). This is the case, for example, for human geography and therefore publication channels other than the peer-reviewed literature are used by scholars. These include reports, book chapters, monographs, reports, policy briefs, working papers and regional or national periodicals (Gorraiz et al., 2016). Also, “a high percentage of social science studies is (in)directly relevant to policy” and is addressed to a non-scholarly public (Nederhof, 2006:88). Identifying academic research on the motorcycle taxi through the various channels thus highlights the interest it generates, the range of topics covered, the degree of spatial concentration of the studies and how they have evolved over time.

However, the academic output in each country does not depend solely on the importance of the role motorcycle taxis play there. It is also influenced by the country’s demographic size, the density of universities, its “academic vitality”, the accurate indexation of its scientific output by search engines and databases, whether transport constitutes an academic field and, in particular, whether or not there are universities in the regions or cities with motorcycle taxis. For example, as shown below, in Table 1, the position of Nigeria, which is by far at the top of the list, does not depend only on the high penetration of motorcycle public transport, which has been observed in a number of studies (for example, Fouracre and Maunder, 1988; Fasakin, 2000; Morenikeji and Umaru, 2012; Obinna Ezeokoli et al., 2016), but also on the size of the country’s university sector compared to the other countries in the subcontinent.

Several factors led us to base our investigations on data from Google Scholar, which is a search engine rather than a database. First, it has free access, which is not the case for multi-disciplinary

citation databases such as Web of Science or Scopus. Next, its content better matches the scientific fields (business and economics, engineering, the social sciences) which are likely to study motorcycle taxis, and includes a larger number of references in languages other than English (Harzing and Van der Wal, 2008). Output in the social sciences is frequently published in a local language to target the local audience (Gorraiz et al., 2016; Chi, 2014) and many Sub-Saharan countries are not English-speaking. The main limitations of Google Scholar which may impinge on our results involve the extent of its coverage: some publication channels are not indexed (e.g. some scientific journals and international or local conference papers and proceedings in the field of transport) or are covered only partially (books and book chapters), the number of “old” documents dating from before 1990 is underestimated, and the coverage of the medical field, with regard to road safety and occupational diseases, is patchy (Harzing and Van der Wal, 2008). However, citation databases are not comprehensive because they mainly cover the peer-reviewed journal literature and do not index grey literature (University of Waterloo Working Group on Bibliometrics, 2016; Neuhaus and Daniel, 2008). They show only the “visible part” of the iceberg while the “much bigger ‘invisible’ part is inaccessible to these citation databases but can be explored to some extent by Google Scholar.” (Gorraiz et al., 2016:895). Even though Google Scholar lacks transparency with regard to its indexing policies (Delgado-Lopez-Cozar and Cabezas-Clavijo, 2013; Neuhaus and Daniel, 2008), and is thus perceived as a “black box” needing more quality control (Aguillo, 2012), it has more comprehensive coverage than the alternatives, particularly in the social sciences (Chi, 2014; Gorraiz et al., 2016) and engineering (Harzing, 2016).

The bibliographical references were retrieved from Google Scholar using the Publish or Perish application (Harzing, 2007). This has the advantage that the results are given in a form that is easier to handle than when Google Scholar is used directly. The search, which was conducted at the end of week 24 (mid-June) 2017, took in journal articles, books, book chapters, papers presented at conferences, conference proceedings, PhD and master’s degree theses and technical reports, and focused on the words in the title. Restricting the search to the title and ignoring the abstract and the body of the text means we missed documents in which motorcycle taxis are mentioned only in the body of the text, for example as one component of transport supply, but provided a way of identifying the key publications (Harzing, 2016). Our search targeted generic terms³ designating

³ The initial lists of generic and local names were drawn up on the basis of the authors’ knowledge about motorcycle taxis in Sub-Saharan Africa which they have gained over more than ten years of research on the subject. These lists were

motorcycle taxis not only in the languages that are the most used for scientific communication in the subcontinent⁴ but also their various local names⁵ and some variant spellings⁶. It was limited to 2-wheeled vehicles, even though use of motorized tricycles is rapidly increasing in some cities (e.g. in Burkina Faso, Ethiopia and Madagascar), where they are sometimes also referred to as motorcycle taxis. The scope of the search was, obviously, limited to the countries of Sub-Saharan Africa, but no restrictions were applied concerning the geographical scale, which ranged from the local to the national, or the environment, which included both urban and rural areas. The time span was not limited either: the first reference retrieved dated from 1988 and the last from 2017.

The resulting database contains 334 references which relate to 14 countries and their respective motorcycle taxi industries, only 4% of which dealt with more than one country (Table 1). The country-by-country distribution shows a very high degree of concentration. Nigeria accounts for almost half the references, and only four other countries - Kenya, Uganda, Benin and Cameroon - account for more than 5% each. The 9 other countries together provide only about 15% of all the references. Representation of the different geographical levels was variable. Half the documents focused on urban areas, but only a tenth of these dealt with small cities with fewer than 100,000 inhabitants. Provincial levels, whatever term is used to describe them - state, province, district, etc. - and the national level each accounted for about one in five of the documents.

added to during the search process through the snowball effect. Also, in many retrieved references, both generic and local words are used in the same article. We have assumed that any unidentified names or variant spellings are infrequent and that their impact on our results would therefore be very limited.

⁴ Motorcycle taxi, motorbike taxi, motorcycle transport, commercial motorcycle, commercial motorcycling, commercial motorbike, public motorcycle, public motorcycling, public motorbike, moto-taxi, mototáxi.

⁵ Achaba, akauke, alalok, bendskin, bodaboda, express, going, inaga, jakartas, kabu-kabu, kupapata, machala, manseba, motari, okada, oleyia, phen-phen, wewa, zabala, zemidjan.

⁶ Such as for example: moto-taxi and taxi-moto; zemidjan, zemijan and zem; bendskinneur and benskinneur, etc.

Table 1. Countries in which academic work on motorcycle taxis were conducted in the period 1988-2016 according to Google Scholar

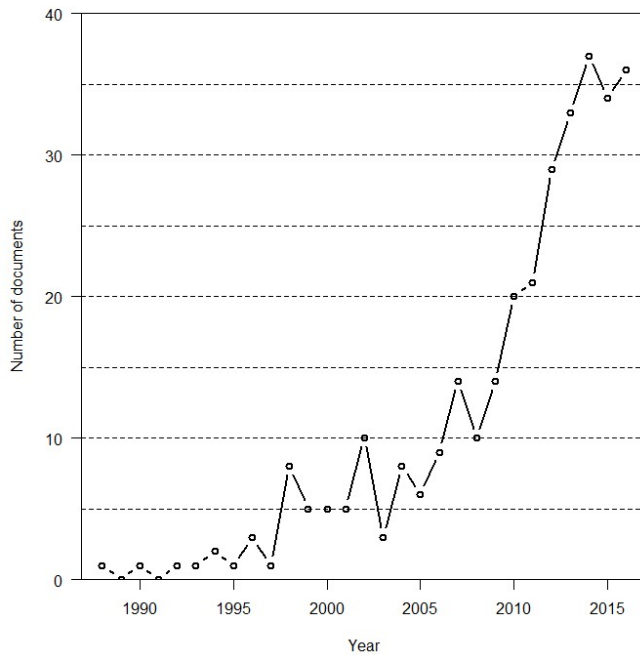
	Number of studies	%
Angola	3	0.9
Benin	26	7.8
Cameroon	19	5.7
Côte d'Ivoire	1	0.3
Ghana	5	1.5
Kenya	45	13.5
Niger	1	0.3
Nigeria	159	47.6
Uganda	33	9.9
Democratic Republic of Congo	2	0.6
Rwanda	4	1.2
Sierra Leone	4	1.2
Tanzania	7	2.1
Togo	11	3.3
Several countries	12	3.6
Country unknown	2	0.6
Total	334	100.0

Source: the authors, on-line search with the Publish or Perish application.

Based on the annual number of publications we have identified three periods (Fig. 1):

- from 1988 to 1997, the number of documents visible on Google Scholar is very small, with on average one reference per year;
- from 1998 to 2006, the number increases, with 6 references per year on average;
- from 2007, the number of documents increases exponentially attaining 36 in 2016, with an average of 25 references per year (2017 not included).

The distribution between urban, provincial and national areas was constant during all the periods. Even though Nigeria's share of the academic output also remained much the same throughout the 30-year period we studied, the frequency pattern per country changed markedly over time. Benin and Nigeria monopolized the publications during the first period (1988-1997), while Uganda and Cameroon started publishing in the second period and Kenya joined them in the last phase (Table 2). Documents dealing with the nine other countries were concentrated in the most recent period.



Source: the authors, on-line search with the Publish or Perish application.

Fig. 1. Number of academic documents on motorcycle taxis in Sub-Saharan Africa in 1988-2016 identified on Google Scholar

Table 2. Number of academic publications in each period for each country*

	Benin	Cameroon	Kenya	Nigeria	Uganda	Other countries	Total
1988-1997	5	0	0	5	0	1	11
1998-2006	9	5	1	29	7	3	54
2007-2016	12	14	44	125	26	34	255

* Fourteen publications dealing with multi-country studies or in which the country is unknown have not been included.

Source: the authors, on-line search performed with the Publish or Perish application.

The increase in the number of publications also coincided with a change in the issues covered (Table 3). Over time, the amount of attention given to the drivers has greatly increased, to the detriment of analysis of the industry as a whole. Road safety aspects also receive more coverage now, with one in three titles referring to these in the most recent period. Other issues have received less coverage, for example between 12 and 16% of the documents during the period from 2007 to 2016 dealt with development issues, governance and the economics of the industry. Two external impacts of motorcycle taxis, which are nevertheless frequently highlighted in the literature, seem to receive only marginal coverage: environmental issues (whose coverage is not only marginal but declining), and concerns about the security of goods and individuals, which have been grouped

together in the category “Others” in the table. The changes in the pattern of topics may be influenced by internal and external factors such as the economic and political environment, the local funding framework for higher education and research, or the policies of international donor agencies concerning their priority intervention fields or projects. However, further analysis in this area is beyond the scope of this paper.

Google Scholar’s listing of academic documents with a title which refers to motorcycle taxis therefore exhibits a number of changes over time. These are both quantitative, with a considerable rise in the number of publications in the last 10 years, and qualitative, with a gradual change in the topics covered. The growing importance of this mode of public transport means that there is a greater amount of interest in those who work in the industry and, above all, greater concern about road safety issues, which assume greater importance as the number of motorcycles on the streets increases. The zones studied are progressively becoming more varied, and are expanding as the motorcycle taxi spreads. Nevertheless, the study of scientific output only provides a partial picture of the extent to which the mode is present in Sub-Saharan Africa as we shall see from the second phase of our study, which is an analysis of articles in the press.

*Table 3. Focus and topics mentioned in the title of academic documents depending on the period (%)**

	1988-1997	1998-2006	2007-2016	All periods
Focus				
Driver	18	36	55	50
Industry	82	64	46	50
Topic				
Road safety	18	24	34	32
Public health	18	15	16	16
Economics	9	7	14	13
Territorial development	9	7	12	11
Governance	9	10	12	11
Environment	18	5	3	4
Others	0	15	9	10

* As several topics can be mentioned in the same title, the column totals do not equal 100.

Source: the authors, on-line search performed with the Publish or Perish application.

2.2. A snapshot of the presence of motorcycle taxis *circa* 2015

Our second analysis focuses on the largest cities in the countries of Sub-Saharan Africa. It is based on two assumptions: first, when motorcycle taxis are present in a city they contribute to its economic and social operation and play a role in the daily lives of the population, all of which are described

in articles in the press; second, the major newspapers have websites and publish their articles online. Like the previous analysis, this is also subject to bias. Two types of bias are particularly worthy of mention here. First, there are major disparities between countries and within a given country regarding both the availability of the Internet and the role and vitality of the local press, which will affect its Internet presence. The second type of bias relates to measurement of the size of cities which we have decided to estimate on the basis of the population because this largely determines the volume of transport demand and the supply that is required to meet it. In order to obtain a single population database, we have used the GeoNames website, which, for each country, gathers together and homogenizes a variety of sources of geographic and demographic data (www.geonames.org). Nevertheless, the reliability of the data it provides depends on the results of national censuses which are conducted at dates which vary a great deal from one country to another. Moreover, the information is associated with local administrative entities, which means the database is sensitive to changes in administrative nomenclatures and boundaries and is therefore generally unable to tell us the population of conurbations, but only the populations of the towns or municipalities that comprise them.

We limited the survey to 45 countries, excluding the smallest island states of SSA, namely Mauritius, the Comoros, the Seychelles, São Tomé and Príncipe and, last, Saint Helena, Ascension and Tristan da Cunha. We identified the cities with populations of at least 100,000 in each country. Where there were none, we selected the largest city, whether or not it was the national capital⁷. In countries with more than ten such cities⁸, we chose the ten largest. This gave us a sample of 211 cities.

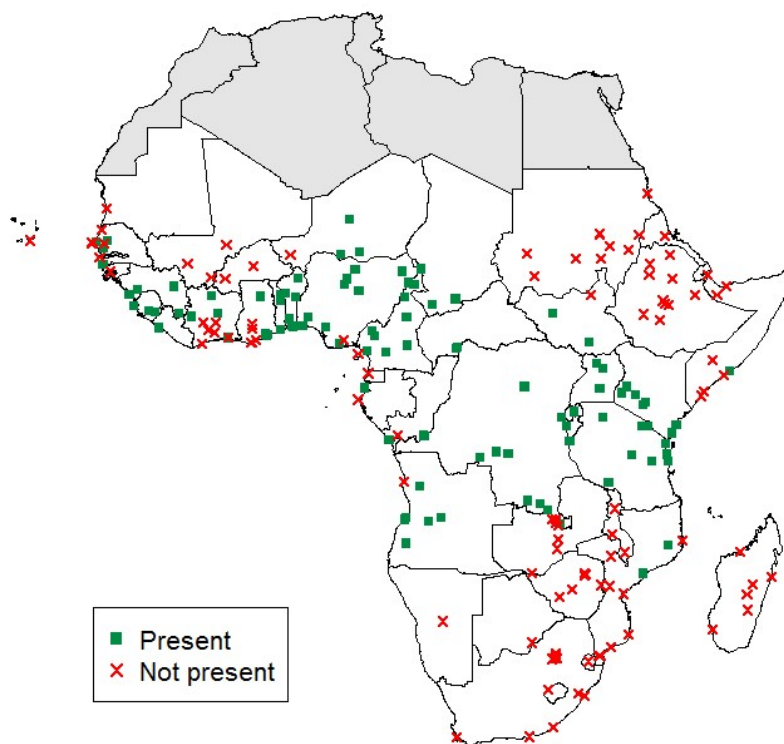
As in the case of the search described above, we focused on two-wheeler motorcycle taxis. The following keywords were used in our Google searches: the name of the city and the local denomination of the motorcycle taxi with its variant spellings, and, depending on the country, its translation into English, French or Portuguese (see footnotes 4, 5 and 6). For a given city, when at least one press article mentioning motorcycle taxis appeared “around” 2015 (2013-2017) they were considered to be present. If no press articles on the local motorcycle taxi industry were published in

⁷ The capitals of Gambia (Banjul) and Swaziland (Mbabane and Lobamba) were thus excluded from the sample as they were smaller, according to the GeoNames database, than Brikama and Manzini, respectively.

⁸ Cameroon, Democratic Republic of Congo, Côte d’Ivoire, Ethiopia, Ghana, Mozambique, Nigeria, Sudan, Tanzania, Zambia.

a city, we assumed it has no such industry. The limitations described above mean that some cities may have been missed during our monitoring of the press, but the results below give an overall assessment of the existence of motorcycle taxis in the largest cities of SSA.

A map of our results shows the area within which motorcycle taxis have spread (Figure 2). Their presence has been observed in 113 of the 211 studied cities (54%). They have spread to the cities of 27 of the 45 countries, in West Africa (with the exception of Mauritania, Burkina Faso and Mali), Central Africa and part of East Africa, while the industry is absent in the cities of Southern Africa, apart from Angola and Mozambique, and the countries of East Africa in the Horn of Africa (Sudan, Ethiopia, and Somalia with the exception of one city). The disparities between sub-regions are marked, with the proportion of cities with motorcycle taxis rising from 25% in Southern Africa to 46% in East Africa, 69% in West Africa and 74% in Central Africa.



Cities with at least 100,000 inhab., no more than 10 by country

Source: Population data: GeoNames; motorcycle taxi data: the authors, internet survey.

Figure 2. The presence of motorcycle taxis in the cities of Sub-Saharan Africa with more than 100,000 inhabitants, based on press articles (circa 2015)

2.3. Long-standing but still ongoing growth to cover an extensive but fragmented area

The motorcycle taxi's increasing presence on the scientific agenda and the growing diversity of the zones covered very much follows the spread of the mode. Thus, Nigeria seems to have been first on the scene, with reports of motorcycle taxis in Calabar and Yola from the early 1970s (Adesanya, 1998; Ogunsanya and Galtima, 1993), and in Port Harcourt and Kaduna in the first half of the 1980s at the latest (Adeniji, 1986; Chile Love, 1988). The phenomenon then appears to have spread through proximity. Motorcycle taxis soon appeared in Benin, reaching Porto Novo in 1976 and Cotonou in 1991 (Agossou, 2003; Sambo, 2010). They appeared slightly later, in the first half of the 1980s, in Niger and Cameroon. In Niger, they were reported from 1984 in the border town of Konni (Dillé, 1998) and in Cameroon at the same time in the major northern cities (Maroua, Garoua, N'Gaoundéré; Sadou, 2007), then further south, in Douala from 1991 (Ngabmen et al., 2000) and Tombel in 1992 (Nkede Njie, 2012). We can identify a second center in East Africa, on the Uganda-Kenya border, as a result of the transformation of bicycle taxis, which first appeared in the early 1960s, into motorcycle taxis (Malmberg Calvo, 1994; Howe, 2002). Motorcycle taxis then became widespread in both countries before spreading to Rwanda and Tanzania. The dates here are less certain, if only because bicycle taxis and motorcycle taxis are both called "boda boda". More recently, the spread of the motorcycle taxi has been fueled by other factors, and the role of international bodies should be mentioned: DDR (Disarmament, Demobilization, Reintegration) initiatives after civil wars have frequently included retraining former members of the military or paramilitary as motorcycle taxi drivers, as in Côte d'Ivoire (Roger et al., 2016), Liberia (Baker, 2007), Rwanda (Rollason, 2013) and Sierra Leone (Menzel, 2011).

Our analysis of the presence of motorcycle taxis, on the basis of articles in the local press that are available on the Internet, supplements our initial identification of scientific publications. While this source provides little information about the chronology of the process, it provides a more precise measure of the spatial presence of the industry at a given time, namely *circa* 2015. While our first analysis identified the presence of motorcycle taxis in 14 countries over a 30 year period, the second phase, even though it is limited to cities with populations of at least 100,000 inhabitants, almost doubles the number of countries. If we were to consider other geographical scales, as we did in the first analysis, more countries would doubtless be added to the list, even though areas with smaller

populations and that are of less administrative importance are probably less frequently mentioned in the press.

Table 4. Percentage of cities with or without motorcycle taxis, according to size

	Present (%)	Not present (%)	Number of cities
100,000 – 200,000 inhab.	45.5	54.5	77
200,000 – 500,000 inhab.	60.9	39.1	64
500,000 – 1 million inhab.	56.2	43.8	32
Over 1 million inhab.	55.3	44.7	38
Total	53.5	46.5	211

Source: Population data: GeoNames; motorcycle taxi data: the authors, internet survey.

The presence of motorcycle taxis seems to bear little relation to the size of the city (Table 4). They are slightly less frequently observed in the cities with between 100,000 and 200,000 inhabitants than in the largest cities. But this may be partly due to the fact that there are fewer press articles on all topics on secondary cities. When motorcycle taxis are observed in a country, in two out of three countries they are present both in the capital and in some or all of the secondary cities⁹. More rarely, they are present in secondary cities but not in the capital. This applies to Côte d’Ivoire, Malawi, Mozambique, Senegal and Zambia. Even more rarely they are present in the capital but not in secondary cities (Gabon, Somalia).

However, the spatial distribution of motorcycle taxis is not uniform. Figure 2 shows pronounced regional differences. We shall not attempt here to give a precise explanation for these regional disparities, nor for any differences which may be apparent within a geographical subset, as the regions themselves are not homogeneous. We can nevertheless suggest some partial explanations. One such explanation is certainly spreading through proximity, as shown by the brief chronological account given at the beginning of this section, or the reconstruction of the spread of motorcycle taxis in Benin by Agossou (2003). Being landlocked, as it makes it more difficult for a country to participate in international trade flows, can also explain some situations: motorcycle taxis are present in just 35% of the cities in landlocked countries as opposed to 60% of those in coastal countries.

⁹ Necessarily, in this context we shall only consider the 31 countries with at least two cities, including the capital, in the sample.

The labor reserve economies of the colonial period (as opposed to cash crop countries and the Africa of the concession companies) nowadays have Central Governments with perhaps the strongest political capacity and are less marked by informal activities (Mkandawire, 2010). In these countries, motorcycle taxis are present in less than one in three cities, compared to more than 75% in the two other groups. In those countries which import few motorcycles from China and India and which are therefore more reliant on European or American manufacturers, motorcycle taxi services are much rarer (12% of cities). Additional investigation would, however, be required to evaluate the relative weights of these different factors, in particular as they are very much intertwined.

Our bibliometric analysis has revealed the spatial distribution of motorcycle taxi use in SSA, provided us with some temporal reference points for its deployment and suggested some reasons for its greater or lesser presence in different sub-regions and countries, for example spatial features, such as geographical proximity, or the possession of a seaboard, or the integration of the country in question within the global economy. These findings provide support for the hypothesis that there is a “motorcycle taxi model” which has been spreading widely in SSA for a number of decades. We shall now attempt to explain the nature of this model, by conducting our observations at a local scale.

3. Understanding the operation of the industry in Lomé

When implemented, the “motorcycle taxi model” is liable to undergo a degree of adaptation to allow for local conditions. Precise characterization of the motorcycle taxi model therefore requires rigorous empirical work in order to construct a set of “good case studies” (Flyvbjerg, 2006). The diverse nature of the services offered by motorcycle taxis, the forms of internal organization and governance, and its dealings with the State have been highlighted by many scholars (Djouda Feudjio, 2014; Ehebrecht et al., 2018; Evans et al., 2018; Goodfellow, 2015; Tuffour and Appiagyei, 2014). This diversity is also reflected in the varying position of the motorcycle taxi in the modal split¹⁰. The bibliographic analysis detailed in Section 2 suggests other factors that can be used to identify contrasting situations: the date the phenomenon first appeared, the country’s degree of economic

¹⁰ In some cities, such as Cotonou or Porto Novo in Benin, motorcycle taxi is the main form of public transport (Agossou, 2004). In other settings, it is only one of several components of a diverse transport offering. In Dar es Salaam, for example, it operates on the outskirts of the city and serves as a feeder mode in order to reach asphalt roads and minibus stops (Andreasen and Møller-Jensen, 2017; Goletz and Ehebrecht, 2018). In Lagos, it is mainly used to connect to the BRT system (Olawole, 2012), while in Kampala, it has an intermediate position, with a presence both on the periphery, as a means of travelling to and from minibus terminuses, and on major roads, where it competes with minibuses (Kumar, 2011).

openness and integration within Asian vehicle export sectors, the political capacity of the State and the city's position within the urban hierarchy. This paper is also a contribution to the study of the dynamics of urban transport informalization in sub-Saharan Africa by means of the case study of Lomé. This case alone cannot, of course, cover the diversity of urban configurations in which the motorcycle taxi is currently spreading in sub-Saharan Africa. Lomé is a major port in West Africa which is well integrated within international trade networks (Bost, 2007) and provides a "good case" of the large cities in which the motorcycle taxi has been established for many years and acquired a dominant position in transport provision (Diaz Olvera et al., 2015). It also illustrates the situation in large cities in countries with weak central governments, which emerged from the cash crop economies of the colonial era and in which the informal economy is flourishing (Mkandawire, 2010).

Meagher (1995:265), following on from previous research by Castells and Portes (1989) and Portes and Haller (1989), took the view that it is necessary to take account of four points in order to understand "the role, and the potential, of the informal sector":

- the role of the State, whose "complicity" (Meagher, 1995:277) is indispensable;
- internal differentiation within these activities if only because some individuals are employers and others employees;
- linkages with the formal economy, which are vital for the concrete functioning of both formal and informal activities;
- lastly, the role of informal social networks which have the capacity, in particular, to regulate the relations between employers and employees.

Our secondary analysis of empirical material collected during field work in Lomé in 2011 and 2012 has allowed us to characterize the motorcycle taxi model that has been taking shape in this city, by applying Meagher's analytical framework. The available data do not allow us to conduct specific analysis of the role of social networks, but we shall nevertheless mention some aspects of it when we examine the links between the players.

Section 3.1 is devoted to the available empirical material. The urban context of Lomé and the major phases of the development of public transport supply are then described in Section 3.2. We go on to highlight the types of public intervention that have affected the motorcycle taxi industry

(Section 3.3), and then examine the heterogeneous nature of the stakeholders who are directly involved in delivering services (Section 3.4), and lastly the links which exist between this type of informal transport and formal economic activities (Section 3.5).

3.1. Varied fieldwork

The survey dealt with the operation of the industry from the two complimentary standpoints of supply (motorcycle taxi drivers) and demand (users). This dual approach provides a comprehensive picture which allows us to check the consistency of our data.

In order to gain a broad understanding of the dynamics of the motorcycle taxi sector, questionnaire-based surveys were conducted among the two target populations (Table 5). Field investigations also included a series of semi-structured interviews with 12 motorcycle taxi drivers, four owners who rented out their vehicles, two Ministry of Transport officials and one senior member of a professional body. Detailed information on spatial and temporal sampling, the content of the questionnaires and the topics addressed during the interviews may be found in Diaz Olvera et al., 2016.

Table 5. Characteristics of the questionnaire-based surveys

	Motorcycle taxi drivers survey	Public transport users survey
Date of survey	March 2012	November 2011
Type of survey	Face-to-face, paper questionnaire, in a public space	
Survey perimeter	The conurbation of Lomé	
Geographical strata	10	
Sampling	Empirical (itinerary method within selected survey sites)	
Sample size (individuals)	147	1,228
Number of survey staff	6	8
Language	Ewé / French	Ewé / French
Training	Yes: 1 day	Yes: 1 day
Period of survey	Monday to Saturday, off peak periods, during drivers' rest times	Monday to Saturday
Average time for administration	30-35 min	10 min
Compensation	Yes: # 2 average rides	No

Source: the authors.

3.2. Lomé: the city and its transport system

Lomé is Togo's capital and its largest city, containing a quarter of the country's population. It is one of the most active ports in the sub-region, and the city exerts a strong attraction for the rural population and the residents of neighboring countries. Between 1981 and 2010, which is the date of the most recent census, the population of the urban conurbation of Lomé grew at an average annual rate of almost 5%, rising from 385,000 to 1,477,000 inhabitants (Bureau Central du Recensement, 2011). At the same time, there was a substantial increase in the size of the urbanized area, which expanded from 6,000 to more than 20,000 hectares (Nyassogbo, 2011). Growth is restricted in the west by the border with Ghana and to the south by the Atlantic Ocean. The city has thus expanded considerably outside the municipality of Lomé and into the peripheral cantons to the north and east. This peripheral sprawl is characterized by low population densities and a lack of basic infrastructure (public facilities, roads, service networks). The need for motorized transport and its financial costs for households tend to grow as the city expands and distances increase. Less than the one in ten households owns a car, and less than three in ten owns a motorcycle (PNUD Togo, 2012). Consequently, most of the population is completely dependent on public transport for its motorized daily travel.

The demise of the municipal transport company in 1982 marked an important stage in the process of informalization which took place in urban public transport in the Togolese capital. As in other large cities of the South (Sclar and Touber, 2011), the company was not replaced by a large private transport company for many years, and it is informal operators (shared taxis and minibuses) which have catered for the travel needs of the city's residents (Pradeilles et al., 1991). It was only several years later, in November 1990, that the first motorcycle taxis appeared, at a time of marked political conflict, during a shared taxi strike. But they did not become established in Lomé until two years later during an unlimited general strike in opposition to the ruling political authorities (Guézéré, 2008). The informalization of Lomé's public transport coincided with the period in which economic policies became globalized as a result of the "Washington Consensus", and the application of structural adjustment programs to the African continent (since the early 1980s in Togo). These "one-size-fits-all neoliberal policies of deregulation, privatization and liberalization" (Kloosterman et al., 2018:7) have been instrumental in the informalization of African economies, increasing urban unemployment and worsening household living conditions. As in other Sub-Saharan cities (Diaz Olvera et al., 2012), the owners of private motorcycles have started to engage in commercial

transport activities against the background of a shortage of transport supply and massive youth unemployment. Since then, the number of motorcycle taxis has continued to rise.

From the middle of the years 2000, the importation of completely knocked down Chinese motorcycles, which cost half as much as Japanese models (200,000 FCFA as opposed to 400,000-500,000 FCFA in 2006¹¹), has boosted the attractiveness of the industry (Guézéré, 2008). The importation of cheaper vehicles lowered both the breakeven point and the capital investment required to purchase a vehicle, even if the amount of capital required is still a major barrier for motorcycle-based businesses. Because of its intrinsic characteristics, the motorcycle has also shown itself to be well suited to service roads, whose deficiencies become more and more marked as one moves further away from the city center (Philifert, 2008). It is difficult to know how many motorcycle taxis are in operation, but a union leader with a thorough knowledge of the sector who we met when conducting the study estimated that there were 90,000 in 2012.

Motorcycle taxis are not the only mode that provides commercial transport services in Lomé. Even though their presence has much diminished since the 1990s, shared taxis still exist and cost the user less than motorcycle taxis for journeys of over 4 km (Diaz Olvera et al., 2015). Furthermore, a public bus company, SOTRAL, has been operating services on several routes since 2009. Nevertheless, motorcycle taxis are the pre-eminent mode, not only in terms of traffic but also in terms of the presence in public spaces of a large number of occupations engaged in motorcycle repair and maintenance – mechanical, bodywork and tire repairs, welding, and washing (Nyassogbo, 2011). Based on the public transport users survey it has been estimated that in 2012 eight out of ten public transport trips were made by motorcycle taxi (Diaz Olvera et al., 2015).

3.3. The role of the State: equivocal public intervention

Togo's public authorities paid attention to the appearance of motorcycle taxi services from a very early stage, but their involvement in organizing the sector has not been substantial, whether as regards the regulatory framework, indirect incentives via planning policies, or structuring relations with the drivers.

¹¹ In 2006, 1,000 FCFA = €1.52, US\$ 2.00 or RMB 16.0.

As early as 1996, the government issued an interministerial order that set out to regulate the motorcycle taxi sector. This laid down the conditions to be fulfilled in order to work as a motorcycle taxi driver (possession of a motorcycle driver's license, a vehicle registration certificate, a license subject to official approval, insurance, a vehicle roadworthiness test certificate, a specific type of number plate to identify the vehicle) and laid down the rules to be obeyed when providing the service (maximum authorized number of passengers, compulsory wearing of a helmet and jacket). However, enforcement of these provisions has been episodic at best, and the regulations have very largely been ignored (Aboudou and Sounon Bouko, 2010; Aholou, 2008; Diaz Olvera et al., 2016; Guézéré, 2008). Most of the drivers rejected the constraints imposed by the regulations, as pointed out by a senior Ministry of Transport official: *"These measures were designed to ensure the occupation prospered and lasted but unfortunately in practice they have not been understood in this way"*. The motorcycle taxi drivers survey confirms that in 2012, very few of them complied with the regulations: of the 147 drivers who were surveyed, only 9 were correctly registered as motorcycle taxi drivers and possessed the appropriate number plate, 6 had a motorcycle driver's license, 7 wore the regulation jacket, 37 had vehicle insurance, and as many often wore a helmet¹². This generalized non-compliance with regulations has fostered corrupt practices. A great many drivers need to bribe the police during road checks in order to be able to continue to operate. According to the motorcycle taxi drivers survey, only 14 never paid bribes, while 34 did so at least once a week.

The "spontaneous" increase in the number of motorcycle taxi ranks is another example of the difficulties the authorities have regulating the motorcycle taxi industry (Guézéré, 2012). While the existence of taxi ranks potentially provides an indirect way of structuring the sector (four out of ten drivers belonged to a rank in 2012), the public authorities have in practice relinquished the ability to improve their operation and charge parking fees. In this situation where the handover of central government powers to local authorities is incomplete (Philifert, 2008), the involvement of the local authorities in the positioning or construction of motorcycle taxi ranks has been extremely limited and their creation has in most cases been the outcome of initiatives by the drivers who have grouped together to form associations or unions. One motorcycle taxi union leader explained the lack of involvement as follows: *"The local authorities think the drivers will rebel if they try to set up an*

¹² However, some more recent changes should be mentioned. Since 2014, after the introduction of a new Highway Code, and awareness raising and subsequent enforcement campaigns (the latter involving vehicle confiscation and fines), compliance with helmet wearing is now good among drivers, but less so among passengers (Pochet et al., 2017).

organized system [of ranks] and fees. But what needs to be done is to raise awareness among the drivers in question and obtain their consent. The second reason is that the city authorities are unsure how this will benefit them. The third reason, is that the drivers are perceived as being small-time crooks who will have to be eliminated sooner or later". Nevertheless, the public authorities are considering another form of indirect action, through the development of a bus company. But the aim is less to limit the role of motorcycle taxis and improve their operating conditions than to eradicate them, as a senior Ministry of Transport official explains: "Motorcycle taxis only exist because there is no public transport. Within the structure of the economy and traffic, motorcycle passenger transport creates more problems than it solves. Public transport is more reassuring and less expensive. If you have carried out surveys, you must know that transport costs in Lomé are unacceptable: if you travel from Adétikopé [a canton to the North in the outer suburbs] to Lomé, it costs at least 700 or 800 FCFA."

Lastly, Central Government has implemented variable policies regarding the internal governance structures of the occupation (drivers' unions in particular, as the vehicle owners have never grouped together to form a union or association) which has tended to weaken them. Initially, when the regulatory texts were at the stage of being drawn up and accepted by the drivers, the unions were the interlocutors of the ministries that deal with the motorcycle taxi industry. The public authorities thus to some extent delegated responsibility for regulating the motorcycle taxi industry to the unions, in particular, by entrusting them at certain times with awareness raising operations and monitoring compliance with the road safety regulations. Nevertheless, in 1999, in response to unrest among drivers due to the constraints resulting from self-regulation of the industry by the unions, central government changed its attitude and liberalized the conditions of entry to the sector, which reduced the influence exerted by the drivers' unions. While until this time membership of a drivers union was compulsory, it now became voluntary, as a leader of the motorcycle taxi drivers union explained: *"Until 1999, almost all motorcycle taxi drivers were compelled to belong to a motorcycle taxi union. They had to wear the jacket which could only be obtained from the unions. In 1999, it was decided to liberalize the transport sector. Laws were passed stating that union membership was voluntary"*. Of the 147 drivers who were surveyed in 2012, only 11 stated that they belonged to a union. The main reasons the others gave for their non-membership were that membership was pointless (52%), the fact that they did not trust the unions (19%) and the fact that the unions were too close to the public authorities (17%).

These different episodes reflect strained and frequently conflictual relations between motorcycle taxi drivers and the public authorities. They also highlight the role played by central government in the formation and development of the motorcycle taxi industry, in both its practices and modes of operation. The motorcycle taxi industry is closely dependent on the attitude of the public authorities with regard to those producing the service, i.e. the owners, the drivers and, when there are any, the unions and associations that represent their interests. The State has never attempted to regulate the relations between the owners and drivers, but has focused regulatory measures on the activity of the drivers, without however providing the resources to ensure compliance except during brief monitoring and punishment campaigns. It has thus left the motorcycle taxi industry free to develop, but has confined it to a setting which fluctuates between *de jure* illegality and *de facto* tolerance.

3.4. Internal differentiation: four categories of players with contrasting profiles

In order to understand the production process for motorcycle taxi services and the role of the different players we need to pay particular attention to the differentiated access to the fundamental means of production: the motorcycle. In spite of the fall in the price of the vehicles due to Chinese imports, most citizens can still not afford to purchase a motorcycle and this also applies to motorcycle taxi drivers. As in other cities of Sub-Saharan Africa (Aboudou and Sounon Bouko, 2010; Ngabmen et al., 2000; Oteng-Ababio and Agyemang, 2012; Oyesiku, 2001; Rollason, 2013), many drivers have to rent one from the owner. Following Diaz Olvera et al. (2016), we consider four groups of players in the motorcycle taxi industry on the basis of the ownership of the motorcycle and the nature of the contract between driver and owner:

- “Self-employed drivers” (almost three out of every five drivers) use their own vehicle;
- “Work-and-pay drivers” (a quarter of drivers) operate within a framework which resembles leasing that enables them to become the owner of the vehicle at the end of the operation;
- “Renters” (one driver in six) pay rent for the temporary use of the motorcycle;
- “Investors” buy motorcycles they do not drive themselves, seeking to make a profit from capital they have derived from other activities. They hire out motorcycles to work-and-pay drivers and renters.

Earnings are very unequally distributed, between drivers and owners and within the two categories¹³. At the bottom end, renters' income is slightly higher than the minimum monthly salary. Work-and-pay drivers earn more than individuals in other non-skilled jobs, but their working days are extremely long. However, they can hope to own the motorcycle when their contract comes to an end, even if many of them do not manage to do so and try again with a different owner. The incomes of self-employed drivers are close to those of work-and-pay drivers, but they work less intensively. Operating one's own vehicle appears to impose fewer constraints than having to hire one from an owner. Last, the investors derive a substantial additional income by almost doubling their initial investment in less than 18 months. Diaz Olvera et al. (2016) show how these income disparities have their basis in differentiated working conditions. Nevertheless, taking other factors into account provides a better understanding of the hierarchy which exists between these four categories of stakeholders.

The two groups of hirers differ in terms of the nature of their relationship with the vehicle owner. In the case of renters, the employment contract is oral, and frequently of unspecified duration. In the event of difficulties, payment of the rent may be partially or totally annulled or postponed. Work-and-pay drivers generally have a written contract which formalizes the bond of dependency with the owner of the motorcycle. It specifies for how long the rent is to be paid, its amount and frequency, and the duties and obligations of each party including how expenditure on the vehicle is to be shared between the driver and owner. Legal disputes, for example when the driver is unable to pay the rent on the agreed date, frequently come before the Lomé labor tribunal. The professional relationship between the renters and the owner is less formalized than for work-and-pay drivers, because a greater degree of social proximity is involved (Table 6). In more than eight out of ten cases of renters, the owner is a family member, a friend or a neighbor. The ties between the owner and work-and-pay driver are less frequently based on proximity – in less than half the cases. In spite of the fact that they can derive a personal income from the activity, renters have some similarities with “unpaid contributing family workers” (Chen, 2008:23). Work-and-pay drivers are in a more ambiguous position. The occupational status implicit in the formal contract seems to be half way between that of an employee and that provided by a hire-purchase contract (Panier, 2012). Their situation, in

¹³ Estimations of earnings are given in Diaz Olvera et al., 2016.

terms of income levels and working conditions, is more precarious than that of self-employed drivers.

Table 6. Nature of the ties between the hirer and the owner of the motorcycle (%)

The owner is...►	...a family member	...a friend	...a neighbor	...another person
Hirer ▼				
Renter	33	13	37	17
Work-and-pay	16	18	13	53

Source: the authors; survey of motorcycle taxi drivers in Lomé, 2012.

The two categories of owners differ in terms of the capital intensity of the business, which is reflected in the way it is financed and the scale on which it is conducted. As has been observed for other informal activities (Benjamin and Mbaye, 2012; Gough et al., 2003), the dominant financing model is that of using one's own resources or those of one's household. In three cases out of four, the owners invested their own funds to purchase the motorcycle. Due to their significant own financial capacities, the investors were able to purchase the vehicle without requiring any other contribution. On the other hand, in half of the cases, the self-employed drivers raised the purchase price by supplementing their own funds with money from another source (usually assistance from the family, rarely bank loan or microcredit). The two groups also differ in terms of the scale on which they carry out their transport operations. More than a third of investors own at least two motorcycles (2.2 on average), while this only applies to one in eight self-employed drivers (1.1 on average). In addition, 18% of investors operate other transport vehicles (passenger or freight), which is not the case for any of the self-employed drivers.

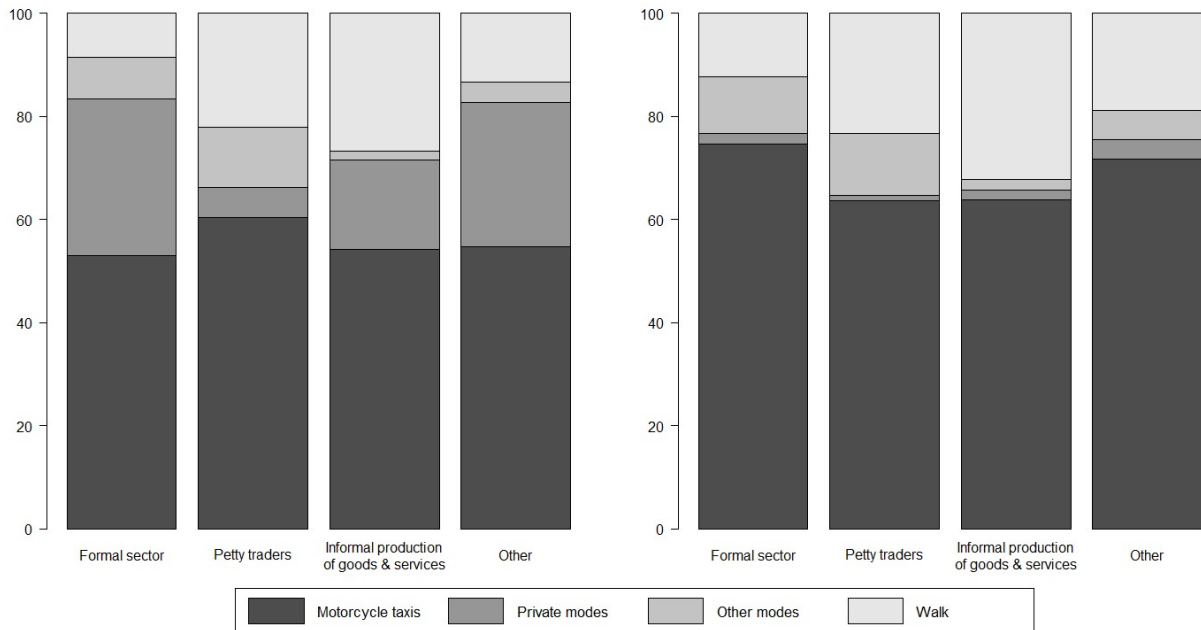
The dynamic of the motorcycle taxi model depends on the combination of four clearly differentiated and relatively compartmentalized groups of players. The investors occupy a central position in the motorcycle taxi system. They contribute indirectly to fix the overall level of supply and also influence the degree of competition between drivers and therefore the concrete conditions of service production. The considerable disparities between the earnings of the four groups, the heterogeneous nature of their socio-occupational profiles and the intensive way that motorcycle taxi drivers operate, particularly the work-and-pay drivers, show that in the motorcycle taxi sector, as in other informal activities, informalization exists both for survival and for accumulation, the latter being made possible by the former (Lourenço-Lindell, 2004).

3.5. Interplay between formal and informal economic activities

In contrast to the dualistic attitudes which have long viewed formal and informal activities as completely separate sectors, approaches that consider informalization set out to reveal the close structural ties which exist between them. These are due to the conditions of production (upstream) and consumption (downstream) of the service itself, and the careers of the various players.

Upstream, we have already mentioned the sector's dependency on low-cost Chinese motorcycles, which confirms "the extent to which the informal sector is dependent for its supplies on conditions in the formal sector and the global economy as a whole" (Meagher, 1995: 276). The largest item of operating expenses for motorcycle taxis, the purchase of fuel, also clearly shows that the activity is dependent on formal channels. Three-quarters of the drivers surveyed obtain their fuel from gas stations, with only one in four using small street vendors. However, the situation is different in Benin's coastal cities, which are closer to Nigeria and therefore better integrated within smuggling networks (Aboudou and Sounon Bouko, 2010; Aholou, 2008). These forms of supply vary over time, depending on the exchange rates between the CFA franc and the naira, as well as the firmness of the policies implemented by Benin and Togo to combat fuel trafficking (Guézéré, 2008). Nevertheless, over the long term, the number of service stations in Lomé increased significantly during the 2000s, a period of rapid rises in both motor vehicle ownership and the number of motorcycle taxis in particular (Biakouye, 2008; Guézéré, 2008).

Downstream, it is obvious but nevertheless necessary to mention that informal transport services, and therefore motorcycle taxis, are not solely or even mainly intended for individuals working in the informal economy and members of their households. The motorcycle taxi is the commonest usual transport mode for travelling to work, capturing between 53 and 60% of the trips to work, depending on the individual's sector of activity (Fig. 3). Among economically active individuals who do not have access to a private vehicle (Fig. 4), the motorcycle taxi plays an even more important role, with modal shares of between 64 and 75%, and individuals working in the formal economy are the most dependent on this type of service. This dominance is confirmed if we examine weekly motorcycle taxi expenditure for all trip purposes together. This stands at 2,340 FCFA for individuals working in the formal economy, higher than for petty traders (2,130 FCFA) and individuals working in the informal production of goods and services (1,930 FCFA).



Source: the authors, public transport users survey

Fig. 3. All economically active individuals: usual transport mode for travelling to work in Lomé

Fig. 4. Economically active individuals without access to a private vehicle: usual transport mode for travelling to work in Lomé

Interplay between formal and informal activities is also apparent when we examine the careers of individuals working in the motorcycle taxi industry. In order to fully appreciate the specific features of the different groups, we need to consider them in relation to the general characteristics of individuals who are in work. If we consider all activities together, in the case of Lomé, the available statistics show the dominance of the informal sector, which accounts for at least 80% of jobs, including most of those in business (Danish Trade Union, 2014; De Vreyer and Roubaud, 2013). However, if we look at individuals' careers we observe a degree of overlap between formal and informal jobs, which may be simultaneous or successive (Owusu, 2007; Potts, 2008). This also applies to those who work in the motorcycle taxi industry. Involvement in formal activities is very high among investors. Almost all of them (95%) have an economic activity, half of them as executives or employees in the formal economy¹⁴. This applies to fewer of the drivers, but the level remains similar to that observed within the economy of Lomé as a whole. While a quarter of motorcycle taxi drivers is engaged in another activity at the same time, in one in five cases this is in

¹⁴ A similar proportion consists of shopkeepers, which illustrates the high degree of permanence exhibited by this type of accumulation, as the same distribution was observed among Lomé's taxi and minibus owners in the late 1980s (Pradeilles et al., 1991) and among motorcycle taxi owners in the mid-2000s (Aholou, 2008).

the formal economy. Three-quarters of drivers had had another job before becoming a motorcycle taxi driver. Their dominant socio-occupational profile is that of a self-employed worker (or rarely an employee) in the informal production of goods and services (60%). The presence of the formal economy is smaller (of the order of 15%).

Linkages between the formal and informal economies are therefore apparent for each category of players but they are different in nature and they do not take place in the same time frame. Linkages enable the investors to gain a profit from capital derived from their principal activity. They thus draw benefits from “their ability to be selectively informal” (Banks et al., 2019). For the drivers they are the outcome of the difficulties they experience finding sufficiently well paid work in the long term in their original branch of activity.

These distinct occupational profiles and the highly contrasting earnings they generate also allow us to glimpse the barriers that exist between the different categories. Investors and self-employed drivers have contrasting socio-occupational backgrounds, which restricts the possibilities of moving from one status to the other. The boundary between work-and-pay drivers and self-employed drivers seems to be more porous, as 16% of self-employed drivers financed their motorcycle as a result of previous work-and-pay arrangements. However this percentage seems to be falling as Guézéré (2008) evaluated it at 40% in the middle of the years 2000. As in Kampala (Kisaalita and Sentongo-Kibalama, 2007), drivers’ incomes are generally not high enough for them to become the owner of a vehicle. In the same way, the investors are mainly civil servants or shopkeepers seeking an additional income, and very rarely former self-employed drivers as a result of the significant capital required in order to put a motorcycle taxi on the road, in spite of the existence of cheap Chinese vehicles.

The motorcycle taxi industry and the formal economy are closely interdependent, be it via the capital invested in the vehicle, via the social profile of the investors (many of whom straddle between formal and informal activities), via the terms of production of the service (which is highly dependent on the availability of low-cost motorcycles), or via the characteristics of those using the service. Intertwining between the formal and informal economies is particularly apparent in the case of motorcycle taxi users with regard to their socio-economic characteristics and travel needs. Workers engaged in formal activities are over-represented among motorcycle taxi users, helping to maintain a high level of solvable demand which preserves the service. But this dependency is equally strong

in the other direction: it is the existence of a supply of informal transport allowing urbanites to travel to work which enables administrations and firms to function.

The strengths and weaknesses of the dynamics that govern the spread of the motorcycle taxi and the informalization of urban transport in Lomé are rooted in the hesitant nature of public governance, the structural interdependency between largely compartmentalized socio-occupational groups and the close links between formal and informal activities.

4. Discussion

Our research shows how the motorcycle taxi, propelled by the interwoven dynamics of globalization and informalization, has been gradually appearing in the last few decades and is today a mode of public transport with an obvious presence in many cities of Sub-Saharan Africa. We present some measures of the spread of the motorcycle taxi in SSA based on bibliometric analysis of documents, both scientific and journalistic, available on the Internet. This dual empirical investigation has made it possible to objectivize the temporal and spatial spread of motorcycle taxis in the cities of SSA. In the mid-2010s, the motorcycle taxi was thus present in urban areas in 27 of the 45 studied countries. It is therefore no longer a marginal phenomenon as it was in the 1980s when its presence was limited to a few cities in West or East Africa, but a component of public transport supply in more than half of all cities.

Nevertheless some conurbations are, at least for the time being, untouched by the motorcycle taxi's spread. How this spread occurs in sub-Saharan African countries can be related to the type of economy that was inherited from the colonial period, and on the country's current degree of integration within the processes of globalization. The motorcycle taxi has developed more in the former colonial cash crop economies which have an older-established tradition of small economic activities than the countries where the labor reserve economy prevailed (Mkandawire, 1985). The reorientation and development of global trade channels, driven by the liberalization of international trade and lower maritime transport prices, has led to the massive arrival in Africa of Chinese motorcycles produced and sold at low prices. In general, motorcycle taxis arrived earlier and developed more quickly in coastal countries, which are the best connected to international shipping routes, than in landlocked countries.

These analyses need to be extended in order to gain a better understanding of this differentiated spatial presence. The uneven effects of globalization in different economic and spatial contexts (Knowles, 2006) still need to be interpreted, and it would also be useful to take account of other local factors such as the varying strength of the formal and informal import/export firms which operate between African countries and the characteristics of the players who invest in commercial networks and draw profits from them.

Then field work that combined questionnaire- and interview-based surveys carried out among the principal players has enabled us to shed some light on the rationales of the motorcycle taxi model, based on the case of Lomé. By analyzing three features, i.e. the role of the State, the heterogeneous nature of the players and the links with formal activities, we have shown how the development of the motorcycle taxi strengthened the informalization of public transport. Globalized policies that relied on the structural adjustment plans that were implemented in the 1980s sped up the offloading by the State of responsibility for the regulation of transport services. In the case of motorcycle taxis, the State's attitude has always been unclear and its intervention limited. Although, since the mid-1990s, the Togolese State has laid down regulations that cover the operation of motorcycle taxis (the need for a driving license and other permits, jacket and helmet, etc.), over the years they have only been applied on a partial and piecemeal basis. In countries where deficiencies in urban public transport rarely lead to strong protests from urban dwellers, an inadequate "capacity to implement formal rules fully" can be seen as a rational approach to allocating limited public resources (Altrock, 2012:185). Nevertheless, by acting in this manner, the State places operators in a position of uncertainty by failing to establish a firm dividing line between practices that are deemed legal and those which are not (Roy, 2009; McFarlane, 2012). Putting in place a regulatory framework without attempting to ensure that it is implemented and complied with undermines the day-to-day operation of motorbikes services by inflicting "permanent temporariness – concurrently tolerated and condemned, perpetually waiting 'to be corrected'" (Yiftachel, 2009:90).

The uncertainty created by the State's modus operandi does not affect all the players involved in the production of motorcycle taxi services in the same way, but tends rather to increase the vulnerability of the weakest who are less able to take advantage of the "gray spaces" (Yiftachel, 2009) created by public action. In the case of Lomé, we can identify four categories of players, between which there is a strong hierarchy based on the ownership of the vehicle and the distribution of wealth. These are:

investors for whom the motorbike taxi industry is part of their accumulation strategies; self-employed drivers who, with the experience they have acquired and in the absence of major accidents or health problems, usually manage to pursue their activity on a long-term basis; work-and-pay drivers who accept difficult working conditions in the hope of gaining ownership of the motorbike at the end of their contract, and finally renters, who are in a precarious situation and on a low income (Diaz Olvera et al., 2016). The relationships between investors and the drivers they employ are based on trust networks (Tilly, 2010), which differ according to the category of driver. They border on a formal arrangement when a written contract binds the owner and the work-and-pay driver, or significantly diverge from one when a motorcycle is rented out on a daily basis to a relative or acquaintance. As a whole, these categories could be perceived as an "organised manifestation of informality" (Simone, 2019: 618), but the rigid and unequal social and economic structure that governs them shows that we must be careful not to "over-romanticise the informality of African cities" (Evans et al., 2018:1).

A number of scholars challenge the perception of informality as a separate sector and prefer to define it as "a series of transactions that connect different economies and spaces to one another" (Roy, 2005:148). Analysis of the production and consumption conditions that prevail in the motorcycle taxi sector confirms the presence of a "symbiotic interaction" (Altrock, 2012:186) between the informal and the formal economies. Such interactions are necessary on a daily basis to allow the operation of the motorcycle taxi service, as evidenced, for example, by the trade-offs between fuel supply sources (service stations or street vending) which are sensitive to currency fluctuations in West Africa. They can also be observed in the careers of motorcycle taxi operators, some of whom may simultaneously engage in another activity in the formal economy while others may be involved in the different economies one after the other. But our analysis of the case of Lomé also confirms the differential capacity of stakeholder groups to take advantage of these interconnections, as shown by the origin of the funds raised by motorcycle owners, with only investors being able to take advantage of the overlapping which exists between formal and informal activities.

Motorcycle taxi activity is thus based on the ability of the actors to link different repertoires of status, action and interaction (Altrock, 2012) in order to deal with the uncertainties created by unclear public policy. This need to permanently juggle between various repertoires of formality and informality is particularly apparent among work-and-pay drivers. They are able to gain access to the

activity, i.e. to a motorcycle, as soon as they sign a contract, which may then be used in the event of a conflict at a police station or in a court of law, thus formalizing their occupational status. But as soon as they start working, when they wait at the station or provide a street-hail service, even before they pick up a customer they engage in an informal type of activity, due to their lack of a vest, helmet, license plate or even a driver's license. Finally, the interaction between the driver and the potential customer is often informal, for example when the price of the trip is negotiated (Diaz Olvera et al., 2016). We can thus see the strength of the "hybrid formal-informal arrangements" (Altrock, 2012:179) which link the different actors involved in the motorcycle taxi business, namely, the owners, the drivers, the State and the users.

5. Conclusion

In the cities of the South, informalization is now omnipresent in the daily lives of urban populations and is central to the social and urban fabric, whether in the case of housing, urban services or economic activities (Acuto et al., 2019; AlSayyad, 2004; Banks et al., 2019; Goodfellow, 2019). In the urban transport sector of sub-Saharan Africa, it takes the form of the rapid and wide-ranging spread of motorcycle taxi services, made possible by the fact that African economies are increasingly affected by the contemporary trends towards globalization. However, the public authorities do not seem to accept this spread. In many countries, the State, after a period of hesitation shortly after the appearance of motorcycle taxis, has frequently exhibited a "hostile orientation" (Recio et al., 2017) towards them, highlighting, in particular the disamenities they generate in terms of pollution or road traffic accidents and denigrating the service they provide. As it has been stressed by McFarlane (2012:93): "The informal is devalued as not only legally illegitimate, but visually, socially, and spatially illegitimate". However, in cities where "both overall mobility levels and inequalities in mobilities are growing [...] rapidly" (Kwan and Schwanen, 2016:251), transport policies expressing this hostile orientation are condemned to failure. By focusing on the operating regulations for these vehicles, i.e. on the consequences and not the causes of the development of the motorcycle taxi, the public authorities penalize, on one hand, the most vulnerable players, the drivers, by lowering their earnings and by doing nothing to balance the power relations between drivers and investors, and on the other hand, the city-dwellers, who do not have other alternatives to motorized public transport. Paradoxically, one unexpected driving force for relaxing hostile policies towards motorcycle taxis could be the greater presence of the Bus Rapid Transit model mentioned in the introduction. BRT is

unable to provide local access at the district level and depends on feeder modes, such as the motorcycle taxi, in order to attract sufficient levels of ridership. If the BRT model were to increase its presence, it could help to perpetuate the motorcycle taxi model, giving new value to this component of public transport which is currently devalued because of its ascribed informality.

Acknowledgements

Our thanks go to the anonymous referees for their insightful comments on earlier drafts of this paper.

References

- Aboudou, R., Sounon Bouko, B., 2010. Portée et enjeux des transports marchands à deux roues au Bénin et au Togo. In Foduop, K., Tape Bidi, J. (Eds.), *L'armature du développement en Afrique. Industries, transport et télécommunications*. Karthala, Paris, pp. 169-188.
- Acuto, M., Dinardi, C., Marx, C., 2019. Transcending (in)formal urbanism. *Urban Studies* 56(3), 475-487.
- Adeniji, K., 1986. The rôle of intermediate public transport in Nigeria. In *Transport urbain dans les pays en développement : Contraintes et opportunités. Actes de la CODATU III, Le Caire, 20-23 janvier*, 11 p.
- Adesanya, A., 1998. The use of motor cycles for public transport: The situation in Ibadan. Nigerian Institute of Social and Economic Research (NISER), Ibadan.
- Agossou, N.S., 2003. La diffusion des innovations: L'exemple des zémijan dans l'espace béninois. *Cahiers de Géographie du Québec* 47(130), 101-120.
- Agossou, N.S., 2004. Les taxis-motos zemijan à Porto-Novo et Cotonou. *Autrepart* 32, 135-148.
- Aguiño, I.F., 2012. Is Google Scholar useful for bibliometrics? A webometric analysis. *Scientometrics* 91, 343-351.
- Aholou, P. 2008. Proximité spatiale et diffusion des modes de vie : Les taxis-motos de Cotonou et Lomé. In Gervais-Lambony, P., Nyassogbo, G.K. (Eds), *Lomé. Dynamiques d'une ville africaine*. Karthala, Paris, pp. 233-250.
- AlSayyad, N., 2004. Urban informality as a "new" way of life. In Roy, A., AlSayyad, N. (Eds), *Urban Informality. Transnational Perspectives from the Middle East, Latin America, and South Asia*. Lexington Books, Oxford, pp. 7-30.
- Altrock, U., 2012. Conceptualising informality: Some thoughts on the way towards generalisation. In: McFarlane, C., Waibel, M. (Eds), *Urban Informalities. Reflections on the Formal and Informal*. Ashgate, Farnham, pp. 171-193.
- Andreasen, M.H., Møller-Jensen, L, 2017. Access to the city: Mobility patterns, transport and accessibility in peripheral settlements of Dar es Salaam. *Journal of Transport Geography* 62, 20-29.
- Angel, S., 2012. *Planet of Cities*. Lincoln Institute of Land Policy, Cambridge (MA).
- Baker, B., 2007. Post-war policing by communities in Sierra Leone, Liberia, Rwanda. *Democracy and Security* 3(2), 215-236.
- Banks, N., Lombard, M., Mitlin, D., 2019. Urban informality as a site of critical analysis. *The Journal of Development Studies*, DOI: 10.1080/00220388.2019.1577384
- Behrens R., McCormick, D., Mfinanga, D., 2016. An introduction to paratransit in Sub-Saharan African cities. In Behrens, R., McCormick, D., Mfinanga, D. (Eds), *Paratransit in African Cities: Operations, Regulation and Reform*. Routledge, New York. pp. 1-25.

- Benjamin, N., Mbaye, A.A., 2012. Les entreprises informelles de l'Afrique de l'ouest francophone. Taille, productivité et institutions. AFD-Banque Mondiale, Pearson France, Montreuil.
- Biakouye, H.K., 2007. Dynamique urbaine et mutations économiques et spatiales dans la zone périphérique nord de Lomé. In Gervais-Lambony, P., Nyassogbo, G.K. (Eds), Lomé. Dynamiques d'une ville africaine. Karthala, Paris, pp. 151-167.
- Björneborn, L., Ingwersen, P., 2004. Toward a basic framework for webometrics. *Journal of the American Society for Information Science and Technology* 55(14), 1216-1227.
- Bost, F., 2007. Entre local et global : le cas de la zone franche de Lomé. In Gervais-Lambony, P., Nyassogbo, G.K. (Eds), Lomé. Dynamiques d'une ville africaine. Karthala, Paris, pp. 121-150.
- Bureau Central du Recensement, 2011. Recensement général de la population et de l'habitat. Résultats définitifs. République togolaise, Lomé.
- Castells, M., Portes, A., 1989. World underneath: The origins, dynamics, and effects of the informal economy. In Portes, A., Castells, M., Benton, L.A. (Eds), *The Informal Economy: Studies in Advanced and Less Developed Countries*, Johns Hopkins University Press, Baltimore, pp. 298-311.
- Cervero, R., 2000. *Informal Transport in the Developing World*. UN-HABITAT, Nairobi.
- Cervero, R., Golub, A., 2011. Informal public transport: A global perspective. In Dimitriou, H.T., Gakenheimer, R.A. (Eds), *Urban Transport in the Developing World: A Handbook of Policy and Practice*. Edward Elgar Publishing, Cheltenham, pp. 488-547.
- Chen, M., 2008. Informality and social protection: Theories and realities. *IDS Bulletin* 39(2), 18-27.
- Chi, P.-S., 2014. Which role do non-source items play in the social sciences? A case study in political science in Germany. *Scientometrics* 101, 1195-1213.
- Chile Love, M., 1988. Industrial land use activity and intra-urban transport demand in Kaduna town, Nigeria. *Proceedings of CODATU IV, Jakarta*. 14 p.
- Danish Trade Union, 2014. Togo labour market profile 2014. Executive Summary. <http://www.ulandssekretariatet.dk/>, accessed 21/07/2017.
- De Vreyer, P., Roubaud, F., 2013. *Urban Labor Markets in Sub-Saharan Africa*. World Bank Publications, Washington DC.
- Delgado-Lopez-Cozar, E., Cabezas-Clavijo, A., 2013. Ranking journals: Could Google Scholar metrics be an alternative to Journal Citation Reports and Scimago Journal Rank? *Learned Publishing* 26(2), 101-114.
- Deng, T., Nelson, J.D., 2011. Recent developments in bus rapid transit: A review of the literature. *Transport Reviews* 31(1), 69-96.
- Diaz Olvera, L., Guézéré, A., Plat, D., Pochet, P., 2015. Improvising intermodality and multimodality. Empirical findings for Lomé, Togo. *Case Studies on Transport Policy* 3, 459-467.
- Diaz Olvera, L., Guézéré, A., Plat, D., Pochet, P., 2016. Earning a living, but at what price? Being a motorcycle-taxi driver in a Sub-Saharan African city. *Journal of Transport Geography* 55, 165-174.
- Diaz Olvera, L., Plat, D., Pochet, P., Sahabana, M., 2012. Motorbike taxis in the "transport crisis" of West and Central African cities. *EchoGéo* 20. <https://echogeo.revues.org/13080>, accessed 28/07/2017.
- Dillé, B., 1998. Les kabu-kabu de Konni : Facteurs de développement ou solution temporaire. In Freeman, P., Jamet, Ch. (Eds), *Urban Transport Policy. A Sustainable Development Tool*. Proceedings of the International Conference CODATU VIII, Balkema, Rotterdam, Brookfield, pp. 361-366.
- Dimitriou, H.T., Gakenheimer, R. (Eds), 2011. *Urban Transport in the Developing World. A Handbook of Policy and Practice*. Edward Elgar Publishing, Cheltenham.
- Djouda Feudjio, Y.B., 2014. Les jeunes benskineurs au Cameroun : Entre stratégie de survie et violence de l'État. *Autrepart* 71, 97-117.

- Ehebrecht, D., Heinrichs, D., Lenz, B., 2018. Motorcycle-taxis in sub-Saharan Africa: Current knowledge, implications for the debate on 'informal' transport and research needs. *Journal of Transport Geography* 69, 242-256.
- Eom, S., 2008. An introduction to bibliometrics and informetrics. In Eom, S., *Author Cocitation Analysis: Quantitative Methods for Mapping the Intellectual Structures of an Academic Discipline*. IGI Global, 1-35.
- Evans, J., O'Brien, J., Ch Ng, B., 2018. Towards a geography of informal transport: Mobility, infrastructure and urban sustainability from the back of a motorbike. *Transactions of the Institute of British Geographers*, 1-15. doi: 10.1111/tran.12239.
- Ezeibe, C.C., Nzeadibe, T.C., Ali, A.N., Udeogu, C.U., Nwankwo, C.F., Ogbodo C., 2017. Work on wheels: Collective organising of motorcycle taxis in Nigerian cities. *International Development Planning Review* 39(3), 249–273.
- Fasakin, J.O., 2000. Willingness to pay for the services of commercial motorcycles in Akure, Nigeria. *Cities* 17(6), 447-452.
- Flyvbjerg, B., 2006. Five misunderstandings about case-study research. *Qualitative Inquiry* 12(2), 219-245.
- Fouracre, P.R., Maunder, D.A.C., 1988. Urban public transport in Nigeria. In *Transport urbain dans les pays en développement : quelles politiques pour nos villes ?* Proceedings of Codatu IV, Jakarta, 12 p.
- Gauthier, A., Weinstock, A., 2010. Africa: Transforming paratransit into BRT. *Built Environment* 36(3), 317-327.
- Goletz, M., Ehebrecht, D., In Press. How can GPS/GNSS tracking data be used to improve our understanding of informal transport? A discussion based on a feasibility study from Dar es Salaam. *Journal of Transport Geography*, <https://doi.org/10.1016/j.jtrangeo.2018.08.015> accessed 26/04/2019.
- Goodfellow, T., 2015. Taming the "rogue" sector: Studying state effectiveness in Africa through informal transport politics. *Comparative Politics* 47(2), 127-147.
- Goodfellow, T., 2019. Political informality: Deals, trust networks, and the negotiation of value in the urban realm. *The Journal of Development Studies*, DOI: 10.1080/00220388.2019.1577385, first published on line 4 March 2019.
- Gorraiz, J., Gumpenberger, C., Glade, T., 2016. On the bibliometric coordinates of four different research fields in geography. *Scientometrics* 107, 873-897.
- Gough, K.V., Tipple, A.G., Napier, M., 2003. Making a living in African cities: The role of home-based enterprises in Accra and Pretoria. *International Planning Studies* 8(4), 253-277.
- Guézéré, A., 2008. Oléya (taximoto) : Acteurs et usagers d'un mode de transport artisanal récent à Lomé. Thèse de doctorat, Université de Lomé, Lomé.
- Guézéré, A., 2012. Territoires des taxis-motos à Lomé: De la pratique quotidienne à la recomposition des espaces urbains et des liens sociaux. *Géographie Economie Société* 14(1), 53–72.
- Harzing, A.W., 2007. Publish or perish, available from <http://www.harzing.com/pop.htm>, accessed 18/07/2017.
- Harzing, A.W., 2016. Publish or perish, <https://harzing.com/resources/publish-or-perish>, accessed 18/07/2017.
- Harzing, A.W., van der Wal, R., 2008. Google Scholar as a new source for citation analysis? *Ethics in Science and Environmental Politics* 8(1), 61-73.
- Hood, W.W., Wilson, C.S., 2001. The literature of bibliometrics, scientometrics, and informetrics. *Scientometrics* 52(2), 291-314.
- Howe, J., 2002. Boda Boda – Uganda's rural and urban low-capacity transport services. Final Report, DFID.
- Hussen, B.W., 2016. Sustaining sustainable mobility: The integration of multimodal public transportation in Addis Ababa. PhD Thesis, Université de Lyon, Lyon.
- Jeanneaux, Ph., Aznar, O., de Mareschal, S., 2012. Une analyse bibliométrique pour éclairer la mise à l'agenda scientifique des « services environnementaux ». *Vertigo – la revue électronique en sciences de l'environnement* 12(3). <http://vertigo.revues.org/12908>, accessed 11/07/2017.
- Kaplinsky, R., 2013. What contribution can China make to inclusive growth in Sub-Saharan Africa? *Development and Change* 44(6), 1295-1316.

- Khayesi, M., Nafukho, F.M., Kemuma, J., 2015. *Informal Public Transport in Practice*. Matatu Entrepreneurship. Routledge, Oxford.
- Kisaalita, W.S., Sentongo-Kibalama, J., 2007. Delivery of urban transport in developing countries: the case for the motorcycle taxi service (boda-boda) operators of Kampala. *Development Southern Africa* 24(2), 345–357.
- Kloosterman, R.C., Mamadouh V., Terhorst P., 2018. Introducing geographies of globalization: genealogies of the concept, existing views on in- and outside geography. In: Kloosterman, R.C., Mamadouh, V., Terhorst, P. (Eds) *Handbook on the Geographies of Globalization*, Edward Elgar, Cheltenham, pp. 2-16.
- Knowles, R.D., 2006. Transport shaping space: Differential collapse in time–space. *Journal of Transport Geography* 14(2006), 407-425.
- Kumar, A., 2011. Understanding the emerging role of motorcycles in African cities. A political economy perspective. SSATP Discussion Paper n° 13, Urban Transport Series.
- Kwan, M.-P., Schwanen, T., 2016. Geographies of mobility. *Annals of the American Association of Geographers* 16(2), 243-256.
- Linard, C., Tatem, A. J., Gilbert, M., 2013. Modelling spatial patterns of urban growth in Africa. *Applied Geography* 44, 23-32.
- Lindell, I. (Ed), 2010. *Africa’s Informal Workers. Collective Agency, Alliances and Transnational Organizing in Urban Africa*. Zed Books, London & New York.
- Lourenço-Lindell, I. 2004. Trade and the politics of informalization in Bissau, Guinea-Bissau. In Hansen, K.T., Vaa, M. (Eds), *Reconsidering Informality: Perspectives from Urban Africa*. Nordiska Afrikainstitutet, Uppsala, pp. 84-98.
- Malmberg Calvo, C., 1994. Case study on intermediate means of transport. Bicycles and rural women in Uganda. The World Bank, SSATP Working paper n° 12.
- McFarlane, C., 2012. Rethinking informality: Politics, crisis, and the city. *Planning Theory & Practice* 13(1), 89-108.
- Meagher, K., 1995. Crisis, informalization, and the urban informal sector in Sub-Saharan Africa. *Development and Change* 26, 259-284.
- Meagher, K., Lindell, I., 2013. ASR forum: Engaging with African informal economies: Social inclusion or adverse incorporation? Introduction. *African Studies Review* 56(3), 57-76.
- Menzel, A., 2011. Between ex-combatization and opportunities for peace: The double-edged qualities of motorcycle-taxi driving in urban postwar Sierra Leone. *Africa Today* 58(2), 96-127.
- Mkandawire, T., 1985. The informal sector in the labour reserve economies on Southern Africa with special reference to Zimbabwe. ILO SATEP Working paper N°1. <https://opendocs.ids.ac.uk/opendocs/handle/123456789/967>, accessed 13/10/2018.
- Mkandawire, T., 2010. On tax efforts and colonial heritage in Africa. *Journal of Development Studies*, 46(10), 1647-1669.
- Mobereola, D., 2009. Lagos bus rapid transit. Africa’s first bus rapid transit scheme. The World Bank, SSATP Discussion Paper n° 9.
- Morenikeji, W., Umaru, E., 2012. Flying without navigational aids – The case of commercial motorcyclists in Minna, Nigeria. *Transportation Research Part F: Traffic Psychology and Behaviour* 15-3, 311-318.
- Najmi, A., Rashidi, H., Abbasi, A., Waller, S.T., 2017. Reviewing the transport domain: An evolutionary bibliometrics and network analysis. *Scientometrics* 110, 843-265.
- Nederhof, A.J., 2006. Bibliometric monitoring of research performance in the social sciences and the humanities: A review. *Scientometrics* 66(1), 81-100.
- Neuhaus, C., Daniel, H.-D., 2008. Data sources for performing citation analysis: An overview. *Journal of Documentation* 64(2), 193-210.

- Ngabmen, H., Habyarimana, M., Eboumbou Jemba, C., 2000. Etude exploratoire sur les taxis-motos dans les villes africaines. Les "bend skin" de Douala. Groupe Interdisciplinaire d'Etudes et de Recherche sur les Transports (Giret), Rapport pour le Ministère français des Affaires Etrangères.
- Nkede Njie, L., 2012. The socio-cultural impact of the introduction of motorbike taxis in the rural community of Tombel, South West region, Cameroon. Master Thesis, Université de Yaoundé 1, Yaoundé.
- Nkurunziza, A., Zuidgeest, M., Brussel, M., Maarseveen, M.V., 2012. Modeling commuter preferences for the proposed bus rapid transit in Dar-es-Salaam. *Journal of Public Transportation* 15(2), 95-116.
- Nyassogbo, G.K., 2011. Les activités informelles et l'occupation des espaces publics. Les trottoirs de Lomé au Togo. *Revue de Géographie Tropicale et d'Environnement* 2, 22-34.
- Obinna Ezeokoli, O., Adamu, L., Ezeamaramu, F., Ovioma, G., Oladele, J., Muinah Fowora, M., Ugo-Ijeh, M., Iyile, J., 2016. Antibiotics susceptibility pattern and plasmid profile of bacteria isolated from public motorcycle helmets. *American Journal of Microbiological Research* 4(4), 126-131.
- Ogunsanya, A.A., Galtima, M., 1993. Motorcycle in public passenger transport service in Nigeria: Case study of Yola Town. In Ikya, S.G., (Ed.), *Urban Passenger Transportation in Nigeria*. Heinemann Educational Books, Ibadan, pp. 190-207.
- Olawole, M.O., 2012. Accessibility to Lagos Bus Rapid Transit (BRT LITE) bus stops: An empirical study. Conference Codatu XV, "The Role of Urban Mobility in (re)Shaping Cities", 22-25 october, Addis Ababa, 15 p.
- Oteng-Ababio, M., Agyemang, E., 2012. Virtue out of necessity? Urbanisation, urban growth and Okada services in Accra, Ghana. *Journal of Geography and Geology* 4(1), 148-162.
- Owusu, F., 2007. Conceptualizing livelihood strategies in African cities: Planning and development implications of multiple livelihood strategies. *Journal of Planning Education and Research* 26, 450-465.
- Oyesiku, K.O., 2001. City poverty and emerging mobility crisis: The use of motorcycle as public transport in Nigerian cities. *Proceedings of the 9th World Conference of Transport Research*, Seoul. 16 p.
- Paget-Seekins, L., 2015. Bus rapid transit as a neoliberal contradiction. *Journal of Transport Geography* 48, 115-120.
- Panier, E., 2012. L'État et les relations de travail au Togo. Thèse de doctorat, Université de Bordeaux IV-Montesquieu, Bordeaux.
- Philifert, P., 2008. Gouvernement de la ville et gestion urbaine à Lomé : Paralysie ou impasse ? In Gervais-Lambony, P., Nyassogbo, G.K. (Eds), *Lomé. Dynamiques d'une ville africaine*. Karthala, Paris, pp. 43-64.
- Pirie, G., 2014. Transport pressures in urban Africa: Practices, policies, perspectives. In Parnell, S., Pieterse, E. (Eds.), *Africa's Urban Revolution*. Zed Books, London-New York, pp. 133-147.
- PNUD Togo, 2012. Togo. Profil de pauvreté 2006–2011. PNUD, Lomé <http://www.tg.undp.org/content/dam/togo/docs/programme/Rapports/TGO-profil-pauvre%C3%A9-2006-2011.pdf> accessed on 28/02/2018.
- Pochet, P., Diaz Olvera, L., Plat, D., Adoléhoumé, A., 2017. Private and public use of motorcycles in Sub-Saharan African cities. In UITP (Ed.), *Public Transport Trends 2017*, UITP, Bruxelles, pp. 103-105.
- Portes, A., Haller, W., 1989. The informal economy. In Smelser, N.J., Swedberg, R. (Eds), *The Handbook of Economic Sociology*. University Press & Russell Sage Foundation, New York/Princeton, pp. 403-425.
- Potts, D., 2008. The urban informal sector in sub-Saharan Africa: From bad to good (and back again?). *Development Southern Africa* 25(2), 151-167.
- Pradeilles, J-C., Garcia-Oriol, G., Tall, I., 1991. L'organisation corporative des taxis collectifs à Bamako et Lomé. Richesse et perspectives. Inrets-Codatu, coll. *Transport Transfert Développement*.
- Rakodi, C. (Ed), 1997. *The Urban Challenge in Africa: Growth and Management of its Large Cities*. New York, The United Nations University Press.
- Recio, R.B., Mateo-Babiano, I., Roitman, S., 2017. Revisiting policy epistemologies on urban informality: Towards a post-dualist view. *Cities* 61, 136-143.

- Rizzo, M., 2015. The political economy of an urban megaproject: The bus rapid transit project in Tanzania. *African Affairs* 114(455), 249-270.
- Roger, D.M., Abou, D., Denis, H.K., Koffi, B.E., 2016. Émergence de taxi-motos et recomposition spatioéconomique à Korhogo : Les taxi-villes entre stratégies d'adaptation et désespoir. *European Scientific Journal* 12(35), 190-208.
- Rogerson, C.M., 1997. Globalization or informalization? African urban economies in the 1990s. In Rakodi, C. (Ed), *The Urban Challenge in Africa: Growth and Management of its Large Cities*. The United Nations University Press, New York, pp. 337-370.
- Rollason, W., 2013. Performance, poverty and urban development: Kigali's motari and the spectacle city. *Afrika Focus* 26(2), 9-29.
- Roy, A., 2005. Urban informality. Toward an epistemology of planning. *Journal of the American Planning Association* 71(2), 147-158.
- Roy, A., 2009. Strangely familiar: Planning and the worlds of insurgence and informality. *Planning Theory* 8(1), 7-11.
- Sadou, A., 2007. Les taxis-motos et l'insécurité urbaine dans le Nord Cameroun. Le cas de la ville de Ngaoundéré. Conférence Le taxi, solution d'avenir pour les mobilités urbaines, Institut pour la Ville en Mouvement, Lisbonne.
- Sambo, A., 2010. Seguendo gli zemijan: Etnografia di una citta' africana in movimento. Tesi di dottorato, Università degli studi di Milano-Bicocca, Milan.
- Sclar, E., Toubert, J., 2011. Economic fall-out of failing urban transport systems: An institutional analysis. In Dimitriou H.T., Gakenheimer R. (Eds), *Urban Transport in the Developing World. A Handbook of Policy and Practice*. Edward Elgar, Cheltenham, pp. 174-202.
- Seto, K.C., Fragkias, M., Güneralp, B., Reilly, M.K., 2011. A meta-analysis of global urban land expansion. *PLoS ONE* 6(8), e23777.
- Siemiatycki, M., 2013. The global production of transportation public-private partnerships. *International Journal of Urban and Regional Research* 37(4), 1254-1272.
- Simone, A.M., 2019. Contests over value: From the informal to the popular. *Urban Studies* 56(3), 616-619.
- Tague-Sutcliffe, J., 1992. An introduction to informetrics. *Information Processing & Management* 28(1), 1-3.
- Tilly, C., 2010. Cities, states, and trust networks: chapter 1 of *Cities and States in World History*. *Theory and Society* 39(3/4), 265-280.
- Tuffour, Y.A., Appiagyei, D.K.N., 2014. Motorcycle taxis in public transportation services within the Accra metropolis. *American Journal of Civil Engineering* 2(4), 117-122.
- University of Waterloo Working Group on Bibliometrics, 2016. White paper: Measuring research outputs through bibliometrics. University of Waterloo, Waterloo, Ontario.
- Venter, C., 2013. The lurch towards formalisation: Lessons from the implementation of BRT in Johannesburg, South Africa. *Research in Transportation Economics* 39(1), 114-120.
- Vermeiren, K., Verachtert, E., Kasaija, P., Loopmans, M., Poesen, J., 2015. Who could benefit from a bus rapid transit system in cities from developing countries? A case study from Kampala, Uganda. *Journal of Transport Geography* 47, 13-22.
- Wood, A., 2015a. Multiple temporalities of policy circulation: Gradual, repetitive and delayed processes of BRT adoption in South African cities. *International Journal of Urban and Regional Research* 39(3), 568-580.
- Wood, A., 2015b. The politics of policy circulation: Unpacking the relationship between South African and South American cities in the adoption of bus rapid transit. *Antipode* 47(4), 1062-1079.
- Yiftachel, O., 2009. Theoretical notes on 'gray cities': The coming of urban apartheid. *Planning Theory* 8(1), 88-100.