Global South countries: The dark side of city logistics. Dualisation vs Bipolarisation

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Dualisation vs bipolarisation

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Abstract:

Despite an increase in academic research about city logistics in recent years, the topic of cities in developing countries, where some of the world's biggest metropolitan are located, is seldom addressed. This article aims to appraise the unevenness of logistics development throughout the world, by comparing city logistics (notion that we define) between developing countries (or Global South countries) (where "modern" and "traditional" models often coexist) and developed countries (or Global North countries), and to consider future developments. Will logistics in Lagos, Cairo, Mumbai or Mexico one day resemble logistics in New York, Tokyo or London? Will methods from developed countries spread to developing ones? Will modern and traditional organisations converge, hybridise each other, or remain a divided dual system? Will original solutions emerge in developing countries? We show that urban logistics in developing countries is not integrated but dual, i.e. split between two distinct and coexisting types of organisation, management and business model. In addition, the results of this research project show that considering the three cases (India, Mexico, and Morocco) implicitly required a comparison with city logistics in developed countries, considered as the reference standard. As a result, analysing logistics in developing countries can advance knowledge not only on these countries but also, indirectly, on developed ones.

Keywords: *City Logistics, Traditional Logistics, Modern Logistics, Dualism, Bipolarisation, North-South Comparison*

1. Introduction

Literature on logistics, including city logistics, does not cover this field in a homogeneous manner. Logistics in Global South countries is addressed far less than it would deserve, even if only from a scientific viewpoint. A systematic review (Behrends, 2016) shows that most papers presented at international conferences about city logistics focus on a few themes:

1. from a sector point of view: the focus is on the distribution of consumer goods, neglecting other crucial channels such as building materials, energy, industrial supply, waste (return logistics), *etc*.
2. from an urban point of view: the literature addresses the central districts of large cities, whereas peripheral areas face different problems that require different solutions, and urban logistics in medium-size cities also require a specific organisation[1].
3. from a geographical point of view: Europe, North America and some Asian countries are thoroughly studied, whereas Latin American, African and several important Asian countries would also call for a dedicated approach.

This observation is confirmed by a recent "scientometrics" review on city logistics literature, showing that most published papers deal with logistics in developed countries and are written by searchers living in developed countries (Hu *et al*., 2019).

An exception to the uneven attention given to developing and to developed countries is the collective survey about the "State of the art of urban freight management" (Holguin-Veras *et al*., 2018, part I&II). It covers 32 countries and 56 cities throughout the world. Still, according to its presentation, respondents from developed countries represent 59% of the sample, and developing countries 41%, whereas corresponding proportions of global population are respectively 16% and 84%[2]. Although duly included, developing countries are underrepresented. We shall refer again to this survey in the fifth part of our paper.

Therefore, we shall deliberately focus on city logistics in Global South countries, considering that a steady knowledge on city logistics in developed country is already established (see Dablanc *et al*., 2013 for a vision of Europe and North America), as shown in the bibliography. These limitations directly determine our methodology. While a review of available literature is indispensable, it cannot provide the sole basis for a study of city logistics in developing countries. This is all the truer as, by nature, official data hardly ever documents the "informal" (i.e. not registered) share of logistics – which is particularly important in developing countries. All information is welcome, regardless of which field of social science it comes from. Respectively a geographer and an economist, the authors are also attentive to regulatory and political issues, which are crucial in this matter. This bidisciplinary approach also allows us to confront macro-economic approaches and knowledge from the research field. Comparative debates on qualitative and quantitative research methods in support of transport and logistics policymaking can be found in the scientific literature. The analyses highlight the potential and limitations of these two approaches, the need of synergies, and their potential to support effective urban freight policies (Gonzalez-Feliu, 2018, Holguin-Veras *et al*; 2017).

[1] For instance, the recent international research program Metrofreight examined four areas: Los Angeles, New York, Seoul and Paris. https://www.metrans.org/metrofreight

[2] These proportions correspond to our calculations: considering the UN Human Development Index, countries with an index equal and over 0.8 are considered as developed, those with an index under 0.8 as developing. The later include, in particular, the two most populous countries in the world, China and India. Source: http://worldpopulationreview.com/countries/developing-countries/

In this academic context, our study can be positioned in the continuation of recent works by Bram Kim *et al*., 2017 on urban freight transports in emerging markets and Leeza Malik *et al*., 2017 who compare freight-parking pratices in Gothenburg and Delhi. They use urban case studies from the global South to characterise city logistics issues. We have to note in their works the heterogeneity of data (type, dates) due to the lack of official data in this sector in developing countries. This obviously hampers systematic comparisons. But despite these difficulties, the works highlight strong trends about city logistics in emerging and developing countries. These research fields need to be further explored in the academic literature, we are positioning ourselves in this research approch.

In the context of this article, we shall proceed step by step with the main objective of highlighting a little-known but essential issue in the evolution of major Global South cities: will modern and traditional organisations converge, hybridise each other, or remain a divided dual system? So, the specific structure of city logistics system will be discussed. The lack of statistical data and academic literature on logistics in the Global South partly due to the importance of the informal sector, also implies that the issue of logistics in the Global South doesn't easily lend itself to quantitative methods. Thus, our methodology combines an inductive approach based on about ten partially-structured interviews with economic, politic and academic actors in three countries considered as emerging, and a hypothetico-deductive approach based on academic literature and reports from international organisations providing macroeconomic data. By confronting bottom-up and top-down analysis, we try to highlight the main trends in the city logistics system in Global South countries, despite the differences between cities.

Based on discussions with fellow researchers, public authorities and private bodies and on the visit and/or study their cities, we selected India, Mexico and Morocco. Despite the absence of a single institution responsible for the efficient management of urban and national freight transport in most countries of the world, all three countries allow us to study the issue of logistics from a political and economic perspective – with phenomena such as the creation of an observatory of logistics in Morocco (Debrie and Mareï, 2019; AMDL, 2016) and Mexico (OECD/ITF, 2015); political debates surrounding this issue in India (Goyal, 2016); and innovations in sustainable transport (for example electric rickshaws for urban transport and deliveries). Another reason for this choice is that these countries are located on three different continents, where they can all be considered as emerging countries. Referring to three deeply different contexts, our study field gives a meaningful view of city logistics in the Global South, after a macroeconomic approach puts these countries in a worldwide and comprehensive comparison.

As a preliminary reminder (section 2), we shall review definitions of logistics and in particular of city logistics. While numerous definitions have been proposed, none is entirely satisfactory due to the variety of meanings this word receives according to the context in which it is used. We shall propose a distinction between urban logistics and city logistics, frequently confounded, and explain why we prefer the "city logistics" phrase.

To characterise logistics in developing countries, we shall consider available data providing an overview of logistics throughout the world, extracted from World Bank surveys and complementary studies (section 3). This quantitative data, produced on a per-country basis, is not specific to city logistics, but it characterises this sector among others and provides a steady foundation for more specific approaches.

In addition, it is necessary to examine qualitative information shedding light on city logistics in significant cases (section 4). To keep this paper to a reasonable size, we shall focus on three emerging countries. Compared with less-advanced countries where logistics is generally poorly organised (as clearly shown by the World Bank survey we shall here-after

examine) and constitutes an obstacle to global economic development, emerging countries show a more complex and interesting situation. As these countries are undergoing a phase of intense transition, they reveal a sharp contrast between the remnants of the old system on the one hand, and the emergence of a new organisation of production and distribution on the other hand. This is particularly the case in the realm of logistics, where so-called "traditional" and "modern" models coexist.

Urban logistics now receives a growing consideration from public authorities. The cited international survey collects abundant and novel data about the variety of initiatives and their respective importance. It also compares developed and developing countries, which contributes to reduce the knowledge gap between urban logistics in developed and in developing countries (section 5).

The study of urban logistics in developing countries, the heart of our research, aims at addressing a key issue: *is urban logistics in developing countries an eroded form of logistics in developed country, or at least a delayed form of it, or is it structurally different?* Is "traditional" logistics an early stage towards "modern" logistics, or are these two entities essentially separate? We shall show that the second answer prevails, that urban logistics in developing countries is not integrated but dual, i.e. split between two distinct and coexisting types of organisation, management and business model. This is the main proposal of or our paper.

Finally, the development of this research project showed that considering these three cases implicitly required a comparison with city logistics in developed countries, considered as the reference standard. As a result, analysing India, Mexico and Morocco can advance knowledge not only on these countries but also, indirectly, on developed countries. Southern countries appear to integrate an ever-growing part of "Northern" logistics, but logistics in Northern countries is also partly "Southern". Each side of the comparison is acting as a magnifying mirror for the other.

In the discussion (section 6), we shall characterise each term of the comparison, and consider whether city logistics in developed and in developing countries are converging, influencing each other to the point of achieving a hybrid situation, or whether they remain deeply distinct, thus opening the way for new considerations on innovation and progress in city logistics, an important component of studies on the urban transition and sustainable development.

2. Reviewing definitions of logistics

There is no single satisfying definition of logistics and, before moving on to the particular subject of this paper, it should be noted that three families of definitions can be found in literature. According to the first one, logistics consists of a range of physical operations, aimed at changing the location of goods in space and time (transport, conditioning, packaging, handling and warehousing), and at making them available (sorting, delivery). Secondly, logistics is also the name of a branch of management sciences, considering individual firms and relationships between firms as a system of flows (flows of products and information), to contribute to the overall monitoring and steering of "supply chains". Finally, logistics is an emerging industry, bundling several traditional professions into a single integrated one: logistics service provision. All three approaches of logistics make sense, and it is not necessary to choose between them, but rather to combine them (Savy and Burnham, 2013; Savy, 2017).

Another complementary approach regards logistics as a major function in modern economies, which combines all social and economic activities. Contrary to the so-called "intangible economy", the volume of DMC (domestic material consumption) and freight transport per capita has not declined over time in developed countries. This figure continues to rise in developing countries, where urbanisation as well as demographic and economic growth are stronger. Logistics added value is quite commonly within the same order of magnitude as manufacturing added value. Beyond its costs, the efficiency or inefficiency of logistics affects processes of production and trade. In the future, according to the World Bank's long-range analysis of manufacturing, logistics will remain one of the critical conditions for success, along with competitiveness, capabilities and connectedness (with the objective of improving logistics and lowering trade restrictions) (Hallward-Driemeier and Nayyar, 2018).

Given the considerable economic role of logistics at a national and international level, this sector is also a topic for public policies, although it was long considered an exclusively business-led activity (Savy, 2016). The success of the World Bank's "Logistics Performance Index" has boosted this awareness (Arvis et al., 2018).

In this context, city logistics forms a specific and important segment of logistics. Considering the vocabulary, urban logistics and city logistics are commonly taken as synonymous. Urban logistics means logistics operations taking place in an urban context. But, at least in developed countries, most people living in outskirts and rural areas have nowadays an urban way of life, at least considering their consumption practices, and they use typically urban logistics, such as e-commerce, as intensely as people living in dense cities. Is urban logistics then only specific according to the type of geographic territory it serves? In a comprehensive approach of logistics, we prefer the term city logistics. The etymological root of "urban", the Latin word *urbs*, means city, but it does not designate only a type of geographical space. It also designates public institutions in charge of the city (sitting in the City Hall). City logistics is not only a matter of professional logistics business; it is strongly influenced by the local political framework it is imbedded in. City logistics does not exist independently from the way the way local government rules public space (traffic and parking regulations, commercial and warehousing facilities location, city planning, etc.) and takes logistics activity into account. City logistics implies logistics city, with an intense interaction between logistics operators and users on the one hand, local authorities on the other hand.

Often referred to as "last mile" logistics, city logistics is the object of numerous publications, but those mainly or even exclusively study the situation in developed countries (Macharis and Melo (ed.), 2011; Taniguchi and Thompson (ed.), 2014; Browne M. et al. (ed.), 2019). Logistics indeed presents specific characteristics when carried out in an urban environment, considering that transport (pick-up, delivery), warehousing and handling operations take place in a particular, densely populated and fragile environment. This environment can generate negative externalities, but also positive externalities due to the presence of customers, of a skilled workforce, of suppliers, of an active real estate market, etc. Logistics is sensitive to agglomeration effects, and in return it contributes to the general process of metropolisation. This process comprises of two dimensions, apparently contradictory: on a large scale, logistics facilities tend to polarise, i.e. to be concentrated around metropolises; on a local scale, they tend to loosen, i.e. to migrate towards remote outskirts and form part of the urban sprawl phenomenon.

The strong "externalities" associated with city logistics call for the involvement of the public sector, and particularly that of local government. However, city logistics is not autonomous; it is often the first or last link in a multi-scale transport chain, connecting long and short distance flows through adequate interface facilities.

3. The uneven development of logistics: a global overview

Before focusing on city logistics, we shall review existing data describing the development of logistics on an international level. Despite its great heterogeneity, logistics has been the object of various attempts at a macroeconomic assessment. The cost of logistics is much more significant in gross national product (GNP) percentage in less developed countries: between 15 and 20% of the GNP for countries such as Morocco, Thailand, China, India while it drops to less than 8% for Japan, USA, Netherlands or Switzerland (Rantasila *et al*., 2012 ; Sheperd, 2012). There is a lack of exact data in this field. These figures must be considered as merely indicative estimates and each correspond to different dates, but they do remain meaningful. Logistics inefficiency hampers economic development and weighs on consumption. Some governments have explicitly announced their will to tackle this problem[3].

The World Bank's "Logistics Performance Index" adopts a different view. It is the product of a survey of international transport and logistics professionals, focuses on international trade and covers six aspects of logistics: efficiency of customs procedures, quality of transport infrastructure, competition in the freight market, quality of logistics services, ability to track shipments in real time, and timely delivery at destination. By assembling these six basic indicators, the World Bank calculates a global Logistics Performance Index (LPI) for some 160 countries and publishes the resulting ranking in its periodic report *Connecting to Compete*. The reports show major discrepancies on a global scale, which reflect general development gaps but also frequently amplify them. If one accepts the idea that the level of logistics performance is generally connected to the national level of development (as shown by the regression curve in the following charts, see fig.1), a wide range of performance levels can be found among countries with the same GNP *per capita index*. Some countries are "underperformers" while others are "overperformers". There is therefore room for maneuver on a national level, which calls for adequate policies.

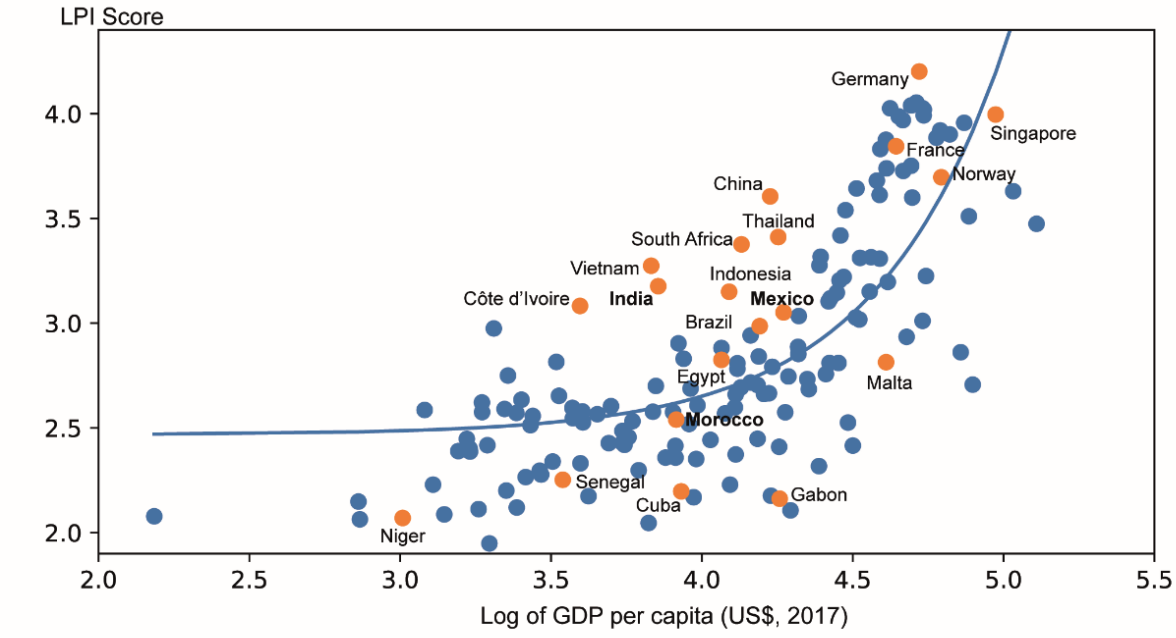

Fig. 1 - LPI underperformers and overperformers

[3] E.g., Morocco has set itself the goal of reducing the cost of logistics from 20% to 15% of GNP, as a first step ; in the US, in some 33 years, the importance of logistics with in GDP was halved, drop from 16% to 8% between 1981 and 2014 (Wilson, 2015)

Source: World Bank database, country selection

The following chart (see fig. 2) highlights the three selected countries (India, Mexico and Morocco) and details the six components of their respective LPIs, compared with other representative countries from the global North or the global South (Senegal, China, France and Germany).

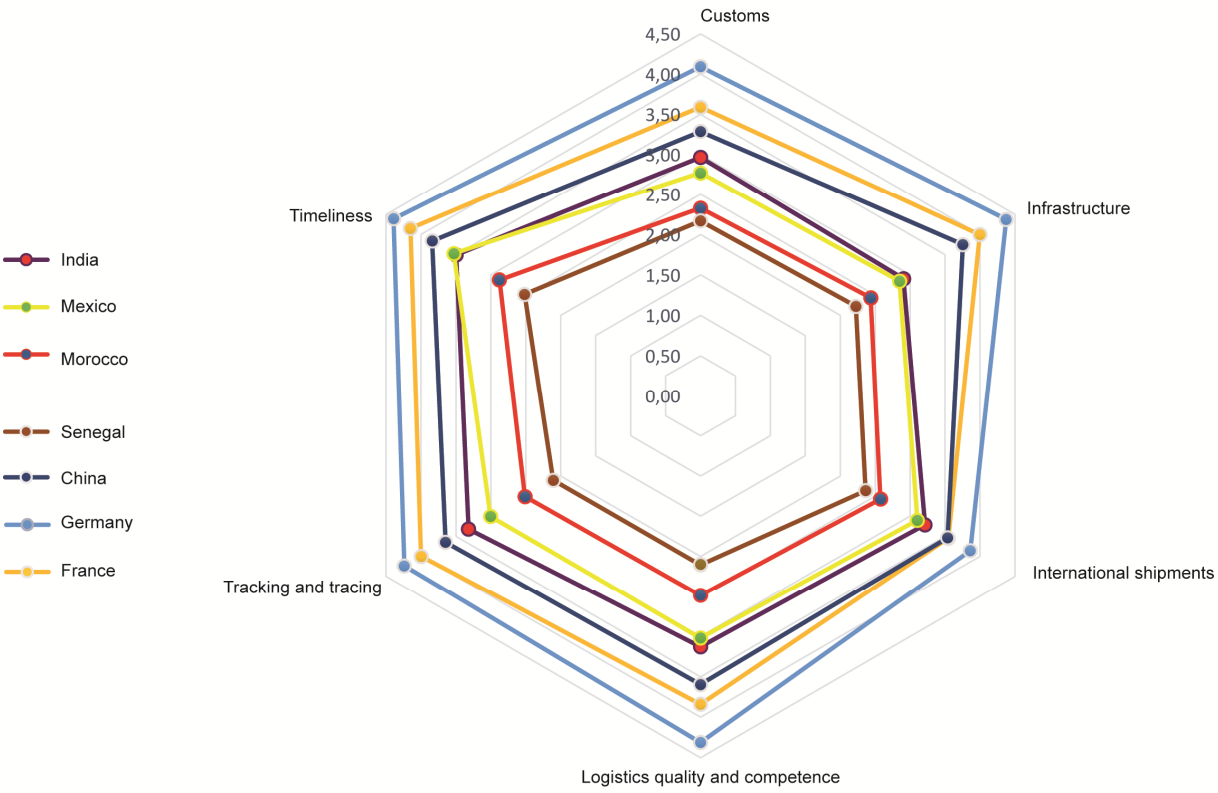

Fig. 2 - Score of different components of the 2018 LPI Index, country selection
Source: World Bank database, country selection

The six components of the LPI are lagging in developing countries, even though they are catching up. But transforming logistics is complex, time-consuming and costly in countries where governments' capacity to invest in infrastructure is limited. It is even the case in countries considered to be emerging where efforts are made to modernise infrastructure and improve the fluidity of flows. Thus, since the first report in 2007, the three countries considered in the study have improved their performance in terms of infrastructure and customs but without significant consequences on their ranking.

These differences also result from several cumulative factors (in addition to the six indicators that make up the LPI). A primary factor is certainly the availability of manpower at a required skill level.

Logistics today is a labor-intensive industry, and in many countries the workforce is mainly “blue collar”, male, low-skilled and aging. Nevertheless, substantial evolutions are underway – feminisation, rising qualification levels, etc. – and crucial changes are to come (digitalisation, automation of handling, of warehousing, and in term of vehicle driving). On the World Bank database about LPI Index, one notices that the top-scoring countries in the

international ranking in terms of "logistics quality and competence" are also the highest performing in terms of their global LPI ranking. Another component that is highly correlated with the overall index is "the ability to track and trace consignments". In contrast, "the quality of trade and transport infrastructure" is strongly influenced by income level and drives down the LPI index for the poor countries and conversely for rich ones.

There is in fact a shortage of competent logistics manpower in all countries (see fig. 3). Rightly so more often than not, logistics jobs have a bad reputation in terms of working hours and conditions, income and career opportunities: employers have difficulty attracting workers. But this problem is particularly acute in countries with a low LPI (first and second LPI quintiles in the chart below), at all skill levels, and particularly in management positions. This situation is difficult to overcome as it results, to a certain extent, from a vicious circle: most of the training is delivered internally in firms or professional bodies, which means that competence produces competence. Initial and vocational education is, in the field of logistics as in all advanced sectors, a key issue of development.

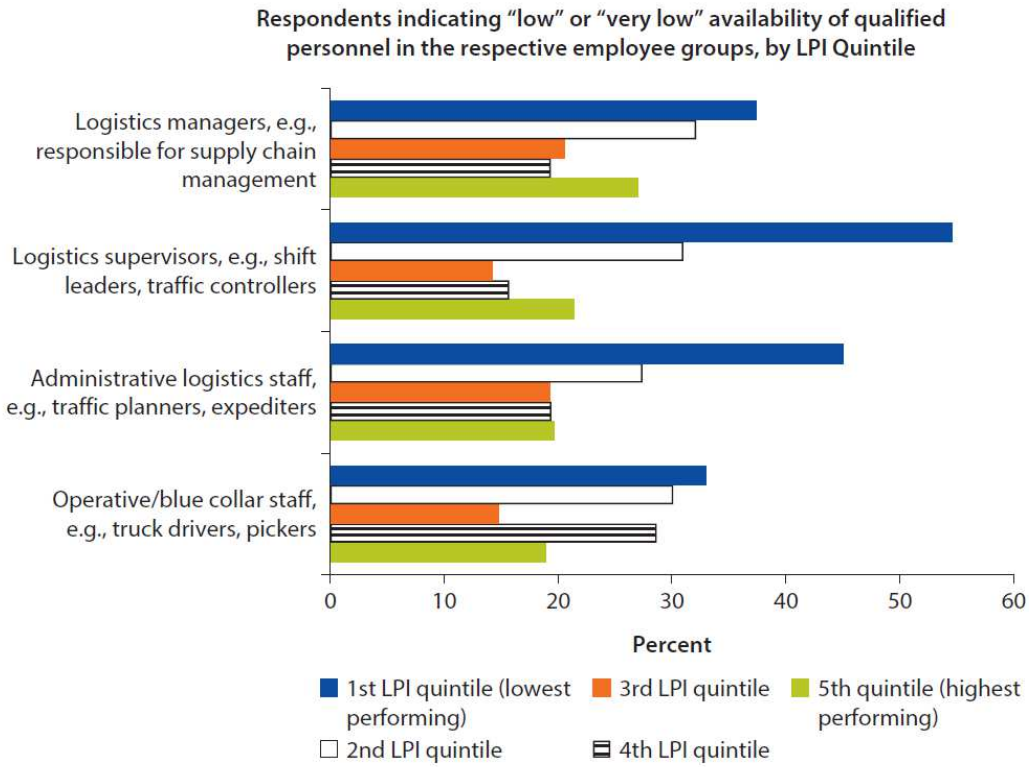

Fig. 3 - Shortage of logistics manpower
Source: McKinnon A. et al. (2017).

Of course, other structural factors contribute to these discrepancies: the organisation of transport activities and trade, the management of roads and streets, the importance of the "informal" economy and its influence on the formal sector, etc. These elements result in the great unevenness of logistics performance, thus amplifying overall development gaps. Ekici *et al.* (2019) use some macroeconomic data to analyse the effect of the pillars of the Global Competitiveness Index (by World Ecomomic Forum) on Logistics Performance Index (by the World Bank). Their results indicate that governments should focus on higher education and training, innovation and technological readiness, market size, and also infrastructure to improve the logistics performance. However, descriptions of the current situation in less advanced countries are rare beyond aggregated macroeconomics indicators mentioned above,

thus hampering the analysis of the causes of problems and the search for solutions. Are these approaches adequate for developing countries? Basic elements are neglected, starting with the availability and quality of transport infrastructure and warehousing facilities, but also the legal frameworks that apply to logistics activities and their actual enforcement. Some specific solutions are thus ignored by macroeconomic studies, along with the transition processes that could bridge the gap between the current situation and future potentialities.

4. Dualisation in Global South countries

Differences between developing and developed countries can be observed across all sectors of logistics, but they are particularly striking on an urban scale. In cities, factors such as congestion, pollution, the lack of space for loading and unloading and the lack of municipal legislation or its poor enforcement all combine to make logistics a major issue in the urban transition. The work by Bin *et al*. (2017) shows that all these complicating factors of the last mile issue are accentuated in the megacities of emerging markets.

There are nearly as many logistics organisations as there are supply chains, to provide the city with all it requires to produce, consume and send away all its products and waste. Beside some massive supply chains, many specialised chains are necessary, for example to deliver to drugstores, butchers, florists, etc. several times a day. Another aspect of urban freight and logistics, seldom addressed and which raises specific issues, is the traffic related to professional occupations that require a vehicle: craftsmen carrying out a repair at their customers' home but also mobile commerce, mobile catering and mobile services, particularly abundant in the cities of developing countries. Light duty vehicles used for this purpose are both a tool for the transportation of people and goods, but also mobile storage for materials, a toolbox, a workshop, an office, a cloakroom, a canteen, a shop, etc. (Savy., Tenfiche, 2016). Approaching city logistics as a whole therefore amounts to an extreme but inevitable simplification, which is criticised in literature but can hardly be avoided. However, we will see that the local urban and socio-economic contexts strongly influence logistics. In the following section, we shall examine the main characteristics of city logistics in Global South countries, with a focus on India, Mexico and Morocco.

Still, before addressing city logistics in the Global South and its specificities, we shall briefly recall the typical structure of city logistics organisation in Global North cities, which we define as "bipolarisation". The "dualisation" term, which we then introduce, aims at underlying the structural difference between North and South. Thus, the sub-title of this article: "Dualisation vs. bipolarisation".

4.1. Bipolarisation in Global North countries

In developed countries, city logistics appears as more heterogeneous, and sometimes more chaotic than expected: it is not as "modern" and strictly organised as literature suggests.

A major factor of heterogeneity is the mass subcontracting of pickup and delivery transport by large logistics service providers (3PL), parcel service operators, etc. to small operators. The larger a freight transport firm, the more it outsources part of its haulage activity, thus turning from a mere carrier to a freight-forwarder. A broad range of transport actors thus cooperate, but on an uneven basis: at one end, major and well-established

international and national firms (such as express parcel integrators and post offices); at the other, very small businesses and self-employed carriers, sometimes bypassing regulatory frameworks such as social security contributions and tax payments, technical controls, working and driving time limitation, etc.

In addition, in urban retail, consignees frequently transport goods using their own means ("own-account" transport), often driving old, polluting and poorly loaded vehicles instead of delegating this service to specialised third-account carriers. However, own-account transport can also be very effective, for instance in the case of tailor-made solutions developed by some wholesale distributors.

The development of e-commerce and B2C parcel services is resulting in the growth of home delivery, sometimes within very short timescales (e.g. Amazon's "Prime" service), which largely relies on self-employed bike couriers who do not benefit from the same social security system as formal employees. A similar trend is developing for meal delivery at home or at the office. The result is an expansion of precarious forms of labor, far from welfare state standards (Dablanc et al., 2017 ; Jaffee, Bensman, 2016).

Nevertheless, in spite of these strong contrasts, it would be a mistake to characterise this system as split in two: large and small transport and logistics operators, whether these are strictly organised or flexible, are for the most part associated as contractor and subcontractor (a typical "principal-agent" situation). The result of this uneven, hierarchical integration is a bipolarisation of the logistics industry (Savy, Burnham 2013). At one end, large firms fluctuate through continuous international merger-acquisition processes; at the other end, small and very small business persist and provide the logistics sector with the unlimited flexibility it often requires. The two poles are linked as the two opposite poles of a magnet.

4.2. Structure of urban retailing, main factor of dualisation

Urban logistics in developing countries, and particularly in emerging countries, is extremely contrasted. Modern retail and logistics are expanding but are still limited to the wealthier segments of the population. Their success sometimes goes beyond predictions, broadening their client base thanks to the prestige of "Western" lifestyles and to habits introduced by formerly emigrated citizens.

However, traditional forms of retail remain predominant. In Casablanca (Morocco), on average, two thirds of customers visit traditional shops 14 times a month while one third visit modern shops twice a month (AMDL, 2016). The weight of traditional retail is logically even higher in other Moroccan cities with a lower proportion of wealthy population. The study by Kin *et al*. (2017) provides a recent perspective on the dominance of small independent retailers in the context of megacities in emerging markets. The authors have collected some data and, like us, are confronted with data gaps and heterogeneity. Nevertheless, some important figures can be noted: less than 10% of retail stores are organised in India; small retailers are 61% in Latin America; 70% in a city like Jakarta; they speak about millions of small stores in Brazil, the Philippines or Mexico City.

The typical cornerstone of traditional logistics and retail in developing countries is the "nanostore"[4]: a very small shop packed with basic consumer goods. The table below shows the main differences between modern supermarkets and traditional nanostores.

	Modern channel supermarket	Traditional channel nanostore
Functions	Professionals,	Single store owner-operator
Logistics support	Dispersed distribution centers, cross-docks, 3PL	None

[4] This neologism was coined by Blanco and Fransoo, 2013.

Financial flows	Formal credit, bank trasfers	Cash, relationship-based credit
Line items	Full casepacks to store, pallets to retailer DC	Consumer units, mixed casepacks
Number of SKUs	Thousands to tens of thousands	Hundreds
Number of consumers served per store	Tens of thousands	A few hundred
Technology	Enterprise systems, POS scanning, EDI	Personal mobile phone

Table 1 - Modern supermarket and traditional nanostore
Source: Blanco E., Fransoo J. (2013)

These small shops, sometimes complemented by temporary and mobile shops (motorized van or scooter, handcart or street vendor on foot), exist in many countries throughout the world under diverse local names: *hanout* in Morocco, *tendajon*, *tienda de abarrotes*, *tiendita* or *changarros* in Mexico (Cedillo *et al*., 2019), *bodega* in Peru, *pulperia* in Costa Rica, *sari-sari store* in the Philippines, *kirana* in India, etc. In addition to these nanostores, temporary but often daily outdoor markets play an important role from Latin America (*tianguis* in Central America) to Asia and Africa. In these markets, a large share of the activity, from transport to trade, is informal and involves street occupation. In Mexico City, tianguis have a market share of 7% in the total consumer food expenditure and represent more than a thousand outdoor markets. Some of them operate without interruption and a third of them are located in the Iztapalapa borough, a highly dense and low incomes area, at the outskirts of the city. In this historic area, one also finds the Central de Abasto, the main wholesale market. It attracts 300,000 to 350,000 visitors each day, including both retailers and final consumers, and approximately 6,000 trucks and 50,000 other vehicles, such as pushcarts and three-wheeled vehicles. 80% of all fresh produce consumed in greater Mexico City passes through this former wholesale market (see Waldhauer *et al*., 2015 for a comparative approach between Mexico City and Cairo about fresh food logistics).

The importance and, to a certain extent, the efficiency of this type of traditional (and largely informal) logistics is generally ignored by academic literature and government documents. Beyond its substantial costs, the nanostores channel presents several advantages, both monetary and non-monetary, that must be taken into account: the stores provide a high number of jobs in countries that suffer from unemployment; as they are numerous and disseminated throughout residential areas, they are located close to their customers most of whom do not own a car: this reduction of motorised mobility for shopping benefits general road traffic; the shops receive frequent deliveries, which allows them to limit the volume of their inventory, to reduce product deterioration, to better meet the fluctuations of demand and to avoid supply disruptions; the sale of basic products in small quantities and the availability of informal credit are adapted to cash-strapped customers. Recently, the resistance to Amazon by Old Delhi's retailers shows that the evolution of trade and logistics structures is a major societal issue. Finally, nanostores are an obvious factor of social cohesion. The analysis of the Indian case below can certainly be transposed to many other countries in the world.

Kirana vs. organised retail
an Indian analysis

Competition from the unorganised sector is another challenge facing the organised retail industry in India. Traditional retailing has been established in India for some centuries. It is a low-cost structure, mostly owner-operated, has negligible real estate and labor costs and little or no taxes to pay. Consumer familiarity that runs from generation to generation is one big advantage for the traditional retailing sector. In addition to that, the unorganised sector has transformed itself with the advent of organised retailing. It has become more customer friendly by offering credit, home deliveries, etc. It adds a personal touch to shopping that organised retailers may find impossible to emulate.

Another challenge is that of the cost of operation. Organised retailers in India, as in many developed countries, cannot concentrate on their core competency alone. They will need to manage everything from supply chain, logistics, selling, sourcing, stocking, merchandizing, trend analysing etc. Players in the organised sector have large expenses to meet, and yet have to keep prices low enough to be able to compete with the traditional sector. This is a huge challenge. High costs for the organised sector arise from: higher labor costs, social security for employees, high quality real estate, rentals, security, maintenance, much bigger premises, comfort facilities such as air-conditioning, back-up power supply, higher electricity tariffs, taxes etc. Organised retail also has to deal with the middle-class psychology according to which the bigger and brighter a sale outlet is, the more expensive it will be. (Dash and Chandy, 2009).

Neither nanostores nor supermarkets exist in isolation; they must receive the commodities they sell from adequate suppliers. City logistics is the final link in a longer chain, from production site or import harbor to final destination: it relies on relationships between final distribution channels and upstream producers, intermediate agents, buyers (wholesale, semi-wholesale), upstream and downstream carriers, final retailers.

Supermarkets in developing countries can be owned by national capital or be the result of a joint venture involving a foreign investor who in some cases provides a methodology for the management of the entire supply chain. In these countries, modern logistics technologies and organisation models tend to diffuse themselves with a slight lag compared to developed countries (as mentioned above regarding the Indian example).

Traditional shops depend on a supply chain that is also traditional, with agents from the informal economy playing more or less the same part as the formal sector, but with a lower level of compliance with regulations: informal road transport (own-account or account of third parties vehicles using non-compliant vehicles and frequently infringing loading limitations are predominant over formal “structured” transport; informal warehousing (frequently in unsafe buildings: the back of shops or even the basement of residential buildings), parking and handling operations on the street, *etc*.

Although they coexist with limited cooperation, modern and traditional supply chains actually interface: the competitiveness of traditional logistics (even considering its illegal practices and heavy hidden social costs) contributes to maintaining low prices that hamper the development of modern logistics that complies with international safety and quality standards.

4.3. Street logistics and informality

Street occupation is in itself an issue. The street is host to numerous, often informal activities (fixed or mobile retail, fixed or mobile catering, diverse services and crafts including appliance and bicycle repair, sewing, etc.) that obstruct the traffic (Steck, 2006). Among these activities, logistics operations are particularly visible: long-term parking of heavy and light duty vehicles, loading and unloading, sorting, packaging, moving of goods in and out of depots, etc., as are commercial transactions. The rate of irregular parking is particularly high. In Mexico City, only 25% of vehicles have access to formal loading/unloading areas (Lozano *et al*., 2006), while the vast majority of trucks of all sizes make deliveries on the street, all day long. This is reinforced by the fact that Mexico City's economy comprises of a high number of very small firms with a high rate of home-based or street-based activities (Dablanc, 2009).
In Casablanca, the majority of vehicles park illegally: in some areas such as Derb Omar, a historic wholesale, semi-wholesale and retail district, infringement rates range from 80 to 100% (AMDL, 2016) (see Fig. 4). Warehousing is deployed on the ground floor of residential buildings – a highly hazardous practice –, while vehicles unload directly onto the sidewalk before delivering to customers on the outskirts of the city or in the interior of the country (Mareï *et al*., 2019). According to the actors[5] met, only 10 to 15% of the flows transit through large standardised warehouses and these same actors use the term "informal" to describe the rest of the logistics chain. In its efforts to modernise and organise logistics, the municipality of Casablanca plans to identify and register light vehicles that transport goods. It is about three-wheeled vehicles, which have proliferated in recent years due to a lack of legislation: they are considered as two-wheeled vehicles, so not registered. The objective of the municipality is to have a better management of this urban distribution without substituting a system well adapted to serve the inner city. But registration is synonymous with control. The project will not be easy to deploy in an economic sector where informal activities predominates (Debrie and Mareï, 2019). These methods of warehousing and distribution and the use of three-wheeled vehicles are similar in other countries across the continent, including Senegal, Ivory Coast or Egypt. The rickshaw that appeared in the 1950s in India spread throughout the world, first in developing countries and today in a modernised form in the global North (Tastevin, 2012).

[5] *Interviews with AMDL and the Valyans consulting office in Morocco, met several times from 2017 to 2019*

Fig. 4 – Street occupation in Derb Omar, Casablanca

In India, the informal occupation of public space by economic activities such as retail or logistics is almost structural and forms a significant barrier to the deployment of modern urban logistics. A team of French architects[6] working on a multimodal railway station project in Nagpur (Maharashtra) indicated that it would be necessary to double the "official" commercial surface of the project to take into account the informal spread of activity, as street activities are subordinated to those of adjacent shops (street traders are granted the right to use a shop's outside space in exchange for services). A study on urban freight parking practices in Delhi shows that there is no provision for loading or unloading zones or dedicated parking in the commercial area studied and that drivers have to pay fees to use facilities that don't really exist (Malik, 2017). The competition for public space is real, and it is a difficult one, in one of the most populated city in the world, where 2.48 million tons of freight circulate every day (CSIR-CRRI, 2018), 5 times what circulates in the Paris Region every day. More generally, urban logistics practices in India show that the final retailer frequently receives its supply from a local hub. In addition, hierarchical relations of subordination, as well as the very cheap price of labor, make it hard or even impossible to establish a comprehensive pattern of urban logistics services. Among our examples, India stands out for its current boom of electric mobility (especially two-wheelers and tricycles for transport and delivery), but the extensive use of these vehicles in logistics chains depends on urban planning, which would need to consider the space required in a densely occupied street to reload vehicles.

As a consequence, in spite of the real social advantages brought by the informal sector which prohibit its elimination, the performance of city logistics in developing countries is low in comparison with the standards of developed countries. The burden of distribution costs on the prices of everyday consumer goods is high, which weighs on the population's purchasing power. A paradox of developing countries is that the price of transport weighs more on the purchasing power than in developed countries. Some practices are also hazardous (uncontrolled warehousing, unsafe and overloaded vehicles…). An evolution is necessary, if only for safety reasons.

[6] *Interview with Enia Architectes about their projets on urban logistics in India, , Paris, November 2019*

5. Public authorities and urban freight management

Logistics was long considered as a business matter. Gradually, a viewpoint shift occurs, boosted by the example of developed countries placing logistics at the core of firm management but also a growing awareness of public authorities' responsibility in the efficiency, or inefficiency, of logistics. As already mentioned, logistics is now a political issue (Savy 2016), and the World Bank succeeded in making its periodic survey *Connecting to Compete* (Arvis J.-F. *et al*. 2018) a powerful tool to convince governments about the necessity of a logistics development policy.

This is also true at local level. Local authorities have long neglected the impact of city logistics on congestion, pollution, greenhouse gas emissions, safety, etc. and their efforts to organise traffic, parking and warehousing within the urban fabric are very disparate from one city to another, even within the same country. But a change is occurring, an international survey clearly shows. J. Holguin-Veras *et al*. (2018, part I&II) address:

- (i) freight and service activities in a sample of cities, on the basis of employment data and trip generation models,
- (ii) an assessment of public sector initiatives in urban freight management,
- (iii) a state of the practice in urban freight policy,
- (iv) a ranking of these initiatives.

Among the rich information thus gathered and disseminated, two tables compare observed practices in developed and developing countries. One deals with infrastructure management, parking/loading areas management, vehicle-related strategies and traffic management. The other one deals with financial approaches, logistical management and demand/land use management. The first pack of initiatives addresses the "hardware" aspect of urban logistics (cf. table 2), the second pack the "software" one (cf. table 3).

Regarding "hardware" oriented initiatives, the survey shows some discrepancy between developed and developing countries: proportionally to the total number of identified initiatives, parking/loading management and vehicle-related strategies are more frequent in developed countries while infrastructure management and traffic management are more frequent in developing countries, but these proportions are of the same order of magnitude.

	Developed countries	**Developing countries**
Infrastructure management	**21.8%**	**23.5%**
Major improvements	14.0%	7.7%
Minor improvements	7.8%	15.8%
Parking/Loading areas management	**27.7%**	**23.9%**
On-street Parking and Loading	18.1%	16.5%
Off-street Parking and Loading	9.6%	7.4%
Vehicle-Related Strategies	**9.1%**	**8.1%**
Traffic Management	**41.5%**	**44.6%**
Access/Vehicle Related Restrictions	24.1%	21.8%
Time Access Restrictions	10.6%	13.0%
Traffic Control/ Lane Management	6.7%	9.8%

Table 2 - Urban freight initiatives: "hardware, source: J. Holguin-Veras *et al*. (2018, part, I)

Regarding "software" oriented initiatives, the survey also shows some discrepancy between developed and developing countries: proportionally to the total number of identified initiatives, logistical management and demand/land use management initiatives are more frequent in developed countries while financial approaches are more frequent in developing countries. Here again, these proportions are not radically different from one group of countries to the other.

	Developed countries	**Developing countries**
Financial approaches	**29.6%**	**35.4%**
Pricing	14.8%	10.8%
Incentives	14.8%	10.8%
Taxation	3.3%	10.8%
Logistical management	**40.3%**	**38.5%**
Consolidation	6.2%	4.6%
ITS	13.6%	13.1%
Last mile delivery practices	20.6%	20.8%
Demand/land use management	**30.0%**	**26.2%**
Demand management	18.1%	14.6%
Land use policy	11.9%	11.5%

Table 3 - Urban freight initiatives: "software", source: J. Holguin-Veras *et al*. (2018, part. II)

The cited papers also address the positive and negative consequences of these initiatives regarding delivery costs, congestion, emissions, safety and liveability. It also distributes positive and negative effects among stakeholders (society, community, freight industry), thus making specific rankings possible. But the issue of informal logistics, the major importance of which in developing countries does not have to be reminded, cannot be addressed. Some initiatives will impact all logistics activities, formal or informal. It is the case of infrastructure management. It can also be the case of vehicle-related strategies and traffic management, assuming that regulations are duly applied. But taxation or incentives and other "software" oriented initiatives can have but little effect on non-registered and technically traditional companies.

Finally, one of the major challenges in urban freight management is the transition from the planning stage to operational stage of these various logistics approach of cities. The comparison between hardware and software oriented initiatives also makes it possible to compare functional logistics (carried by uses and practices of local economic actors) and political logistics (carried by institutions), and this beyond the generally accepted geographical and socio-economic limits (global north-south, centre-periphery, etc.). In this way, examining how this sector can play a key role in the consolidation of metropolitan areas in developing countries is a real challenge for territorial governance and planning. In developing countries, the governance of the informal part of logistics is a tricky but not impossible issue that Morocco is considering through, for example, projects for the registration of informal tricycles used in centre cities.

6. Discussion: convergence, hybridisation, dualisation, innovation?

Approaching the possible futures of city logistics is not made any easier by available literature. In many developing countries, professional journals as well as scientific conferences and administration papers only address modern logistics and its methods (implicitly assessing they will gradually expand to the total logistics system), while ignoring the actual system operated in their local neighbourhood and its important informal share.
Among many examples, a recent PhD thesis about logistics in China duly characterises the system as fragmented, traditional, informal, etc., but the only solution put forward is a central distribution centre the location of which would be determined by optimisation software, without considering which actors would or would not be able to access it (Ma, 2014).
Similarly, the proceedings of a national conference about urban mobility in India[7] recommend that the objectives of urban freight transport should focus on efficiency, economy, road safety, on protecting the environment, on the provision of the right type of infrastructure and on the design of a holistic urban structure. In order to minimise the negative impact of urban freight transport, this sector should strive to achieve environmental, economic and social sustainability. The report concludes that urban freight transport regulations, including vehicle restrictions, time windows and environmental zones, should be introduced "to promote the safe and smooth movement of goods without disturbing the city's functioning and people's movements". These recommendations could have been put forward, word for word, in any developed country. No mention is made of the specific characteristics of the Indian logistics system, such as *kirana* shops.

The comparison between urban logistics in developing and developed countries outlined above shows that nothing is simple on either side. In developing countries, modern and traditional systems coexist but hardly interact. In developed countries, so-called modern logistics partly relies on methods and practices likely to be considered as archaic and unsustainable. Nevertheless, there is no symmetry of structures between Southern and Northern countries, and the "dual" system found in developing countries is not equivalent to the "bipolarised" system found in developed countries.
Obviously, logistics management methods and tools used in developed countries tend to spread to the developing world, whereas precarious and informal forms of logistics are expanding into developed countries. However, the gap between developed and developing countries remains very broad, as traditional retail remains predominant in the latter for the majority of low-income customers, and a massive convergence is unlikely to happen, at least in the medium term.

It can be expected that the diversity of city logistics in developed countries will expand even more. For example, the format of the hypermarket (a vast range of products of various quality levels under one single roof, which is accessed almost exclusively by car) was highly successful in France, but is now declining if not in crisis. Various alternative solutions are developing, targeting segmented client groups (due to growing social inequality, to an aging population, to new tastes and consumption habits that value differentiation, or to new passenger mobility concerns): hard discount, specialist shops, small supermarkets accessible by foot or public transport (re-centralisation in large cities), organic shops, short food supply chains, etc., without forgetting the continuous development of e-commerce and its delivery practices. These underlined items represent a significant structural change in the entire retail

[7] 11th Urban Mobility India Conference & Expo 2018, Green Urban Mobility, organised from 2nd to 4th November, 2018 Nagpur, Maharashtra. Technical Session 8: Urban Freight.

and logistics systems (Hesse, 2002). New solutions, aimed both at identifying profitable niche markets and at responding to sustainability criteria, will in term emerg
In developing countries, evolutions are even quicker in a context of economic growth and urbanisation. The comparison of Chinese retail twenty years ago and today is striking (Alibaba is the only firm in the world that can be compared to Amazon). Modern logistics, with practices comparable to those of developed countries, is expanding. But modern urban logistics in developing countries is no more homogeneous than its original model, and this expansion is more of a transposition and adaptation than a mere copy. The supermarket, hard discount store or nanostore can be the object of diverse local variations, which interface with traditional logistics as they explore modern technologies (starting with the many functionalities of smart phones) and seek to adapt to their customers' evolutions.

Within the growing diversity of city logistics, interesting hybridisation tendencies can be observed. In India, some modern e-commerce wholesale operators focus on small shops (*kirana*), thus connecting traditional downstream commerce with modern upstream supply. In Morocco, Turkish hard discounter BIM is expanding its network of small shops (more than 400 throughout the country): while their format is more similar to that of a *hanout* than to a supermarket, they are managed as part of an integrated chain. In Latin America, multinational beverage manufacturers (cola, etc.) can deliver their products directly to nanostores with their fleet of own-account vehicles. Despite a large informal channel remains, the few studies about food logistics show that food deliveries become more centralized and organized (Kin *et al*., 2017; Waldhauer *et. al*; 2015). The emergence of a large middle-class with changing consumptions patterns contribute to these trends. It is also participating in the growth of e-commerce in the food industry (see for example the development of delivery companies such as Rappi and Ifood in Latin America or Lalamove, an Asian company that also operates in South America).Nanostores also exist in developed countries, particularly in the centre of the largest cities. These "corner shops" can sell coffee, groceries, snack foods, over-the-counter drugs, tobacco, toiletries, newspapers, sometimes alcohol, etc. Their local names (or nicknames) are just as diverse as in developing countries: "deli" or "milk bar" in Australia, "dairy" in New Zealand, "*dépanneur*" or "*dep*" in Canada, "kiosk" in Finland, "Tante Emma Laden" in Germany. Some of these shops are traditional. The most advanced model is that of the *kombini* (a transposition of "convenience") shops, a typical element of the Japanese way of life. Open 24/7, these shops are part of large integrated chains, are restocked several times a day with fresh foods according to an optimised routing program and offer the example of a traditional form of commerce (small corner shops) connected and managed through an intense use of high technology. These shops have links with takyubin companies: another typical element of the Japanese way of life, these B2C parcel service companies rely on a powerful network of pick-up and delivery points and also sell own-brand products (Libesking, 2018).

In addition, the future will also strongly depend on public decision-making at a local or national scale, at a time when sustainable logistics is becoming a global buzzword (Cui *et al*., 2015; Anderson *et al*., 2005). Tightly interwoven technical, economic and political factors contribute to determining drivers of evolution, such as the energy transition (electro-mobility) to reduce greenhouse gas emissions and local pollution. Digitalisation is another driver of change, for the management of the supply chain but also, through automation, for the completion of operational tasks such as handling goods and driving vehicles. Social, technical and tax regulations also have an impact, as well as the conditions of their enforcement.

Without frontally targeting the informal sector, the Moroccan government has set up a dedicated agency to develop logistics[8], aimed at a gradual "modernisation" of logistics. A special program is dedicated to largest cities, starting with Casablanca, the economic capital of the country. This transition should be supported by more stringent controls over storage conditions, vehicle safety and parking in public spaces, and by the creation of facilities such as truck centres and logistics terminals, as well as fiscal and social security controls (that provide incentives to "formalize" the sector).

7. Conclusion

In conclusion, we consider that the distinction between dualisation and bipolarisation is established, and shows that the difference between Southern and Northern city logistics is structural, systemic. Such a gap requires approaches adequate to each context, considering that innovation is intense on both sides and can follow original paths. In Bombay, the "*dabbawalla*" lunchbox distribution system, largely relying on the smart use of regional passenger trains, does not resemble the Western meal delivery services using bike couriers and was invented earlier. And more unexpected logistics inventions are bound to occur.

Closing a searchers' paper with the call for more research is certainly not original! However, this conclusion is, in this case, indisputably relevant. The imbalance of research between Global North and Global South city logistics is massive and obvious. The question is not only to expand research it but also to broaden its geographical scope, to make it global. Beyond the mere advance of scientific knowledge, more studies and comparisons, including bench marks of best practices, would provide a more solid foundation for public policies for city logistics improvement.

In this respect, Global Southern cities discrepancies compared with Northern ones are fundamental and certainly long-lasting. Simply distributing Nordic tools and turnkey logistics organisations will not solve the problem of logistics advancement in the South, the necessity of which is unquestionable. The elaboration and diffusion of specific solutions, embracing technical, economic, social and territorial dimensions of city logistics in the South, is necessary.

By the way, if originally adequate to this particular context, future innovations could expand towards the North. On the example of Japanese "kombini", numerous high-tech nanostores could develop in Northern city centres, thus transposing a typical Southern mode of retail. Finally, more qualitative and quantitative studies and comparisons are needed, that can act as a magnifier to shed light on both developed and developing countries.

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