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The collaboration potential between cycle logistics carriers in Belgium.

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Abstract

Context: Urban freight transportation generates high level of congestion and pollution. Cycle logistics has various commercial and non-commercial usages and is part of the solution for the sustainable development of urban logistics. In Belgium, cycle logistics carriers, often called bike messengers companies or bike couriers, are small transport companies operating mainly locally for clients requiring transportation services at a city level. They can also execute (as subcontractors) the last mile operations of urban consolidation centres and large postal and courier, express & parcels companies. Together Belgian cycle logistics carriers represent a turnover of 1 to 2 million euros while it is estimated that 25% of urban commercial deliveries could be achieved with cargo bikes. Various challenges impede their growth: (1) the lack of awareness among the general public and shippers about their existence or load capacity and quality of services; (2) the inadequate infrastructures; (3) the low level of public support; (4) the fact that motorized transportation does not have to internalise the costs of its externalities while logistics service providers are chosen mainly on a cost basis; (5) the limited level of professionalization and capitalization of these companies.

Purpose: The aim of this thesis is to establish the opportunities that a collaboration represents for these cycle logistics carriers and the conditions to reach these opportunities. In other words, this paper investigates the extent to which collaboration between these local operators can help them to unleash their potential. This, in order to contribute to the cycle logistics literature by developing new strategic insights related to interfirm networks. Indeed, the development of the commercial cycle logistics activities had not been treated through the lens of horizontal collaboration in an academic paper yet. Also, the literature on horizontal collaboration between logistics services providers and the broader literature on interorganizational relationships and interfirm networks would benefit from new observations from a sector at its very early stage.

Methodology: 22 semi-structured interviews have been conducted with 7 representatives of Belgian cycle logistics carriers, 4 logistics experts with deep knowledge concerning cycle logistics and urban logistics, 7 representatives of networks regrouping cycle logistics carriers and 4 other stakeholders (1

representative of the public authority, 1 of a collaborative platform, 1 of a large international logistics company and 1 of the motorized transport sector). The data have been analysed following an inductive approach in a four step process. First, interviews were transcribed. The second phase included the thorough reading of the transcripts, notes taking and summarizing the data in order to have a comprehensive overview on these. The third step corresponded to the first iteration of coding with the help of a CAQDS software (Atlas.ti 8). The last phase was the refinement and the classification of the code into broader categories. The results have been classified around the opportunities and the conditions to reach these opportunities and take a supply side perspective.

Results: Collaboration offers opportunities to Belgian cycle logistics carriers to tackle their main challenges by joining their capacities, establishing a representative voice and having more bargaining power regarding the different stakeholders. However, it is very difficult to set in place. The primary opportunities can be summarized as follow:

- To access nationwide clients and e-commerce volumes through geographical expansion by setting a collective inter-city offer.
- To gain capacity to answer larger tenders by joining their capacity.
- To gain visibility and credibility towards shippers.
- To gain visibility, credibility and support from public authorities.
- To achieve economies of scales through joint-purchasing and mutualisation of operational and supportive tasks and tools.
- To learn from partners.
- To ease access to external projects.
- To ease access to funding.

Even though, interviewed CLCs share the same values, numerous difficulties remain. Their heterogeneity in terms of maturity, current functioning and the various market realities in different cities impede the setting of a common value proposition. Also, collaboration is made difficult by the low level of resources that CLCs can invest, their risk-averse behaviour and to a limited extent by the potential competition issues. Then, choosing the appropriate governance structure is not an easy task and various configurations from trade association to joint-venture are

considered. The allocation of the tasks, benefits and the costs is a sensitive topic. The development of an ICT system supporting the collaboration is also difficult.

Conclusion: In the short term, the impacts of horizontal collaboration between cycle logistics carriers would be very modest for the urban logistics but can be significant for these small companies.

Horizontal collaboration offers cycle logistics carriers a unique opportunity to catalyse their development differently of what they have tried before and of what they could do independently. The rationales favouring collaboration and not competition found in this study are in line with the literature on interorganizational relationships. Indeed, collaboration enable new development efforts by dividing the related risks and costs between the partners, by allowing co-investments and by easing the access to funding and external projects and support. It also allows broadening the knowledge and the list of contacts of each company which open their eyes on new opportunities. Furthermore, it enables to link already developed local expertise, load capacities and reputation in a fast and cheap way. On top of that, adopting a longer time perspective, it can be perceived that the outcomes of collaboration can free up the time and benefits needed to make further investments.

This paper has identified various co-exploitation and co-exploration opportunities supporting the view that interfirm networks are interesting platforms for innovation. This is the case for the development of new services as well as the improvement of internal resources and capabilities.

The establishment of a convenient integrated inter-city service would be one of the most radical innovation that collaboration could provide. It would help to penetrate the last mile segment. This finding is striking for two reasons. First, the literature on cycle logistics had previously considered the penetration of cycle logistics carriers in the last mile segment only as a function of their integration into broader external logistics networks as subcontractors of urban consolidation centres and couriers, parcels and express operators. Actually, trough the setting of an intermodal transportation system several local cycle logistics carriers can create their own national or European network and ensure the first and last part of inter-city deliveries. Second, this can reconcile the advantages of a national scope and

the willingness to remain local. This motive to collaborate did not appear in the literature on horizontal collaboration between logistics service providers.

The sharing of knowledge and the mutualisation or co-development of operational and supportive tasks and tools could enable to make significant time and costs savings and contribute to the professionalization of these companies. For instance, the sharing of the development and maintenance costs of an ICT solution integrating the process from the order to the electronic signature of the proof of delivery and the invoicing, but also the related administrative tasks could greatly influence the convenience offered to the shippers and the receivers as well as the productivity of the partners sharing this new resource.

From an institutional theory perspective joint-lobbying and marketing efforts could enable to provide visibility and credibility to these companies. More legitimacy could influence the rules of the games in favour of cycle logistics industry and within it. Various scenarios have been discussed in this thesis.

However, the success of collaboration is not guaranteed and a lot of uncertainty remains on the potential results. A quantitative analysis of the gains in terms of margins and turnover could complete this study to help to better apprehend the added value of collaboration and its factors of success. For this purpose, in two or three years, the comparison of the achievements of more mature cycle logistics collaborative efforts could be useful.

Finally, the ambition and the configuration of a collaboration will be function of the resources committed. Public support or the involvement of an external party that would coordinate a commercial collaboration could help to circumvent the limited network capabilities of these companies. This are two solutions to circumvent the issue of making collective upfront investments when there is uncertainty regarding the future results.

Keywords: Sustainable development – Urban Logistics – Cycle Logistics – Cycle Logistics Carriers – Horizontal Collaboration – Interorganizational Relationships – Interfirm Networks.

List of acronyms

CEP Courier, Express and Parcel

CL Cycle Logistics

CLC Cycle Logistics Carrier

HC Horizontal Collaboration

IOR Interorganizational Relationship

LSP Logistic Service Provider

UCC Urban Consolidation Centers

UFT Urban Freight Transportation

UL Urban Logistics

4PL Fourth Party Logistics

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1. Introduction

The Urban Freight Transportation (UFT) impacts the environmental, social and economic performances of our cities. Indeed, it strongly impacts its level of local employment and competitiveness and generates significant negative externalities (Bandeira, D'Agosto, Ribeiro & Bandeira, 2018). UFT generates around 10 to 15% of the urban traffic, 25% of its greenhouse gases emissions and up to 50% of its other polluting emissions (Maes, 2017). Other externalities include noise pollution, congestion (exacerbated by double parking), accidents, feelings of insecurity, conflicts and constraints on the public space (Bandeira et al., 2018). These concerns are reinforced by the urban population growth as well as the rise of e-commerce and other consumption behaviours favouring express practices and reduced inventory levels (Melo & Baptista, 2017). This leads to more deliveries *per se* and to more fragmentation of the freight flows. Indeed, it induces to deliver more addresses and smaller parcels under higher time constraints impeding the consolidation and enhancing the need for dedicated routes (Kin, Verlinde & Macharis, 2017). These observations combined with the fact that UFT is far from being optimized (Gevaers, van de Voorde & Vanelslander, 2009) have led public and private initiatives to seek sustainable alternatives. However, traditional Logistics Services Providers (LSPs) want to provide cheap and high-quality services with little intention to internalize these externalities (Russo & Comi, 2012). Local authorities have undertaken various (complementary) solutions by supporting, for instance, the development of Urban Consolidation Centers (UCC) and low emission zones. The fact that the main European urban centres should be offered near-zero emission logistics services by 2030 (EC, 2011) is another demonstration of the urgent need for more efficiency and emission-free vehicles such as bikes and especially cargo bikes in urban logistics (UL).

Cycle logistics (CL) "*describes the use of human-powered or electrically-assisted standard bicycles, cargo bikes and cargo tricycles for the transport of goods between A and B, primarily in urban areas"* (Schliwa, Armitage, Aziz, Evans & Rhoades, 2015: 3). Interestingly, CL can reconcile, under certain conditions, the private and public interests in dense urban areas (Arnold, Cardenas, Sorënsen & Dewulf, 2017; Melo & Baptista, 2017; Rudolph & Gruber, 2017) and has a promising potential since it is estimated that 25% of the urban commercial transportation trips could be achieved with cargo bikes (Lenz & Riehle, 2013). Nevertheless, this potential is not met at all. The commercial expansion of CL might come from the penetration of bikes in various markets. Non-logistics firms can deliver themselves their own

goods and services with cargo bikes or use it for internal transportation purposes (Rudolph & Gruber, 2017). Also, traditional LSPs could change their fleets (Gruber, Kihm & Lenz, 2014). Currently, a small part of the internal activities of UCCs and of large postal and Courier Express and Parcel (CEP) such as bpost or DHL is concerned with cargo bikes. Moreover, the disruptive business models of collaborative platforms linking shippers, receivers and drivers can rely on bikes as well (Maes, 2017). This research does not focus on these commercial usages and rather takes the perspective of cycle logistic carriers (CLCs) whose core business is the transportation of goods using a whole range of bikes.

This paper investigates the potential of horizontal collaboration (HC) between CLCs from a supply side perspective and constitutes the first academic research on the topic. The objectives are to determine both the opportunities and the requirements that such a collaboration entails. In other words, the aim is to investigate to what extent a network of CLCs can contribute to the development of the sector in Belgium.

The types of collaboration considered are interorganizational relationships (IORs) between organizations active at the same level of the supply chain. IORs are arrangements of strategic importance between interdependent organizations, aiming to fulfil the collective and self-interests of the partners, which are neither arm's-length transactions nor acquisition (Mandell & Steelman, 2003; Tjemkes, Vos & Burgers, 2017). It encompasses various types of equity and contractual arrangements, such as joint ventures, alliances, networks, consortium, cooperatives and trade associations, whose purposes and definitions are overlapping in the literature (Lin & Darnall, 2014; Mandell & Steelman, 2003). HC between LSPs refers to the collaboration between LSPs having a similar position in the supply chain and offering rather similar services (Cruijssen, Cools & Dullaert, 2007).

This paper is a first attempt to reconcile the literature on CL, IORs and HC between LSPs. The CL literature is in its early development especially from a business and economic perspective (Maes, 2017; Rudolph & Gruber, 2017). This Master Thesis provides new strategic insights for the development of the sector by answering a call from Rudolph & Gruber (2017) to investigate on the potential of CL networks. Also, while the literature on IORs (Barringer & Harrison, 2000) and vertical collaborations between LSPs is very-well established, the literature on HC is more recent especially concerning road transportation (Schmoltzi & Wallenburg, 2011) and sustainability issues (Chen et al., 2017; Monios & Berdvist, 2015). Although 60% of LSPs

collaborate horizontally with other LSPs (Schmoltzi & Wallenburg, 2011) these literatures have never been applied to CL.

Furthermore, the interest for various types of collaboration between CLCs is important. Fiestkoeriers.nl in the Netherlands, Swiss Connect in Switzerland, and Imagine Cargo in Switzerland, Germany and Austria offer same and next-day inter-city services relying on local CLCs for intra-city transportation and respectively on green gas vehicles, train and a mix of solutions for inter-city transportation (Fietskoeriers.nl, 2018; Imagine Cargo, 2018; Swiss Connect, 2018). The recent or coming incorporation of national federations in Belgium, Germany, Spain, France and in the United-Kingdom are other examples. The European Cycle Logistics Federation also contributes to develop the sector (ECLF, 2018). Other networks are about to be created. For instance, CoopCycle is a project aiming to enable cooperatives across Europe to mutualise their means including an open source collaborative platform. It also exhibits a political component as they intend to show to the general public that an alternative exist to the current development of the collaborative economy (CoopCycle, 2018).

The paper presents the following structure. First, a literature review constitutes the theoretical background to support the empirical investigation. Then, the qualitative methodology is presented. Based on 22 interviews the findings are drawn and are discussed in the following part. Finally, the conclusions, limitations and further research propositions are presented.

2. Literature review

The first two sections investigate why and how organizations need to collaborate by using a multi-paradigm approach that is justified to overcome the intricacy of IORs (Gomes, Barnes, & Mahmood, 2016) and the exploratory nature of this study. The third section provides an overview of the CLCs sector based on European literature with a special focus on Belgium.

2.1. Why do firms collaborate?

2.1.1. Resource-Based View Theory: Innovation, Learning and Access to New Markets

According to the resource-based view theory, firms collaborate to access the resources, capabilities and knowledge of other organizations because they perceive they cannot self-acquire these efficiently (Grant, 2003). This is the most common approach to explain why firms collaborate (Ozman, 2009). According to Parmigiani & Rivera-Santos (2011), co-innovation emerges from the *co-exploration* and *co-exploitation* of resources and capabilities. *Co-exploration* consists in the joint-creation of new capabilities, resources, goods and services (Parmigiani & Rivera-Santos, 2011) together with new business models (Lin & Darnall, 2014). Conversely, *co-exploitation* of existing resources allows to improve existing value propositions (Parmigiani & Rivera-Santos, 2011). More generally, scholars positively relate IORs' participation with interorganizational learning and innovation (Cowan, Jonard & Ozman, 2003; Mowery, Oxley & Silverman, 1996; Qiao, Ju & Fung, 2014).

Organizations access resources through collaboration instead of buying or self-developing these for several reasons. First, collaboration allows to access already developed and specialized resources and capabilities in a fast and flexible way without having to specialize itself (Grant, 2013). Therefore, collaboration is often used to enter new markets (Tjmekes et al., 2017). Second, it enables to share the risks and the costs of investments (Elmuti & Kathawala, 2000). Finally, not all the resources and capabilities are available on the market or can be developed alone (Tjmekes et al., 2017).

2.1.2. Transaction Cost Economics Theory: Efficiency

The Transaction Cost Economics Theory considers three types of organizational structure; IORs, the market and hierarchies. It posits that the organizational structure is defined to minimize the transaction and the production costs (Barringer & Harrison, 2000). IORs can mitigate the production costs by enabling economies of scale and by increasing the

specialization's degree (Tjemkes, 2017). The transaction costs implied by the need to initiate and monitor the market exchanges and by opportunistic behaviours can be mitigated by IORs as trust and mutual knowledge emerge from repeated interactions (Barringer & Harrison, 2000). However, some "partnership costs" need to be added to the equation.

2.1.3. Institutional Theory: Legitimacy and Reputation

The institutional theory posits that firms face regulatory, normative and cognitive pressures forcing them to behave similarly in order to appear legitimate in their organizational field (DiMaggio & Powell, 1983; Marques, 2016). Typically, trade associations withstand and exert pressure through internal and external actions to gain legitimacy and reputation (Rajwani Lawton, & Minto, 2017). External actions consist in collective lobbying and sensitization (Lawton et al., 2017; Rajwani et al., 2015). Internal actions consist in developing a common identity and self-industry regulations in order to signal an appropriate behaviour (Lawton et al., 2017; Lin & Darnall, 2015). By improving their reputation and legitimacy with the authorities, firms can dampen and anticipate new regulations, ease current compliance and gain access to direct support. They can also raise barriers to entry by imposing industry norms and regulations (Rajwani et al., 2015). Moreover, by contributing to the *market discourse* they can influence the cognitive perception on certain products and services (Kahl, 2017).

2.1.4. Social Network Theory: Social Capital and Power

This theory considers that "*social life is created primarily and most importantly by relations and the patterns formed by these relations"* (Marin & Wellman, 1988: 12). Being well-connected enable to benefit from the resources and capabilities embedded in these relationships (Borgatti & Halgin, 2011). Also, by acting as one, organizations can gain power over other organizations by diminishing the number of alternatives they have and increase their dependency (ibid).

Thus, there is a wide consensus among scholars that IORs can increase firms' efficiency, power, reputation, social capital, capabilities, innovativeness and shape "the rules of the games" in a favourable way. IORs allow benefiting from the sharing of the costs and the risks, the partner's specialization and from a fast access to existing knowledge and capabilities and *in fine* to markets. The following motivations of LSPs to collaborate provide specific examples.

2.1.5. Why do LSPs collaborate?

LSPs suffer from a *vicious circle* induced by the low margins in the sector impeding investments and innovation which in turn entail a fiercer price competition ending up with larger margins reduction (Cruijssen, 2006). The trends imposing higher flexibility and time constraints further reduce their load rate and due to their low bargaining power, it is difficult to pass the supplementary costs on the shippers (Cruijssen, 2012). Therefore, they collaborate to break this dynamic.

Typically, LSPs pursue economies of scales through joint-routing and joint-planning. It enables to share the orders and/or the fleets to increase the filling rates, reduce the covered distances and the investments (Verdonck, Caris, Ramaekers & Janssens, 2013). A more efficient usage of the storage capacities and the joint-purchasing of vehicles or software are other opportunities to make savings (Cruijssen, 2012).

Another common motive for collaboration is to expand the range of services offered, for instance, by combining the warehousing and transport capacities of partners (Cruijssen et al., 2007).

Also, the transfer of expertise improves the human resources and the operational management, further reducing the costs and improving the quality of services (ibid).

The ability to access larger clients is also a primary motive for LSPs to collaborate. Indeed, through the bundling of their capacities LSPs can accept larger load and expand their geographic coverage (Cruissen, 2012; Schmoltzi & Wallenburg, 2011).

Joint-marketing, joint-access to capital (Schmoltzi & Wallenburg, 2011) and gain bargaining power (Krajewska, Kopfer, Laporte, Ropke & Zaccour, 2008) are other motives that can be found in the literature.

To conclude, the main strategic motives for LSPs to collaborate horizontally are the improvement of their services, market shares and efficiency and the decrease of their supportive costs (Schmoltzi & Wallenburg, 2011).

2.2. Drivers and impediments of a successful collaboration

While collaborative opportunities are plenty, setting an effective collaboration is difficult. Indeed, the rate of failure of strategic alliances is about 70% (Cruijssen et al. 2007). Defining the optimal structure of the collaboration is not straightforward as it needs to consider its objectives and its context (Mandel & Steelman, 2003) but also the complexity entailed by the chosen structure (Raue & Wieland, 2015; Schmoltzi & Wallenburg, 2012). This section explores the main factors of failures and success exposed by the literature.

2.2.1. Co-opetition

HC is negatively affected by the fact that partners are also (potential) competitors referring to the *co-opetition* issue (Cruijssen et al., 2007). The self-appropriation of sensitive information is more valuable when collaborating with competitors fostering the risks of opportunistic behaviours. This is an important issue for LSPs as their competitive advantage relies on processes that can be easily imitated (Schmoltzi & Wallenburg, 2011).

2.2.2. Network capabilities

Firms have different *network competencies* referring to their ability to manage the network as a whole, their specific relations with each partner and to benefit from the value generated collectively (Jüttner, Deigendesch & Michel, 2005; Ritter & Gemünden, 2004; Ritter, Wilkinson & Johnson, 2004). Ritter & Gemünden (2004) positively relate these firm's competencies to (1) their ability to invest resources in the collaboration; (2) their economic and legal skills allowing to allocate and enforce the repartition of the costs and the benefits; (3) their relational skills; (4) their degree of *openness of the culture*. Previous collaborative experiences increase these network capabilities (Christoffersen, 2012). Firms also vary in their *absorptive capacity* referring to their ability to capitalize on external knowledge which is partially linked to the quality of their human resources (van Wijk, Jansen & Lyles, 2008).

2.2.3. Trust and commitment

Trustful and committed behaviours are critical for a successful collaboration. Both are self-reinforcing, diminish opportunistic behaviours and conflicts (Christoffersen, 2012). Also, previous success foster trust and commitment (Suseno & Ratten, 2007).

Commitment can result from a cost-benefit analysis or from an emotional attachment towards the partners (Christoffersen, 2012; Schmoltzi & Wallenburg, 2012).

Trust emerges from the perception that partners act in good faith, respect the ethics of the trustor and that they will be able to deliver the promised task (Christoffersen, 2012; Suseno & Ratten, 2007).

2.2.4. Communication system

An appropriate communication system is also vital for collaboration. Partnerships oriented towards *co-exploration* are typically concerned with tacit and complex knowledge as well as uncertainty and require stronger ties, i.e. more frequent and personal interactions. This, to foster the trust and the flexibility needed to explore new opportunities and the sharing of tacit knowledge (Lin & Darnall, 2014; Parmigiani & Rivera-Santos, 2011). On the opposite, partnerships oriented towards *co-exploitation* are concerned with standardized exchanges. Then, weak ties are sufficient because tasks are often well-defined and concern explicit knowledge (ibid). Generally, for collaboration among LSPs, an ICT system is crucial to exchange operational information. For instance, it enables to centralize the orders and to compute the most efficient routes (Verdonck et al., 2013).

An appropriate communication system is not only useful for the collaboration's effective implementation but also to design the common objectives and the plan to reach them (Jüttner et al., 2005). This is crucial since the shared understanding of a common goal is an important factor of success (Elmuti & Kathawala, 2001).

2.2.5. Partner selection

Determining the right partners implies various trade-offs. The first trade-off concerns the number of members to involve. More partners mean more resources available and more bargaining power. However, it increases the coordination costs (Marques, 2016).

The second trade-off is concerned with the similarities among partners. Cultural and operational similarities ease the communication, mutual understandings, the development of trust between partners (Christoffersen, 2012; van Wijk et al., 2008) and are especially important when the scope of collaboration is broad and complex (Raue & Wallenburg, 2013). Also, similar firms are encouraged to collaborate because reputational issues concerning competitors are more likely to impact them as well (Barnett, 2006). Furthermore, cultural similarities enable to mitigate the *co-opetition* issue (Schmoltzi & Wallenburg, 2012). However, dissimilarities offer access to varied resources and ideas and can, therefore, catalyse innovation (Lin & Darnall, 2015; van Wijk et al., 2008).

2.2.6. Governance

Setting an appropriate governance structure is also a critical and difficult task (Cruijssen et al., 2007; Jüttner et al., 2005). Due to the *co-opetition* dimension, HC performance is positively related to formal arrangements (Raue & Wieland, 2015; Schmolzti & Wallenburg, 2012). They define the processes to follow and the expected contributions enabling more transparency and a better understanding of the responsibilities (ibid). Social control arising from trust, reciprocity and solidarity also affects positively the collaborative performance (ibid).

The distribution of the costs, benefits, risks and responsibilities must be clear. The final compromise between the partner is a function of their relative bargaining power, mutual dependence and their *willingness to make compromises* (Krawejska et al., 2008).

Benefits' sharing between LSPs is often based on *proportional rules* regarding the volumes, the number of clients or the distance covered but these unidimensional rules do not always reflect the real contributions (for instance some deliveries are more time consuming than others) (Cruijssen et al., 2012). Auction mechanisms can also be used. Here, the company offering the lowest price, reflecting its ability to deliver at lower costs, takes charge of the orders increasing the joint-efficiency of the collaboration (Verdonck et al., 2013).

The collaboration can be centralized or decentralized in terms of operational and or strategic management (Cruijssen et al., 2012). Centralized collaborations require a leader which is either an external party or a large company (McKinsey, 2010). Although, they are easier to manage they are generally less fair for the smaller partners and imply the loss of control on part of the operations (ibid).

To sum up, trust, commitment, an efficient communication system and a common vision are needed for an efficient collaboration. On the opposite, the *co-opetition* dimension needs to be tackled by formal and social control. Homogeneity among partners eases the coordination, the emergence of trust and the management of complex tasks. Heterogeneity enables to access varied complementary resources and more radical innovation. Also, more partners can help to be more efficient, more innovative and to enlarge the influence on the authorities and customers, but it complicates the coordination. There is no single rule of thumb concerning the allocation of the costs and the benefits. These will be the results of negotiations. Fierce negotiations will be detrimental to the collaboration (Cruijssen et al., 2007). Finally, centralized collaborations are easier to manage but are less sensitive to smaller partners' needs.

Now that the main opportunities and difficulties that inter-firms and HC represent have been exposed, an overview of the CLCs' realities is presented.

2.3. Overview of the cycle logistics carriers

This section exposes the inherent advantages and disadvantages of CLCs, the markets they are active in and their current characteristics.

CL and its literature are at an early stage. Nowadays, between 20 and 50 FTEs are employed by CLCs in Belgium (Maes, 2017). In order to scale up, the needs for (1) professionalization of CLCs; (2) awareness-raising about CLC's value proposition among potential clients and public authorities; (3) the development of adequate infrastructures such as large bicycle lanes and UCCs are widely acknowledged. From a societal perspective, CL is appealing while its economic viability is less clear. Indeed, the *marginal transport costs* corresponding to the costs per stop is estimated at 3,4€ for *light commercial vehicles (LCV)* and at 4,61€ for cargo bikes when reaching 250 stops per day while the *societal marginal transport costs* internalising their externalities amount respectively to 6,05€ and 4,52€ (Maes, 2017).

2.3.1. Strategic positioning

On the environmental side, CL is an energy efficient, (nearly) emission-free and noiseless solution (Melo & Baptista, 2017). On the social and economic side, it reduces congestion, requires less space and lighter infrastructure than vans and cars and increases the liveability of the cities (ibid). It is also more labour intensive than van transportation (Maes, 2017).

In terms of competitivity, CLCs have pro and cons that must be balanced with cities' characteristics. In any case, they are restricted to urban areas. On the downside, bicycles are limited in terms of volumes, weights, maximum speed and distance coverage (Arnold et al., 2017). However, the increasing usage of electrically-assisted cargo bikes mitigates this drawback. On the positive side, cargo bikes are advantageous in terms of fuel, taxes, insurances and acquisition costs (ibid). Then, cargo bikes can be faster or slower than other vehicles according to the level of congestion, the infrastructure and the topology of the cities. They are faster to park and can be parked closer to the delivery points.

2.3.2. Markets

The majority of the CLCs offer couriers services at a city scale mixing express, same-day and next-day deliveries while some are subcontractors for UCCs, CEP and postal operators (ECLF,

2016; Maes, 2017). Couriers services refer to the transportation of goods between shippers and end receivers located in the same city (Rudolph & Gruber, 2017). CLCs deliver a wide range of products from administrative documents, flowers, advertising materials and medical parcels to food mainly in a B2B setting (Maes & Vanelslander, 2012; Wrighton & Reiter, 2016). While these "segments" have different requirements most of the actors operate simultaneously on these (ECLF, 2016; Schliwa et al., 2015).

The CEP sector is quickly growing driven by the e-commerce growth and is dominated by international operators such as DHL, TNT, FedEx or UPS (Ducret, 2014). Recently, CEP and postal actors have started to use cargo bikes either internally or through subcontracting to CLCs. Cargo bikes are used in the first and final part of regional, national and international deliveries. These parts are particularly inefficient and expensive (Perboli, Mariangela & Gobbato, 2017). The last mile segment refers to the delivery from a hub to the city centre (Perboli et al., 2017) and is the main opportunity for CLCs in terms of volumes (Maes, 2017; Wrighton & Reiter, 2016). The first mile consists in collecting parcels within cities and then ship it to the larger network and is less exploited (Schliwa et al., 2015).

2.3.3. Companies characteristics

CLCs are SMEs with space for professionalization (Lenz & Riehle, 2013; Maes, 2017; Schliwa et al., 2015). In Europe, few exhibit a turnover of more than 1 million euros (ECLF, 2016) and none in Belgium (Maes, 2017).

The efforts are concentrated on the operational activities with little resources dedicated to their marketing and development (ECLF, 2016; Maes, 2017). This is an important concern since potential clients do not know their existence or underestimate their load capacity and quality of service (Gruber et al., 2014; Maes, 2017; Schliwa et al., 2015).

The use of a Transport Management System enabling automatic route planning, real-time tracking and invoicing and electronic proof of delivery is recommended to contract with large shippers and gain efficiency (Maes & Vanelslander, 2012; Schliwa et al., 2015). However, few companies use this kind of software (ECLF, 2016).

Also, their lack of capital makes their development difficult (Maes, 2017).

These companies generally use a mix of fix and flexible staffing (ECLF, 2016). The daily variations in volumes, the employment taxes, the difficulty of the job and the availability of a

large pool of potential workers explain the use of a flexible workforce (Maes & Vanelslander, 2012).

These companies differ in their status ranging from private limited companies, sole proprietorships to cooperatives and social enterprises (ECFL, 2016).

While the contribution to better cities is their main aim (Schliwa et al., 2015), some traditional operators have turned to cargo bikes for efficiency purpose (Lenz & Riehle, 2013).

This literature review has exposed the main opportunities and requirements entailed by an interfirm collaboration as well as a picture of the realities faced by CLCs. The next parts of this paper empirically investigate what is the potential of a collaboration between Belgian CLCs.

3. Methodology

A qualitative approach was undertaken in order to determine (1) what are the opportunities that a collaboration between CLCs represents to develop their activities and (2) what are the conditions to benefit from these opportunities. 22 semi-structured interviews were conducted and the data were analysed through an inductive approach. The data collection and analysis processes were iterative which is a standard approach for these methods (Dey, 1993; Saunders, Lewis & Thornhill, 2009).

This methodology is appropriate to understand the reasons driving respondents to adopt a certain behaviour or belief (the willingness to see some form of collaboration happen) and to circumvent the fact that a rigid structure to collect the data couldn't be followed due to the intertwinements between the questions (Saunders et al., 2009).

3.1. Data collection

A *judgment sampling* was used which means that the respondents were selected based on their ability to answer the research question more than on their ability to contribute to theoretical developments and on the easiness to access them (Blandford, 2013).

22 interviews were conducted during face-to-face and online sessions with an average length of 50'55''. The agreements for recording was granted by all respondents while the anonymity of the respondent was ensured. 7 Belgian CLCs representatives were met. They are responsible for the strategic and operational decisions in their companies and are bike messengers as well. 4 logistics experts were interviewed, and were selected for their previous experience with CLCs and their deep knowledge of the UL's dynamics. Together, these 11 respondents systematically gave their perception on the opportunities and the challenges that such a collaboration would entail. The governance, partner selection and ICT dimensions were also systematically addressed. Then, as no formal network among CLCs exists in Belgium so far, the purely exploratory nature of these interviews was completed with the description of 10 regional, national and European existing and emerging projects connecting several CLCs. For this purpose, 7 interviews addressing the previously exposed topics with representatives in charge or closely related to one or several of these networks were conducted. 4 interviews with relevant Belgian stakeholders including representatives of the public authorities, the motorized transport sector, a collaborative platform and a large CEP operator were used in order to cross-check the

information, explore their specific interests in the establishment of such a collaboration and balance other respondents' opinions.

3.2. Data analysis

An inductive approach which is commonly used for qualitative and exploratory studies was followed (Blais & Martineau, 2006). This approach was required to focus on the topics emerging from the field itself (Thomas, 2006) as the theories on HC and IORs have never been applied to the specificities of CL.

Following Blais & Martineau (2006) recommendations, the 4 following main steps have been undertaken. First, 21 out the 22 interviews were fully transcribed. The exception comes from a technical problem. However, due notes have been taken during the interview. The second phase included the thorough reading of the transcripts, notes taking and summarizing the data in order to have a comprehensive overview on these. The third step corresponded to the first iteration of coding with the help of a CAQDS software (Atlas.ti 8) ensuring that any modification in the codes was systematically applied across the whole data as recommended by Lewis (2004). 25 codes were selected. The last phase was the refinement and the classification of the code into broader categories. Following the requirements of Dey (1993), the final refinement was dictated by the need to establish categories that can be related to each other and contain a cohesive set of data. Two sections have been established. One regarding the opportunities and the added value that would represent a collaboration. It is organized around 5 main opportunities that can be pursued independently of each other and also reinforce each other. The second is concerned with the feasibility of attaining these opportunities and is articulated around 5 dimensions that are dependent on the objectives set in the first section.

4. Findings

HC offers a wide range of opportunities but is a heavy burden for small entities. All the Belgian CLCs interviewed are interested in collaboration. The primary opportunities offered by collaboration are (1) to gain access to nationwide shippers and e-commerce volumes through geographical expansion by setting a unique inter-city service; (2) to answer larger tenders by joining their capacity; (3) to gain visibility and credibility towards shippers; (4) to gain support from public authorities; (5) to achieve economies of scales through joint-purchasing and mutualisation of supportive tasks and tools; (6) to gain new insights from partners; (7) to ease access and support to external projects; (8) to access funding to support their growth.

Interviewed CLCs tend to share the same values. However, their heterogeneity in terms of maturity, current functioning and the various market realities in different cities impede the setting of a common and standard value proposition. Also, collaboration is made difficult by the fact that CLCs have limited resources to invest, are risk-averse and to a limited extent by the potential competition issues. Then, choosing the appropriate governance structure is not an easy task and various configurations from trade association to joint-venture are considered. The same can be said for the development of an ICT system supporting the collaboration.

4.1. Added value and opportunities

4.1.1. Gain market share

By joining their intra and inter-city capacities CLCs could attract more and larger clients in the last mile and CEP segment as well as in the local courier segment.

4.1.1.1. Geographical expansion

A collaboration between CLCs located in different cities would enlarge the geographical coverage that can be offered by local operators. This would enable to access new and higher volumes through two mechanisms.

First, a CLC's client having entities located in several cities can replicate its collaboration with other CLCs in other cities. Overall, it would increase the penetration of CLCs in local deliveries.

Second, the establishment of an inter-city service would offer the possibility for clients to ship parcels from one city to another and use CLCs services without facing the efforts and the risks of contracting with at least two different CLCs and one traditional LSP. In this setting, a local CLC is responsible for picking up the parcel from the shipper. Then, it transports the parcel to a hub or a point where another type of vehicle can take the parcel in charge. Next, this vehicle transports the good to another city. For this purpose, trains or electric, natural gas, bio fuels and polluting vans or trucks are used in foreign networks. Finally, a local CLC established in the final city is responsible for the last part of the delivery to the end-receiver.

This would help to increase the penetration of CLCs in the last mile segment.

The most developed form of inter-city collaboration consists in setting a unique standard service where clients can order inter-city deliveries through a single point of contact. This service would offer a unique pricing, interface, track and trace, invoicing and helpdesk system to the clients. Furthermore, the orders coming from the shippers' webshops could be automatically integrated into the system.

This is the *modus operandi* of three successful foreign networks offering competitive inter-city (same and next-day) deliveries with large logistics players.

This collective offer could help to attract large, nationwide shippers and e-commerce volumes from shippers having the need to deliver in different cities. The importance of offering a convenient one-stop solution with a sufficient geographic coverage is strongly underlined to convince these clients.

A well-established inter-city offer could also improve the credibility of CL in Belgium.

The rationales exposed to pursue geographical expansion by collaborating with established CLCs in other cities rather than through self-expansion are the following: it is faster, less risky and requires less investment. Also, it reconciles the willingness of many CLCs to remain local and grow organically and the benefits of a national coverage.

4.1.1.2. Joint-capacity

At an intra-city level, collaboration enables to treat larger volumes and offer more flexibility. Indeed, CLCs can share the orders according to their availabilities and join their load and storage capacities.

4.1.2. Economies of scales

On top of increasing their turnover, collaboration can increase CLCs' margins. However, no base case assessing if the potential savings would compensate the costs of collaboration exist. One respondent suggests that virtually everything can be mutualized at varying degrees.

4.1.2.1. Mutualisation of the supporting operations

The sharing of supportive tasks could avoid the duplication of numerous efforts. This opportunity was mentioned for tasks related with marketing, lobbying, accounting, legal and HR management. Also, they could share their efforts to answer and watch public procurement tenders.

The operational management could also be centralized with the support of an appropriate ICT tool.

Nowadays, the dispatching, planning, order treatment, invoicing and other supporting activities are highly time-consuming (approximately 1 FTE is needed to support 2 FTEs on the road).

4.1.2.2. Joint-purchasing and co-development

Collective discounts through joint-purchasing of bikes, equipment and bike parts can be achieved. Together CLCs could also obtain cheaper and specific insurance schemes as well as a common wage guarantee fund. The sharing of a hub or storage facility is another opportunity.

The joint-acquisition of an ICT tool for internal operational purposes would enable to share the related development and maintenance costs. These costs are too high for the majority of the CLCs. Although, the use of a software isn't necessary when dealing with low volumes it is needed to manage larger volume. Also, it is required to offer automatic tracking, invoicing and proof of delivery as other logistics operators do. Nevertheless, some possess their own solution and opinions diverge on the feasibility to share it.

4.1.2.3. Optimization of deliveries

The improvement of the productivity of the deliveries is not a significant motive for CLCs to collaborate yet. This because the consolidation and optimization of freight flows require a critical mass.

However, collaboration could increase the load rate by adding volumes to existing ones. Also, exchanging orders with more efficient partners can enhance the joint-productivity.

4.1.2.4. Bargaining power

On the one hand, standing together could enable to negotiate better rates with shippers and suppliers. On the other hand, the establishment of an inter-city network was motivated by the possibility to attract inter-city volumes without having to deal with the bargaining power of large CEP operators that dictate low rates and important operational constraints.

4.1.3. Visibility and awareness-raising

All the interviewed CLCs consider the enhancement of their visibility towards the authorities and the clients as primary collaborative objectives. Nowadays, they are not visible enough, their load capacities and quality of services are underestimated and they do not have the means to advertise at a significant scale.

4.1.3.1. Joint-marketing and sensitization

Common branding and joint-marketing are two opportunities to increase their reputation and signal the range of clients, cities and solutions they serve. A common identity could help them to be differentiated from the collaborative platforms. Collaboration further allows joint-prospection and to benefit from the partners' sales efforts bringing volumes into the network.

As the general public is not concerned or unaware of the negative externalities generated by motorized transportation, express and just-in-time practices, sensitization activities have been suggested as an interesting collaborative outcome. However, three respondents remind that influencing the consumers' habits is probably beyond the scope of what CLCs can achieve together.

4.1.3.2. Lobbying

Urban mobility legislations and infrastructures are among the main determinants of success of the sector. Also, public authorities need alternatives to motorized transportation.

Having a professional, unified and larger voice to reach the public authorities is a main motive for CLCs to collaborate. There is a need to demonstrate and communicate how they can meet public objectives to obtain public support while sufficient data are required to establish

thorough impact assessments. Environmental, congestion and employment benefits are interesting axes.

Public authorities can grant direct or indirect support at a city, regional, national and European level.

Direct support to a network and its member can be found in public investments funds, accompanying structures, public procurement tenders, direct subsidy, legislative information, fiscal advantages, the development of cycling infrastructure and of UCCs.

Indirect support consists in (1) limiting the access of motorized and large vehicles in terms of areas and time and in (2) increasing the economic burden on their activities.

4.1.4. Interorganizational learning

4.1.4.1. Inter-members exchange

The exchange of knowledge is considered as another important opportunity. This can be organized through workshops, conferences, online or face-to-face meetings, data collection and reports publishing. Exchange of information about clients, services, processes, technology, ICT, HR, legal issues, suppliers, political contacts and other "tips and tricks" have been mentioned.

Joint-research is another opportunity.

Moreover, previous collaborative experiences have facilitated the development of other collaborative efforts.

4.1.4.2. External partner exchange

A representative of the sector would ease the exchanges not only with public authorities and clients but also with researchers and suppliers. Indeed, it could help the exchange of information with research projects concerned with logistics, collaborative models and social innovation. This could lead to participation to subsidized pilot projects.

Also, abroad a collaboration attempt to collaborate with universities and suppliers to make cargo bikes with large loading capacity more reliable as they are not produced in an industrial way yet.

4.1.5. Access funding

Together CLCs can jointly-fund investments.

Also, collaboration could help CLCs to gain access to capital. They could more easily access bank loans, venture capital and public funding. at better rates. Moreover, they could obtain better rates.

Another potential advantage is the creation of a separate entity that could raise capital to fund collective investments. This would avoid individual companies to take this risk.

However, there are divergences among CLCs on the needs and willingness to access capital.

4.2. Conditions and difficulties

As seen, a wide range of opportunities can be achieved. According to the objectives of the collaboration, different structures are considered. Defining the right strategic positioning, governance structure and ICT support as well as committing sufficient resources to the network appear to be necessary and difficult steps.

4.2.1. Strategic positioning

An important step is to define a common and clear value proposition. This process is difficult and iterative as it needs to follow the markets' feedbacks. When defining a common commercial offer, it is important to be competitive in terms of prices and quality of service because the wide majority of clients do not want to pay more for sustainable services. Also, when focusing on express deliveries, prices can be higher while, when focusing on next-day deliveries prices must be lower.

The strategy of the networks also needs to consider the requirement and the capacities of its members. In Belgium, the establishment of a standard offer is made difficult by the differences between CLCs in terms of their maturity and cities' realities. Also, CLCs want to keep their own identity.

4.2.2. Partner selection

The partner selection is evolutive. Partners must fit into the value proposition and must not negatively impact the reputation of the network.

4.2.2.1. Selection criteria

The importance to first create a feeling of community, trust and knowledge between partners is strongly underlined. The Belgian CLCs selection criteria include the sharing of values and ethical criteria's, the benevolence and the pro-activity of partners and the fact that they deliver mainly with bikes. Cooperatives with social purpose would like to promote this status but recognize that it would limit the number of partners. Collaborate only between local operators is justified by the need to understand each other and by the fear that large operators would impose their rules.

In commercial collaboration, it is important to rely on reliable partners that can be integrated into the overall process. However, the required level of professionalism to join an inter-city collaboration depends of the volumes generated by the collaboration.

4.2.2.2. Number of partners

Debates exist on the number of partners to involve. More members make the network management more complex. Similarly, having partners in different countries implies to deal with different languages, markets requirements, legislations and degree of development of CL. However, more partners provide more bargaining power, more opportunities for mutualisation and a larger geographic coverage.

4.2.2.3. Diversity of partners

The possibility to include clients, public authorities, supporting operators such as IT provider and repair services as well as universities in the network can help to develop the ecosystem around the needs of CL.

The appropriateness to include other logistic operators in the network is perceived differently among respondents. It can enable complementarities and the optimization of the operations. For instance, in order to provide a sufficient geographic coverage, two inter-city networks collaborate with other logistic partners in cities where no CLCs exist or when the volumes are too large.

While there is no intention to include large logistic operator within the network, collaboration with these actors can still happen outside the network. For instance, collaboration with bpost, FedEx, UPS, TNT, or DHL would allow being connected to the global logistics networks.

However, they try cargo bikes internally and are not sure that Belgian CLCs are sufficiently developed yet. Also, Belgian operators are mitigated on their willingness to collaborate with them. Barriers lie in the fact that these large companies generally dictate to not mix their parcels with others, to use their specific ICT system and very low prices. Also, CLCs wonder if these companies are interested in CL only for greenwashing purposes.

Finally, a collaboration with collaborative platforms is excluded by all the interviewed CLCs and network's representatives as they state that their values are too different, that these companies are unstable and that they treat bike messengers poorly.

4.2.3. Network capabilities

To set up an integrated and standardized national offer, large investments in human resources, ICT and inter-city transportation systems are required. A related issue, is the long lead time between the negotiation with shippers and the first parcel entering the network, further stressing the importance of upfront investments and capital.

Also, regarding non-commercial associations, the quality of the marketing, lobbying and knowledge diffusion are partially a function of the invested means.

Without sufficient investments, the threshold effects needed to scale up might not be reached.

However, CLCs are small companies and have very few resources to set in a network. This is why the Belgian Pedal Powered Solution project "rely" on subsidy to pay a dedicated staff to investigate the need of Belgian CLCs, set a common vision, agenda and visual identity, conduct pilot projects and constitute a formal structure at the horizon 2019. A related barrier is that all CLCs might not have the vision of what capitalization could bring to their development and that generally social entrepreneurs are willing to remain "pure" and lack of commercial aggressiveness.

Their limitations in financial, sales and managerial capabilities were also underlined.

4.2.4. ICT support

To offer a convenient inter-city one-stop solution and to manage large flows an evolutive and performant software is necessary. An ICT tool can also, be used for joining intra-city capacities.

From the shipper perspective, a seamless experience with a single and convenient user interface to order, track the parcels, receive the invoices and the proof of deliveries is required. An easy integration to the webshops is also recommended if the aim is to attract e-commerce volumes.

The receivers must know precisely when the parcels arrive for their convenience but also to avoid failed deliveries conducting to the duplication of delivery efforts.

ICT is also necessary to coordinate the collaboration. A tool enabling to centralize the dispatching and invoicing activities as well as the real-time tracking of the orders improves the efficiency of the collaboration. However, connecting the existing systems of partners, if they use any, to the overall system is difficult.

However, developing the right software to support this type of collaboration remains an important challenge.

Indeed, rough development costs' estimation by 3 respondents lie between 100000 and 400000€.

Furthermore, the ICT solution must be defined according to the services offered and the logistics process implied.

Finally, an ICT platform alone cannot respond to all the collaborative requirements. Collaborative agreements depicting the costs and benefits' sharing, the responsibilities and a coordinator must be defined. Then, interpersonal relationships and trust are needed to set these arrangements.

4.2.5. Governance

Defining the right governance is difficult.

A transparent system is crucial. Partners need to perceive the benefits of the collaboration.

4.2.5.1. Democratic decision-making process

A democratic decision-making process can guarantee the degree of autonomy and control requested by the partners. It helps the partners to feel comfortable in the collaboration. The cooperative model seems to offer that. At the same time, a decentralized system slows down the decision-making process. A solution is to have different levels of decision for different issues.

4.2.5.2. Co-opetition

The potential or existing competition between partners can complicate the collaboration. However, these concerns are mitigated by the fact that interviewed CLCs share the same values and that there is space for everyone because the sector is far from its full potential. One respondent considers that CLCs must realize that together they can create a larger market for themselves.

4.2.5.3. Non-commercial collaboration

A non-governmental structure is easier to set in place and does not require a lot of investments. There is still a need for a management board, legal and financial control and an animated network. The revenues could come from membership fees, advise to the cities and the organization of workshops. These are typically trade associations focusing primarily on know-how exchange and lobbying activities.

4.2.5.4. Inter-city collaboration

To achieve geographical expansion, franchises, alliances and joint-ventures have been set in Europe.

These models can be decentralized from an operational point of view. A client can be shared formally or not in exchange for a fee or not. Also, a trade association can simply set an interface presenting all the partners where clients can select which partners to collaborate with in each city. Then the client has to deal with several contacts.

Then, today successful networks offer a convenient one-stop inter-city same and next-day solution. They are governed both strategically and operationally by one entity. This leading entity is either an external service provider or the larger CLC in the network. It offers marketing, sales, inter-city transportation and the ICT solution to local partners in exchange for a fee on the first and last mile transportation. The fee is set according to a standard process or not. In these settings, local partners do not formally have their words to say but their satisfaction is crucial because while the leading entity offers them a solution to access the national market, the local companies together offer a large geographical scope and their local expertise. The centralization is needed for an efficient operational management and a fast decision-making process. Part of the sales can be delegated to the local CLCs who also pay a fee to ship the parcels through the network.

In these commercial collaborations the sharing of the benefits is a sensitive issue because margins are very low in the sector and the collaboration must remind profitable for the different stakeholders.

5. Discussions

This section puts the results into perspective in terms of magnitude, temporality, competing solutions and institutional isomorphism and link the results to the literature.

The very small size of the sector and its low maturity restrict the collaboration potential

In Belgium, from this study, the yearly turnover of all the Belgian CLCs is estimated between 1 and 2 million euros. Also, the sector is strongly fragmented. Only in Brussels, 6 different CLCs can be found. That means that the number of parcels by CLC remains strongly restrained.

Moreover, there is a ceiling on the growth of CLCs compared to other logistics players. First, CLCs are only active in UL which is a niche in the broader logistics sector. Second, they can't transport all types of goods. Third, cargo bikes are also used by large postal and CEP operators, UCCs and various SMEs for own delivery purposes. This further reduces the market shares available for CLCs.

Currently, the very small size of the sector and the low maturity of CLCs entail 2 main limitations on the collaboration potential, especially in the short term.

Firstly, opportunities to consolidate and optimize the freight flows are limited. While the literature on HC between LSPs presents the improvement of the speed, reliability and the productivity of the operations through joint-routing as primary motives for LSPs to collaborate (Schmolzti & Wallenburg, 2011), this does not apply to CLCs at this stage.

Secondly, the network capabilities of Belgian CLCs are rather limited. This means that sufficient funding to set an effective collaboration might difficult to find if an external party does not step up. Indeed, CLCs are rather risk-averse and have limited resources available to commit in the collaboration. Cruijssen (2012) also exposes the difficulty for LSPs to make collective upfront investments when the benefits are uncertain and faraway. If few resources are invested, the potential impacts of collective lobbying and marketing efforts might be limited.

Furthermore, these considerations are an important impediment to the most radical innovation that collaboration would offer: setting an ambitious inter-city service. This would enable to increase their penetration in the last mile segment especially by attracting e-commerce volumes, nationwide clients and global CEP and postal operators. The level of penetration would be a

function of the price, geographical coverage, flexibility and convenience of the solution. Setting that type of collaboration requires a high degree of capitalisation and managerial competencies. Perhaps we are at a too early stage in Belgium to see an ambitious collaboration emerge while CL is more developed in the Netherlands for instance.

Then, an external actor might be necessary to conduct the development process and manage the strategic and operational aspects. This would enable to circumvent the difficulties linked with the limited network capabilities. Also, this external party can provide the full solution from sales to the ICT and connect the partners to set an ambitious commercial collaboration. This reflects the conclusions of Hingley, Lindgreen, Grant & Kane (2011) that a Fourth Party Logistics service provider (4PL) is needed in intense collaborations. Similarly, McKinsey (2010) consider that a sole leader eases HC. Then, local CLCs act as subcontractors for an external party or a leading entity.

Before to go further, it must be noticed that the penetration in the last mile segment through collaboration is a particularly interesting result. Indeed, while the CL literature constantly reminds that the last mile segment driven by the rise of e-commerce is the main opportunity for the sector, it has not explored yet how local CLCs could benefit from it in another way than through subcontracting with CEP operators and UCCs at a city level.

Also, the opportunity to reconcile the willingness to remain purely local while benefiting from a larger network is an interesting vision for a sector concerned with actors depicted as idealistic. This latest finding could be added as an opportunity in the literature on IORs and HC between LSPs.

Access to unexplored territories: an industry life cycle perspective

While these limitations restrain the collaboration potential in the short term, it also means that collaboration could lead Belgian CLCs into unexplored territories. This optimistic perspective can be better perceived through an industry life cycle lens. At the moment, CLCs are in the start-up phase meaning that the market needs to be educated and the offer refined. However, if the industry enters the growth phase and exhibits more standard services, geographical expansion and a service adapted to a larger market then the demand can grow exponentially (Grant, 2013). As we have seen, the opportunities offered by collaboration reflect these considerations and, therefore, could support the sector to enter this phase.

Break the vicious circle: a dynamic perspective

The opportunities that represent a collaboration and their self-reinforcing effects make collaboration a promising avenue to circumvent both *the vicious circle* of LSPs (Cruijssen, 2006), previously exposed, and the *chicken-or-the-egg story* described by Maes & Vanelslander (2012: 422): "*To professionalise, bike couriers need bigger volumes. To work with the bikers, logistics companies ask for a professionalization before handing over the volumes*." The following discussion taking a dynamic and longer-term perspective supports this vision.

Even by starting with a non-governmental association or with relatively modest commercial objectives, collaboration could bring growth to the sector through the following and complementary paths.

First, a federation or trade association can set the scene for a future more elaborated collaboration between the partners and with external parties. By pre-building trust, interpersonal relationships, a common vision as well as the exchange of knowledge, a pool of partners would then be ready to join research projects together or to be integrated into other expanding networks without having to start from scratch. Therefore, networks are *platforms for innovation* (Jüttner et al., 2005) not only by enabling *co-exploitation* and *co-exploration* mechanisms but also by setting the ground to co-access external innovative projects and co-create future projects. This also relaunches the debate on whether trust as to be considered either as an desired outcome or an antecedent of the collaboration (Christoffersen, 2012).

Second, the sharing of clients across cities, a better capacity to access larger tenders and joint-marketing efforts might only bring an incremental penetration in the couriers, postal and CEP markets. Nevertheless, this can already be a significant improvement for these CLCs with spillovers on their benefits as well. Indeed, an increase of 30% in terms of density of the deliveries would make cargo bikes competitive with vans (Maes, 2017). Also, the pooling of supporting activities and tools could really improve their margins as their current administrative and operational managements are highly time-consuming. These elements could enable them to finally have sufficient financial resources and time to invest properly in their development.

Third, lobbying efforts could result in the development of better infrastructures that would further increase CLCs' efficiency. It could also increase their turnover with clause in public procurement and by making alternatives less competitive. Together these outcomes would help them to growth and increase their profits.

Fourth, collaboration eases the access to capital and offers joint-funding possibilities. Therefore, it can enable to support CLCs' growth and the setting of ambitious collaborative efforts.

Together these fourth points highlight that the opportunities of collaboration must be considered as evolutive and self-reinforcing letting the hope that it could help the CLCs to become more mature and the market to be better educated. However, the development of a collaboration is complicated and the two following extreme scenarios can be considered. On one side, with significant investments and capitalization, a collaboration can pursue quickly ambitious objectives with the risk that these small companies burn themselves and become distracted from their current services. On the other side, a cautious approach can be taken with limited investments but then the risk to not reach sufficient results fast enough would appear. This can demotivate the partners and reduce their commitments or give the time for competing forces to saturate the market leaving only small niches to local CLCs.

Competing forces

As Barnett (2006) reminds, there is a trade-off between the resources set into the collaborative efforts and the ones dedicated to internal purpose. It must not be forgotten that CLCs could choose to focus exclusively on self-expansion if no common ground is found or if no company takes the lead.

Other competitive forces have to be considered. A new entrant supported by an important fundraising can overtake the collective geographical expansion. Also, large logistics players seem to prefer to use cargo bikes internally in the last mile segment rather than subcontracting. For instance, DHL and bpost already use cargo bikes and have adopted a clear strategy towards sustainability (bpost, 2017; DHL, 2018). Collaborative platforms, such as Parcify, offering innovative B2C solutions, could also tap into this segment in the future. This can be the purpose of its recent buying by bpost (Lauwers, 2017). These considerations can strongly restrain the place left for CLCs in the last mile segment.

Furthermore, it could be tempting for more companies to do their own deliveries and internal transportation with cargo bikes themselves. Also, in the courier market, logistics operators and independents could decide to turn towards the use of cargo-bikes and trikes (Gruber et al., 2014). This could be the case especially if the UL ecosystem (including suppliers, biker repairs or the infrastructures) would become more cargo bikes friendly.

The development of these alternatives could also be an opportunity for CLCs. In the short term, they could train these new bike messengers and give advice regarding the local environment. In the middle term, if the large LSPs make an important transition towards cargo bikes then the perception of CL among large companies (in the retail for instance) and the infrastructures could change. This would offer new market opportunities to CLCs.

Moreover, public support could be granted to other emerging sustainable alternatives such as "*electric vehicles, dropbox, drones and automatic vehicles"* (Perboli, 2017: 1) or the penetration of cargo bikes for personal trips (Wrighton & Reiter, 2016).

Potential manifestations of institutional isomorphisms

The last part of these discussions takes an institutional theory perspective. It is concerned with varying manifestations of institutional isomorphisms that could affect or be affected by the investigated collaboration.

Influences within the organizational field

The collaborative platforms have rendered CL more visible and more acceptable (Maes, 2017). Nowadays, it remains unclear if these platforms would be able to maintain their business model based on low-cost and flexible employment. Indeed, legal battles have led to the reclassification of these technology companies into transport companies and self-employed into employees (Sargeant, 2017). Also, strikes of dissatisfied bike messengers have been multiplied. As CLCs have a different employment policy than these technology companies, it would be interesting to see if, through self-industry regulation, they would deliberately try to signal to the general public that an alternative exists to Deliveroo, UberEATS or Parcify. On the opposite, they could follow the trends towards cheap and flexible employment in order to increase their competitivity. However, it seems unlikely at the moment.

Also, CLCs can gain legitimacy by demonstrating that ambitious projects can be successful. For instance, the Fietskoerier.NL's recent award as the best e-business delivery company in the Netherlands (Reijndorp, 2018) could convince CEP and postal operators that CL is a worthy path to explore.

These elements could bring CLCs practices from niche to mainstream in UL but once again we are far from it.

Influences within the network

Finally, collaboration could create alignments between the members in terms of services and ethical positioning. It could force all the CLCs to respect standards in terms of quality and, therefore, foster their professionalization.

Then, as some have expressed their willingness to promote the status of cooperative with a social purpose in the collaboration it could push other CLCs to adopt a similar structure. On the opposite, the realities of the collaboration could lead these companies to adopt a less "pure" attitude. For instance, they could start to serve clients whose values are not aligned with theirs, adopt new employment practices or new status.

As a conclusion for this section, we see that CLCs are not alone in the CL industry and that CL is not the only solution for a sustainable development of UL. Collaboration does not guarantee to scale up or to be a profitable project especially as UL is very dynamic and the challenges are plenty. However, what is guaranteed is that collaboration offer to CLCs numerous opportunities to catalyse their growth in a very different way of what has been tried before or of what they could do independently.

6. Conclusion

This paper, based on the perception of 22 respondents, has shown that collaboration could catalyse the growth of CLCs in different and complementary ways. However, collaboration in Belgium won't be easy as many challenges need to be tackled. Also, in the short term it would contribute only modestly to the sustainable development of UL.

For two main reasons this study does not allow to conclude what would be the exact added value of a potential collaboration in Belgium or its optimal form or structure. First, the uncertainties linked with the fact that the sector is at its early stage and that UL is very dynamic make predictions difficult. Second, the success of existing collaboration hasn't been properly quantified due to the variety of outcomes entailed but also to the fact that the costs and benefits are spread among separate entities. Their aggregation would require a difficult accounting treatment.

However, this paper has the merit to explicitly expose the whole range of opportunities and difficulties (as well as their intertwinements) that various type of collaboration represents.

One must read the results that are summed up below with cautious by taking into account its dynamics.

First, the current situation of Belgian CLCs is exposed. Then the primary collaboration opportunities are depicted. Finally, the conditions, the difficulties and the facilitators to reach them are also presented.

Nowadays, Belgian CLCs operate mainly with a local focus in B2B niches. They offer high-quality services both in express and next-day deliveries. However, they are small, not fully professionalized yet and make few advertising and development efforts. This, combined with their low visibility and the fact that they do not all have the vision of what capitalization can bring to their development, strongly impede their growth. Furthermore, the fact that the market chose LSPs on a cost basis and does not want to pay higher prices for sustainable transportation is another call to improve their competitivity. Their competitiveness in terms of price is under treat since motorized operators do not have to internalize their externalities. Also, it is difficult for them to access large and nationwide shippers.

Collaboration can help to circumvent these challenges. An important opportunity is that together CLCs could set an inter-city offer. A one-stop solution and a large geographic coverage

could provide access to nationwide clients, webshops and CEP operators and increase their penetration in the last mile segment. Then, a costly ICT support enabling to offer a single interface, track and trace, invoicing, price, helpdesk and proof of delivery system to shippers, receivers and partners is needed. The same can be said for an intermodal inter-city transportation system. Less integrated and standardized inter-city collaborations can already allow dealing with clients having needs in different cities but the volume that can be attracted and managed would be lower.

At an intra-city level, CLCs could offer more flexibility and larger capacities by joining their availabilities and load capacities and so they could access larger clients.

On top of increasing their turnover, CLCs could increase their margins especially through the sharing and co-development of supportive activities and tools to varying degrees. Together, they can obtain better rates and more specific services from suppliers. The mutualisation of insurance schemes, legal, accounting and operational managements, storage capacities, purchasing of cargo-bikes or operational softwares are important opportunities. Larger volumes can also increase the density of the deliveries and so their efficiency.

Then, their visibility and image could be enhanced through a common branding, marketing and sensitization.

They could also have a unified, stronger voice towards public authorities. Interorganizational learning is another important opportunity to help these different companies to easily catch up with the best practices. More generally it can offer them an outreach perspective on the sector. Furthermore, having a representative voice helps to access external research projects and to collaborate with suppliers.

Setting a trade association seems easier, but a joint-venture, an alliance or a cooperative could enable to sell a national solution. A successful collaboration requires the establishment of trust and to a certain extent the definition of a common positioning. Its development process has to be lean in order to adapt to the market requirements and to limit the upfront investments. So a trade association or an informal collaboration could logically precede the creation of a joint-commercial entity, which is difficult to set for companies at such an early stage. The collaboration can be eased by the fact that the interviewed CLCs are quite close in terms of values, all promoting the respect of the bike messengers and being motivated by improving the liveability of the cities. However, their heterogeneity in terms of maturity, current functioning

and the different market realities in different cities impede the setting of a common vision. The biggest challenge might be that these firms have rather limited network capabilities with few resources to invest and low managerial capabilities. Moreover, the setting of the right governance and ICT system require important resources commitment. The important lead time to convince shippers and the important delay between reaping the benefits of the collaboration and the first investments are supplementary difficulties to tackle.

Currently the Belgian collaboration's efforts are concentrated around the *Belgian Pedal Powered Solutions project for a network of cargo bikes messengers* which will be incorporated as a non-governmental association in the next months. Up to now, the first report and workshop have already contributed to generate genuine interest and diffuse knowledge among CLCs. The current pilot projects, (1) the investigation of an ICT solution from supporting the process from the order to the proof of delivery, (2) the constitution of a portal describing their offer or a communication folder for the media and the public authorities and (3) the prospection of nationwide clients and the setting up of a process to deal with the distribution of the tasks (BPPS, 2018), seem to reflect the priorities of the sector and the opportunities that a collaboration represent. As the efforts are conducted thanks to public subsidy it remains to be seen what would be the CLCs' commitment to collaboration without it. If it fades a 4PL could step up and connect the local CLCs and capitalize on them in exchange for offering a national reach or other services. Of course the market and stakeholders' feedbacks are also uncertain.

Limitations and further research

No IORs has been set in Belgium yet, meaning that experts, CLCs and the stakeholders have to project themselves in the future which is a difficult exercise. Also, all the experts and Belgian CLCs were enthusiastic about the idea of collaboration. Belgian CLCs that weren't met could have been more critical. The fact that they refused to be interviewed or didn't respond could be explained by a low willingness to collaborate.

However, these limitations were circumvented partially through interviews with existing foreign networks representatives even if CLCs are less developed in Belgium than in the Netherlands or in Germany. This means that the realities are different in these countries and that their insights might not be fully transferable to Belgium. It would be interesting for the CL literature to make a cross-country comparison of the maturity of the CLCs, analyze the factors explaining the differences and similarities and see if collaboration is part of it.

Also, in order to complete this study, as established CL networks are young and many projects are about to be created, it would be interesting to either make a longitudinal study on their development or to investigate and compare their achievements and factors of success in a few years.

This would also help to develop a typology of the collaborations among CLCs. Clearly, UL is disrupted by the On Demand Delivery or Crowd Logistics companies which are tech companies linking shippers, receivers and self-employed drivers or bikers (Maes, 2017). Also, some effective commercial HCs are centrally organized with the support of an ICT tool and have similarities with collaborative platforms aggregated as electronic platform by the Belgian authorities. It would be interesting to compare these models and to assess the potential impact of collaborative platforms on traditional CLCs and LSPs. Their main idea to reconcile the demand and offer in a flexible and efficient way could represent opportunities for CLCs and the sustainable development of UL. It can also contribute to update the governance models presented in the literature on HC between LSPs. At the moment collaborative platforms create new demand for transportation (Maes, 2017) mainly in B2C markets. So they do not considerably affect CLCs and could negatively affect the sustainable development of UL.

Another limit is that this paper has taken mainly a supply side perspective. It would be interesting to investigate from the demand side perspective the reasons to use or not the services of CLCs. It must be better understood if they know these companies and how to influence the demand in order to make them use CL. This is a big task as each client as its specific requirements. Also, it would be interesting to study to what extent shippers and receivers are aware or concerned with the negative externalities generated by the e-commerce, express and just-in-time trends as well as UFT in general. Also, their considerations of the employment policy of the collaborative economy could be studied. These studies would help to know what sensitization works must be undertaken and how CLCs must position themselves in order to increase their market share and public support. It would also help the literature on UL and the public authorities to have insights on how to influence the demand side as well.

This paper has only mentioned the existence of debates surrounding the new forms of employments reflected by the collaborative economy practices. Here, a thorough comparison of the bike messengers' satisfaction and the employment policies of UCCs, collaborative platforms, CEP and postal operators, companies making their own deliveries and CLCs could support or not the need for legislation or self-industry regulations concerning employment

policies in CL. Then a trade association regrouping CLCs could impose standards in terms of employment to receive public and citizens support if it is justified. It would also allow to make the link between the literature on labour practices in CL and in the collaborative economy.

The literature of CL could also be enhanced by a benchmarking study across authorities' measures supporting CL. Their links to lobbying efforts could be made. This would help to identify the impacts of collective lobbying and how to conduct it in an efficient way.

Finally, I would join Cruijssen (2012) on the need to investigate how to tackle the problem of collective upfront investments when the benefits are not clear.

7. References

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