



## Urban freight, parking and pricing policies: An evaluation from a transport providers' perspective



Edoardo Marcucci<sup>a,\*</sup>, Valerio Gatta<sup>a</sup>, Luisa Scaccia<sup>b</sup>

<sup>a</sup> DISP, University of Roma Tre and CREI, Via Gabriello Chiabrera, 199, 00145 Rome, Italy

<sup>b</sup> DED, University of Macerata, Via Crescimbeni 20, 62100 Macerata, Italy

### ARTICLE INFO

#### Article history:

Received 8 October 2013

Received in revised form 4 February 2015

Accepted 9 February 2015

Available online 13 March 2015

#### Keywords:

Urban freight policy

Parking

Pricing

Stated preferences

Stakeholders

### ABSTRACT

This paper investigates transport providers' preferences for alternative loading bays and pricing policies. It estimates the importance of loading bays, the probability of finding them free and offers strategically relevant information to policy makers. The results underline the relevance of both preference heterogeneity and non-linear attribute effects. Three classes of agents are detected with substantially different preferences also characterized by non-linear sensitivity to attribute level variations. The specific freight sector, frequency of accesses and number of employees are all relevant covariates explaining different preferences for alternative transport providers' categories. The implications of the results obtained are illustrated by simulating alternative policy scenarios. In conclusion, the paper underlines the need for rigorous policy analysis if the correct policy outcomes are to be estimated with an adequate level of accuracy.

© 2015 Elsevier Ltd. All rights reserved.

*"When we delay the harvest, the fruits rot. When we delay resolving problems, they continue to grow."*

– Paulo Coelho

## 1. Introduction and motivation

City centers are major destinations for goods pick-up and delivery where parking spaces are scarce. Although trucks represent a relatively small proportion of all vehicle traffic, the combination of high demand for parking and limited supply provokes an increase in both private and social costs. In fact, transport providers have either to cruise for a free parking space<sup>1</sup> or double-park illegally<sup>2</sup> (Jaller et al., 2013). Both options imply, from a private perspective, an increase in expenditures due to delays in deliveries, additional fuel consumption, rising driving stress and parking fines aggravating the cost of last mile distribution representing one of the largest shares of total distribution costs (O'Laughlin et al., 2007). From a social perspective, instead, they contribute to congestion, infrastructure damage, vehicle emissions, greenhouse gases, and noise (Giuliano and Dablanc, 2013). These negative externalities are relevant given the high density of city dwellers.

\* Corresponding author.

E-mail address: [edoardo.marcucci@tlc.uniroma3.it](mailto:edoardo.marcucci@tlc.uniroma3.it) (E. Marcucci).

<sup>1</sup> While a vehicle in New York spends approximately nine minutes to find a parking space in Manhattan's Central Business District, according to Shoup (2005), it is reasonable to assume a longer time for truck delivery since they will search for a parking place close to the delivery location.

<sup>2</sup> In European cities, and mainly in France, Patier et al. (2014, p.100) report a 70–80% of double parked deliveries.

An efficient and effective urban freight distribution system is fundamental for cities whose performance is crucial for national economies. Local policy makers are faced with contrasting policy objectives since they have both to foster economic vitality while minimizing the negative impact of urban freight (Lindholm, 2013; Wygonik et al., 2014). Literature surveys have underlined the sub-optimality conditions of freight transport in urban areas, the need for policy intervention and discussed the pros and cons of the numerous options available (e.g. Ambrosini and Routhier, 2004; Muñuzuri et al., 2005; Dablanc, 2007; Allen et al., 2008; Russo and Comi, 2011; Arvidsson, 2013; Marcucci and Puckett, 2013).

The difficulties encountered by policy makers in dealing with such a complex environment are magnified by the natural proximity and interaction among stakeholders characterized by contrasting objectives. An emblematic example is represented by off-hour deliveries (Holguín-Veras et al., 2007, 2008; Holguín-Veras, 2011; Jaller and Holguín-Veras, 2013). In fact, in this case transport providers favor this option since it facilitates loading and unloading operations and the use of uncongested roads. Retailers would, on the contrary, prefer to have the goods consigned during regular opening hours, while citizens are interested in having both a quiet environment during night-time and fully re-stocked shelves when shopping. Policy interventions usually aim at re-balancing social costs and benefits.

Among all the relevant actors, transport providers play a key role in making urban freight distribution more sustainable (Quak, 2012), and are becoming progressively more important since just-in-time concepts have been adopted in complex supply chains (Massiani et al., 2009; Ehmke, 2012). They are confronted with daunting challenges in their daily activities and focus their efforts on technology and logistics to increase operational efficiency. At the same time, they have limited influence on the conditions under which urban freight transport takes place. These, in fact, are often determined by policy makers having environmental sustainability objectives in mind (e.g. emission zones, charging entrance fees, time-windows restrictions, etc.) that might be in contrast with transport providers' pursuit of efficiency.

This paper offers useful insights into transport providers' preferences for alternative loading bays and pricing policies in a large urban area. The development of sustainable management policies for urban logistics should be based on site-specific data given the heterogeneity and complexity of urban freight systems (Comi et al., 2008; Nuzzolo and Comi, 2014). The paper focuses on Rome where freight data are publicly available given the local public administration has carried out various dedicated surveys in the last ten years.

In particular, the paper investigates the limited traffic zone in the city center where freight distributors have to pay for access. The research motivation originates from the qualitative results obtained in two previous studies underlining the important role loading bays play for environmental sustainability and urban freight distribution effectiveness (STA, 1999; Filippi et al., 2008). The paper estimates the relative importance of the number of loading bays and the probability of finding them free. In fact, these two elements are at the core of a deep-rooted problem in Rome and, possibly, in other cities. Already back in 1998 the majority of the 779 transport providers sampled in a research performed by the Mobility Agency of Rome indicated that the two most relevant elements hindering an efficient urban freight distribution system were the insufficient number of loading bays and the lack of appropriate surveillance with respect to their correct use (STA, 1999).

This paper extends and complements previous research based on data derived from a Volvo Research and Educational Foundation project (VREF, 2009) that can be summarized as follows: (1) Marcucci et al. (2012) report on the survey instrument development process to study freight agents' behavior, describe the stated preference experiment used and discuss the multi-stage efficient experimental design implemented incorporating agent-specific priors; (2) Marcucci and Gatta (2013a) focus on retailers concentrating on the role of the status quo and test for non-linear attribute effects; (3) Marcucci and Gatta (2013b) study own-account operators to investigate the impact time windows restrictions have on their behavior also considering preference heterogeneity; (4) Gatta and Marcucci (2014) test, from a policy-maker's perspective, the implications heterogeneity between own-account, retailers and transport providers has on specific policies equally impacting all agents' utility.

The present paper reports an in-depth analysis on transport providers, specifically addresses the role played by parking and pricing policies, while jointly tests for non-linear attribute effects and discrete mixture heterogeneity. The results obtained entrust local authorities with quantitative and strategically relevant results useful for policy making.

The main contribution of the paper, within the freight vehicle parking policy literature, is the specific focus, at a strategic level, on the overall number of loading bays and the probability of finding them free which, to the best of our knowledge, have never been investigated.

The paper is structured as follows: Section 2 reports a brief literature review on freight vehicle parking policies in urban areas clarifying the contribution of the paper and positioning it with respect to previous research; Section 3 describes methodology and data; econometric results are illustrated in Section 4, while simulations of different policies are reported in Section 5; Section 6 concludes and discusses future research.

## 2. Literature review

This section reports on the freight vehicle parking policies literature. It illustrates recent contributions and positions the present paper.

Urban freight transport research underlines, among the different policy options available, the importance of parking/loading related policies (CoE-SUFS, 2014). Less attention has been paid to commercial vehicles with respect to the investigation of passenger car parking in urban areas (e.g. Thompson and Richardson, 1998; Ommeren et al., 2012; Ibeas et al., 2014; Millard-Ball et al., 2014).

Download English Version:

<https://daneshyari.com/en/article/6781323>

Download Persian Version:

<https://daneshyari.com/article/6781323>

[Daneshyari.com](https://daneshyari.com)