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# Analysis of outsourcing conditions for freight transport and logistics among manufacturing companies: insights from a review of data and a field investigation

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## Abstract

This paper reports the results of a research work carried out among manufacturing companies of the metropolitan area of Turin (Italy) to investigate status and motivation for outsourcing transport and logistics services or for choosing otherwise, as well as to clarify which commercial terms are used and why, since the choice of commercial terms affects transport and logistics. Also other points, including e-commerce and logistics, were examined. The work involved interviewing the managers of sixteen manufacturing companies of different types and was carried out during 2016-2017, on behalf of the Association of transport and logistics companies belonging to the “Unione Industriale” of Torino.

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*Keywords:* freight transport; logistics; outsourcing; INCOTERMS

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## 1. Introduction

This paper reports the main findings of a study concerning outsourcing freight transport and logistics in the metropolitan area of Turin (I), carried out in 2016/2017. The study was commissioned by the Association of Transport and Logistics Companies at the *Unione Industriale* (Association of Industrialists) of Turin. The study

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focused mostly on medium and small manufacturing; it aimed at clarifying whether and under which conditions it is currently appropriate for manufacturers to:

- carry out transport on own account or hire external transport companies for transport services;
- outsource internal services and activities to logistics service providers;
- sell products and purchase supplies with ex-works and F type INCOTERMS, i.e. implying transport organized and paid by other parties, rather than D type INCOTERMS, which imply transport controlled by the interviewees.

The study also aimed at verifying whether common assumptions concerning wide use of own account transport as well as of ex-works or similar INCOTERMS are true. The results are complementary to other recently published works about freight transport and logistics in Italy and abroad: AA.VV. (2006), ACI-ANFIA (2013), Beretta et al. (2011), Langley and Capgemini (2016), Lieb and Lieb (2014), Marchet et al. (2016), Papadopoulou (n.d.).

The next section of the paper introduces the method and the companies involved, whereas the following sections summarize the results. Results are reported separately depending on whether they concern transport and outsourcing (section 3), warehousing (section 4), choice of commercial terms (section 5), and effects of e-commerce on logistics (section 6). Section 7 closes the paper by recalling some key points and drawing conclusions.

## 2. Method and sample of companies interviewed

The work was organised in two stages: the first stage involved reviewing relevant literature and statistics. The second stage entailed interviewing manufacturing companies that volunteered to participate, following an invitation by the *Unione Industriale* of Turin. This paper focuses on the results of the interviews. Sixteen companies were interviewed in order to consider different value chains and company sizes, as shown in table 1. All of these companies sell their products both in Italy and abroad, except for one, which sells building materials only locally.

Table 1. Value chain and number of employees of the companies interviewed.

Value chain	Number of companies interviewed	Number of employees, by range
Automotive, metalworking and mechanical engineering	6	20-50 and 100-250
Plant equipment	2	20-50
Building materials	2	20-50 and 50-100
Clothing and accessories	2	20-50 and 50-100
Food	2	100-250 and >1000
Steel working	1	20-50
Distribution of spare parts	1	20-50
Total	16	From 20-50 to >1000

Semi-structured interviews were carried out with transport and logistics managers or with people in a similar role. Interviews were guided by a questionnaire including five groups of questions concerning: outsourcing of transport and logistics; hired or on own account transport; INCOTERMS used and reasons for their choice; use of different modes of transport and environmental constraints or sensitivity; use of on-line sale portals.

### 3. Results concerning transport

#### 3.1. Use of own account or outsourcing of transport

Own account or hire transport may be seen as the basic outsourcing choice. Differently from what it is often assumed (see e.g. Finelli, 2006, and, recently, Terpolilli, 2018), the interviews revealed that use of own account transport is minor and limited to local distribution, short-range pick-ups, transport of materials to fairs, and intra-company transports. In fact, the low importance of own account transport was also clear for the whole of Italy from the initial survey of ISTAT / Eurostat data related to tonnes and tonnes-km by type of transport. The interviews confirmed that outsourcing is an established practice since the '90s for companies that are responsible for outbound transport of finished products. The only exception, among the interviewees, is a company of the food sector.

On the other hand, in most cases inbound transport of materials or semi-finished products is provided by the supplier as purchases are often made with D type INCOTERMS rather than ex-works or F type INCOTERMS (see also part 5 of this paper).

One of the interview questions investigated whether companies are aware of own account transport costs. Indeed, such awareness was the prime reason that led them to having transport operated by third parties. In more detail, reasons to abandon own account transport were: issues and costs with owning and maintaining vehicles; issues with managing staff dedicated to transport along with other staff (e.g. for overtime).

The interviews also clarified that own account transport is typically minor, also in terms of resources employed: it is carried out with small vans or LDV that can be driven by company employees with a common automobile driving license. This implies limited ownership costs and allows for flexibility of use. As a consequence, the companies interviewed no longer have staff dedicated to transport. To get an additional dimension of the change, it is worth citing directly an interviewee: “drivers no longer have the commercial role they used to have: they would speak with the customers, have a feel for the market and the competition, and in so doing gave added value to their employer”.

#### 3.2. Difficulties with finding specialised transport and logistics services

Most interviewees experience difficulties with finding transport companies offering carriage to particular areas or using HDVs with specific equipment (able to carry specific goods or equipped with cranes). Internet alone is not sufficient to support manufacturers with finding such suppliers.

#### 3.3. Production and transport KPI misalignment

Some interviewees reported their disappointment with the difference between the performance (and relevant indicators) that they deliver when selling goods and the performance of transport companies. Food products ready to be picked up for deliveries to customers may be, for instance, 100% good, but transport companies are fine with a limited number of damaged deliveries. However, if only 97% of deliveries are without damage, for some consignors the performance may be nil because they received, for instance, their single pallet of a particular product damaged.

In general, interviewees complained about the lack of responsibility of transport companies for loss and damage. In fact, one of the companies interviewed outsourced transport services but required to keep in-house strict quality control in order to ensure its own quality standards along the whole value and supply chains, which includes, for instance, accepting only vehicles that are up to the reputation of the manufacturing company.

#### 3.4. Traceability

Contrary to the attention to traceability recurring in the general trends in transport and logistics, traceability of transports does not seem critical for the interviewees, except for key events during the shipment: goods departed from the origin, loaded on the ship, proof of delivery.

### 3.5. Direct relationships with freight terminals

Most of the companies interviewed have no direct relationship with freight terminals. For some of them, the freight terminal is known as the location of the courier they may refer to for shipments which are ready late in the afternoon in order to ensure the departure on the same day, after the last pick-up at their factory. In one case only, the Interporto of Turin (“interporto” is a logistics center or a freight village including a main freight terminal with road-rail combined transport, facilities and customs, see Dalla Chiara, 2015) is used for customs formalities directly from the company interviewed.

### 3.6. Use of rail transport

Rail transport has resulted rarely used. Reasons revealed include its lack of flexibility compared to road transport and long times required to obtain quotes (minimum 10 days as opposed to a few hours for transport by truck).

### 3.7. Combined transport

Road-rail combined transport is used directly by only 4 companies out of 16 interviewed and only on long distance routes. One of the companies interviewed has a customer in Northern Europe asking to receive shipments by intermodal transport rather than by road, for environmental reasons. A concern reported against combined transport in Italy is the security of the cargo, whereas that is not perceived as a problem for shipments abroad. Additionally the “last mile” of combined transport is perceived as too difficult to manage and with highly variable costs.

### 3.8. Maritime and air transport

Maritime transport is widely used by respondents for long-distance transport. Maritime transport agents play a critical role and trust is the key element in the relationship with them since manufacturing companies delegate entirely to them the relationship with the shipping companies.

Air transport is used only for emergencies or very precious cargo. Emergencies include quick supply of goods with low value per unit of volume - such as clothing and accessories – in case of pressing delivery deadlines.

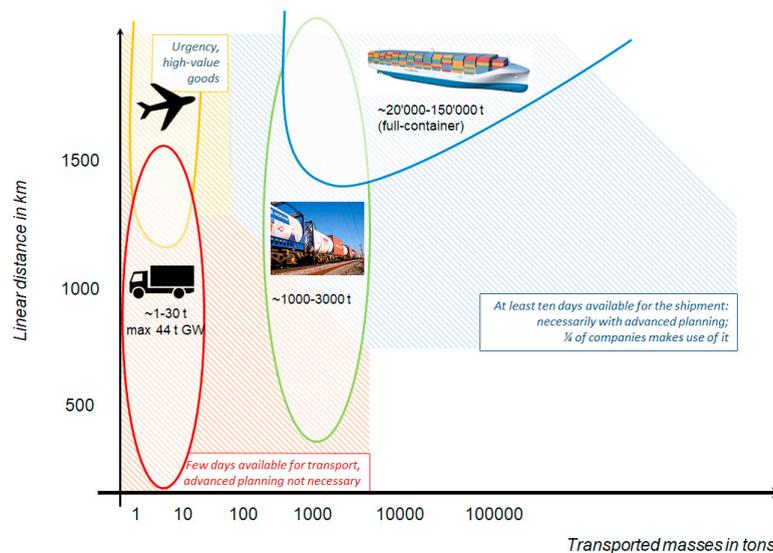


Fig. 1. General relationships among mass and distances in freight transport and usage from survey.

### 3.9. *Effects of environmental sensitivity and technological innovation on transport choices*

Energy and environmental issues do not affect the logistic choices of the manufacturing companies interviewed. This is the case even though several companies show environmental sensitivity, leading to environmentally conscious choices on other matters. In fact, the interviews revealed that production companies do not act as a driving force requiring innovation from logistics operators. For instance, they do not ask for latest generation vehicles that may have low environmental impacts.

## 4. Results concerning outsourcing of warehousing

### 4.1. *Outsourcing of warehousing*

There are several activities that may be outsourced beside inbound and outbound transport, such as: distribution, warehousing, packaging and re-packaging, customs procedures, management of products in special conditions. Much of the discussion during the interviews focused on outsourcing warehousing and this is reflected here.

All of the companies interviewed considered outsourcing warehousing but only 5 out of 16 actually did. Those are medium and large companies with complex distribution needs in remote areas, with many points of delivery, that gave to third parties also the management of advanced warehouses.

Companies choosing against outsourcing explained they made their decisions because of:

- too small a warehouse and little staff required (1-3 workers): outsourcing would not result in cost reductions;
- warehouse and production/packaging too interconnected (sometimes in terms of processes and at times in terms of workers/workloads): they were seen as hardly separable also due to needs changing over time;
- high specialization of production and warehousing: no logistic operator made a convincing offer;
- confidentiality.

One company insourced warehouse activities due to the unreliability of the cooperative that was tasked with them and in order to interact directly as well as effectively with the warehouse workers, rather than through a liaison person.

### 4.2. *Warehousing management billing and cost control*

Companies that outsourced warehouse activities agreed with their logistics operators different cost drivers that have in common the search for simple billing methods in order to avoid frequent meetings to discuss bills and aiming, where possible, for pre-billing. It is also worth noting that manufacturing companies interviewed check logistics cost typically on a monthly basis, thus much less frequently than transport and logistics companies.

### 4.3. *Warehouse and transport management software*

The production companies interviewed do not use specific software for warehouse management or for transport, if not occasionally SAP, and rarely do they use WMS (Warehouse Management System), specific software that improves warehouse management. Most often, the interviewees employ the warehouse and transport parts of the management software used by their companies (ERP, AS 400, etc.).

## 5. Results concerning the choice of commercial terms

### 5.1. *Use of commercial terms and reasons for their choice*

INCOTERMS (ICC, 2010) are the international standard commercial terms clarifying who is responsible for what in a commercial exchange and when the responsibility changes from one party to the other. In particular, they clarify who bears risks and expenses for loading/unloading, transport, customs operations, insurance. INCOTERMS

or customized commercial terms are relevant here because they imply which party is choosing and paying the transport service. It is often assumed that Italian manufacturing companies are not controlling the transport of supplies and products and sell ex-works, leaving the choice of the transport company to the other party in the transaction. For international transports, this results in a disadvantage to Italian transport companies.

In fact, the interviews clarified that the choice of INCOTERMS for both sale and supply of goods depends mostly on the negotiating position of each party in the commercial transaction. In the case of sales, typically the customers choose the conditions that suit them best. For the purchase of supplies, the companies interviewed are in turn customers of their suppliers and manage to impose their own terms. However, the general picture is more complex and it is noteworthy that choices have organizational reasons. For instance, controlling transports implies control over incoming and outgoing flows at plants and, therefore, over warehouse and production flows.

Among the interviewees, the use of INCOTERMS of the D group (with the selling party in charge of transport to the destination or to a terminal close to it) is more common than it is generally assumed (see e.g. Consulta Generale per l'Autotrasporto e la Logistica, 2010, p. 56). Table 2 summarizes the results of the interviews. The table refers to INCOTERMS of the E/F group and INCOTERMS of the D group in broad terms, consistently with the level of details that interviewees were willing to discuss.

Table 2. Use of INCOTERMS at companies interviewed.

Value chain	Number of companies interviewed	Prevailing commercial terms for sales of products	Prevailing commercial terms for purchases of supplies
Automotive, metalworking and mechanical engineering	6	E/F type (EXW, FCA)	D type
Plant equipment	2	D type	D type
Building materials	2	D type	D type
Clothing and accessories	2	D type (with exceptions, see comments)	FOB and terms implying an important part of the transport charged to the interviewee (See comments)
Food	2	D type	E type (due to the type of raw materials)
Steel working	1	E type	Ex-works type and CIF/CFR
Distribution of spare parts	1	E type in half of the cases, D type in the other half	E type in half of the cases, D type in the other half

The automotive industry typically gets its supplies ex-works in order to optimize transport costs (by aggregating flows in milk runs) and have control on incoming flows thus optimizing reception and warehouses activities.

Interviewees supplying building materials and plant equipment typically sell goods with D type INCOTERMS as the destination is often a building site and particular care is required to carry and deliver plant equipment.

Clothing and accessories are typically sold using D type commercial terms, except for part of the production in the Far East that is sold Ex Works. Food is collected by the manufacturing companies at the farmers', since farmers do not deal with transport. Food products are sold delivered at destination (with D type commercial terms).

## 5.2. Payment and insurance of the goods

The companies interviewed insure only the goods sold with D type INCOTERMS. Goods sold Ex-Works are not insured even though the Italian Federation of Forwarders (FEDESPEDI) advises to do so in order to avoid losses in case the payment is deferred with respect to the delivery of the goods. Interviewees confirmed that the payment of the goods occurs always after the delivery, except in the cases of new customers or deliveries to Countries at risk.

Customs proofs of export, which transporters must return to shippers also for tax reasons, are not an issue. Interviewees explained that getting such proofs from transporters was an issue in some cases in the past but presently transport operators are reliable and return documents as expected. Still on transport out of the EU, interviews clarified that anyone exporting other than Ex Works relies on external specialized customs operators.

## 6. Results concerning e-commerce

### 6.1. Use of e-commerce and value of technical support

Sale through web sites is essential for B2C transactions whereas it has limited use for B2B ones. Although some companies selling B2B have created proprietary websites for their customers to see what is readily available and place orders directly, there is some reluctance to open this commercial channel since purchases by customers who are not sufficiently competent would lead to managing return items, an operation depicted as difficult and expensive. Therefore, the added value provided by commercial and technical employees, especially for the sale of technical goods, is significant and fundamental.

### 6.2. Effects of e-commerce on logistics

Discussion with companies interviewed indicated the importance of e-commerce websites (e.g. Amazon and others) in imposing reference prices. They also drive the logistics standards –especially the speed- to levels that several manufacturing companies are not ready to cope with. They need delivery times shorter than the current ones, and greater production and warehouse flexibility to “stay in the game”. Therefore, there is room and need for logistics companies able to assist production companies with e-commerce requirements and operations.

It is noteworthy that the relationships between production companies and e-commerce portals may be of different types. For instance, manufacturing companies may refer to Amazon for contracts of different reach: just as a portal to showcase products while keeping in-house logistics and billing, or delegating transport and billing to Amazon while keeping warehousing in-house, or having Amazon providing complete logistics services with its own facilities and packaging, which relieves manufacturing companies from dealing with returned goods.

## 7. Conclusions

The interviews to 16 manufacturing companies in the metropolitan area of Turin (Italy) provided very interesting insights about their transport and logistics choices, including those concerning outsourcing transport and warehousing, as well as those regarding commercial terms that condition transport.

It was clarified that, contrary to a diffused belief, outsourcing of transport is a consolidated practice. Costs and issues related to in-house transport, including the management of transport staff, have driven manufacturing companies to entrust transport companies with their shipments. Own account transport still exists but only for minor tasks and it is carried out with small vehicles without dedicated staff.

Interviews revealed that rail is rarely used, due to its lack of flexibility, long times required for quotes if compared to road transport, and last mile costs perceived as difficult to control. Combined transport is occasionally used, due to perceived poor cargo security, except for shipments to Northern Europe.

Warehouse management is outsourced at 5 of the companies interviewed but, interestingly, all of them have assessed outsourcing it. Reasons against such an option range from small numbers of staff in the warehouse that work also on the production lines, to confidentiality, as well as logistics companies unable to deliver cost reductions.

Altogether, the interviews indicated that there is room for logistics companies to support manufacturing companies with warehousing and ancillary services such as packaging. It is also noteworthy that manufacturing companies related their difficulties with finding transport companies for specific goods or areas which shows a possible lack of visibility of some operators and, again, room for development of services.

The study clarified that INCOTERMS different from Ex-Works are often used and that the choice depends on the position or on the negotiating power of the parties. Moreover, often the choice is due to organizational reasons, be they the control of incoming flows or the need to ensure quality transport and delivery of the goods.

The standards recently imposed by the success of e-commerce created possibilities for logistics companies: manufacturing companies are not always ready to cope with the flexibility and the speed required and need support. E-commerce is key for B2C transactions but the support of commercial staff is critical for B2B sales.

Outsourcing of transport activities	Consolidated practice among manufacturing companies	<ul style="list-style-type: none"> <li>• New vehicles</li> <li>→ Satisfaction of constraints on emissions and modern powertrains</li> <li>• Medium-long distances</li> <li>→ Satisfaction of organisational needs and balancement of shipments</li> <li>• Professional drivers</li> <li>→ Satisfaction of professional requirements</li> </ul>
Own account transport	Mainly for short haul, local pick-ups, fairs	
Outsourcing of warehousing	Assessed by all, limited uptake Room for ancillary services, support for e-commerce	
Use of logistics sw	Scarce usage of SAP or WMS	
INCOTERMS	E and D type, depending on negotiating position and type of product	
e-commerce	Common for B2C, not for B2B; imposes prices and new logistics standards	
Rail/Combined	Limited use; long access times; security/organisational concerns	
Track+trace	Limited interest	
Demand	Manufacturers demand deliveries totally without damages	
Energy/Envirmt	Not a driver of logistics choices but manufacturers are open to innovation	
Professionals	Logistics professionals in SMEs often have other background	

Fig. 2. Summary results about outsourcing, commercial terms, e-commerce, track and trace, energy.

Concluding, the authors noted a generally limited knowledge of logistics, with related theories and methods, among manufactures, with people in charge of them coming from different backgrounds – often purchase departments – and lacking specialized knowledge, other than that acquired in day-to-day operations, that would be instead required to diagnose issues and characterize development opportunities.

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## References

- AA.VV. (2006). Accesso all'Autotrasporto di merci. EGAF. Forli.
- ACI-ANFIA (2013). Trasporto Merci su strada. Analisi economico-statistica delle potenzialità e criticità di un settore strategico per lo sviluppo sostenibile. Roma
- Beretta E., Dalle Vacche A. and Migliardi A. (2011). "Competitività ed efficienza della supply-chain: un'indagine sui nodi della logistica in Italia", Banca d'Italia, Le infrastrutture in Italia: dotazione, programmazione, realizzazione, Seminari e convegni, n. 7.
- Consulta Generale per l'Autotrasporto e la Logistica (2010). Il Piano Nazionale della Logistica 2011/2020. Ministero delle Infrastrutture e dei Trasporti.
- Spano, F.M. (2016). "Presupposti, vantaggi e svantaggi dell'outsourcing". Presentazione a durante l'evento dedicato a Outsourcing/in house: opportunità e rischi. Confindustria, Cuneo.
- Dalla Chiara B. (2015). "Sistemi di trasporto intermodali: progettazione ed esercizio", December 2015, ISBN: 978-88-8482-636-7, II ed. EGAF Editore
- Finelli R. (2006). Logistica dell'ultimo miglio: esternalizzare per competere meglio. Uomini e trasporti, 222.
- International Chamber of Commerce (2010). INCOTERMS 2010. International Chamber of Commerce. Paris.
- Langley, J. and Capgemini (2016). 2017 Third-Party Logistics Study. The State of Logistics Outsourcing. Results and Findings of the 21st Annual Study
- Lieb R.C. e Lieb K.J. (2014). Is Amazon a 3PL?. Supply chain logistics quarterly, 3
- Marchet G., Fossa A., Melacini M. e Frosi D. (2016). L'innovazione tecnologica e digitale per una logistica sempre più SMART. Osservatorio Contract Logistics. Politecnico di Milano.
- Papadopoulou C. (n.a). An overview of third party logistics industry. Centre for Transportation Studies. Massachusetts Institute of Technology.
- Terpolilli M. (2018). Veicoli autonomi e connessi per la consegna dei pacchi. In dossier su Trasporti e logistica, sfida per lo sviluppo. Il Sole 24 Ore.