

ORGANIZATION AND SUBCONTRACTING RELATIONSHIPS IN FRENCH ROAD HAULAGE.

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ABSTRACT.

Today road haulage is France's most important transport mode, proving its ability to meet shippers' demands. Road haulage has several success factors, some of which are technical (for example, the speed and density of the motorway and road network). Others are economic (the low price or road transport). Last but not least, relationships among road hauliers play a major role in competitiveness. Among other factors, the opportunity that large companies have to subcontract with very small ones, with very low fixed costs and great flexibility, is often quoted as a major advantage.

The ECHO survey, conducted in France in 2004, provides information on 10 000 shipments made by 3000 shippers. For each shipment, the survey gives details about the shipper, the

shipment itself, and each company providing transport or logistics services for that shipment.

The survey allows us to analyze subcontracting, by showing us each stage at which a shipment is contracted to the next carrier. This analysis reveals the frequency of subcontracting in France, and gives us the opportunity to study why subcontracts are made. Of course, some of the subcontracts are mainly cost driven. However, others aim at using the specialized skills of a particular haulier (a frequent service to a given destination, for example). Finally, the aim of some subcontracts is to increase transport chain efficiency.

The usual transport segments are studied : single parcel delivery service, parcel delivery service, less than truck load, full truck load. The share of shipments and the number of tonnes which fall under the purview of subcontracting are studied. For each transport segment, subcontracting is described in terms of size of companies involved, services provided, and the reason for subcontracting. These results demonstrate the main features of several different types of subcontracting relationships.

Beyond the search for low costs, the paper highlights the various forms of partnership between road hauliers.

Keywords : road haulage, subcontracting, partnership.

INTRODUCTION.

As in many other European countries today, road haulage is France's main transport mode, demonstrating its ability to meet shippers' demands. The success factors are numerous: some of them are technical (for example, the permitted speed and the density of the road and motorway network), others are economic (the low price of transport). Last but not least, relationships among road hauliers play a major role in competitiveness. Among other factors, the opportunity that large companies have to subcontract with very small ones with very low fixed costs and great flexibility is often quoted as a major advantage.

This paper's aim is to explain the various road haulage organizations and focuses on subcontracting.

The survey of French shippers (named "ECHO") provides an opportunity to study how "physical" characteristics of each shipment (weight, distance, value per weight unit) impact the organization, and the role of big and small carriers in this organization.

The ECHO survey, conducted in France in 2004, provides information about 10 000 shipments forwarded by 3 000 shippers. For each shipment, the survey gives details about the shipper, the shipment itself, and the companies providing transport or logistics services.

The first section is a quick summary of road haulage evolution since the eighties in France. Section 2 presents the ECHO database. The third section introduces the different kinds of organizations in road transport (in terms of numbers of carriers). Sections 4 and 5 show the strong link between two particular organizations, own account and integrators, and the physical

characteristics of shipments they deal with. Section 6 focuses on the relationship between shippers and carriers. Section 7 studies the relationships between carriers. Here, the different kinds of subcontracting, and what they reveal about how carriers seek competitiveness, will be explained.

1. THE EVOLUTION OF ROAD HAULAGE IN FRANCE.

During the eighties and nineties, except for agricultural products, flows of raw products tended to decrease, whereas manufactured goods increased. These trends are the consequences of new industry phenomena (Salini, 1997) :

- low labor costs in emerging countries justify the importations of manufactured instead of raw goods,
- concentration on the core business and specialisation of production units have meant potential productivity gains,
- the decrease in the average shipping weight allows a decrease in stocks.

The latter has been shown by Guilbault and Houée (to be published) and is of paramount importance to the transport industry.

This new way of organizing industrial production is made possible by strong improvements in supply chain management. Supply chain management is then defined as the link between scattered product units. (Savy, 2007). A striking effect is the rising use of road transport since the mid-eighties, since road transport is well adapted to small shipments.

Thus, as in many European countries, road haulage has increased to become, by far, France's primary transportation mode : In 2008, 87 % of tonne kilometres in France moved by road (CGDD, 2009).

Besides, road hauliers face an incessant pressure from customers to reduce costs while maintaining and improving effectiveness (Davies, Mason and Lalwani, 2007).

On the one hand, in order to adapt to the evolving market, the road hauliers sector has tended to become more concentrated since the mid-eighties. On the other hand, the number of small road haulage companies has increased dramatically. (Salini, 1997). At the same time, road haulage prices have decreased, and margins subsequently have decreased since the beginning of the nineties. (Bernadet, 1997).

This situation is often explained by the share between big and small road hauliers : big ones are supposed to be able to sell a whole service to shippers, subcontracting the only road haulage, whose margins are low, to small hauliers. (Cussy, 1993). In the Netherlands, road haulage is characterised by many family enterprises, with 81 % owning fewer than 10 vehicles. Small enterprises often fail and are used by larger firms for subcontracting (Karis and Dinwoodie, 2005).

The reality is not so straightforward : A.Sauvant (2007) emphasizes that subcontracting rates of big French companies for intercity road haulage are only about 15 % of their total sales. M.Savy (2007) explains that big and small companies need each other, and have a much more complex relationship than that described above.

Carbone and Stone (2005), studying European logistics service providers, most of whom are also road hauliers, quote three prime objectives that led 3 PLs to link. These are as follows :

- to enlarge and strengthen the geographical network concerning a specific business,
- to penetrate new markets, in terms of services,
- to penetrate new geographic markets, dominantly beyond Europe.

This paper aims to use figures to describe and quantify the relationships between road hauliers.

2. THE “ECHO” SURVEY.

The ECHO survey was conducted in France in 2004 (Guilbault, Gouvernal and Soppé, 2007). The aim of this survey was to provide a comprehensive description of transport chains based on the door-to-door tracking of each shipment, from the shipper to the final consignee. Shippers were also interviewed about their production constraints and transport practices. This information allows us to analyze the link between production and transport. The survey also allows us to study subcontracting between carriers, as the tracking of shipments includes trips and carriers involved.

“Shipment” is defined as a quantity of freight that is made available, at a given time, in order to be transported during a single transport operation from a given shipper to a given consignee. It is the natural observation unit for reconstructing transport chains. The shipment is a representation of transport closely integrated with the production and distribution process. It allows us to understand the economic context of the exchange of goods.

The ECHO survey was based on the observation of 2 935 shippers and 10 462 shipments, of which 24 % were international, and 9 742 transport chains.

The survey covered sites with 10 or more employees in the wholesale trading and industrial sectors, not including mining, building and construction. It also covered mail-order companies, farm cooperatives, warehousing services and industrial waste treatment centres. The total of about 70 000 sites surveyed covers all of metropolitan France; the average sampling rate was 4 %. These characteristics of the survey scope affected the portrayal of the total traffic measured in that they excluded almost all large bulk shipments of raw intermediate goods (raw oil products, solid mineral fuels, ores and minerals, raw construction materials such as sand and gravel). Nevertheless, a large range of sectors was covered, in particular those undergoing the most rapid change. In terms of national transported tonnages (national shipments and the part of export transport which occurs within French territory), in 2004 this scope represented

approximately 47 % of total tonnage. When the large bulk shipments mentioned above are excluded, this scope accounted for 84 % of total tonnage.

Another characteristic of the survey scope relates to the choice of shipments that were surveyed. It was decided to consider all freight shipments with no limit other than a minimum weight of 1 kg. The selection of this very low threshold enables us to highlight the very large number of small shipments which are an important aspect of the modern economy. The frequency and size of shipments are closely linked, so the representation of heavy shipment was increased.

Interviewing some integrators (Fedex, UPS, DHL, TNT, Exapaq, Chronopost, La Poste) was not possible. The integrators' websites listed the trips by origin and destination of the shipments, but the different carriers involved in each shipment are not known.

3. OVERVIEW OF DIFFERENT TYPES OF ORGANIZATIONS.

In this section, for every defined market segment, the shares of different types of transport organizations are given, especially those which involve subcontracting.

The freight transportation market is not homogeneous. We use the following shipping weight categories to define the different market segments :

- Up to 30 kg : single parcel delivery service
- Between 30 kg and 300 kg: parcel delivery service
- Between 300 kg and 3 t (metric tonne) : less than truck load (LTL)
- Between 3t and 30 t (in fact 25 t): full truck load (FTL).

These market segments are not only a matter of trade : these different weight categories use different networks (storage facilities and haulage lines).

The choice of these categories can be discussed and criticized, but results for each market segment are more relevant than results aggregating the market segments, as each market segment is a very different situation.

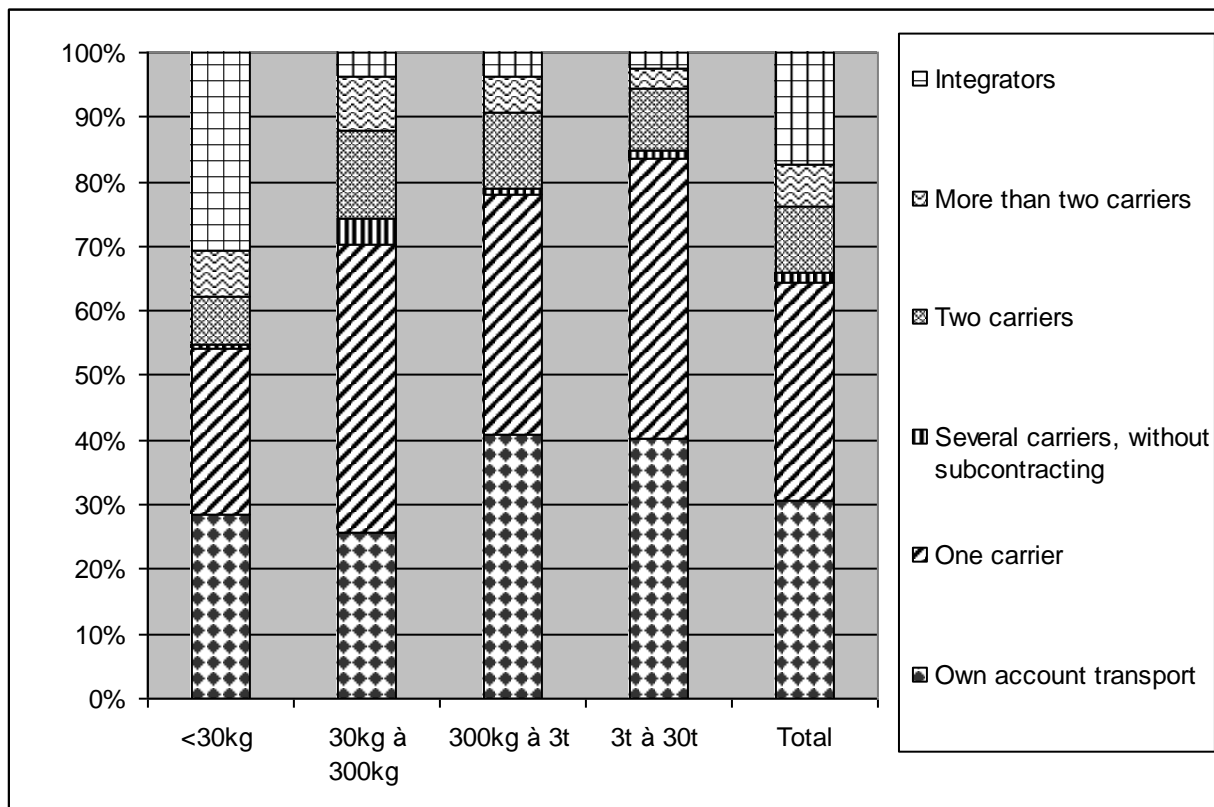
In order to focus on subcontracting, the type of organization is defined by the number of carriers involved in the shipment forwarding:

- own account transport : the shipment is carried by the shipper,
- one carrier : only one carrier transports and provides logistic services for the shipment;
- several carriers, without subcontracting : several carriers transport and/or provide logistic services for the shipment, each of them contracting directly with the shipper.
- two carriers : one carrier contracts with the shipper, and subcontracts partly or totally to another carrier;
- more than two carriers : one carrier contracts with the shipper, and subcontracts partly or totally to more than one carrier;

- integrators : as explained in the previous section, integrators correspond to several companies (Fedex, UPS, DHL, TNT, Exapaq, Chronopost, La Poste) which were not possible to interview. Integrators are then excluded from the final stages of the analysis, as explained in part 6.

Figure 1 shows that “own account transport” and “one carrier”, without any subcontracting, are the two main types of organizations, carrying 65 % (31 % “Own account transport”, 34 % “One carrier”) of shipments (for all weights of shipments). This share increases with the shipment’s weight, from 54 % for shipments under 30 kg, to 84 % for shipments heavier than 3 t. Other kinds of organizations deal with less than 15 % of shipments, except integrators which deal with 31 % of light shipments under 30 kg.

Figure 1. – For each market segment, share of different kinds of organizations, in % of shipments.



Two weight values act as thresholds :

- below 30 kg, integrators take a large share of shipments (30 %)
- above 30 kg, the “one carrier” organization becomes important (around 40 % of shipments)
- above 300 kg, own account increases to reach 40 % of shipments.

The following sections show the link between “physical” characteristics of the considered shipment (weight, distance, value per weight unit) and the transport organization. Two types of

organizations show a strong link with physical characteristics of the shipment : own account transport, and integrators.

4. OWN ACCOUNT TRANSPORT.

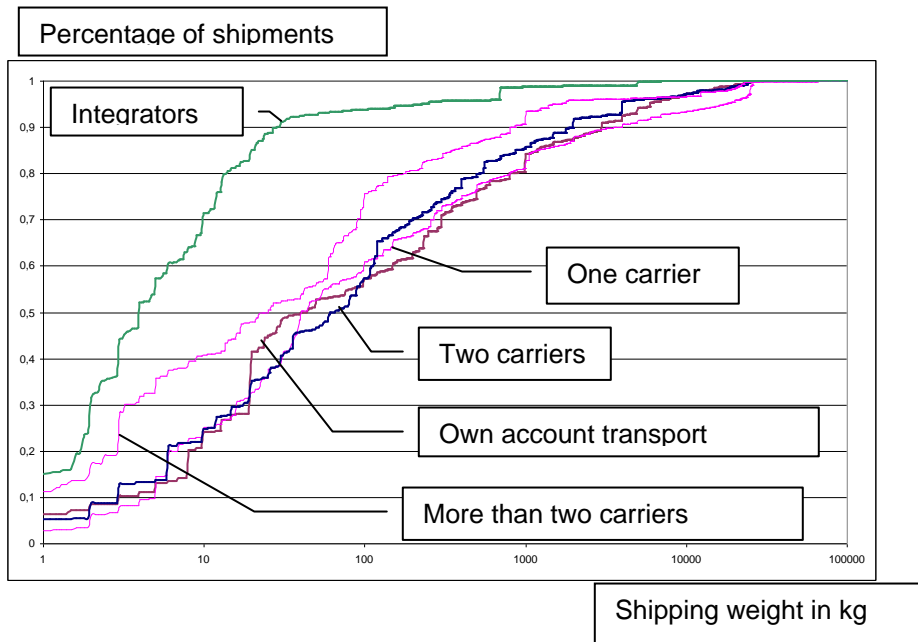
Own account transport (OAT) is the organization used for 31 % of shipments and 30 % in tonnes, in the “ECHO” field, described in section 2.

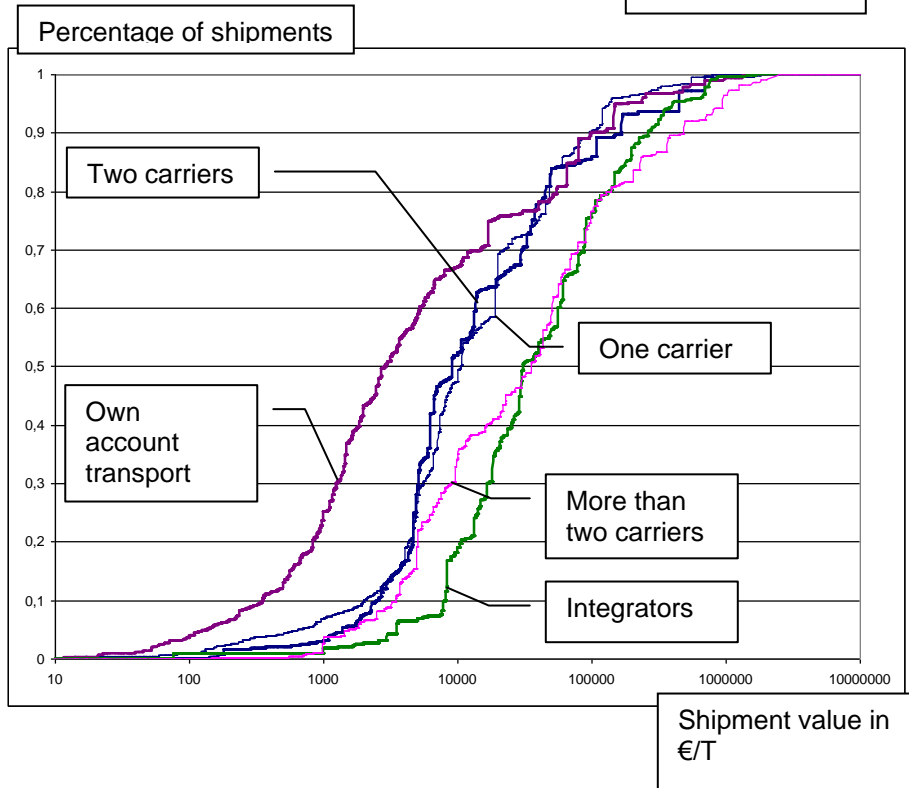
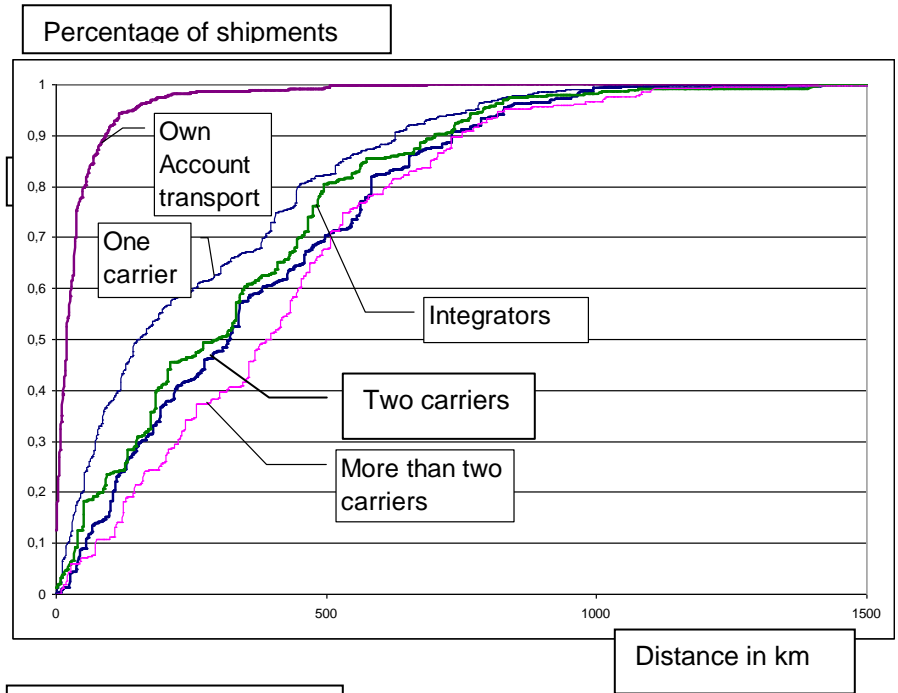
Figure 2 gives distributions of shipping weight, distance and value per tonne for each type of organization. For instance, the first graph gives the distribution of shipping weights : for a given shipping weight, a curve gives, for the considered organization, the share of shipments below or equal to this weight, out of the total number of shipments.

It appears that shipping weights carried by OAT are similar to those forwarded by other types of organizations; but distance and value per weight unit are remarkably lower. In more than 70 % of cases, shipments forwarded by OAT are part of a round trip. A round trip is a trip beginning and ending at the same place, allowing the delivery of goods to several clients.

Unfortunately, ECHO was not designed to accommodate OAT. The ECHO survey does not give detail about the inner organization of OAT, so the analysis cannot go further.

Figure 2 – Distributions of shipments weight, distance and value for each kind of organization.





5. INTEGRATORS.

Integrators are chosen for 17 % of shipments and 1.5 % of tonnes, for the “ECHO” field.

Figure 2 shows that integrators are chosen for shipments of low weight and rather high value per

tonne. This is consistent with the use of “just in time” transport for goods which can’t be stocked in big amounts, considering their value.

Integrators were not possible to interview. Thus, their own subcontracting can’t be analysed, although these kinds of carriers are known for their subcontracting.

In this first section, we saw that OAT and integrators forward very particular shipments in terms of weight, distance and value per weight unit. The ECHO survey doesn’t enable further investigations for these organizations. We also saw that other types of organization (one carrier, two carriers, more than two carriers) cannot be distinguished by analysing Figure 2. Further investigations must be undertaken to explain why these types of organizations were chosen. In the following sections we analyse each stage of the organization : the relationship between shipper and carrier, and between carriers.

6. RELATIONSHIP BETWEEN SHIPPER AND CARRIER.

OAT and integrators are now excluded from the analysis. Thus we are now analyzing 52 % of the shipments, and 68.5 % of the tonnes.

Two features are used to characterize the carriers : the number of employees, and the relative position of the two carriers working in partnership. The nature of service provided by the carrier being analyzed is also examined.

First of all, we focus on the nature of service the shipper entrusts the carrier with, then on the contract between the shipper and the carrier.

6.1. Kind of service provided by carrier to shipper.

6.1.1. Categories used for the analysis.

The “ECHO” database gives details about the services provided by the transport carrier using the following categories :

- material operation directly linked to transport : this refers to a material operation such as change of vehicle, providing a container, or loading/unloading a container...
- tracing : this refers to tracing by information technology.
- freight forwarding with a trip : the carrier carries out part or all of the freight forwarding, and at least a part of the transport,
- freight forwarding without a trip : the carrier carries out part or all of the freight forwarding, but not the transport : the transport is subcontracted to another carrier.
- formalities : formalities such as quality control, customs formalities,
- stocks management and picking,
- post-manufacturing,
- warehousing,

- customs transit in ports or airports, handling.

In order to simplify the analysis, three groups of services are used, which are representative of the levels of service :

- the low service level is for shipments requiring no other service except transport, or only “material operations directly linked to transport”,
- the intermediate service level is for shipments requiring value-added services related to transport : these shipments do or do not require “material operations directly linked to transport” and either one or both of the following services : “freight forwarding with a trip”, or “tracing” (using information technology) . We stress that this kinds of services are the ones required for consolidation and deconsolidation.
- The high service level is the previous level with one or both of the following services : “stock management and picking”, and “formalities”. These services go beyond simple transport, or else they deal with international transport, which requires specific knowledge.

Other cases are services combinations which don’t fit into our three “service levels”. This can be an isolated service such as only “warehousing” only.

6.1.2. Share of each service level.

We count the share of each service level by building a tree, each branch of the tree representing “yes” or “no” for the fulfilment of a service. We start by the most frequent service (material operations), then for the second most frequent (tracing) and so on. Table 1 gives the results of this classification.

Table 1 –Level of services provided to shipments, for each market segment.

Level of services	Share of total shipments “ECHO” field.	Share of total weight “ECHO” field.	Shipping weight			
			Below 30 kg, in shipments.	Between 30 and 300 kg, in shipments	Between 300 kg and 3 tonnes, in shipments	Between 3 and 30 tonnes, in shipments
Low	13 %	29 %	8 %	11 %	18 %	33 %
Intermediate	33 %	24 %	45 %	29 %	23 %	17 %
High	38 %	29 %	28 %	44 %	38 %	24 %
Other cases	16 %	18 %	19 %	16 %	22 %	26 %
Total	100 %	100 %	100 %	100 %	100 %	100 %

OAT and integrators excluded.

38 % of shipments require a high level of services. For each market segment, this share is bigger than 24 %, and is particularly big for shipments between 30 kg and 300 kg. A further analysis shows that only 5 % of shipments below 30 kg require stock management and picking.

This can partly explain the relatively low rate of high level services provided to these shipments.

33 % of shipments require an intermediate level of services. This level, which reveals the consolidation and deconsolidation operations, is required for nearly one out of two shipments for those shipments below 30 kg, but only for 17 % of heavy shipments. Integrators and OAT are not included in the analysis, but these organizations often provide high and intermediate levels of shipping service.

A low level of services is provided for only 13 % of total shipments. This share is strongly related to shipping weight : for heavy shipments, this low service level is provided one out of every three times, whereas for small shipments, it is provided only 8 % of the time. This explains why 29 % of the tonnes in the ECHO field fall into the “low” service level category.

Table 1 shows that a large part of the services provided to shipments is directly linked to the consolidation and deconsolidation requirements : these are present in the intermediate and high service levels, which account for 71 % of shipments, and 53 % of tonnes.

Shipments above 3 tonnes (33 % of shipments) often require a low level of services, but quite often too, a high level of services, and combinations of services which don't fit into our three “service levels”. Transport for this weight category can't be reduced to road haulage only : the variety of situations is great, as some shipments of this weight require consolidation, some don't, and some require other kinds of services.

6.2. Transport agreement between shipper and carrier.

The first question about transport organization is to know who decides it. In the ECHO field, the first carrier is nearly always (95 % of cases) chosen by the shipper. The consignee chooses the first carrier in only 5 % of cases. This underlines the important role of shippers in transport organization.

To what extent do shippers contract with large versus small carriers ? Table 2 answers this question for each market segment.

Table 2 – For each market segment, size of the carrier commissioned by the shipper.

Size of carrier in number of employees	Shipping weight. % of shipments.				
	Below 30 kg	Between 30 and 300 kg	Between 300 kg and 3 tonnes	Between 3 and 30 tonnes	All weight categories (% of tonnes)
Below 20	26 %	6 %	9 %	11 %	15 % (11%)
Between 20 and 49	5 %	6 %	8 %	23 %	7 % (22%)
Between 50 and 99	7 %	3 %	9 %	13 %	7 % (13 %)
Between 100 and 499	11 %	16 %	32 %	29 %	18 % (25 %)
More than 500	51 %	69 %	42 %	24 %	53 % (29 %)
Total	100 %	100 %	100 %	100 %	100 % (100 %)

OAT and integrators excluded.

In general, the lower the shipping weight, the larger the market share belonging to large carriers. The exception is for shipments below 30 kg, where small companies are relatively frequent, making up 26 % of shipments. This is due to carriers who transport short distances : two thirds of the shipments carried by these small companies are carried less than 50 kilometres.

This observation can be explained by the requirements of consolidation for small shipments :

- a network of consolidation facilities, with accompanying staff, to cover a large territory,
- a high number of shipments in order to make them profitable,
- efficient information systems, to monitor the high number of shipments.

Big companies more easily meet these requirements than small ones, and are able to build such a service with a high number of employees and large assets. These requirements tend to decrease when the shipping weight rises : they are weaker for LTL than for parcel delivery service, and tend to vanish for FTL shipments when no consolidation is needed. In this last case, big companies as well as small ones are able to fulfil shipper's requirements.

Before detailing subcontracting between carriers, the following features of shipments forwarded by only one carrier have to be stressed.

Shipments forwarded by only one carrier are heavier than the average, and are heavier than the average weight of shipments forwarded by carriers who subcontract a part of the transport (namely 1.8 tonnes, 1.3 tonnes and 0.6 tonne). As shown in Table 3, they are more often

forwarded by small carriers, even if big companies are the most frequent.

Table 3 – Share of shipments carried by large and small carriers (commissioned by the shipper) for two cases : the carrier doesn't subcontract, and the carrier subcontracts.

Size of carrier	No subcontracting	Subcontracting
Below 20 employees	18 %	6 %
Other sizes	32 %	30 %
More than 500 employees	50 %	64 %
Total	100%	100 %

We have shown that shipping weight, and then the consolidation operations, determine a large part of the services provided for the shipment; and also strongly determine the carrier size.

This section examined the contract between the shipper and the carrier. The next section examines the contract between carriers, when some services are subcontracted by the first carrier.

7. SUBCONTRACTING BETWEEN CARRIERS.

OAT and integrators are still excluded from the analysis. Shipments without any subcontracting are also excluded. As the aim is to explain relationships between road hauliers, shipments commissioned by the shipper to forwarding agents are also excluded. The following analysis therefore concerns 14 % of shipments (see Figure 1), and 7 % of tonnes of the total ECHO field.

7.1. Six different kinds of subcontracting.

Six different kinds of subcontracting are distinguished. This is based on how the carriers define their role for the shipment in question (forwarder, road haulier, non-road carrier) and on whether or not the carrier and subcontractor belong to the same conglomerate. These six kinds of subcontracting are detailed below :

- road haulage subcontracting : a road haulier subcontracts to another haulier, not a member of the same conglomerate,
- road haulage co-contracting : a road haulier subcontracts to another haulier, a member of the same conglomerate,
- subcontracting as a purchase : the company which subcontracts is a forwarding agent or a railway, air or maritime carrier,
- logistics subcontracting : the subcontractor does not do road haulage nor freight forwarding,
- subcontracting to a forwarding agent,
- subcontracting to a non-road carrier (railway, air, maritime).

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It's important to stress that the ECHO database gives information on the shipment, on the subcontractors and along the trips chain. When the shipment is subcontracted to another carrier, the latter can consolidate this shipment with others going in the same direction or to the same consignee. The shipment forwarded by the subcontractor is then heavier than the initial shipment. The Echo database gives information only about the initial shipment. For example, when a carrier consolidates LTL shipments on its consolidation facility and subcontracts the haulage, a 500 kg shipment can be consolidated with 10 tonnes of other shipments; in this case, the ECHO database would continue consider the 500 kg shipment.

What kind of subcontracting is the most frequent ? Table 4 answers this question, giving the share of shipments concerned by each kind of subcontracting.

Table 4 – For two types of organization, the share of shipments for each kind of subcontracting (in % of shipments).

Type of organization	Kind of subcontracting					
	Road haulage		Subcontracting as a purchase	Logistic subcontracting	Subcontracting to a forwarding agent	Subcontracting to a non-road carrier
	Sub-contracting	Co-contracting				
Two carriers	56 %	37 %	/	3%	/	0 %
More than two carriers	65 %	41 %	24 %	8 %	24 %	5 %

For “two carriers” organizations, total is below 100 % because characteristics of some carriers have not been quoted in the ECHO database. For “more than two carriers” organizations, the total is above 100 % because there are at least two, and often more than two subcontracts in these organizations.

Table 4 shows that road haulage subcontracting is the main kind of subcontracting : this kind of subcontracting occurs in 56% of “two carriers organizations”, and 65 % of “more than two carriers organizations”. “Co-contracting” is also frequent : it occurs in 37 % of “two carriers organizations”, and in 41 % of “more than two carriers organizations”.

Logistic subcontracting is scarce, showing that, in 2004, logistic services were mainly provided in association with transport.

Subcontracting to a forwarding agent occurs one time out of four in “more than two carriers” organizations, showing that forwarding agents are commissioned not only to deal with a whole shipment, but also as subcontractors, to provide a particular service.

The next section deals with road haulage subcontracting. For the two main kinds of subcontracting, we will focus on several features (size of carriers involved, services provided by the subcontractor, reason of subcontracting) to describe relationships between the carriers.

7.2. Road haulage subcontracting : size of carriers involved.

Table 5 - Road haulage subcontracting. Size of carrier and its subcontractor, in % of subcontracts.

Carrier's number of employees	Subcontractor's number of employees					Total
	Below 20	Between 20 and 49	Between 50 and 99	Between 100 and 499	More than 500	
Below 99	2.4 % (70)	1.1 % (44)	2 % (26)	2 % (38)	4.3 % (30)	11.8 %
Between 100 and 499	2.7 % (37)	11 % (60)	1.7 % (34)	4.8 % (48)	6.5 % (46)	26.7 %
More than 500	21 % (120)	8.3 % (87)	3.8 % (42)	8.8 % (63)	19.6 % (115)	61.5 %
Total	26.1 %	20.4 %	7.5 %	15.6 %	30.4 %	100 %

The figure between brackets gives the number of records in the ECHO database.

The analysis of the Table 5 "Total" column and row leads to the following conclusions :

- Carriers who subcontract are mainly big companies : carriers of more than 500 employees represent 61.5 % of subcontracting between two carriers not belonging to the same conglomerate. This corroborates that few carriers subcontract (half of subcontracting, measured in amount of money, is done by less than 5 % of carriers) , and subcontracting use, in terms of turnover share, increases with carrier size (Podevin, 2001)
- Large carriers are often also subcontractors of smaller carriers. This shows that the case of large carriers subcontracting to smaller ones is not the only case by far, even if it is the most frequent. The relationship between big and small companies is more tricky than simple "master and servant". Lionnel Grand (1997) explains that a carrier may subcontract to fulfil his client's needs, concentrating his own means on strategic or profitable tasks : in this system, every carrier may subcontract, or be a subcontractor.

A further analysis of Table 5 shows that the two main cases of subcontracting can be isolated. These two cases, "large carrier subcontracting to small one" and "large carrier subcontracting to another large carrier" each represent roughly 20 % of the total.

Analysing each market segment (single parcel delivery service, parcel delivery service, LTL) leads to the same conclusion.

Analysis of the FTL segment gives different results (178 records in the database) : carriers between 100 and 499 employees subcontract the most : 71 % of subcontracting is generated by these carriers. This is quite striking because carriers between 100 and 499 employees deal with only 29 % of shippers' needs for FTL transport (see Table 2). Subcontractors are often carriers

with between 20 and 49 employees (64 % of FTL subcontracting cases). The ECHO sample for FTL is not big enough to say more.

In the following chapter, we are looking to characterize these different kinds of subcontracting.

7.3. Road haulage subcontracting : Consolidation networks and FTL.

Here, we call organizations dealing with shipments of up to 3 tonnes “consolidation networks”, because using consolidation facilities, where consolidation is performed, is the most frequent way to deal with shipments of up to 3 tonnes.

FTL, dealing with shipments above 3 tonnes, generally uses other systems of organization. Either a single shipment is big enough to fill the lorry, or the shipments are collected via a round trip, without using a consolidation facility.

Table 6 – Features of main subcontracting cases. % of subcontracts.

		Subcontracting case.		
		Consolidation network		Full truck load.
		First case (big carriers subcontracting to small ones)	Second case (big carriers subcontracting to big ones)	
Level of service	High	19 %	52 %	25 %
	Intermediate	11 %	31 %	6 %
	Low	67 %	16 %	66 %
	Other cases	3 %	1 %	3 %
	Total	100 %	100 %	100 %
Location of carriers' agencies	Same region	87 %	29 %	52 %
	Different regions	13 %	71 %	48 %
	Total	100 %	100 %	100 %
Subcontracting reason	Transport plan application	41 %	8 %	10 %
	Search for low costs	31 %	21 %	10 %
	Lack of vehicle	17 %	8 %	12 %
	Unusual freight or destination	15 %	53 %	49 %
	Outsourcing of drayage	18 %	34 %	9 %

In the first “consolidation network” subcontracting case (big carriers subcontracting to small ones, shipments below 3 tonnes):

- the subcontractor provides a low level of service two times out of three (67 % of cases),
- the big and small carriers’ agencies involved in the subcontracting are usually (87 % of cases) located in the same region.

This case fits the “low product complexity/low asset specificity” outsourcing case described by Vining and Globerman (1999). According to them, this combination provides the clearest case for outsourcing.

In the second “consolidation network” subcontracting case (big carriers subcontracting to big ones, shipment below 3 tonnes) :

- the subcontractor provides a high level of service in 52 % of cases, and an intermediate level of service in 31 % of cases,
- the carriers’ agencies involved in the subcontracting are usually located in different regions(71 % of cases).

When the subcontracting reason, given by the carrier who subcontracts, is examined, strong differences are observed :

- in the first case described above, “transport plan application”, “search for low costs” and “lack of vehicle” are quoted more often than in the second case of subcontracting (41 %, 31 % and 17 % of cases, to compare to 8 %, 21% and 8 %),
- in the second subcontracting case, “unusual freight or destination”, and “outsourcing of drayage” are more often quoted than in the first subcontracting case (53 % and 34 % of cases compared with 15 % and 18 %).

Other reasons appear at a similar rate for both subcontracting cases.

For the FTL segment, subcontractors provide a low level of service two times out of three, but also a high level of service one time out of four.

Analysis of subcontracting reasons for each market segment shows particular features for FTL : the “unusual cargo or destination” is quoted in one subcontracting out of two, whereas “search for low costs” is rarely quoted.

7.4. Road haulage co-contracting

Table 7 shows that co-contracting is mainly present for single parcel delivery service or parcel delivery service.

Table 7 - Co-contracting and subcontracting distribution in each market segment.

Shipment weight	Below 30 kg	Between 30 and 300 kg	Between 300 kg and 3 t	Between 3 t and 30 t	Total
Co-contracting	48 %	45 %	6 %	1 %	100 %
Sub-contracting	43 %	33 %	19 %	5 %	100 %

Co-contracting (689 records in the “ECHO” database) is mainly (89 % of cases) a relationship between two big carriers (more than 500 employees).

The level of service provided by the subcontractor is mainly intermediate (44 % of co-contracting) and high (42 % of co-contracting).

The two carrier agencies involved in co-contracting are mainly located in the same region (73 % of co-contracting).

Co-contracting has then the same features as subcontracting between two big companies.

CONCLUSION.

Road hauliers interact through a wide range of organizations : there is no absolute organization rule, and there are many cases which run counter to the main trends we observe.

The ECHO database gives us a better knowledge of subcontracting. First of all, subcontracting between road hauliers is not that frequent, since ECHO database analysis (excluding “own account transport” and “integrators”) show that subcontracting is present in only 14 % of shipments (7 % of shipments in tonnes).

The various analyses performed enable a better understanding of road haulage organization.

A major phenomenon has taken place these last twenty years : a decrease in the shipping weight. This has required consolidation and deconsolidation facilities, key elements of asset demanding networks. These requirements have made the advent of big carriers easier; these big carriers are commissioned by shippers in more than one case out of two for shipments lighter than 300 kg, and are still strongly present for shipments up to 3 tonnes.

For three road haulage segments, having in common the use of consolidation networks (single parcel delivery service, parcel delivery service, less than truck load) , it is mainly big companies that subcontract. Two main kinds of subcontracting can be distinguished :

- Large carrier subcontracting to a small carrier located in the same region, who provides a low service level. This kind of subcontracting is more often motivated by application of a transport plan, costs, and a lack of means such as lorries and drivers than is the other kind of subcontracting.

*Organization and subcontracting relationships in French road haulage.
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- Large carrier subcontracting to another large carrier, the offices of the carriers involved located in two separate regions, and the subcontractor providing a high service level. This kind of subcontracting is more often motivated by the subcontractors' network possibilities than is the other kind of subcontracting, even if low costs remains a necessary condition.

For the full truck load segment, which requires lower assets than other segments discussed above, large carriers are less frequently commissioned by shippers : shipments are forwarded, with similar shares (around 25 %), taken by large carriers (more than 500 employees) and by smaller carriers (100 to 499 employees, and 20 to 49 employees) (Table 2). Subcontracting is mainly conducted by a fairly large carrier (100 to 499 employees), whereas small carriers (20 to 49 employees) are more often subcontractors. All FTL subcontracting is chiefly motivated by the ability of the subcontractor to deal with an usual cargo or destination.

Beyond the search for low costs, subcontracting is also strongly motivated by the will to use the subcontractor's specialized skills. In transport, these are 1) a particular destination or region, 2) a particular cargo, or 3) a particular service combining destination, departure timetable, and transit time.

Comparisons of subcontracting habits from different countries would be interesting, but unfortunately databases similar to ECHO, with the same accuracy, do not exist in other countries to our knowledge.

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